

PERPETUAL
TROUBLE SHOOTER'S MANUAL

Reg. U.S. Pat. Off.

VOLUME XVI



JOHN F. RIDER PUBLISHER, INC.

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PERPETUAL TROUBLE SHOOTER'S MANUAL

Volume VI	Volume XI
Volume VII	Volume XII
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Volume X	Volume XV

Volumes I to V, Abridged

MASTER INDEX
Volumes I to XV

AUTOMATIC RECORD CHANGERS AND RECORDERS

AN HOUR A DAY WITH RIDER

on

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D-C. VOLTAGE DISTRIBUTION IN RADIO RECEIVERS
ALTERNATING CURRENTS IN RADIO RECEIVERS



A-C. CALCULATION CHARTS, by R. LORENZEN
UNDERSTANDING MICROWAVES, by V. J. YOUNG

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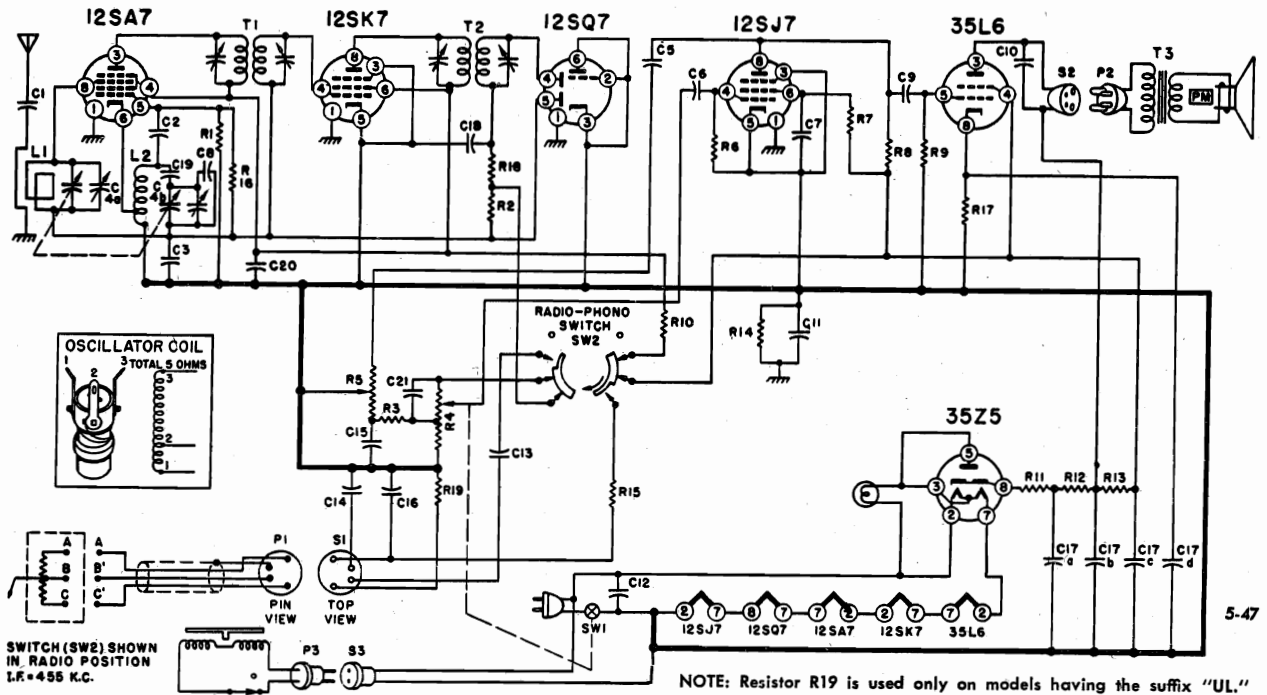
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ADMIRAL CORPORATION

MODEL 7C62, Chassis 6M1
 MODELS 7RT41, 7RT42, 7RT43



MODELS 7RT41, 7RT42, 7RT43

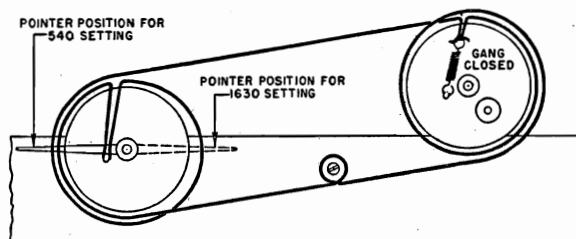
MODEL 7C62

ALIGNMENT PROCEDURE

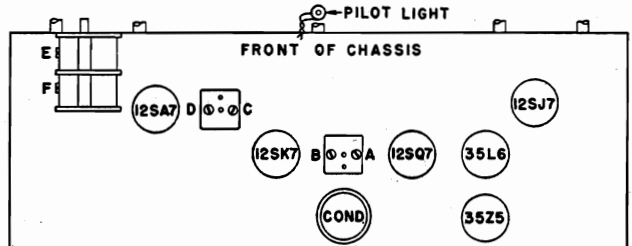
1. Connect Output Meter across Voice Coil.
 2. Turn Receiver Volume Control—full on.
 3. Use lowest Output setting of Signal Generator
 4. Repeat adjustments to insure good results.
- capable of producing adequate Output Meter indication and then proceed in the following sequence.

Connect Signal Generator to—	Dummy Antenna Between Radio and Generator	Set Generator Frequency to—	Set Receiver Dial Frequency to—	Adjust Following Trimmers	Type of Adjustment
Tuning Condenser Antenna Stator	250 mmfd. Condenser	455 K.C.	High frequency end of Dial	A-B—2nd I. F. C-D—1st I. F.	Adjust to maximum Output
Tuning Condenser Antenna Stator	250 mmfd. Condenser	1630 K.C.	High frequency end of Dial	E—Osc.	Adjust to maximum Output
Loop radiator (or place lead from generator close to loop of set to obtain adequate signal)	No actual connection between set and generator.	1400 K.C.	Tune in generator signal	F—Ant.	Adjust to maximum Output

DIAL CORD STRINGING & POINTER SETTING



TOP VIEW



MODEL 7C62
 MODELS 7RT41, 7RT42,
 7RT43

ADMIRAL CORPORATION

MODEL 7RT41, 7RT42, 7RT43

REPLACEMENT PARTS

RESISTORS			CONDENSERS			CABINET PARTS		
Symbol	Description	Part No.	Symbol	Description	Part No.	Description	Part No.	
R1	22,000 Ohms, 1/2 Watt	60B 8-223	C11	.18 mfd., 200 Volts, Paper	64A 2-2	Cabinet Body Less Lid (7RT41)	34D 11-11	
R2	1 Megohm, 1/2 Watt	60B 8-105	C12	.05 mfd., 400 Volts, Paper	64B 1-22	Cabinet Lid (7RT41)	34D 11-10	
R3	27,000 Ohms, 1/2 Watt	60B 8-273	C13	.001 mfd., 600 Volts, Paper	64B 1-15	*Cabinet, Wood (7RT42)	35D 47	
R4	1 Megohm Volume Control (Tapped at 500,000 ohms)	75B 2-6	C14	.05 mfd., 400 Volts, Paper	64B 1-25	*Cabinet, Wood, Walnut (7RT43)	35D 48-1	
R5	2 Megohm Tone Control and Switch SW1	75B 1-12	C15	.01 mfd., 400 Volts, Paper	64B 1-24	*Cabinet, Wood, Mahogany (7RT43)	35D 48-2	
R6	4.7 Megohms, 1/2 Watt	60B 8-475	C16	.1 mfd., 200 Volts, Paper	64B 1-30	Clip, Dial Glass Mounting (7RT43)	18A 12	
R7	1.8 Megohms, 1/2 Watt	60B 8-185	C17a	30 mfd., 150 Volts	Elect.....67A 14-1	Dial Scale, Glass (7RT41-7RT42)	21B 35-1	
R8	100,000 Ohms, 1/2 Watt	60B 8-104	C17b	30 mfd., 150 Volts		Dial Scale, Glass (7RT43)	21B 33-1	
R9	470,000 Ohms, 1/2 Watt	60B 8-474	C17c	20 mfd., 150 Volts		Escutcheon, Overlay (7RT41-7RT42)	23C 23-1	
R10	100 Ohms, 1/2 Watt	60B 8-101	C17d	20 mfd., 25 Volts		Grille, Inside	16C 1	
R11	33 Ohms, 1 Watt	60B 28-3	C18	250 mmfd. ±20%, Ceramic	65B 6-5	PHONOGRAPH PARTS		
R12	220 Ohms, 1 Watt	60B 28-7	C19	.02 mfd., 200 Volts, Paper	64B 1-24	Note: See record changer manual for complete parts list.		
R13	1,000 Ohms, 1 Watt	60B 28-2	C20	.05 mfd., 400 Volts, Paper	64B 1-22	Cartridge and Needle, Pickup.....A 1372		
R14	150,000 Ohms, 1/2 Watt	60B 8-154	C21	500 mmfd. ±20%, Ceramic	65B 6-6	Centerpost .....G400B137-1		
R15	22,000 Ohms, 1/2 Watt	60B 8-223	COILS, TRANSFORMERS, ETC.			Drive Disc Assembly.....G 400A 179		
R16	10 Megohms, 1/2 Watt	60B 8-106	L1	Antenna, Loop	69B 13	Idle Wheel (407B3 Motor).....G 400A 23		
R17	150 Ohms, 1 Watt	60B 14-151	L2	Coil, Oscillator	69A 14	Idle Wheel (407B1 Motor).....G 400A 57		
R18	100,000 Ohms, 1/2 Watt	60B 8-104	T1	Transformer, 1st I.F.	72B 3	Motor, 60 Cycle 115 Volt A.C.....407B 3-2		
R19	33,000 Ohms, 1/2 Watt	60B 8-333	T2	Transformer, 2nd I.F.	72B 4	Pickup Cable and Plug.....A 1322		
CONDENSERS			T3	Transformer, Output	98A 17	MISCELLANEOUS		
C1	.005 mfd., 600 Volts, Paper	64B 1-12	Speaker (5") & Output Transformer .....78B 19-1			Background, Dial.....22B 9-1		
C2	50 mmfd. ±20%, Ceramic	65B 6-4	SWITCHES, PLUGS & SOCKETS			Bracket, Tuning Shaft.....15A 152		
C3	.1 mfd., 200 Volts, Paper	64B 1-30	P1	Plug, Pickup	88A 8-5	Bracket, Dial.....15B 151		
C4a	Gang, 0 to 420 mmfd.	68B 5	P3	Plug, Motor	88A 8-1	Cord, Dial (48").....50A 1-3		
C4b	Gang, 0 to 162 mmfd.	68B 5	S1	Socket, Phono	88A 8-6	Drum, Dial.....17A 14		
C5	.002 mfd., 600 Volts, Paper	64B 1-14	S3	Phono-Motor Socket & Leads (Female connector)	89A 6-3	Grommet, Rubber.....12A 1-2		
C6	.01 mfd., 400 Volts, Paper	64B 1-25	SW1	Part of Tone Control R5		Knob.....33A 19-1		
C7	.05 mfd., 400 Volts, Paper	64B 1-22	SW2	Switch, Radio-Phono	77A 16-2	Pilot Light #47.....81A 1-8		
C8	15 mmfd. ±20%, Ceramic	65B 6-18						Pilot Light Socket and Leads.....82A 2-3
C9	.01 mfd., 400 Volts, Paper	64B 1-25						Pointer.....25A 21
C10	.03 mfd., 400 Volts, Paper	64B 1-23						Pulley, Fibre Dial 1/8"x1/2" O.D.....17A 1-3

MODEL 7C62

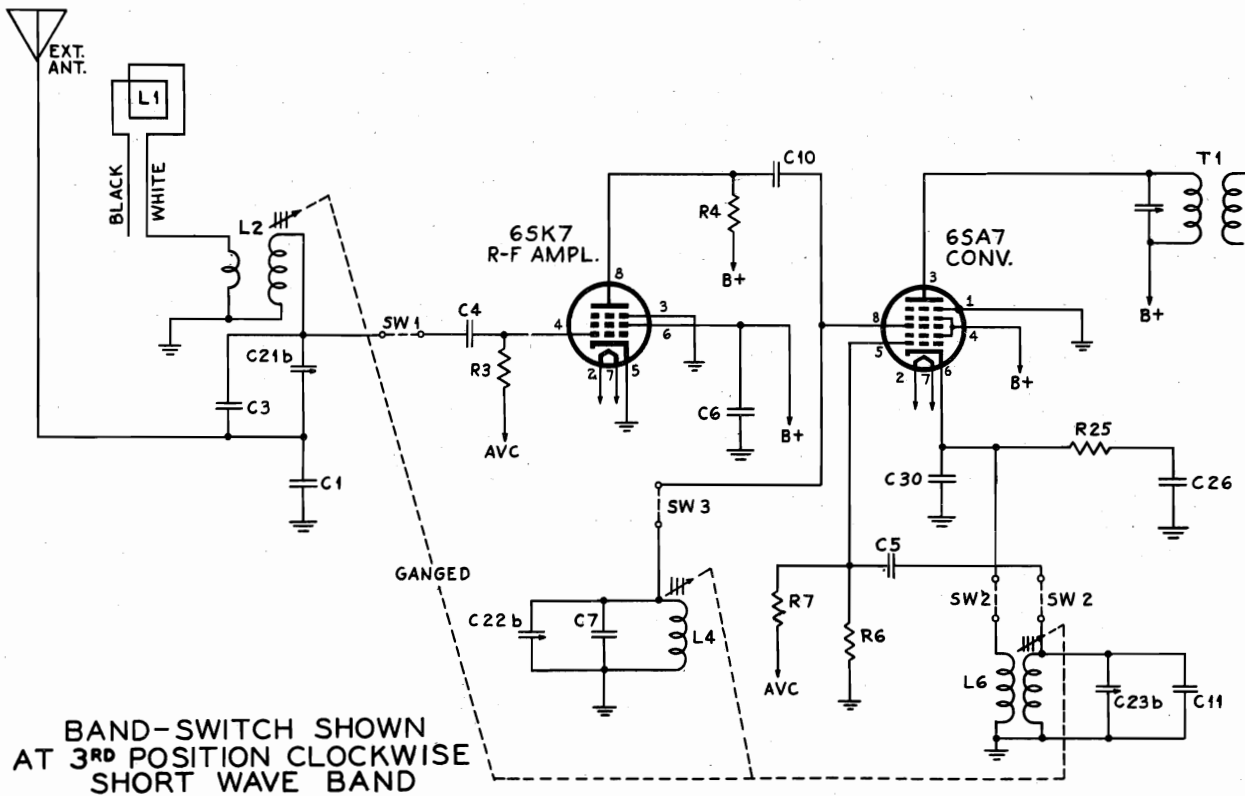
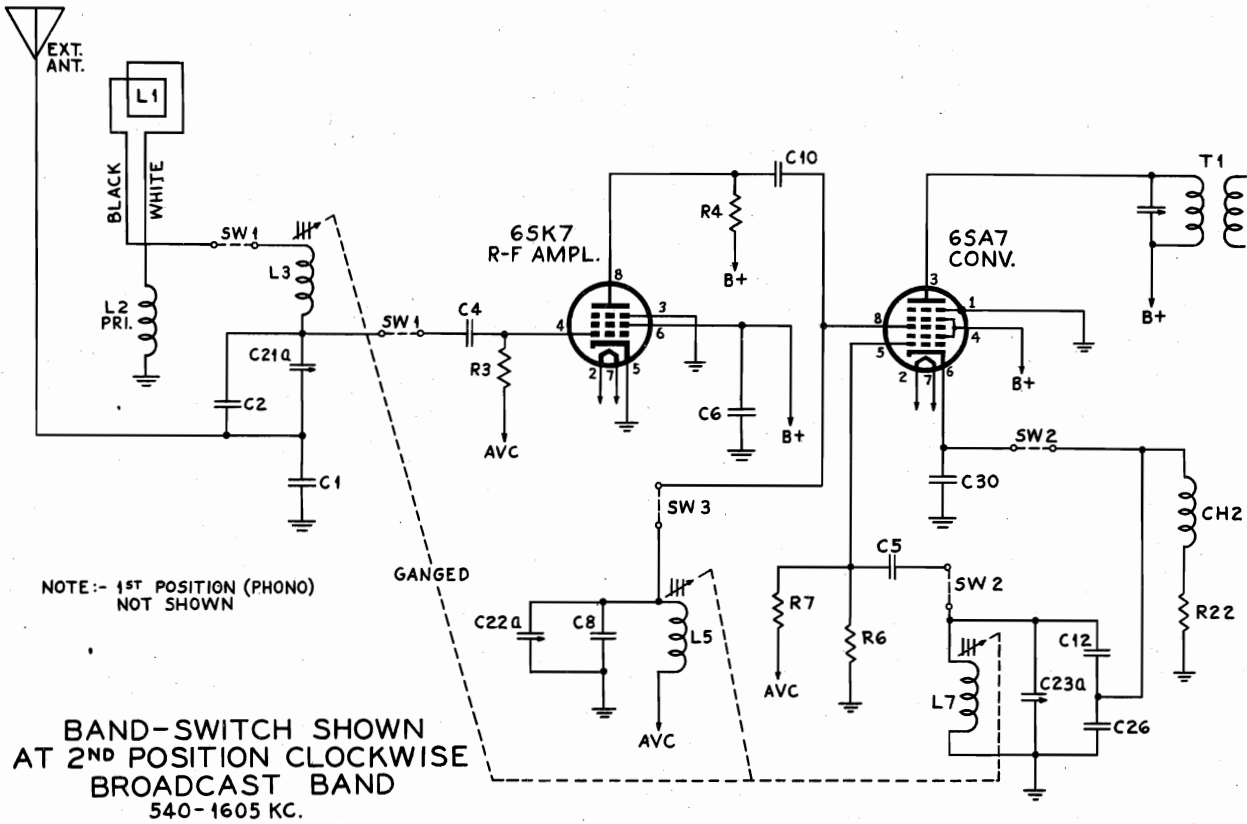
REPLACEMENT PARTS

RESISTORS			CONDENSERS			CABINET PARTS	
Symbol	Description	Part No.	Symbol	Description	Part No.	Description	Part No.
R1	22,000 Ohms, 1/2 Watt	60B 8-223	C9	.01 mfd., 400 Volts, Paper	64B 1-25	Screw, Chassis Mounting	1A 67-17-2
R2	1 Megohm, 1/2 Watt	60B 8-105	C10	.03 mfd., 400 Volts, Paper	64B 1-23	Tie Bar, Tilt Out	15B 126
R3	27,000 Ohm, 1/2 Watt	60B 8-273	C11	.1 mfd., 400 Volts, Paper	64B 1-20	Springs, Tilt Out	19A 15-1
R4	1 Megohm Volume Control and Switch SW1 (Tapped at 500,000 ohms)	75B 2-2	C12	.05 mfd., 400 Volts, Paper	64B 1-22	Escutcheon, Plastic	23C 22-2
R5	2 Megohms, Tone Control	75B 1-8	C13	.001 mfd., 600 Volts, Paper	64B 1-15	Dial Window, Plastic	24B 1
R6	4.7 Megohms, 1/2 Watt	60B 8-475	C14	.05 mfd., 400 Volts, Paper	64B 1-22	*Cabinet, Wood (7C62)	35E 52
R7	1.8 Megohms, 1/2 Watt	60B 8-185	C15	.02 mfd., 400 Volts, Paper	64B 1-24	Hinge Assembly, Record Support Side	AC 118-1
R8	100,000 Ohms, 1/2 Watt	60B 8-104	C16	.1 mfd., 200 Volts, Paper	64B 1-30	Hinge Assembly, Pickup Arm Side	AC 118-2
R9	470,000 Ohms, 1/2 Watt	60B 8-474	C17a	30 mfd., 150 Volts	Elect.....67C 7-46	PHONOGRAPH PARTS	
R10	100 Ohms, 1/2 Watt	60B 8-101	C17b	30 mfd., 150 Volts		Note: See record changer manual for complete parts list.	
R11	33 Ohms, 1 Watt	60B 28-3	C17c	20 mfd., 150 Volts		Cartridge and Needle, Pickup.....A 1372	
R12	220 Ohms, 1 Watt	60B 28-7	C17d	20 mfd., 25 Volts		Centerpost .....G400B137-1	
R13	1,000 Ohms, 1 Watt	60B 28-2	C18	250 mmfd. ±20%, Ceramic	65B 6-5	Drive Disc Assembly.....G 400A 179	
R14	150,000 Ohms, 1/2 Watt	60B 8-154	C19	.02 mfd., 200 Volts, Paper	64B 1-24	Idle Wheel (407B3 Motor).....G 400A 23	
R15	22,000 Ohms, 1/2 Watt	60B 8-223	C20	.05 mfd., 400 Volts, Paper	64B 1-22	Idle Wheel (407B1 Motor).....G 400A 57	
R16	10 Megohms, 1/2 Watt	60B 8-106	C21	500 mmfd. ±20%, Ceramic	65B 6-6	Motor, 60 Cycle 115 Volt, A. C. ....407B 3-2	
R17	150 Ohms, 1 Watt	60B 14-151	COILS, TRANSFORMERS, ETC.			Pickup Cable and Plug.....A 1304	
R18	100,000 Ohms, 1/2 Watt	60B 8-104	L1	Antenna, Loop	69B 18	MISCELLANEOUS	
R19	33,000 Ohms, 1/2 Watt	60B 8-333	L2	Coil, Oscillator	69A 14	Compression Ring (For pointer).....18A 5-2	
CONDENSERS			T1	Transformer, 1st I.F.	72B 3	Cord, Dial.....50A 1-3	
C1	.005 mfd., 600 Volts, Paper	64B 1-12	T2	Transformer, 2nd I.F.	72B 4	Grommet, Rubber (For gang cond.).....12A 1-2	
C2	50 mmfd. ±20%, Ceramic	65B 6-4	T3	Transformer, Output	98A 18	Knob.....33A 19-2	
C3	.1 mfd., 200 Volts, Paper	64B 1-30	Speaker (8" PM) & Output Transformer .....78C 20-1			Pilot Light #47.....81A 1-8	
C4a	Gang, 0 to 420 mmfd.	68B 5	SWITCHES, PLUGS & SOCKETS			Pilot Light Socket & Leads.....82A 3-3	
C4b	Gang, 0 to 162 mmfd.	68B 5	P1	Plug, Pickup	88A 8-5	Pointer.....25B 22	
C5	.002 mfd., 600 Volts, Paper	64B 1-14	P2	Plug, Speaker	88A 4	Scale, Dial.....21B 30-2	
C6	.002 mfd., 600 Volts, Paper	64B 1-14	P3	Plug, Motor	88A 8-1	Shaft, Pointer.....28A 16	
C7	.05 mfd., 400 Volts, Paper	64B 1-22	S1	Socket, Phono	88A 8-6	Shaft, Tuning.....28A 10-1	
C8	15 mmfd. ±20%, Ceramic (Used on Model 7C62-N)	65B 6-18	S2	Socket, Speaker	87A 6-1	Spring, Dial Drum Cord Tension.....19B 1-5	
C8	20 mmfd., Mica (Used on Model 7C62-UL)	65B 7-5	S3	Phono-Motor Socket & Leads (Female connector)	89A 6-6	Spring, Tuning Shaft Tension.....19A 18	

"clarified schematics"

MODEL 7C63,

ADMIRAL CORPORATION

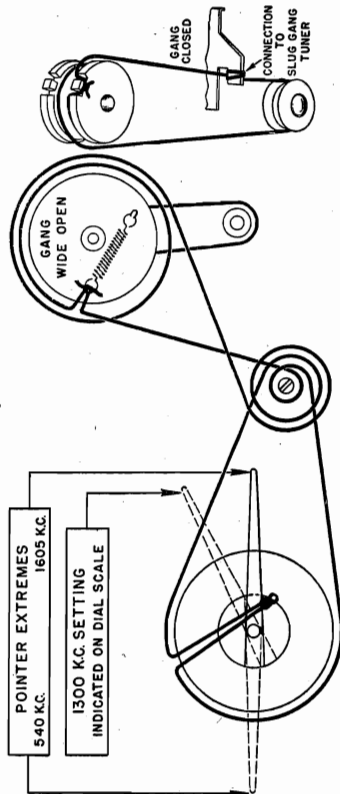


ADMIRAL CORPORATION

MODEL 7C63

- ### ALIGNMENT PROCEDURE
1. Loop must be connected during alignment. Check the set screws that hold the tuning drum to the shaft to see that they are tight and that the drum has not slipped. The position of the drum can be seen on the straining diagram.
 2. In the closed position the stop on the rear of the dial drum must be against the stop position.
 3. With the gang wide open, all slugs should be 1/8 inch out of their coil forms. If there is any serious deviation or if there has been any tampering, turn the adjusting screws until this distance is correct.
 4. Be sure both the set and the signal generator are thoroughly warmed up before starting alignment.
 5. Turn receiver Volume Control full on.
 6. Use lowest output setting of signal generator that gives a satisfactory reading on meter.
 7. Proceed in sequence as outlined below.

Step	Connect Signal Generator To	Dummy Antenna Between Radio and Signal Generator	Signal Generator Frequency	Tuning Gang Setting	Adj. Trimmers to Follow Order to Max.
1	Set Band Change Switch to Broadcast Position. 6SA7 Grid (Pin No. 8)	.1MFD.	485 K.C.	Set Pointer to Upper Limit	A, B, C, D
2	Before proceeding to step 3 check pointer travel and slug position as described below.				
3	Black Loop Lead	10 MMFD. If not available wrap several turns of the generator lead around the Black loop lead.	1605 K.C.	Set Pointer to Upper Limit	E, F, G
4	Black Loop Lead		1300 K.C.	Set Pointer to 1300 K.C. on Dial Scale	H, I, J
5	Set Band Change Switch to Short Wave Position.				
6	White Loop Lead	400 Ohms	12.5 M.C.	Set Pointer to Upper Limit	K, L, M
7	White Loop Lead	400 Ohms	12.0 M.C.	Set Pointer to 12.0 M.C. on Dial Scale	N, O, P



RECORD CHANGER SERVICE DATA

The element in the new Admiral pickup cartridge is made of a special rubber which acts as a high resistance electrical conductor. The resistance varies as the length of the rubber is changed. A needle is clamped to the center of the resistive rubber as shown at "B" (see schematic). A DC voltage is applied at "A". The voltage drop from "B" to "C" varies as the resistance changes due to the "back and forth" movement of the needle. This varying voltage drop, which is in reality an alternating voltage of audio frequency, is applied through the coupling condenser to the grid of the audio amplifier tube. In case of distortion or low volume on phono operation only, check as follows:

1. Replace cartridge and check operation. If not satisfactory, proceed with tests.
2. With the volume control at maximum, touch the needle with the finger. If a loud hum is heard, then on the cartridge assembly as this will void the warranty.

The circuit from the needle to the grid of the audio amplifier tube is not open or shorted. If hum is not heard, check the circuit from "B" to the grid. If a hum is heard, check the voltage across outer terminals "A" and "C" on the bottom of cartridge. Generally it should measure from 80 to 100 volts DC. If it does not, check the circuit for fault. The resistance of the cartridge is not critical, but should measure between 100,000 ohms and 2 megohms. If the needle is bent, it can be straightened by bending it so that it projects 1/16 inch below the cartridge. It should then be pressed back several times with a flat object.

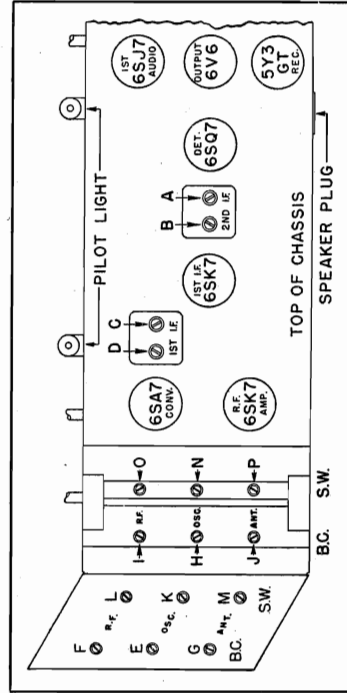
POINTER ADJUSTMENT

Turn the tuning control knob clockwise until tuning gang is wide open. The pointer should now be at 1605 Kc. (last dial dot). If it is not, grasp the pointer with your hand and move it to 1605 Kc. Then proceed with alignment.

REPLACING TUNING SLUG

Set the gang to its wide open position, unsolder and remove the old slug. Set the slug adjusting screw about half way down. Place the new slug in such a position that 1/8 inches of its length is above the coil form. Solder it in this position making sure that the slug wire is straight. Re-align the set as shown in the chart.

TUBE AND TRIMMER LAYOUTS



ANTENNA CONNECTIONS

In replacing connections to antennas, it is necessary to see that the flat twin parallel conductor is not twisted. The rear parallel conductor should be connected to the rear terminal screw on each loop antenna. The front parallel conductor should be connected to the front terminal screw on each loop antenna.

MODEL 7C63
MODEL 7C73

ADMIRAL CORPORATION

PARTS LIST - 7C63

RESISTORS

SYMBOL	DESCRIPTION	PART NO.
R1.....	12,000 Ohms, 5 Watt.....	61A 1-1
R2.....	2.2 Megohms, Carbon, 1/2 Watt.....	60B 8-225
R3.....	470,000 Ohms, 1/2 Watt.....	60B 8-474
R4.....	10,000 Ohms, 2 Watt.....	60B 20-103
R6.....	22,000 Ohms, 1/2 Watt.....	60B 8-223
R7.....	10 Megohms, 1/2 Watt.....	60B 8-106
R8.....	1 Megohm, 1/2 Watt.....	60B 8-105
R9.....	2.2 Megohms Tone Control.....	75B 1-8
R10.....	22,000 Ohms, 1/2 Watt.....	60B 8-273
R11.....	1 Megohm Volume Control and Switch SW4 Tapped at 500,000 Ohms.....	75B 2-2
R12.....	470,000 Ohms, 1/2 Watt.....	60B 8-474
R13.....	470,000 Ohms, 1/2 Watt.....	60B 8-474
R14.....	3.3 Megohms, 1/2 Watt.....	60B 8-335
R15.....	390 Ohms, 1 Watt.....	60B 14-391
R16.....	10 Megohms, 1/2 Watt.....	60B 8-106
R17.....	100 Ohms, 1/2 Watt.....	60B 8-101
R18.....	220,000 Ohms, 1/2 Watt.....	60B 8-224
R19.....	100,000 Ohms, 1/2 Watt.....	60B 8-104
R20.....	100,000 Ohms, 1/2 Watt.....	60B 8-104
R22.....	100 Ohms, 1/2 Watt.....	60B 8-101
R23.....	100,000 Ohms, 1 Watt.....	60B 14-104
R24.....	47,000 Ohms, 1/2 Watt.....	60B 8-473
R25.....	470 Ohms, 1/2 Watt.....	60B 8-471

CONDENSERS

C1.....	1000 mmfd., Mica.....	65B 7-33
C2.....	35 mmfd., Silver Mica 3%.....	65B 1-31
C3.....	25 mmfd., Silver Mica 3%.....	65B 1-28
C4.....	100 mmfd., Mica.....	65B 7-17
C5.....	50 mmfd., Ceramic.....	65B 6-4
C6.....	.05 mfd., 400 V.D.C., Paper.....	64B 1-22
C7.....	65 mmfd., Silver Mica 3%.....	65B 1-27
C8.....	420 mmfd., Silver Mica.....	65B 1-13
C9.....	1000 mmfd., Mica.....	65B 7-33
C10.....	200 mmfd., Mica 2%.....	65B 7-5
C11.....	65 mmfd., Silver Mica 3%.....	65B 1-27
C12.....	200 mmfd., Silver Mica, 2%.....	65B 1-14
C13.....	.1 mfd., 400 V.D.C., Paper.....	64B 1-20
C14.....	250 mmfd., Mica.....	65B 7-22
C15.....	1000 mmfd., Mica.....	65B 7-33
C16.....	.02 mfd., 400 V.D.C., Paper.....	64B 1-24

SYMBOL	DESCRIPTION	PART NO.
C17.....	.01 mfd., 400 V.D.C., Paper.....	64B 1-25
C18.....	.005 mfd., 600 V.D.C., Paper.....	64B 1-12
C19.....	.01 mfd., 600 V.D.C., Paper.....	64B 1-10
C20a.....	30 mfd., 350 V.D.C., Elec.....	67C 6-25
C20b.....	30 mfd., 350 V.D.C., Elec.....	
C20c.....	20 mfd., 25 V.D.C., Elec.....	66A 1-5
C21a.....	3-40 mmfd., Dual Trimmer.....	
C21b.....	3-40 mmfd., Dual Trimmer.....	66B 8-1
C22a.....	3-40 mmfd., Trimmer.....	
C22b.....	3-40 mmfd., Trimmer.....	66B 8-1
C23a.....	3-40 mmfd., Trimmer.....	
C23b.....	3-40 mmfd., Trimmer.....	66B 8-1
C24.....	100 mmfd., Mica.....	
C26.....	1,200 mmfd., Mica.....	65B 5-34
C27.....	.05 mfd., 200 V.D.C., Paper.....	64B 1-32
C28.....	.25 mfd., 200 V.D.C., Paper.....	64B 1-28
C29.....	.1 mfd., 400 V.D.C., Paper.....	64B 1-20
C30.....	.20 mmfd., Mica.....	65B 7-5
C31.....	500 mmfd. ± 20%, Ceramic.....	65B 6-6

CHOKES, COILS, TRANSFORMERS, ETC.

LI.....	Loop Antenna, (Record Support Side).....	AD120
LI.....	Loop Antenna, (Pickup Arm Side).....	AD117
L2.....	Coil, S.W. Antenna.....	AD116-1
L3.....	Coil, B. C. Antenna.....	AC105-2
L4.....	Coil, S.W. R.F.....	AD116-2
L5.....	Coil, B. C. R.F.....	AB100-1
L6.....	Coil, S.W. Oscillator.....	AD116-3
L7.....	Coil, B.C. Oscillator.....	AC101-1
CH1.....	Choke, Filter.....	74A 3
CH2.....	Coil, Oscillator Choke.....	AB103-1
T1.....	Transformer, 1st I.F.....	72B 7
T2.....	Transformer, 2nd I.F.....	72B 8
T3.....	Transformer, Power.....	80B 1
T4.....	Transformer, Output.....	98A 20
	Speaker 10" and Transformer.....	78B 6

When Ordering Slugs Specify Color Code

Slug, Tuning (B.C.—Osc. & R.F.).....	71B 1-3
Slug, Tuning (S.W.—Ant. R.F. & Osc.).....	71B 1-9
Slug, Tuning (B.C. Ant.).....	71B 1-13

SWITCHES, PLUGS AND SOCKETS

SYMBOL	DESCRIPTION	PART NO.
P1.....	Plug, Pickup.....	88A 5-7
P2.....	Plug, Speaker.....	88A 4
S1.....	Phono Socket, Shielded.....	88A 5-9
S2.....	Socket, Speaker.....	87A 6-1
S3.....	Phono-Motor Socket & Leads.....	89A 6-8
SW1.....	Switch, Antenna.....	76B 1-3
SW2.....	Switch, Oscillator.....	76B 1-2
SW3.....	Switch, R.F.....	76B 1-1
SW4.....	Part of Volume Control R11	

PHONOGRAPH PARTS

Note: See record changer manual for complete parts list.

DESCRIPTION	PART NO.
Cartridge and Needle, Pickup.....	A1372
Centerpost.....	G400B 137-1
Drive Disc Assembly.....	G400A 179
Idler Wheel (407B 3 Motor).....	G400A 23
Idler Wheel (407B 1 Motor).....	G400A 57
Motor.....	407B 3-2
Pickup Cable and Plug.....	A1305
Tilt Out Hinge Assembly (Record Support Side).....	AC118-1
Tilt Out Hinge Assembly (Pickup Arm Side).....	AC118-2
Tilt Out Spring.....	190A 15-1
Tilt Out Tie Bar.....	15B 126

MISCELLANEOUS

*Cabinet (7C63), Wood.....	35D 51
Compression Ring-Pointer.....	18A 5-2
Cord, Dial.....	50A 1-3
Dial Background Assembly.....	A1357
Dial Window—Plastic.....	24B 1
Drum and Hub Assembly, Pointer.....	A1355
Drum and Hub Assembly, Tuner.....	A1356
Escutcheon—Plastic Dial.....	23C 22-1
Handle, Door.....	37B 10-1
Knob.....	33A 19-2
Pilot Light No. 47.....	31A 1-8
Pilot Light Socket.....	82A 3-8
Pointer, Dial.....	25B 22
Screw, Escutcheon Mounting.....	1A 15-6-58
Spring, Dial Cord Tension.....	19B 1-10
Spring, Tension.....	19B 1-11
Transmission Line (43").....	95A 16-1
Transmission Line (54").....	95A 16-2

*Supplied only if old cabinet cannot be repaired. When ordering, describe condition of old cabinet in detail.

PARTS LIST (CONTD.) - 7C73-9A1

Symbol	COILS, TRANSFORMERS, ETC.	Part No.	Description	TUNER PARTS	Part No.	Description	PHONOGRAPH PARTS	Part No.
CH1.....	Choke, F.M. Antenna.....	AB 103-35	Tuning Shaft.....	28A 17	Tilt Out Spring (2-1/4" long).....	19A 15-1		
CH2.....	Choke, Grounded Grid Cathode.....	AB 103-56	Slug Travel Bracket, Bushing and Roller Assy. (front).....	A1396	Shoulder Eye Bolt (for Tilt Out Spring).....	1A87-1		
CH3.....	Choke, Grounded Grid Plate.....	AB 103-56	Slug Travel Bracket, Bushing and Roller Assy. (rear).....	A1398	Tilt Out Tie Bar.....	15B 126		
CH4.....	Choke, R.F. Plate.....	AB 103-56	Brass Guide Rod (Tuner).....	28A 7-2				
CH5.....	Choke, A.M. Oscillator Cathode.....	AB 103-1	Cam and Hub for Tuner (front).....	A1400				
CH6.....	Choke, F.M. Oscillator Cathode.....	AB 103-34	Cam and Hub for Tuner (rear).....	A1467				
CH7.....	Choke, R.F. Filament.....	Consists of approximately 8 turns of #20 solid hookup wire wound around condenser C51	Spring, Bearing Takeup.....	19A 16				
CH8.....	Choke, Filter.....	74A 3	Cable, Drive (for Cam and Hub).....	95A 16				
LI.....	Antenna, F.M. Folded Dipole.....	AB 128	Spring, Coil (for Cam and Hub).....	19B 1-14				
L2.....	Antenna, A.M. (13').....	96A 18	Bakelite Plate for slug mounting (1-15/16" x 2-5/8").....	32A 36				
L3.....	Coil, A.M. Antenna (less slug).....	AC 106-2	Drum and Hub on Tuner Shaft (includes 1" drum and 3-11/32" drum).....	A1401				
L4.....	Coil, F.M.-R.F. (less slug).....	AA 122	Description	DIAL PARTS	Part No.			
L5.....	Coil, F.M. Converter (less slug).....	AA 122	Pointer Shaft.....	28A 19				
L6.....	Coil, A.M. Converter (less slug).....	AB 100-1	Drum and Hub Assembly (Pointer Shaft).....	A1388				
L7.....	Coil, F.M. Oscillator (less slug).....	AA 125	Dial Cord (100 inches).....	50A 1-3				
L8.....	Coil, A.M. Oscillator (less slug).....	AC 101-2	Spring, Dial Cord (2 used).....	19B 1-5				
SW1.....	Switch, Antenna (Second from chassis front).....	76C 11-5	Dial Scale & Indicator Assembly.....	A1404				
SW2.....	Switch, R.F. (Fourth from chassis front).....	76C 11-5	Indicator Link.....	15A 176				
SW3.....	Switch, Oscillator (Third from chassis front).....	76C 11-4	Indicator Arm & Hub (on Band Switch Shaft).....	A1406				
SW4.....	Switch, I.F. (Farthest from chassis front).....	76C 11-6	Dial Bulb #47.....	81A 1-8				
SW5.....	Switch, audio (Closest to chassis front).....	76C 11-2	Socket, Dial Bulb.....	82A 3-9				
SW6.....	Switch (ON-OFF).....	Part of R-25	Dial Pointer.....	A1477				
SW7.....	Switch (Tone Control).....	Part of R-26	Dial Escutcheon (less rectangular insert).....	23E 20				
T1.....	Band-Switch Shaft Assembly.....	76C 11-1	Dial Escutcheon insert (Approx. 2-1/2" x 3-5/8").....	23C 25				
T2.....	Set Screw, #6-32 x 1/4.....	1A 5-64	Description	PHONOGRAPH PARTS	Part No.			
T3.....	Spacers for Shaft Assembly.....	28A 4-4	M.L. Cartridge and Needle, Pickup.....	A1372				
T4.....	Transformer, 1st I.F. (F.M.).....	72B 24	M.L. Pickup Cable & Plug Assembly.....	A1415				
T5.....	Transformer, 2nd I.F. (F.M.).....	72B 25	Centerpost.....	G400B 137-1				
T6.....	Transformer, Ratio Detector.....	72B 27	Drive Disc Assembly (under turntable).....	G400A 179				
T7.....	Transformer, 1st I.F. (A.M.).....	72B 25	Idler Wheel (407B 3 Motor).....	G400A 23				
T8.....	Transformer, 2nd I.F. (A.M.).....	72B 25	Idler Wheel (407B 1 Motor).....	G400A 57				
T9.....	Transformer, Power.....	80B 2	Motor.....	407B 3-2				
T10.....	Transformer, Output.....	98A 22	Pickup Cable and Plug.....	A1305				
	Speaker (12" P.M.) and Output Transformer.....	78B 21	Tilt Out Hinge Assembly (Record Support Side).....	AC118-1				
	When Ordering Slugs Specify Color Code		Tilt Out Hinge Assembly (Pickup Arm Side).....	AC118-2				
	Slug, Iron Core (F.M.—Osc., Conv., & R.F.).....	71B 1-19						
	Slug, Iron Core (A.M.—Osc., Conv.).....	71B 1-20						
	Slug, Iron Core (A.M.—Antenna).....	71B 1-21						

MODELS 7P32, 7P33, 7P34
MODELS 7T06, 7T12

ADMIRAL CORPORATION

MODELS 7P32, 7P33, 7P34
CHASSIS 5H1

ALIGNMENT PROCEDURE

1. Disconnect Loop Antenna leads from clips on set and remove chassis from cabinet.
2. Make alignment using a battery whenever possible.
3. Connect a fresh battery to the set.

IMPORTANT: Check dial drum position on shaft. Tuner arm should just complete downward travel when gang is fully meshed. At this point, tuner arm should be on short flat part of cam. Check pointer. It should be at last dial scale mark just below 550 K.C. when gang is fully meshed. If not, move pointer on dial cord

Step	Dummy Antenna Signal Generator	Connect High Side Signal Generator to	Signal Generator Frequency	Receiver Gang Setting	Trimmer Designation and Description	Type of Adjustment
(1)	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Grid of 1R5 (Pin 6)	455 K.C.	Any point where it does not affect signal	2nd I.F. (A), (B), 1st I.F. (C), (D).	Maximum Deflection Then repeat
(2)	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Stator lug of rear variable condenser section	1620 K.C.	Tuning Gang Wide Open	Oscillator Trimmer (F)	Maximum Deflection
(3)	.00025 Mfd. when using A.C. .1 Mfd. when using Battery	Stator lug of rear variable condenser section	1400 K.C.	Tune in Generator Signal	R.F. Slug (E)	Maximum Deflection

Replace Set in Cabinet

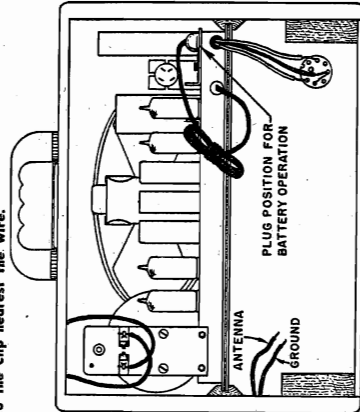
(4)	.00025 Mfd.	Antenna and Ground Leads	1400 K.C.	Tune in Generator Signal	Antenna Trimmer (G)	Maximum Deflection
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REPLACING R.F. TUNING SLUG

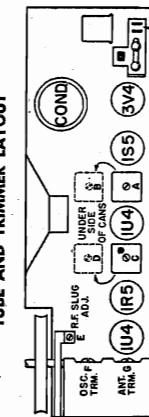
If the R.F. Tuning Slug has to be changed use the flush with the top of the coil. Solder the slug wire to the following procedure. Set the gang condenser to the adjusting screw. Be sure that the position of the point where the plates are fully meshed. Screw the slug adjusting screw about halfway down. Place the slug in the coil in such a position that the top of the slug is

INTERNAL ANTENNA CONNECTIONS

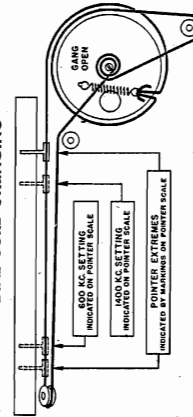
Note: Antenna connections cross over as shown above for 7P32, 7P33, 7P34. For 7P32, 7P33, 7P34 antenna connections are made to the clip nearest the wire.



TUBE AND TRIMMER LAYOUT



DIAL CORD STRINGING



MODELS 7T06, 7T12
CHASSIS 4B1

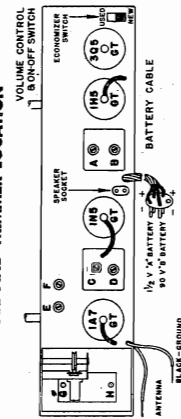
ALIGNMENT PROCEDURE

1. **IMPORTANT** — Check to see that dial pointer reaches each end of dial scale when Station Selector Control is turned from one end to the other.
2. Volume control—Maximum for all adjustments.
3. Connect radio chassis to ground post of signal generator with a short heavy lead.
4. Connect output meter across voice coil of speaker.
5. Connect dummy Antenna value in series with generator output lead, when needed (see below).
6. Allow chassis and signal generator to "heat up" for several minutes.
7. Use lowest Output setting of Signal Generator capable of producing adequate Output Meter indication and then proceed in the following sequence.

Band	Signal Generator Frequency Setting	Connection to Radio	Receiver Dial Setting	Trimmers Adjusted (In Order Shown)	Trimmer Function	Type of Adjustment
I.F.	455 K.C.	Grid of 1A7 (Cap)	High Frequency end of dial	A-B—2nd I.F.	Output I.F.	Adjust to maximum output
I.F.	455 K.C.	Grid of 1A7 (Cap)	High Frequency end of dial	C-D—1st I.F.	Input I.F.	Adjust to maximum output
Broad-cast	1630 K.C.	Antenna Lead	High Frequency end of dial	E-(See note below) F-(See note below)	Oscillator Antenna	Adjust to maximum output
Broad-cast	1300 K.C.	Antenna Lead	1300 K.C.	G H	Oscillator Antenna	Adjust to maximum output

NOTE: Before adjusting trimmers "E" and "F," make sure that each iron core is $1\frac{1}{2}$ " or more outside of its coil form. If necessary, turn adjustments "G" and "H" to accomplish this.

TUBE AND TRIMMER LOCATION

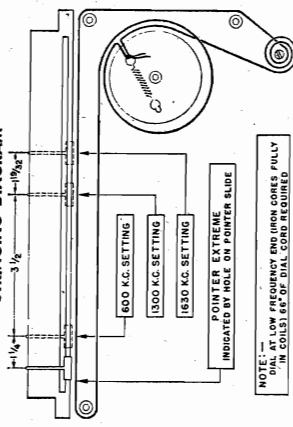


ECONOMIZER SWITCH

The battery economizer switch is located on the top of the chassis, right side.

Always have this Economizer Switch in the "NEW" battery position when first placing radio in operation or when installing a new battery.

STRINGING DIAGRAM



NOTE: DIAL AT LOW FREQUENCY END (IRON CORES FULLY IN COILS) 60° OF DIAL CORD REQUIRED

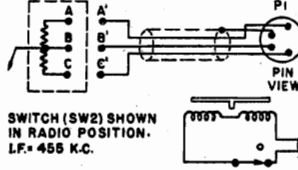
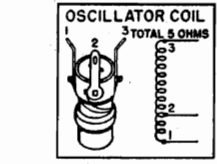
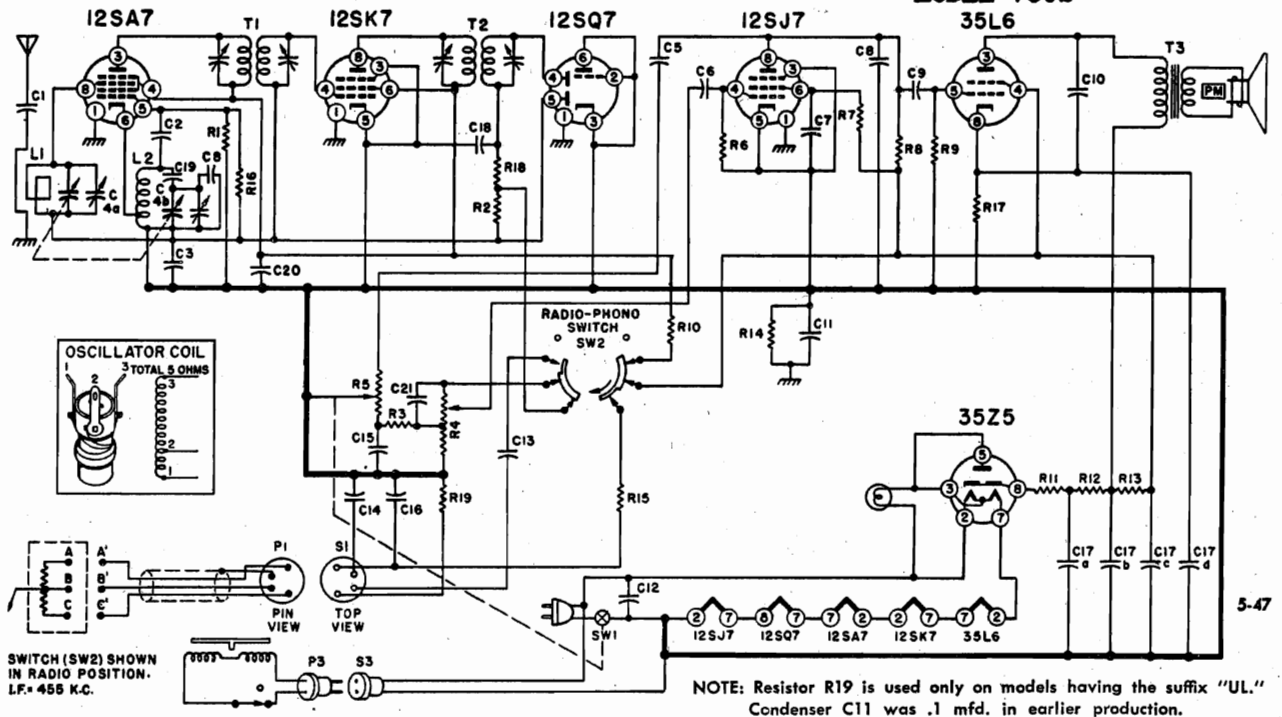
CIRCUIT

Battery-operated 4 Tube Superheterodyne with Single Tuning Range: 535 K.C. to 1630 K.C. Covers standard broadcast band, using antenna and ground. Permeability tuning on Antenna and Oscillator circuits. Intermediate Frequency is 455 K.C.

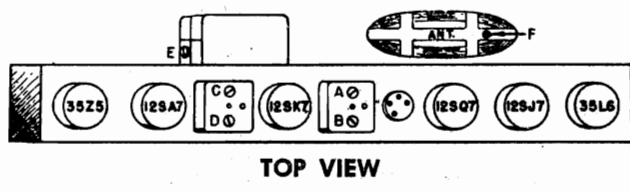
POWER SUPPLY

Single unit "AB" battery pack: 90 volt "B", 1 1/2 volt "A." Plug-in connection. Use Ensign AB48, Burgess 17G-D60, Eveready 748, General 60DL-11L, Ray-O-Vac AB-82, Bond 0528 Battery or equivalent.

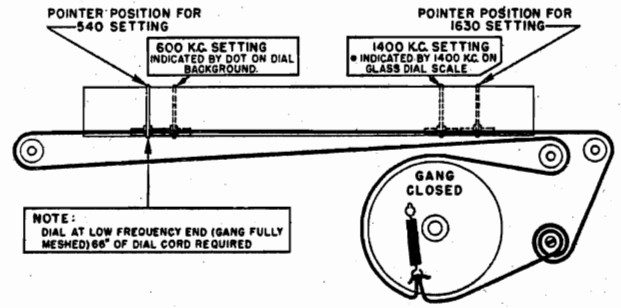
ADMIRAL CORPORATION **MODELS 7RT41, 7RT42, 7RT43**
Chassis 6L1
MODEL 7C62



TUBE & TRIMMER LOCATION



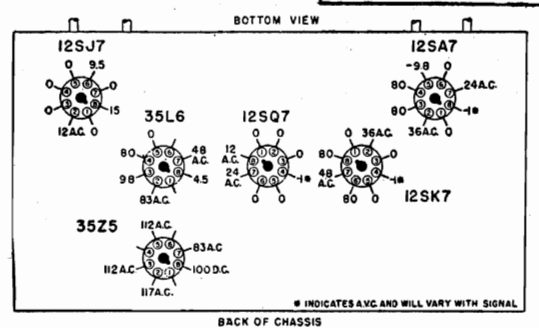
DIAL CORD STRINGING & POINTER SETTING



VOLTAGE DATA

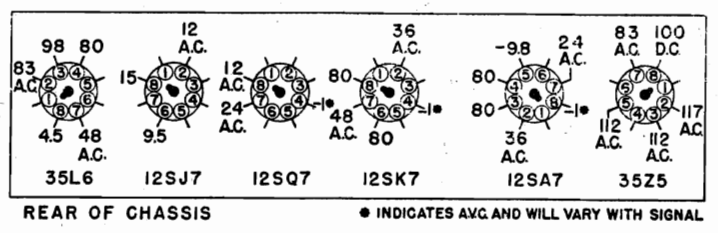
- All readings made between Tube Socket Terminals and B minus.
- Measured on a 117 Volt A.C. line.
- Volume control full on.
- Dial tuned to low frequency end, no signal.
- Voltage obtained on Vacuum Tube Voltmeter.

MODEL 7C62



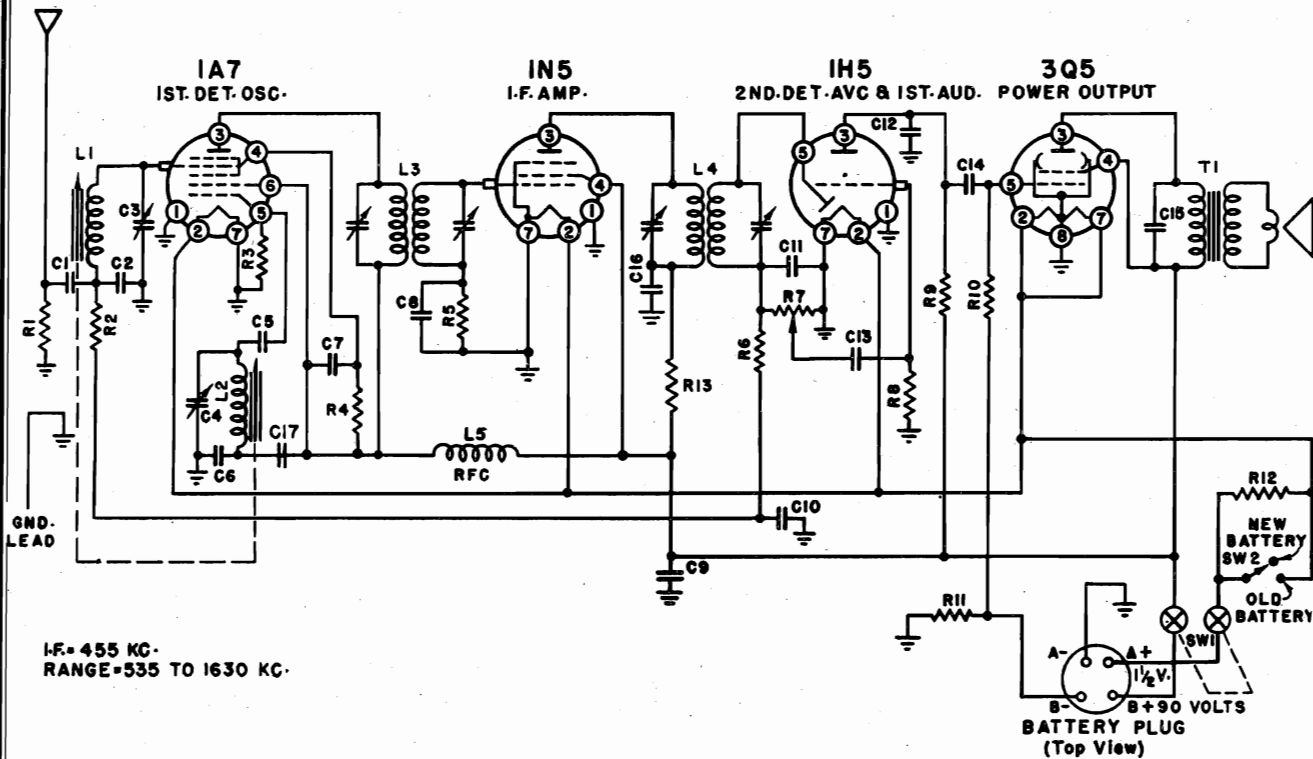
MODEL 7RT41, 7RT42, 7RT43

VOLTAGE CHART



MODELS 7T06, 7T12,
Chassis 4B1

ADMIRAL CORPORATION

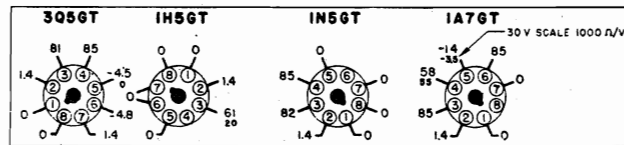


IF = 455 KC.
RANGE = 535 TO 1630 KC.

VOLTAGE DATA

All readings made between tube socket terminals and chassis. Voltages indicated have been obtained using a Vacuum Tube Voltmeter. A second voltage reading is shown made with a 1000 ohm-per-volt meter, when use of this instrument would result in appreciably lower readings. Measured with a fresh battery, volume control full on, dial at the high frequency end, no signal.

VOLTAGE CHART



BACK OF CHASSIS

OSCILLATION IN 4B1 RADIO CHASSIS

Occasionally audio oscillation may occur in the 4B1 chassis with the volume control in an intermediate position. Should you encounter this trouble, reverse the leads of the primary of the output transformer or ground the speaker frame to the chassis. The speaker leads and the grid lead of the 1H5 should be kept as far as possible from the 3Q5 output tube.

REPLACEMENT PARTS

ISSUE A 1947

CONDENSERS

Symbol	Description	Part No.
C1	.01 mfd., 400 Volts	.648 1-25
C2	.0008 mfd., Mica	.65B 5-31
C3	Trimmer, Antenna	.66A 9-1
C4	Trimmer, Oscillator	
C5	.0001 mfd., Mica	.65B 7-17
C6	.0008 mfd., Mica	.65B 5-31
C7	.01 mfd., 400 Volts	.648 1-25
C8	.002 mfd., 600 Volts	.64B 1-14
C9	4. mfd., 150 Volts (Elect.)	.67A 4-2
C10	.05 mfd., 200 Volts	.64B 1-32
C11	.00025 mfd., Mica	.65B 7-22
C12	.00025 mfd., Mica	.65B 7-22
C13	.01 mfd., 400 Volts	.648 1-25
C14	.01 mfd., 400 Volts	.64B 1-25
C15	.005 mfd., 600 Volts	.64B 1-12
C16	.01 mfd., 400 Volts	.64B 1-25
C17	.01 mfd., 400 Volts	.64B 1-25

(C17 omitted in early models)

RESISTORS

Symbol	Description	Part No.
R1	15,000 ohm - 1/2 Watt	.60B 8-153
R2	470,000 ohm 1/4 Watt	.60B 2-474
R3	220,000 ohm 1/2 Watt	.60B 8-224
R4	33,000 ohm 1/2 Watt	.60B 8-333
R5, R8	4,700,000 ohm 1/4 Watt	.60B 2-475
R6	2,200,000 ohm 1/4 Watt	.60B 2-225
R7	1 meg. Vol. Control	.75B 1-1
R9, R10	1,000,000 ohm 1/4 Watt	.60B 2-105
R11	390 ohm 1/4 Watt	.60B 2-391
R12	.75 ohm 1/2 Watt (wire)	.61A 2-1
R13	2200 ohm 1/4 Watt	.60B 2-222

TRANSFORMERS and COILS

Symbol	Description	Part No.
L1	Antenna Coil	.AC105-1
L2	Oscillator Coil	.A1020
L3	1st I.F. Transformer	.72B 5
L4	2nd I.F. Transformer	.72B 6
L5	Choke Coil (RF)	.AB103-1
T1	Output Transformer	.98A 5

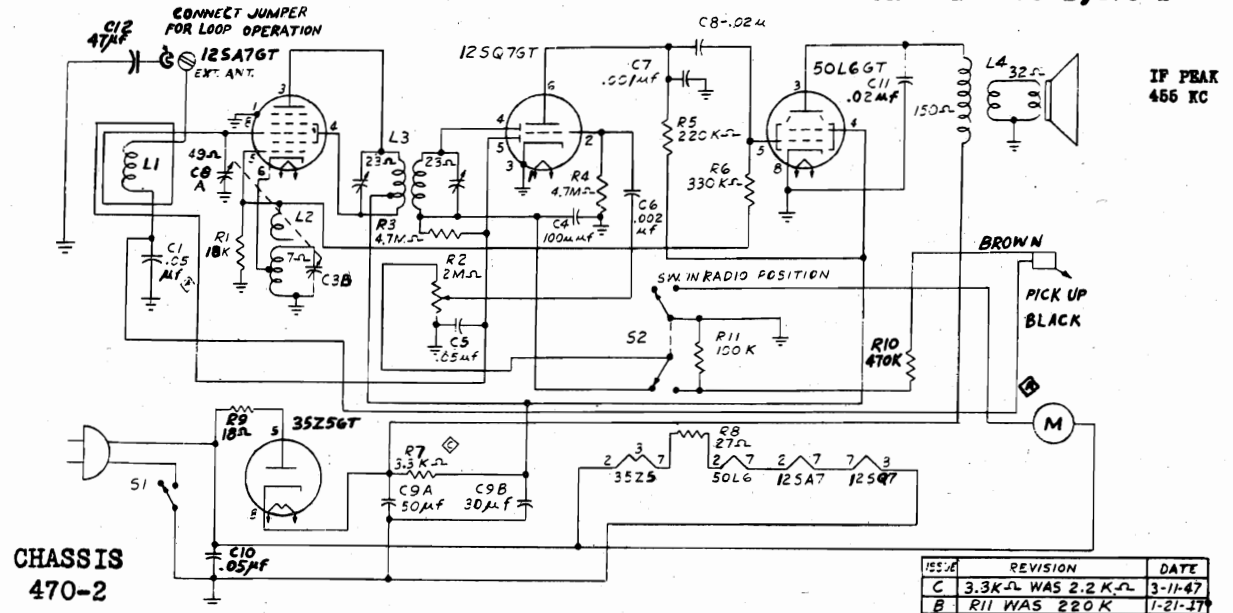
MISCELLANEOUS

Description	Part No.
Background, Dial	.X22C 5-1
Cabinet, Plastic (7T12)	.34D 10
Cabinet, Wood (7T06)	.35D 49
Cable, Battery (complete with plug)	.A1026
Cord, Dial (5" on tuner and 66" on dial drive)	.50A 1-3
Drum and Hub, Tuning	.A1035
Iron Slug, with wire (Osc.)	.71B 1-3
Iron Slug, with wire (Ant.)	.71B 1-4
Knob	.33A 21-3

MISCELLANEOUS

Description	Part No.
Plug, Battery 5 Prong	.88A 4-4
Pointer, Dial	.25A 9-1
Pulley, Fibre Dial	.17A 1-3
Scale, Glass Dial (7T06)	.21B 31-1
Scale, Glass Dial (7T12)	.21B 32-1
Screw studs (for iron cores)	.27A 4
Shaft, Tuning	.28A 1-1
Shield, Tube	.87A 8
Socket, Octal Tube	.87A 5-1
Speaker and Output Transformer	.78B 3
Spring, Dial Drum Cord Tension	.19B 1-7
Spring, Hairpin (To hold Ant. or Osc. coils)	.19A 3-1
Spring, Tuner, back bearing takeup	.19A 6
Spring, Tuner, front bearing takeup	.19A 5
Spring, Tuner Slide Cord Tension	.19B 1-8
Spring, Tuner Slide Pressure	.18A 9
Switch, SPST (Economizer) SW2	.77B 1-6
Washer, C	.4A 4-1
Washer, spring (coils)	.4A 6-12-0
Washer, spring (shaft)	.4A 6-3-0

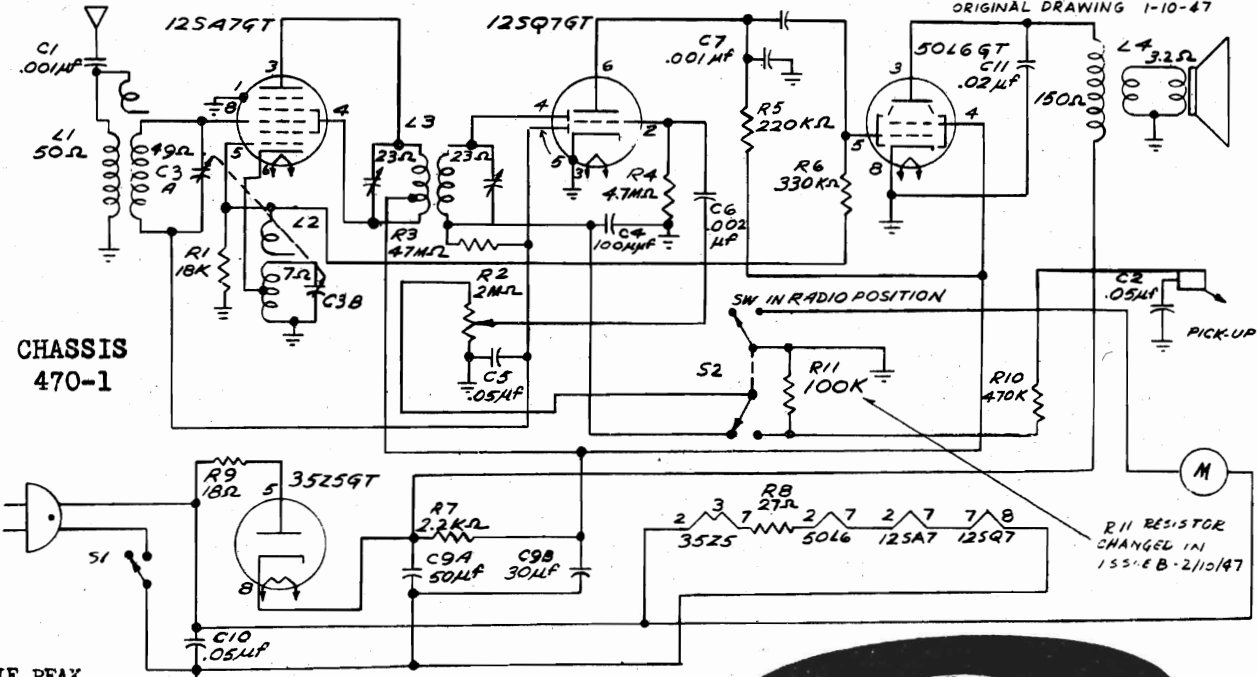
AIR KING PRODUCTS CO., INC. MODEL A-403 COURT JESTER
Chassis 470-1, 470-2



CHASSIS 470-2

ISSUE	REVISION	DATE
C	3.3KΩ WAS 2.2KΩ	3-11-47
B	R11 WAS 220K	1-21-47
A	C2 GROUND REMOVED-C1 WAS .001-BLK LEAD BETWEEN XTAL & C1 ADDED	1-16-47

ORIGINAL DRAWING 1-10-47



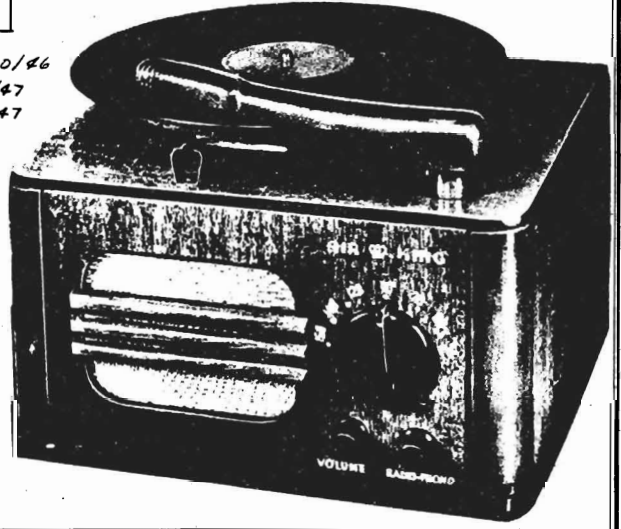
CHASSIS 470-1

R11 RESISTOR CHANGED IN 155-EB-2/10/47

IF PEAK 455 KC

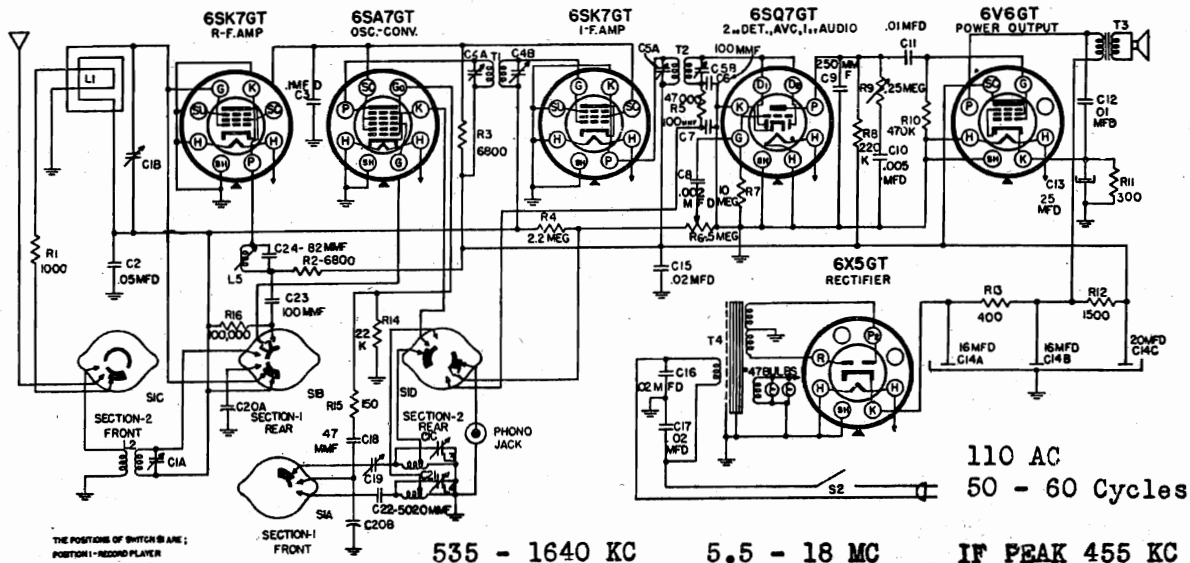
- ORIGINAL DWG DATED 12/10/46
155UEA REVISION 1/10/47
155UEB REVISION 2/10/47
- A403 Cabinet, wood less lid
 - 5A77 Speaker and output transformer
 - 39150 Knob, tuning wood
 - 39161 Knob, (volume, phono-radio)
 - 49507 Instruction book
 - 1-75 Variable condenser
 - 2-73 Electrolytic condenser unit 50-30 mf/150 v
 - 2-95 Volume control 2 meg with switch
 - 29104 Oscillator coil
 - 28185 Antenna coil (chassis 470-1)
 - 3376 I.F. transformer
 - 28186 Loop and loading coil (chassis 470-2)
 - 28189 Line cord
 - 5555 Switch radio/phono
 - 3828 Pick-up arm and rest
 - 6343 Motor and turntable 8"
 - 6418 Lifetime needle
 - Paper condenser
 - .05 mf 400 v.
 - .02 200 v.
 - .05 "
 - .01 "
 - Ceramic 100 mmf 500 volts
 - 16K ohms 1/2 w.
 - 4.7 meg ohms 1/2 w.
 - 220K " 1 w.
 - 2200 " 2 w.
 - 18 " 1 w.
 - 47 " 1/2 w.
 - 330K " 1 w.
 - 470K " 1 w.

PARTS LIST AND CABINET ARE THE SAME FOR BOTH CHASSIS 470-1 and 470-2



MODELS 4604D, 4604F
Chassis 458-2

AIR KING PRODUCTS CO., INC.



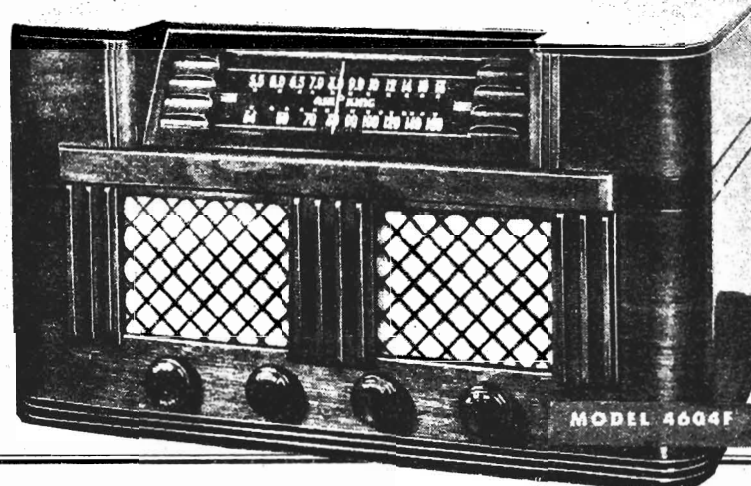
THE POSITIONS OF SWITCH SANE:
POSITION 1 - RECORD PLAYER
POSITION 2 - BROADCAST
POSITION 3 - SHORT WAVE
THE SWITCH IS DRAWN IN POSITION 1
(MAXIMUM COUNTERCLOCKWISE)

If this receiver is to be operated in conjunction with an external phonograph record player, the pin plug from the phonograph pick-up arm should be inserted in the Phono Input Socket at the back of the receiver chassis. The switch should be placed in the RP position (fully counter-clockwise). Both the volume control and tone control of the receiver function for the record player. These should be set to give the loudness and tone quality desired.

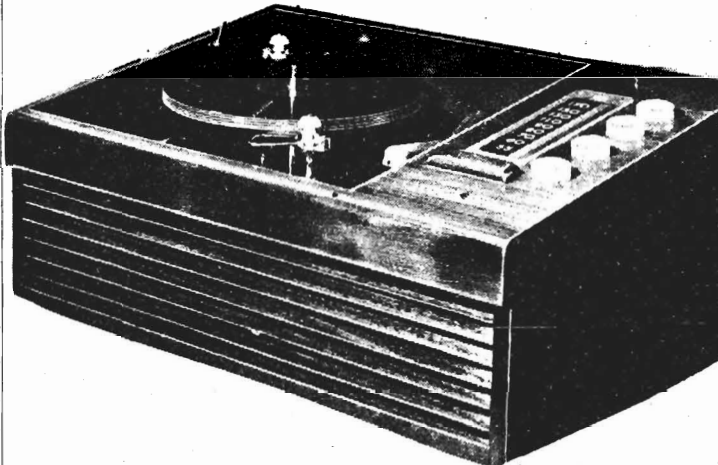
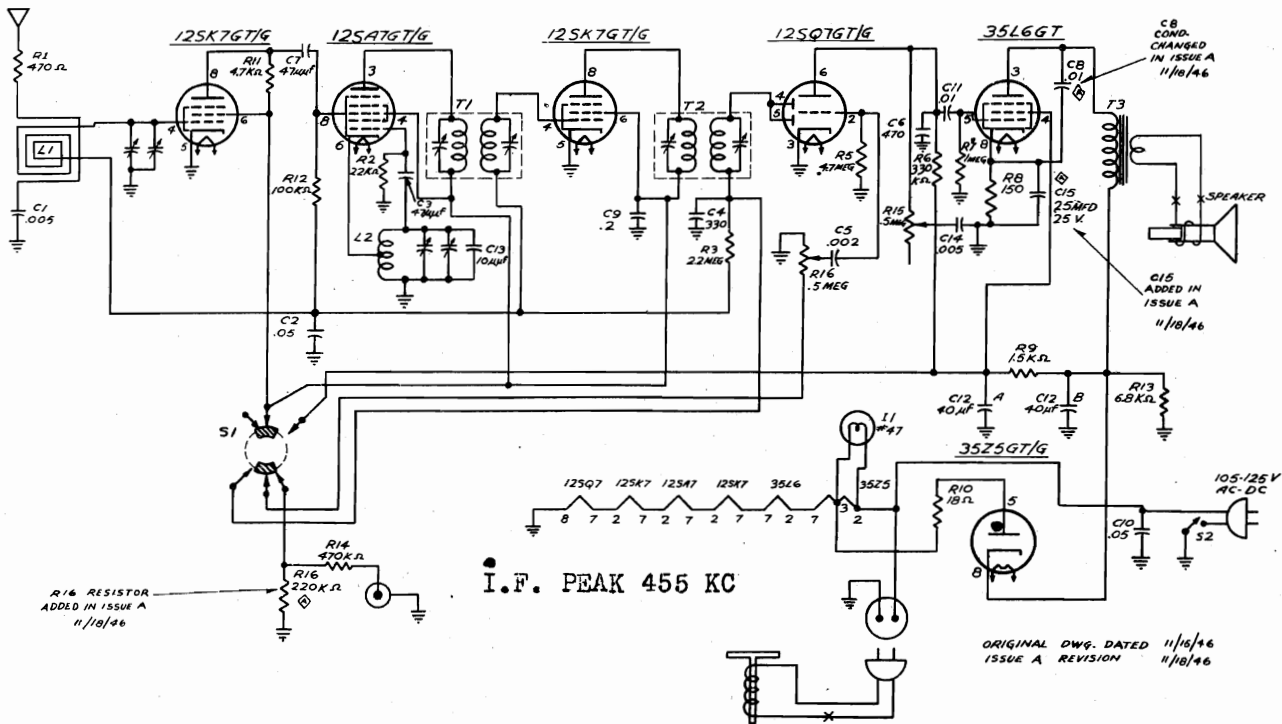
Location Schematic	Part No.	Description
	62189	Cabinet Back
C-20	1668	Condenser, Variable
C14	A20102	Condenser, Electrolytic 20-16-16 mfd. x 350 V.
C13	20105	Condenser, Electrolytic 25 mfd. x 25 VDC.
C1	A1725	Condenser, Trimmer, 3 Section, 3-30mmfd.
C18		Condenser, Mica 47 mmfd.
C6, C7, C23		Condenser, Mica 100 mmfd.
C9		Condenser, Mica 250 mmfd.
C22		Condenser, Mica 5020 mmfd.
C24		Condenser, Mica 82 mmfd.
C2		Condenser, Paper .05 mfd. 600 V.
C3		Condenser, Paper .1 mfd. 400 V.
C8		Condenser, Paper .002 mfd. 400 V.
C10		Condenser, Paper .005 mfd. 400 V.
C11		Condenser, Paper .01 mfd. 600 V.
C12		Condenser, Paper .01 mfd. 800 V.
C15		Condenser, Paper .02 mfd. 400 V.
C16, C17	1975	Condenser, Oil filled metal case .02 mfd. 600V.
R6	2470-A	Control, Volume .5 Meg
R9	2521	Control, Tone .25 Meg with switch
L1	28170	Coil, Loop
L2	28167	Coil, S.W. Antenna

Location Schematic	Part No.	Description
L3	28169	Coil, B.C. Oscillator
L4	28168	Coil, S.W. Oscillator
L5	28175	Coil, Wave Trap
		Knob, Tone-off-on
		Knob, Volume
		Knob, Tuning
		Knob, (RP, BC, SW)
		Pilot Lamp #47
R1		Resistor, 1,000 ohms 1/2 W.
R2, R3		Resistor, 6,800 ohms 2 W.
R14		Resistor, 22,000 ohms 1/2 W.
R4		Resistor, 2.2 Megohms 1/2 W.
R5		Resistor, 47,000 ohms 1/2 W.
R7		Resistor, 10 Meg ohms 1/2 W.
R8		Resistor, 220,000 ohms 1/2 W.
R10		Resistor, 470,000 ohms 1/2 W.
R11		Resistor, 300 ohms 2 W. Wirewound
R12		Resistor, 1500 ohms 2 W. Wirewound
R13		Resistor, 400 ohms 2 W. Wirewound
R15		Resistor, 150 ohms 1/2 W. Wirewound
R16		Resistor, 100,000 ohms 1/2 W.
	5866	Speaker, P. M.
T1	3360	Transformer, I.F. Input
T2	3530	Transformer, I.F. Output
T3	1333	Transformer, Output
T4	1020	Transformer, Power

- CD-4604 Cabinet 4604D
- CF-4604 Cabinet 4604F
- 3785A Rotary Bandswitch
- 4675B Drive Shaft Assembly
- 54161 Grommets for mounting Variable Condenser
- 40114 Dial scale
- 4140 Pointer
- 4633 Cord Spring Knob Felts Back Fastener Clips
- 54170 Antenna-Ground Post
- 24A5 Phono Jack
- Ins 4604 Instruction Book



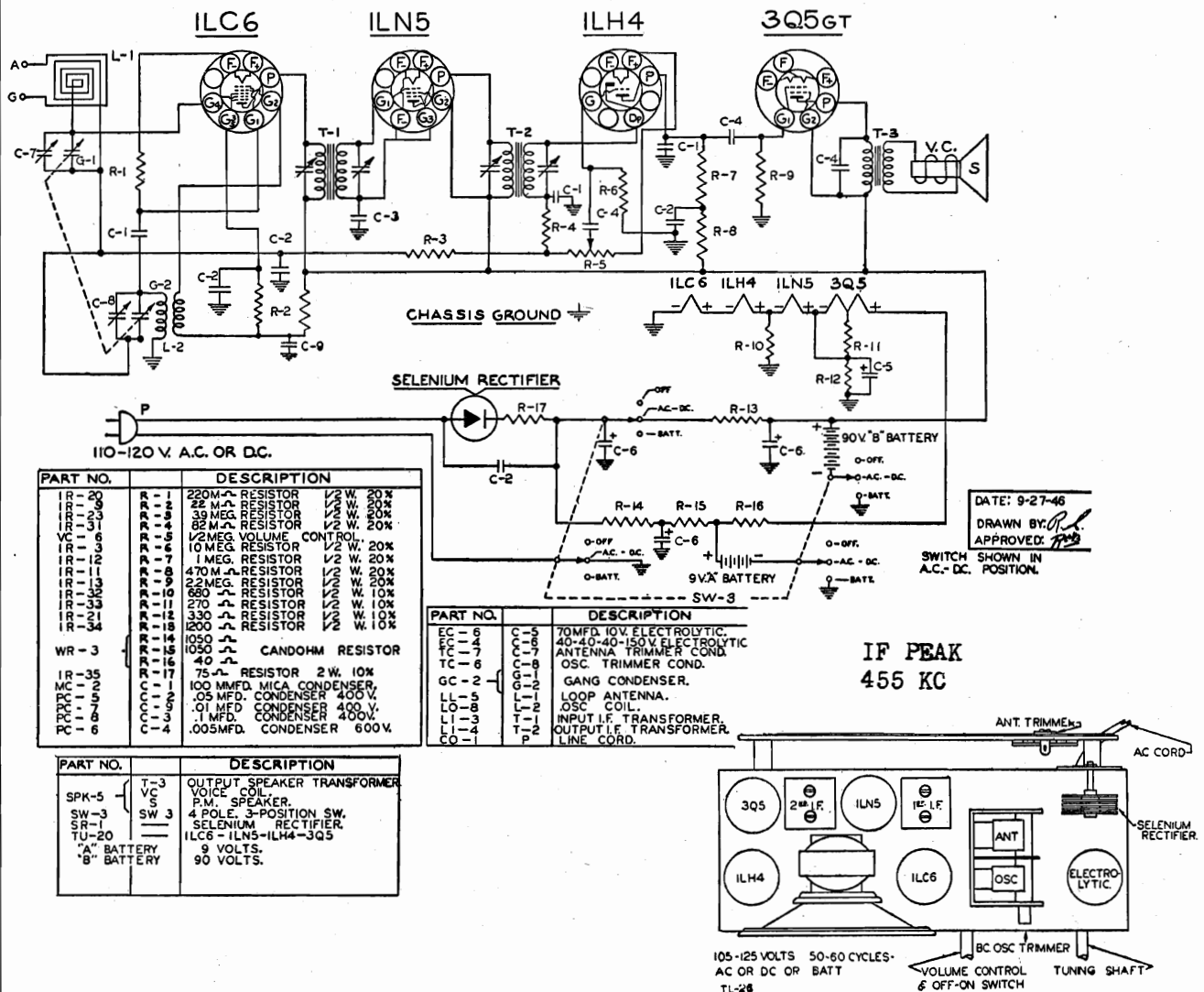
MODEL 4704 CROWN PRINCESS AIR KING PRODUCTS CO., INC.
Chassis 451-2



- 1639 Variable condenser
- 28177 Loop antenna
- 28172 Oscillator coil
- 3329 I.F. input transformer
- 3529 I.F. output transformer
- Electrolytic 40-40 mf, 150 WVDC
- Mica condenser 10 mmf
- " " 47 "
- " " 50 "
- " " 330 "
- " " 470 "
- Paper condenser 200 WVDC .05mf
- " " 400 " .002mf
- " " " " .005mf
- " " " " .01mf
- " " " " .02mf
- " " " " .05mf
- 2477 Volume control
- 2476 Tone control with switch
- 1/4W. carb. resistor 18 ohms
- " " " 470 "
- " " " 4700 "
- " " " 6800 "
- " " " 22000 "
- " " " 100000 "
- " " " 330000 "
- " " " 470000 "
- " " " 2.2meg "
- " " " 4.7meg "
- 1/2W. " " 150 "
- 2W. " " 2200 "

- 4678 Drive shaft
- Pointer
- 1851 Pilot light socket
- 4633 Cord spring
- Grommet (for variable)
- 40177 Lucite dial face
- 62191 Cabinet back
- 39150 Knob, phono-radio
- 39151 Knob, tone
- 39152 Knob, volume
- 39153 Knob, tuning
- Back fastener clips
- 3827A Phono switch
- Lifetime needle
- C4704 Cabinet
- 5870 Speaker w/transformer
- C4704 Record changer assembly

ALLIED RADIO CORP.



PART NO.	DESCRIPTION
IR-20	220M Ω RESISTOR 1/2 W. 20%
IR-21	22 M Ω RESISTOR 1/2 W. 20%
IR-22	39 M Ω RESISTOR 1/2 W. 20%
IR-23	82 M Ω RESISTOR 1/2 W. 20%
VC-1	1/2 MEG. VOLUME CONTROL
IR-11	10 MEG. RESISTOR 1/2 W. 20%
IR-12	1 MEG. RESISTOR 1/2 W. 20%
IR-13	470 M Ω RESISTOR 1/2 W. 20%
IR-14	22 MEG. RESISTOR 1/2 W. 20%
IR-15	680 Ω RESISTOR 1/2 W. 10%
IR-16	270 Ω RESISTOR 1/2 W. 10%
IR-17	1200 Ω RESISTOR 1/2 W. 10%
WR-3	1050 Ω CANDOHM RESISTOR
IR-35	40 Ω RESISTOR 2 W. 10%
MC-1	100 MMFD. MICA CONDENSER
IR-18	.05 MFD. CONDENSER 400 V.
IR-19	.1 MFD. CONDENSER 400 V.
IR-24	.01 MFD. CONDENSER 400 V.
IR-25	.005MFD. CONDENSER 600 V.

PART NO.	DESCRIPTION
EC-1-8	C-5 70MFD. 10V. ELECTROLYTIC.
TC-1-4	C-6 40-40-40-150V. ELECTROLYTIC
TC-1-7	C-7 ANTENNA TRIMMER COND.
TC-1-8	C-8 OSC. TRIMMER COND.
GC-2	C-9 GANG CONDENSER.
LL-5	L-1 LOOP ANTENNA.
LO-8	L-2 OSC. COIL.
LI-3	T-1 INPUT I.F. TRANSFORMER.
LI-4	T-2 OUTPUT I.F. TRANSFORMER.
CO-1	P LINE CORD.

PART NO.	DESCRIPTION
SPK-5	T-3 OUTPUT SPEAKER TRANSFORMER
SW-3	VC-1 VOICE COIL
SR-1	P.M. SPEAKER.
TU-20	4 POLE, 3-POSITION SW.
	SELENIUM RECTIFIER.
	ILC6 - ILN5-ILH4-3Q5
	9 VOLTS.
	90 VOLTS.

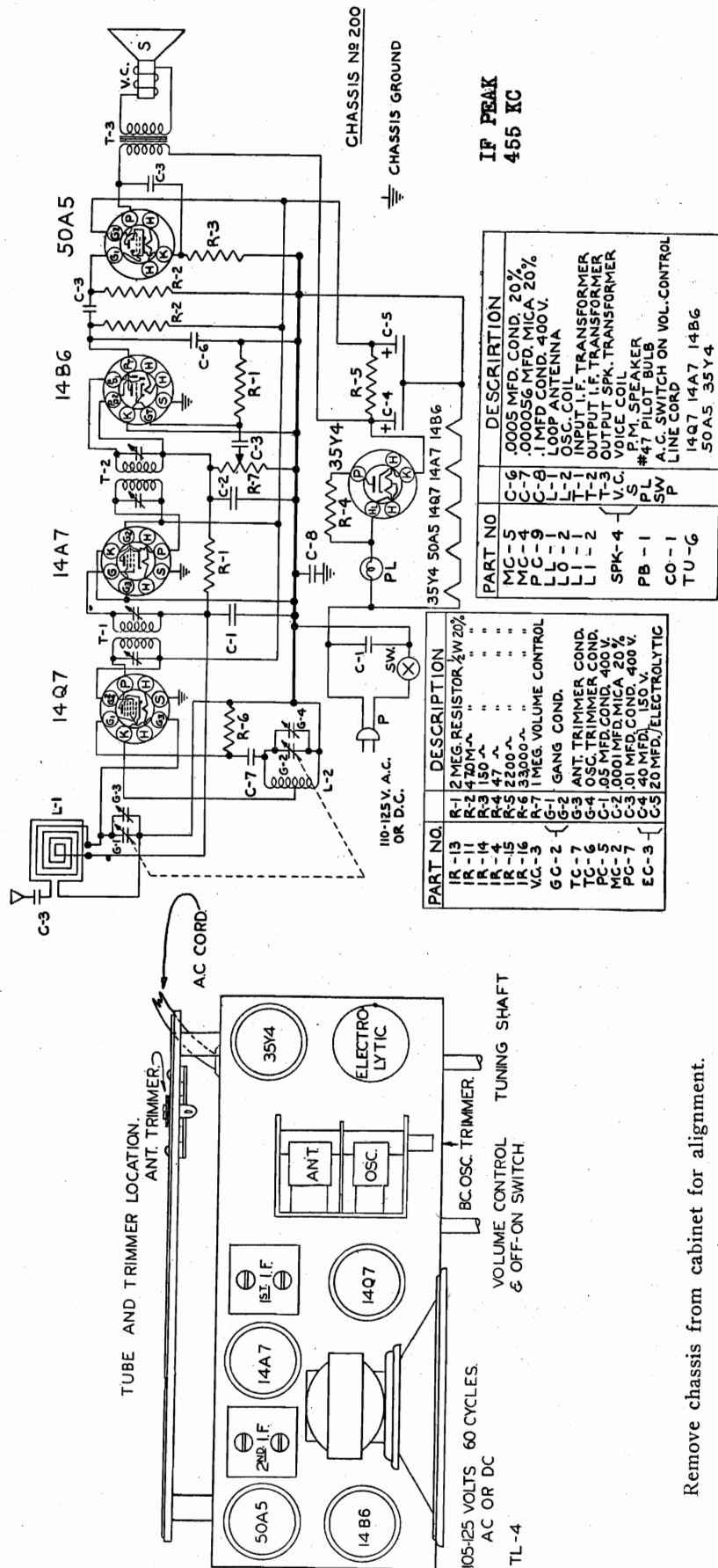
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IF PEAK
 455 KC

Remove chassis from cabinet for alignment.
 A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the metal frame of the gang condenser. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.
SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the top of the oscillator section of the gang condenser. Adjust this trimmer until the 1720 KC signal is tuned in.
THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the antenna lead wire that projects from the back of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

MODELS 5B-175, 5B-176
Chassis 200

ALLIED RADIO CORP.



Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

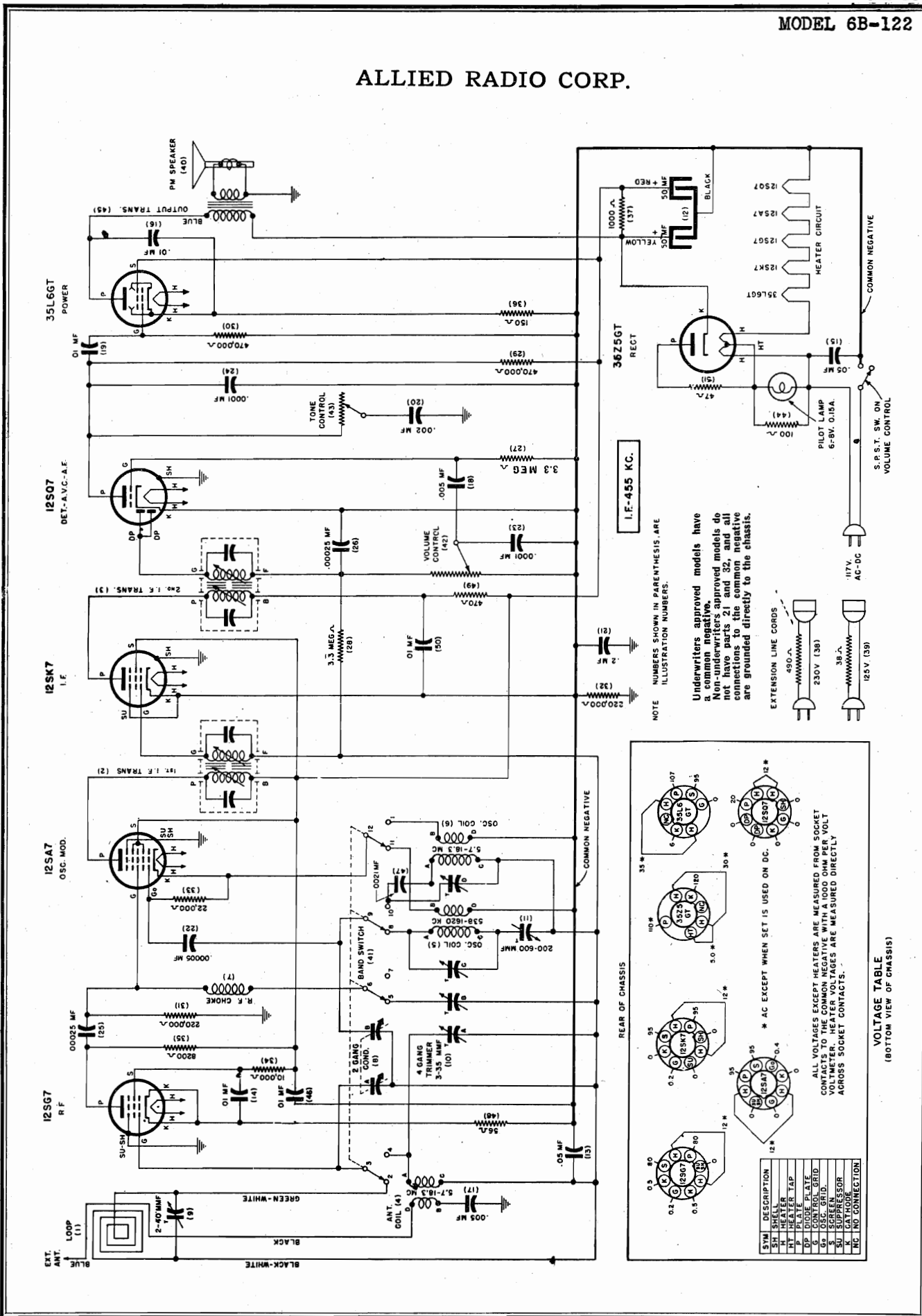
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the metal frame of the gang condenser. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis between the volume and tuning controls. Adjust this trimmer until the 1720 KC signal is tuned in.

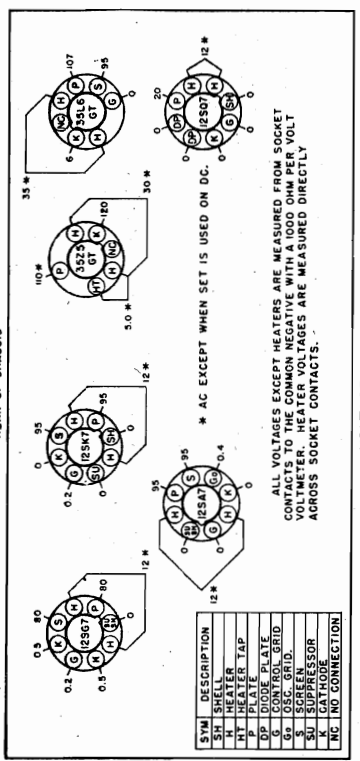
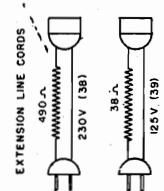
THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the antenna lead wire that projects from the back of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

IF PEAK
455 KC

ALLIED RADIO CORP.



Underwriters approved models have a common negative. Non-underwriters approved models do not have parts 1 and 32, and all common negative points in these models are grounded directly to the chassis.



REAR OF CHASSIS

SYM	DESCRIPTION
SH	SHELL
H	HEATER TAP
P	PLATE
DP	DODGE PLATE
G	GRID
S	SCREEN
SU	SUPPRESSOR
NC	NO CONNECTION

* AC EXCEPT WHEN SET IS USED ON DC.

ALL VOLTAGES EXCEPT HEATERS ARE MEASURED FROM SOCKET CONTACTS TO THE COMMON NEGATIVE WITH 100 OHM PER VOLT VOLTMETER. HEATER VOLTAGES ARE MEASURED DIRECTLY ACROSS SOCKET CONTACTS.

VOLTAGE TABLE (BOTTOM VIEW OF CHASSIS)

ALLIED RADIO CORP.

PARTS LIST

Illus. No.	Part Name	Description	Part No.	Part Name	Description
1	20E105 Coil	Antenna Loop	27	27E335 Resistor	Carbon, 3.3 Megohm, 1/3 Watt.
2	20E21 Coil	1st I. F. Transformer	28	27E335 Resistor	Carbon, 3.3 Megohm, 1/3 Watt.
3	20E22 Coil	2nd I. F. Transformer	29	27E474 Resistor	Carbon, 470,000 Ohm, 1/3 Watt.
4	20E72 Coil	Antenna	30	27E474 Resistor	Carbon, 470,000 Ohm, 1/3 Watt.
5	20E102 Coil	Oscillator, Broadcast Band	31	27E224 Resistor	Carbon, 220,000 Ohm, 1/3 Watt.
6	20E103 Coil	Oscillator, Short Wave Band	32	27E224 Resistor	Carbon, 220,000 Ohm, 1/3 Watt (Und. App'd Only)
7	2E19 Coil	R. F. Choke	33	27E223 Resistor	Carbon, 22,000 Ohm, 1/3 Watt
8	24E9 Condenser	Tuning, 2 gang with pulley	34	27E103 Resistor	Carbon, 10,000 Ohm, 1/3 Watt
9	24E3 Capacitor	Trimmer, 2-40 MMF (On Loop)	35	27E822 Resistor	Carbon, 8,200 Ohm, 1/3 Watt.
10	24E15 Capacitor	Trimmer, 4 Gang Strip	36	27E151 Resistor	Carbon, 150 Ohm, 1/3 Watt.
11	24E16 Capacitor	Padder, 200-600 MMF	37	27E102-3 Resistor	Carbon, 1,000 Ohm, 1 Watt.
12	25E6 Capacitor	50-50 Mfd. 150 Volt Dry Electrolytic.	38	Resistor	230 Volt Extension Line Cord Used Only in Models Not Having Common Ground
13	23E216 Capacitor	Tubular, .05 Mfd.—200 Volt.		Resistor	125 Volt Extension Line Cord Used Only in Models Not Having Common Ground
14	23E211 Capacitor	Tubular, .01 Mfd.—200 Volt.		Resistor	Elliptical Shape 4" x 6"
15	23E416 Capacitor	Tubular, .05 Mfd.—400 Volt.	40	1E1 Speaker	Band
16	23E411 Capacitor	Tubular, .01 Mfd.—400 Volt.	41	29E8 Switch	Volume Control with S.P.S.T. Switch.
17	23E408 Capacitor	Tubular, .005 Mfd.—400 Volt.	42	28E7 Resistor	Tone Control
18	23E208 Capacitor	Tubular, .005 Mfd.—200 Volt.	43	28E8 Resistor	Carbon, 100 Ohm, 1/2 Watt.
19	23E411 Capacitor	Tubular, .01 Mfd.—400 Volt.	44	27E101-2 Resistor	Output, Speaker
20	23E205 Capacitor	Tubular, .002 Mfd.—200 Volt.	45	22E8 Transformer	Tubular, .01 Mfd., 200 Volt.
21	23E421 Capacitor	Tubular, .2 Mfd. 400 Volt (Und. App'd Only)	46	23E211 Capacitor	Mica, .0021 Mfd.
22	23E37 Capacitor	Mica, .00005 Mfd.	48	27E560 Resistor	Carbon, 56 Ohm, 1/3 Watt.
23	23E39 Capacitor	Mica, .0001 Mfd.	49	27E471 Resistor	Carbon, 470 Ohm 1/3 Watt.
24	23E39 Capacitor	Mica, .0001 Mfd.	50	23E211 Capacitor	Tubular, .01 Mfd. 200 Volt.
25	23E42 Capacitor	Mica, .00025 Mfd.	51	27E470-2 Resistor	Carbon 47 Ohm, 1/2 Watt.
26	23E42 Capacitor	Mica, .00025 Mfd.			

MISCELLANEOUS PARTS

Part No.	Part Name	Description
40E1	Bulb	6-8 Volt .150 Amp. Dial light, No. 47.
7E100	Cabinet	Wood Table Model.
7E61	Cabinet Back	For Wood Table Model.
65E2	Dial Cord Spring	Tension Spring
4E1	Dial Cord	36" of 18 lb. Drive Cord
68E1	Dial Shaft	Drive Shaft
19E3	Dial Shaft Bearing	Bearing for Drive Shaft.
12E103-F10	Dial Shaft Washer	"C" Retainer Washer for Drive Shaft.
20E65	Dial Back Plate	Back Plate Assem. less Calibrated Scale.
36E28-1	Dial Scale	Calibrated Glass Scale.
32E4	Dial Scale Clip	For Mounting Dial Scale.
35E13	Dial Pointer	Dial Indicator
9E5	Dial Crystal	Marked "OFF-ON-VOLUME" for Wood Table Cabt.
37E21-10	Knob	Marked "TONE" for Wood Table Cabt.
37E21-11	Knob	Marked "TUNING" for Wood Table Cabt.
37E21-12	Knob	Marked "SW-BC" for Wood Table Cabt.
37E21-13	Knob	

OUTSIDE AERIAL

A 50 TO 75 FOOT AERIAL must be connected to the receiver WHEN TUNING FOR SHORT WAVE STATIONS or when the volume of 588-1620 KC band stations is not satisfactory. Attach this external aerial to the blue lead coming out of the rear of the chassis. WARNING—DO NOT ATTACH A GROUND TO THE RADIO—ANY EXTERNAL GROUND CONNECTION TO ANY METAL PART OF THE CHASSIS WILL CAUSE A SHORT AND POSSIBLE DAMAGE.

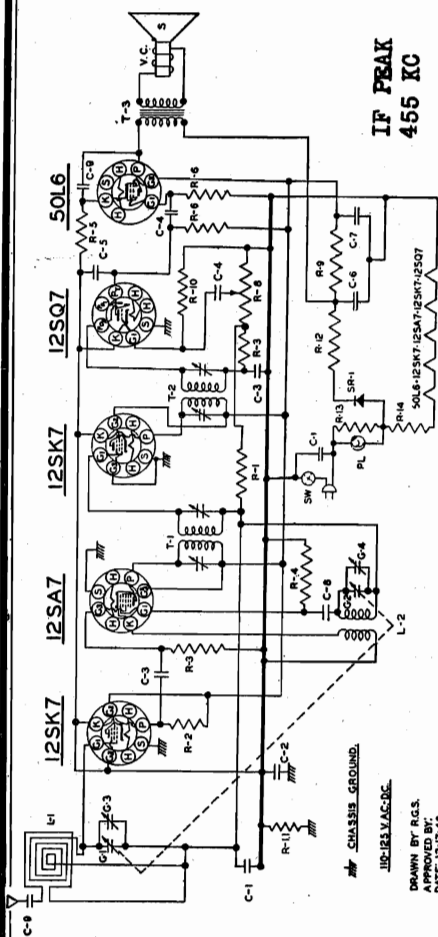
5.7 - 18.3 M.C. BAND

OPERATING INSTRUCTIONS

BE SURE TO ATTACH A REGULAR AERIAL TO BLUE ANTENNA LEAD COMING OUT OF REAR OF CHASSIS WHEN TUNING FOR SHORT WAVE STATIONS. TURN WAVE BAND SWITCH KNOB to the left hand position. Use section of dial that is calibrated from 5.7 - 18.3 M.C.

MODELS 6B-155, 6B-156
MODEL 5B-171

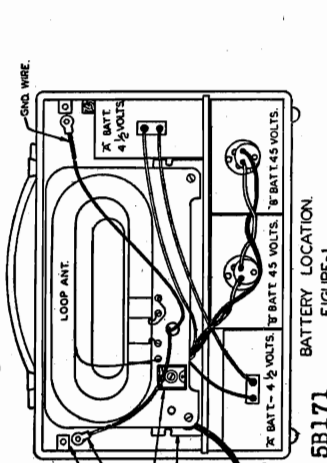
ALLIED RADIO CORP.



PART NO.	DESCRIPTION.	PART NO.	DESCRIPTION.
IR-23	1.5 MEG. RESISTOR 1/2 W 10	GC-2	1 GANG CONDENSER
IR-9	1.5 MEG. RESISTOR 1/2 W 10	TC-7	ANT. TRIMMER CONDENSER
IR-10	1.5 MEG. RESISTOR 1/2 W 10	TU-23	OSC. TRIMMER CONDENSER
IR-11	1.5 MEG. RESISTOR 1/2 W 10	WR-4	SW. SWITCH ON VOLUME CONTROL
IR-12	1.5 MEG. RESISTOR 1/2 W 10	SR-1	SELENIUM RECTIFIER
IR-13	1.5 MEG. RESISTOR 1/2 W 10		
IR-14	1.5 MEG. RESISTOR 1/2 W 10		
VC-4	1.5 MEG. VOLUME CONTROL		
IR-25	1.5 MEG. RESISTOR 1/2 W 10		
IR-26	1.5 MEG. RESISTOR 1/2 W 10		
IR-27	1.5 MEG. RESISTOR 1/2 W 10		
IR-28	1.5 MEG. RESISTOR 1/2 W 10		
IR-29	1.5 MEG. RESISTOR 1/2 W 10		
IR-30	1.5 MEG. RESISTOR 1/2 W 10		
IR-31	1.5 MEG. RESISTOR 1/2 W 10		
IR-32	1.5 MEG. RESISTOR 1/2 W 10		
IR-33	1.5 MEG. RESISTOR 1/2 W 10		
IR-34	1.5 MEG. RESISTOR 1/2 W 10		
IR-35	1.5 MEG. RESISTOR 1/2 W 10		
IR-36	1.5 MEG. RESISTOR 1/2 W 10		
IR-37	1.5 MEG. RESISTOR 1/2 W 10		
IR-38	1.5 MEG. RESISTOR 1/2 W 10		
IR-39	1.5 MEG. RESISTOR 1/2 W 10		
IR-40	1.5 MEG. RESISTOR 1/2 W 10		
IR-41	1.5 MEG. RESISTOR 1/2 W 10		
IR-42	1.5 MEG. RESISTOR 1/2 W 10		
IR-43	1.5 MEG. RESISTOR 1/2 W 10		
IR-44	1.5 MEG. RESISTOR 1/2 W 10		
IR-45	1.5 MEG. RESISTOR 1/2 W 10		
IR-46	1.5 MEG. RESISTOR 1/2 W 10		
IR-47	1.5 MEG. RESISTOR 1/2 W 10		
IR-48	1.5 MEG. RESISTOR 1/2 W 10		
IR-49	1.5 MEG. RESISTOR 1/2 W 10		
IR-50	1.5 MEG. RESISTOR 1/2 W 10		
IR-51	1.5 MEG. RESISTOR 1/2 W 10		
IR-52	1.5 MEG. RESISTOR 1/2 W 10		
IR-53	1.5 MEG. RESISTOR 1/2 W 10		
IR-54	1.5 MEG. RESISTOR 1/2 W 10		
IR-55	1.5 MEG. RESISTOR 1/2 W 10		
IR-56	1.5 MEG. RESISTOR 1/2 W 10		
IR-57	1.5 MEG. RESISTOR 1/2 W 10		
IR-58	1.5 MEG. RESISTOR 1/2 W 10		
IR-59	1.5 MEG. RESISTOR 1/2 W 10		
IR-60	1.5 MEG. RESISTOR 1/2 W 10		
IR-61	1.5 MEG. RESISTOR 1/2 W 10		
IR-62	1.5 MEG. RESISTOR 1/2 W 10		
IR-63	1.5 MEG. RESISTOR 1/2 W 10		
IR-64	1.5 MEG. RESISTOR 1/2 W 10		
IR-65	1.5 MEG. RESISTOR 1/2 W 10		
IR-66	1.5 MEG. RESISTOR 1/2 W 10		
IR-67	1.5 MEG. RESISTOR 1/2 W 10		
IR-68	1.5 MEG. RESISTOR 1/2 W 10		
IR-69	1.5 MEG. RESISTOR 1/2 W 10		
IR-70	1.5 MEG. RESISTOR 1/2 W 10		
IR-71	1.5 MEG. RESISTOR 1/2 W 10		
IR-72	1.5 MEG. RESISTOR 1/2 W 10		
IR-73	1.5 MEG. RESISTOR 1/2 W 10		
IR-74	1.5 MEG. RESISTOR 1/2 W 10		
IR-75	1.5 MEG. RESISTOR 1/2 W 10		
IR-76	1.5 MEG. RESISTOR 1/2 W 10		
IR-77	1.5 MEG. RESISTOR 1/2 W 10		
IR-78	1.5 MEG. RESISTOR 1/2 W 10		
IR-79	1.5 MEG. RESISTOR 1/2 W 10		
IR-80	1.5 MEG. RESISTOR 1/2 W 10		
IR-81	1.5 MEG. RESISTOR 1/2 W 10		
IR-82	1.5 MEG. RESISTOR 1/2 W 10		
IR-83	1.5 MEG. RESISTOR 1/2 W 10		
IR-84	1.5 MEG. RESISTOR 1/2 W 10		
IR-85	1.5 MEG. RESISTOR 1/2 W 10		
IR-86	1.5 MEG. RESISTOR 1/2 W 10		
IR-87	1.5 MEG. RESISTOR 1/2 W 10		
IR-88	1.5 MEG. RESISTOR 1/2 W 10		
IR-89	1.5 MEG. RESISTOR 1/2 W 10		
IR-90	1.5 MEG. RESISTOR 1/2 W 10		
IR-91	1.5 MEG. RESISTOR 1/2 W 10		
IR-92	1.5 MEG. RESISTOR 1/2 W 10		
IR-93	1.5 MEG. RESISTOR 1/2 W 10		
IR-94	1.5 MEG. RESISTOR 1/2 W 10		
IR-95	1.5 MEG. RESISTOR 1/2 W 10		
IR-96	1.5 MEG. RESISTOR 1/2 W 10		
IR-97	1.5 MEG. RESISTOR 1/2 W 10		
IR-98	1.5 MEG. RESISTOR 1/2 W 10		
IR-99	1.5 MEG. RESISTOR 1/2 W 10		
IR-100	1.5 MEG. RESISTOR 1/2 W 10		

To replace batteries, loosen and remove the two screws at the upper left and right hand corners of the cabinet back. Remove the back and pull out the plug from each battery. Never pull on the wires connected to the plugs as they may break. Always grasp the plug form between the fingers, or use a flat blade to pry out the plug. Observe with care the position of the batteries and plugs when replacing. Be sure that batteries and plugs are replaced as shown in the "Battery Location" diagram. (Figure No. 1)

After the batteries have been installed, replace the back, making sure that the two washers riveted to the bottom of the back, fit into the slots near the bottom edge of the cabinet. Also make sure that the two wires from the loop antenna are held in place between the top brackets of the cabinet and the back by the two fastening screws.



Mfg.	Volts	Type No.
Burgess	45 "B"	M30
General	45 "B"	W30B
Bright Star	45 "B"	3033
Usalite	45 "B"	640
Rayovac	45 "B"	P7830
Eveready	45 "B"	482
Burgess	4 1/2 "A"	G3
General	4 1/2 "A"	3H3
Bright Star	4 1/2 "A"	361
Usalite	4 1/2 "A"	683
Rayovac	4 1/2 "A"	P83A
Eveready	4 1/2 "A"	746

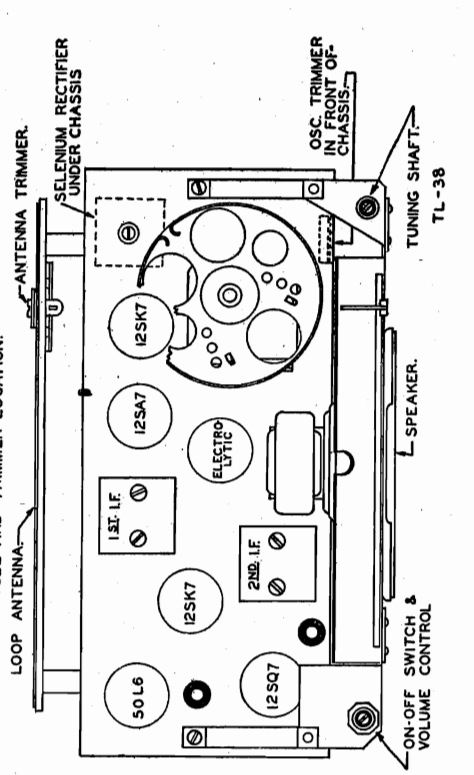
Remove chassis from cabinet for alignment.
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

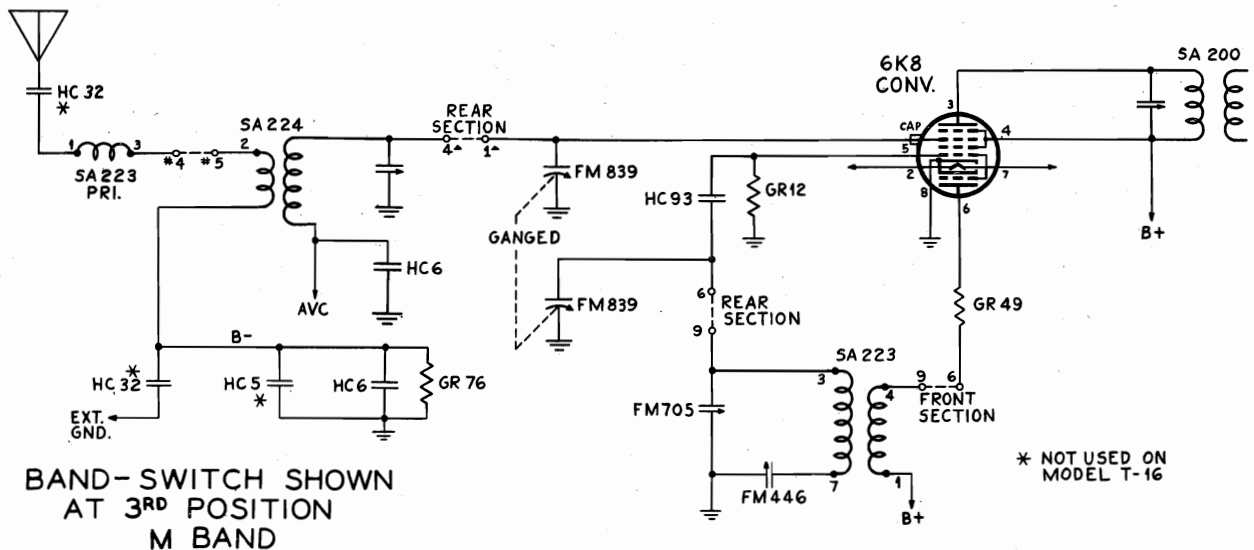
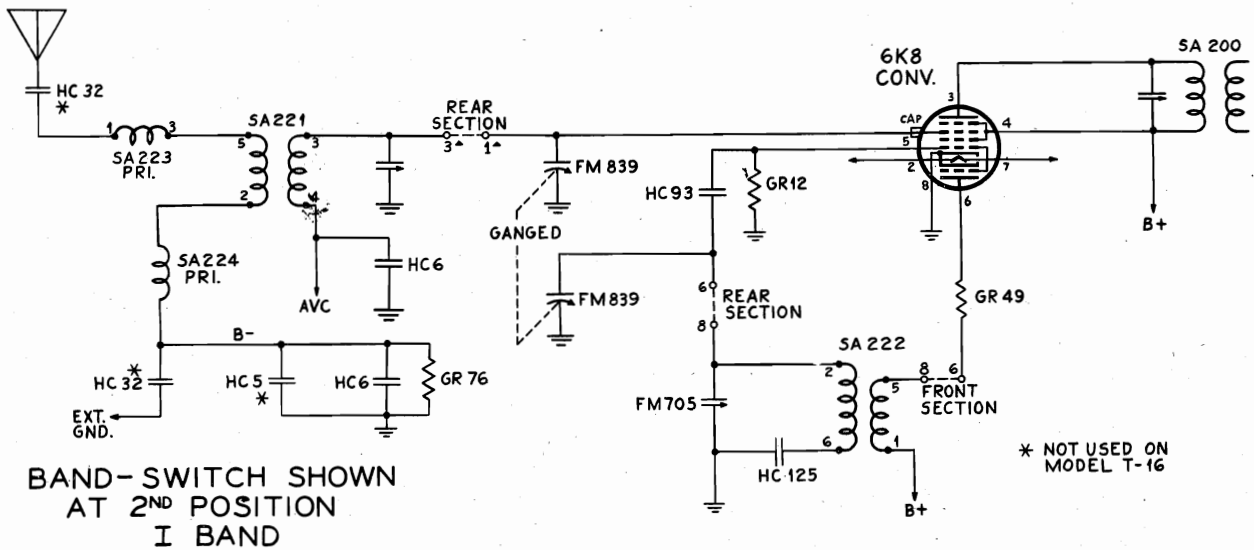
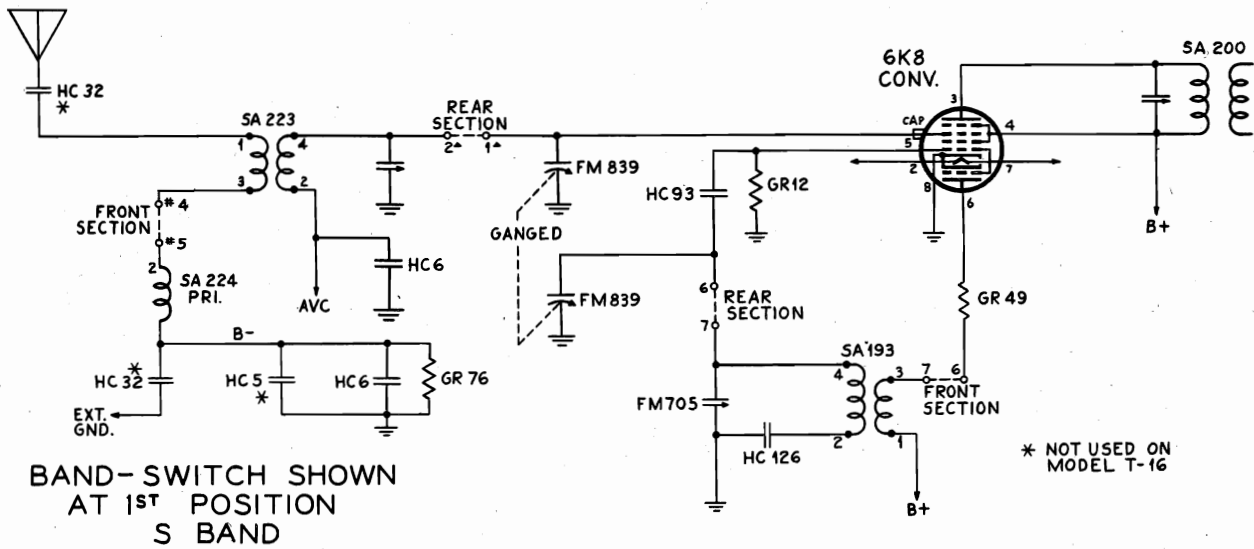
THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



"clarified schematics"

MODEL T-16

ANDREA RADIO CORP.



ANDREA RADIO CORP.

adjust the generator to 22,000 kc., and the receiver reference scale to 22.0 mc. Vary the S band oscillator shunt trimmer slowly from maximum to minimum. You will hear the signal at two settings of the trimmer, one nearer the minimum capacity (plates open) and one near the maximum capacity (plates closed). The setting near minimum capacity is correct, because the setting near maximum capacity is at the image frequency.

Now adjust the antenna shunt trimmer. During this adjustment, be sure to rock the gang condenser back and forth SLOWLY each time you make an adjustment of the trimmer. As you continue to do this, you will reach a point where further turning of the trimmer screw, while rocking the gang condenser, will not increase the signal response. This is the correct adjustment.

A simple method of determining if the receiver and generator are tuned for correct alignment is as follows:

Set the signal generator at 22,000 kc. and tune the receiver slowly from 21,000 to 23,000 kc. Two signals should be heard, 940 kc. apart. One will be lower in frequency than 22,000 kc. and the other will be higher. The higher frequency, as indicated on the dial, is the correct aligning frequency, and the lower one is the image.

As a further check, leave the receiver tuned to the higher frequency. Vary slowly, increase the generator frequency from 22,000 kc. to about 23,000 kc. A signal will be heard near 23,000 kc. if all the settings are correct for alignment. If there is no signal, the original settings were on the image frequency. In that case, you must start again from the beginning, in order to be sure of accurate results.

After you have found the correct settings, the image, or lower, frequency response on the receiver will always sound weaker than the true signal.

"I" BAND ALIGNMENT: With the signal generator connected in accordance with the preceding instructions, set the generator at 6,000 kc., turn the wave band switch to the I position, and adjust the gang reference scale to 6 mc., as set forth in the chart. Following the procedure just described, adjust the I band oscillator shunt trimmer for maximum signal response. Next, adjust the I band antenna shunt trimmer. Rock the gang condenser back and forth slowly as you adjust the trimmer, in accordance with the instructions for the S band adjustment. This completes the adjustment for the I band.

"M" BAND ALIGNMENT: Replace the 400-ohm resistor in the generator lead by a .00025 mfd. condenser. Set the generator at 1,500 kc., turn the wave band switch to the M position, and set the gang reference scale of the receiver at 1,500 kc., as set forth in the chart. Adjust the M band oscillator shunt trimmer for maximum signal response. Next, adjust the antenna shunt trimmer for maximum response.

This band must be aligned at 600 kc. also. Set the generator accordingly, and tune the receiver to 600 kc., as set forth in the chart. Adjust the M band oscillator series trimmer for maximum response. During this adjustment, be sure to rock the gang condenser for each small change of capacity of the series trimmer. When this adjustment has been completed, recheck the antenna adjustment at 1,500 kc. This completes the adjustment of the M band.

After installing the chassis in the cabinet, turn the tuning knob until the gang condenser plates are completely meshed. Then slide pointer along cord (without opening gang) until the center of the pointer is over the last diamond marking on the left side of the 2-8-7 mc. scale. When the above is followed correctly along with method of alignment, the pointer will match the correct scale calibration throughout.

TUNES:

6K8	Oscillator & Modulator	6S7S	1st Audio
6V6GT	Beam Power Output	5Y3C	Rectifier
6BE	2nd Detector & AVC	6SK7	I.F. Amplifier

IMPORTANT: If you find it necessary to replace any part in this receiver, bear this in mind: In order to maintain the high performance standards of Andrea Radio receivers, the component parts on all Andrea models are held to exceedingly close tolerance limits. Furthermore, Andrea components are given the exclusive "Climate Sealed" treatment which protects them from all weather and temperature conditions. Consequently, standard Andrea Radio replacement parts must be used for all service work, for the substitution of ordinary stock items will result in inferior performance.

FOR OPERATION ON AC - LINE VOLTAGES OF 106-125, 210-240, 50/60 CYCLES

WARNING! Always remove the line plug from the electric outlet before removing the chassis from the cabinet. Also - connect the speaker plug to the receiver before switching on the power. Otherwise, damage will result.

I. F. REALIGNMENT GENERALLY SUFFICIENT: As a rule, it is not necessary to readjust the short wave oscillator and antenna shunt and series trimmers unless they have been tampered with, or require replacing. Consequently, careful realignment of the I. F. system is all that requires attention, ordinarily. Before making any adjustments, tune in one particular station and note the quality of reception so that you can check the improvement after the I. F. system has been realigned.

USE SIGNAL GENERATOR AND OUTPUT VOLTMETER: For realigning, use a signal generator to supply a modulated carrier of 470, 500, 1,500, 6,000, and 22,000 kc., plus an output voltmeter. Alignment by any other means is not recommended. Your service test generator should be checked frequently for change in calibration by getting a zero beat between the generator and broadcast stations of known frequency.

SPECIAL NOTES: Before proceeding to align the antenna and oscillator circuits bear in mind that these circuits control the accuracy of the main tuning dial calibration particularly the oscillator trimmers. As the main dial is a part of the cabinet, servicing of the chassis can be made without the use of this dial by using the reference alignment scale 0 to 100 divisions attached permanently to the gang condenser drive drum.

The table below indicates the reference dial settings for the required alignment frequencies. You will note that the chassis contains a self-tapping screw located just below the gang condenser drum, the purpose of which, is to enable you to wrap a piece of bare wire and thereby form a pointer to the reference scale. Set the pointer at the zero marking on the reference scale with the gang condenser plates fully meshed (all capacity in) after which rotate the drum to the correct reference setting for proper circuit alignment and procedure in accordance with the Band alignment instruction. Remove reference pointer before installing in cabinet.

ALIGNMENT FREQ.	REFERENCE DIAL
KC.	SETTING
1,500	88.5
600	15.5
6,000	80.5
22,000	85

NOTES ON REALIGNING THE BANDS: During the aligning measurements, the output of the signal generator must be kept low so that it will not cause the AVC circuit in the set to function. In other words, when the volume control on the set is turned to maximum, the output should not show more than .5 volt across the voice coil, or 50 milliwatts in the plate circuit of the output tube.

Generally, at frequencies above 7,000 kc., the signal generator frequency will change with each adjustment of the generator output attenuator control. Hence, the receiver must be retuned each time the attenuator is adjusted.

Some generators cause trouble by direct radiation to the set at frequencies above 8 mc. Experience indicates that more accurate alignment is possible when the generator is separated by several feet from the receiver under test, in order to eliminate this direct pickup.

470-KC. I. F. ALIGNMENT: Connect the high-potential lead of the signal generator in series with a .1 mfd. condenser to the grid of the 6K8 tube. Set the generator at 470 kc., and adjust the output until a small deflection is obtained in the output meter. Adjust the trimmers condensers on the top of the 1st and 2nd I.F. transformers (see circuit diagram) for maximum deflection on the output meter. After this adjustment has been made, disconnect the generator from the grid of the 6K8 tube. This completes the alignment of the I.F. system.

"S" BAND ALIGNMENT: Connect the high-potential lead from the generator in series with a 400 ohm resistor to the antenna terminal (marked A) on rear of loop, and the low side of the generator to the ground terminal (marked G) on rear of loop. Put the wave band switch at the S position.

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"S" BAND ALIGNMENT: Connect the high-potential lead from the generator in series with a 400 ohm resistor to the antenna terminal (marked A) on rear of loop, and the low side of the generator to the ground terminal (marked G) on rear of loop. Put the wave band switch at the S position, adjust the generator to 22,000 kc., and the receiver to 22.0 mc. Vary the S band oscillator shunt trimmer slowly from maximum to minimum. You will hear the signal at two settings of the trimmer, one nearer the minimum capacity (plates open) and one near the maximum capacity (plates closed). The setting near minimum capacity is correct, because the setting near maximum capacity is at the image frequency.

Now adjust the antenna shunt trimmer. During this adjustment, be sure to rock the gang condenser back and forth slowly each time you make an adjustment of the trimmer. As you continue to do this, you will reach a point where further turning of the trimmer screw, while rocking the gang condenser, will not increase the signal response. This is the correct adjustment.

A simple method of determining if the receiver and generator are tuned for correct alignment is as follows: Set the signal generator at 22,000 kc., and tune the receiver slowly from 21,000 to 23,000 kc. Two signals should be heard, 940 kc. apart. One will be lower in frequency than 22,000 kc. and the other will be higher. The higher frequency, as indicated on the dial, is the correct aligning frequency, and the lower one is the image.

As a further check, leave the receiver tuned to the higher frequency. Vary slowly, increase the generator frequency from 22,000 kc. to about 23,000 kc. A signal will be heard near 23,000 kc. if all the settings are correct for alignment.

If there is no signal, the original settings were on the image frequency. In that case, you must start again from the beginning, in order to be sure of accurate results. After you have found the correct settings, the image, or lower, frequency response on the receiver will always sound weaker than the true signal.

"I" BAND ALIGNMENT: With the signal generator connected in accordance with the preceding instructions, set the generator at 6,000 kc., turn the wave band switch to the I position, and adjust the dial to 6 mc. Following the procedure just described, adjust the I band oscillator shunt trimmer for maximum signal response. Next, adjust the I band antenna shunt trimmer. Rock the gang condenser back and forth slowly as you adjust the trimmer, in accordance with the instructions for the S band adjustment. This completes the adjustment for the I band.

"M" BAND ALIGNMENT: Replace the 400-ohm resistor in the generator lead by a .00025 mfd. condenser. Set the generator at 1,500 kc., turn the wave band switch to the M position, and set the dial of the receiver at 1,500 kc. Adjust the M band oscillator shunt trimmer for maximum signal response. Next adjust the antenna shunt trimmer for maximum response. This band must be aligned at 600 kc. also. Set the generator accordingly, and tune the receiver to 600 kc. Adjust the M band oscillator series trimmer for maximum response. During this adjustment, be sure to rock the gang condenser for each small change of capacity of the series trimmer. When this adjustment has been completed, recheck the antenna adjustment at 1,500 kc. This completes the adjustment of the M band.

- TUBES:** The following tubes are required for this receiver:
- 6X8 Oscillator and Modulator
 - 6XK7 I. F. Amplifier
 - 6BE 2nd Detector and AVC
 - 6S7's 1st Audio
 - 25L6G Beam Power Output
 - 28Z6G Rectifier
 - 763 Ballast Tube

IMPORTANT! If you find it necessary to replace any part in this receiver, bear this in mind: in order to maintain the high performance standards of Andrea Radio receivers, the components parts on all Andrea models are held to exceedingly close tolerance limits. Furthermore, Andrea components are given the exclusive "Climate Sealed" treatment which protects them from all weather and temperature conditions. Consequently, standard Andrea Radio replacement parts must be used for all service work, for the substitution of ordinary, stock items will result in inferior performance.

100-120-150-220-250 40/50 CYCLES OR DC FOR OPERATION ON AC OR DC, LINE VOLTAGES OF 100 TO 250

WARNING! Always remove the line plug from the electric outlet before removing the chassis from the cabinet. Also - connect the speaker plug to the receiver before switching on the power. Otherwise, damage will result.

I. F. ALIGNMENT GENERALLY SUFFICIENT: As a rule, it is not necessary to readjust the short wave oscillator and antenna shunt and series trimmers unless they have been tampered with, or require replacing. Consequently, careful realignment of the I. F. system is all that requires attention, ordinarily. Before making any adjustments, tune in one particular station and note the quality of reception so that you can check the improvement after the I. F. system has been realigned.

USE SIGNAL GENERATOR AND OUTPUT VOLTMETER: For realigning, use a signal generator to supply a modulated carrier of 470, 600, 1,500, 6,000, and 22,000 kc., plus an output voltmeter. Alignment by any other means is not recommended. Your service test generator should be checked frequently for change in calibration by getting a zero beat between the generator and broadcast stations of known frequency.

SPECIAL NOTES: Before proceeding to align the antenna and oscillator circuits bear in mind that these circuits control the accuracy of the main tuning dial calibration particularly the oscillator trimmer. As the main dial is a part of the cabinet, servicing of the chassis can be made without the use of this dial by using the reference alignment scale 0 to 100 divisions attached permanently to the gang condenser drive drum.

The table below indicates the reference dial settings for the required alignment frequencies. You will note that the chassis contains a self-tapping screw located just below the gang condenser drum, the purpose of which, is to enable you to wrap a piece of bare wire and thereby form a pointer to the reference scale. Set the pointer at the zero marking on the reference scale with the gang condenser plates fully meshed (all capacity in) after which rotate the drum to the correct reference setting for proper circuit alignment and procedure in accordance with the Band alignment instruction. Re-move reference pointer before installing in cabinet.

ALIGNMENT FREQ. KC.	REFERENCE DIAL SETTING	BAND
1,500	86.5	"M"
600	16.5	"M"
6,000	80.5	"I"
22,000	85	"S"

NOTES ON REALIGNING THE BANDS: During the aligning measurements, the output of the signal generator must be kept low so that it will not cause the AVC circuit in the set to function. In other words, when the volume control on the set is turned to maximum, the output should not show more than .5 volt across the voice coil, or 50 milliwatts in the plate circuit of the output tube.

Generally, at frequencies above 7,000 kc., the signal generator frequency will change with each adjustment of the generator output attenuator control. Hence the receiver must be returned each time the attenuator is adjusted.

Some generators cause trouble by direct radiation to the set at frequencies above 8 mc. Experience indicates that more accurate alignment is possible when the generator is separated by several feet from the receiver under test, in order to eliminate this direct pickup.

470 KC. I. F. ALIGNMENT: Connect the high-potential lead of the signal generator in series with a .1 mfd. condenser to the grid of the 6X8 tube. Set the generator at 470 kc., and adjust the output until a small deflection is obtained in the output meter. Adjust the trimmer condensers on the top of the 1st and 2nd I. F. transformers (see circuit diagram) for maximum deflection on the output meter. After this adjustment has been made, disconnect the generator from the grid of the 6X8 tube. This completes the alignment of the I. F. system.

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ANSLEY RADIO CORP.

Replacement Parts
The F.M. Tuner - Model F.M. 4

Req.	Description	Part No.	List Price
3	I.F. Transformer 4.3 M.C.	8.21A	1.50
1	Discriminator Transformer 4.3 M.C.	8.22A	5.00
1	Antenna Coil	28.39A	1.00
1	Oscillator Coil	28.41A	1.00
1	R.F. Coil	28.40	1.00
1	Pilot Bulb 12-100 M.A.	18.06	.65
	(Dial Assembly	25.63)	
	(Flexible Connecting Shaft		
	(Flexible Casing		7.50
	(Hardware Shaft and Casing		
1	On-Off Switch	16.12	1.60

Condensers

1	3 Section Variable	6.87A	6.00
17	.01 MFD 400 volt P.T.C.	7.76	.15
2	.0015 MFD Mica MW	6.88	.15
2	.0005 MFD Mica MW	6.10	.15
1	.00025 MFD Mica MO	6.47	.15
2	.0001 MFD Mica MO	6.08	.15
1	.00033 MFD Mica MO	6.89	.15
1	.000022 MFD Mica MO	6.90	.15
3	.00005 MFD Mica MO	6.70	.15
1	.0001 MFD Silver Mica MO	6.91	.35
1	5 MMF Sprague Type 3 Liquid Dielectric Cond.	6.92	.50

Resistors

2	68 Ohms $\frac{1}{2}$ Watt	7.89	.15
2	220 Ohms $\frac{1}{2}$ Watt	7.67	.15
2	330 Ohms $\frac{1}{2}$ Watt	7.73	.15
1	470 Ohms $\frac{1}{2}$ Watt	7.90	.15
4	1000 Ohms $\frac{1}{2}$ Watt	7.47	.15
2	10 K Ohms $\frac{1}{2}$ Watt	7.91	.15
1	22 K Ohms $\frac{1}{2}$ Watt	7.92	.15
1	33 K Ohms $\frac{1}{2}$ Watt	7.93	.15
4	47 K Ohms $\frac{1}{2}$ Watt	7.94	.15
1	68 K Ohms $\frac{1}{2}$ Watt	7.95	.15
4	100 K Ohms $\frac{1}{2}$ Watt	7.14	.15
1	180 K Ohms $\frac{1}{2}$ Watt	7.96	.15
1	220 K Ohms $\frac{1}{2}$ Watt	7.97	.15
4	470 K Ohms $\frac{1}{2}$ Watt	7.98	.15
1	1 Megohm $\frac{1}{2}$ Watt	7.34	.15
1	10 K Ohms 1 Watt	7.59	.15
1	230 Ohm 5 Watt Metal Clad	7.99	1.25

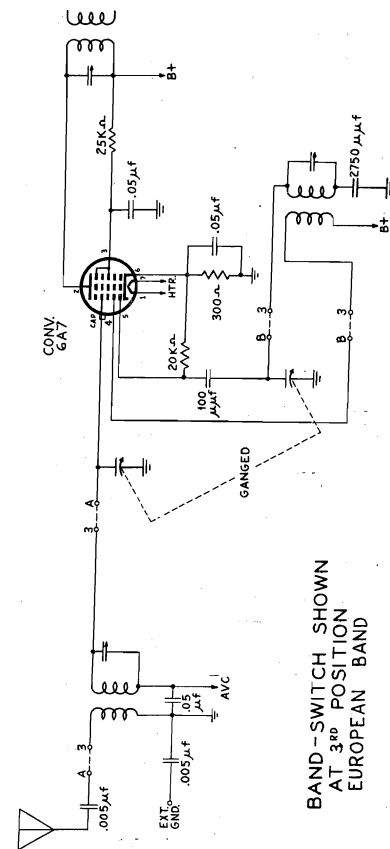
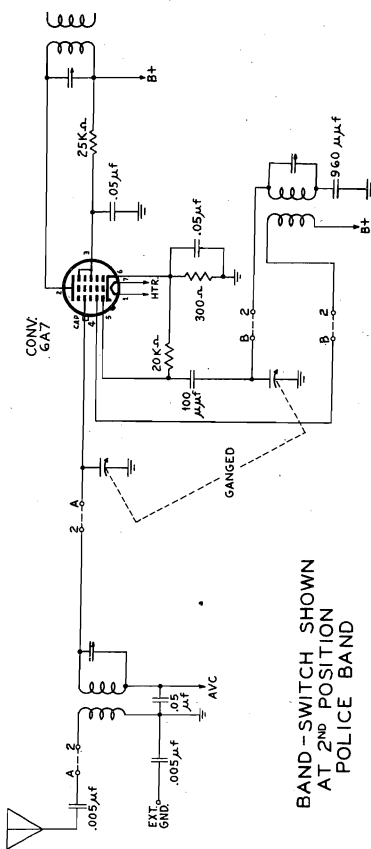
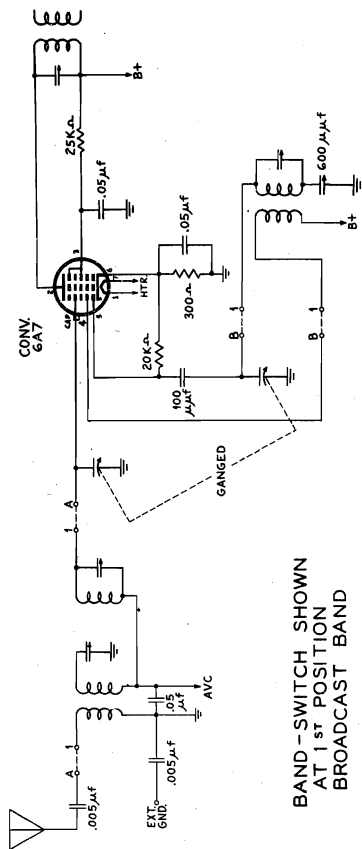
Tubes

1	12K8	34.38
3	14H7	34.39
2	14C7	34.40
1	7A6	34.41

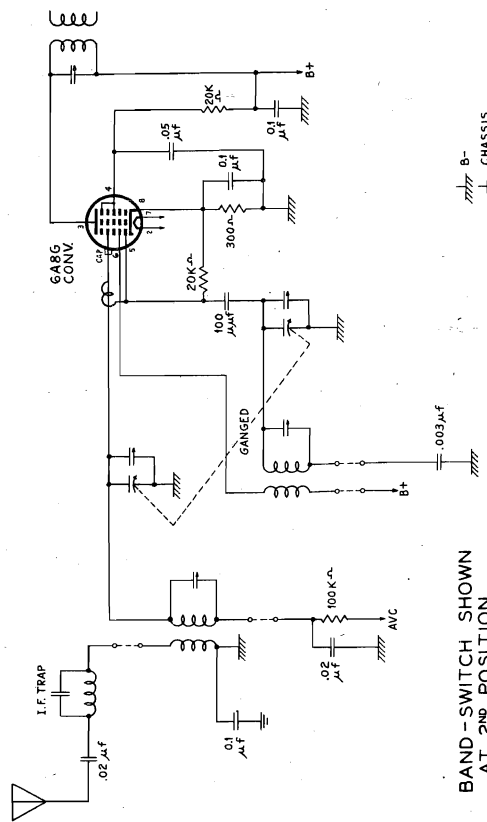
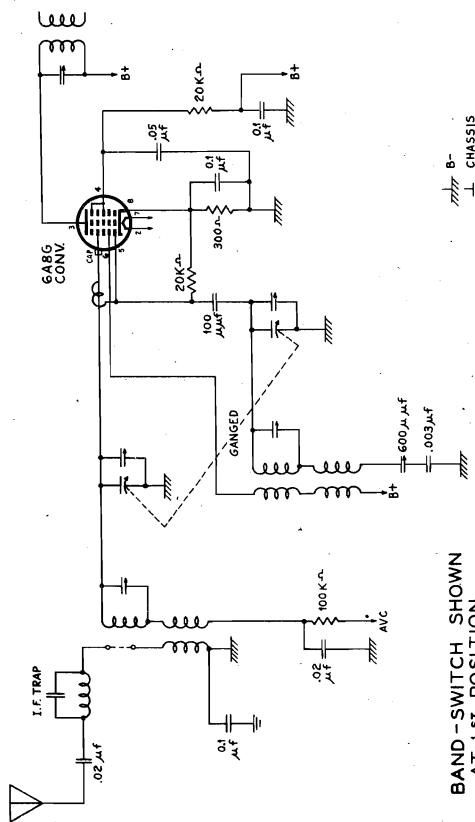
ANSLEY RADIO CORP.

MODELS 677, 678
MODEL 5111

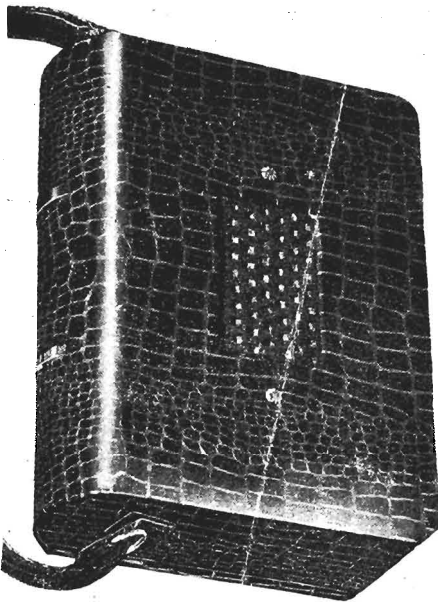
MODEL 5111



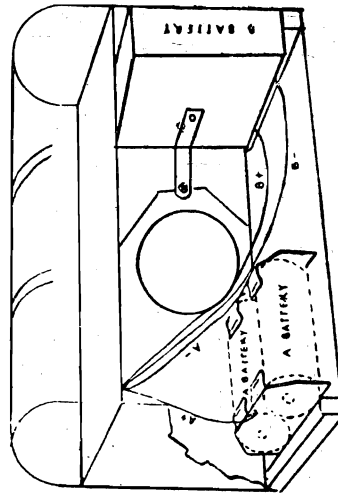
MODELS 677, 678



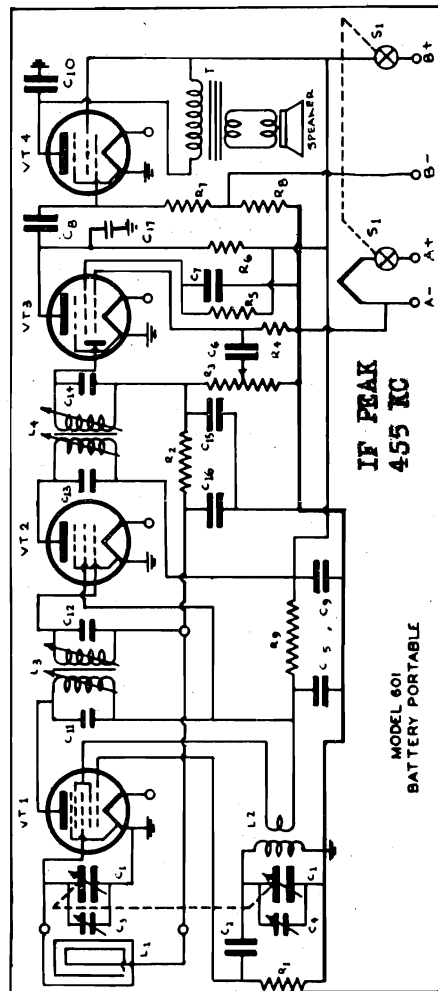
ARC RADIO CORP.



Cut-Away View
Showing Batteries
Placed in Cabinet



NOTE: Nipple end of "A" batteries go to A+. Snap back cover in proper place. Set will not operate with cover open.



IF PEAK
455 IC

MODEL 601
BATTERY PORTABLE

Quantity	Item**	Part No.	Description	Price
1.	c1	601-5	Two Gang Variable Condenser	\$2.35
2.	c2, c17	601-43	50 MMF Condenser	.20 each
2.	*c3, c4	601-5	Trimmers, Part of Variable Condenser	0
1.	c15	601-42	.00025 Tubular Condenser	.20
3.	c6, c8, c10	601-41	.002MFD, 200 Volt Tubular Condenser	.20 each
3.	c7, c5, c16	601-44	.05MFD, 200 Volt Tubular Condenser	.20 each
1.	c9	601-10	8MFD, 150 Volt Dry Electrolytic Condenser	.50
4.	*c11, c12, c13, c14	601-3, 3A	Part of I.F. Transformers	0
1.	L1.	601-8	Loop Antenna Assembly	.85
1.	L2.	601-9	Oscillator Coil	.50
1.	L3.	601-3	Double tuned iron core First I.F. Transformer	.95
1.	L4.	601-3A	Double Tuned Iron Core Second I.F. Transformer	.95
1.	T.		Output Transformer	.95
1.	601-2		100,000 ohm 1/4 Watt Carbon Resistor	.15
1.	R1.	601-16	2.2 Megohm 1/4 Watt Carbon Resistor	.15
1.	R2.	601-17	1 Megohm Volume Control with S1	1.05
1.	R3.	601-6	10 Megohm 1/4 Watt Carbon Resistor	.15
1.	R4.	601-18	4.7 Megohm 1/4 Watt Carbon Resistor	.15
1.	R5.	601-19	1 Megohm 1/4 Watt Carbon Resistor	.15
1.	R6.	601-20	3 Megohm 1/4 Watt Carbon Resistor	.15
1.	R7.	601-21	820 Ohm 1/2 Watt Carbon Resistor	.15
1.	R8.	601-22	5000 Ohm 1/2 Watt Carbon Resistor	.15
1.	R9.	601-23	Double Pole Single Throw Switch	0
1.	*S1.		1R5 Tube	2.20
1.	VT.1	601-55	1T4 Tube	2.20
1.	VT.2	601-54	1S7 Tube	2.20
1.	VT.3	601-56	3S4 Tube	2.20
1.	VT.4	601-4	4" Permanent Magnet Dynamic Speaker 1 oz. Alnico No.5	3.00

*NOT SUPPLIED SEPARATELY.

MODEL 601

ARC RADIO CORP.

LOCATION OF COILS AND ADJUSTMENTS

The oscillator coil is located beneath the chassis. The loop is mounted inside the cover with the connection of the loop soldered to snaps on the cover. The trimmers for oscillator coil and loop are mounted on the variable condenser. The IF is permeability tuned, and the slugs are reached from top and bottom of the IF transformer.

The IF transformers are located in cans mounted on top of the chassis. The first IF transformer No. 1455-1R is at the rear right of the chassis. The second IF transformer No. 1455-6 is to the front left of the variable condenser.

NOTE: The top iron core slug is the secondary of each transformer.

A signal generator with frequencies of 455 & 1400 KC is required. An output meter should be used across the voice coil or output transformer for observing maximum response. Always use as weak a test signal as possible when aligning the receiver.

I.F. ALIGNMENT

Connect two jumpers, one to each snap button on cover to other part of snap button on posts of cabinet. This connects the loop.

Swing variable condenser to minimum capacity position. Feed 455KC to the grid of the 1R5 tube through a .01 condenser. Tune secondary of second IF for maximum indication of output meter, then tune primary in similar manner. Tune first IF secondary and then primary.

R.F. ALIGNMENT

Set the dial pointer at 1400KC. Feed 1400 KC from the signal generator into a loop of wire about 12 inches in diameter. Hold this radiating loop approximately one foot away from and parallel to the receiver loop antenna and advance the output of the signal generator until a suitable deflection is obtained on the output meter. First adjust the oscillator and then the antenna trimmer for maximum response.

If the loop antenna has been replaced it may be necessary to adjust the loop inductance. Align at 1400KC. Set the dial at 600KC and feed 600KC to the antenna lead. A portion of the outside turn of loop may be swung to either side of the center to give maximum response. Realign at 1400 KC.

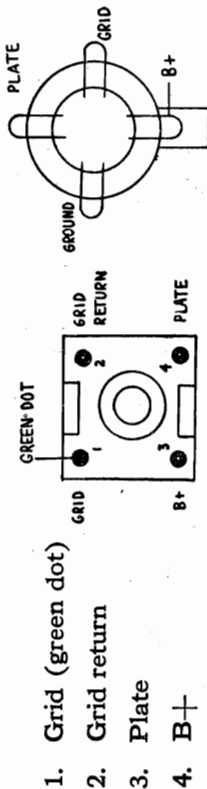
Current drain A Battery-0.220 Amps.
 B Battery-0.008 Amps.
 Frequency Range.....1600 KC to 550 KC

GENERAL NOTES

1. Batteries: The model No. 601 is designed to house the complete set of batteries within the cabinet. The battery complement should be as follows:

Type Battery No. Req. Eveready Part No. Burgess Part No. Ray-O-Vac Part No.
 1 1/2 Volt "A" 2 No. 950 No. 2R No. 2LP
 6 7/2 Volt "B" 1 No. 467 No. XX 45 No. 4367

2. The lug connections for the I.F. transformers and oscillator coil are as follows:
 Oscillator Coil



3. If replacements are made in the R.F. section of the circuit, the receiver should be carefully re-aligned.
 4. The self-contained loop antenna has directional characteristics. It is important therefore, once the station is tuned in, that the cabinet be rotated on its base, back and forth, through a quarter of a circle (90°) and left at the position where the station is received with maximum volume.

TUBE DATA

The tube complement is as follows:

- 1 1R5 oscillator modulator
- 1 1T4 I.F. amplifier
- 1 1S5 2nd detector, AVC, A.F. amplifier
- 1 3S4 beam power output

VOLTAGE ANALYSIS

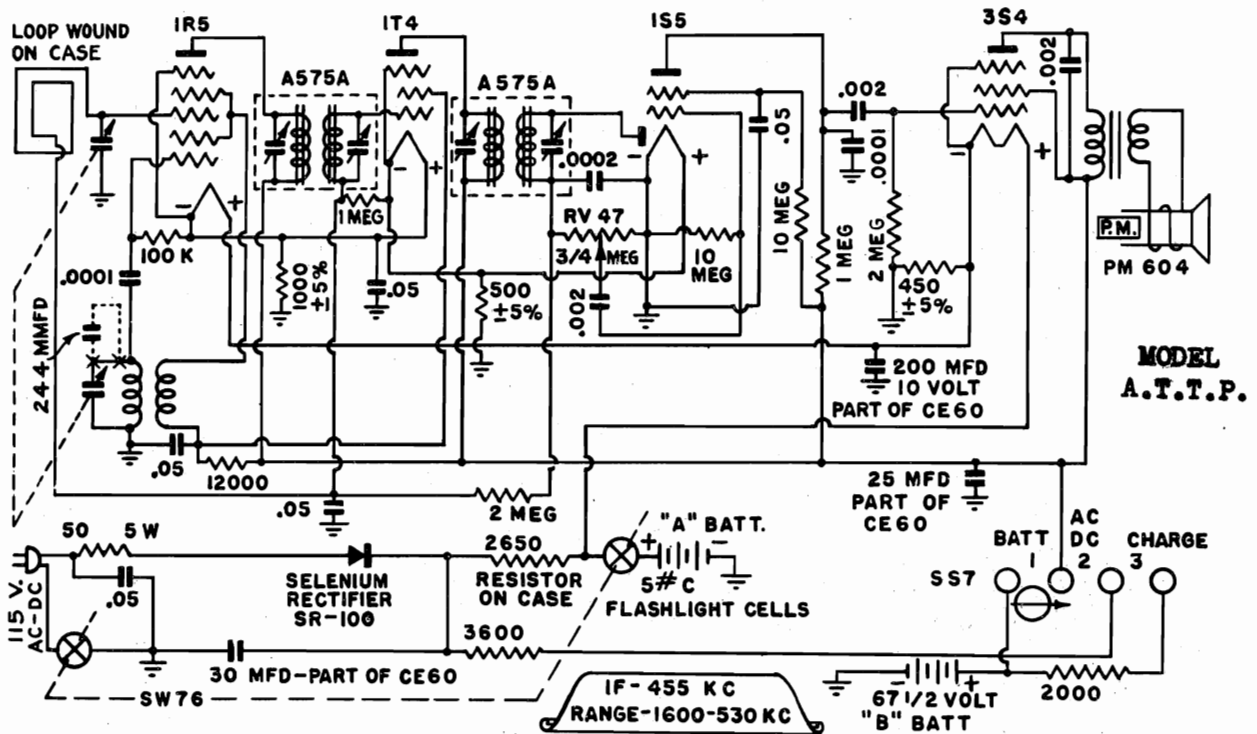
Reading should be taken with a 20,000 OHMS-PER-VOLT meter. Voltages listed are from point indicated to chassis with volume control turned on full and no signal. The battery voltages for these readings are as follows:
 "A" Battery 1.4 Volts.
 "B" Battery 60 Volts.

TUBE	PLATE	SCREEN	OSC. PLATE	FIL.
1R5	43 Volts	43 Volts	43 Volts	1.4 Volts
1T4	60 Volts	43 Volts		1.4 Volts
1S5	14 Volts	10 Volts		1.4 Volts
3S4	60 Volts	60 Volts		1.4 Volts

Bias for the 3S4 is obtained across the R8. The voltage drop across this resistor should be 6.9 volts.

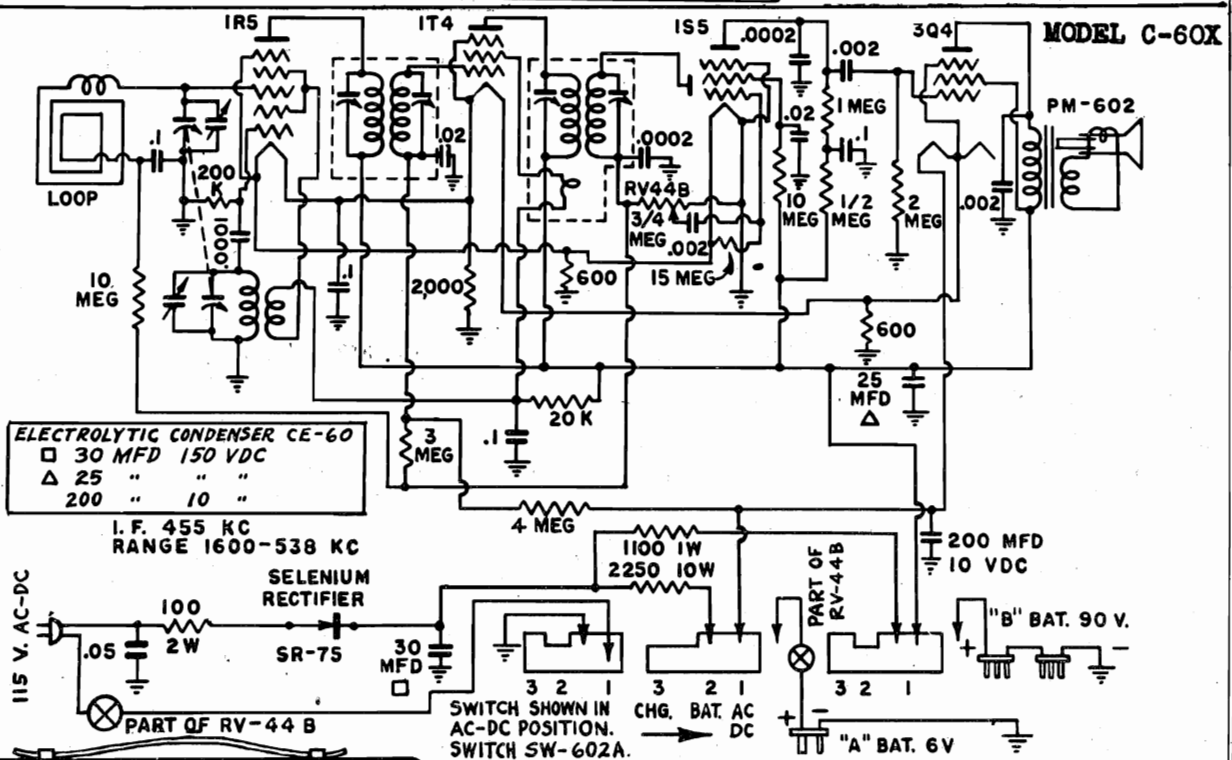
AUTOMATIC RADIO MFG. CO., INC.

MODEL A.T.T.P. MODEL C-60X



MODEL A.T.T.P.

MODEL C-60X

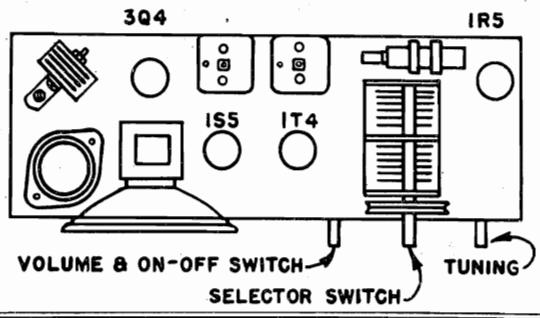
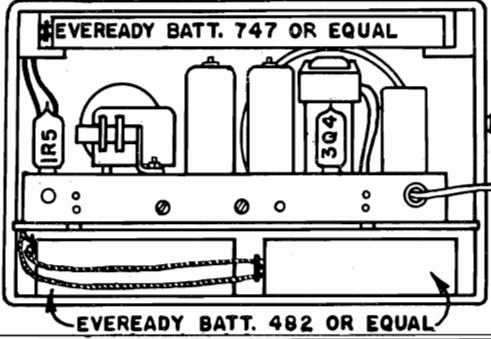


ELECTROLYTIC CONDENSER CE-60
 □ 30 MFD 150 VDC
 Δ 25 " " " "
 200 " " " "

I.F. 455 KC
 RANGE 1600-538 KC

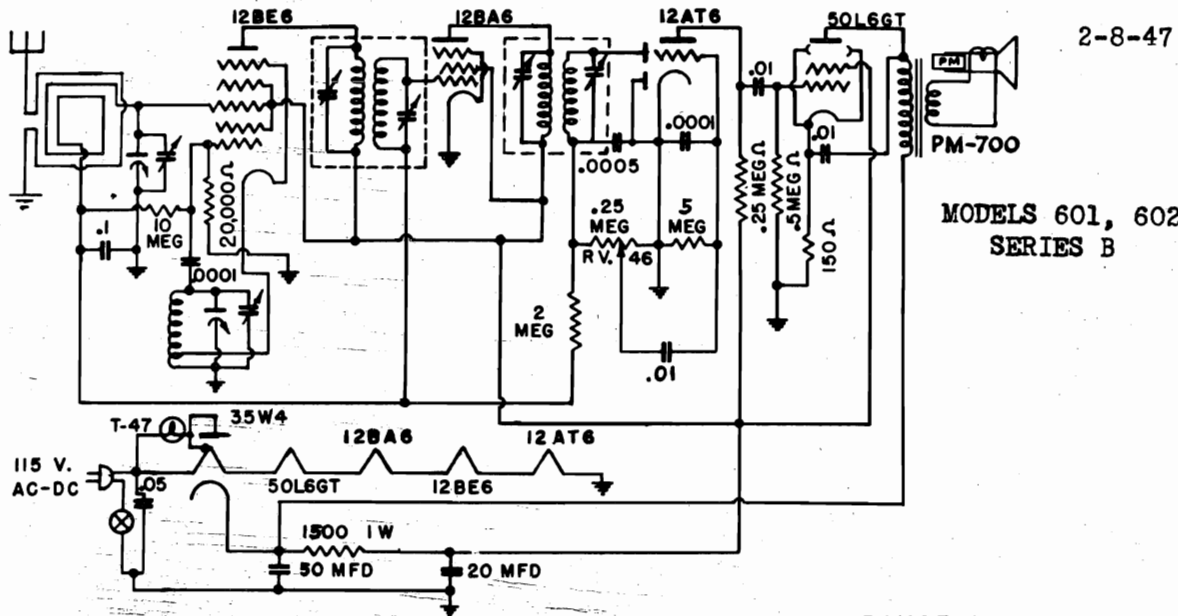
115 V. AC-DC
 .05
 2W
 SR-75
 30 MFD
 PART OF RV-44 B

SWITCH SHOWN IN AC-DC POSITION.
 SWITCH SW-602A.

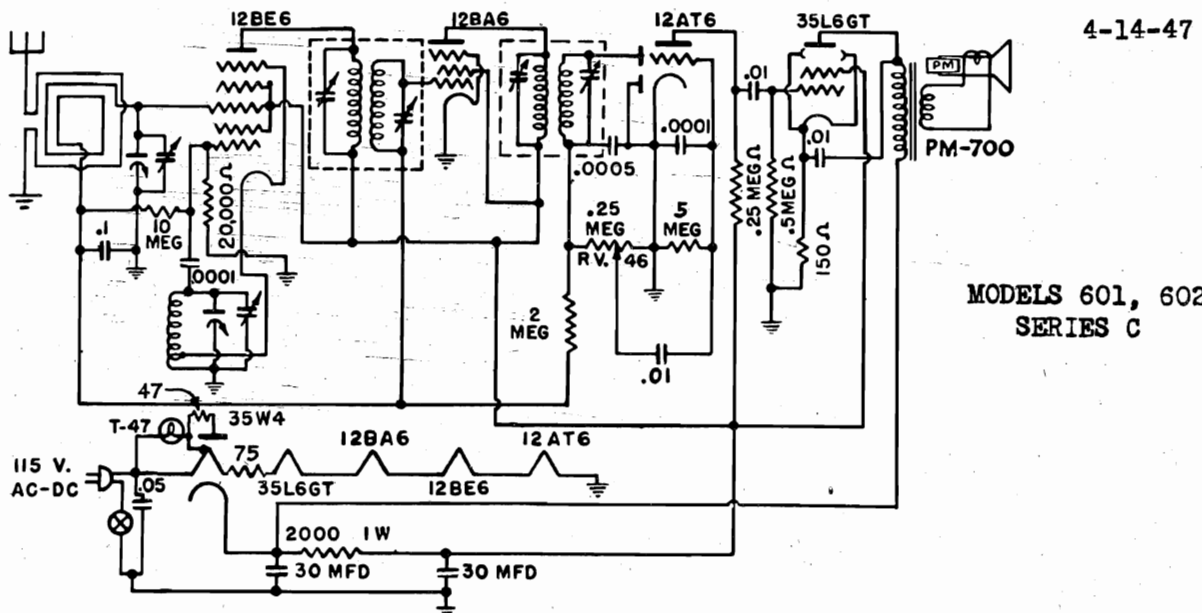
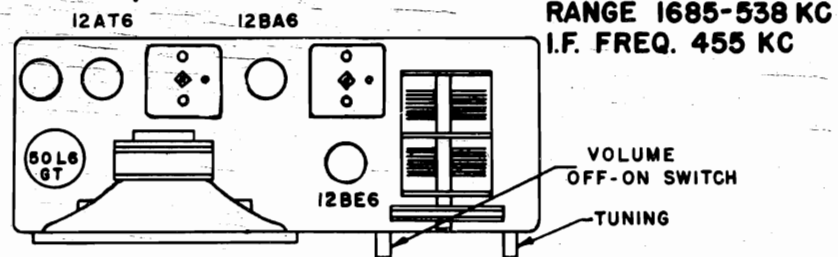


MODELS 601,602, Series B
 MODELS 601,602, Series C

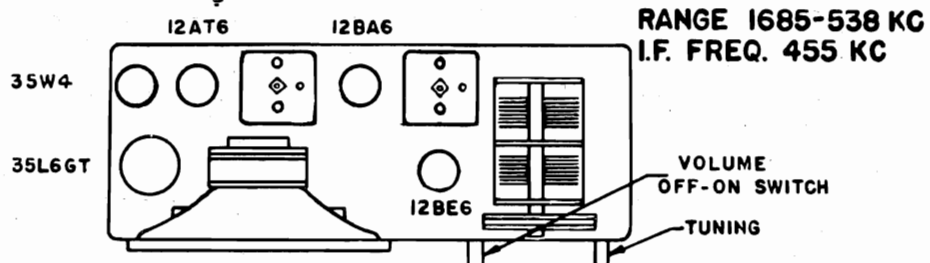
AUTOMATIC RADIO MFG. CO., INC.



MODELS 601, 602
 SERIES B

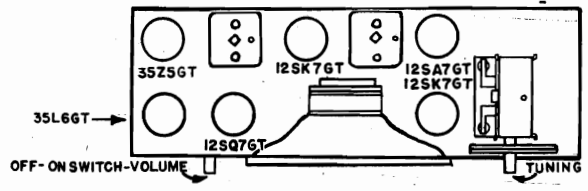
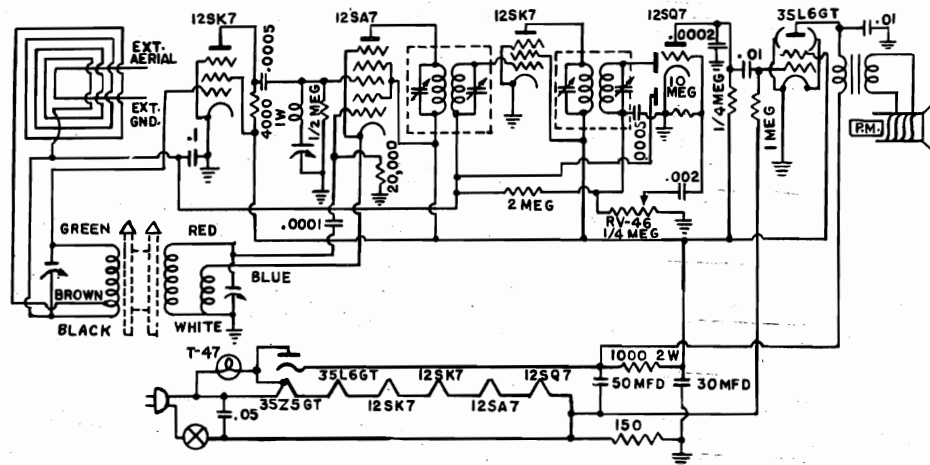


MODELS 601, 602
 SERIES C



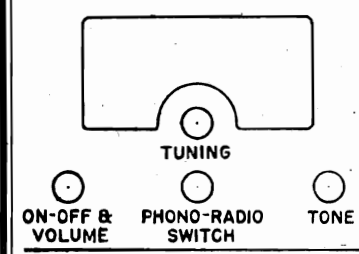
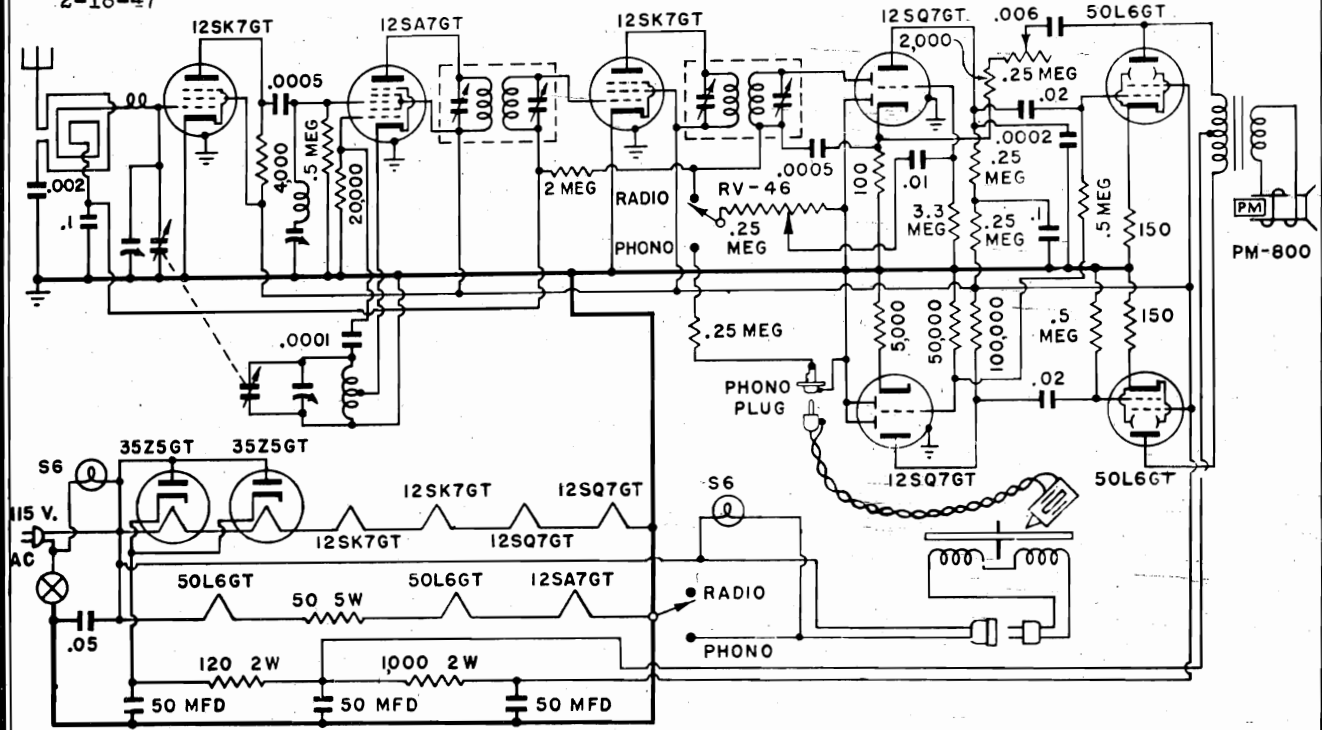
AUTOMATIC RADIO MFG. CO., INC.

MODEL 620
MODEL F-790



MODEL 620

2-18-47

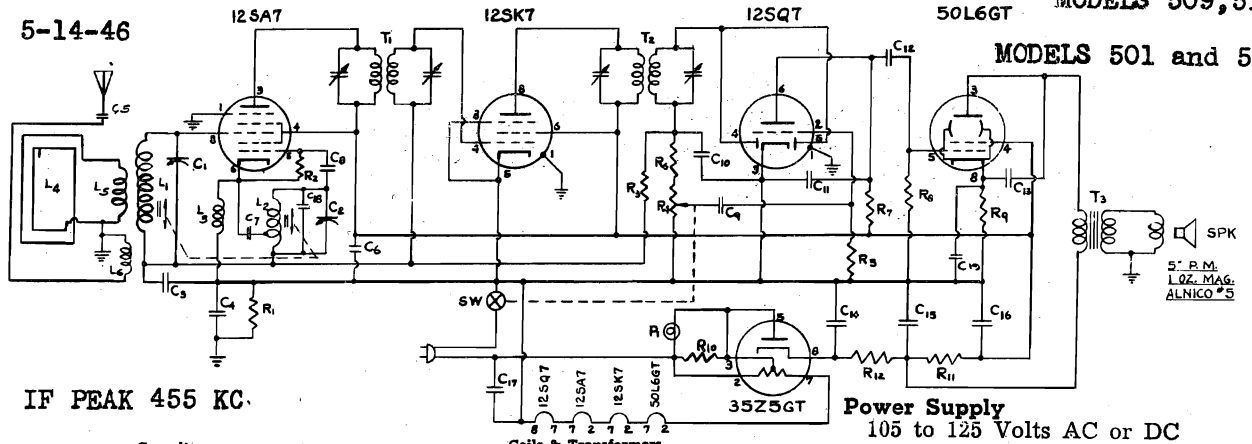


I. F. 455 K. C.
RANGE 1700-540 K. C.

MODEL F-790

AVIOLA RADIO CORP.

MODELS 501,512
MODELS 509,518

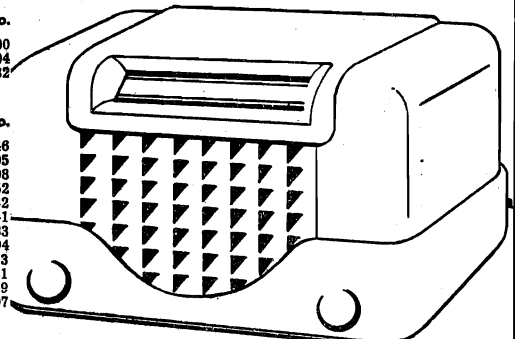


IF PEAK 455 KC.

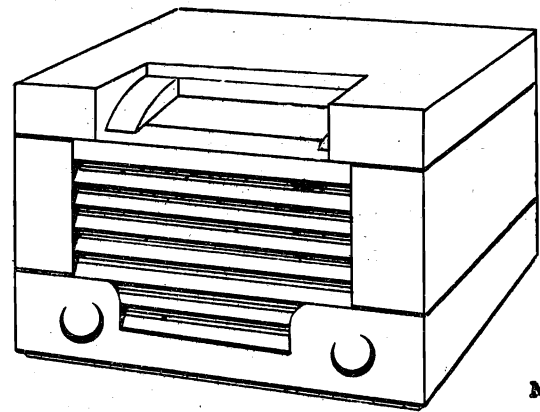
Power Supply
105 to 125 Volts AC or DC

Capacitors		Coils & Transformers		Power Consumption	
Part No.	Value	Part No.	Value	Part No.	Value
C1	Ant. Trimmer 160 mmf	L1	R. F. Coil	R-1162	30 Watts
C2	Osc. Trimmer 160 mmf	L2	Osc. Coil	R-1163	540 KC to 1625 KC
C3	.05 mf 200 V	L3	Tracking Coil	R-1165	
C4	1 mf 200 V	L4	Loop	R-1075	
C5	100 mmf Mica	L5	Primary Coil	R-1166	
C6	.05 mf 200 V	T1	1st IF	R-1025-1	
C7	2000 mmf Mica	T2	2nd IF	R-1025-2	
C8	50 mmf Mica	T3	Output Trans.	R-1040-1	
C9	.01 mf 400 V	L6	Ant. Coil	R-1093	
C10	100 mmf Mica				
C11	250 mmf Mica				
C12	.01 mf 400 V				
C13	.03 mf 400 V				
C14	20 mf 150 V				
C15	20 mf 150 V				
C16	20 mf 150 V				
C17	.05 mf 400 V				
C18	250 mmf Mica				
C19	10 mf 25 V				

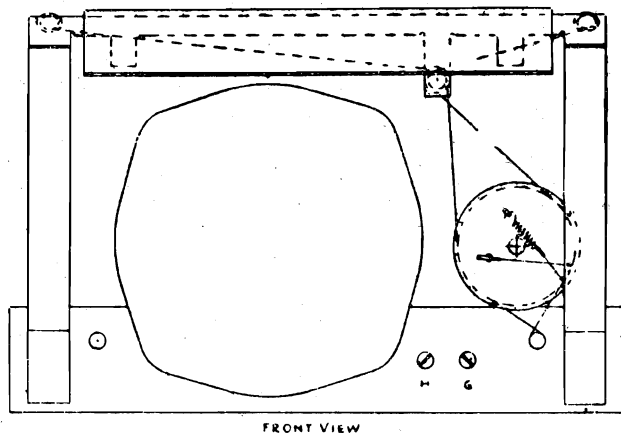
Resistors		Miscellaneous	
Part No.	Value	Part No.	Item
R1	220,000 1/2W	R-1046	Spk Speaker
R2	33,000 1/2W	R-6005	P1 Mazda No. 47
R3	2.2 Meg. 1/2W	R-1098	Pilot Light Socket
R4	500,000 V. C. & SW	R-1052	Dial-Glass
R5	6.8 Meg. 1/2W	10132	Dial-Glass
R6	47,000 1/2W	R-1255-1	Dial-String
R7	470,000 1/2W	10083	Dial-Pointer
R8	470,000 1/2W	R-1194	Dial-Spring
R9	150 1/2W	R-1194	Diffusion Screen
R10	150 1/2W	R-1013	Pulley
R11	1200 1W	10111-1	Line Cord
R12	100 1/2W	R-1159	Tuning Shaft, Model 501 - R-1160, Model 512 - R-1159
		R-1197	Dial Glass Clip



Model 501

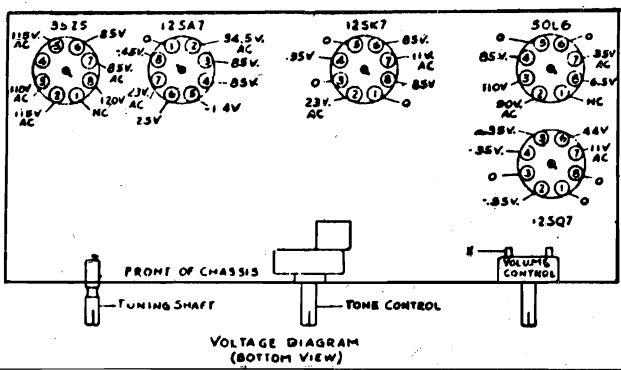


Model 512



FRONT VIEW

MODELS 501,512; 509,518



VOLTAGE DIAGRAM (BOTTOM VIEW)

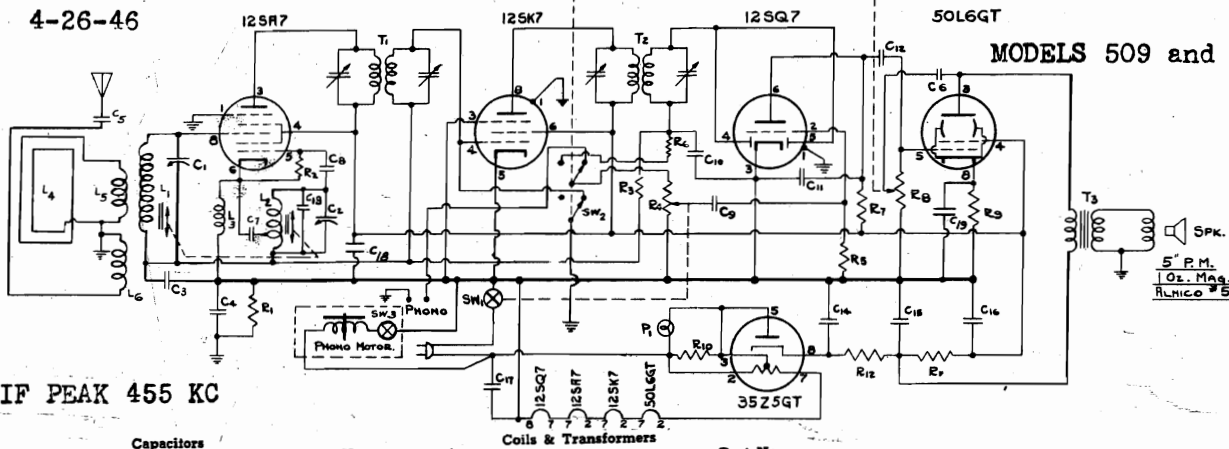
VOLTAGE DATA

Measured in 115 Volt line.
Volume control in maximum position.
Dial tuned to low frequency end — no signal.
Readings taken between tube socket and B-bus—point x on volume control.
Voltages measured with high resistance voltmeter, 20,000 ohm per volt preferable.

MODELS 501,512 MODELS 509,518 AVIOLA RADIO CORP.

4-26-46

MODELS 509 and 518



IF PEAK 455 KC

Capacitors		Coils & Transformers		Phonograph Unit	
Part No.	Value	Part No.	Value	Part No.	Description
C1	Ant. Trimmer 160 mmf	L1	R. F. Coil	RC-206 or RC-207	Phono Motor & Turntable Assem.
C2	Osc. Trimmer 160 mmf	L2	Osc. Coil	RC-251	Pickup Arm Assem.
C3	.05 mf 200 V	L3	Tracking Coil	RC-148	Motor Switch
C4	1 mf 200 V	L4	Loop		
C5	100 mmf Mica	L5	Primary Coil		
C6	1000 mmf Mica	T1	1st IF		
C7	2000 mmf Mica	T2	2nd IF		
C8	50 mmf Mica	T3	Output Trans.		
C9	.01 mf 400 V	L6	Antenna Coil		
C10	100 mmf Mica				
C11	250 mmf Mica				
C12	.01 mf 400 V				
C13	250 mmf Mica				
C14	20 mf 150 V				
C15	20 mf 150 V				
C16	20 mf 150 V				
C17	.35 mf 400 V				
C18	.05 mf 200 V				
C19	10 mf 25 V				

Specifications: These combinations are available for both 110V-60 Cycle and 50 Cycle AC.

WARNING: DO NOT USE ON DC
Each instrument is shipped operating on 110V-60 Cycle. Additional motor bushings will be supplied to each dealer desiring 50 Cycle operation.

Power Supply
105 to 125 Volts 50 or 60 Cycle AC

Power Consumption
50 Watts AC

Tuning Range
540 KC to 1625 KC

Circuit
5 tube superheterodyne. Built in Antenna with provision for connecting external antenna. Do not connect ground to receiver.

501,512 ALIGNMENT PROCEDURE 509,518

Allow receiver to warm up thoroughly before alignment. Turn volume control to maximum. Connect output meter to voice coil terminals.

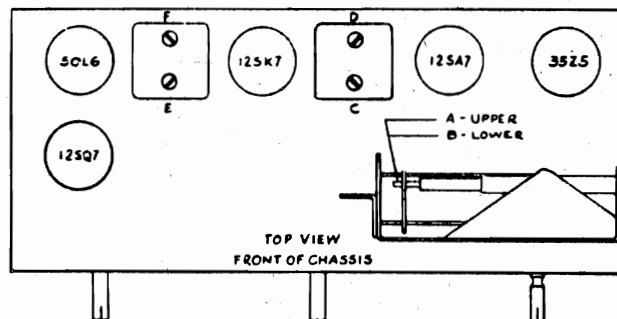
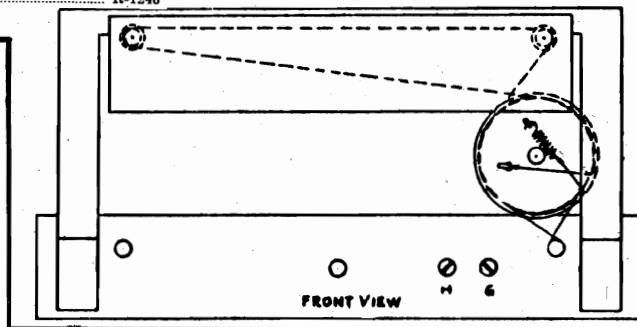
455 IF ALIGNMENT

Tune receiver to high end of dial. Connect signal generator to antenna through .0005 mf condenser. Set generator to 455 KC, tune trimmers E-F-G-D- to maximum output. Always use lowest input from signal generator that provides good output indication.

540 KC to 1640 KC ALIGNMENT

Loosely couple the signal generator to receiver by placing S.G. output lead near the pick-up antenna. (Not connected to it.) Set generator and receiver to 1400 KC.

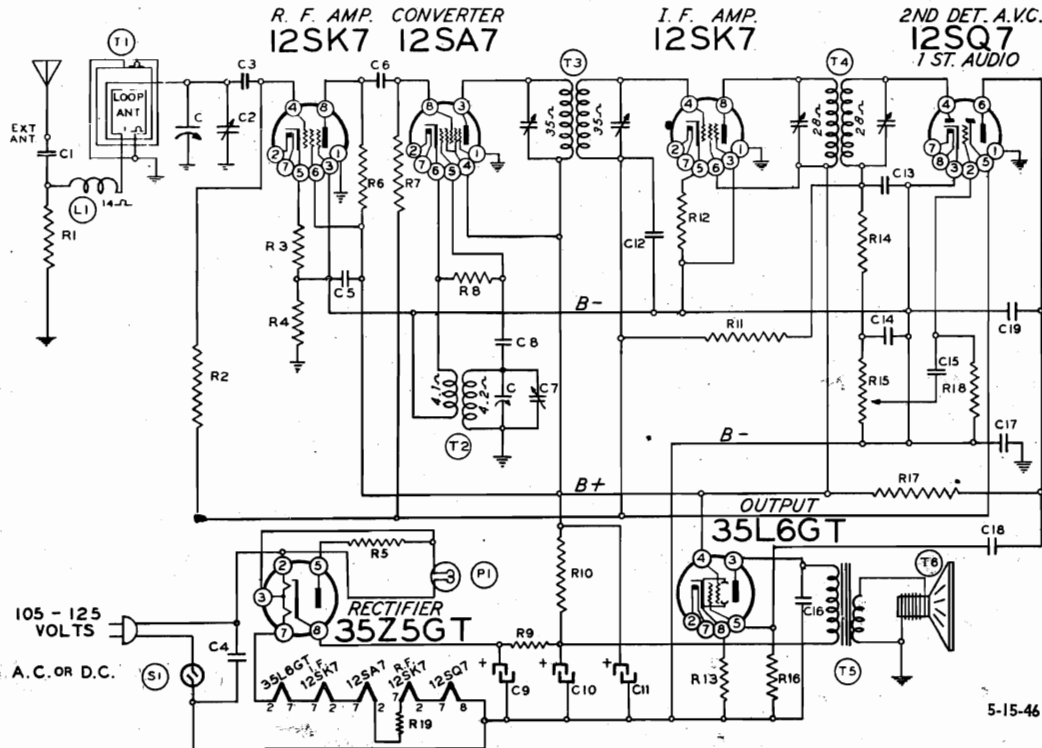
Adjust trimmer H to signal.
Adjust trimmer G to maximum output.
Set generator to 600 KC. Tune receiver to 600 KC. Adjust tuning slug A to signal meter.



Adjust tuning slug B to maximum output. Decrease signal generator output as receiver alignment provides more output to

BELMONT RADIO CORP.

MODEL 6D111, Series B



Tuning range	530 to 1650 Kc.	Selectivity	55 Kc. broad at 1000 x signal at 1000 Kc.
Intermediate frequency	455 Kc.	Power output (in voice coil)	
Power consumption	35 Watts	Undistorted	0.8 watt
Sensitivity (for 0.05 watt output)	10 microvolts average	Maximum	1.0 watt
		Voice coil impedance	3.2 ohms

- 115448
- 115448C
- 115146
- 115143
- 117528
- 117602
- 131181
- 117604
- 117600
- 115361
- 120283
- 115449B
- 112785
- A-53A-10989
- A-49A-11087
- A-3N-11086
- 120143
- B-6D-10241
- 112659
- A-2M-7758
- 117833
- 10798
- 101218
- B-8A-10211
- 107249
- 134123
- 128495B
- 131193
- 13141
- 128292B-8
- 112784
- 112606
- 128473-9
- 128496-8
- A-5B-10994-9
- A-3F-10995
- 120388
- A-2H-10715
- A-2H-11271

DIAL PARTS

- End plate (right hand bracket)
- End plate (left hand bracket)
- Cams
- Key washer (13 used on cam shaft)
- Brass spacer (one used on cam shaft)
- Brass spacer (four used on cam shaft)
- Spring washers, for locking collar
- Locking collar
- Lever shaft
- Lever with roller
- Return spring for levers
- Dial bracket assembly
- Pointer
- Drive cord, 6 inches used
- Spring on tuning shaft, for cord
- Spacer under above spring
- Take-up spring for drive cord
- Dial scale
- Crystal, clear, for dial scale
- Cinch buttons for fastening scale to bracket
- Brass spacer (for spacing pointer from dial)

MISCELLANEOUS

- Line cord and plug
- Volume control and switch, 1 megohm
- 2-gang variable condenser
- Pilot light bulb, type T-47
- Rubber bumper (bottom of cabinet)
- Cardboard back
- Cinch buttons, for fastening back to cabinet
- Cinch buttons, to cover trimmer holes in cabinet
- Pushbuttons
- Station call letters, set
- Acetate tabs for call letters
- Cabinet, bakelite
- Knob, volume
- Knob, tuning
- Locking screw for tuning knob
- Locking spring for tuning knob
- Tube shield (for metal-base 12SA7GT)
- Tube shield (for bakelite-base 12SA7GT)

R15
C
P1

- C-8D-10778
- 1292
- 1001
- 1006
- 1295
- 11994
- A-8C-10946
- 1009
- 129161
- 10026
- 100110
- 100106
- C-9B1-70
- C-9B1-31
- C-9B1-50
- C-9B1-26
- C-9B1-42
- C-9B1-17
- C-9B1-25
- C-9B1-23
- C-9B2-53
- C-9B2-63
- C-9B1-34
- C-9B1-52
- C-9B1-29
- C-9B1-27
- C-9B1-35
- C-9B2-44
- 12310
- B-13E-10242
- A-13D-10215
- 108140H
- 108145
- 121210
- 121171
- 121216
- 107271
- 114197
- 105104

- CONDENSERS**
- C1, C15 .002 x 600 volts, +40%, -15%
 - C3 .0005, mica, ±20%
 - C4 1 x 400 volts, +50%, -10%
 - C5 .25 x 200 volts, ±20%
 - C6, C8, C19 .0001, mica, ±20%
 - C9, C10, C11 Electrolytic (for 60-cycle sets), 40 mfd. x 150 volts, 20 mfd. x 150 volts, 20 mfd. x 150 volts.
 - C9, C10, C11 Electrolytic (for 25-cycle sets), 60 mfd. x 150 volts, 40 mfd. x 150 volts, 40 mfd. x 150 volts.
 - C12 .05 x 200 volts, ±25%
 - C13, C14 Dual .0001, mica, +25%, -10%
 - C16 .02 x 400 volts, ±25%
 - C17 .2 x 400 volts, +5%, -20%
 - C18 .004 x 600 volts, ±10%

- RESISTORS ***
- R1 4700 ohms, 1/2 watt, ±10%
 - R2 1 megohm, 1/2 watt, ±20%
 - R3 100 ohms, 1/2 watt, ±10%
 - R4 150,000 ohms, 1/2 watt, ±20%
 - R5 22 ohms, 1/2 watt, ±10%
 - R6 4700 ohms, 1/2 watt, ±20%
 - R7 100,000 ohms, 1/2 watt, ±20%
 - R8, R14 47,000 ohms, 1/2 watt, ±20%
 - R9 180 ohms, 1 watt, ±10%
 - R10 1200 ohms, 1 watt, ±10%
 - R11 3.3 megohms, 1/2 watt, ±20%
 - R12, R13 150 ohms, 1/2 watt, ±10%
 - R16 470,000 ohms, 1/2 watt, ±20%
 - R17 220,000 ohms, 1/2 watt, ±20%
 - R18 4.7 megohms, 1/2 watt, ±20%
 - R19 33 ohms, 1 watt, ±10%

- COILS**
- L1 Load coil
 - T1 Loop antenna assembly, complete on back
 - T2 Oscillator coil
 - T3 Input I.F. coil in can, 455 Kc.
 - T4 Output I.F. coil in can, 455 Kc.

- SOCKETS**
- 8-prong octal tube sockets, molded
 - 8-prong socket for 12SK7, laminated
 - Socket base, bakelite
 - Pilot light socket assembly

- SPEAKER**
- T6 5-inch P.M. speaker
 - T5 Output transformer for speaker

MODEL 6D111, Series B

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

- No aligning adjustments should be attempted until all other possible causes of trouble have been checked.
- Chassis must be removed from cabinet for proper alignment. Slight adjustments of the oscillator and antenna circuits can be made, without removing the chassis, through two holes provided on the bottom of the cabinet. The two adjustment screws can be reached with a long insulated screwdriver.
- It is important that during alignment the loop antenna

- be maintained at the same distance from the chassis as when the chassis is installed in the cabinet.
- Turn volume control to maximum for all adjustments.
- Connect ground post of signal generator to B- of radio through a 0.1 mfd. condenser.
- Connect dummy antenna value in series with generator output lead.
- Connect output meter across primary of output transformer.

Band	Signal Generator Frequency Setting	Dummy Antenna	Connection to Radio	Tuning Condenser Setting	Adjust for Maximum Output (see chassis view)
I.F.	455 Kc.	0.1 mfd.	Grid of 12SA7	Rotor full open (plates out of mesh)	4 trimmers on input and output I.F. transformers
Broadcast	1650 Kc.	0.1 mfd.	Grid of 12SA7	Rotor full open (plates out of mesh)	Oscillator trimmer C7 on bottom of radio
	1400 Kc.	None	See note A	Set dial at 1400 Kc.	Antenna trimmer C2 on bottom of radio

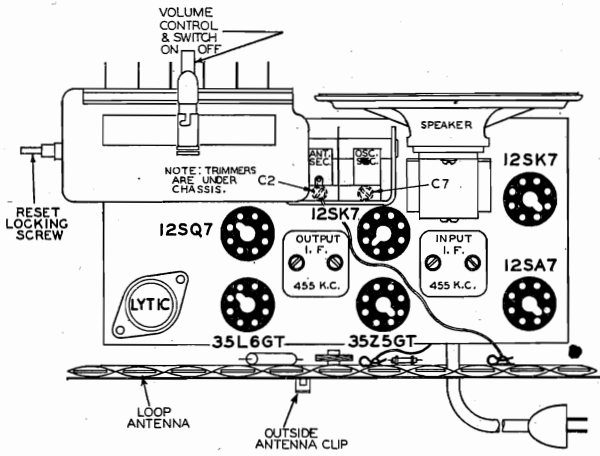
Note A: Lay output lead of generator in back of loop antenna. Turn up generator output. Loop antenna will pick up energy.

REPLACING DIAL POINTER DRIVE CORD

Six inches of cord are required in the set. Use a piece slightly longer so that knots may be tied at each end. Numbers below correspond to circled numbers in diagram.

1. Rotate tuning knob to extreme clockwise position. This closes tuning condenser. Knob should remain in this position until installation is completed.
2. Tie cord to loop in spring as shown. Wind cord one turn around shaft in direction shown.
3. Pass cord over idler pulley.
4. Pass cord over pointer shaft; wind it one turn around shaft; pass it through key washer; wind it one more turn around shaft.
5. Hook spring over end of dial support. Tie cord to spring. **IMPORTANT:** Before tying knot stretch spring enough so that full contraction of spring will rotate pointer shaft at least one-half turn.
6. Remove dial crystal by removing Cinch buttons.
7. Make sure tuning knob is in extreme clockwise position.

Then rotate pointer clockwise, against friction of shaft, until it is in horizontal position, as shown.

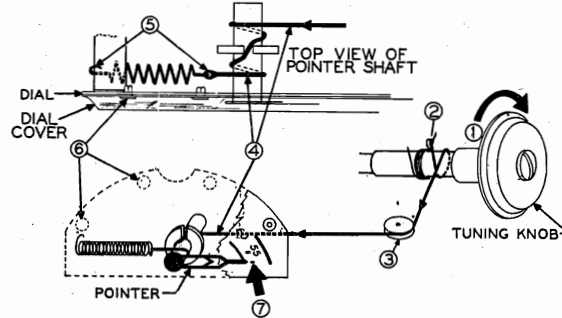


CHASSIS VIEW, SHOWING TUBE LOCATIONS

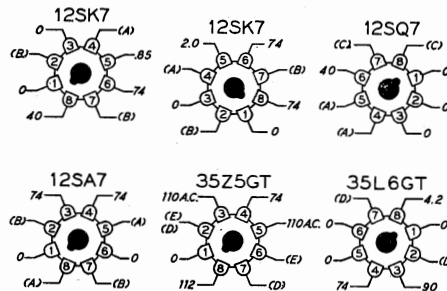
SETTING THE PUSHBUTTONS

The pushbuttons may be used, after proper adjustment, for the automatic tuning of any six stations which you select. They can be set up in any order.

1. Turn on the radio. Allow it to warm up for at least one minute.
2. Push out the call letters of the six stations from the call-letter sheets supplied with this manual.
3. Insert one call-letter tab in the rectangular opening in each of the pushbuttons, in any sequence. Press an acetate tab (supplied in small envelope) into each of the pushbuttons.
4. With the screwdriver supplied, check to see that the locking screw in the center of the tuning knob (see illustration) is loose. If it is not, turn it several turns to the left (counterclockwise).
5. Press the first pushbutton down all the way. With one hand hold the button down firmly and with the other carefully tune in the desired station. Release the pushbutton.
6. Follow this procedure for each of the five other buttons, adjusting each one for a different station.
7. Rotate the tuning knob on the side of the cabinet as far to the right as it will go. Tighten the locking screw in the center of the knob. **IT IS IMPORTANT THAT THIS SCREW BE TIGHTENED VERY FIRMLY.**
8. The pushbuttons are now properly set for automatic tuning. Any of the six stations may now be tuned in simply by pressing the proper button down as far as it will go. If it is desired to reset any of the buttons for a new station, loosen the locking screw in the center of the tuning knob, set the pushbutton as described above, and re-tighten the locking screw.



A-CANNOT BE MEASURED WITH VOLTMETER.
 B-12 VOLTS A.C. MEASURED ACROSS PINS 2 & 7.
 C-12 VOLTS A.C. MEASURED ACROSS PINS 7 & 8.
 D-30 VOLTS A.C. MEASURED ACROSS PINS 2 & 7.
 E-117 VOLTS A.C. MEASURED ACROSS PINS 2 & 6.
 VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS & B-LINE VOLTAGE 117 VOLTS AC. VOLUME CONTROL AT MINIMUM.

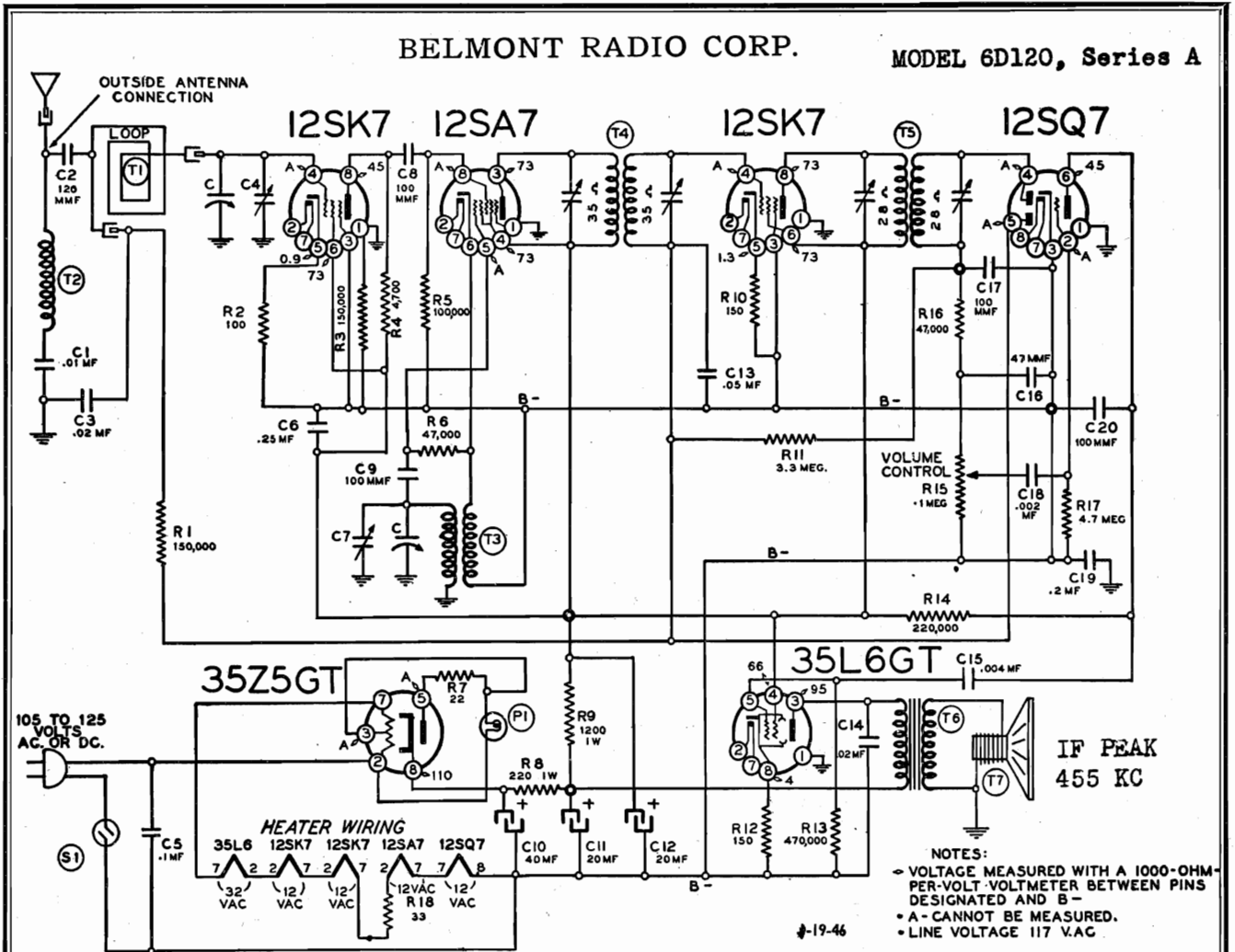


BOTTOM VIEW OF CHASSIS

VOLTAGES AT TUBE SOCKET TERMINALS

BELMONT RADIO CORP.

MODEL 6D120, Series A



CAPACITORS*

C ₄ , C ₇	B-8A-10211	Two-gang, including antenna and oscillator trimmers
C ₁	C-8D-10761	.01 mf, 400 volts, 20%
C ₂	C-8E3-114	120 mmf, 500 volts, 10%, mica
C ₃ , C ₁₄	C-8D-10774	.02 mf, 400 volts, 20%
C ₅	C-8D-10760	.1 mf, 400 volts, +20%—10%
C ₆	C-8D-10775	.25 mf, 200 volts, +20%—10%
C ₈ , C ₉ C ₁₇ , C ₂₀	C-8E3-8	100 mmf, 500 volts, 20%, mica
C ₁₀ , C ₁₁ , C ₁₂	11994 or 11995	Electrolytic for 60 cycles; 40 mf, 20 mf x 150 volts Electrolytic for 25 cycles; 60 mf, 40 mf, 40 mf x 150 volts
C ₁₃	C-8D-10770	.05 mf, 200 volts, 20%
C ₁₅	C-8D-10788	.004 mf, 600 volts, 20%
C ₁₆	C-8E3-6	47 mmf, 500 volts, 20%, mica
C ₁₈	C-8D-10778	.002 mf, 600 volts, +40%—15%
C ₁₉	C-8D-10942	.2 mf, 400 volts, +30%—10%

RESISTORS*

R ₁ , R ₃	C-9B1-26	150,000 ohms, 1/2 watt, 20%
R ₂	C-9B1-50	100 ohms, 1/2 watt, 10%
R ₄	C-9B1-70	4700 ohms, 1/2 watt, 10%
R ₅	C-9B1-25	100,000 ohms, 1/2 watt, 20%
R ₆	C-9B1-82	47,000 ohms, 1/2 watt, 10%
R ₇	C-9B1-42	22 ohms, 1/2 watt, 10%
R ₈	C-9B2-54	220 ohms, 1 watt, 10%
R ₉	C-9B2-63	1200 ohms, 1 watt, 10%
R ₁₀ , R ₁₂	C-9B1-52	150 ohms, 1/2 watt, 10%
R ₁₁	C-9B1-34	3.5 megohms, 1/2 watt, 20%
R ₁₃	C-9B1-29	470,000 ohms, 1/2 watt, 20%
R ₁₄	C-9B1-27	220,000 ohms, 1/2 watt, 20%
R ₁₅ , S ₁	101193	Volume control (1 megohm) and on-off switch
R ₁₆	C-9B1-23	47,000 ohms, 1/2 watt, 20%
R ₁₇	C-9B1-35	4.7 megohms, 1/2 watt, 20%
R ₁₈	C-9B2-44	33 ohms, 1 watt, 10%

COILS AND TRANSFORMERS

T ₁ , T ₂	B-212-11062 or B-212-11404	Loop antenna assembly, including capacitors C ₁ and C ₂ , coil T ₂ , and cardboard back.
T ₃	A-13D-10215	Oscillator coil
T ₄	108140G	Input I.F. coil complete in can. Range of trimmers: 56-104 mmf.
T ₅	108145C	Output I.F. coil complete in can. Range of trimmers: 56-104 mmf.
T ₆	10595B	Output transformer

TUNER MECHANICAL PARTS

115146	Cams (6 used on cam shaft)
115143	Key washers (12 used)
117528	Spacer (1 used on shaft)
117602	Spacer (4 used on shaft)
117604	Locking collar
131181	Spring washer for collar
A-3N-11086	Spacer on shaft for drive cord
A-49A-11087	Spring on shaft for drive cord
115561	Cam lever with roller
120283	Return spring for lever
112785	Pointer
A-53A-10989	Drive cord (6 inches)
120143	Tension spring for drive cord
B-6D-10241	Dial scale
or	
B-6D-10241-1	Dial scale
112659	Crystal for dial scale
B-2M-10383	Snap-in rivets (4) for crystal

MISCELLANEOUS

T ₇	114191B	Speaker, 5-inch, P.M.
121171	Socket for tube (6 used)	
10798D	Line cord and plug	
P ₁	107249	Dial lamp, 6-8 volts, T-47
107271	Socket assembly for dial lamp	
A-2H-11271	Tube shield for bakelite-base 12SA7GT	
A-2H-10715	Tube shield for metal-base 12SA7GT	
128334B-9	Cabinet, ivory	
A-5B-11249-8	Knob, volume, ivory	
B-5B-10994-9	Knob, tuning, ivory	
120388	Locking spring for tuning knob	
A-3E-10995	Locking screw in tuning knob	
128292B-8	Pushbutton, ivory	
134123	Rubber bumper for bottom of cabinet	
131193	Snap-in rivets (4) for mounting back	
112784	Station call letters, 1 set	
112606	Acetate tabs for call letters	

NOTE ON TUBE REPLACEMENT
 Replace a defective metal 12SK7 tube with another metal tube. Replace a glass 12SK7 tube with a metal tube or with an exact duplicate of the tube now in the set.

*The values of the resistors and mica capacitors listed above are based on RMA standards. Due to conditions beyond our control, some receivers have been shipped with components of pre-standardized values. This receiver will operate equally well with components of either group. An illustration of the differences follows:

Pre-standardized value—200,000 ohms, 20%, 1/3 watt
 RMA value—220,000 ohms, 20%, 1/2 watt
 Pre-standardized value—50 mmf, 500 volts, 20%
 RMA value—47 mmf, 500 volts, 20%

MODEL 6D120, Series A

BELMONT RADIO CORP.

ALIGNMENT PROCEDURE

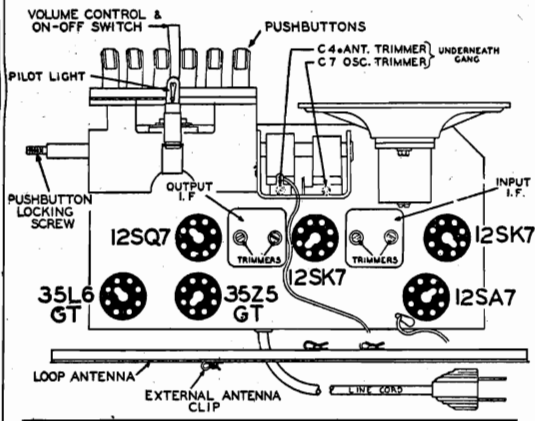
(Refer to Chassis View for location of trimmers)

- Output meter across 3.2-ohm output load.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.
- Volume control at maximum for all adjustments.
- Connect ground post of signal generator to B— of radio.
- Chassis must be removed from cabinet for proper alignment. Slight adjustments of the oscillator and antenna circuits can be made, without removing the chassis, through two holes provided on the bottom of the cabinet. The screws can be reached with a long screwdriver.

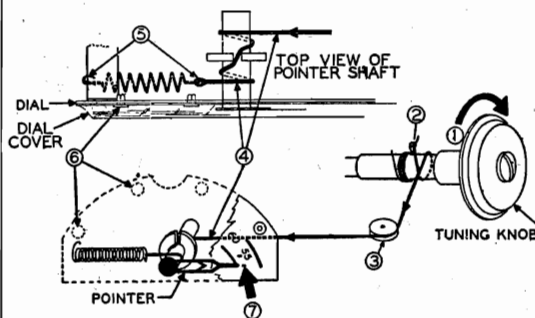
SIGNAL GENERATOR

Frequency	Dummy Antenna	Connection to Radio	TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT (in order shown)
455 kc	.1 mf	Grid (pin 8) of 12SA7	Plates out of mesh	Trimmers on output and input I.F. cans
1650 kc	.1 mf	Grid (pin 8) of 12SA7	Plates out of mesh	Oscillator trimmer C7 on bottom of gang
1400 kc	200 mmf	See note below	Set dial at 1400 kc	Antenna trimmer C4 on bottom of gang

Note: Lay output lead of generator in back of loop antenna. Turn up generator output. Loop will pick up energy.



Chassis View



REPLACING DIAL POINTER DRIVE CORD

Six inches of cord are required. Numbers below correspond to circled numbers in diagram.

1. Rotate tuning knob to extreme clockwise position.
2. Tie cord to loop in spring as shown.
3. Pass cord over idler pulley.
4. Pass cord OVER pointer shaft; wind it one turn around shaft; pass it through key washer, then once more around shaft.
5. Hook spring over end of dial support. Tie cord to spring. IMPORTANT: Full contraction of spring must rotate pointer shaft at least one half turn.
6. Remove dial crystal by removing snap-in rivets.
7. Make sure tuning knob is in extreme clockwise position. Then rotate pointer clockwise, against friction of shaft, until it is in a horizontal position, as shown.

SETTING THE PUSHBUTTONS—The pushbuttons may be used, after proper adjustment, for the automatic tuning of any six stations on the standard broadcast band. They can be set up in any order.

1. Turn on the radio.
2. Push out the call letters of the six stations from the call-letter sheets supplied with this manual.
3. Insert one call-letter tab in the rectangular opening in the front of each pushbutton, in any order. Press an acetate tab (supplied in small envelope) into each of the pushbuttons.
4. With the screwdriver supplied, check to see that the locking screw in the center of the tuning knob (see front view) is loose. If it is not, turn it several turns to the left (counterclockwise).
5. Press the first pushbutton down *all the way*. With one hand hold the button down firmly and with the other carefully tune in the desired station. Release the pushbutton.

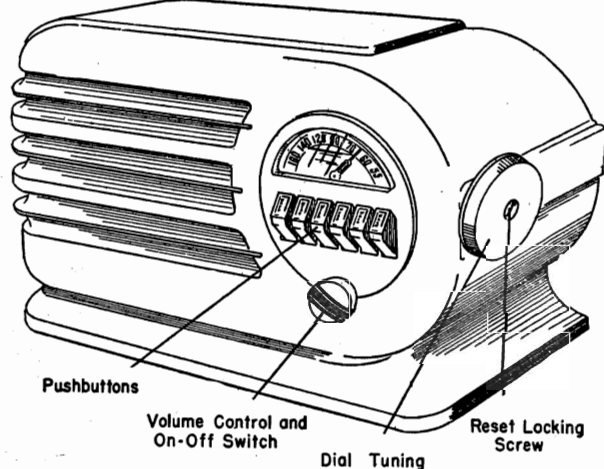
6. Follow this procedure for each of the five other buttons, setting each one for a different station.

7. Rotate the tuning knob on the side of the cabinet as far to the right as it will go. Tighten the locking screw in the center of the

knob. IT IS IMPORTANT THAT THIS SCREW BE TIGHTENED VERY FIRMLY.

8. The pushbuttons are now properly set for automatic tuning. Any of the six stations may be tuned in simply by pressing the proper button down as far as it will go. If you wish to reset any of the buttons for a new station, loosen the locking screw, set the pushbutton as described above, and re-tighten the locking screw.

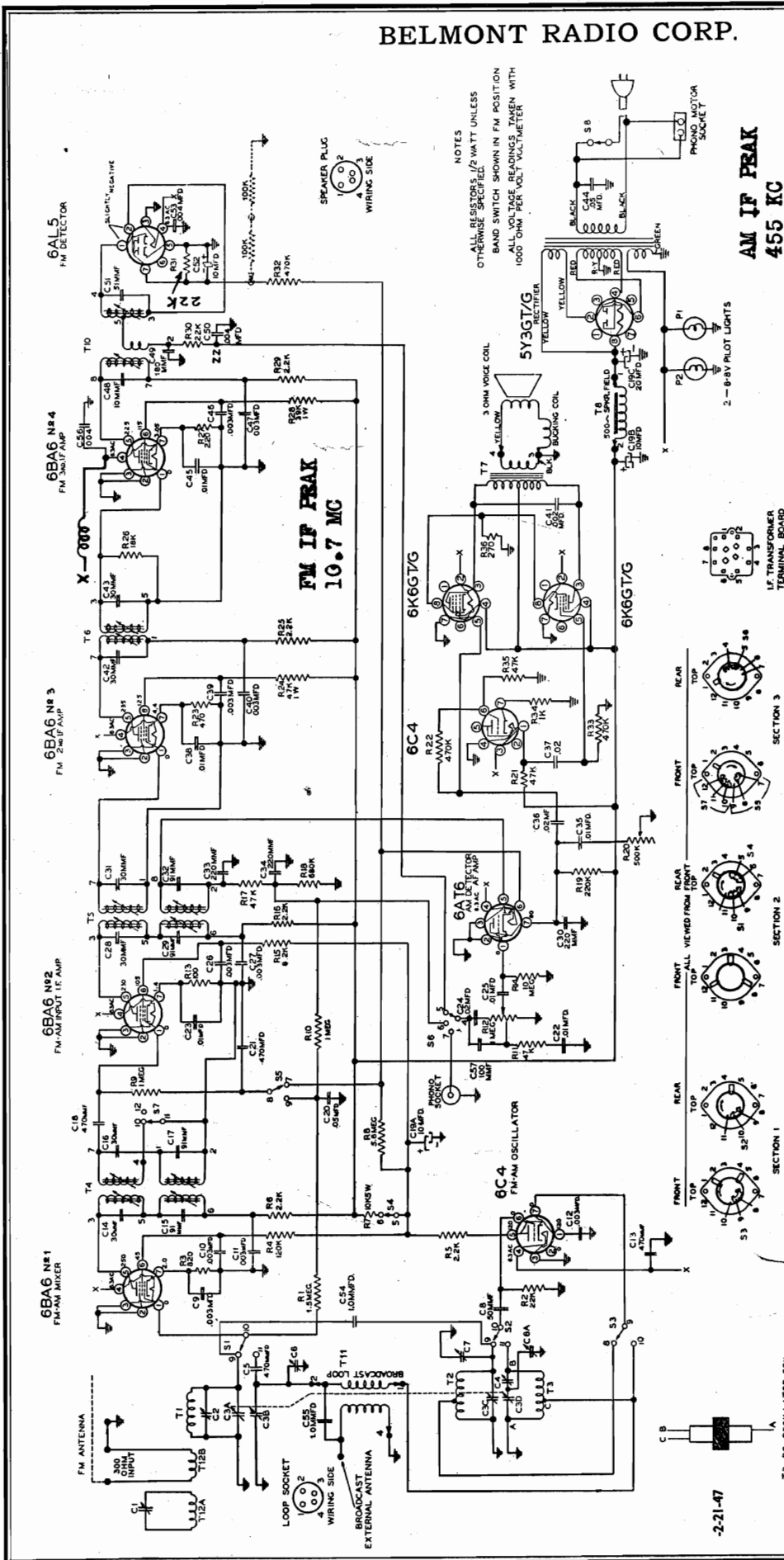
DIAL LIGHT—If the dial lamp burns out the set should not be operated until a new lamp has been installed. Failure to heed this caution may result in a burned-out 35Z5GT tube. To replace the lamp, first remove the four buttons which hold the back to the cabinet. On the inside of the back unclip the green, black, and white wires clipped to the back. The Chassis View illustration shows the location of the dial lamp. Pull the lamp bracket toward the rear of the radio. The lamp can now be removed and replaced. Use a 6- to 8-volt lamp, type T-47. When replacing the back on the cabinet, connect the green wire to the green-painted clip, the black wire to the black-painted clip, and the white wire to the unpainted clip.



Pushbuttons
Volume Control and On-Off Switch
Dial Tuning
Reset Locking Screw

BELMONT RADIO CORP.

MODEL 11AF21, Series A



NOTES
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
BAND SWITCH SHOWN IN FM POSITION
LOW VOLTAGE READINGS TAKEN WITH 1000 OHM PER VOL VOLTMETER

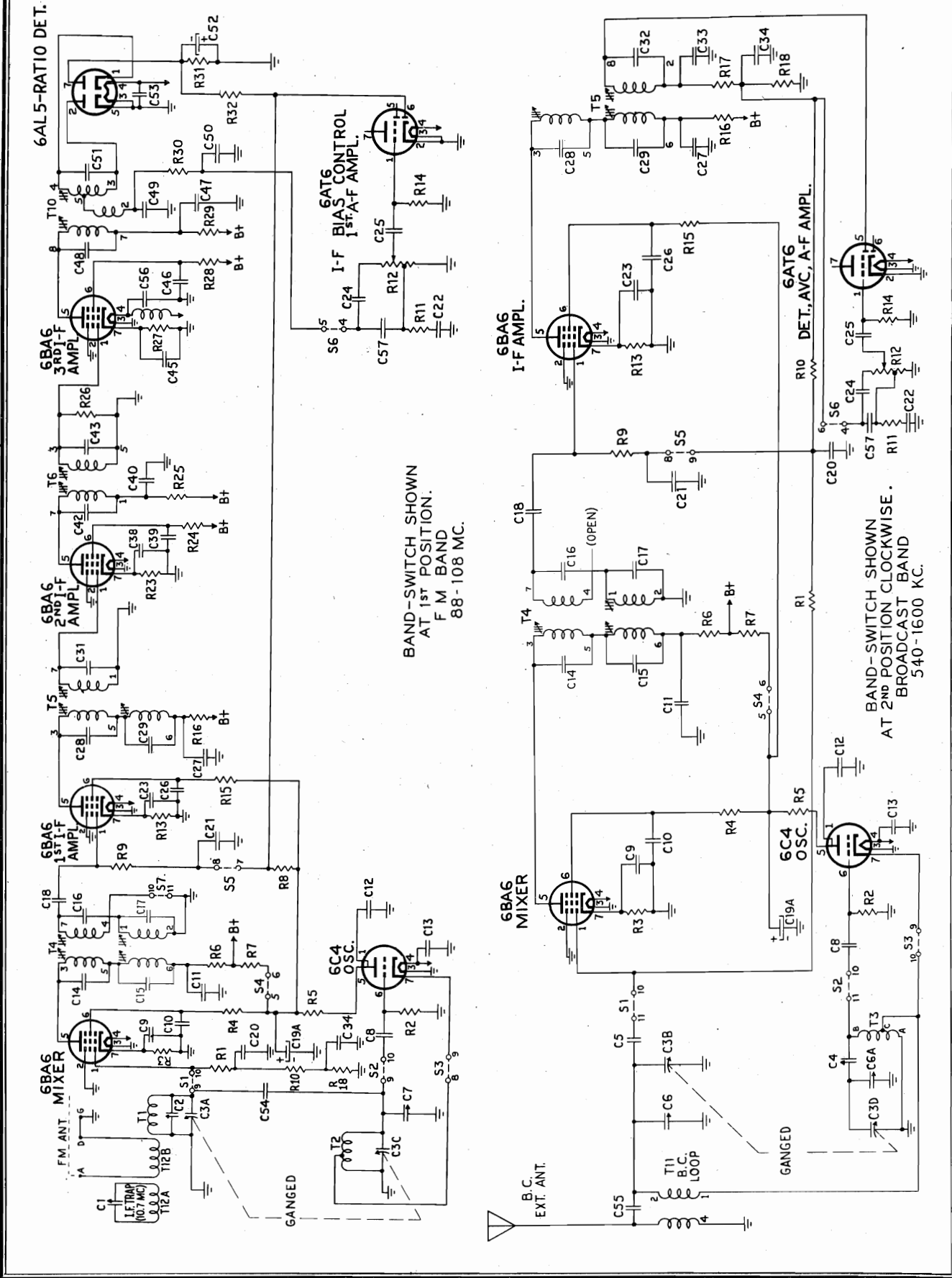
AM IF PRAK
455 KC

Power Output.....5.5 watts 10% distortion. 7 watts maximum.
Loud Speaker.....10" electrodynamic. Voice coil impedance 3.2 ohms, 400 cycles.
AM Sensitivity.....(For .5 watt output with external antenna)—20 microvolts average.
FM Sensitivity.....(For .5 watt output)—15 microvolts average.

Power Supply.....105 to 125 volts, AC, 60 cycles; Chassis only 90 watts. With phono operation 115 watts.
Frequency Ranges.....Broadcast Band—540 to 1600 kc. F.M. Band—88 to 108 mc.
Intermediate Freq......AM—455 kc.; FM—10.7 mc.
Selectivity.....AM—50kc. broad at 1000 times signal measured at 1000 kc. I.F. FM—180 kc. broad at 2 times down. I.F. FM—290 kc. broad at 10 times down.

MODEL 11AF21, Series A

BELMONT RADIO CORP.

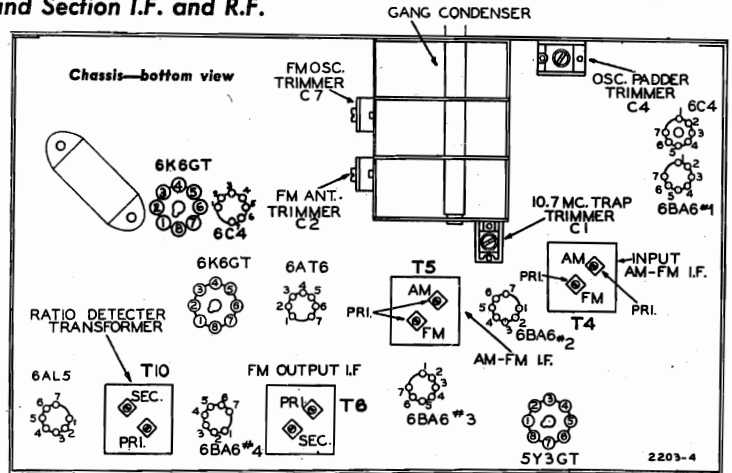


ALIGNMENT PROCEDURE

Broadcast Band Section I.F. and R.F.

The alignment procedure below includes the sensitivities at the inputs of various stages. All signal input values are based on an output of 1/2 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2-ohm resistor across the secondary winding of the output transformer. A reading of 1.3 volts AC across this resistor will be approximately equivalent to a 1/2-watt output with the speaker connected. The volume control must be set at maximum. The tone control must be set for maximum treble.

The signal source must be an accurately calibrated signal generator capable of supplying the frequencies designated, modulated 30% with a 400-cycle audio signal. A 400 cycle audio signal is required for the audio measurement. Variations in sensitivities of plus or minus 25% are usually permissible.



AM - I. F. ALIGNMENT

Band Switch in AM Position. Tune Set to 1400 Kc. Dummy Antenna .1 Mfd.

Signal Generator Frequency	Connection to Radio	Adjustment to Be Made	Adjust for
455 Kc. Use 2100 microvolts	Pin No. 1 of 6BA6 No. 2 and ground	Primary and Secondary of T5 AM windings. See top and bottom views	Maximum output. Should be 1/2 watt
455 Kc. Use 64 microvolts	Pin No. 1 of 6BA6 No. 1 and ground	Primary and Secondary of T4 AM windings. See top and bottom views	Maximum output. Should be 1/2 watt
400 cycles. Use 63 millivolts	Pin No. 1 of 6AT6 and ground	None	Maximum output. Should be 1/2 watt

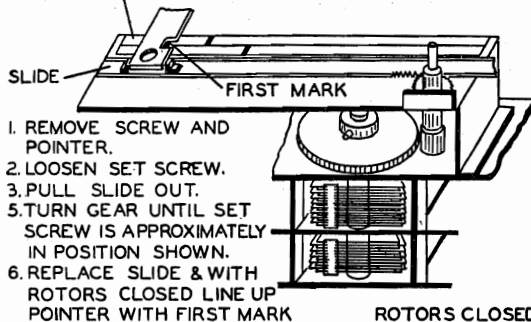
BROADCAST BAND - R. F. ALIGNMENT

Check Pointer so that the inside of the notch is exactly over the first mark to the extreme left when Gang is fully closed. For adjustment loosen set screw on large gear. (see dial mechanism illustration).

Signal Generator Frequency	Connection to Radio	Dummy Antenna	Adjust
1400 Kc. Use 15 microvolts	Antenna and Ground	200 mmf.	C6A for maximum. 1/2 watt
600 Kc. Use 25 microvolts	Antenna and Ground	200 mmf.	C4 for maximum. 1/2 watt
1400 Kc.	Antenna and Ground	200 mmf.	C6 See Note

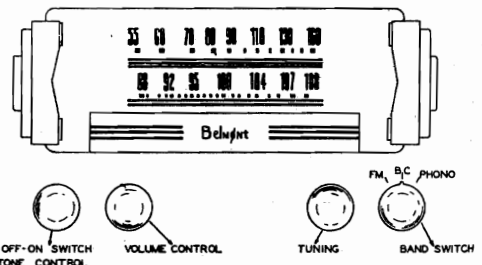
NOTE: Recheck first two adjustments after this adjustment because of inter-locking effects.

CALIBRATION



1. REMOVE SCREW AND POINTER.
2. LOOSEN SET SCREW.
3. PULL SLIDE OUT.
5. TURN GEAR UNTIL SET SCREW IS APPROXIMATELY IN POSITION SHOWN.
6. REPLACE SLIDE & WITH ROTORS CLOSED LINE UP POINTER WITH FIRST MARK ON CALIBRATION SCALE
7. TIGHTEN SCREW.

ROTORS CLOSED



Procedure for disassembly and assembly of dial mechanism

ALIGNMENT PROCEDURE
FM Band Section. I.F. and R.F.

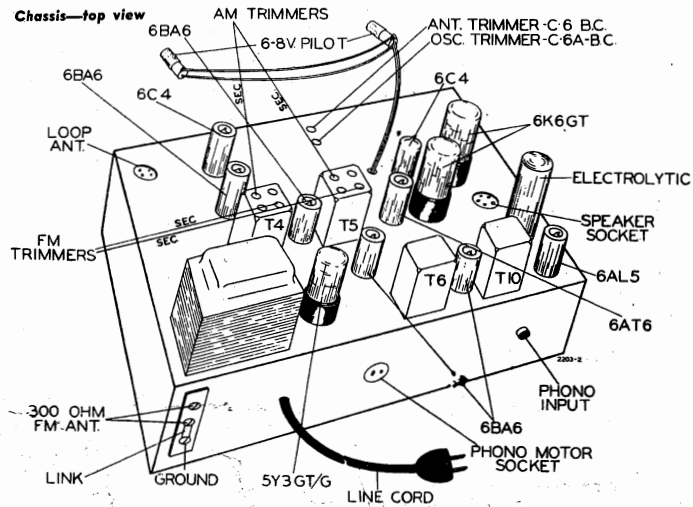
IMPORTANT

No alignment of the FM section of this radio should be attempted unless you are positive that the circuits are in need of adjustment and you have the necessary equipment. All components used in this radio are extremely stable and the tuned circuits should require no adjustment over long periods of time.

NOTE

The following alignment is based on the use of the new Simpson vacuum tube voltmeter which has a "floating ground." In other words, the meter, when used as a vacuum tube voltmeter, can have both the positive and negative sides connected to points above ground and still give true readings.

A standard AM signal generator is required.



FM - I. F. ALIGNMENT

Band Switch in FM Position. Dummy Antenna .1 Mfd.

Signal Generator Frequency	Connection to Radio	Vacuum Tube Volt Meter Connection to Radio	Adjustment to Be Made	Adjust for
10.7 Mc. Use about .1 volt	Pin No. 1 of 6BA6 No. 4 and ground	Pin No. 7 of 6AL5 and ground	Primary of T10	Resonance should be about 3 volts
10.7 Mc. Use about .1 volt	Pin No. 1 of 6BA6 No. 4 and ground	See note "A"	Secondary of T10	Zero. Use zero center scale. See note "B"
10.7 Mc. Use about 4000 microvolts	Pin No. 1 of 6BA6 No. 3 and ground	Pin No. 7 of 6AL5 and ground	Primary and Secondary of T6	Resonance should be about 3 volts
10.7 Mc. Use about 150 microvolts	Pin No. 1 of 6BA6 No. 2 and ground	Pin No. 7 of 6AL5 and ground	Primary and Secondary of 10.7 mc. windings of T5. See top and bottom views.	Resonance should be about 3 volts
10.7 Mc. Use 3000 microvolts	FM Antenna input and ground	Pin No. 7 of 6AL5 and ground	Primary and Secondary of 10.7 mc. windings of T4. See top and bottom views.	Resonance should be about 3 volts See Note "C"
10.7 Mc.	FM Antenna input and ground	Pin No. 7 of 6AL5 and ground	C1	Minimum response. This is a trap circuit

NOTES ON FM-I.F. ALIGNMENT

NOTE "A"—Connect two resistors, 100K OHMS each, from Pin No. 7 of 6AL5 to ground. These resistors must be matched within 5%. Connect as shown in dotted lines on schematic diagram. Connect vacuum tube voltmeter between the mid point of the resistors and point zz.

NOTE "B"—If T10 has been tampered with, it is possible that no cross-

over point will be found at first. Careful adjustment of both primary and secondary is necessary.

GENERAL—Input signals should be adjusted to give approximately 3 volts. The ratio detector is operating at a reasonable level at this point and will give the truest indication of correct alignment with the procedure specified.

NOTE "C"—The input microvolts specified is based on the trap circuits being adjusted.

FM - R. F. ALIGNMENT

Check Pointer so that the inside of the notch is exactly over the first mark to the extreme left when Gang is fully closed. For adjustment loosen set screw on large gear. (see dial mechanism illustration).

Signal Generator Frequency	Connection to Radio	Dummy Antenna	Adjust	Vacuum Tube Volt Meter Connection to Radio	Adjust to
100 Mc. Use about 15 microvolts	FM Antenna lead	300 ohms	C7 Osc. C2 Ant.	Pin No. 7 of 6AL5 and Ground	Resonance about 3 volts

NOTE—If a signal generator with the above fundamental frequency is not available, it is sometimes possible to use harmonics. Use extreme care in picking harmonics. An alternate procedure is to use a local

station carrier of known frequency to align the F.M. Band and to use the vacuum tube volt meter as above for resonance indication. A weak carrier, however, will not produce 3 volts.

REPLACEMENT PARTS LIST

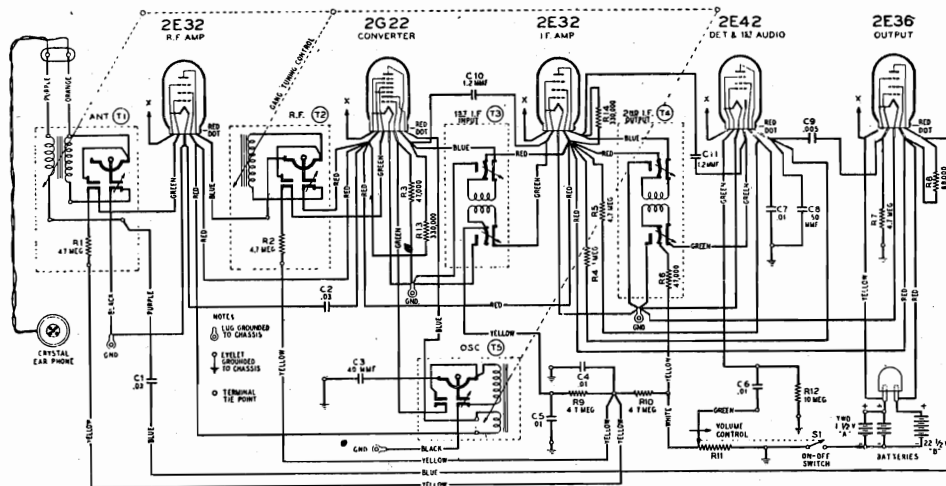
When ordering specify part number, model number, and series

Ref. No.	Part No.	Description	Qty. Used in Set	Ref. No.	Part No.	Description	Qty. Used in Set
R.F. TUNER PARTS							
CONDENSERS							
C3A-B, C-D	B-8A-11275	Two gang split stator variable	1	C51	C-8G-11891	51 mmfd, 5%, ceramic	1
C2	A-8E-12079	Trimmer cond. F.M. antenna	1	C15-17	C-8G-12160	91 mmfd, 5%, ceramic	2
C1	A-8E-11506	Trimmer cond. I.F. trap	1	C-29-32	C-8F5-224	91 mmfd, 5%, silver mica	2
C7	A-8E-11279	Trimmer cond. F.M. osc. trimmer	1	C41	C-8D-10789	.002 mfd x 600 v., 20%	1
C6, C6A	A-8E-12557	Trimmer cond. B.C. antenna and oscillator	1	C57	C-8F3-8	100 mmfd x 500 v., 20%, mica	1
C4	A-8E-12177	Padder cond.—B.C. Band	1	RESISTORS			
C8	C-8G-11484	50 mmf, ±10%, ceramic	1	R4	C-9B1-87	120K ohms, 1/2 watt, 10%	1
C55	C-18G-12408	1.0 mmf, ±2 mmf, ceramic	1	R15	C-9B1-73	8200 ohms, 1/2 watt, 10%	1
C-9-10-11-12	C-8G-11486	3000 mmf, ±20%, ceramic	4	R26	C-9B1-77	18K ohms, 1/2 watt, 10%	1
C5-13	C-8F3-12	470 mmf, 500 volts, ±20% mica	2	R18	C-9B1-96	680K ohms, 1/2 watt, 10%	1
RESISTORS				R21, 35	C-9B1-82	47K ohms, 1/2 watt, 10%	2
R3	C-9B1-61	820 ohms, 1/2 watt, 10%	1	R28	C-9B2-81	39K ohms, 1 watt, 10%	1
R12	A-10B-11263	Volume control (1 megohm)	1	R7	B-9C-11489	10K ohms, 1/5 watt, 10%, wire-wound	1
R20, S8	A-11A-11262	Tone control (500M ohms) and switch	1	R30	C-9B1-78	22K ohms, 1/2 watt, 10%	1
R5, R6	C-9B1-15	2200 ohms, 1/2 watt, 20%	2	R16, 25, 29	C-9B1-15	2200 ohms, 1/2 watt, 20%	3
R1	C-9B1-32	1.5 megohm, 1/2 watt, 20%	1	R8	C-9B1-107	5.6 megohms, 1/2 watt, 10%	1
R2	C-9B1-78	22K megohms, 1/2 watt, 10%	1	R9, 10	C-9B1-31	1 megohm, 1/2 watt, 20%	2
MISCELLANEOUS				R13	C-9B1-50	100 ohms, 1/2 watt, 10%	1
	A-15C-11491	7-prong miniature tube socket	1	R11, R17	C-9B1-23	47K ohms, 1/2 watt, 20%	1
	A-15A-11276	Miniature tube socket, ceramic with base	1	R19	C-9B1-27	220K ohms, 1/2 watt, 20%	1
	A-2H-12337	Socket shield base	1	R14	C-9B1-37	10 megohms, 1/2 watt, 20%	1
	A-2H-11494	Tube shield	2	R27	C-9B1-54	220 ohms, 1/2 watt, 10%	1
	200-12862	Spur gear assembly—consists of two gears, two springs and bushing	1	R32, 22, 33	C-9B1-94	470K ohms, 1/2 watt, 10%	3
	A-49A-11673	Spring for above assembly	2	R31	C-9B1-78	22K ohms, 1/2 watt, 10%	1
S1-2-3-4-5-6-7	B-20A-11261	Band switch and phono-radio switch	1	R23	C-9B1-58	470 ohms, 1/2 watt, 10%	1
	B-2C-11188-1	Dial plate assembly with tape guide, bushing, shaft and pinion gears	1	R34	C-9B1-62	1000 ohms, 1/2 watt, ±10%	1
	A-3J-11182	Pinion gear—inner side of plate	1	R36	C-9B2-55	270 ohms, 1 watt, ±10%	1
	A-3J-11183	Pinion gear—outer side of plate	1	COILS			
	A-3A-11181	Shaft—for pinion gears	1	T3	A-13D-11285	B.C. oscillator coil	1
	B-2J-11190	Rack tape—with teeth and bracket	1	T4	C-203-11743	Input I.F. coil combination assembly, 455 kc and 10.7 mc	1
	B-2G-10588-2	Pointer, 1	1	T5	C-203-11746	2nd I.F. coil combination assembly, 455 kc and 10.7 mc	1
	A-2D-11513	Pointer bracket	1	T6	C-203-11744	3rd I.F. coil assembly, 10.7 mc	1
	A-2J-11041	Pointer tension spring	1	T10	C-203-11745	Ratio detector I.F. coil assembly, 10.7 mc	1
	32F4-10830	B.H.M.S. 4-40 x 1/8 screw, to fasten pointer and bracket to tape bracket	1	T11, C55	C-13E-12340	Loop antenna assembly with 1.0 mmfd cond. C-8G-12408	1
COILS				TRANSFORMERS			
T2	A-13D-11282	88-108 mc oscillator coil	1	T7	B-12C-10234-2	Output transformer for speaker	1
T1	A-13E-11283	88-108 mc antenna coil secondary	1	T9	B-12A-12254	Power transformer—105-125 volts AC, 60 cycles primary	1
T12A, T12B	A-13E-11284	88-108 mc antenna coil primary with trap	1	SPEAKER			
MAIN CHASSIS PARTS				T8	B-18B-10617	Electrodynamic speaker, 10-inch, less output transformer	1
C52	A-8C-11495	Electrolytic condenser 10 mfd x 150 volts	1	MISCELLANEOUS			
C19A, B, C	A-8C-10272	Electrolytic condenser 10 mfd x 10 mfd x 20 mfd	1	C-6D-12459	Dial scale	1	
C24, C36, C37	C-8D-10774	.02 mfd x 400 v., 20%, tubular	3	B-5C-12457-14	Escutcheon—walnut	2	
C20	C-8D-10770	.05 mfd x 200 v., 20%, tubular	1	B-5C-12457-41	Escutcheon—mahogany	2	
C22	C-8D-11738	.01 mfd x 200 v., 20%, tubular	1	B-5B-10376-14	Knob, "Volume"—walnut	1	
C25, 35	C-8D-10761	.01 mfd x 400 v., 20%, tubular	2	B-5B-11672-14	Knob, "Bandswitch"—walnut	1	
C50, 53, 56	C-8D-10788	.004 mfd x 600 v., 20%, tubular	3	B-5B-10377-14	Knob, "Tuning"—walnut	1	
C49	C-8F3-116	180 mmfd x 500 v., 10%, mica	1	B-5B-10378-14	Knob, "Tone"—walnut	1	
C23, 38, 45	C-8F9-20	10K mmfd x 300 v., 20%, mica	3	B-5B-10376-41	Knob, "Volume"—mahogany	1	
C21, 18	C-8F3-12	470 mmfd x 500 v., 20%, mica	2	B-5B-11672-41	Knob, "Bandswitch"—mahogany	1	
C30, 33, 34	C-8F3-10	220 mmfd x 500 v., 20%, mica	3	B-5B-10377-41	Knob, "Tuning"—mahogany	1	
C44	C-8J-11388	.05 mfd x 600 v., 20%, molded case paper	1	B-5B-10378-41	Knob, "Tone"—mahogany	1	
C26-27-39-40-46-47	C-8G-12449	3000 mmfd, 20%, ceramic-insulated	6	B-47A-12458	Pilot lite assembly	1	
C14, 16, 28, 31, 42, 43	C-8G-12159	30 mmfd, 500 volts, 5%, ceramic	6	A-46A-11739	Pilot lite bulb, 6-8 volt, T-44	2	
C48	C-8G-11789	10 mmfd, 10%, ceramic	1	A-19B-11009	Socket for phono motor	1	
				A-15B-11538	Speaker socket	1	
				A-19B-12170	Socket for tone arm lead	1	
				A-19B-11272	Antenna socket	1	
				A-15B-10440	8-prong, octal, tube socket	3	
				A-15C-10717	7-prong, miniature tube socket	6	
				A-2H-10718	Shield base	6	
				A-2H-10974	Shield can	6	
				B-14M-11479	A.C. line cord	1	
				A-23A-10344	Line cord lock	1	
				RECORD CHANGER			
				B-201-12262	Record changer assembly, 115 volts, 60 cycles	1	

Note: For list of record changer parts, see Record Changer Manual.

MODELS 5P113, 5P116, 5P117,
Boulevard

BELMONT RADIO CORP.



CAPACITORS

- C1, C2 A-8J-10295 .03 mf, 150 volts, 20%
- C3 A-8G-11083 40 mmf, ±2.5 mmf
- C6, C7 A-8J-10297 .01 mf, 150 volts, 20%
- C8 A-8J-10298 50 mf, 150 volts, 20%
- C9 A-8J-10296 .005 mf, 150 volts, 20%
- C10, C11 A-13G-11303 1.2 mmf, ±0.2 mmf (two wires)

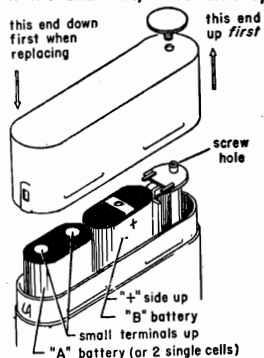
RESISTORS

- R3 C-9B9-82 47,000 ohms, 1/5 watt, 10%
- R4 C-9B3-98 1 megohm, 1/3 watt, 10%
- R5, R7 C-9B3-106 4.7 megohms, 1/3 watt, 10%
- R8 C-9B9-84 68,000 ohms, 1/5 watt, 10%
- R12 C-9B3-37 10 megohms, 1/3 watt, 20%
- R13, R14 C-9B9-92 330,000 ohms, 1/5 watt, 10%

MISCELLANEOUS

- A-48A-10346 Crystal phone
- A-19B-10354 Phone connector and cord
- A-5M-10455 Earpiece (medium)
- A-5M-10455-1 Earpiece (small)
- A-5M-10455-2 Earpiece (large)
- B-2E-10308 End bell, top (Model 5P116)
- B-2E-10308-1 End bell, top (Models 5P113, 5P117)
- B-202-10419 End bell, bottom (Model 5P116)
- B-202-10419-1 End bell, bottom (Models 5P113, 5P117)
- A-5B-10466-2 Knob, tuning (Models 5P113, 5P117)
- A-5B-10466-51 Knob, tuning (Model 5P116)
- A-5B-10806-2 Knob, volume (Models 5P113, 5P117)
- A-5B-10806-51 Knob, volume (Model 5P116)

How to Install Them—Three "A" batteries and one "B" battery are supplied with the Boulevard. The extra "A" batteries are for replacement purposes. Remove the screw on the bottom of the radio and lift off the end bell, screw side up first, as shown in the illustration. (To avoid distorting the end bell, grasp it at the ends, not on the sides. Insert the "A" and "B" batteries in the case exactly as shown, with the "B" battery on the side with the screw hole. (If desired, the wide rubber band supplied with the set may be placed around the batteries to prevent any movement.) Then replace the end bell and the screw.

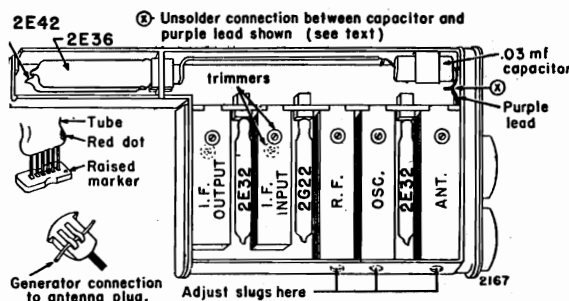


ALIGNMENT PROCEDURE

Output meter must give 1.5-volt deflection without loading output tube. Use any 1½-volt "A" battery and 22½-volt "B" battery which can be connected to set. Keep battery leads short. Unsolder lead between .03 mf output capacitor and purple lead (see illustration). Connect one side of meter to this capacitor terminal, other side to receiver chassis. Be sure to reconnect leads after alignment is completed. Volume control at maximum. Connect ground lead of generator to chassis. Align for maximum output. Reduce input as needed to keep output near 1.5 volts.

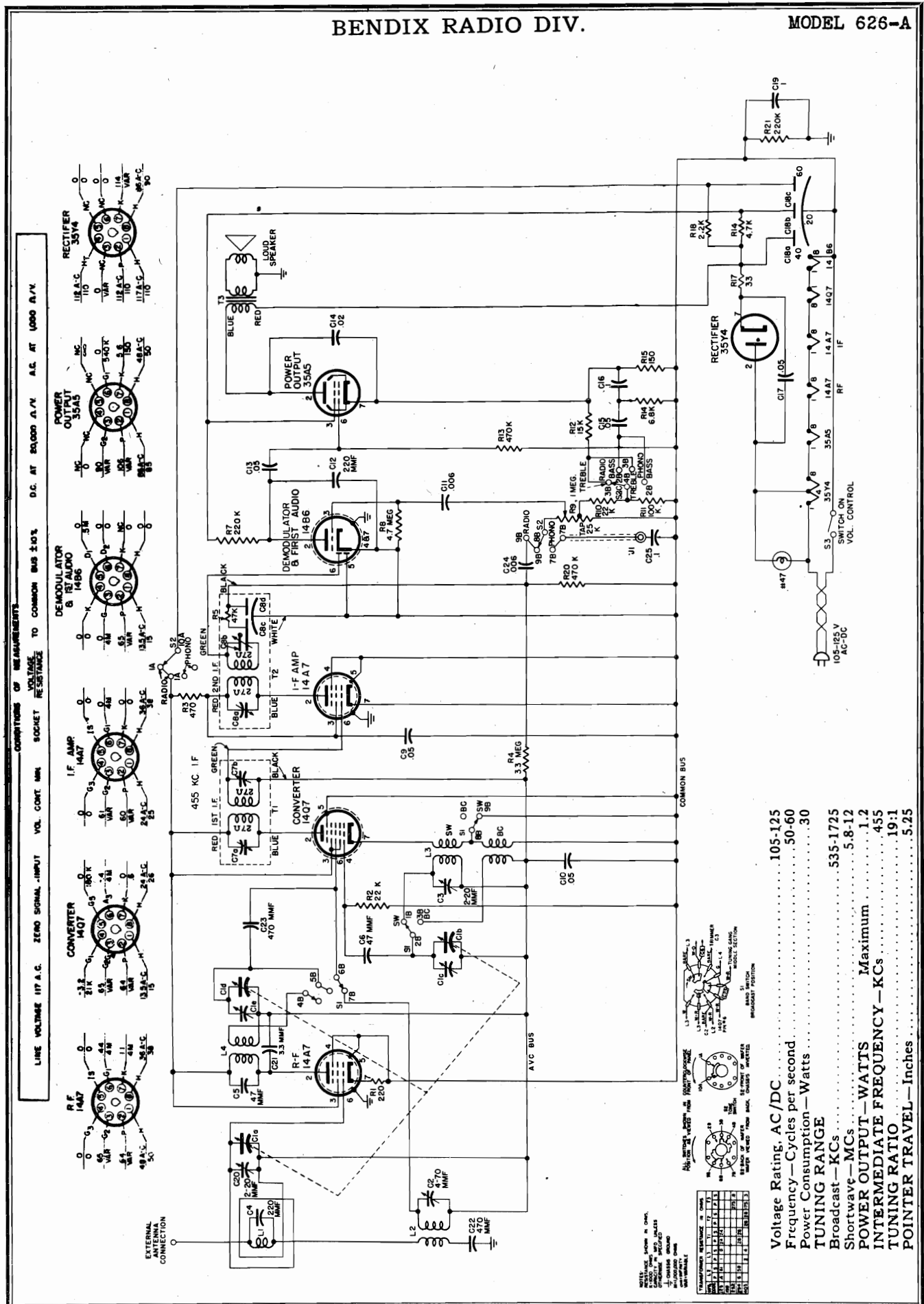
Generator Frequency	Coupling Capacitor	Connection to Set	Adjust for Max. Output
455 kc	.1 mf	Converter	Trimmers on both I.F. transformers
1625 kc	.1 mf	Converter	Oscillator trimmer
1400 kc	.1 mf	Converter	Oscillator tuning slug*
1625 kc	10 mmf	Antenna lead (see illust.)	Osc, ant, rf trimmers
1400 kc	10 mmf	Antenna lead	Antenna, rf tuning slugs*

Repeat this and previous step alternately for best tracking.



BENDIX RADIO DIV.

MODEL 626-A

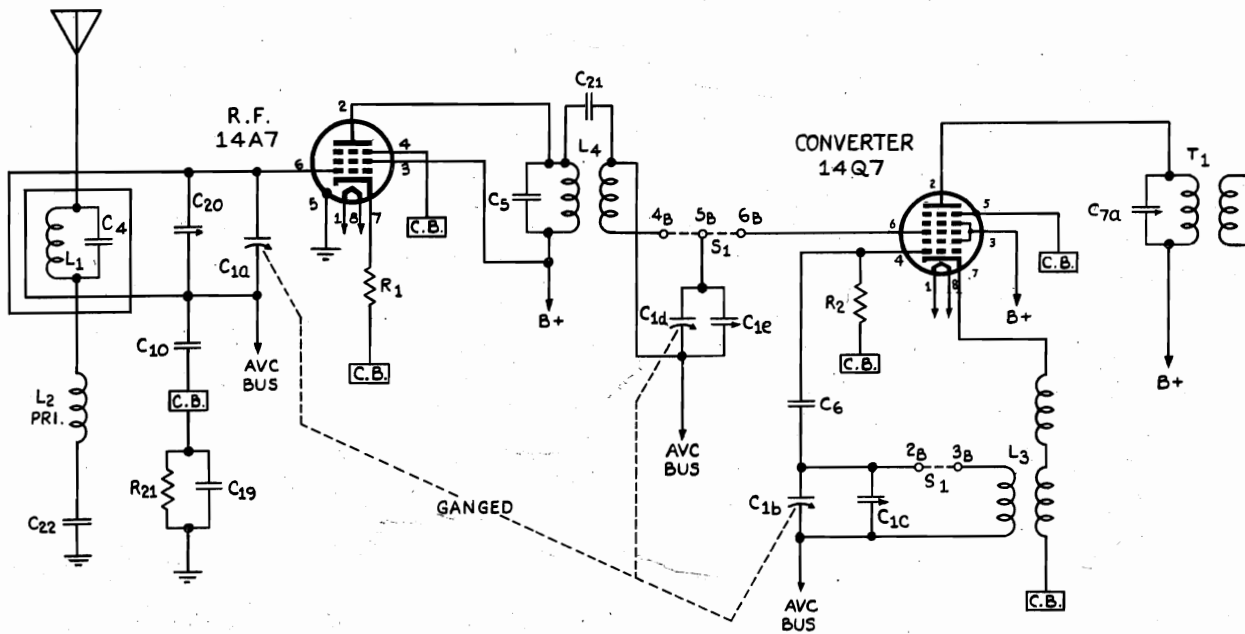


Voltage Rating, AC/DC	105-125
Frequency—Cycles per second	50-60
Power Consumption—Watts	30
TUNING RANGE	
Broadcast—KCs	535-1725
Shortwave—MCs	5.8-12
POWER OUTPUT—WATTS	Maximum
INTERMEDIATE FREQUENCY—KCs	455
TUNING RATIO	19:1
POINTER TRAVEL—Inches	5.25

"clarified schematics"

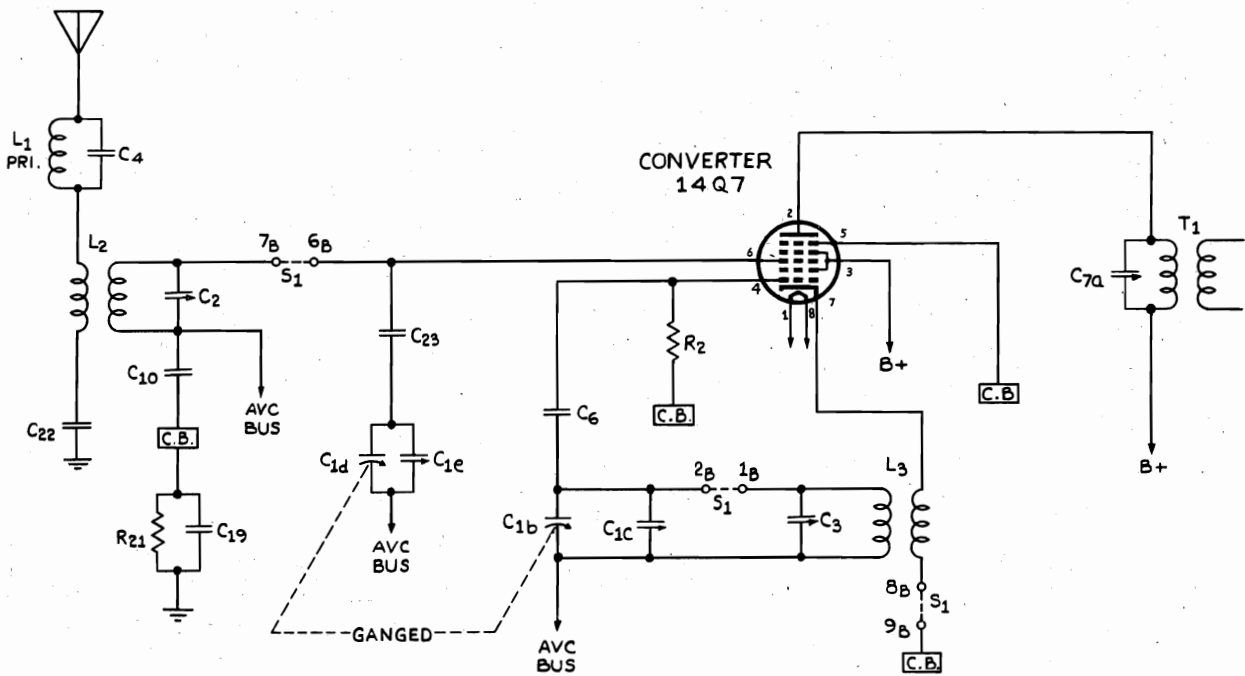
MODEL 626-A

BENDIX RADIO DIV.



BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
535-1725 KC.

⊥ DENOTES COMMON BUS
ABOVE GROUND BY
R₂₁ (220k) & C₁₉ (.1μf)



BAND-SWITCH SHOWN
AT 2ND POSITION.
SHORT WAVE BAND
5.8-12 MC.

⊥ DENOTES COMMON BUS
ABOVE GROUND BY
R₂₁ (220k) & C₁₉ (.1μf)

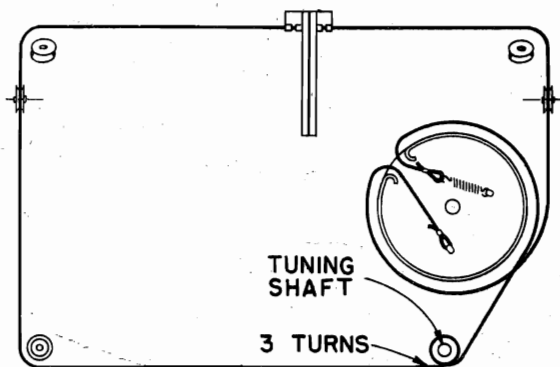
BENDIX RADIO DIV.

MODEL 626-A

Stock No.	Description	List Price
ELECTRICAL COMPONENTS		
AL0C01*	ANTENNA—Loop (L1)	2.60
CC9A16†	CAPACITOR—Ceramic 3.3 mmf. (C21)	.05
CE3A00	CAPACITOR—Electrolytic 40, 20, 60	
CE3A00†	CAPACITOR—Electrolytic 40, 20, 60 mfd. (C18a, C18b, C18c)	1.86
CL2A01†	CORD—AC Power	.42
CM5A14†	CAPACITOR—Mica 47 mmf. (C5, C6)	.18
CM5A30†	CAPACITOR—Mica 220 mmf. (C4, C12)	.22
CM5A38†	CAPACITOR—Mica 470 mmf. (C22)	.21
CM8S50†	CAPACITOR—Mica 470 mmf. 3% (C23)	.47
CP4T20	CAPACITOR—Paper 400 V .006 mfd. (C11, C24)	.14
CP4T34†	CAPACITOR—Paper 400V .02 mfd. (C14)	.14
CP4T40†	CAPACITOR—Paper 400V .05 mfd. (C9, C10, C13, C15, C17)	.16
CP4T51†	CAPACITOR—Paper 400V .1 mfd. (C16, C19, C25)	.18
CT2A00	CAPACITOR—Trimmer (C2 4-70 mmf., C3 2-20 mmf.)	.46
CV0C00	CAPACITOR—Variable. 3 gang (C1a, C1b, C1c, C1d, C1e)	7.91
LO6H00	COIL—Oscillator (L3)	1.61
RC1H16†	RESISTOR—220 ohms 1/4 W Comp. (R1)	.04
RC1H20†	RESISTOR—470 ohms 1/4 W Comp. (R3)	.04
RC1H32†	RESISTOR—4700 ohms 1/4 W Comp. (R19)	.04
RC1H34†	RESISTOR—6800 ohms 1/4 W Comp. (R14)	.04
RC1H38†	RESISTOR—15000 ohms 1/4 W Comp. (R12)	.06
RC1H40†	RESISTOR—22000 ohms 1/4 W Comp. (R2, R10)	.04
RC1H44†	RESISTOR—47000 ohms 1/4 W Comp. (R5)	.04
RC1H51†	RESISTOR—100000 ohms 1/4 W Comp. (R11)	.04
RC1H54†	RESISTOR—220,000 ohms 1/4 W Comp. (R7, R21)	.04
RC1H58†	RESISTOR—470,000 ohms 1/4 W Comp. (R13, R20)	.04
RC1H68†	RESISTOR—3.3 meg. 1/4 W Comp. (R4)	.04
RC1H70†	RESISTOR—4.7 meg. 1/4 W Comp. (R8)	.04
RC4G28†	RESISTOR—2200 ohms 2W Comp. (R18)	.14
RV4S00†	POTENTIOMETER—1 meg. with Switch (R9, S3)	.92
RW1A06†	RESISTOR—33 ohms WW 1W (R17)	.14
RW1B28†	RESISTOR—150 ohms WW 1W (R15)	.08
SO0D01	SOCKET—Dial Lamp	.23
SO9S00†	SOCKET—Loctal Tube	.19
SR2C01	SWITCH—Rotary 2 Pos. 3 Pole (S1)	.70
SR4C00†	SWITCH—Rotary 4 Pos. 3 Pole (S2)	.84
T10C01†	TRANSFORMER IF—1st (T1)	3.75
T10D01†	TRANSFORMER IF—2nd (T2)	2.65
TR6D00	TRANSFORMER RF—Shortwave (L2)	1.26
TR6L00†	TRANSFORMER BC—RF Interstage (L4)	3.75
#47†	LAMP—Pilot	.09

Stock No.	Description	List Price
ELECTRICAL COMPONENTS (continued)		
JR1S00†	JACK—Receptacle, 1 Contact, Phono Jack (J1)	.06
SPEAKER AND COMPONENTS		
SP400†	SPEAKER—Oval PM (4 x 6)	5.70
CS4000†	CONE & VOICE COIL ASS'Y.—Code 252	
CS4001†	CONE & VOICE COIL ASS'Y.—Code 328	
CS4002†	CONE & VOICE COIL ASS'Y.—Code 270	
CS4006†	CONE & VOICE COIL ASS'Y.—Code 191	
CS4007†	CONE & VOICE COIL ASS'Y.—Code 371	
TA0001†	TRANSFORMER—Output (T3)	.96
MECHANICAL COMPONENTS		
AD0C00	ASSEMBLY—Dial Back Plate	1.04
BT1S00†	BOARD—Terminal Strip 1 Lug 1 Mt	.03
BT2S00	BOARD—Terminal Strip 2 Lugs 1 Mt	.02
BT4S01†	BOARD—Terminal Strip 4 Lugs 1 Mt	.05
CD0C02	CABLE—Dial	.17
GR0S00†	GROMMET—Shockmount Rubber	.05/c
HC0C00†	CLIP—Coil Mtg	.64/c
HC0C02†	CLIP—Coil Mtg	.90/c
HC0C03†	CLAMP—Cable (Dial)	.43/c
HC0S00†	CLIP—Tuning Shaft Spring	.01
HC0T00†	CLAMP—Tube Shield	.01
HN9P45†	PALNUT—3/8 x 32	.60/c
HR0P00†	RIVET—Plain 13/64 x .121	.40/c
HR0P01†	RIVET—Plain .088 x 1/8	.40/c
HR0S01†	RIVET—Shoulder .171 x .118 .083 x .088	.02
HS0C00†	SPRING—Dial Cable	.04
HS0P01†	SPACER—Antenna, Wood	.01
HS6F00†	SLEEVE & SPACER—Tuning Capacitor	.02
ID0M06†	INDICATOR—Metal, Dial	.28
IT0C01	INSULATOR—Elec. Cap. Tube	.04
IW0F00†	INSULATOR—Felt Washer	.20/c
MB0B00†	BEARING—Bushing (Tuning Shaft)	.18
MP0F00†	PULLEY—Fiber (Idler)	.02
MS0T02†	SHAFT—Tuning	.15
PI0P01†	PLATE—Insulating, Power Cord	.01
SM0T00†	SHIELD—Metal, Tube	.05
CABINET COMPONENTS		
DS0C01	DIAL—Scale	.77
GC0D02	GASKET—Dial, Cork Strip	.09
HC0D00	CLIP—Dial (Metal) Retainer R.H.	.04
HC0D01†	CLIP—Dial Retainer (Metal) L.H.	.03
HC0S09	CLIP—Spring, Knob, Band Switch	.01
HK0R00†	CLIP—Spring, Knob	.01
IT0F00	INSULATOR—Flexible Tubing	.08/ft.
KB0B03	KNOB—Indexed, Tan	
KC0B08	KNOB—Plain, Tan	
KY0B00	KNOB—Brown, Band Switch	.31
ZP0I00	CABINET—Ivory, Plastic	

*Subject to excise tax /c—Price per hundred Prices subject to change without notice †Used on previous models PRINTED IN U.S.A.



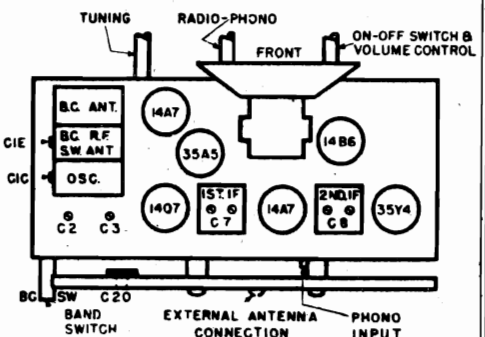
Adjust pointer 2 in. from left end with tuning gang fully meshed

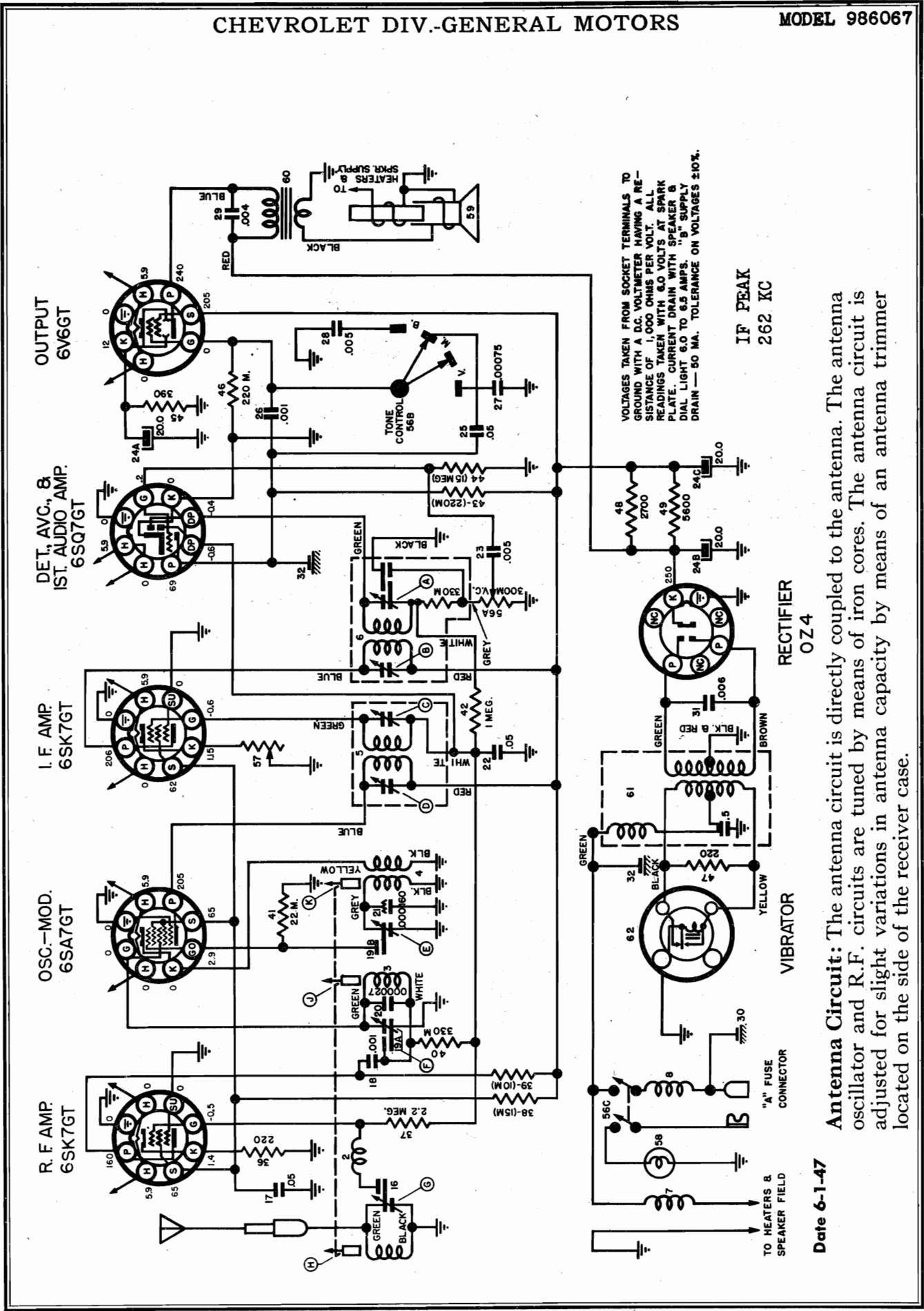
Make adjustments in table for maximum output with output meter connected across voice coil. Always keep input as low as possible for perceptible output.

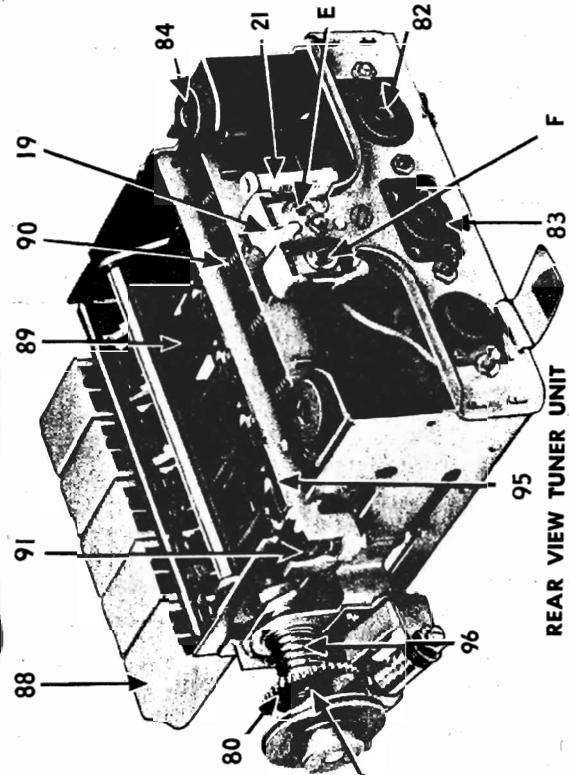
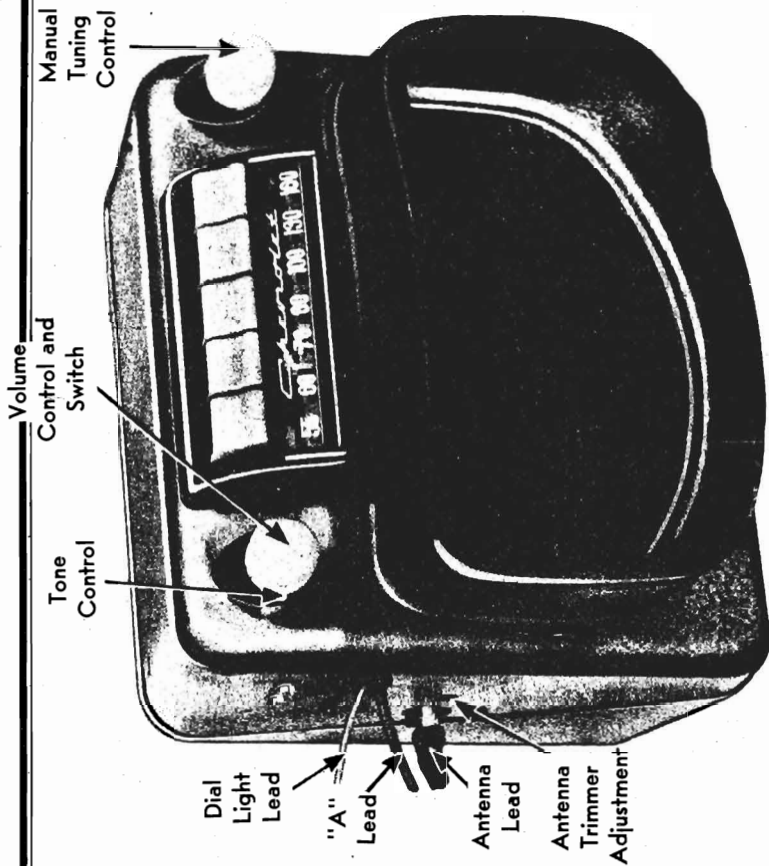
PRECAUTIONS

An isolating transformer should be used between the power supply and the receiver if any of the test equipment is AC operated. The use of isolating capacitors is not recommended as AC through the capacitor may introduce hum modulation, and if the capacitors should break down the test instruments will likely be damaged.

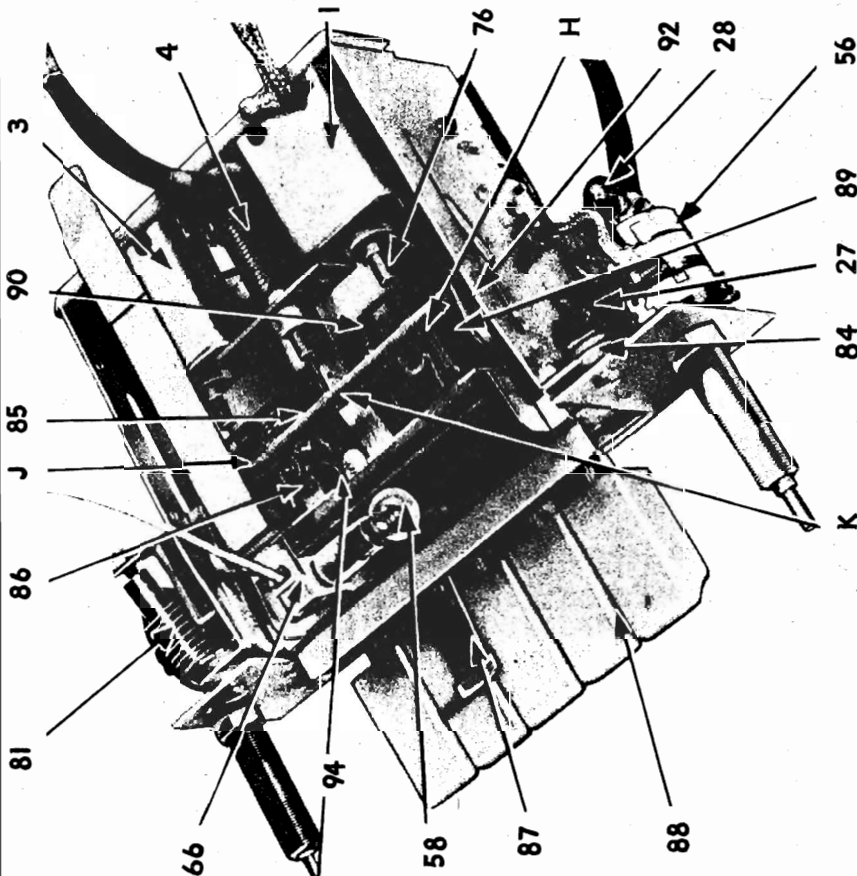
CIRCUIT	CONTROL POSITIONS	APPLY	THRU	TO	ADJ
I.F.	Volume—Maximum			Grid	C8b
	Tone—Treble			14A7	C8a
I.F.	Band Switch—Broadcast	455 KC	.01mfd.	I.F. Amp,	C7b
	Tuning Condenser—Fully Open			14Q7	C7a
Broadcast	Pointer 4 3/8 in. from left end.	1475 KC	50 mmf.	External Antenna Connection	C1c C1e C20
Short Wave	Pointer 4 1/2 in. from left end.	11 MC	400 ohms in series with .01 mfd.	External Antenna Connection	C3 C2







REAR VIEW TUNER UNIT

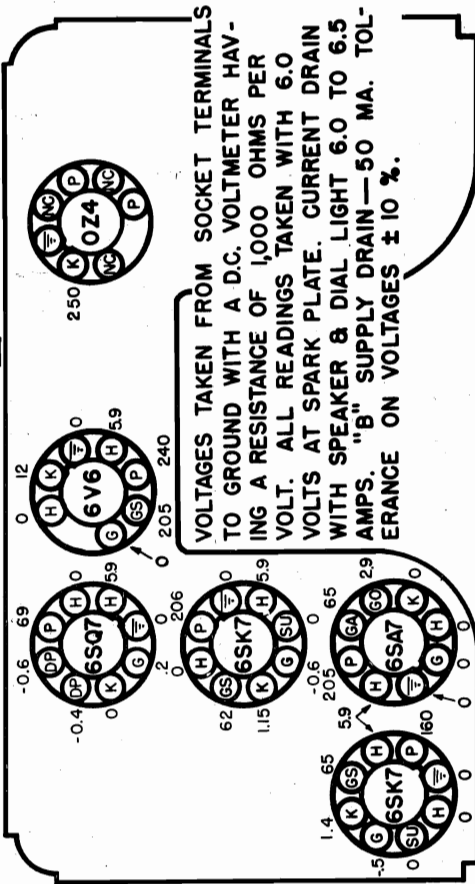


FRONT VIEW TUNER UNIT

Procedure for Setting Pushbuttons

Turn on the receiver for ten minutes or longer to allow circuits to stabilize.

1. Select your five favorite stations in order of frequency.
2. Pull the button slightly to the left and out approximately one-half inch.
3. Turn the manual control knob until the desired station is tuned in. To secure an accurate set-up, turn the manual tuning knob back and forth until the station is tuned in clearly.
4. Push button in firmly to the end of its travel.
5. Repeat the same procedure to set up the remaining four buttons.



Circuit Alignment

The trimmer condensers in this receiver have been carefully adjusted at the factory and should require no further adjustment (except the antenna trimmer) unless tampered with or a coil replaced. It is advisable not to attempt any adjustment unless it is definitely known that alignment is necessary. Since the iron cores of the tuning unit are sealed in place at the factory, only the trimmer adjustment as outlined under "Capacity Alignment" should be made, unless the coils or cores of the iron core tuning unit are changed. A signal generator and an output meter must be used to align the receiver circuits correctly. To make all alignment adjustments the back cover must be removed.

Capacity Alignment

1. I.F. Alignment at 262 Kilocycles

- (a) Connect a 0.1 mfd. condenser between the plate prong of the 6V6GT output tube and one terminal of the output meter, to protect the meter from DC voltages. Connect the other terminal of the output meter to ground.
- (b) Connect the ground lead of the signal generator to the chassis frame.
- (c) Connect the signal lead of the signal generator to the grid (G) prong of the 6SA7 tube socket through a 0.1 mfd. condenser.
- (d) Turn the set volume control on full and rotate the tone control knob to the center of its range. Adjust the signal generator to 262 kilocycles, and tune the receiver to a frequency where no squeals or beat notes may be heard and so that when the tuning control is moved through narrow limits no appreciable change in output is noticeable.
- (e) Adjust the I.F. trimmers A, B, C, and D for maximum output.

2. Aligning at 1615 Kilocycles

- (a) Connect the signal lead of the signal generator to the receiver antenna connection through a .000070 mfd. condenser.
- (b) Turn the manual control of the receiver to the stop at the high frequency end of the dial.
- (c) Set the signal generator to 1615 kilocycles.
- (d) Adjust the oscillator trimmer "E" for maximum output.
- (e) Adjust the R.F. trimmer "F" for maximum output.
- (f) Adjust the antenna trimmer "G" for maximum output.

3. Aligning at 1400 Kilocycles

- (a) Set the signal generator frequency to 1400 kilocycles or the nearest frequency at which there is no interference from radio stations.
 - (b) Tune the receiver to this signal and readjust the R.F. trimmer "F" and antenna trimmer "G" for maximum output. The signal generator output should be as low as possible and still give a satisfactory output meter reading.
- NOTE: This type tuning circuit does not require alignment at 600 kilocycles.

4. Alignment with Car Antenna

Antenna trimmer "G" must be adjusted to match the car antenna when receiver is installed. With the antenna fully extended, tune in a weak station, adjust trimmer for maximum volume.

Capacity and Inductance Alignment

This alignment should be used only when there is definite evidence that the iron cores are out of adjustment.

1. I.F. Alignment at 262 Kilocycles

The same procedure as previously outlined should be followed.

2. Aligning at 1615 Kilocycles

- (a) Connect the signal lead of the signal generator to the set through a .000070 mfd. condenser.
- (b) Set the signal generator to 1615 kilocycles.
- (c) Rotate the manual tuning knob until the pointer is against the high frequency stop. Mechanically align the iron cores H, J, and K by setting the oscillator core "K" so that its rear edge is 1 3/4" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) The antenna core "H" and the R.F. core "J" are aligned in the same way as the oscillator core "H".
- (d) Adjust the oscillator trimmer "E," the R.F. trimmer "F," and the antenna trimmer "G" for maximum output.

3. Aligning at 1400 Kilocycles

- (a) Adjust the signal generator to 1400 kilocycles or the nearest frequency at which there is no radio station interference.
- (b) Adjust the R.F. core "J" for maximum output.
- (c) Adjust the antenna core "H" for maximum output.

NOTE: The rear end of iron cores are slotted so the maximum output adjustment can be made with a non-metallic screw driver that fits loosely in the coil form. (No inward force should be used.)

4. Realignment at 1615 and 1400 Kilocycles

- (a) Repeat alignment of trimmers "F" and "G" at 1615 kilocycles.
- (b) Repeat alignment of cores "H" and "J" at 1400 kilocycles. Do not change adjustment of oscillator core "K".
- (c) Reseal core studs in guide bar with gypal or household cement.

5. Alignment with Car Antenna

The same procedure as outlined previously should be followed.

MODEL 986067

CHEVROLET DIV.-GENERAL MOTORS

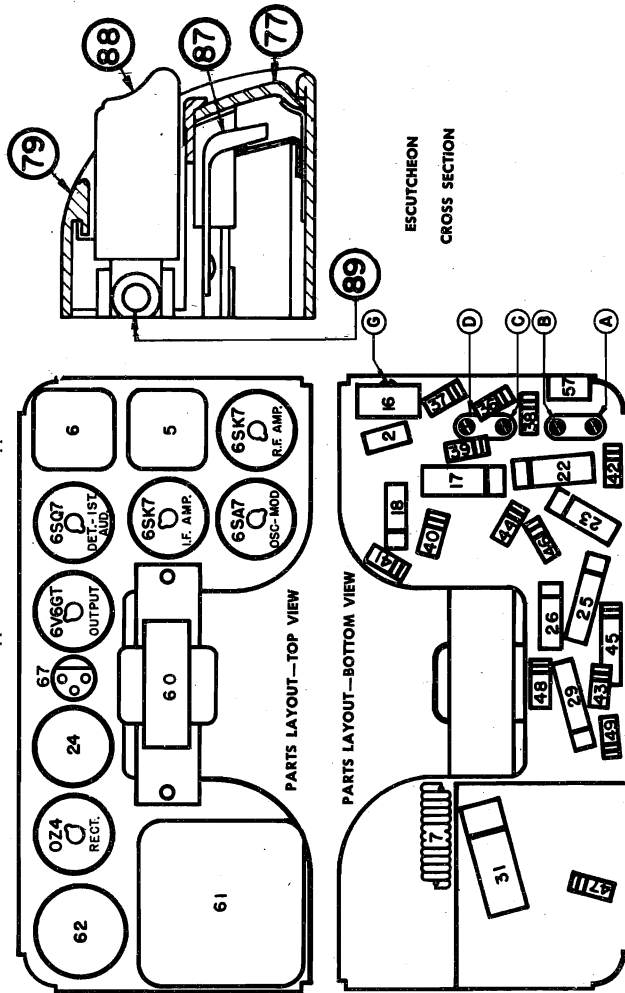
7255985	Push Button (Included in Slide and Push Button Package)	88
1217837	Slide and Push Button Package	89
7255984	Slide Return Spring	90
7255980	Cam Return Spring	91
7255990	Treadle Bar Connecting Link Spring	92
7256269	(Included in Pointer Assembly Connecting Link)	94
7255992	Pointer Connecting Link Spring	95
7255987	Declutch Lever Spring	96
7255991	Clutch Spring	96

Tube Complement

1211924	024 Rectifier (1 required)
1213637	6V8GT Output (1 required)
7237886	6SA7GT Oscillator Modulator (1 required)
7237887	6SK7GT R.F. and I.F. Amplifier (2 required)
7237888	6SQ7GT Detector AVC and 1st Audio (1 required)

Installation Parts

494786	Static Collector (Front Wheel)
1849161	Ammeter Condenser
1908848	Generator Condenser
1910147	Ignition Coil Condenser
147685	Fuse—Radio, 14 Amp.
7256297	Fuse Holder
7255986	Wing Knob Tone Control
7255985	Knob
7256148	Knob
1217909	Control Knob
1888204	"A" Lead (Includes Fuse Holder)
986121	Rubber Nipple (Distributor Suppressor)
1887829	Static Powder (Tire)
1887829	Distributor Suppressor



The tuning circuits are tuned by varying the inductance of the antenna, R.F. and oscillator coils by means of iron cores which slide in and out of the coils like pistons. The alignment of the cores has been sealed at the factory and further adjustment should not be required unless the coils have been changed or an iron core has been replaced.

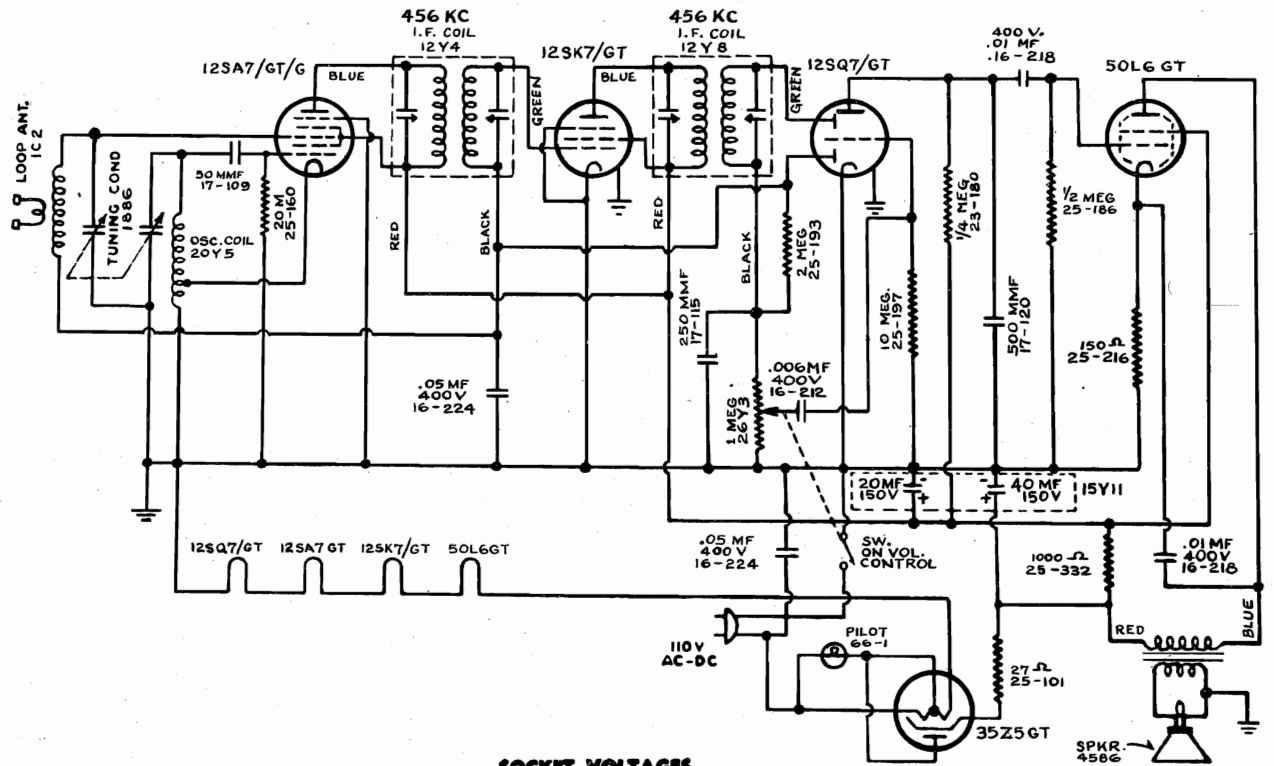
Pro-duction Part No.	Service Part No.	Part Name	Description—Function	Illus. No.
7256293	7256293	Coil	Antenna—Coil	1
7240251	7256293	Choke	Antenna—Choke	2
7256293	7256293	Coil	R.F. Coil	3
7256011	7256293	Coil	Oscillator—Coil	4
7256012	7256293	Coil	1st I.F. Transformer Assembly	5
7256012	7256293	Coil	2nd I.F. Transformer Assembly	6
7256004	7256293	Choke	Hash Choke	7
7255907	7256293	Trimmer	"A" Choke (inside front cover)	8
7236842	7256293	Condenser	Antenna Trimmer	16
7242454	7256293	Trimmer	Tubular—.05 Mfd. 600 Volt, Screen By Pass	17
7256276	7256293	Condenser	Tubular—.001 Mfd. 600 Volt, R.F. Coupling	18
7230767	7256293	Condenser	Dual Trimmer—R.F. and Oscillator Sections	19
7230767	7256293	Condenser	Molded .00027 Mfd.	20
7230767	7256293	Condenser	Temperature Compensating .000160 Mfd.	21
7230767	7256293	Condenser	Tubular .05 Mfd. 600 Volt, AVC By Pass	22
7230767	7256293	Condenser	Tubular .005 Mfd. 600 Volt, Audio Coupling	23
7240724	7256293	Condenser	3 Section Electrolytic	24
7230767	7256293	Condenser	Section A 20 Mfd. 25 Volt, Output By Pass	24A
7230767	7256293	Condenser	Section B 520 Mfd. 400 Volt, "B" Input Filter	24B
7230767	7256293	Condenser	Section C 20 Mfd. 400 Volt, "B" Output Filter	24C
7230767	7256293	Condenser	Tubular .05 Mfd. 600 Volt, Tone Control (Voice)	25
7230767	7256293	Condenser	Tubular .001 Mfd. 600 Volt, Audio Coupling	26
7230767	7256293	Condenser	Tubular .00075 Mfd. 400 Volt, Tone Control (Music)	27
7230767	7256293	Condenser	Tubular .005 Mfd. 600 Volt, Tone Control (Music)	28
7230767	7256293	Condenser	Tubular .004 Mfd. 600 Volt, 6V6 Output	29
7230767	7256293	Condenser	Tubular .006 Mfd. 600 Volt, Buffer	30
7230767	7256293	Condenser	Chassis Condenser	31
7230767	7256293	Resistor	Insulated, 220 ohms 1/2 watt, R.F. Amp. Bias	32
7230767	7256293	Resistor	Insulated, 2.2 Megohm 1/2 watt, AVC Isolating	33
7230767	7256293	Resistor	Insulated, 15,000 ohm 2 watt, Screen Dropping	37
7230767	7256293	Resistor	Insulated, 10,000 ohm 1 watt, Plate Dropping	38
7230767	7256293	Resistor	Insulated, 330,000 ohm 1/2 watt, AVC Isolating	39
7230767	7256293	Resistor	Insulated, 22,000 ohm 1/2 watt, Oscillator Grid	41
7230767	7256293	Resistor	Insulated, 1 Megohm 1/2 watt, AVC Isolating	42
7230767	7256293	Resistor	Insulated, 220,000 1/2 watt, Plate Dropping	43
7230767	7256293	Resistor	Insulated, 15 Megohm 1/2 watt, 6SQ7 Grid	44
7230767	7256293	Resistor	Insulated, 390 ohm 1 watt, Output Tube Bias	45
7230767	7256293	Resistor	Insulated, 220,000 ohm 1/2 watt, 6V6 Grid	46
7230767	7256293	Resistor	Insulated, 220 ohm 1 watt, Power Transformer, Primary Load	47
7240917	7242844	Resistor	Insulated, 2700 ohm 2 watt, "B" Filter	48
7240918	7242844	Resistor	Insulated, 5,600 ohm 1 watt "B" Filter	49
7256188	7242844	Control	Volume, Tone and Switch	56
7256188	7242844	Control	Volume Control, 300,000 ohm	56A
7256188	7242844	Control	Tone Control	56B
7256188	7242844	Control	Switch	56C
7256188	7242844	Control	Sensitivity Control	57
7256188	7242844	Control	Dial Lamp	58
7256188	7242844	Control	Electro Dynamic 6% x 9 1/4" Elliptical Less Cable	59
7256188	7242844	Control	Output Transformer	60
7256188	7242844	Control	Power Transformer	61
7256188	7242844	Control	Non-Synchronous 4 Prong	62
7256188	7242844	Control	Speaker Cable and Plug	66
7256188	7242844	Control	Antenna Socket	67
7256188	7242844	Control	Dial Light Assembly (Less Lamp)	67
7256188	7242844	Control	Tube—Octal	67
7256188	7242844	Control	Speaker Socket	67
7256188	7242844	Control	Vibrator Socket	67

Tuner Unit Part

7256112	Iron Tuning Core	76
7255986	Dial (Included in Escutcheon Assembly)	77
7256105	Clutch Driver Disc	78
7256177	Escutcheon Assembly	79
7256102	Gear and Bushing (Tuning)	80
7256100	Gear and Bracket Worm (Tuning)	81
7244021	Antenna & R.F. Coil Grommet	82
7244021	Oscillator Coil Grommet	83
7244021	Mounting Bracket Grommet	84
7244021	Guide Bar—Parallel	85
7244021	Pointer Assembly Connecting Link	86
7244021	Pointer Assembly	87

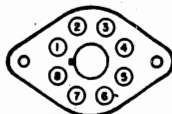
CONCORD RADIO CORP.

MODELS 6C51B, 6C51W



SOCKET VOLTAGES

TUBE	POSITION	1	2	3	4	5	6	7	8
12SA7GT	Osc. and Mixer	0	37.5 AC	99	99	-4.2	0	24.5 AC	0
12SK7GT	IF Amplifier	0	24.5 AC	0	0	0	99	12.5 AC	99
12SQ7GT	2nd Det.—1st Audio	0	0	0	0	0	16	12.5 AC	0
50L6GT	Power Output	0	85 AC	91.5	99	0	0	37.5 AC	5.9
35Z5GT	Rectifier	0	117 AC	112 AC	0	112 AC	0	85 AC	112



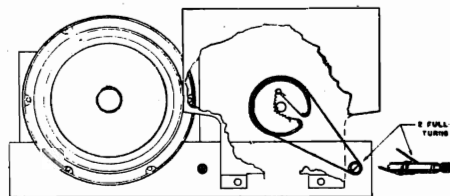
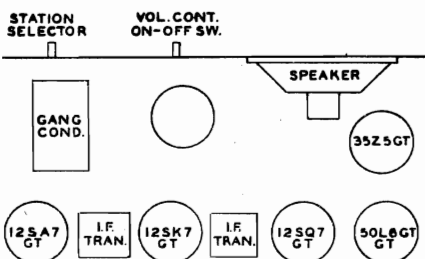
NOTE: All DC voltages measured with a 1000 ohm per volt meter from ON-OFF switch (-B) to socket contact indicated. All AC voltages are measured from ON-OFF switch (-B) to socket contact indicated. All voltages are positive DC unless otherwise marked. Volume control full on. Line voltage 117 volts AC.

The following equipment is necessary to properly align this chassis:

1. A signal generator which will provide an accurately calibrated signal at the frequencies listed.
2. An output meter.
3. A non-metallic screwdriver.
4. Dummy antenna: — .1 mfd., — 10 mmf.

GENERATOR	CONNECTION AT RADIO	DUMMY ANTENNA	DIAL	TO TUNE TRIMMERS	REMARKS
IF 455 kc.	12SA7GT grid	.1 mfd.	HF end	IF trimmers C D E F	Tune to max.
535 kc.	12SA7GT Grid	10 mmf.	LF end	Osc. trimmer B	Set limit of band
1400 kc.	12SA7GT Grid	10 mmf.	1400 kc.	Ant. trimmer A	Tune to max.

Frequency Range...540-1700 kc.
 Intermediate Frequency...455 kc.
 Power Supply 105-125 volts AC-DC
 Loudspeaker ...5-inch Dynamic
 V.C. Impedance...3.5 ohms at 400 cycles
 Power Output (Undistorted) .75 watts
 Power Output (Maximum) 1.5 watts
 Tuning Drive Ratio.....3 to 1
 Rated Power Input32 watts



Dial Mechanism

MODEL 7G26C

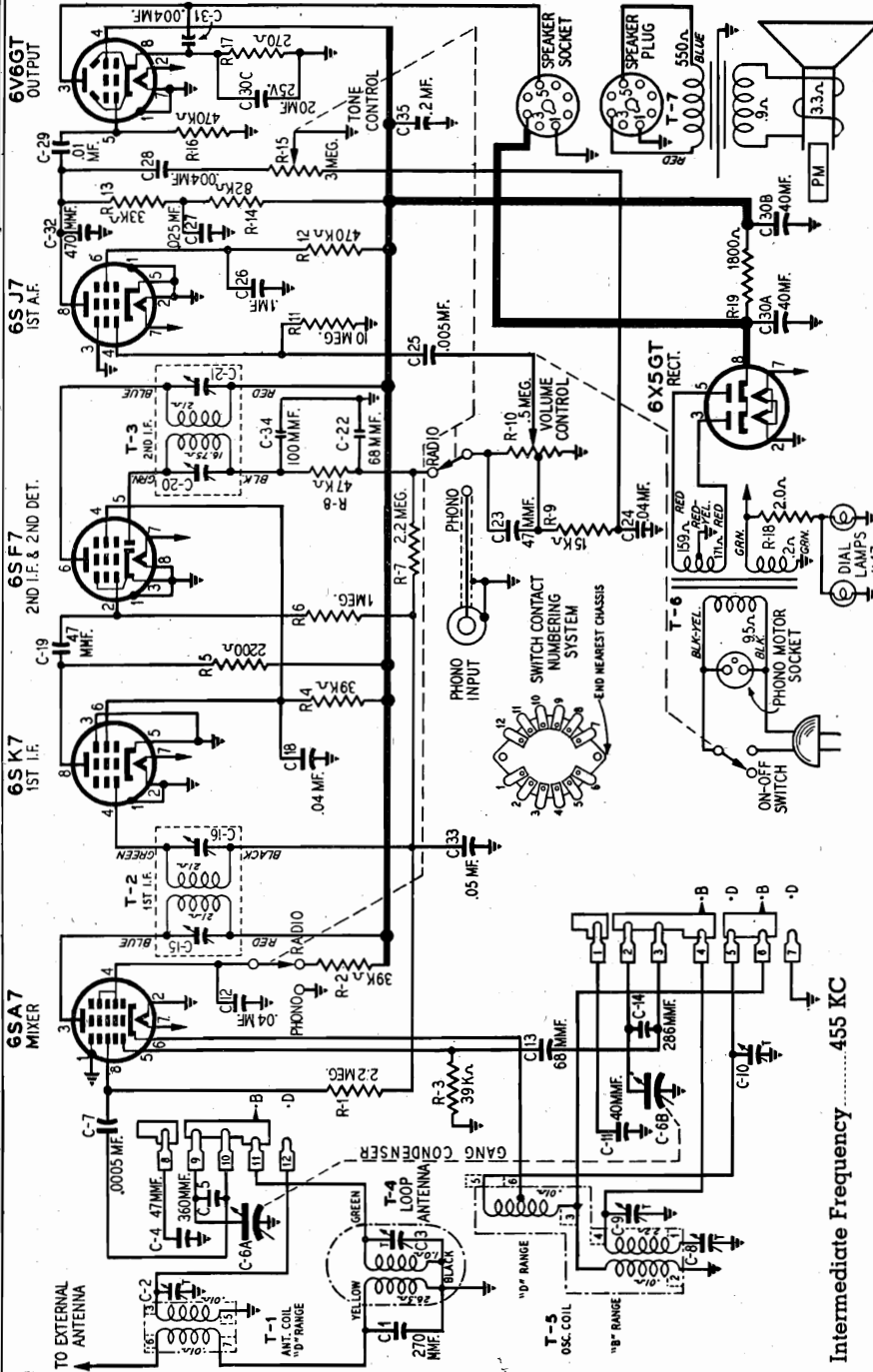
REMOVAL OF CHASSIS FROM CABINET

Before the chassis may be taken from the cabinet, it is necessary to pull off the 4 control knobs, remove the 4 chassis mounting bolts, disconnect the leads running to the loop antenna, record changer and speaker and loosen the screw and remove the black lead fastened to the lower left corner of the chassis.

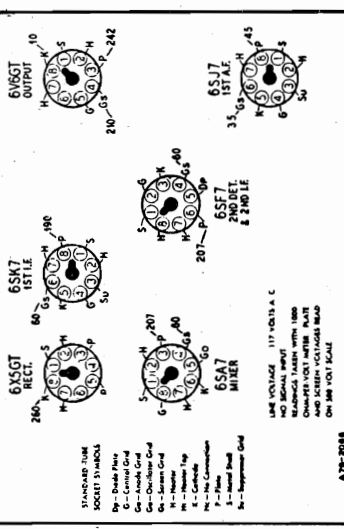
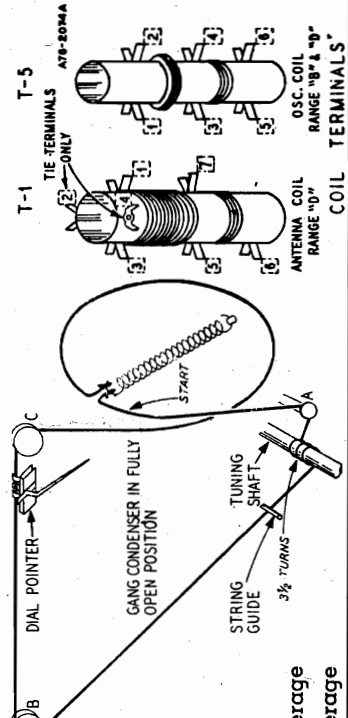
Power Consumption
(at 117 Volts AC) 40 Watts (normal)
58 Watts (phono operating)

Power Output... 4 Watts, Maximum
2.3 Watts, 10% Distortion

Tuning Frequency Range
B Range... 540-1600 Kilocycles
D Range... 9.25-15 Megacycles



DRIVE CORD REPLACEMENT



Intermediate Frequency..... 455 KC

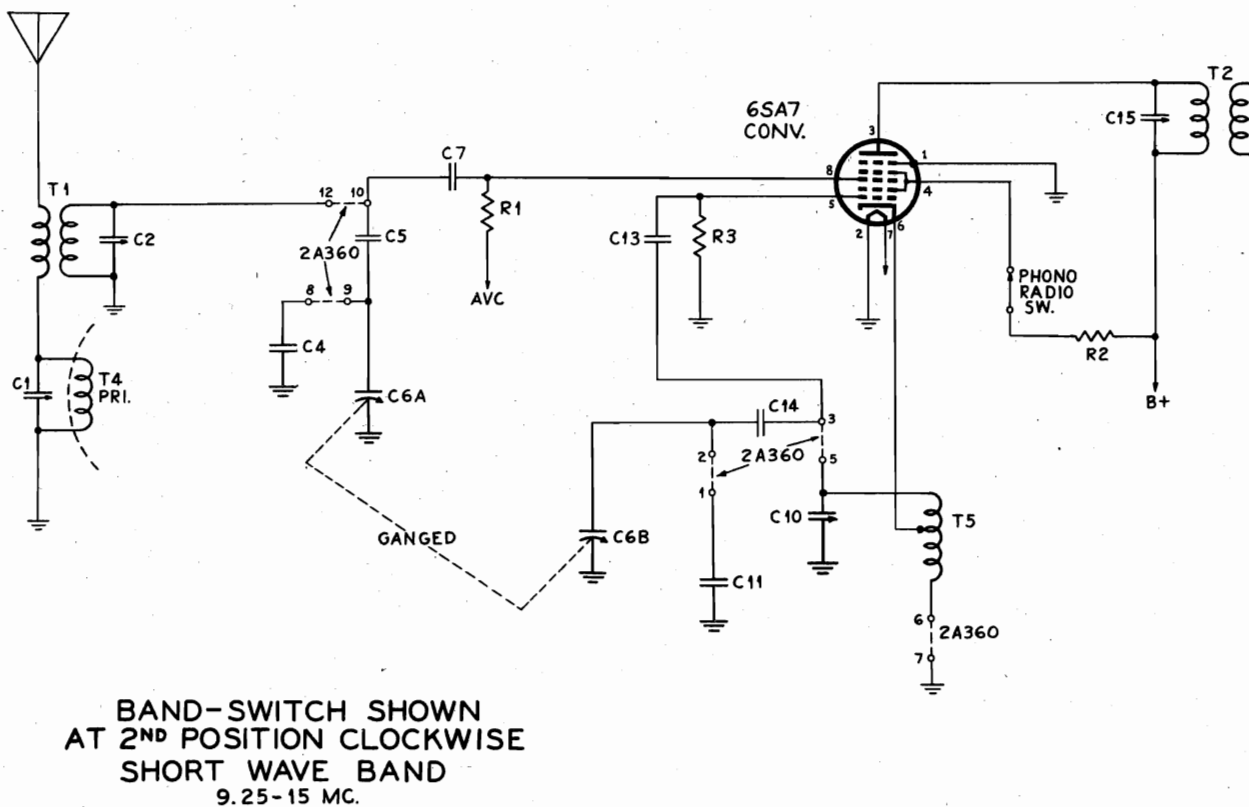
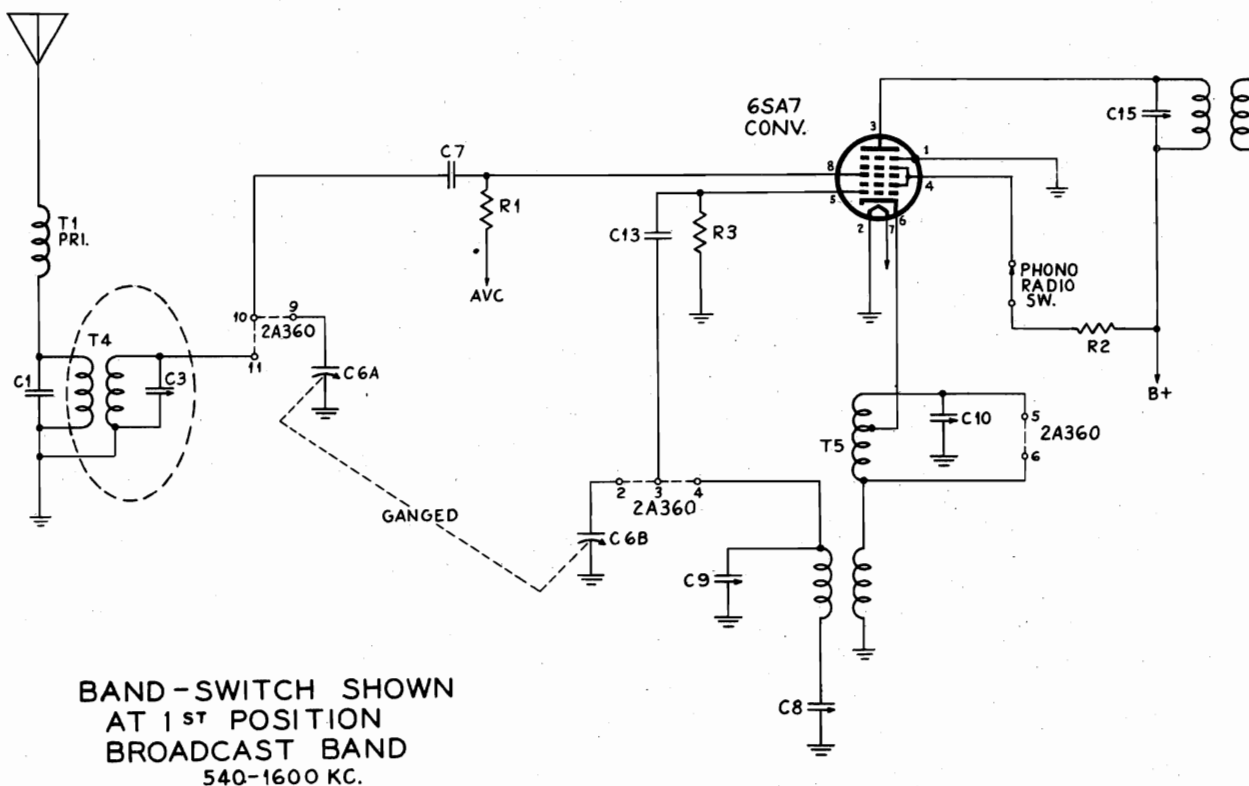
Sensitivity (For 0.5 Watt Output, with External Antenna)
B Range..... 9 Microvolts Average
D Range..... 20 Microvolts Average

Selectivity..... 40 KC Broad at 1000 Times Signal

"clarified schematics"

CONCORD RADIO CORP.

MODEL 7G26C

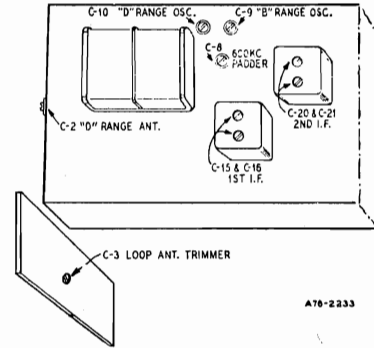


ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

SIGNAL GENERATOR		CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
FREQUENCY SETTING	Grid of 6SA7 Pin 8					
I.F.	455 KC	Grid of 6SA7 Pin 8	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C20) & (C21)
RANGE B	1620 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output See Note A	Ant. Range B (C3)
	600 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output See Note B	Oscillator (C8)
Repeat above steps at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C9) causes no further improvement of output.						
RANGE D	15.6 MC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
	14 MC	Antenna Lead	400 Ohm	D Range	Tune Rotor to Max. Output	Ant. Range D (C2)
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Ant. Range B (C3)



NOTE A—Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn rotor back and forth and adjust the trimmer until peak of greatest intensity is obtained.

REPLACEMENT PARTS LIST

NOTICE: There is a Model Number label on the chassis. This label identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

MISCELLANEOUS

PART NO.	DESCRIPTION
12A442	6" P.M. Speaker complete with Output Transformer.....
12A436	8" P.M. Speaker complete with Output Transformer..... Cone and Voice Coil Assembly (Specify part number and letters stamped on speaker)..... Output Transformer (Specify part number and letters stamped on speaker).....
3A303	Tube Socket—Octal (8 prong) Molded.....
3A304	Phono Motor Socket.....
3A305	Phono Socket—Single Pin Tip.....
2A360	Band Change Switch.....
13X328	Line Cord and Plug Assembly.....
10A614	Knob (Tuning).....
10A615	Knob (Volume).....
10A616	Knob (Tone—R.P.).....
10A617	Knob (SW-BC).....

TRANSFORMERS AND COILS

T-1	9A1812	"D" Range Antenna Coil Assembly.....
T-2	9A1814	1st I-F Coil Assembly.....
T-3	9A1815	2nd I-F Coil Assembly.....
T-4	26A449	"B" Range Loop Antenna Assembly.....
T-5	9A1813	"B" and "D" Range Oscillator Coil Assembly.....
T-6	53X282	117 Volt, 60 Cycle, Standard Power Transformer.....
T-7		Output Transformer (See Miscellaneous).....

CAPACITORS

C-1	47X445	270 mmf	Molded
C-2	17A164	5-50 mmf	Trimmer
C-3	17A235	2-12 mmf	Trimmer
C-4	47X473	47 mmf	Silvered Mica
C-5	47X474	360 mmf	Silvered Mica
C-6A, C-6B	14A184	Gang Condenser	
C-7	B66501	.0005 mf	200 V Tubular
C-8	17A155	350-430 mmf	Trimmer
C-9, C-10	17A109	2.5-35 mmf	Dual Trimmer
C-11	47X472	40 mmf	Silvered Mica
C-12, C-18	D56403	.04 mf	400 V Tubular
C-13	47X466	68 mmf	Molded
C-14	47X481	286 mmf	Silvered Mica
C-15, C-16	Part of T-2	1st I-F Coil Assem.	
C-19, C-23	47X463	47 mmf	Molded
C-20, C-21	Part of T-3	2nd I-F Coil Assem.	
C-22	47X471	68 mmf	Molded
C-24	D64403	.04 mf	400 V Tubular
C-25	D66502	.005 mf	400 V Tubular
C-26	D67104	.10 mf	400 V Tubular
C-27	D64253	.025 mf	400 V Tubular
C-28	D66402	.004 mf	400 V Tubular
C-29	D66103	.01 mf	400 V Tubular
C-30A	45X346	40 mf	Three Section Electrolytic..
C-30B		40 mf	
C-30C		20 mf	
C-31	F66402	.004 mf	600 V Tubular
C-32	47X505	470 mmf	Molded
C-33	B66503	.05 mf	200 V Tubular
C-34	47X476	100 mmf	Molded
C-35	D67204	.2 mf	400 V Tubular

RESISTORS

	OHMS	WATTS	
R-1, R-7	B85225	2.2 meg.	0.5 Carbon
R-2, R-4	C84393	39 K	1.0 Carbon
R-3	B94393	39 K	0.5 Carbon
R-5	B84222	2200	0.5 Carbon
R-6	B85105	1 meg.	0.5 Carbon
R-8	B85473	47 K	0.5 Carbon
R-9	B84153	15 K	0.5 Carbon
R-10	36X357	.5 meg.	Volume Control & Switch
R-11	B85106	10 meg.	0.5 Carbon
R-12, R-16	B85474	470 K	0.5 Carbon
R-13	B84333	33 K	0.5 Carbon
R-14	B84823	82 K	0.5 Carbon
*R-15	40X277	3 meg.	Tone Control & Radio Phono Switch
R-17	C84271	270	1.0 Carbon
R-18	43X213	2.0	0.5 Wire-wound
R-19	D84182	1800	2.0 Carbon

DIAL AND DRIVE ASSEMBLY

6X21	Rubber Grommet	
20X329	Cond. Cushion Stud	Mtg. Gang Condenser
26A443	Dial Bracket Assembly complete with Snacers, Pulleys, Diffusers and Dial Background less Dial Glass.....	
58X676	Dial Glass	
26A444	Idle Bracket Assembly.....	
26X486	Drive Shaft	
19X192	"C" Washer (for drive shaft).....	
15X163	Painter	
10X38	Drive Cord Assembly or 50" Cord.....	
28X113	Drive Cord Tension Spring	
7X199	Pilot Light Socket Assembly.....	
4X353	No. 47 Pilot Light	Escutcheon

TYPE F-28A131 RECORD CHANGER PARTS

F-44038	Motor, 60 Cycle, 115 volts.....
F-59175	Tone Arm (Less Crystal Cartridge).....
F-71214	Crystal Cartridge.....
F-64343	Tone Arm Spring.....
F-13510	Control Knob Assembly.....
F-13412	Automatic Stop Switch & Bracket Assembly.....
F-13435	Turntable.....
F-13544	Shelf Cover Arm & Record Hold Down Assembly.....
F-59176	Shelf Cover.....
F-561333	Shelf Cover Spring.....
	Needle, Permo No. 100.....

SUBSTITUTE PARTS

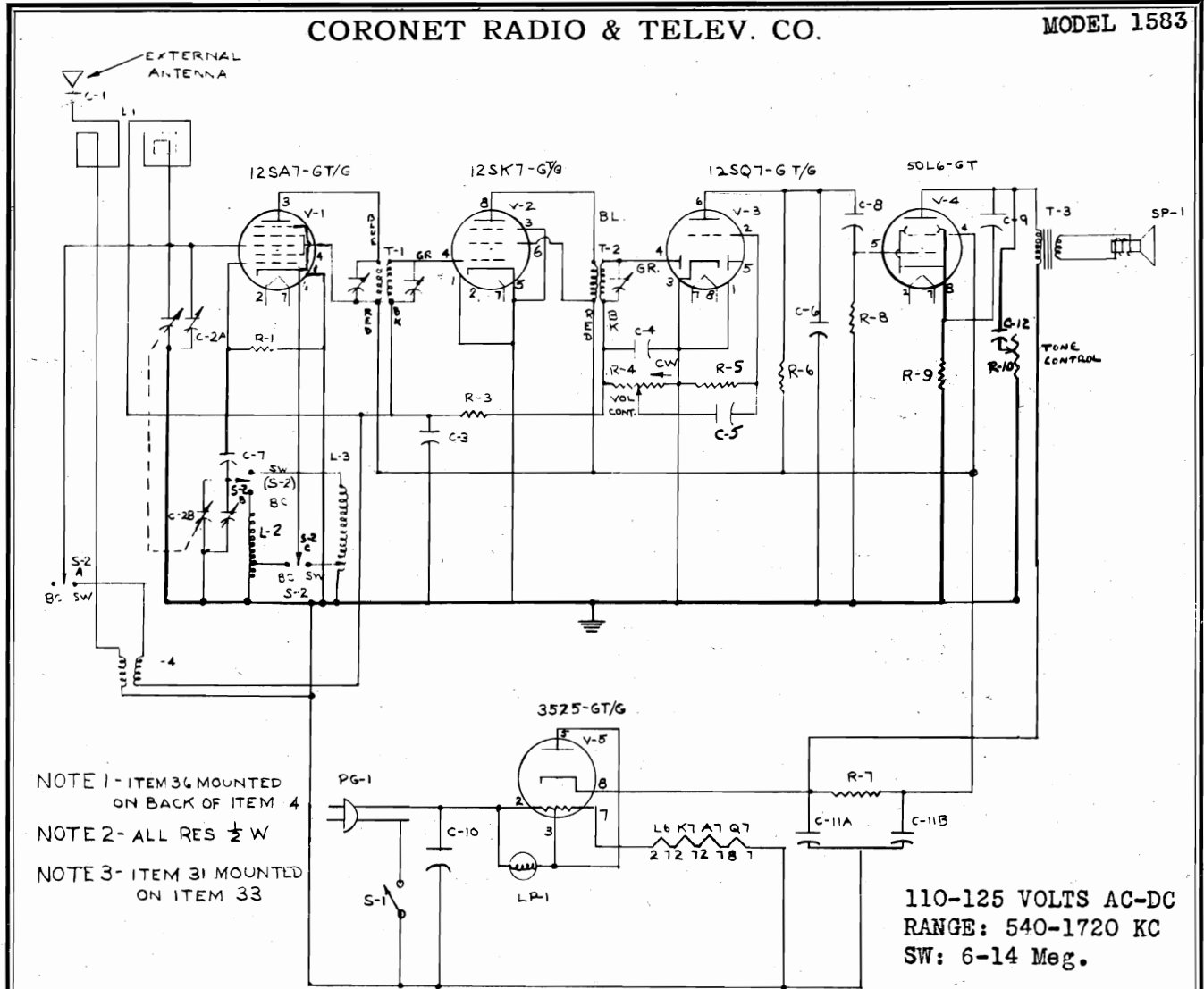
The following parts are used in some receivers only. Check part numbers on old part before ordering and order part originally used in receiver.

*40X282	Tone Control (Substitute for 40X277).....
*25X1539	Radio Phono Switch Lever (Use with 40X282).....
*2A161	D.P.D.T. Switch (Use with 40X282).....

Use only GENUINE factory tested parts to insure service jobs you can depend on and to obtain original set performance.

CORONET RADIO & TELEV. CO.

MODEL 1583

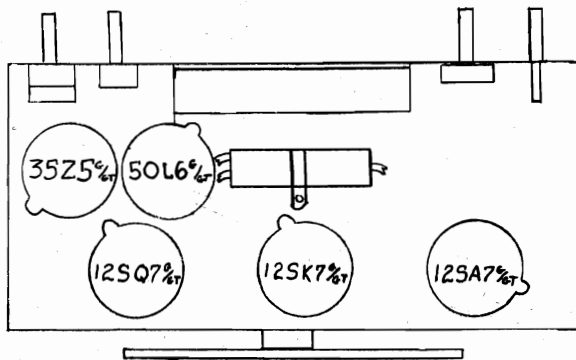


NOTE 1- ITEM 36 MOUNTED ON BACK OF ITEM 4
 NOTE 2- ALL RES 1/2 W
 NOTE 3- ITEM 31 MOUNTED ON ITEM 33

110-125 VOLTS AC-DC
 RANGE: 540-1720 KC
 SW: 6-14 Meg.

VOL. CON. TDNE

BAND SW. STATIONS



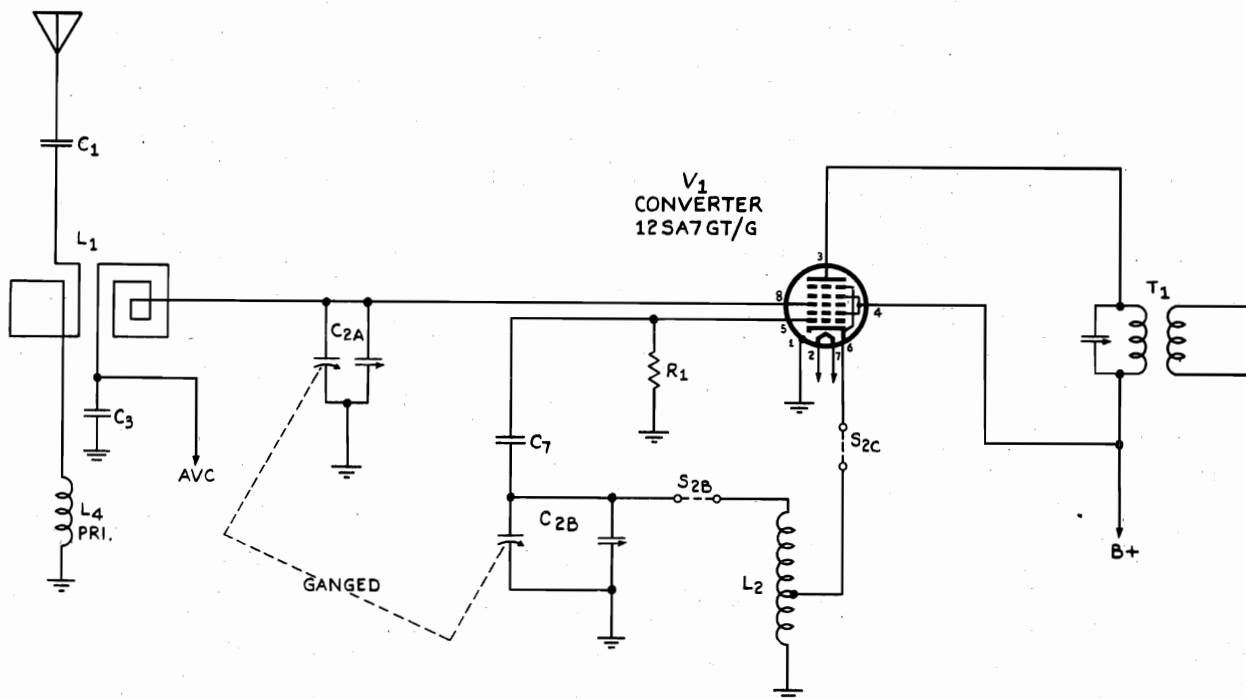
CODE	PART	DESCRIPTION	ITEM
R-1	A-95	Resistor, 22,000 ohms	1
R-3	A-17	" 2.2 meg	2
R-4	A-96	Potentiom'r, 0.5 meg.	3
R-5	A-18	Resistor, 10 meg	4
R-6	A-14	" 0.25 meg	5
R-7	A-98	" 1200 ohm	6
R-8	A-15	" 0.5 meg	7
R-9	A-16	" 140 ohm	8
R-10	A-18	Potentiom'r .1 meg	9
			10
			11

C-1	A-5	Condens'r;	02 meg	200v	12
C-2	A-19	"	Tuning	"	13
C-3	A-7	"	.05 mf	200v	14
C-4	A-9	"	250 mmf	"	15
C-5	A-6	"	.002 mf	"	16
C-6	A-9	"	250 mmf	"	17
C-7	A-8	"	100 mmf	"	18
C-8	A-5	"	.02 mf	"	19
C-9	A-5	"	.02 "	400v	20
C-10	A-4	"	0.1 "	200v	21
C-11	A-3	"	50-20mf	150v	22
S-2	A-97	4 pole 2 pos'ion			23
C-12	A-99	Cond.	.05 mf	200v	24
L-1	A-1	Internal loop ant.			25
L-2	A-28	B.C. osc. coil			26
L-3	A-98	SW osc. coil			27
L-4	A-98	SW ant. coil			28
T-1	A-10	456 kc. IF xformer			29
T-2	A-11	" "			30
T-3	A-2	Output			31
LP-1	A-30	Lamp, 6v, 0.15A.			32
SP-1	A-2	P.M. speaker			33
PG-1	A-55	Power plug			34
					35
S-1	A-96	Power switch			36
V-1	A-22	Vac. tube, 12SA7-6T/G			37
V-2	A-23	" " 12SK7-			38
V-3	A-24	" " 12SQ7 "			39
V-4	A-25	" " 50L6-GT			40
V-5	A-26	" " 35Z5-6T/G			41

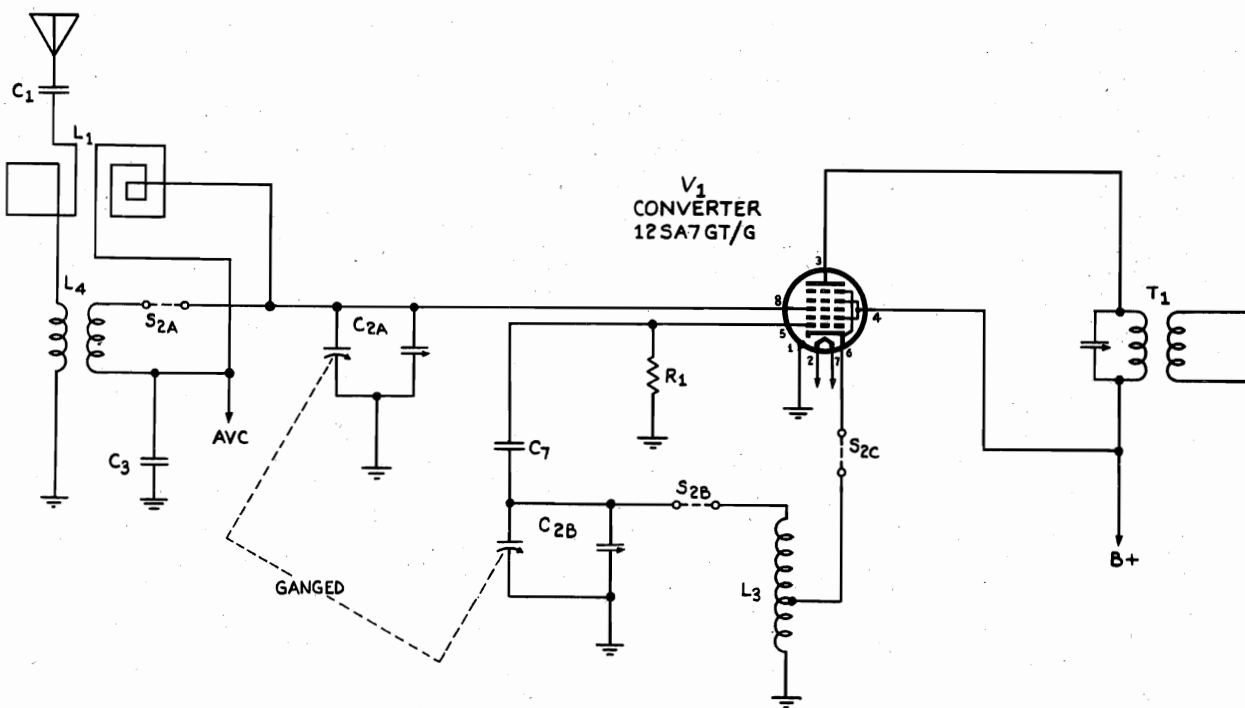
"clarified schematics"

MODEL 1583

CORONET RADIO & TELEV. CO.



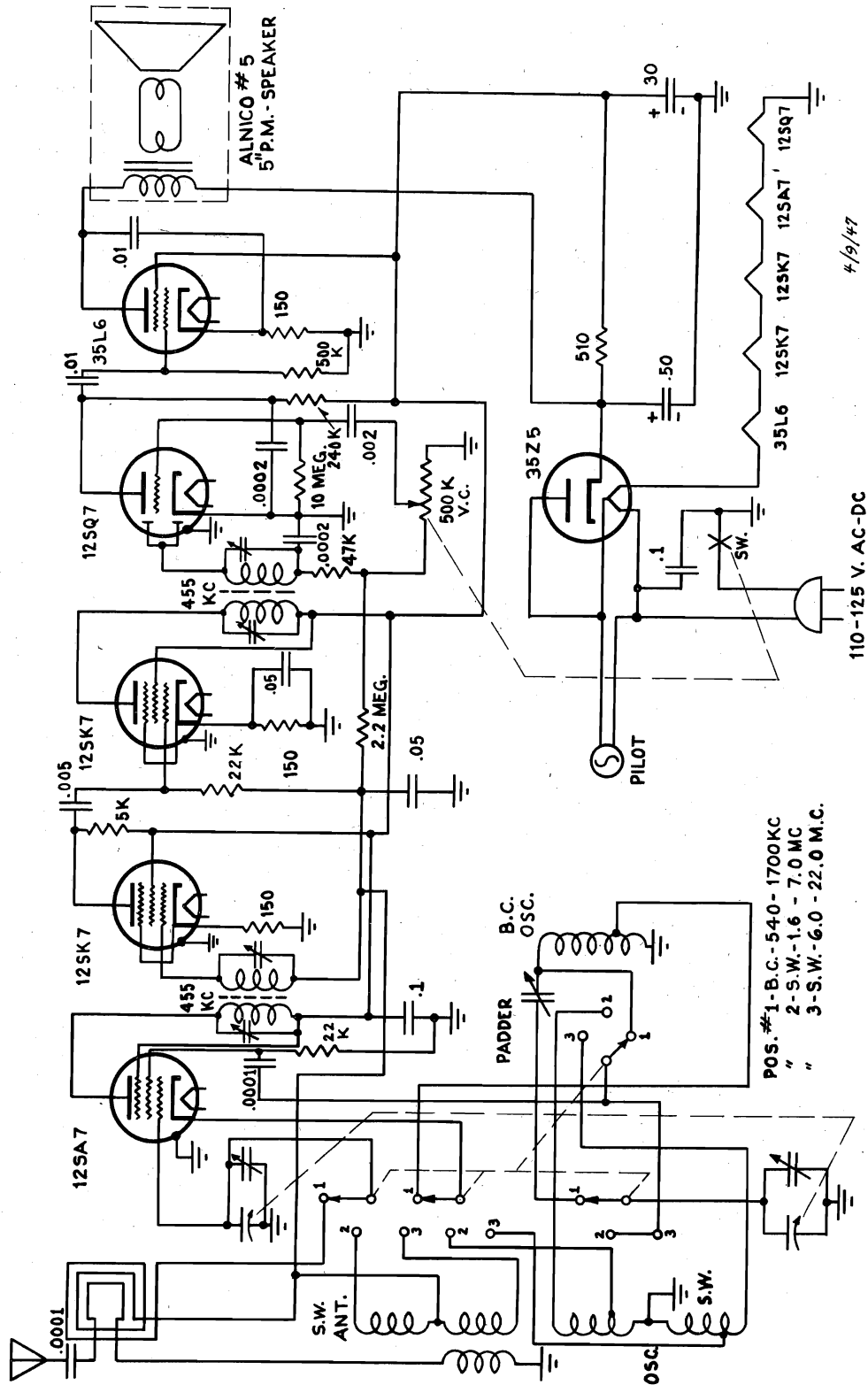
BAND-SWITCH SHOWN AT 1ST POSITION.
BROADCAST BAND
540-1720 KC.



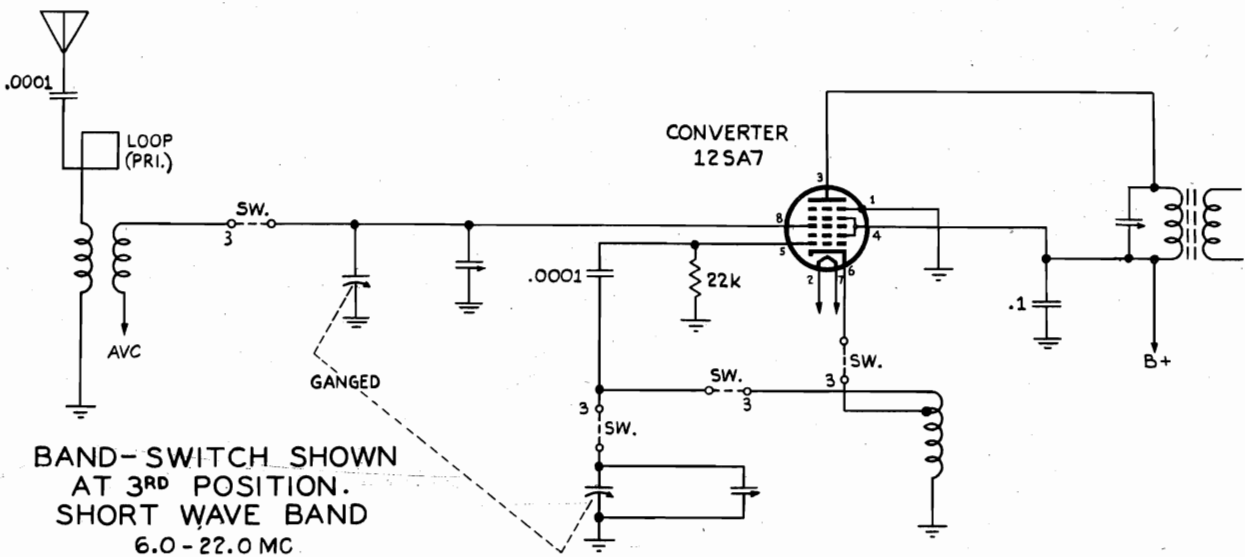
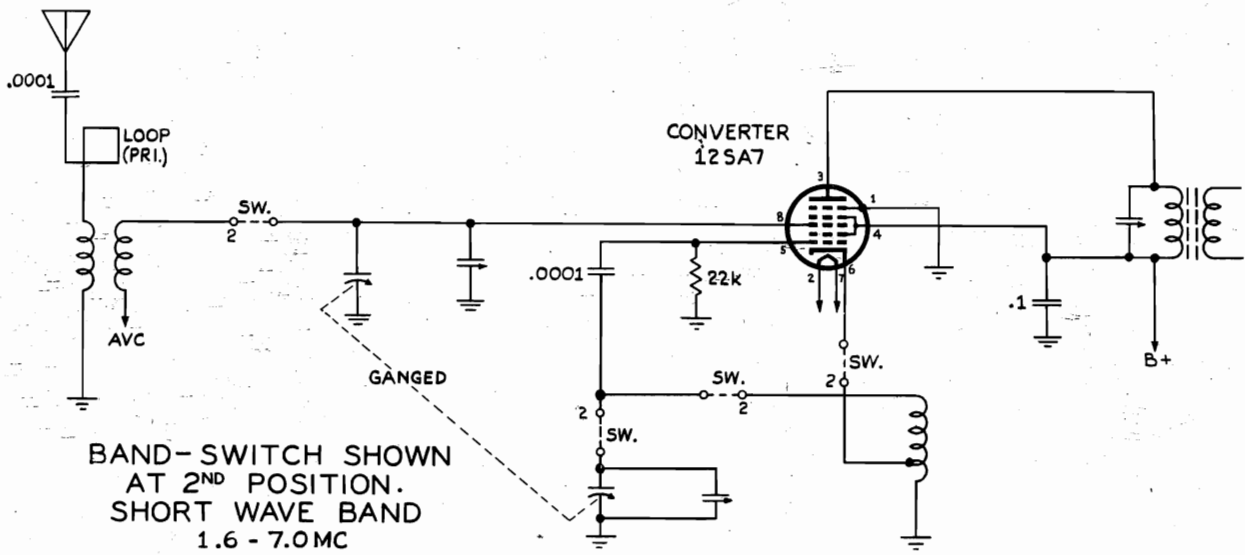
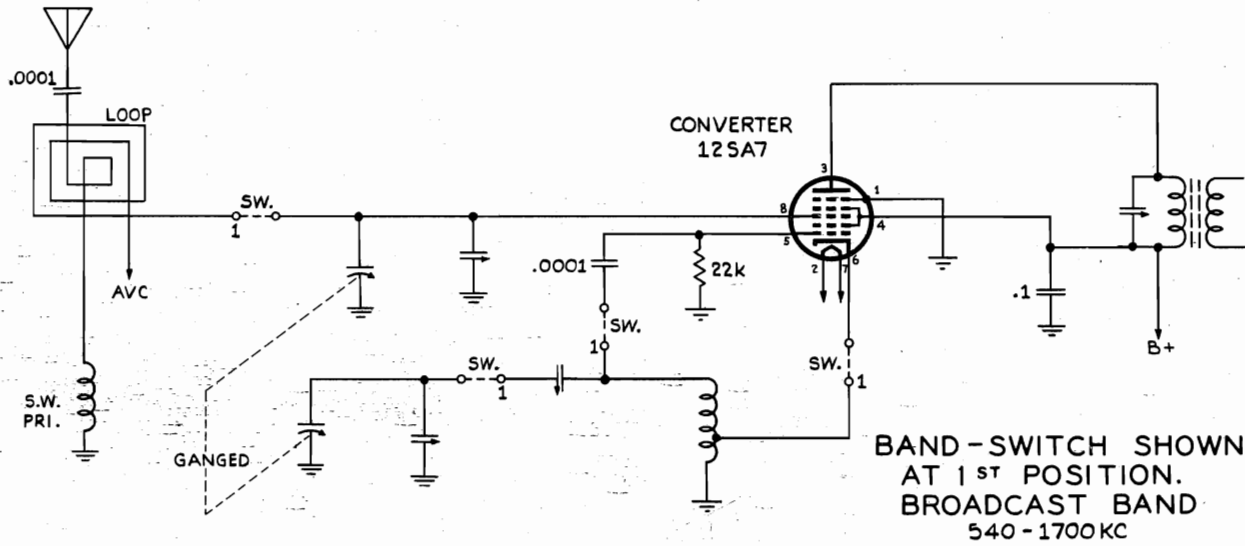
BAND-SWITCH SHOWN AT 2ND POSITION.
SHORT WAVE BAND
6 - 14 MC.

CORONET RADIO & TELEV CO.

MODEL 1701

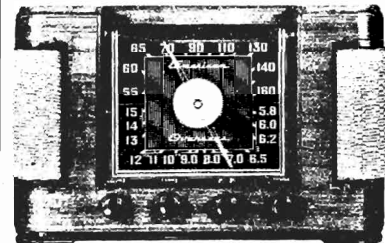
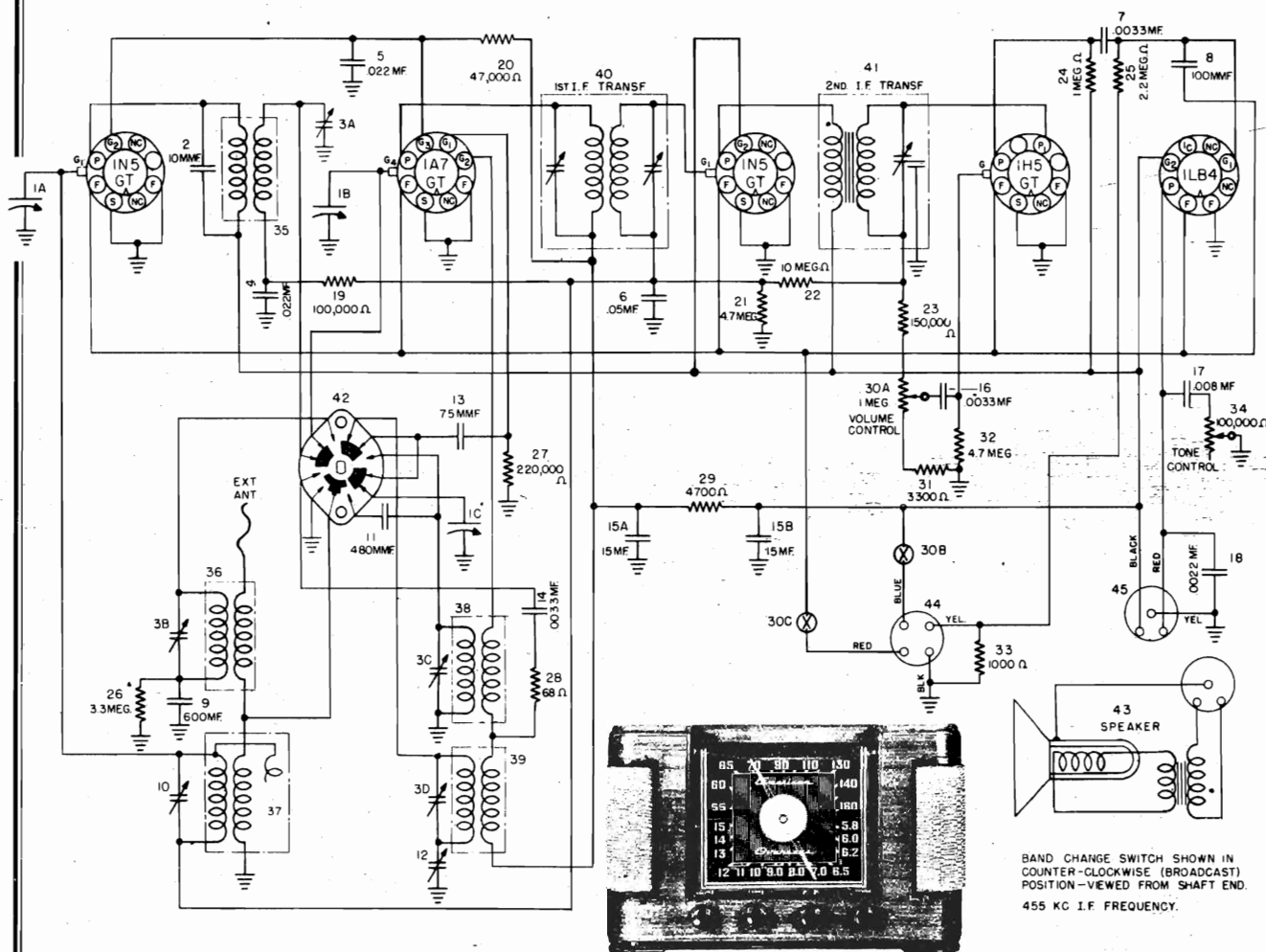


"clarified schematics"



CROSLY DIV.
AV CO MFG. CORP.

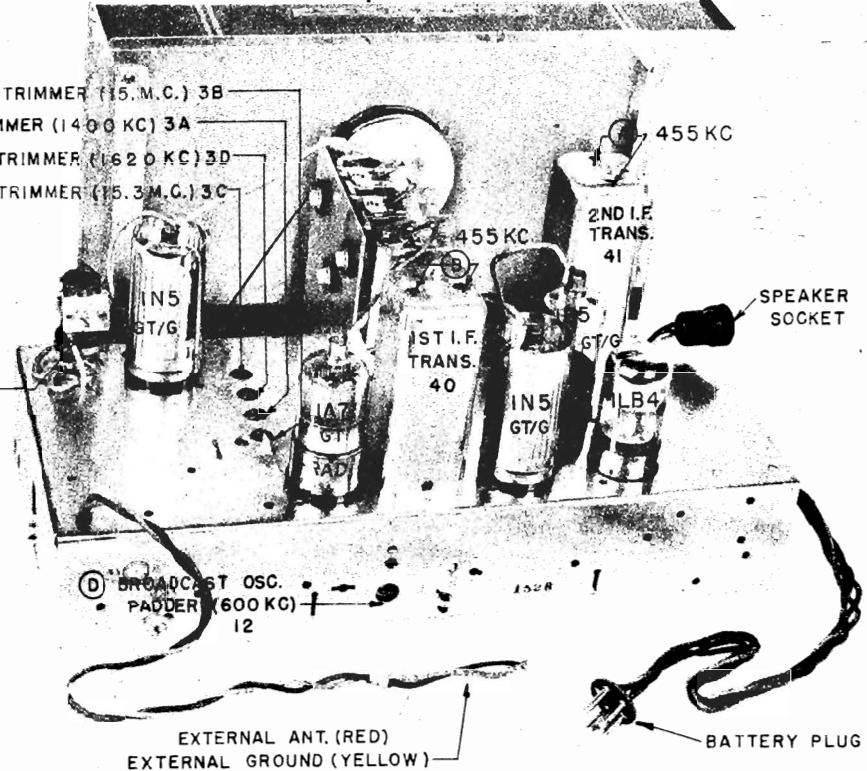
MODEL 56FC



BAND CHANGE SWITCH SHOWN IN COUNTER-CLOCKWISE (BROADCAST) POSITION - VIEWED FROM SHAFT END. 455 KC I.F. FREQUENCY.

- (H) - SHORT WAVE ANT. TRIMMER (15.0 M.C.) 3B
- (E) - INTERSTAGE TRIMMER (1400 KC) 3A
- (C) - BROADCAST OSC. TRIMMER (1620 KC) 3D
- (G) - SHORT WAVE OSC. TRIMMER (15.3 M.C.) 3C

- (F) BROADCAST ANT. TRIMMER (1400 KC.) 10



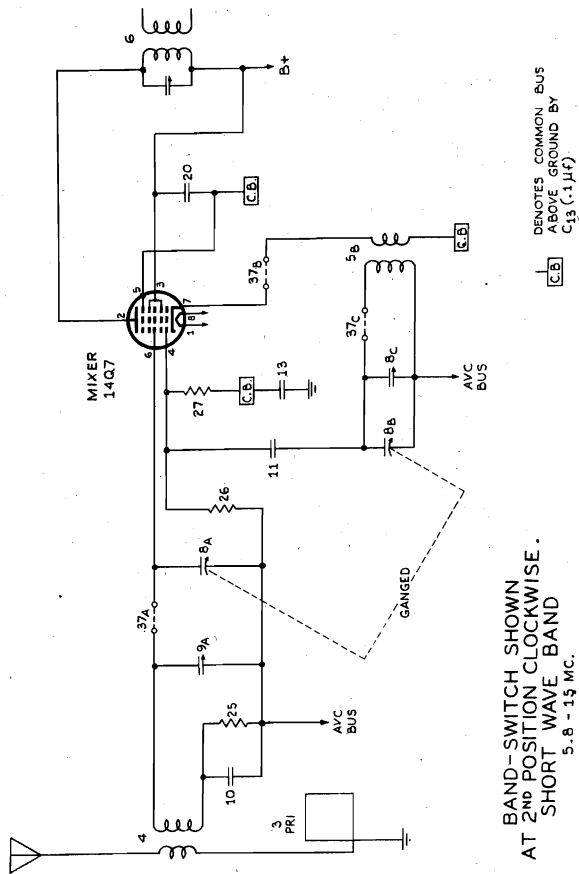
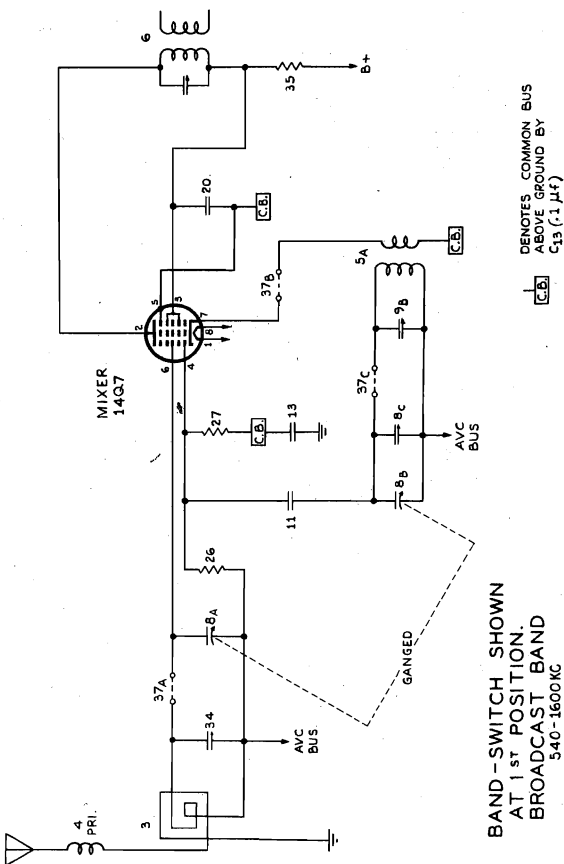
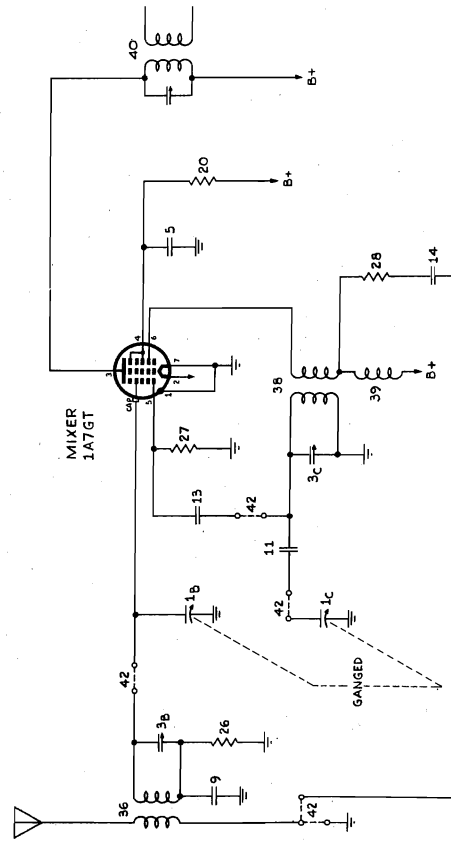
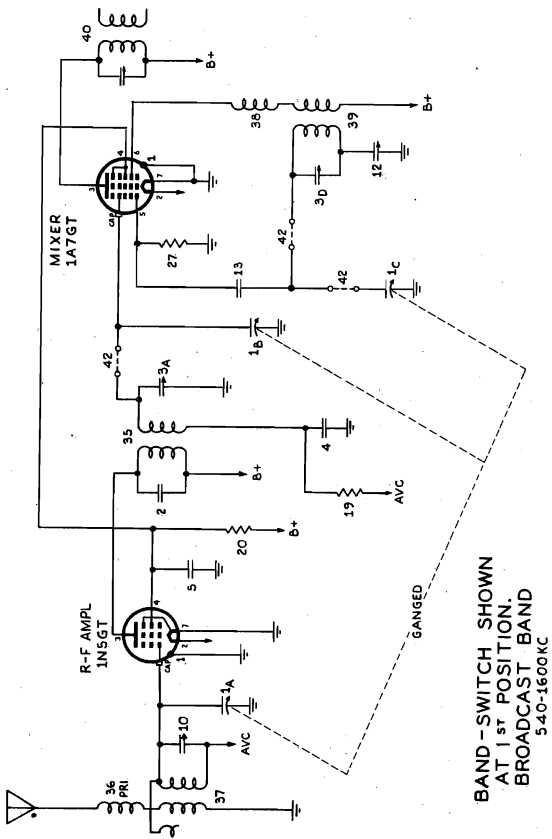
October, 1946

EXTERNAL ANT. (RED)
EXTERNAL GROUND (YELLOW)

"clarified schematics"

MODEL 56FC
MODEL 56TX-L

CROSLLEY DIV.
AVCOMFG. CORP.



CROSLLEY DIV.
AV COMFG. CORP.

MODEL 56FC

ALIGNMENT PROCEDURE

1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil.
3. The r.f. signal input from the signal generator should be connected to the antenna lead (red) as indicated in the alignment chart. Connect the low side (ground) of the signal generator to the chassis.
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

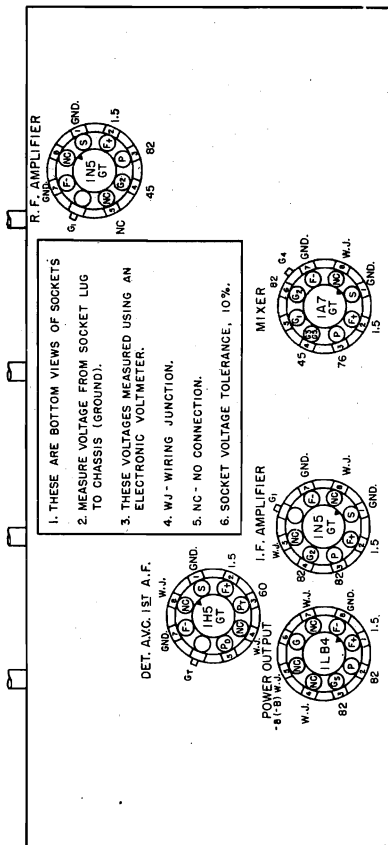
ALIGNMENT CHART

Alignment Sequence	Signal Generator Output		Position of		Adjust for Maximum Output
	Frequency in kc.	In Series with	To	Band Switch	
1	455	200 mmf.	Ant.	A	A & B
2	1,620	200 mmf.	Ant.	A	C
3	600	200 mmf.	Ant.	A	D
4	1,620	200 mmf.	Ant.	A	C
5	1,400	200 mmf.	Ant.	A	E & F
6	600	200 mmf.	Ant.	A	D
7	15,300	400 ohms	Ant.	O	G*
8	15,000	400 ohms	Ant.	O	H

* NOTE: When aligning the short-wave oscillator trimmer (G), be sure that the circuit is aligned at the correct frequency and not at the image frequency which is 910 kilocycles lower as indicated by the receiver dial. To check: Tune in the generator frequency, then increase the generator output and tune in the image frequency. The image frequency should be weaker than the fundamental and audible 910 kilocycles lower on the receiver dial. If the image cannot be tuned in, the oscillator trimmer is adjusted to the wrong peak; i.e., the oscillator trimmer may be adjusted to the image or one of the harmonics instead of the fundamental frequency. The correct peak is the second one heard as the trimmer adjustment screw is opened from the completely closed position.

TYPE: Five-tube, two-band superheterodyne.
 INTERMEDIATE FREQUENCY: 455 kc.
 FREQUENCY RANGE: American Broadcast Band, 540 to 1600 kc. (Selector Switch at A.)
 POWER SUPPLY: Crosley "A-B" Battery Pack, Overseas Short-wave Band, 5.8 to 15 mc. (Selector Switch at 0.)
 VOLTAGE RATING: 1½ v. "A"; 90 v. "B"
 POWER OUTPUT: 170 mw. minimum.

SOCKET VOLTAGE CHART



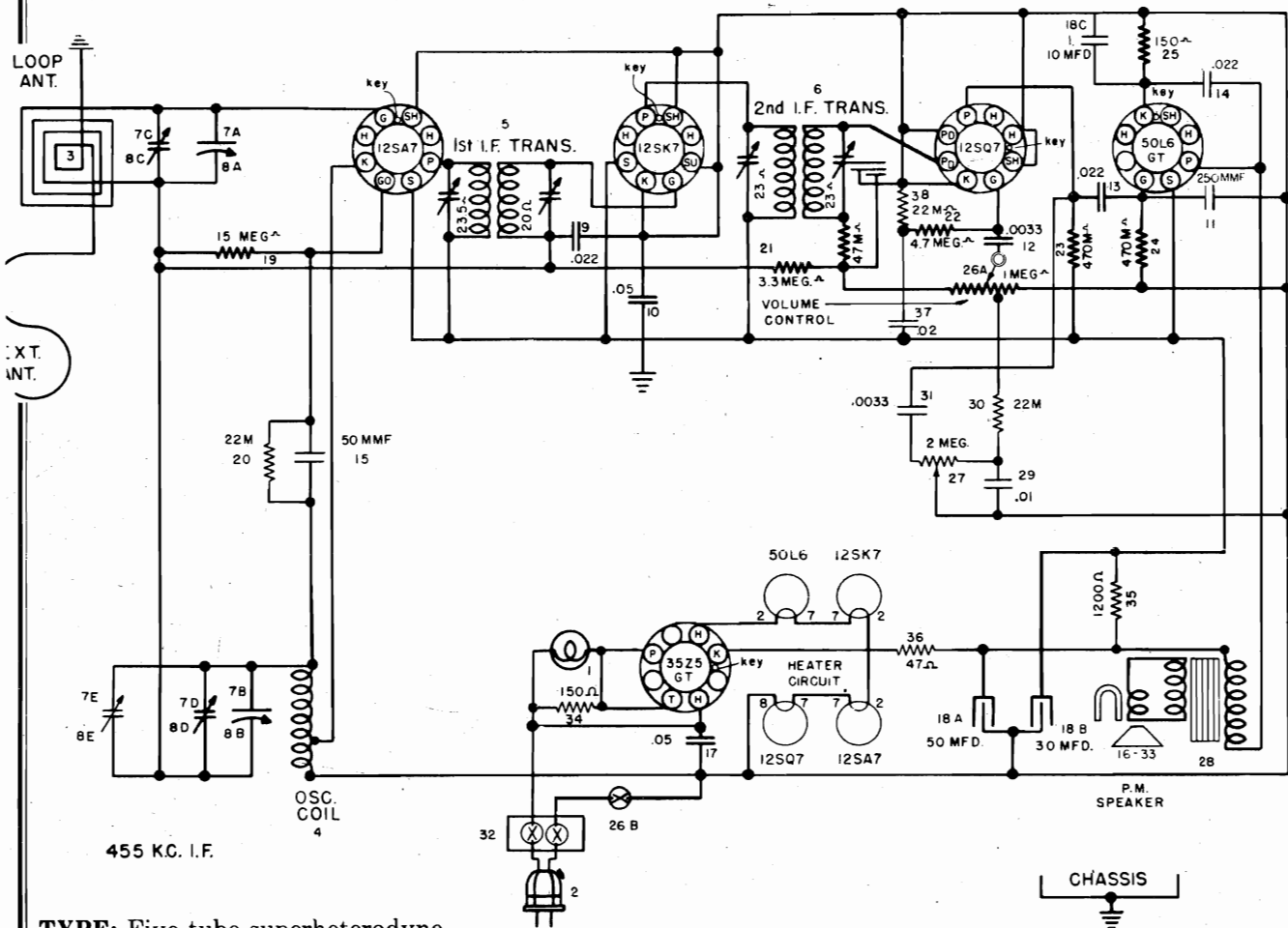
PARTS LIST—MODEL 56FC

Item No.	Part No.	Description	Item No.	Part No.	Description
1A	AC-134898	Condenser (Variable) Section	39368-8		Control (Volume)
1B	39001-76	Condenser (Variable) Assembly	39369-2		Switch (Plate Supply)
2	39004-1	Condenser, 10 mfd., 500v., Mica	39294-16		Resistor, 3300 ohm, ½ w.
2A	B-152386-12	Condenser, 100,000 ohm, ½ w.	39294-35		Resistor, 4.7 megohm, ½ w.
3	39001-77	Condenser, 100,000 ohm, ½ w.	39365-1		Control (Tone)
3A	B-152386-12	Condenser, 100,000 ohm, ½ w.	39365-5		Control (Tone)
3C	39001-77	Condenser, 100,000 ohm, ½ w.	39365-5		Control (Tone)
3D	39001-77	Condenser, 100,000 ohm, ½ w.	39365-5		Control (Tone)
4	39001-80	Condenser, .02 mfd., 600v., Paper	AW-135133		AW-135133
5	39001-80	Condenser, .02 mfd., 600v., Paper	AW-135147		AW-135147
6	39001-77	Condenser, .05 mfd., 600v., Paper	AW-135154		AW-135154
7	39001-77	Condenser, .05 mfd., 600v., Paper	AW-135141		AW-135141
8	39001-77	Condenser, .05 mfd., 600v., Paper	AW-135141		AW-135141
9	GC-210685-99	Condenser, 600 mmf., 300v., Mica	AW-1322803		AW-1322803
10	W-48652-15	Condenser, Trimmer	AW-1322804		AW-1322804
11	GC-210685-138	Condenser, 480 mmf., 500v., Mica	B-135079		B-135079
12	B-292830-54	Condenser, Padder	C-135199		C-135199
13	B-292830-54	Condenser, 100,000 ohm, ½ w.	W-132922		W-132922
14	39001-76	Condenser, .03 mfd., 600v., Paper	W-135371		W-135371
15A	W-48664	Condenser, 15 mfd., 140 v. v. Section	G-39204		G-39204
15B	39001-76	Condenser, 15 mfd., 140 v. v. Section	W-46447-1		W-46447-1
16	39001-76	Condenser, .003 mfd., 600v., Paper	CR69		CR69
17	39001-78	Condenser, .005 mfd., 600v., Paper	W-134571		W-134571
18	39001-74	Condenser, .002 mfd., 600v., Paper	W-134667		W-134667
19	39294-25	Resistor, 100,000 ohm, ½ w.	W-134917		W-134917
20	39294-23	Resistor, 47,000 ohm, ½ w.	W-51071		W-51071
21	39294-35	Resistor, 4.7 megohm, ½ w.	W-134916		W-134916
22	39294-25	Resistor, 100,000 ohm, ½ w.	D-132926		D-132926
23	39294-26	Resistor, 150,000 ohm, ½ w.	C-132668		C-132668
24	39294-31	Resistor, 1 megohm, ½ w.	W-130197		W-130197
25	39294-33	Resistor, 2.2 megohm, ½ w.	W-46580		W-46580
26	39294-34	Resistor, 3.3 megohm, ½ w.	39220-38		39220-38
27	39294-27	Resistor, 220,000 ohm, ½ w.			
28	39294-17	Resistor, 95 ohm, ½ w.			
29	39294-17	Resistor, 95 ohm, ½ w.			
30A	B-130520-3	Control (Volume (1 megohm) Assy.)			
30B		Switch (Plate Supply)			
30C		Switch (Filament Supply)			

*These parts will replace the original equipment parts.

MODEL 56TD

CROSLLEY DIV.
AVCO MFG. CORP.



TYPE: Five-tube superheterodyne.

FREQUENCY RANGE: 540 to 1600 kc.

INTERMEDIATE FREQUENCY: 455 kc.

POWER SUPPLY: a. c.—d. c.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 30 watts.

SOCKET VOLTAGE CHART POWER OUTPUT: 2 watts maximum.

Det.-AVC-1st A.F. Ampl.

POWER OUTPUT

I.F. Amplifier

MIXER

RECTIFIER

NOTES:

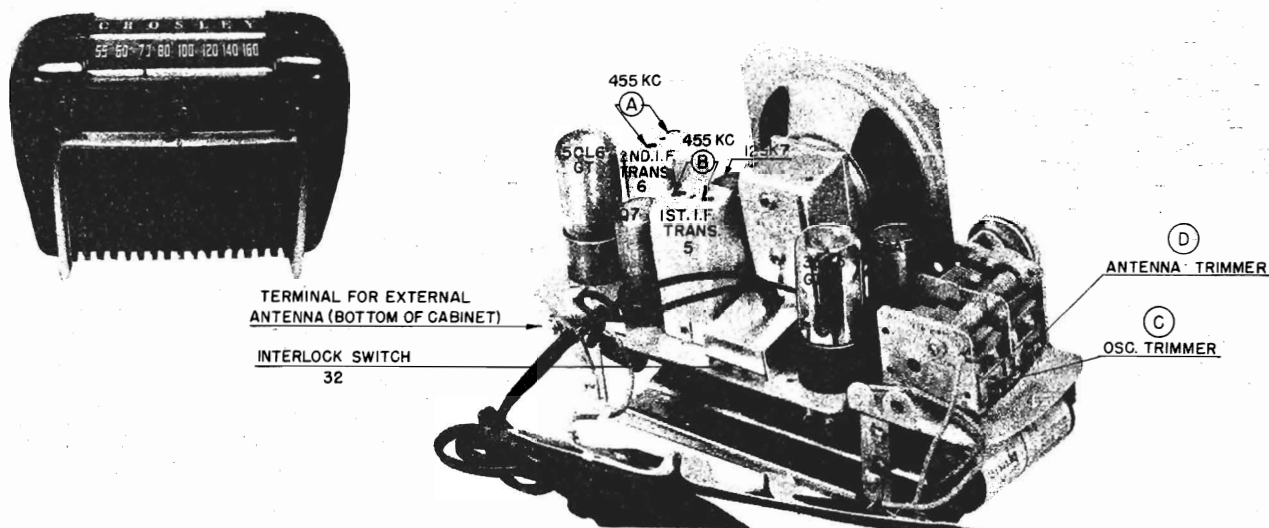
- Bottom view of tube sockets.
- Measure voltages from socket lug to (B-) (Pin 3 on the 12SK7).
- Voltages are measured with an Electronic Voltmeter.
- W.J. - Wiring Junction.
- N.C. - No Connection.
- * - A.C. Voltages
- Voltage Tolerance, 10%
- Line-Voltage 117 V, 60 A.C.

OSCILLATOR GRID VOLTS

FREQUENCY	VOLTS
540 KC	-7

January, 1947

CROSLLEY DIV.
AVCO MFG. CORP.



When using direct current it may be necessary to reverse the position of the power plug in the electric outlet for correct polarity.

Reversing the position of the power plug when alternating current is used may reduce power hum.
Under no circumstances should a ground be connected to this receiver.

When checking or replacing tubes or aligning this receiver, the back of the cabinet must be removed. This is accomplished by removing the two screws located near the top of the cabinet back in the louvre recess. Remove the back carefully and do not exert too much pressure. When the back is removed it disengages the interlock safety switch (item 32 on schematic) and cuts off the power to the receiver. To turn on the radio when the back of the cabinet is removed, it is necessary to hold in the lever on the interlock switch and caution should be exercised not to come in contact with exposed wires on the chassis.

ALIGNMENT PROCEDURE

1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil.
3. The r. f. signal input from the signal generator should be connected to the external antenna terminal screw, as indicated in the alignment chart. Connect the signal generator ground through a 0.1 mfd. condenser to—B (pin 3 on 12SK7 tube socket).
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

Alignment Sequence	Signal Generator Output			Position of Tuning Dial KC	Adjust for Maximum Outout
	Frequency in KC	In Series with	To		
1	455	200 mmf.	Ant.	1620	A & B
2	1620	200 mmf.	Ant.	1620	C
3	1400	200 mmf.	Ant.	1400	D

MODEL 56TD
 MODEL 56TN-L
 MODEL 56TX-L
 MODELS 57TQ, 56TZ

CROSLLEY DIV.
 AV CO MFG. CORP.

PARTS LIST—MODEL 56TX-L

Item No.	Part No.	Description	Item No.	Part No.	Description
1	W-4858	Bulb (Dial), Type 47, 6.3v., 15 amp.	26	39294-38	Resistor, 15 megohm, 1/2 w.
2	C-132300-1	Cable and Plug (Power)	27	39294-21	Resistor, 22,000 ohm, 1/2 w.
3	AC-134228	Antenna Loop Assembly	28	39294-34	Resistor, 33 megohm, 1/2 w.
4	AW-134994	Antenna (H.F. Oscillator)	29	39294-33	Resistor, 33 megohm, 1/2 w.
5A	AW-134995	Coil (H.F. Oscillator) Section	30	39294-35	Resistor, 47 megohm, 1/2 w.
6	AW-134065	Transformer (1st I. F.)	31	W-137367	Resistor, 47 ohm, 1 w.
7	AW-134158	Transformer (2nd I. F.)	34	Part of Item #3	Condenser (Antenna Trimmer)
8	W-134996	Condenser (Variable) Section	35	39294-11	Resistor, 470 ohm, 1/2 w.
9A	Part of Item #8B	Condenser (Trimmer) Section	37A	W-13772-3	Switch (Band Change) Section
9B	GC-210685-143	Condenser (Trimmer) Section	37B	AB-137006	Speaker and Transformer Assembly
10	39001-17	Condenser, .05 mfd., 600 v., Paper	38	C-46846-6	Switch (Band Change) Section
11	39001-17	Condenser, .05 mfd., 600 v., Paper	39	39368-8	Control, Volume
12	39001-17	Condenser, .05 mfd., 600 v., Paper	39368-1	Socket, Tube	
13	39001-17	Condenser, .05 mfd., 600 v., Paper	W-135371	Socket Assembly (Dial Light)	
14	39001-17	Condenser, .05 mfd., 600 v., Paper	C-135175	Pointer (Dial)	
15	39001-17	Condenser, .05 mfd., 600 v., Paper	B-134952	Pointer (Dial)	
16	W-134983	Condenser, 60 mfd., 150v., Electrolytic	W-134667	Clip (Dial Pointer)	
17A	39001-80	Condenser, .02 mfd., 600 v., Paper	W-134917	Ring (Retaining)	
18	39001-80	Condenser, .02 mfd., 600 v., Paper	W-51071	Spring (Dial Cord)	
19	39001-80	Condenser, .02 mfd., 600 v., Paper	W-51071	Shaft (Drive)	
20	39294-29	Resistor, 470,000 ohm, 1/2 w.	61752	Washer, Spring	
21	39294-29	Resistor, 470,000 ohm, 1/2 w.	W-134055	Grommet	
22	39294-29	Resistor, 470,000 ohm, 1/2 w.	AW-134738	Cabinet	
23	39294-7	Resistor, 150 ohm, 1/2 w.	B-134610	Lens (Dial)	
24	39294-7	Resistor, 150 ohm, 1/2 w.	W-134650	Stud, Trimount	
25	39294-28	Resistor, 330,000 ohm, 1/2 w.	W-132124	Stud, Trimount	

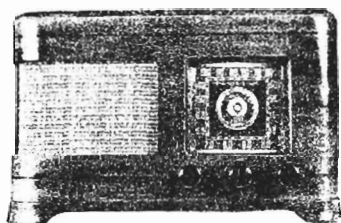
*These parts will replace the original equipment parts.

PARTS LIST—MODEL 56TD

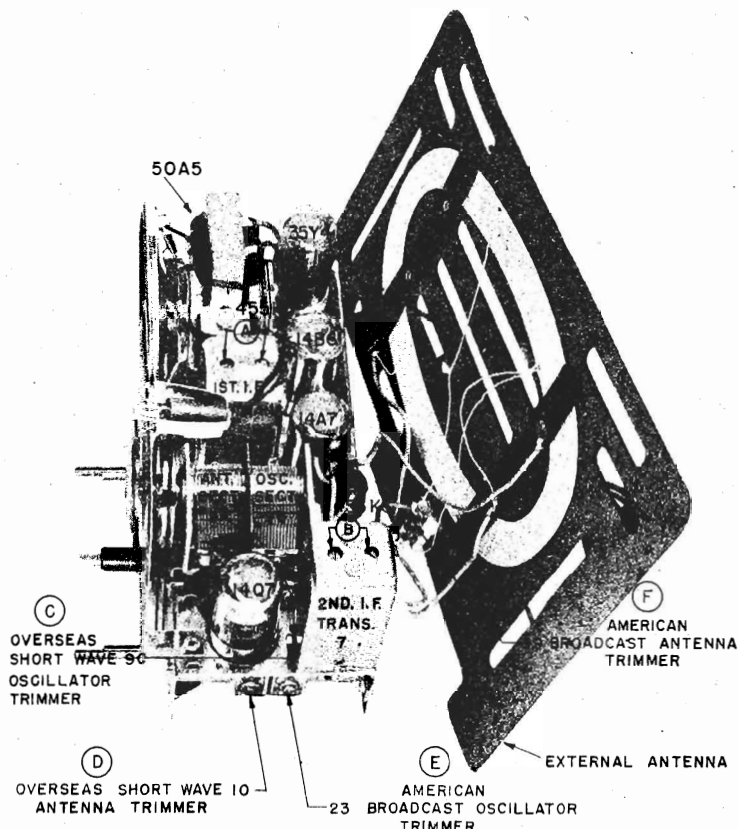
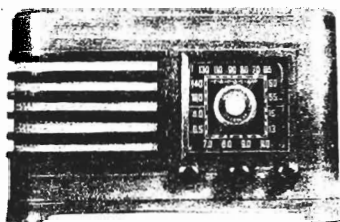
Item No.	Part No.	Description	Item No.	Part No.	Description
1	W-13653	Control (Volume)	33	39294-31	Resistor, 22,000 ohm, 1/2 w.
2	39370-2	Switch (Plug)	34	39294-32	Resistor, 22,000 ohm, 1/2 w.
3	AC-136091	Switch (Power)	35	39294-33	Resistor, 22,000 ohm, 1/2 w.
4	AW-136058	Control (2 megohm)	36	39294-34	Resistor, 22,000 ohm, 1/2 w.
5	AW-137656	Control (Tone)	37	39294-35	Resistor, 22,000 ohm, 1/2 w.
6	AW-137657	Control (Output)	38	39294-36	Resistor, 22,000 ohm, 1/2 w.
7	AW-136819	Coil (H.F. Oscillator) Section	39	39294-37	Resistor, 22,000 ohm, 1/2 w.
8	AW-134065	Transformer (1st I. F.)	40	39294-38	Resistor, 22,000 ohm, 1/2 w.
9	AW-134158	Transformer (2nd I. F.)	41	39294-39	Resistor, 22,000 ohm, 1/2 w.
10	W-134996	Condenser (Variable) Section	42	39294-40	Resistor, 22,000 ohm, 1/2 w.
11	39001-17	Condenser, .05 mfd., 600 v., Paper	43	39294-41	Resistor, 22,000 ohm, 1/2 w.
12	39001-17	Condenser, .05 mfd., 600 v., Paper	44	39294-42	Resistor, 22,000 ohm, 1/2 w.
13	39001-17	Condenser, .05 mfd., 600 v., Paper	45	39294-43	Resistor, 22,000 ohm, 1/2 w.
14	39001-17	Condenser, .05 mfd., 600 v., Paper	46	39294-44	Resistor, 22,000 ohm, 1/2 w.
15	39001-17	Condenser, .05 mfd., 600 v., Paper	47	39294-45	Resistor, 22,000 ohm, 1/2 w.
16	W-137367	Resistor, 47 ohm, 1 w.	48	39294-46	Resistor, 22,000 ohm, 1/2 w.
17	B-136717	Socket, Tube	49	39294-47	Resistor, 22,000 ohm, 1/2 w.
18	W-136717	Socket Assembly (Dial Light)	50	39294-48	Resistor, 22,000 ohm, 1/2 w.
19	W-136717	Pointer (Dial)	51	39294-49	Resistor, 22,000 ohm, 1/2 w.
20	W-136717	Pointer (Dial)	52	39294-50	Resistor, 22,000 ohm, 1/2 w.
21	W-136717	Clip (Dial Pointer)	53	39294-51	Resistor, 22,000 ohm, 1/2 w.
22	W-136717	Ring (Retaining)	54	39294-52	Resistor, 22,000 ohm, 1/2 w.
23	W-136717	Spring (Dial Cord)	55	39294-53	Resistor, 22,000 ohm, 1/2 w.
24	W-136717	Washer, Spring	56	39294-54	Resistor, 22,000 ohm, 1/2 w.
25	W-136717	Shaft, Drive	57	39294-55	Resistor, 22,000 ohm, 1/2 w.
26	W-136717	Washer, Spring	58	39294-56	Resistor, 22,000 ohm, 1/2 w.
27	W-136717	Ring, Retaining	59	39294-57	Resistor, 22,000 ohm, 1/2 w.
28	W-136717	Shaft, Drive	60	39294-58	Resistor, 22,000 ohm, 1/2 w.
29	W-136717	Washer, Spring	61	39294-59	Resistor, 22,000 ohm, 1/2 w.
30	W-136717	Ring, Retaining	62	39294-60	Resistor, 22,000 ohm, 1/2 w.
31	W-136717	Shaft, Drive	63	39294-61	Resistor, 22,000 ohm, 1/2 w.
32	W-136717	Washer, Spring	64	39294-62	Resistor, 22,000 ohm, 1/2 w.
33	W-136717	Ring, Retaining	65	39294-63	Resistor, 22,000 ohm, 1/2 w.
34	W-136717	Shaft, Drive	66	39294-64	Resistor, 22,000 ohm, 1/2 w.
35	W-136717	Washer, Spring	67	39294-65	Resistor, 22,000 ohm, 1/2 w.
36	W-136717	Ring, Retaining	68	39294-66	Resistor, 22,000 ohm, 1/2 w.
37	W-136717	Shaft, Drive	69	39294-67	Resistor, 22,000 ohm, 1/2 w.
38	W-136717	Washer, Spring	70	39294-68	Resistor, 22,000 ohm, 1/2 w.
39	W-136717	Ring, Retaining	71	39294-69	Resistor, 22,000 ohm, 1/2 w.
40	W-136717	Shaft, Drive	72	39294-70	Resistor, 22,000 ohm, 1/2 w.
41	W-136717	Washer, Spring	73	39294-71	Resistor, 22,000 ohm, 1/2 w.
42	W-136717	Ring, Retaining	74	39294-72	Resistor, 22,000 ohm, 1/2 w.
43	W-136717	Shaft, Drive	75	39294-73	Resistor, 22,000 ohm, 1/2 w.
44	W-136717	Washer, Spring	76	39294-74	Resistor, 22,000 ohm, 1/2 w.
45	W-136717	Ring, Retaining	77	39294-75	Resistor, 22,000 ohm, 1/2 w.
46	W-136717	Shaft, Drive	78	39294-76	Resistor, 22,000 ohm, 1/2 w.
47	W-136717	Washer, Spring	79	39294-77	Resistor, 22,000 ohm, 1/2 w.
48	W-136717	Ring, Retaining	80	39294-78	Resistor, 22,000 ohm, 1/2 w.
49	W-136717	Shaft, Drive	81	39294-79	Resistor, 22,000 ohm, 1/2 w.
50	W-136717	Washer, Spring	82	39294-80	Resistor, 22,000 ohm, 1/2 w.
51	W-136717	Ring, Retaining	83	39294-81	Resistor, 22,000 ohm, 1/2 w.
52	W-136717	Shaft, Drive	84	39294-82	Resistor, 22,000 ohm, 1/2 w.
53	W-136717	Washer, Spring	85	39294-83	Resistor, 22,000 ohm, 1/2 w.
54	W-136717	Ring, Retaining	86	39294-84	Resistor, 22,000 ohm, 1/2 w.
55	W-136717	Shaft, Drive	87	39294-85	Resistor, 22,000 ohm, 1/2 w.
56	W-136717	Washer, Spring	88	39294-86	Resistor, 22,000 ohm, 1/2 w.
57	W-136717	Ring, Retaining	89	39294-87	Resistor, 22,000 ohm, 1/2 w.
58	W-136717	Shaft, Drive	90	39294-88	Resistor, 22,000 ohm, 1/2 w.
59	W-136717	Washer, Spring	91	39294-89	Resistor, 22,000 ohm, 1/2 w.
60	W-136717	Ring, Retaining	92	39294-90	Resistor, 22,000 ohm, 1/2 w.
61	W-136717	Shaft, Drive	93	39294-91	Resistor, 22,000 ohm, 1/2 w.
62	W-136717	Washer, Spring	94	39294-92	Resistor, 22,000 ohm, 1/2 w.
63	W-136717	Ring, Retaining	95	39294-93	Resistor, 22,000 ohm, 1/2 w.
64	W-136717	Shaft, Drive	96	39294-94	Resistor, 22,000 ohm, 1/2 w.
65	W-136717	Washer, Spring	97	39294-95	Resistor, 22,000 ohm, 1/2 w.
66	W-136717	Ring, Retaining	98	39294-96	Resistor, 22,000 ohm, 1/2 w.
67	W-136717	Shaft, Drive	99	39294-97	Resistor, 22,000 ohm, 1/2 w.
68	W-136717	Washer, Spring	100	39294-98	Resistor, 22,000 ohm, 1/2 w.
69	W-136717	Ring, Retaining	101	39294-99	Resistor, 22,000 ohm, 1/2 w.
70	W-136717	Shaft, Drive	102	39294-100	Resistor, 22,000 ohm, 1/2 w.
71	W-136717	Washer, Spring	103	39294-101	Resistor, 22,000 ohm, 1/2 w.
72	W-136717	Ring, Retaining	104	39294-102	Resistor, 22,000 ohm, 1/2 w.
73	W-136717	Shaft, Drive	105	39294-103	Resistor, 22,000 ohm, 1/2 w.
74	W-136717	Washer, Spring	106	39294-104	Resistor, 22,000 ohm, 1/2 w.
75	W-136717	Ring, Retaining	107	39294-105	Resistor, 22,000 ohm, 1/2 w.
76	W-136717	Shaft, Drive	108	39294-106	Resistor, 22,000 ohm, 1/2 w.
77	W-136717	Washer, Spring	109	39294-107	Resistor, 22,000 ohm, 1/2 w.
78	W-136717	Ring, Retaining	110	39294-108	Resistor, 22,000 ohm, 1/2 w.
79	W-136717	Shaft, Drive	111	39294-109	Resistor, 22,000 ohm, 1/2 w.
80	W-136717	Washer, Spring	112	39294-110	Resistor, 22,000 ohm, 1/2 w.
81	W-136717	Ring, Retaining	113	39294-111	Resistor, 22,000 ohm, 1/2 w.
82	W-136717	Shaft, Drive	114	39294-112	Resistor, 22,000 ohm, 1/2 w.
83	W-136717	Washer, Spring	115	39294-113	Resistor, 22,000 ohm, 1/2 w.
84	W-136717	Ring, Retaining	116	39294-114	Resistor, 22,000 ohm, 1/2 w.
85	W-136717	Shaft, Drive	117	39294-115	Resistor, 22,000 ohm, 1/2 w.
86	W-136717	Washer, Spring	118	39294-116	Resistor, 22,000 ohm, 1/2 w.
87	W-136717	Ring, Retaining	119	39294-117	Resistor, 22,000 ohm, 1/2 w.
88	W-136717	Shaft, Drive	120	39294-118	Resistor, 22,000 ohm, 1/2 w.
89	W-136717	Washer, Spring	121	39294-119	Resistor, 22,000 ohm, 1/2 w.
90	W-136717	Ring, Retaining	122	39294-120	Resistor, 22,000 ohm, 1/2 w.
91	W-136717	Shaft, Drive	123	39294-121	Resistor, 22,000 ohm, 1/2 w.
92	W-136717	Washer, Spring	124	39294-122	Resistor, 22,000 ohm, 1/2 w.
93	W-136717	Ring, Retaining	125	39294-123	Resistor, 22,000 ohm, 1/2 w.
94	W-136717	Shaft, Drive	126	39294-124	Resistor, 22,000 ohm, 1/2 w.
95	W-136717	Washer, Spring	127	39294-125	Resistor, 22,000 ohm, 1/2 w.
96	W-136717	Ring, Retaining	128	39294-126	Resistor, 22,000 ohm, 1/2 w.
97	W-136717	Shaft, Drive	129	39294-127	Resistor, 22,000 ohm, 1/2 w.
98	W-136717	Washer, Spring	130	39294-128	Resistor, 22,000 ohm, 1/2 w.
99	W-136717	Ring, Retaining	131	39294-129	Resistor, 22,000 ohm, 1/2 w.
100	W-136717	Shaft, Drive	132	39294-130	Resistor, 22,000 ohm, 1/2 w.
101	W-136717	Washer, Spring	133	39294-131	Resistor, 22,000 ohm, 1/2 w.
102	W-136717	Ring, Retaining	134	39294-132	Resistor, 22,000 ohm, 1/2 w.
103	W-136717	Shaft, Drive	135	39294-133	Resistor, 22,000 ohm, 1/2 w.
104	W-136717	Washer, Spring	136	39294-134	Resistor, 22,000 ohm, 1/2 w.
105	W-136717	Ring, Retaining	137	39294-135	Resistor, 22,000 ohm, 1/2 w.
106	W-136717	Shaft, Drive	138	39294-136	Resistor, 22,000 ohm, 1/2 w.
107	W-136717	Washer, Spring	139	39294-137	Resistor, 22,000 ohm, 1/2 w.
108	W-136717	Ring, Retaining	140	39294-138	Resistor, 22,000 ohm, 1/2 w.
109	W-136717	Shaft, Drive	141	39294-139	Resistor, 22,000 ohm, 1/2 w.
110	W-136717	Washer, Spring	142	39294-140	Resistor, 22,000 ohm, 1/2 w.
111	W-136717	Ring, Retaining	143	39294-141	Resistor, 22,000 ohm, 1/2 w.
112	W-136717	Shaft, Drive	144	39294-142	Resistor, 22,000 ohm, 1/2 w.
113	W-136717	Washer, Spring	145	39294-143	Resistor, 22,000 ohm, 1/2 w.
114	W-136717	Ring, Retaining			

CROSLEY DIV.
AVCOMFG. CORP.

MODEL 56TN-L



Alternate Cabinet Design



1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil.
3. The r.f. signal input from the signal generator should be connected to the external antenna lead. Connect the signal generator ground through a 0.1 mfd. condenser to -B (pin 4 on 14A7 tube socket).
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

Alignment Sequence	Signal Generator Output			Position of		Adjust for Maximum Output
	Frequency in kc.	In Series with	To	Band Switch	Tuning Dial	
1	455	200 mmf.	Ant.	A	1,620	A & B
2	15,300	400 ohms	Ant.	O	15,300	C
3	15,000	400 ohms	Ant.	O	15,000	D
4	1,400	200 mmf.	Ant.	A	1,400	E & F

NOTE: When aligning the short-wave oscillator trimmer (C), be sure that the circuit is aligned at the correct frequency and not at the image frequency which is 910 kilocycles lower as indicated by the receiver dial. To check: Tune in the generator frequency, then increase the generator output and tune in the image frequency. The image frequency should be weaker than the fundamental and audible 910 kilocycles lower on the receiver dial. If the image cannot be tuned in, the oscillator trimmer is adjusted to the wrong peak; i.e., the oscillator trimmer may be adjusted to the image or one of the harmonics instead of the fundamental frequency. The correct peak is the second one heard as the trimmer adjustment screw is opened from the completely closed position.

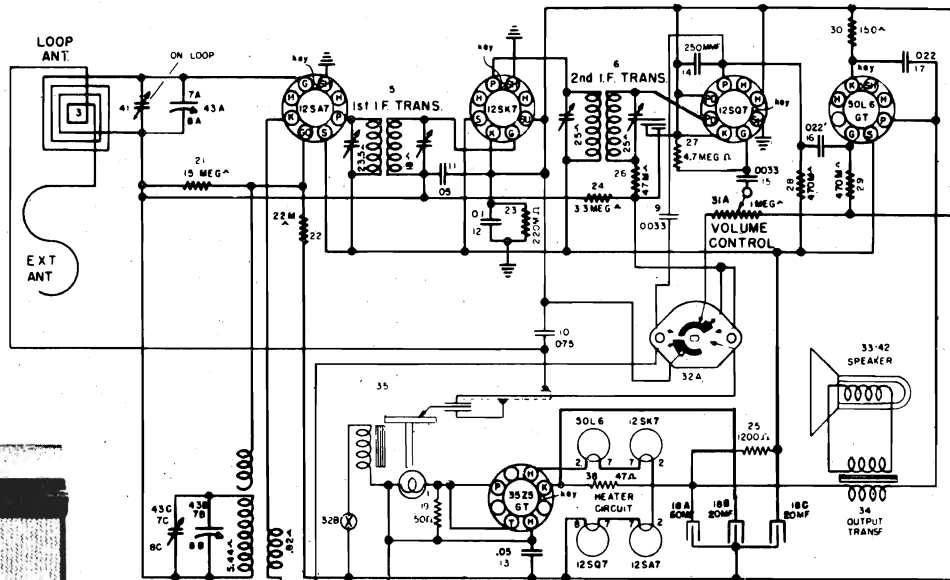
MODELS 57TQ, 56TZ
1st and 2nd Production

CROSLEY DIV.
AV CO MFG. CORP.

January, 1947

Under no circumstances should a ground be connected to this receiver.

BAND CHANGE SWITCH SHOWN IN EXTREME
COUNTER-CLOCKWISE POSITION SWITCH
SEQUENCE: RADIO NORMAL TONE, RADIO
LOW TONE, PHONO LOW TONE, PHONO
NORMAL TONE.



56TZ



455 KC. I.F.

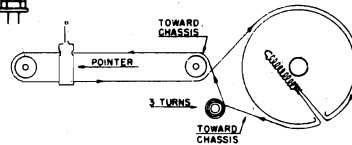
TYPE: Five-tube, single-band, superheterodyne.

FREQUENCY RANGE: 540 to 1600 kc. (Selector switch at R.)

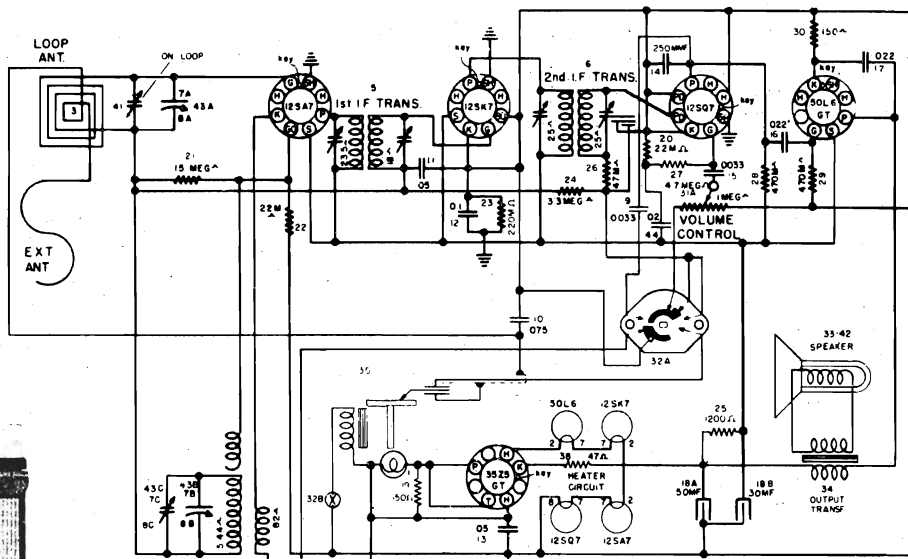
INTERMEDIATE FREQUENCY: 455 kc.

POWER SUPPLY: 60 cycle a.c. only.

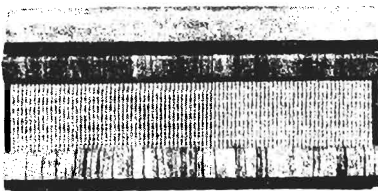
SCHMATIC DIAGRAM—MODELS 56TZ, 57TQ, 1st PRODUCTION



BAND CHANGE SWITCH SHOWN IN EXTREME
COUNTER-CLOCKWISE POSITION SWITCH
SEQUENCE: RADIO NORMAL TONE, RADIO
LOW TONE, PHONO LOW TONE, PHONO
NORMAL TONE.



57TQ



455 KC. I.F.

VOLTAGE RATING: 105-125 volts.

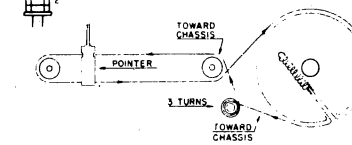
POWER CONSUMPTION:

Radio position—30 watts.

Phono position—45 watts.

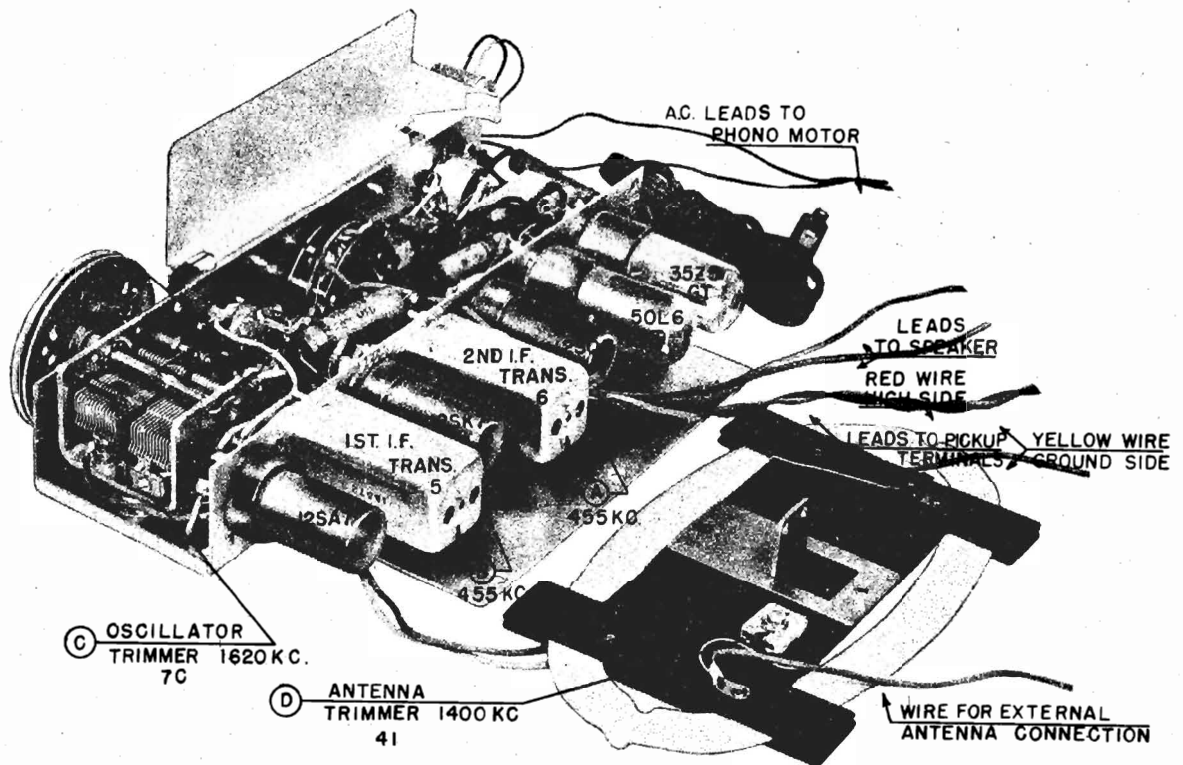
POWER OUTPUT: 1.5 watts maximum.

SCHMATIC DIAGRAM—MODELS 56TZ, 56TQ, 2nd PRODUCTION



CROSLEY DIV.
AV COMFG. CORP.

MODELS 57TQ, 56TZ



ALIGNMENT PROCEDURE

Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.

Turn the tone control to the normal tone position.

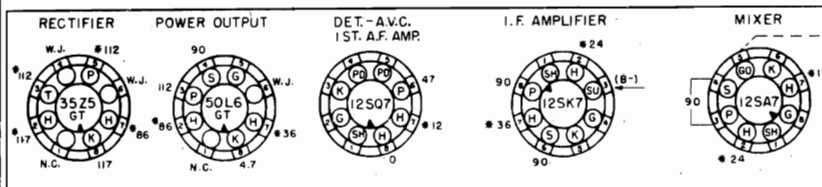
Connect the output meter across the speaker voice coil.

The r.f. signal input from the signal generator should be connected to the external antenna lead. Connect the signal generator ground through a 0.1 mfd. condenser to—B (Pin 3 on 12SK7 tube socket).

Turn volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

Alignment Sequence	Signal Generator Output			Position of		Adjust for Maximum Output
	Frequency in kc.	In Series with	To	Selector Switch	Tuning Dial	
1	455	200 mmf.	Ant.	R	1620	A & B
2	1620	200 mmf.	Ant.	R	1620	C
3	1400	200 mmf.	Ant.	R	1400	D

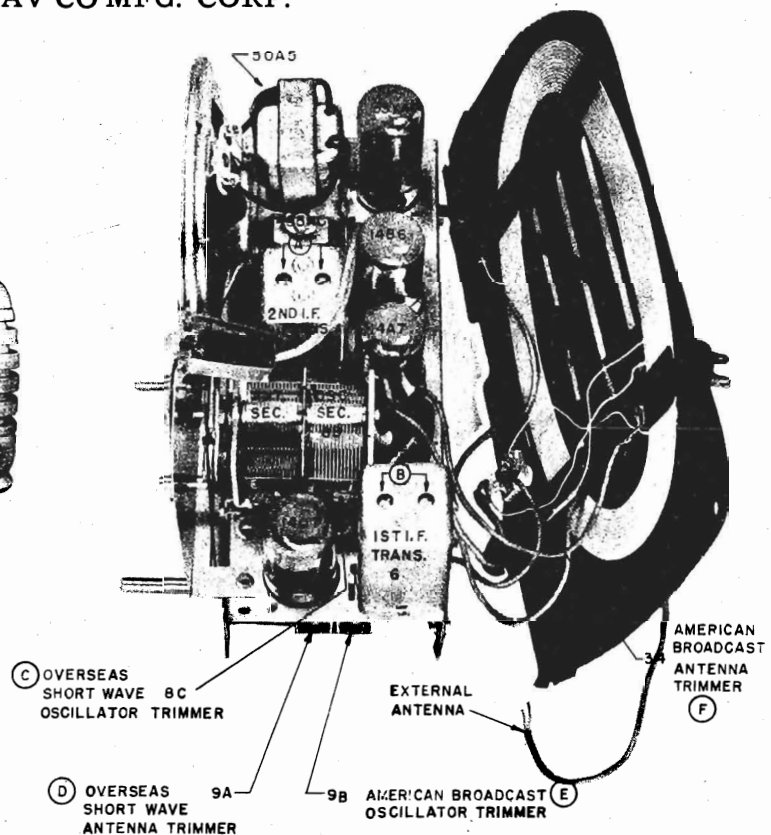
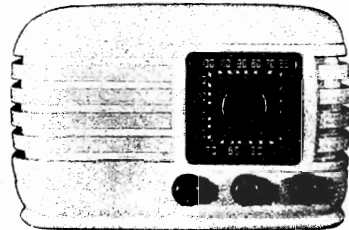
OSCILLATOR GRID VOLTAGE		
BAND	FREQUENCY	VOLTS
AMERICAN	540 KC	-5.5



- NOTES:
1. THESE ARE BOTTOM VIEWS OF TUBE SOCKETS.
 2. MEASURE VOLTAGES FROM SOCKET LUGS TO B—(PIN 3 ON THE 12SK7).
 3. THESE VOLTAGES WERE MEASURED USING AN ELECTRONIC VOLTMETER.
 4. W.J. — WIRING JUNCTION.
 5. N.C. — NO CONNECTION.
 6. * — 60 CYCLE A.C. VOLTAGES.
 7. SOCKET VOLTAGE TOLERANCE, 10%.
 8. LINE VOLTAGE 117 V, 60~A.C.

CROSLLEY DIV.
AV CO MFG. CORP.

MODEL 56TX-L



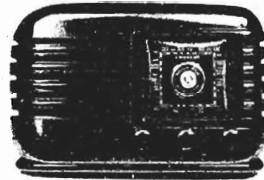
1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil.
3. The r.f. signal input from the signal generator should be connected to the external antenna lead. Connect the signal generator ground through a 0.1 mfd. condenser to —B (pin 4 on 14A7 tube socket).
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

Alignment Sequence	Signal Generator Output			Position of		Adjust for Maximum Output
	Frequency in kc.	In Series with	To	Band Switch	Tuning Dial	
1	455	200 mmf.	Ant.	Left	1,620	A & B
2	15,300	400 ohms	Ant.	Right	15,300	C
3	15,000	400 ohms	Ant.	Right	15,000	D
4	1,400	200 mmf.	Ant.	Left	1,400	E & F

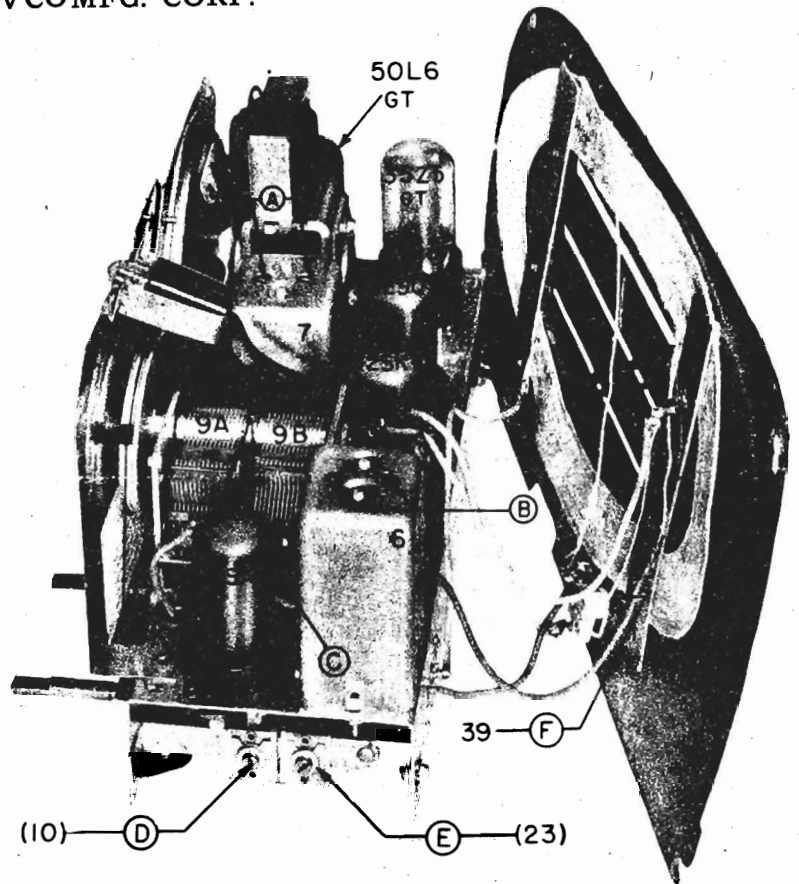
NOTE: When aligning the short-wave oscillator trimmer (C), be sure that the circuit is aligned at the correct frequency and not at the image frequency which is 910 kilocycles lower as indicated by the receiver dial. To check: Tune in the generator frequency, then increase the generator output and tune in the image frequency. The image frequency should be weaker than the fundamental and audible 910 kilocycles lower on the receiver dial. If the image cannot be tuned in, the oscillator trimmer is adjusted to the wrong peak; i.e., the oscillator trimmer may be adjusted to the image or one of the harmonics instead of the fundamental frequency. The correct peak is the second one heard as the trimmer adjustment screw is opened from the completely closed position.

CROSLLEY DIV.
AVCOMFG. CORP.

56XTA



56XTW



1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil.
3. The r.f. signal input from the signal generator should be connected to the external antenna lead. Connect the signal generator ground through a 0.1 mfd. condenser to —B (pin 3 on 12SK7 tube socket).
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

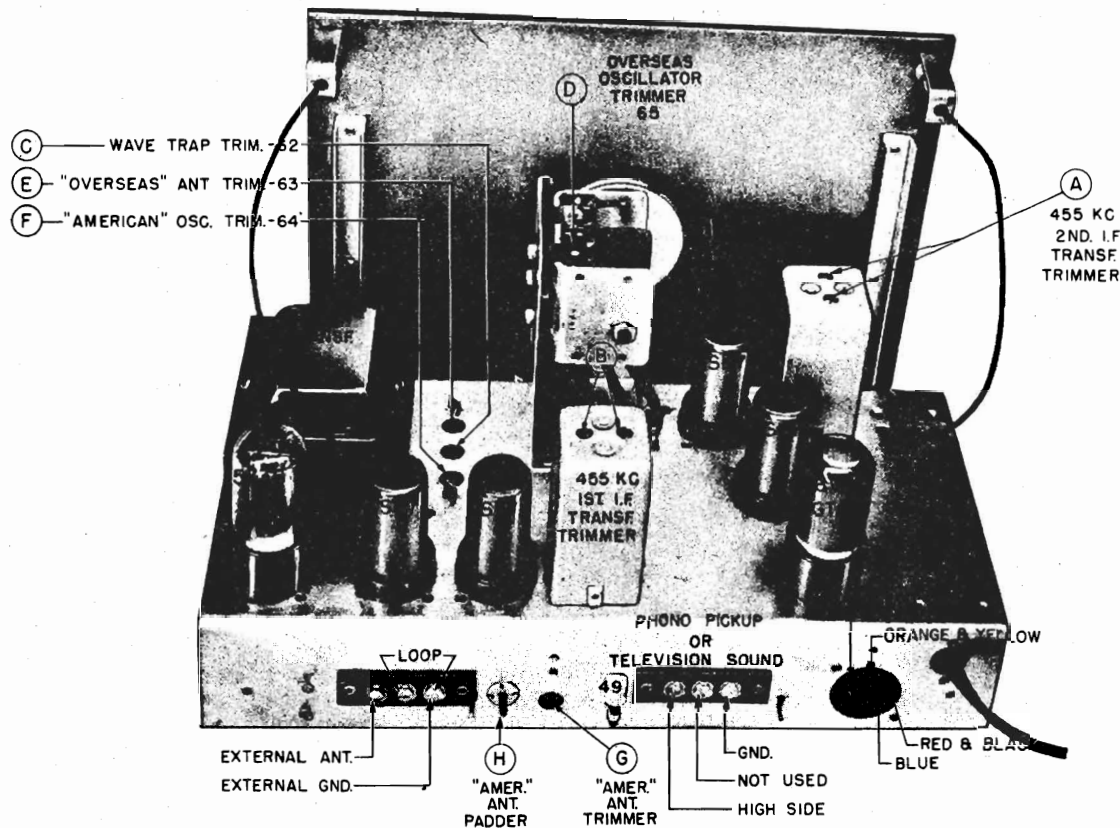
For English translation, see Crosley 56TX-L

Orden de Ajustes	SALIDA DEL OSCILADOR			Interrupor de Bandas	Sintonia Cuadrante	Ajuste a Maximum
	Frecuencia en KC	En serie con	A			
1	455	200 mmfd	Ant	Izquierda	1,620	A y B
2	15,300	400 ohms	Ant	Derecha	15,300	C
3	15,000	400 ohms	Ant	Derecha	15,000	D
4	1,400	200 mmfd	Ant	Izquierda	1,400	E y F

Nota: Cuando ajuste el trimer (C) de onda corta asegúrese que el circuito sea ajustado a la frecuencia correcta y nó en la imagen que es 910 kilociclos más baja en el receptor. Para chequear: Sintonice la frecuencia del oscilador, aumente la salida del oscilador y sintonice la imagen en el receptor, la imagen debe ser más débil que la fundamental y estar 910 KC más abajo. Si no se puede sintonizar la imagen, el trimer del oscilador está mal ajustado, es decir el oscilador quizás esté ajustado a la imagen o algun armónico de la frecuencia del oscilador. El pico correcto es el segundo que se escuche cuando se abre el tornillo de ajuste después de cerrarlo por completo.

CROSLEY DIV.
AV COMFG. CORP.

MODELS 66CS, 66CSM
Model 66CS(s)



1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil.
3. The r. f. signal input from the signal generator should be connected to the external antenna post as indicated in the alignment chart. Connect the low side (ground) of the signal generator to the chassis.
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain the signal generator output as low as possible to prevent AVC action in the receiver.

Alignment Sequence	Signal Generator Output			Position of		Adjust for Maximum Output
	Frequency in kc.	In Series With	To	Band Switch	Tuning Dial	
1	455	200 mmf.	Ant.	A	1620	A & B
2	455	200 mmf.	Ant.	A	1620	C*
3	15,300	400 ohms	Ant.	O	15,300	D
4	15,000	400 ohms	Ant.	O	15,000	E
5	1620	200 mmf.	Ant.	A	1620	F
6	1400	200 mmf.	Ant.	A	1400	G
7	600	200 mmf.	Ant.	A	600	H
8	1400	200 mmf.	Ant.	A	1400	Recheck G

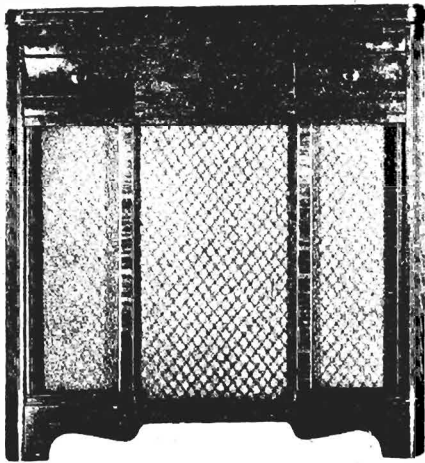
*Adjust for Minimum Output (Wave Trap).

NOTE: When aligning the "Overseas" oscillator trimmer (D), be sure that the circuit is aligned at the correct frequency and not at the image frequency which is 910 kilocycles lower as indicated by the receiver dial. To check: tune in the generator frequency, then increase the generator output and tune in the image frequency. The image frequency should be weaker than the fundamental and audible 910 kilocycles lower on the receiver dial. If the image cannot be tuned in, the oscillator trimmer is adjusted to the wrong peak of the trimmer from the closed position.

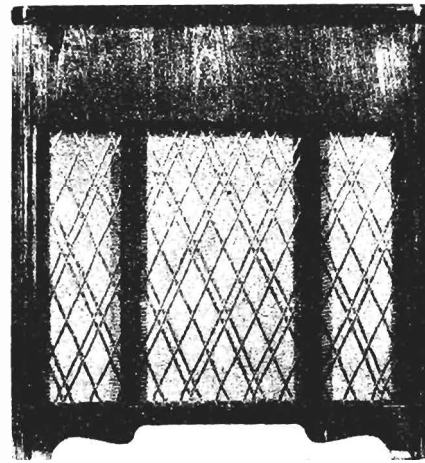
MODELS 66CS, 66CSM
MODEL 66CS(s)

CROSLEY DIV.
AV COMFG. CORP.

66CS



66CSM



TYPE: Six-tube, two-band, superheterodyne.

FREQUENCY RANGE: American Broadcast Band, 540 to 1600 kc. (Selector Switch at A.)

Overseas Short-wave Band, 5.8 to 15 mc. (Selector Switch at 0.)

INTERMEDIATE FREQUENCY: 455 kc.

POWER SUPPLY: 60 cycle a. c. only.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 60 watts maximum.

POWER OUTPUT: 4.5 watts minimum.

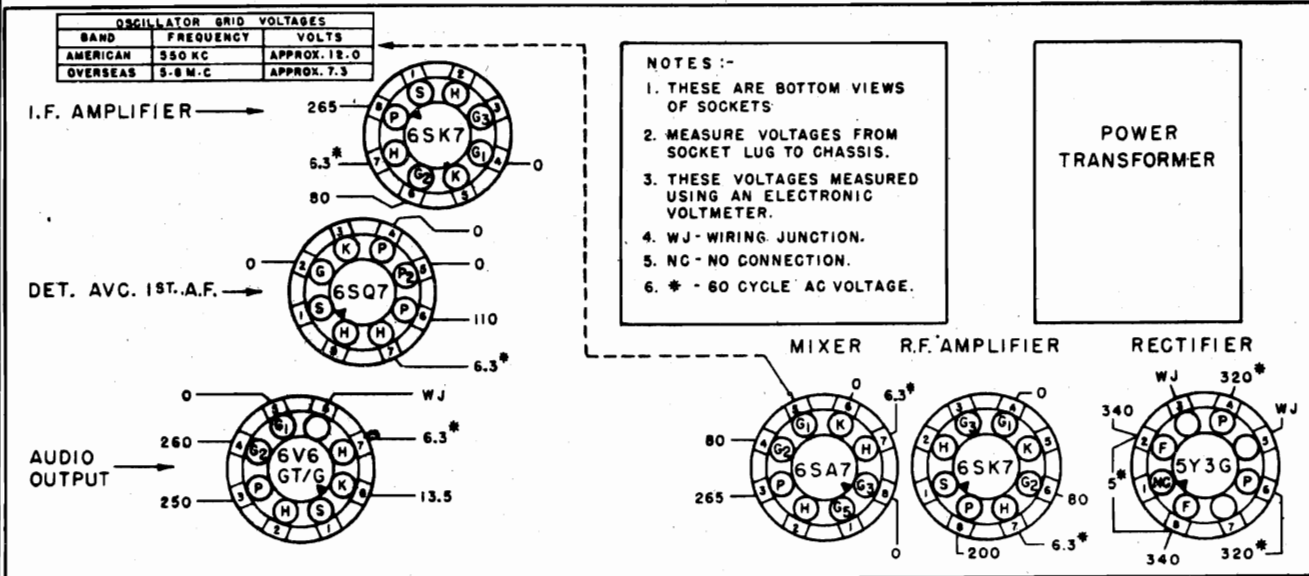
VOLTAGE DROP ACROSS SPEAKER FIELD: 76 volts.

RESISTANCE OF SPEAKER FIELD: 900 ohms.

TUBE COMPLEMENT:

Type	Function
6SA7 (GT/G)	Mixer
6SK7 (GT/G)	R. F. Amplifier
6SK7 (GT/G)	I. F. Amplifier
6SQ7 (GT/G)	Detector, AVC, 1st A.F. Amplifier
6V6 (GT/G)	A. F. Power Output
5Y3 GT/G	Rectifier

DIAL BULB: Type 51, 7.5 volts, .25 amp.



SOCKET VOLTAGE TOLERANCE: 10%

CROSLLEY DIV.
AVCOMFG. CORP.

MODELS 66CS, 66CSM
MODEL 66CS(s)
MODEL 66TC-S
MODELS 56XTA, 56XTW

Figures in first column correspond to figures in Schematic Diagram
PARTS LIST—MODEL 66TC-S

Item No.	Part No.	Description	Item No.	Part No.	Description
45	B-135859	Volume Control (1 Megohm) and Switch	34	32294-29	Resistor, 470,000 ohm, 1/2 w.
46	W-132287-1	Cable and Plug Assembly	35	32294-4	Resistor, 150 ohm, 1/2 w.
47	B-132300-1	Terminal Board Assembly	36	32294-5	Resistor, 150 ohm, 1/2 w.
48	39013-3	Terminal Board Assembly	37A	W-135858	Switch, Band Change Section
49	39013-3	Terminal Board Assembly	37B	W-135858	Switch, Band Change Section
50	39013-3	Terminal Board Assembly	37C	W-135858	Switch, Band Change Section
51	W-134968-1	Speaker Socket	38A	C-46846-6	Control (1 megohm), Volume Assembly
52A	B-134689	Change Switch	38B	39368-8	Control (1 megohm), Volume Assembly
52B	AW-135907	R. F. Coil Assembly	39	Part of Item #3	Switch, Power
53	AW-135907	R. F. Coil Assembly	40	39015-26	Resistor, 1200 ohm, 1 w.
54	AW-135909	Antenna Coil Assembly	41	39015-26	Resistor, 1200 ohm, 1 w.
55	AW-135909	Antenna Coil Assembly	42	39368-8	Control (1 megohm), Volume Assembly
56	C-137339	Speaker	39017-4	Socket, Tube Ohm, Dial Light	
57	AW-135910	Antenna Loading Coil Assembly	C-18562	Chart, Dial Face	
58	W-132386-7	Three Section Condenser	C-18721	Background, Dial	
59	W-132386-7	Three Section Condenser	W-134667	Chin, Dial Pointer	
60	W-132386-7	Three Section Condenser	51752	Spring, Dial Cord	
61	W-132386-7	Three Section Condenser	W-134917	Shaft, Drive	
62	W-132386-7	Three Section Condenser	W-134916	Washer, Spring	
63	W-132386-7	Three Section Condenser	W-50771	King, Retaining	
64	W-132386-7	Three Section Condenser	W-135164	Bumper, Rubber	
65	B-137077	CABINET PARTS	AW-134055	Grommet	
			AW-134054	Resistor (Line Voltage Reducing, 230 v. to 115 v. (66XTW))	
			AW-134788	Cabinet (66XTW)	
			D-132136-1	Lens, Dial	
			B-134610	Knob (66XTA)	
			W-134882	Knob (66XTW)	
			W-134883	Stud, Trimount	
			W-132124	Stud, Trimount	

*These parts will replace the original equipment parts.

Figures in first column correspond to figures in Schematic Diagram.
PARTS LIST—MODELS 66CS, 66CSM

Item No.	Part Number	Description	Item No.	Part Number	Description
1	39231-16	Resistor, 3300 ohm, 1/2 w.	1	W-48553	Bulb (Dial), Type 47, 6.3 v., 15 amp.
2	39231-21	Resistor, 22,000 ohm, 1/2 w.	2	C-132300-1	Cable and Plug (Power)
3	39013-3	Resistor, 22,000 ohm, 1/2 w.	3	W-134994	Coil, Antenna (H. F.)
4	39013-3	Resistor, 22,000 ohm, 1/2 w.	4A	AW-134994	Coil, Antenna (H. F.)
5	39040-13	Resistor, 1,000 ohm, 1/2 w.	5A	AW-134993	Coil, Oscillator (H. F.) Section
6	39231-33	Resistor, 2.2 megohm, 1/2 w.	6	AW-137495	Transformer (1st I. F.)
7	39231-33	Resistor, 2.2 megohm, 1/2 w.	7	AW-134158	Transformer (2nd I. F.)
8	39231-33	Resistor, 2.2 megohm, 1/2 w.	8	B-135169	Condenser, Variable Section
9	39231-33	Resistor, 2.2 megohm, 1/2 w.	9A	Part of Item #9B	Condenser, Variable Section
10	39231-33	Resistor, 2.2 megohm, 1/2 w.	9B	Part of Item #9B	Condenser, Variable Section
11	G-39012-8	Core (Iron)	9C	GC-21065-143	Condenser Assy. (Trimmer)
12	G-39204	Socket (Tube)	10	AB-135083	Condenser, 500 mmf., Mica
13	39017-3	Dial Face Assembly	11	39001-19	Condenser, .02 mid., 600 v., paper
14	AW-134793	Pointer (Dial)	12	39001-17	Condenser, .02 mid., 600 v., paper
15	B-134571	Clip (Dial Pointer)	13	39004-9	Condenser, .02 mid., 600 v., paper
16	W-134667	Spring (Dial Cord)	14	B-137649	Condenser, 30 mid., 150 v., Electro. Filter
17	W-51752	Shaft (Drive)	15	39004-9	Condenser, .02 mid., 600 v., paper
18	W-134917	Washer (Spring)	16	39001-19	Condenser, .02 mid., 600 v., paper
19	W-134916	Ring (Retaining)	17	39001-19	Condenser, .02 mid., 600 v., paper
20	W-51071	Washer (Spring)	18A	Part of Item #10	Resistor, 470 ohm, 1/2 w.
21	W-132386-2	Condenser, 220 mmf., Mica	18B	39294-17	Resistor, 350,000 ohm, 1/2 w.
22	39004-9	Condenser, 220 mmf., Mica	19	39001-80	Resistor, 22,000 ohm, 1/2 w.
23	39004-9	Condenser, 220 mmf., Mica	20	39001-80	Resistor, 22,000 ohm, 1/2 w.
24	39004-5	Condenser, 50 mmf., Mica	21	39001-80	Resistor, 22,000 ohm, 1/2 w.
25	39001-11	Condenser, .01 mid., 600 v., Paper	22	39294-23	Resistor, 220,000 ohm, 1/2 w.
26	39001-11	Condenser, .01 mid., 600 v., Paper	23	39294-27	Resistor, 220,000 ohm, 1/2 w.
27	39001-11	Condenser, .01 mid., 600 v., Paper	24	39294-34	Resistor, 47,000 ohm, 1/2 w.
28	39001-11	Condenser, .01 mid., 600 v., Paper	25	39294-35	Resistor, 47,000 ohm, 1/2 w.
29	39001-11	Condenser, .01 mid., 600 v., Paper	26	39294-35	Resistor, 47,000 ohm, 1/2 w.
30	W-30805	Grommet (Variable Condenser Mtg.)	27	39294-35	Resistor, 47,000 ohm, 1/2 w.
31	39001-11	Condenser, .01 mid., 600 v., Paper	28	39294-35	Resistor, 47,000 ohm, 1/2 w.
32	39001-11	Condenser, .01 mid., 600 v., Paper	29	39294-35	Resistor, 47,000 ohm, 1/2 w.
33	39001-11	Condenser, .01 mid., 600 v., Paper	30	39294-35	Resistor, 47,000 ohm, 1/2 w.
34	39001-11	Condenser, .01 mid., 600 v., Paper	31	39294-35	Resistor, 47,000 ohm, 1/2 w.
35	39004-5	Condenser, 50 mmf., Mica	32	39294-35	Resistor, 47,000 ohm, 1/2 w.
36	39004-5	Condenser, 50 mmf., Mica	33	39294-35	Resistor, 47,000 ohm, 1/2 w.
37A	B-134995	Cabinet (66CSM)	34	39294-35	Resistor, 47,000 ohm, 1/2 w.
37B	D-132897	Lens (Dial)	35	39294-35	Resistor, 47,000 ohm, 1/2 w.
38A	W-134158	Antenna Loop Assembly	36	39294-35	Resistor, 47,000 ohm, 1/2 w.
38B	W-134625	Record Changer	37	39294-35	Resistor, 47,000 ohm, 1/2 w.
38C	W-134625	Record Changer	38	39294-35	Resistor, 47,000 ohm, 1/2 w.
38D	W-134625	Record Changer	39	AW-134065	Transformer (1st I. F.)
39	AW-134065	Transformer (1st I. F.)	40	AW-134158	Transformer (2nd I. F.)
40	W-134625	Record Changer	41	B-134925	Dial Light, Type 51, 7.5 v., 0.2 Amp.
41	B-134925	Dial Light, Type 51, 7.5 v., 0.2 Amp.	42	W-48567	Control, Tone (3 megohm)
42	W-48567	Control, Tone (3 megohm)	43	W-134959	Control, Volume (1 megohm) & Switch
43	W-134959	Control, Volume (1 megohm) & Switch	44	W-185248	Control, Volume (1 megohm) & Switch
44	B-135651	Knob	45	W-185248	Control, Volume (1 megohm) & Switch
45	W-185248	Control, Volume (1 megohm) & Switch	46	W-185248	Control, Volume (1 megohm) & Switch
46	W-185248	Control, Volume (1 megohm) & Switch	47	B-132300-1	Cable and Plug (Power)
47	B-132300-1	Cable and Plug (Power)	48	39013-3	Terminal Board Assembly
48	39013-3	Terminal Board Assembly	49	39013-3	Terminal Board Assembly
49	39013-3	Terminal Board Assembly	50	W-134968-1	Speaker Socket
50	W-134968-1	Speaker Socket	51	W-134968-1	Speaker Socket
51	W-134968-1	Speaker Socket	52A	AW-135907	R. F. Coil Assembly
52A	AW-135907	R. F. Coil Assembly	52B	AW-135909	Antenna Coil Assembly
52B	AW-135909	Antenna Coil Assembly	53	AW-135910	Antenna Loading Coil Assembly
53	AW-135910	Antenna Loading Coil Assembly	54	AW-135910	Antenna Loading Coil Assembly
54	AW-135910	Antenna Loading Coil Assembly	55	AW-135910	Antenna Loading Coil Assembly
55	AW-135910	Antenna Loading Coil Assembly	56	AW-135910	Antenna Loading Coil Assembly
56	AW-135910	Antenna Loading Coil Assembly	57	AW-135910	Antenna Loading Coil Assembly

MODEL 66CS (s) PARTS LIST

Item No.	Part Number	Description
13	B-210735-32	Resistor, 1000 ohm, 5 w.
14	B-137076	Condenser, 40 mid., 450 v. v. Four Section
15	39013-3	Resistor, 20 mid., 450 v. v. Elect.
16	39013-3	Resistor, 20 mid., 450 v. v. Elect.
17	C-135974	Speaker, 20 mid., 25 w. v. Filter
18	W-137143	Antenna (Transmission Line, 116')

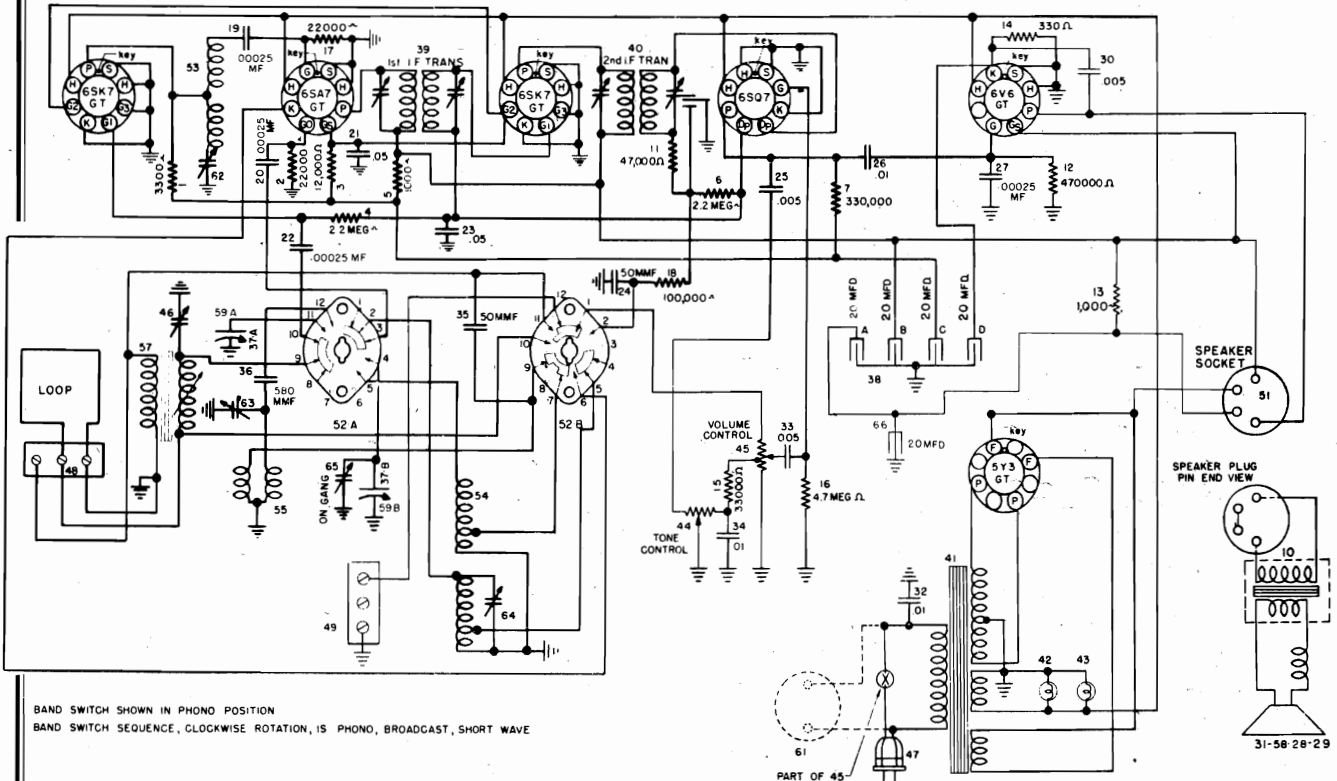
NOTE:

The above models use the Model K (Part No. D-134945-1) automatic record changer.

NOTE—All other parts and service information are the same as used on models "66CS" and "66CSM".

MODEL 66TC-S

CROSLEY DIV.
AVCO MFG. CORP.



BAND SWITCH SHOWN IN PHONO POSITION
BAND SWITCH SEQUENCE, CLOCKWISE ROTATION, IS PHONO, BROADCAST, SHORT WAVE

TYPE: Six-tube, two-band superheterodyne with terminals provided for record player or television sound.

FREQUENCY RANGE: American Broadcast Band: 540 to 1600 kc. (Selector switch at A.)

Overseas Short-wave Band: 5.8 to 15 mc. (Selector switch at 0.)

INTERMEDIATE FREQUENCY: 455 kc.

POWER SUPPLY: 60 cycle a.c. only.

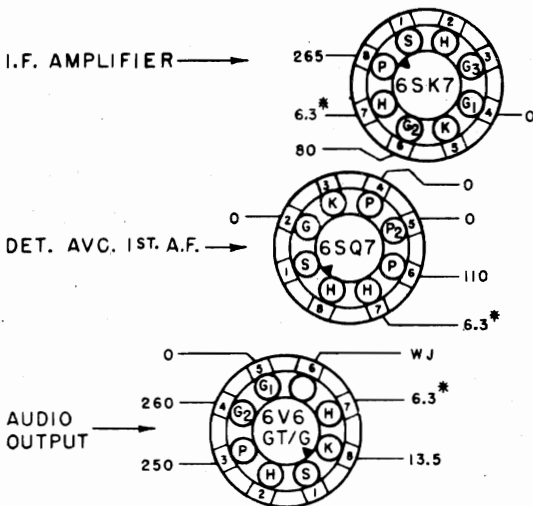
VOLTAGE RATING: 110-120 volts.

POWER CONSUMPTION: 60 watts maximum.

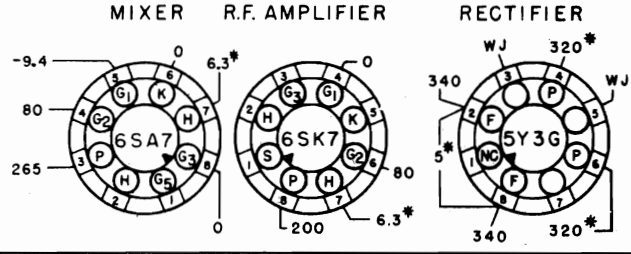
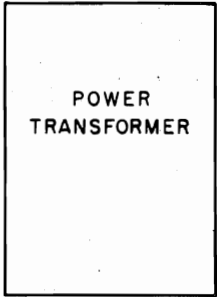
POWER OUTPUT: 4.5 watts minimum.

VOLTAGE DROP ACROSS SPEAKER FIELD: 76 volts. WITH E.M. SPEAKER

RESISTANCE OF SPEAKER FIELD: 900 ohms.

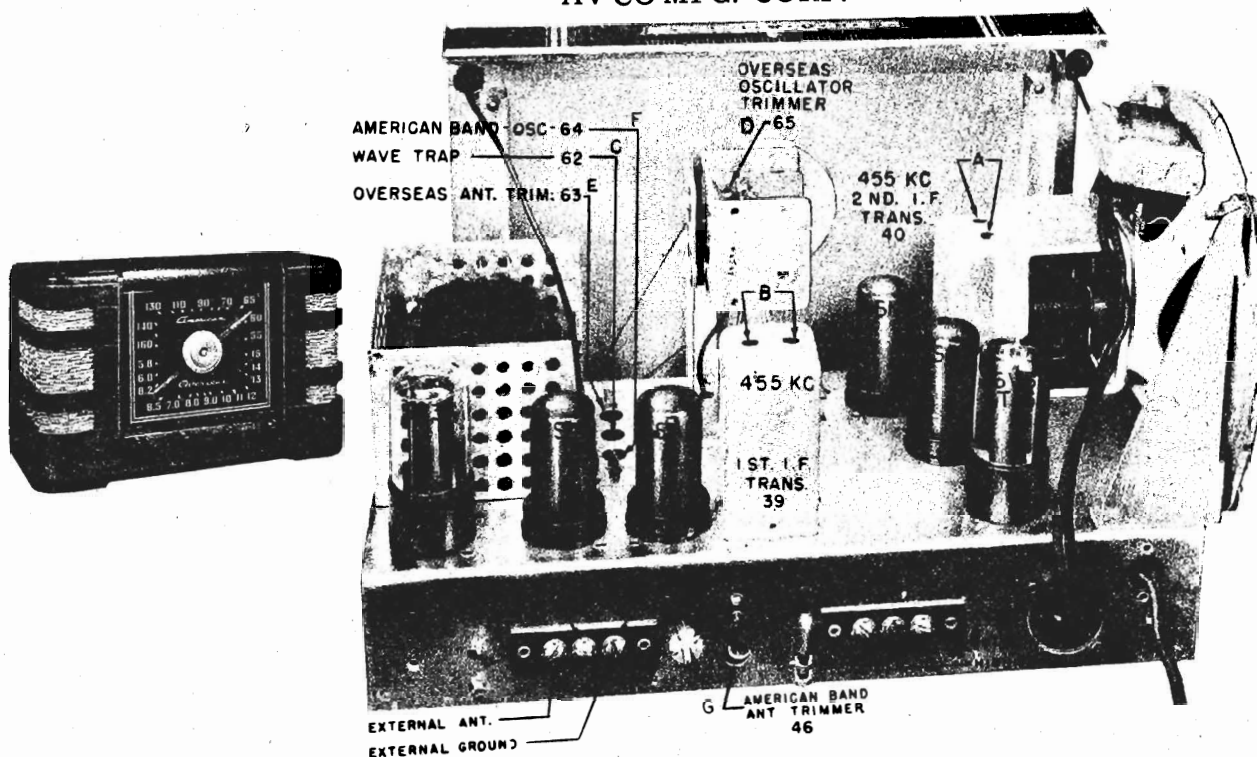


- NOTES :-
1. THESE ARE BOTTOM VIEWS OF SOCKETS.
 2. MEASURE VOLTAGES FROM SOCKET LUG TO CHASSIS.
 3. THESE VOLTAGES MEASURED USING AN ELECTRONIC VOLTMETER.
 4. WJ - WIRING JUNCTION.
 5. NC - NO CONNECTION.
 6. * - 60 CYCLE AC VOLTAGE.



Socket Voltage Tolerance: 10%

MODEL 66TC-S

CROSLEY DIV.
AV COMFG. CORP.

1. Turn the tuning capacitor to the completely closed position against the stop, and set the dial pointer to the reference line at the end of the dial scale.
2. Turn the tone control to the high or treble position.
3. Connect the output meter across the speaker voice coil.
4. The r.f. signal input from the signal generator should be connected to the external antenna post. Connect the signal generator ground to the chassis.
5. Turn the volume control on full, and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

Alignment Sequence	Signal Generator Output			Position of		Adjust for Maximum Output
	Frequency in kc.	In Series with	To	Band Switch	Tuning Dial	
1	455	200 mmf	Ant.	A	1620	A & B
2	455	200 mmf	Ant.	A	1620	C*
3	15,300	400 ohms	Ant.	O	15,300	D
4	15,000	400 ohms	Ant.	O	15,000	E
5	1620	200 mmf	Ant.	A	1620	F
6	1400	200 mmf	Ant.	A	1400	G
7	600	200 mmf	Ant.	A	600	H

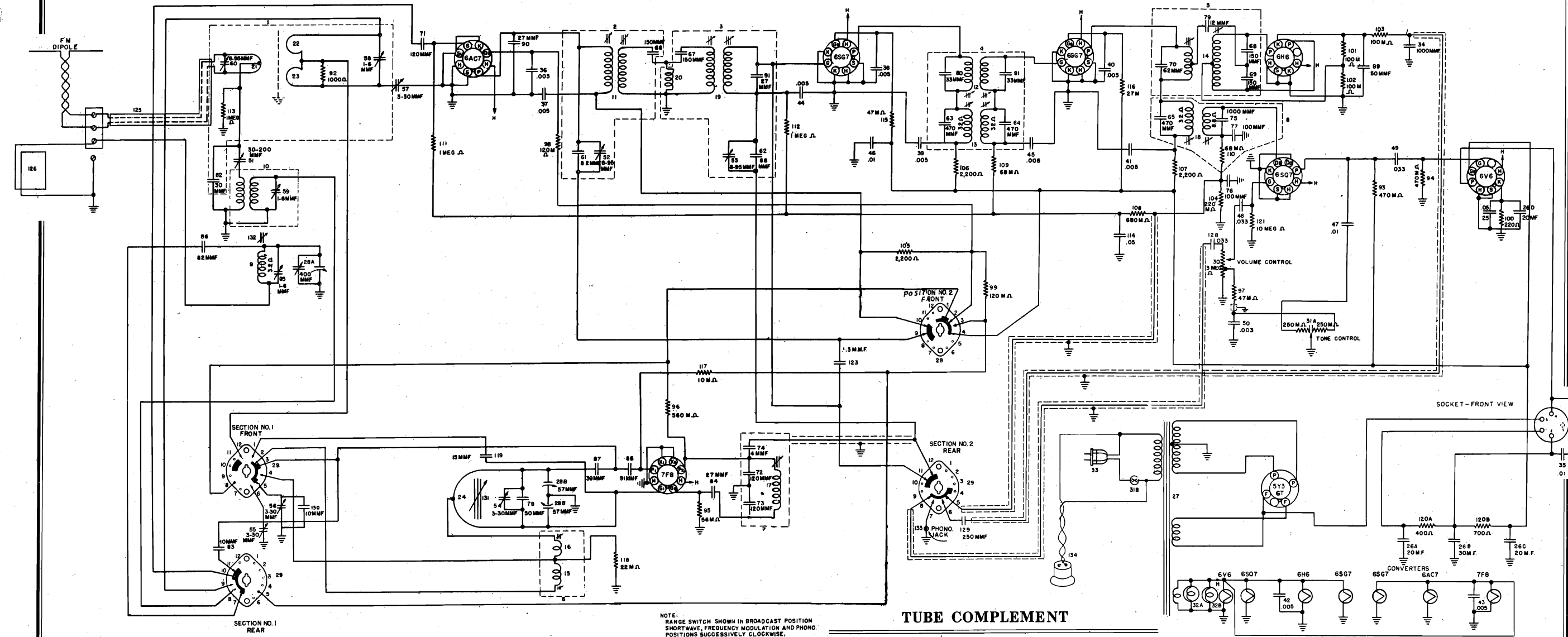
*Adjust for minimum output (wavetrap).

NOTE: When aligning the short-wave oscillator trimmer (D), be sure that the circuit is aligned at the correct frequency and not at the image frequency which is 910 kilocycles lower as indicated by the receiver dial. To check: Tune in the generator frequency, then increase the generator output and tune in the image frequency. The image frequency should be weaker than the fundamental and audible 910 kilocycles lower on the receiver dial. If the image cannot be tuned in, the oscillator trimmer is adjusted to the wrong peak; i.e., the oscillator trimmer may be adjusted to the image or one of the harmonics instead of the fundamental frequency. The correct peak is the second one heard as the trimmer adjustment screw is opened from the completely closed position.

CROSLY DIV.
A V COMFG. CORP.

MODELS 86CR, 86CS

November, 1946



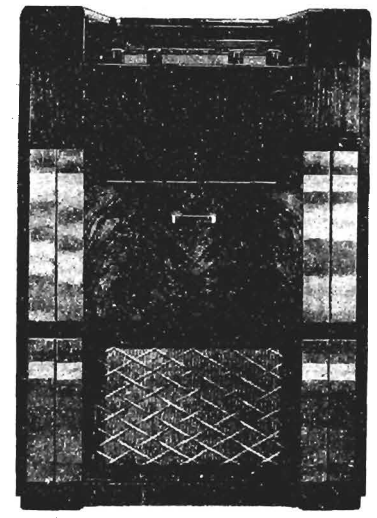
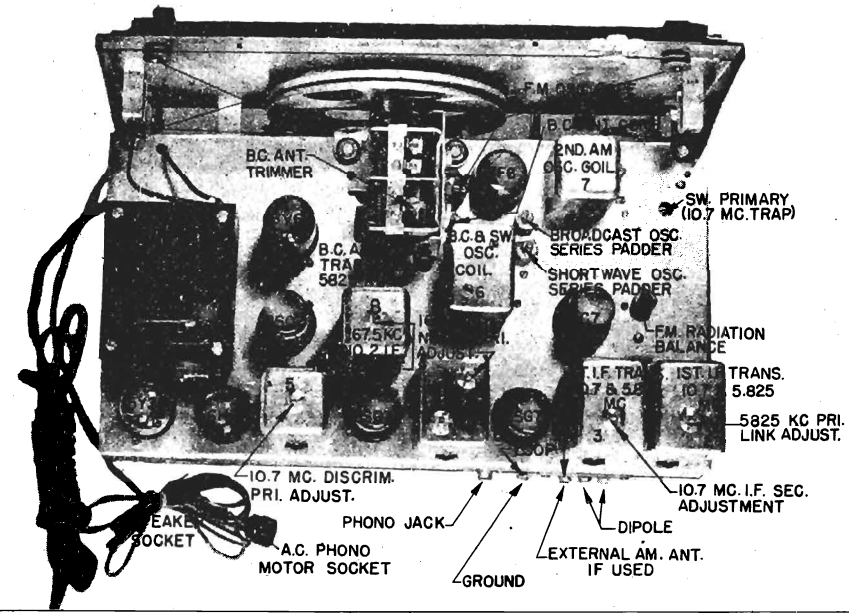
NOTE: RANGE SWITCH SHOWN IN BROADCAST POSITION. SHORT WAVE, FREQUENCY MODULATION AND PHONO POSITIONS SUCCESSIVELY CLOCKWISE.

TUBE COMPLEMENT

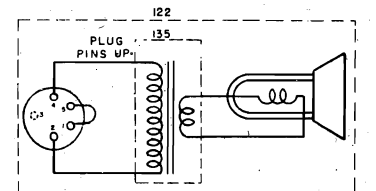
Type	Function
6AC7	1st A.M. Mixer—FM Mixer
7F8	1st and 2nd A.M. OSC.—F.M. OSC.
6SG7	2nd A.M. Mixer—1st I. F. Ampl. F.M.
6SG7	I. F. Ampl. A. M., 2nd I. F. Ampl. F. M.
6H6	F. M. Detector (Discriminator)
6SQ7	A. M. Det. AVC, 1st A. F. Ampl.
6V6 GT/G	Output
5Y3 GT/G	Rectifier

TYPE: Eight-tube, three-band, Superheterodyne.
FREQUENCY RANGE: American Broadcast Band, 540 to 1600 kc. (Selector Switch at AM position). Overseas Short-Wave Band: 9.45 to 11.9 mc. (Selector Switch at SW position). Frequency Modulated

Band: 88.1 to 107.9 mc. Channel 201 to 300 (Selector Switch at FM position).
INTERMEDIATE FREQUENCY: Broadcast Band: 167.5 and 5825 kc
FREQUENCY MODULATION BAND: 10.7 mc.
POWER SUPPLY: 60 cycle a.c. only.
VOLTAGE RATING: 105-125 volts.
POWER CONSUMPTION: 85 watts maximum at normal power supply voltage (117), 20 watts additional for record changer.
POWER OUTPUT: 80 watts minimum at 3.2 ohm load.



Model 86CR Uses Walnut Cabinet
Model 86CS Uses Mahogany Cabinet



CROSLEY DIV.
AVCOMFG. CORP.

MODELS 86CR, 86CS

ALIGNMENT CHART (Output Meter Method)

Alignment Sequence	Signal Frequency	Generator Output in Series with	To	Position of Range Tuning Dial Switch or Tuning Cap.		Adjust	Osc. Freq.	Remarks
1.	167.5 KC.	0.1 MFD	2nd I.F. Grid 6SG7 B	S. W.	Open	2nd I.F. Trans. 8	.....	.....
2.	167.5 KC.	0.1 MFD	1st I.F. Grid 6SG7 A	S. W.	Open	1st I.F. Trans. 4	.....	.....
3.	10.7 MC.	30 MMF	2nd I.F. Grid 6SG7 B	F. M.	Open	Discriminator Trans. 5	.....	.....
4.	10.7 MC.	30 MMF	1st I.F. Grid 6SG7 A	F. M.	Open	2nd I.F. 10.7 Trans. 4	.....	.....
5.	10.7 MC.	30 MMF	See Procedure	F. M.	Open	1st I.F. 10.7 Trans. 2 & 3	.....	Signal Generator Ground Connection as Short as Possible
6.	5825 KC.	30 MMF	1st I.F. Grid 6SG7 A	S. W.	Open	2nd A.M. Osc. Core 7	167.5 KC. Above	.....
7.	5825 KC.	30 MMF	*Link Coupling on 10.7 I.F. 2	S. W.	Open	5825 KC. I.F. Trans. 3	167.5 KC. Above	*Short Lead Between Transformers 2 & 3
8.	5825 KC.	30 MMF	6AC7 Grid	S. W.	Open	5825 KC. I.F. Trans. 2	167.5 KC. Above	.....
9.	100 MC.	78 ohm Dummy	F.M. Dipole Ant. Terms.	F. M.	Channel 261	Osc. Core & Trim. F.M. Ant. Trims. Pri. & Sec.	10.7 MC. Above	See Circuit Under the Title "Alignment Equipment"
10.	87.9 MC.	78 ohm Dummy	F.M. Dipole Ant. Terms.	F. M.	Closed	F.M. Osc. Core	10.7 MC. Above	.....
11.	107.9 MC.	78 ohm Dummy	F.M. Dipole Ant. Terms.	F. M.	Channel 300	F.M. Osc. Trimmer	10.7 MC, Above	.....
12.	Disconnect Generator Connect Field Strength Meter			F. M.	Channel 215	Radiation Bal. Trimmer (Null Point)	.....	See Paragraph on Field Strength Meter, Under "Alignment Equip."
13.	9.6 MC.	30 MMF	One FM. Ant. Term.	S. W.	9.6 MC.	S.W. Oscillator Series Padder	5825 KC. Above	Disconnect Field Strength Meter Con- nect Signal Generator
14.	11.8 MC.	30 MMF	One FM. Ant. Term.	S. W.	11.8 MC.	S. W. Oscillator Core	5825 KC. Above	.....
15.	10.7 MC.	30 MMF	One F.M. Ant. Term.	S. W.	10.7 MC.	S. W. Ant. Pri. & Sec. Padder	.....	.....
16.	10.7 MC.	30 MMF	One F.M. Ant. Term.	F. M.	10.7 MC.	S. W. Primary (10.7 MC. Trap)	.....	Adjust for Null Point
17.	535 KC.	30 MMF	Hi. Side of Dummy Loop	B. C.	Closed	B. C. Oscillator Series Padder	5825 KC. Above	.....
18.	1620 KC.	30 MMF	Hi. Side of Dummy Loop	B. C.	Open	B. C. Oscillator Core	5825 KC. Above	.....
19.	1400 KC.	30 MMF	Hi. Side of Dummy Loop	B. C.	1400 KC.	B. C. Antenna Trimmer	.....	.....
20.	600 KC.	30 MMF	Hi. Side of Dummy Loop	B. C.	600 KC.	B. C. Antenna Core	.....	First Models Only. Omitted in Later Mod
21.	5825 KC.	30 MMF	Hi. Side of Dummy Loop	B. C.	1400 KC.	B. C. Wave Trap Trimmer	.....	Adjust for Null Point

ALIGNMENT PROCEDURE

1. This receiver has been aligned at the factory for best performance, and no attempt should be made to re-align this receiver unless the proper test equipment is available.
2. Turn the tuning condenser to full mesh, against stop, and set the dial pointer to reference point which is Channel 200 on the dial.
3. Set tone control knob to the treble position, (extreme right).
4. When output meter is used, connect across voice coil: (3.2 ohms).
5. Feed an R. F. Signal modulated 30%; at 400 cycles to the receiver as indicated on the alignment chart; connect signal generator ground terminal to the chassis of the receiver, except where noted.
6. When F. M. Signal generator is used, a 30% modulated signal is equal to 22.5 kilocycles deviation.
7. Turn volume control knob to maximum clockwise position and adjust signal generator output to produce a noticeable output meter reading, (approx. 500 mw). Keep signal generator output as low as possible to prevent excessive AVC action in the receiver.
8. The low impedance "Signal Web" antenna should remain connected at all times.

ALIGNMENT EQUIPMENT

FOR OUTPUT METER ALIGNMENT

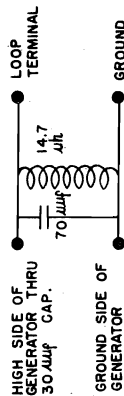
Signal Generator AM with 400 cycle modulated signal to cover 167.5 KC to 108 MC. Suitable output meter. Field strength meter.

DUMMY ANTENNAS TO BE USED WITH GENERA-



DUMMY LOOP ANTENNA:

14.7 uh inductance shunted by a 70 uuf condenser (to replace low impedance "Signal Web" when chassis is removed from cabinet.

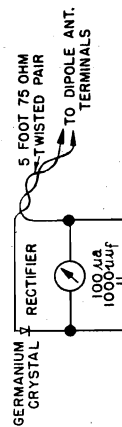


SHUNTS:

5000 ohm carbon resistor in series with a 0.1 mfd. condenser. Hairpin shunting shunt composed of 2' of No. 14 bare tinned wire.

FIELD STRENGTH METER:

The Field Strength Meter may consist of a D. C. 100 microampere (full scale) meter shunted by a 1000 uf mica by-pass condenser; a crystal rectifier is connected in series with the meter and a five foot, 75 ohm twisted pair for leads. The open end of the twisted pair is connected to the dipole antenna terminals. Circuit for the field strength meter is given below:



NOTE: Connect condenser directly across meter terminals and crystal directly to one meter terminal, so leads are as short as possible.

OUTPUT METER ALIGNMENT

Use this procedure in conjunction with alignment chart. Sequence numbers correspond to numbers on alignment chart. Refer to alignment chart first for connection of signal generator and control settings, then follow procedure

167.5 KC I. F. TRANSFORMER ALIGNMENT: (For maximum output)

1. (a) Shunt primary of transformer No. 8 with a 5000 ohm resistor in series with a 0.1 mfd. condenser from ground to link between transformers No. 5 and 8. Adjust secondary of 2nd I. F. Transformer No. 8 (above chassis).
- (b) Shunt secondary of transformer No. 8 with a 5000 ohm resistor in series with a 0.1 mfd. condenser from diode plate (Pin No. 4) of the 6SQ7 to shielded lead junction on transformer and adjust primary of 2nd I. F. Transformer No. 8 (bottom of chassis).
2. (a) Connect signal generator to grid of 1st I. F. 6SG7 (A).
- (b) Shunt primary of transformer No. 4 with a 5000 ohm resistor in series with a 0.1 mfd. condenser from plate of the 6SG7 (A) to the transformer side of the 2200 ohm resistor (106). Adjust secondary of 1st I. F. Transformer No. 4 (bottom of chassis).
- (c) Shunt secondary of transformer No. 4 with a 5000 ohm resistor in series with a 0.1 mfd. condenser from the grid of the 6SG7 (B) to transformer side of the 68,000 ohm resistor (109). Adjust primary of 1st I. F. Transformer No. 4 (top of chassis).

10.7 MC. DISCRIMINATOR TRANSFORMER ALIGNMENT:

3. (a) Adjust discriminator transformer No. 5 secondary (bottom of chassis) padder for null point.
- (b) Tune signal generator for maximum output meter reading, approximately 75 to 100 KC. off of the 10.7 megacycle null point and note output meter reading. Retune signal generator to the opposite side of the 10.7 megacycle null point to maximum reading on the output meter reading. If the two readings are not equal, adjust discriminator primary padder until equal output meter readings and equal peak spacing are obtained on both sides of the 10.7 megacycle null point.

10.7 MC. I. F. TRANSFORMER ALIGNMENT:

4. (a) Set signal generator to peak on high side of 10.7 MC. and adjust 10.7 MC. primary (top) and secondary (bottom) of transformer No. 4 for maximum output and note output meter reading.
- (b) Tune signal generator to peak on low side of 10.7 MC. and note output meter reading. If readings are unequal, readjust primary and secondary slightly until output meter readings and peak spacings are equal on both sides of the 10.7 MC. null point.
5. (a) Connect signal generator output to either lug of the F.M. ANTENNA Transformer Primary Trimmer (60). Connect signal generator ground to the receiver chassis at a point close to the trimmer to keep lead lengths to a minimum. Shielded cable of generator output should not be draped near under side of chassis.
- (b) Set signal generator to peak on high side of 10.7 MC. and adjust 10.7 MC. primary on transformer No. 2 (bottom of chassis), and 10.7 MC. secondary on transformer No. 3 (top of chassis) for maximum output, and note reading on output meter.
- (c) Set signal generator to peak on low side of 10.7 MC. and note output meter reading. If meter readings are not equal, readjust primary and secondary until equal readings are obtained on the peaks on both sides of 10.7 MC. Peaks should appear approximately 80 KC. on each side of 10.7 MC.

5825 KC. I. F. TRANSFORMER ALIGNMENT:

6. (a) Turn core adjustment-screw on bottom of 2nd A. M. Oscillator Coil No. 7 until core is out of coil. DO NOT USE FORCE.
- (b) Turn core adjustment in until first peak (maximum output) is obtained.
7. (a) Connect signal generator output to link coupling (see chart).
- (b) Adjust 5825 KC. secondary trimmer and 5825 KC. secondary link adjustment on bottom of 1st I. F. Transformer No. 3 and retune 2nd A. M. Oscillator coil No. 7; adjust alternately for maximum output.
8. (a) Connect signal generator output to 6AC7 grid (see chart).
- (b) Adjust 5825 KC. primary trimmer on bottom and 5825 KC. primary link adjustment on top of 1st I. F. Transformer No. 2 for maximum output.

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FREQUENCY MODULATED BAND ALIGNMENT:

9. (a) Pre-set F. M. Oscillator iron core (131) located on the top of the chassis to midway position.
 - (b) Pre-set F. M. radiation balance adjustment (57) on top of the chassis to approximately two turns from the closed position.
 - (c) Set signal generator to 100 megacycles A. M. modulated at 400 cycles.
 - (d) Set dial pointer to channel 261 (100 MC).
 - (e) Adjust F. M. oscillator trimmer (54) (bottom of chassis) to maximum output (on sets without oscillator trimmer, adjust oscillator core) but keep signal generator output as low as possible.
 - (f) Short circuit F. M. Antenna primary trimmer (60) with hairpin shorting shunt.
 - (g) Adjust F. M. Antenna secondary trimmer (58) on bottom of chassis for maximum output.
 - (h) Transfer shorting shunt to F. M. Antenna secondary trimmer (58), and adjust F. M. Antenna primary trimmer (60) for maximum output.
 - (i) Remove shorting shunt.
- NOTE: ON SETS WITHOUT OSCILLATOR TRIMMER CONDENSER, OMIT STEPS 10 AND 11.**
10. (a) Set signal generator to 87.9 MC. amplitude modulated at 400 cycles.
 - (b) If set does not tune to 87.9 MC. (Channel 200) adjust F. M. Oscillator core in slowly until 87.9 MC. signal is tuned in.
 11. (a) Set signal generator to 107.9 MC. amplitude modulated at 400 cycles.
 - (b) Set dial pointer to channel 300 and adjust F. M. Oscillator trimmer (54) for maximum output.
 - (c) Repeat steps 10 and 11 until frequency shift stops.

NOTE: TOO MUCH COVERAGE ON F. M. BAND INDICATES CAPACITY OF OSCILLATOR TRIMMER CONDENSER SET TOO HIGH.

F. M. RADIATION BALANCE ADJUSTMENT:

12. (a) Disconnect signal generator and connect Field Strength Meter to the dipole antenna terminals. (See paragraph on Field Strength Meter under title "Alignment Equipment".)
- (b) Set dial pointer to channel 215.
- (c) Adjust F. M. Radiation Balance Trimmer (57) (on top of chassis) to null point. If this trimmer adjustment is changed more than a quarter turn repeat step 9 (f) to (i), and 12.

SHORTWAVE ALIGNMENT:

13. (a) Set signal generator to 9.6 MC. Amplitude Modulated at 400 cycles.
- (b) Turn volume control to maximum.
- (c) Adjust shortwave oscillator series padder (55) on top of chassis for maximum output with dial pointer set at 9.6 MC.
14. (a) Set signal generator to 11.8 MC. Amplitude Modulated at 400 cycles.
- (b) Set dial pointer to 11.8 MC.
- (c) Adjust shortwave oscillator core on bottom of chassis for maximum output.
 Repeat steps 13 (a) and (c) and 14 (a), (b) and (c) until dial tracks at 9.6 and 11.8 MC.
15. (a) Set signal generator to 10.7 MC. Amplitude Modulated at 400 cycles.
- (b) Shunt shortwave Antenna Primary Padder (51) (lug connected to coil) to chassis with shorting clip.
- (c) Retune set to 10.7 MC. signal, increase signal generator output if necessary.
- (d) Adjust shortwave antenna secondary trimmer (59) for maximum output while rocking gang.
- (e) Remove shorting clip.
- (f) Shunt across shortwave antenna secondary trimmer (59) with shorting clip.
- (g) Retune radio to 10.7 MC. signal, increase signal generator output, if necessary.
- (h) Adjust SW. antenna primary padder (51) (top of chassis) for maximum output while rocking gang.
- (i) Remove shorting clip.

WAVE TRAP ADJUSTMENT (10.7 MC.):

16. (a) Turn band switch to F. M. position.
- (b) Connect field strength meter from signal generator side of 30 mmf. cond. to chassis.
- (c) Increase or decrease signal generator output until field strength meter reads between 10 and 15 microvolts.
- (d) Adjust SW. Antenna primary padder (51) for lowest reading on Field Strength Meter. Make this adjustment slowly, otherwise the dip may be passed unnoticed when a highly damped meter is used.
- (e) Disconnect Field Strength Meter.

BROADCAST BAND ALIGNMENT:

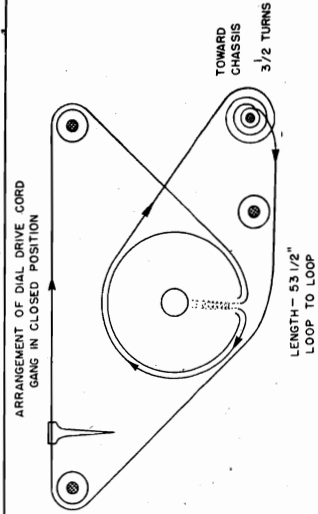
17. (a) Connect dummy loop: (14.7 uh) to Signal Web terminal and ground terminal.
- (b) Connect Signal Generator in series with a 30 mmf. condenser to high side of dummy loop.
- (c) Preset Broadcast Antenna Wave Trap (85) on top of chassis to approximately two turns from the closed position.
- (d) Set signal generator to 535 KC. Amplitude Modulated.
- (e) Set dial pointer to 535 KC. (tuning condenser gang closed).
- (f) Adjust Broadcast Oscillator Series Padder (56), on top of chassis, for maximum output.
18. (a) Set signal generator to 1620 KC.
- (b) Set dial pointer to 1620 KC. (tuning condenser gang to minimum capacity, but not against stop).
- (c) Adjust Broadcast Oscillator core on the bottom of chassis for maximum output.
- (d) Repeat steps 17 (d) to 18 (c) until frequency shift stops.
19. (a) Set signal generator to 1400 KC.
- (b) Tune receiver to 1400 KC. maximum output.
- (c) Adjust Broadcast Antenna Trimmer on top of tuning condenser gang for maximum output.
20. (a) Set signal generator to 600 KC.
- (b) Tune receiver to 600 KC. maximum output.
- (c) Adjust Broadcast Antenna Core (132), on top of chassis, for maximum output while rocking gang.

NOTE: B. C. ANTENNA CORE IN FIRST MODELS ONLY. OMIT STEP 20 WHEN ALIGNING LATER MODELS.

5825 KC. WAVE TRAP ADJUSTMENTS:

21. (a) Set signal generator to 5825 KC. Amplitude Modulated.
- (b) Set dial pointer to approximately 1400 KC. and retune signal generator to maximum output.
- (c) Adjust signal generator output to approximately midscale reading on output meter.
- (d) Adjust Broadcast Antenna Wave Trap Trimmer (85) for lowest reading on output meter.

NOTE: All air trimmers should be locked in position by applying a drop of household cement on the screw threads.



MODELS 86CR, 86CS

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Item No.	Part No.	Description	Item No.	Description	Part No.	Item No.	Description	Part No.	Description	Part No.	Description
1	AC-136171	Transformer Assy. (F. M. Antenna)	53	Condenser, Trimmer (6.825 mc. Secondary)	39294-20	109	Resistor, 680,000 ohm, 1/2 w.	39294-20	Resistor, 680,000 ohm, 1/2 w.	D-136252	Dial Glass
2	AC-136254	Transformer, 10.7 MC. and 5.825 MC. I. F. (A)	54	Condenser, Air Trimmer (F. M. Osc.)	W-136964	110	Resistor, 68,000 ohm, 1/2 w.	Part of Item #8	Resistor, 68,000 ohm, 1/2 w.	W-136251	Clip, Dial Glass
3	AC-136081	Transformer, 10.7 MC. and 5.825 MC. I. F. (B)	55	Condenser, Air Trimmer (S. W. Osc.)	W-136964	111	Resistor, 1 megohm, 1/2 w.	Part of Item #8	Resistor, 1 megohm, 1/2 w.	W-136853	Cushion, Rubber (Dial Glass)
4	AC-136276	Transformer, 10.7 MC. and 167.5 KC. I. F. Coil Assy., 1st Oscillator (B.C. & S.W.)	56	Condenser, Air Trimmer (B. C. Osc.)	W-136964	112	Series, Padder	39294-31	Resistor, 1 megohm, 1/2 w.	W-136176	Pointer, Dial
5	AC-136266	Transformer, 10.7 MC. and 167.5 KC. I. F. Coil Assy., 2nd Oscillator	57	Condenser, Air Trimmer (F. M. Radiation Balance)	W-136964	113	Series, Padder	39294-31	Resistor, 1 megohm, 1/2 w.	W-51752	Spring, Dial Drive Cord
6	AC-136390	Transformer, 167.5 KC., Diode	58	Condenser, Trimmer (F. M. Ant. Secondary)	39014-42	114	Condenser, 470 mfd., 500v., mica	39294-23	Condenser, .05 mfd., 600v., paper	W-51071	Ring, Shaft Retaining
7	AC-136251	Coil Assy., S.W. Antenna	59	Condenser, Trimmer (S. W. Ant. Secondary)	39014-42	115	Condenser, 470 mfd., 500v., mica	39294-23	Condenser, 47,000 ohm, 1/2 w.	W-136979	Washer, Spring
8	AW-136444	Coil Assy., S.W. Antenna	60	Condenser, Trimmer (F. M. Ant. Primary)	39014-41	116	Condenser, 470 mfd., 500v., mica	39014-42	Resistor, 27,000 ohm, 1/2 w.	W-136979	Washer, Spring
9	Part of Item #2	Coil Assy.	61	Condenser, 82 mfd., 300v., ceramic	W-137021	117	Condenser, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
10	Part of Item #4	Coil Assy.	62	Condenser, 68 mfd., 300v., ceramic	W-137021	118	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
11	Part of Item #4	Coil Assy.	63	Condenser, 470 mfd., 300v., mica	C-136974	119	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
12	Part of Item #6	Coil Assy.	64	Condenser, 470 mfd., 300v., mica	AW-136911	120	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
13	Part of Item #6	Coil Assy.	65	Condenser, 470 mfd., 300v., mica	39013-3	121	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
14	Part of Item #7	Coil Assy.	66	Condenser, 150 mfd., 500v., mica	W-137143	122	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
15	Part of Item #7	Coil Assy.	67	Condenser, 150 mfd., 500v., mica	AW-137220	123	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
16	Part of Item #7	Coil Assy.	68	Condenser, 150 mfd., 500v., mica	39001-17	124	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
17	Part of Item #7	Coil Assy.	69	Condenser, 150 mfd., 500v., mica	B-226635-49	125	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
18	Part of Item #7	Coil Assy.	70	Condenser, 150 mfd., 500v., mica	39012-59	126	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
19	Part of Item #7	Coil Assy.	71	Condenser, 150 mfd., 500v., mica	39012-59	127	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
20	Part of Item #7	Coil Assy.	72	Condenser, 150 mfd., 500v., mica	W-136998	128	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
21	Part of Item #7	Coil Assy.	73	Condenser, 150 mfd., 500v., mica	W-137213	129	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
22	Part of Item #7	Coil Assy.	74	Condenser, 150 mfd., 500v., mica	B-138131-2	130	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
23	Part of Item #7	Coil Assy.	75	Condenser, 150 mfd., 500v., mica	B-138131-2	131	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
24	Part of Item #7	Coil Assy.	76	Condenser, 150 mfd., 500v., mica	39019-3	132	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
25	Part of Item #7	Coil Assy.	77	Condenser, 150 mfd., 500v., mica	39232-5	133	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
26	Part of Item #7	Coil Assy.	78	Condenser, 150 mfd., 500v., mica	39232-5	134	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
27	Part of Item #7	Coil Assy.	79	Condenser, 150 mfd., 500v., mica	39232-5	135	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
28	Part of Item #7	Coil Assy.	80	Condenser, 150 mfd., 500v., mica	39232-5	136	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
29	Part of Item #7	Coil Assy.	81	Condenser, 150 mfd., 500v., mica	39232-5	137	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
30	Part of Item #7	Coil Assy.	82	Condenser, 150 mfd., 500v., mica	39232-5	138	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
31	Part of Item #7	Coil Assy.	83	Condenser, 150 mfd., 500v., mica	39232-5	139	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
32	Part of Item #7	Coil Assy.	84	Condenser, 150 mfd., 500v., mica	39232-5	140	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
33	Part of Item #7	Coil Assy.	85	Condenser, 150 mfd., 500v., mica	39232-5	141	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
34	Part of Item #7	Coil Assy.	86	Condenser, 150 mfd., 500v., mica	39232-5	142	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
35	Part of Item #7	Coil Assy.	87	Condenser, 150 mfd., 500v., mica	39232-5	143	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
36	Part of Item #7	Coil Assy.	88	Condenser, 150 mfd., 500v., mica	39232-5	144	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
37	Part of Item #7	Coil Assy.	89	Condenser, 150 mfd., 500v., mica	39232-5	145	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
38	Part of Item #7	Coil Assy.	90	Condenser, 150 mfd., 500v., mica	39232-5	146	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
39	Part of Item #7	Coil Assy.	91	Condenser, 150 mfd., 500v., mica	39232-5	147	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
40	Part of Item #7	Coil Assy.	92	Condenser, 150 mfd., 500v., mica	39232-5	148	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
41	Part of Item #7	Coil Assy.	93	Condenser, 150 mfd., 500v., mica	39232-5	149	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
42	Part of Item #7	Coil Assy.	94	Condenser, 150 mfd., 500v., mica	39232-5	150	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
43	Part of Item #7	Coil Assy.	95	Condenser, 150 mfd., 500v., mica	39232-5	151	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
44	Part of Item #7	Coil Assy.	96	Condenser, 150 mfd., 500v., mica	39232-5	152	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
45	Part of Item #7	Coil Assy.	97	Condenser, 150 mfd., 500v., mica	39232-5	153	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
46	Part of Item #7	Coil Assy.	98	Condenser, 150 mfd., 500v., mica	39232-5	154	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
47	Part of Item #7	Coil Assy.	99	Condenser, 150 mfd., 500v., mica	39232-5	155	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
48	Part of Item #7	Coil Assy.	100	Condenser, 150 mfd., 500v., mica	39232-5	156	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
49	Part of Item #7	Coil Assy.	101	Condenser, 150 mfd., 500v., mica	39232-5	157	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
50	Part of Item #7	Coil Assy.	102	Condenser, 150 mfd., 500v., mica	39232-5	158	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
51	Part of Item #7	Coil Assy.	103	Condenser, 150 mfd., 500v., mica	39232-5	159	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
52	Part of Item #7	Coil Assy.	104	Condenser, 150 mfd., 500v., mica	39232-5	160	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
53	Part of Item #7	Coil Assy.	105	Condenser, 150 mfd., 500v., mica	39232-5	161	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
54	Part of Item #7	Coil Assy.	106	Condenser, 150 mfd., 500v., mica	39232-5	162	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring
55	Part of Item #7	Coil Assy.	107	Condenser, 150 mfd., 500v., mica	39232-5	163	Resistor, 10 megohm, 1/2 w.	39014-37	Resistor, 10,000 ohm, 1/2 w.	W-136979	Washer, Spring

*These parts will replace the original equipment parts.

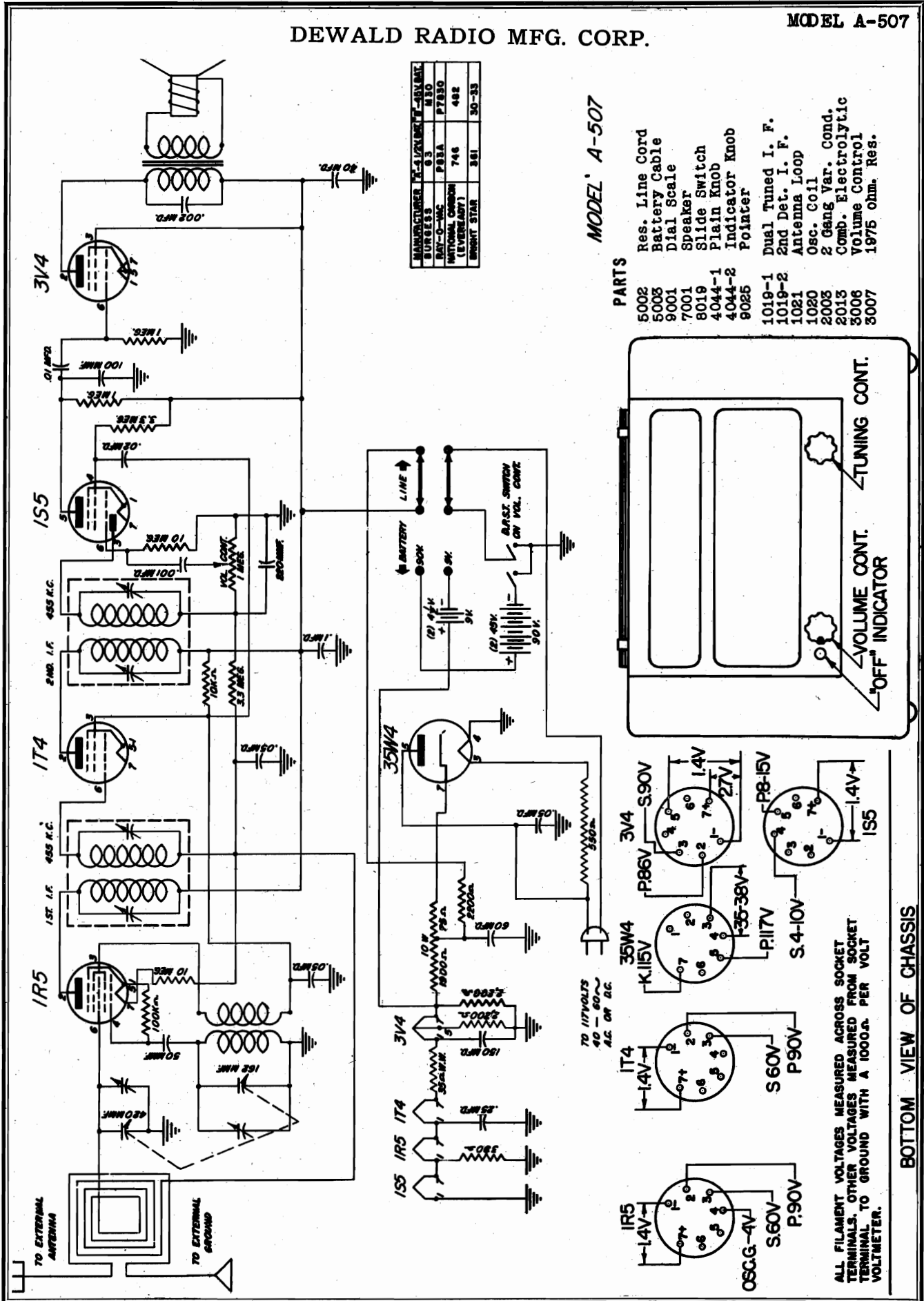
CHANNEL NUMBERS TO MEGACYCLES
Cross Index between channel calibrations on the dial and frequency in megacycles follow:

Channel No.	Frequency in Megacycles
200	87.9
205	88.9
210	89.9
215	90.9
220	91.9
225	92.9
230	93.9
235	94.9
240	95.9
245	96.9
250	97.9

To find the frequency in megacycles for CHANNEL NUMBERS between those given above, add .2 megacycle for every one added to the CHANNEL NUMBER; for example Channel 204 would be 88.7 megacycles and 251 would be 98.1 megacycles.

DEWALD RADIO MFG. CORP.

MODEL A-507

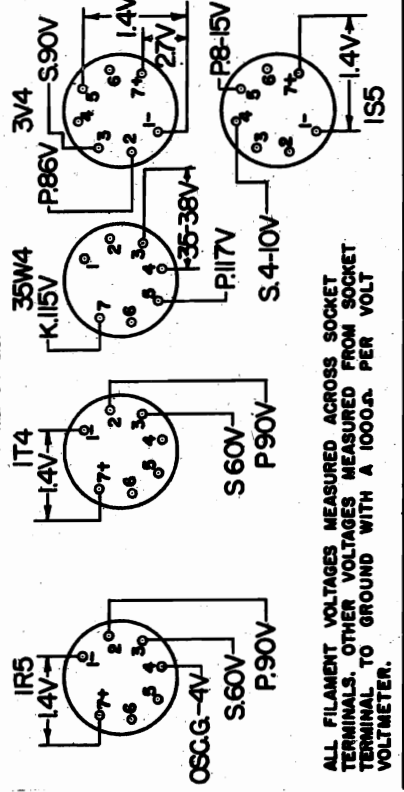
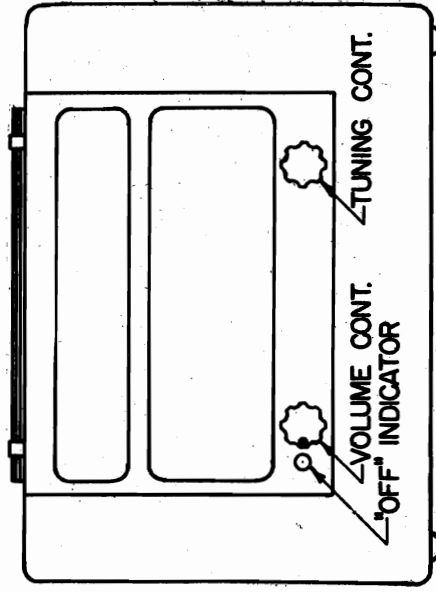


MANUFACTURER	K-1 (VALVE TUBES)	GEN. CAT.
BURGESS	03	M30
RAT-O-WAC	P83A	P7330
NATIONAL CORDON (LEVEREADY)	746	482
BRIGHT STAR	381	30-33

MODEL A-507

PARTS

- 5002 Res. Line Cord
- 5003 Battery Cable
- 9001 Dial Scale
- 7001 Speaker
- 8019 Slide Switch
- 4044-1 Plain Knob
- 4044-2 Indicator Knob
- 9025 Pointer
- 1019-1 Dual Tuned I. F.
- 1019-2 2nd Det. I. F.
- 1021 Antenna Loop
- 1020 Osc. Coil
- 2003 2 Gang Var. Cond.
- 2013 Comp. Electrolytic
- 3006 Volume Control
- 3007 1975 ohm. Res.

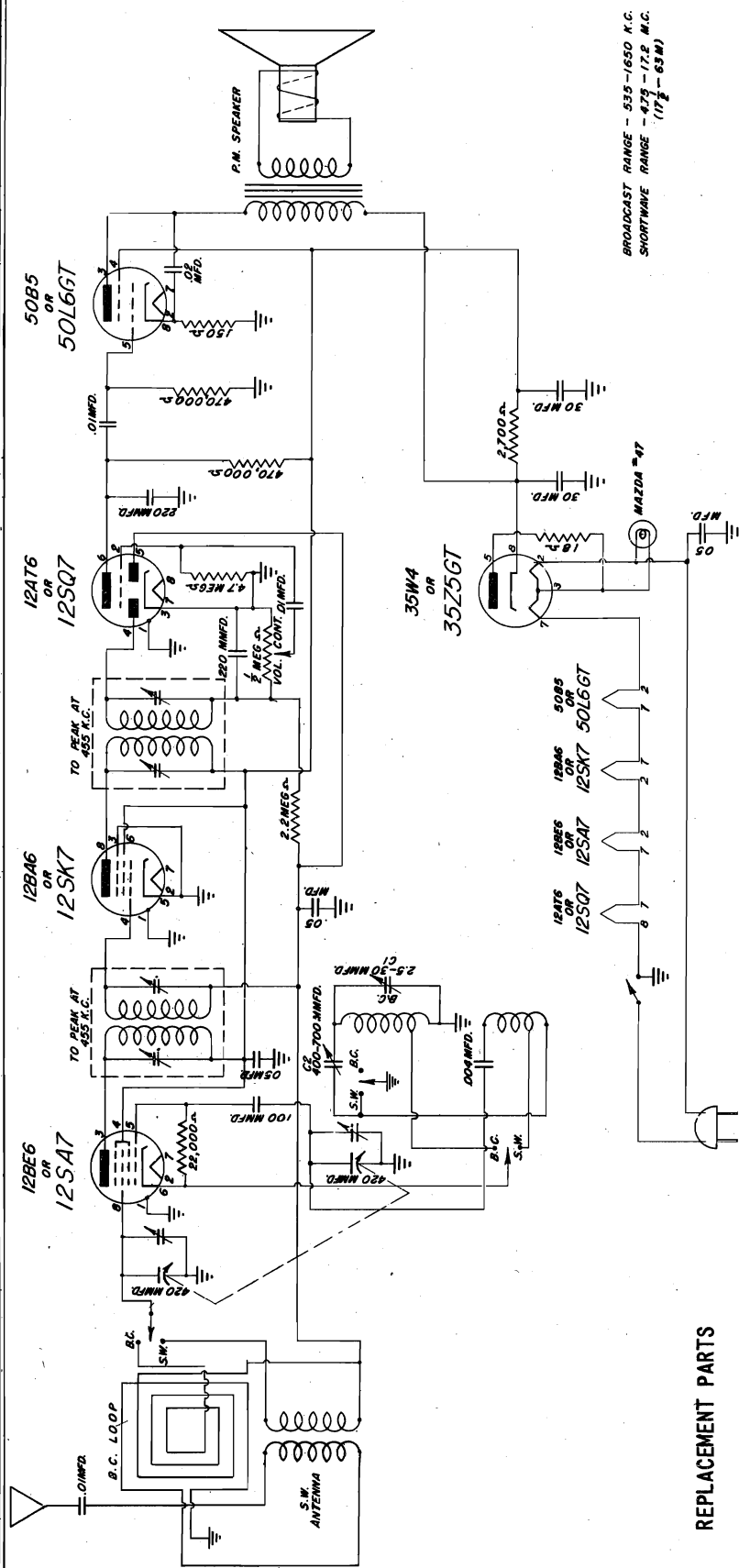


ALL FILAMENT VOLTAGES MEASURED ACROSS SOCKET TERMINALS. OTHER VOLTAGES MEASURED FROM SOCKET TERMINAL TO GROUND WITH A 1000Ω. PER VOLT VOLTMETER.

BOTTOM VIEW OF CHASSIS

MODEL A-509

DEWALD RADIO MFG. CORP.



BROADCAST RANGE - 535-1650 K.C.
SHORTWAVE RANGE - 475-17.2 M.C.
(17.2 - 63 M)

REPLACEMENT PARTS

- 1016 loop ant.
- 1017 B.C. oscillator coil
- 1018 S.W. oscillator coil
- 1009 S.W. ant. coil
- 1000 1st I.F. coil
- 1002 2nd detector I.F.
- 2014 variable condenser
- 2002 comb. electrolytic
- 2000 paper condenser
- 2012 Ceramic condenser
- 3000 1/4 W. resistor
- 3003 1/2 W. resistor
- 3004 2 W. resistor
- 6003 dial scale
- 9001 dial back plate
- 8001 pilot lamp assembly
- #47 pilot lamp
- #20 dial cord
- 9762 drive spring
- 9818 bushing
- 9000 shaft
- 7000 speaker
- 8017 wave band switch
- 5000 line cord
- 2011 padder condenser
- 3002 comb. volume control

TO 105-125K
40-60~
UNLESS OTHERWISE SPECIFIED

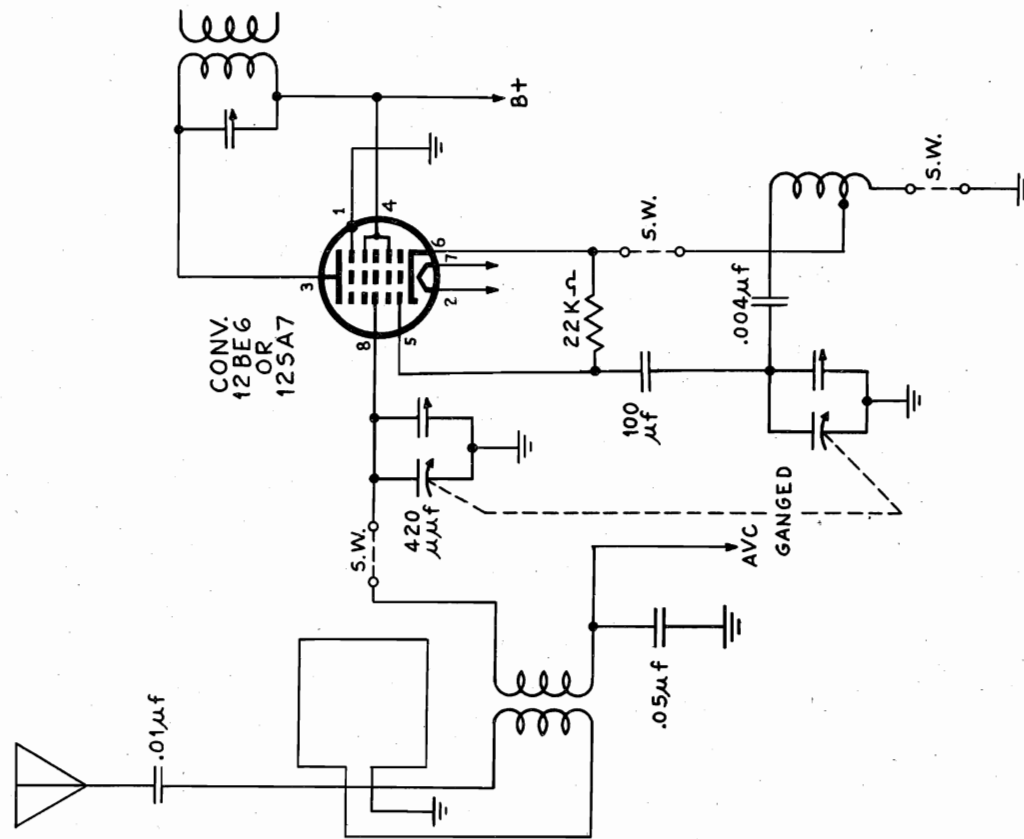
TUBES	IF MINIATURE USE
1 35Z5GT	35W4
1 50L6GT	50B5
1 12SA7	12BE6
1 12SK7	12BA6
1 12SQ7	12AT6

- CABINET 4004
- KNOB 4037
- BACK 4016

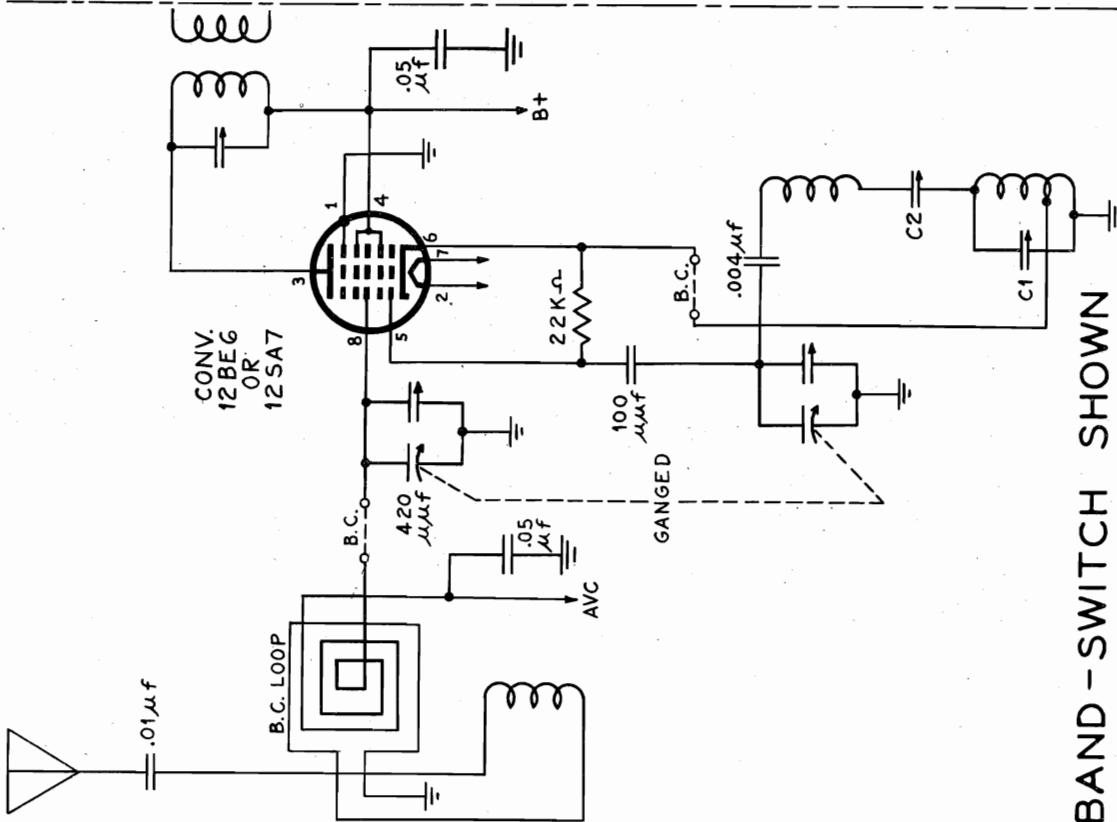
To calibrate receiver connect the output of signal generator in series with a 200 MMFD fixed condenser to the flexible antenna lead attached to the loop antenna. Connect the low side of signal generator through a 1/10 mfd. condenser to receiver chassis. The wave band switch should be in the broadcast position. Adjust signal generator to 455 Kilocycles and adjust both I.F. transformers for maximum signal. Open the receiver variable condenser for minimum capacity. Turn the band switch to short wave position. Set signal generator at 17.2 Megacycles. Peak oscillator section of receiver condenser for maximum signal. Next set signal generator at 16 Megacycles. Tune in this signal. Adjust R.F. section of receiver variable condenser for maximum signal strength. The low frequency end of the dial is automatically adjusted by a fixed padder condenser. Next turn band switch to broadcast position. Rotate drive shaft until variable condenser is in minimum capacity position. Adjust signal generator to 1650 Kilocycles. Adjust the broadcast oscillator trimmer screw (C-1) until maximum signal from generator is heard. To adjust the low frequency, set the signal generator and receiver to 600 Kilocycles. Peak the broadcast padder (C-2) for maximum output. The variable condenser should be rocked during the operation. Keep the signal generator output as low as possible when making all of these measurements. It is extremely necessary in making the short wave adjustments, that the fundamental oscillator signal be tuned in and not the image frequency, which will fall below the fundamental.

DEWALD RADIO MFG. CORP.

MODEL A-509



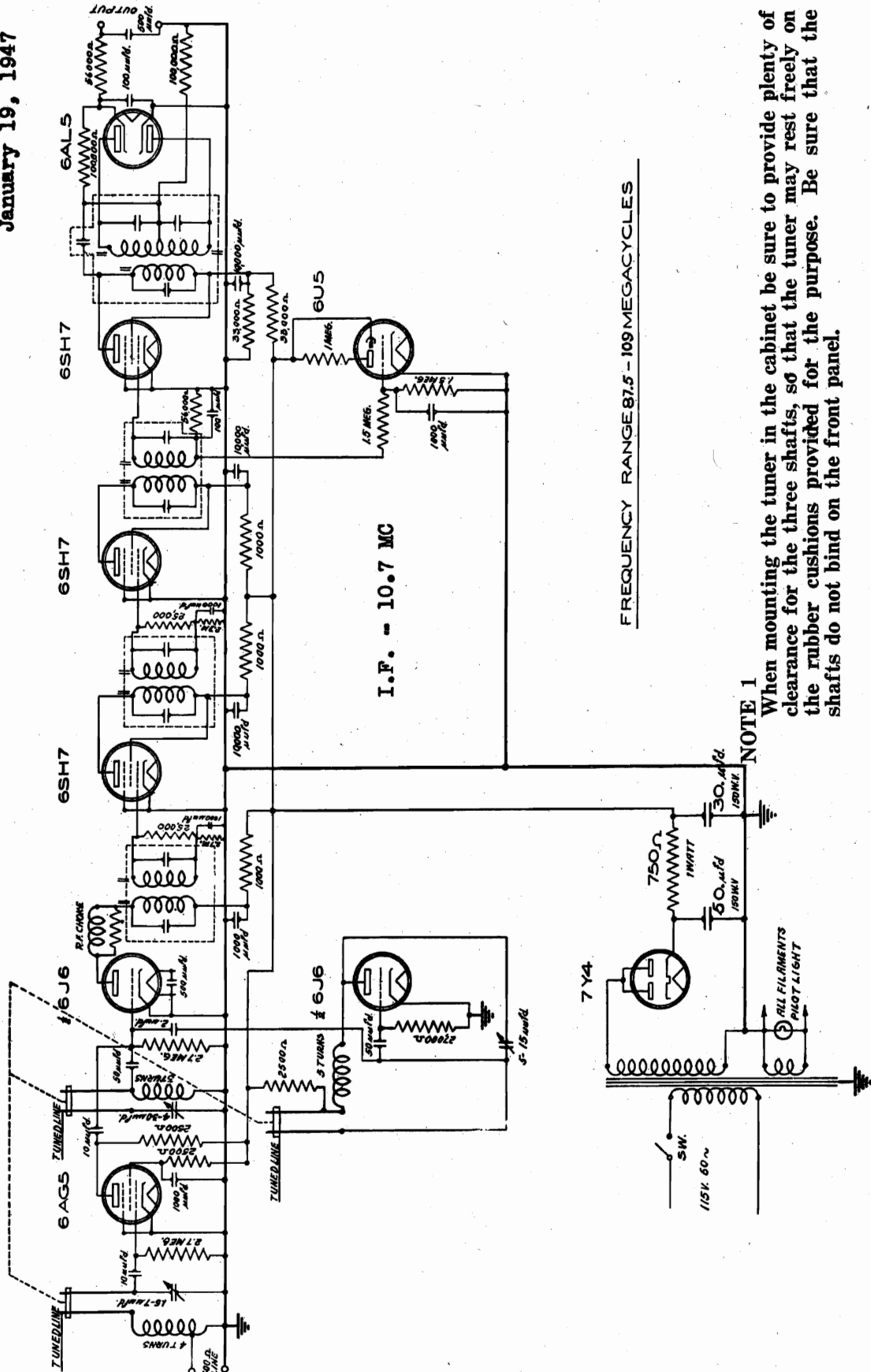
BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE
SHORT WAVE BAND
4.75 - 17.2 MC.



BAND-SWITCH SHOWN
AT 1ST POSITION
BROADCAST BAND
535-1650 KC.

EDWARD'S FM RADIO CORP.

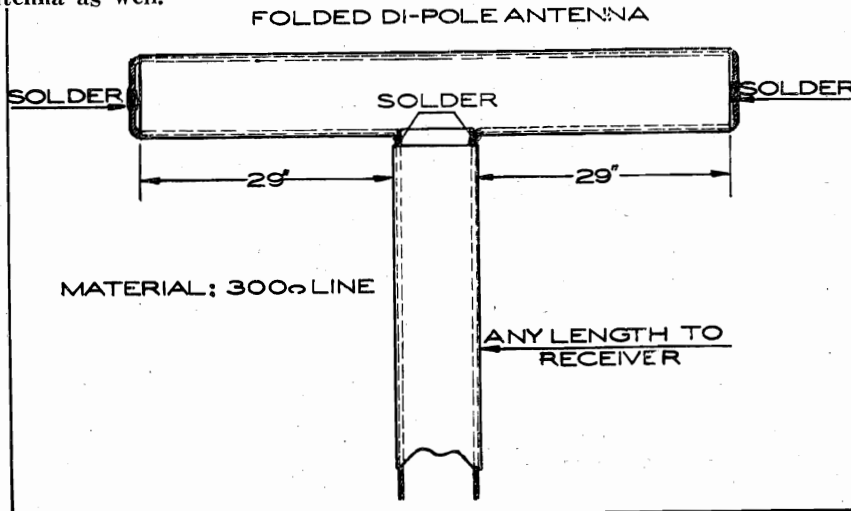
January 19, 1947



FM TUNER

EDWARD'S FM RADIO CORP.

In most metropolitan locations an indoor antenna may be all that is necessary. This by all means should be tried first, unless a suitable F.M. type outdoor antenna is already available. A very satisfactory indoor antenna may be improvised from a piece of 300 ohm flat type transmission line. (Same material as the antenna connection coming out from the tuner.) Cut the piece to a length of 60 inches. Then short circuit both ends. Then in the exact center cut one side of the line and use the two resulting ends to connect to the antenna line coming from the tuner. The antenna may be fastened to a molding or to a piece of wood with thumb tacks. (See diagram.) It is also advisable to try positioning the antenna at various angles and positions, so as to favor most desired stations. This applies to an outdoor antenna as well.



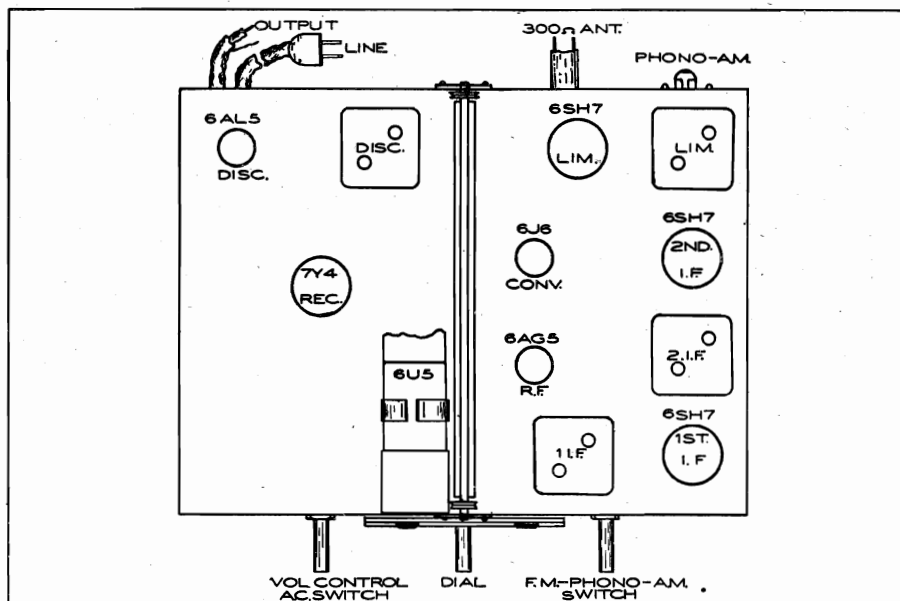
If this indoor antenna should prove unsatisfactory for your location, any standard half wave di-pole F.M. outdoor antenna may be used. A 300 ohm transmission line should be used to couple to the tuner.

Any high quality audio system may be employed. Connection can be made to the phono connection provided for on most better radio receivers. Volume may be controlled either directly at the tuner by means of the volume control provided for on the receiver or amplifier, whichever is more convenient. A phono input is provided in the rear of the tuner. The selector switch in the front may be used to switch from F.M. to phono, all connections then being permanent. If desired an A.M. tuner may be connected to the rear phono jack instead of a phono pickup.

After the tuner is in operation for about 10 minutes each time it is turned on it may be necessary to retune to compensate for a slight temperature rise drift. This will not be necessary thereafter. Tuning should be so done as to get maximum closing of the target on the 6U5 tuning eye mounted directly on the dial. However the ear should be the final judge of the exact dial position. This point will always be in the region of maximum tuning eye closing.

The output line is high impedance 500,000 ohms.

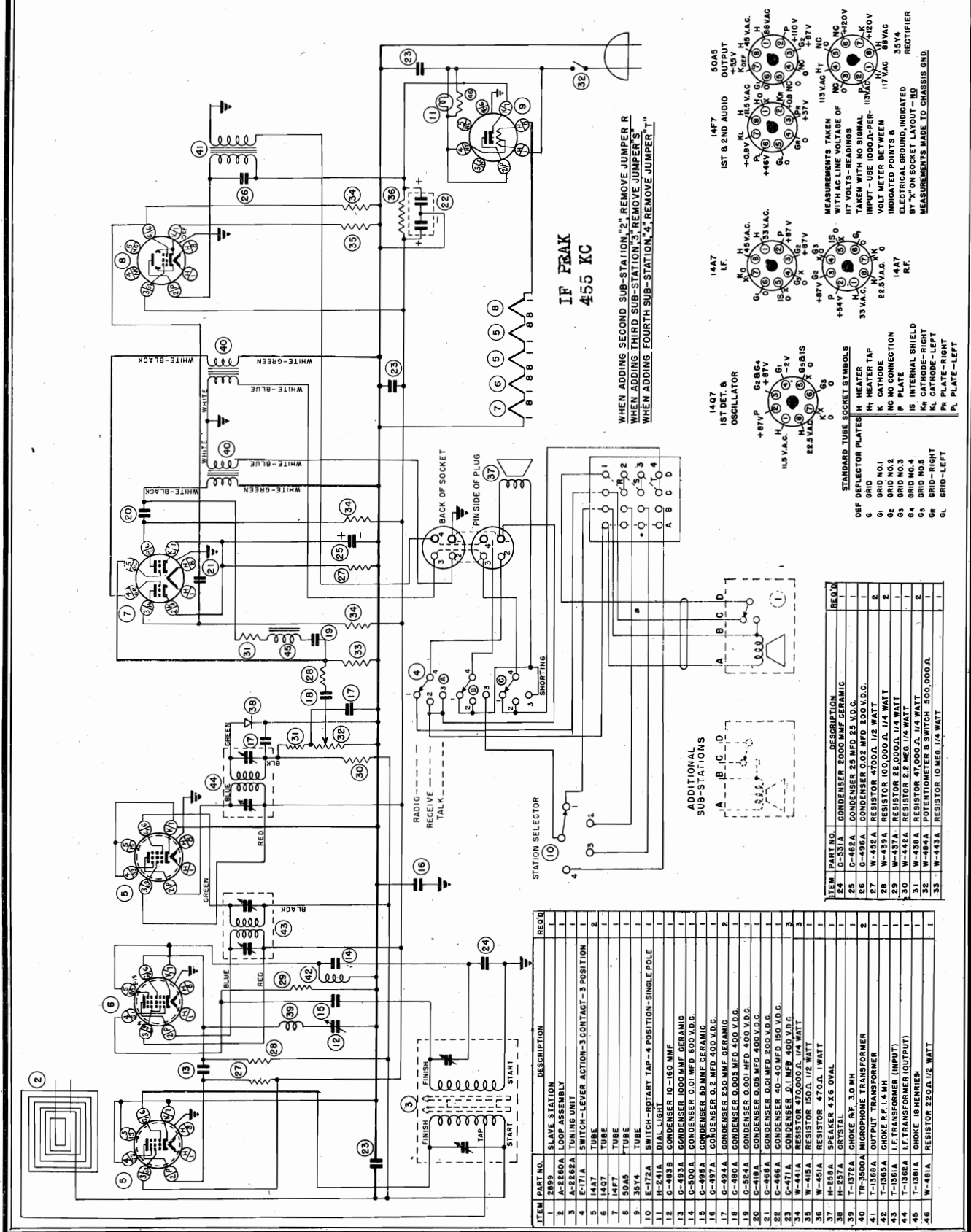
It should be ascertained that the 6J6 and 6AG5 miniature tubes mounted under the chassis are firmly in their sockets before attempting to operate the tuner.



ELECTRONIC LABORATORIES, INC.

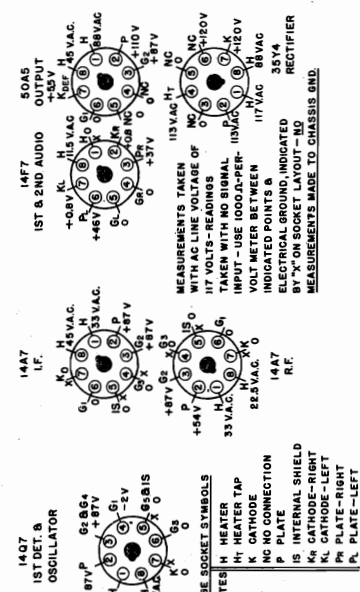
Radio Utiliphone,

MODEL 76RU,
Chassis 2865



IF PEAK
455 KC

WHEN ADDING SECOND SUB-STATION, 2, REMOVE JUMPER R
WHEN ADDING THIRD SUB-STATION, 3, REMOVE JUMPER S
WHEN ADDING FOURTH SUB-STATION, 4, REMOVE JUMPER T

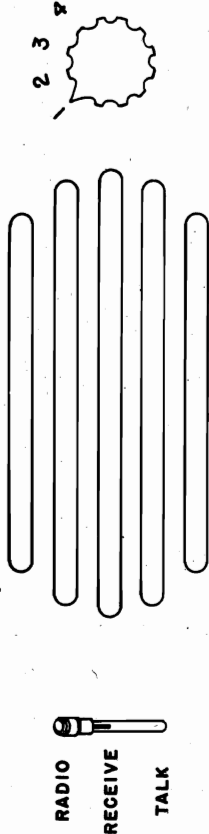


STANDARD TUBE SOCKET SYMBOLS
DEF DEFLECTOR PLATES H HEATER TAP
C GRID
G1 GRID NO.1
G2 GRID NO.2
G3 GRID NO.3
G4 GRID NO.4
G5 GRID NO.5
G6 GRID NO.6
G7 GRID NO.7
G8 GRID NO.8
G9 GRID NO.9
G10 GRID NO.10
H HEATER
K CATHODE
NC NO CONNECTION
P PLATE
IS INTERNAL SHIELD
KR CATHODE-RIGHT
KL CATHODE-LEFT
PL PLATE-LEFT

ITEM	PART NO.	DESCRIPTION	QTY	RECD
1	2899	SLAVE STATION	1	
2	A-2860A	LOOP ASSEMBLY	1	
3	A-2866A	TUNING UNIT	1	
4	E-717A	SWITCH-LEVER ACTION-3 CONTACT-3 POSITION	1	
5	147A	TUBE	2	
6	147B	TUBE	1	
7	1447	TUBE	1	
8	50A5	TUBE	1	
9	35Y4	TUBE	1	
10	E-172A	SWITCH-ROTARY TAP-4 POSITION-SINGLE POLE	1	
11	H-241A	DIAL LIGHT	1	
12	C-483B	CONDENSER 10-160 MMF	1	
13	C-493A	CONDENSER 1000 MMF CERAMIC	1	
14	C-500A	CONDENSER 0.01 MFD 500 V.D.C.	1	
15	C-499A	CONDENSER 50 MMF CERAMIC	1	
16	C-497A	CONDENSER 0.2 MFD 400 V.D.C.	1	
17	C-494A	CONDENSER 250 MMF CERAMIC	2	
18	C-489A	CONDENSER 0.005 MFD 400 V.D.C.	1	
19	C-526A	CONDENSER 0.001 MFD 400 V.D.C.	1	
20	C-481A	CONDENSER 0.005 MFD 400 V.D.C.	1	
21	C-486A	CONDENSER 40-40 MFD 150 V.D.C.	1	
22	C-471A	CONDENSER 0.1 MFD 400 V.D.C.	3	
23	W-41A	RESISTOR 470,000 Ω 1/4 WATT	1	
24	W-41A	RESISTOR 150 Ω 1/2 WATT	1	
25	W-451A	RESISTOR 470 Ω 1 WATT	1	
26	W-451A	SPEAKER 8 X 6 OVAL	1	
27	H-257A	CRYSTAL	1	
28	T-1572A	CHOKE 150 Ω 30 MH	1	
29	T-3500A	MICROPHONE TRANSFORMER	1	
30	T-1586A	CHOKE 150 Ω 30 MH	1	
31	T-1586A	CHOKE 150 Ω 30 MH	1	
32	T-1586A	CHOKE 150 Ω 30 MH	1	
33	T-1586A	CHOKE 150 Ω 30 MH	1	
34	T-1586A	CHOKE 150 Ω 30 MH	1	
35	T-1586A	CHOKE 150 Ω 30 MH	1	
36	T-1586A	CHOKE 150 Ω 30 MH	1	
37	T-1586A	CHOKE 150 Ω 30 MH	1	
38	T-1586A	CHOKE 150 Ω 30 MH	1	
39	T-1586A	CHOKE 150 Ω 30 MH	1	
40	T-1586A	CHOKE 150 Ω 30 MH	1	
41	T-1586A	CHOKE 150 Ω 30 MH	1	
42	T-1586A	CHOKE 150 Ω 30 MH	1	
43	T-1586A	CHOKE 150 Ω 30 MH	1	
44	T-1586A	CHOKE 150 Ω 30 MH	1	
45	T-1586A	CHOKE 150 Ω 30 MH	1	
46	W-481A	RESISTOR 220 Ω 1/2 WATT	1	

Radio Utiliphone,
MODEL 76RU,
Chassis 2865

ELECTRONIC LABORATORIES, INC.



VOLUME, ON-OFF Turn knob to the right to turn Radio-Utiliphone on. A click will be heard - wait 30 seconds for tubes to heat. Continue to turn the knob to the right to increase volume.

The Volume, ON-OFF switch must be turned on to operate both the radio, and the utiliphone.

DIAL Standard Broadcast Band - 540 to 1620 Kilocycles. Calibrated in kilocycles. Shadow indicator behind moving dial.

TUNING Radio Turn knob until desired station is heard. Rotate slowly back and forth until signal is strongest and clearest. Reduce or increase signal by using the volume control.

RADIO-RECEIVE-TALK SWITCH

This is a lever switch with a fixed position at "Radio" and "Receive", and a spring return from "Talk" to "Receive". To operate the radio, set the switch to the position marked "Radio".

To talk on the utiliphone, push the lever to "Talk" and hold in position while talking. To listen, release lever and let it swing back to "Receive" position.

SUB-STATION SELECTOR SWITCH

This is a four position switch with positions marked 1, 2, 3, and 4 indicating sub-stations 1, 2, 3, and 4 respectively. Set the sub-station selector switch for the desired station.

Model 7S Sub-Stations are each equipped with a push-to-talk switch, which is normally in the listen position. In order to talk from any sub-station, this switch must be depressed and held down while talking.

IF THE RADIO-UTILIPHONE FAILS TO OPERATE

FIRST- Check power supply by connecting a lamp to the outlet, or by connecting the radio-utiliphone in another socket.

SECOND - When used on DC, if the radio does not operate, even though the tubes are lighted, reverse the plug in the socket to provide correct polarity.

THIRD - See if tubes are lighted after the radio-utiliphone has been turned on for almost a minute. Tubes in the Electronic Model 76RU are connected so that if one tube is loose in its socket, or defective, none of the tubes will light.

See that tubes are pushed into sockets. If they still fail to light, have them checked by your local radio dealer.

IF THE UTILIPHONE FAILS TO OPERATE, but the radio does operate, check the following:

FIRST - Check the setting of the sub-station selector switch.

SECOND - Check for loose interconnecting wires.

THIRD - Check for correct connections between stations. Example: - Be sure the same wire is connected from Row 1 - Terminal "A" to Station 1 - Terminal "A", etc.

Any difficulties that are not corrected by following the above instructions should be referred to a competent serviceman.

SERVICE DATA—ALIGNMENT NOTES

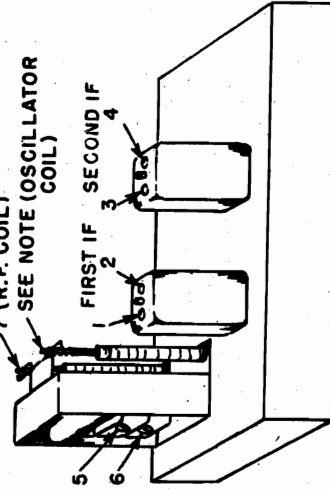
A. MECHANICAL ALIGNMENT:- The following mechanical adjustments should be made before alignment:

1. Rotate shaft of tuning unit until carriage is against top stop position.
2. Space oscillator coil slug 1-5/32" out from top of oscillator coil form.
3. Space R.F. coil slug 1-29/64" out from top end of R.F. coil winding. (Note:-The distance 1 and 2 should be measured from mounted end of the slug.)
4. Adjust screw on trimmer of wave trap towards open position so that condenser plates are open at least 1/32".

7 (R.F. COIL)

SEE NOTE (OSCILLATOR COIL)

FIRST IF SECOND IF



ELECTRONIC LABORATORIES, INC.

**Radio Utiliphone,
MODEL 76RU,
Chassis 2865**

B. I.F. ALIGNMENT PROCEDURE

1. Feed I.F. frequency from the signal generator through a 0.01 mfd condenser to the control grid of the R. F. tube.
2. No signal will be heard unless trimmer condenser under chassis is unscrewed and reduced from original setting.
3. Turn volume control full on.
4. Make preliminary I.F. adjustment with signal level approximately 50 Mv.
5. Tune I.F. trimmers for maximum signal, reducing I.F. signal input to coupling loop to keep output voltage less than 0.5 V.
6. When maximum output has been secured, adjust trimmer condenser in the I.F. trap (under chassis) by turning clockwise to the minimum signal.

C. R.F. ALIGNMENT PROCEDURE

1. Volume control full on.
2. Adjust tuning unit to top stop position.
3. Feed 1620 kc signal into external loop. Hold audio output below 0.5 V. Adjust the oscillator trimmer condenser to maximum output.
4. Move slugs in by means of tuning dial so that pointer is approximately 1" from the stop end, and a signal received from the external loop on a frequency of 1400 kc. Adjust lower trimmer (R.F. trimmer) to maximum output. Reduce R.F. input to keep signal output voltage below 0.5 V.
5. Rotate tuning shaft until pointer is approximately 1" from the other end of the scale. Feed to the external loop a test signal at 700 kc. Adjust the R.F. coil slug by rotation in the Tinnerman nut to maximum output.

NOTE: Alternately adjust R.F. trimmer and R. F. slug until maximum output is reached at both 1400 KC and 700 KC as instructed in paragraphs C4 and C5.

CAUTION: Extreme care should be taken in the 700 kc. position to make sure that the tuner carriage is not moved by the adjusting tools or hand pressure on the slug screw. Carriage should not be held against the frame, but should be allowed to assume its normal position when adjusting the R.F. coil slug.

SPECIFICATIONS

Power consumption..... 35 Watts
(At 117 volts AC Supply)
Power Output- 1.1 Watts 10% Distortion
1.6 Watts Max.
Selectivity----49 KC Broad at
1000 times Signal
Intermediate Frequency..... 455 KC
Speaker..... 4"x6" Oval
Tuning Frequency Range..540 to 1620 KC
Sensitivity (For .05 Watt output-external Antenna) 15 microvolts average

ALIGNMENT PROCEDURE-

Volume Control-Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The equipment in column at right is required for Aligning:

Signal Generator which will provide an accurately calibrated signal at test frequencies as listed.

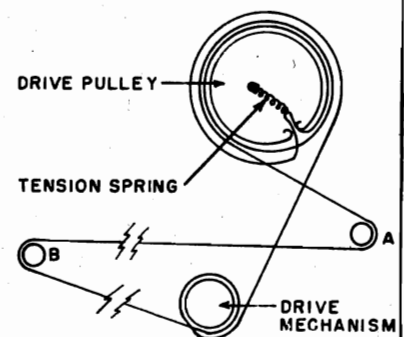
Output Indicating Meter; Non-Metallic Screwdriver.

Dummy Antennas-.01 mf., and 400 ohms.

SIGNAL GENERATOR			DUMMY ANTENNA	TUNER SETTING	TRIMMER ADJUSTMENT (SEE DIAGRAM)	NOTES
FREQUENCY SETTING	ANTENNA CONNECTION	COUPLING				
I.F. 455 KC	Grid of RF tube 14A7	Ground generator to chassis	0.01 mfd	Out	Adjust for Max. 1, 2, 3 and 4	
I.F. 455 KC	Grid of RF tube 14A7	Ground generator to chassis	0.01 mfd	Out	Trim condenser under chassis for Min. output.	If it is found that regeneration prevails when the loop antenna is put in its normal position close to the tubes, then the under chassis trimmer is incorrectly set, and should be adjusted to prevent the regenerative condition.
1620 KC	Inductive Coupling to Loop	Loop coupling with leads brought out	400 ohms in series with Antenna & Gnd. leads	Out	Adjust Osc. #5 for Max. Signal	
1400 KC	Inductive Coupling to Loop	Loop coupling with leads brought out	400 ohms in series with Antenna & Gnd. leads	Dial set for 1400KC	Adjust RF trimmer #6 for Max. Signal	
700 KC	Inductive Coupling to Loop	Loop Coupling with leads brought out	400 ohms in series with Antenna & Gnd. leads	Dial set for 700KC	Adjust RF tuning core #7 for Max. Signal (care should be taken not to disturb carriage position of tuner)	Alternately adjust R.F. trimmer and R.F. slug until maximum output is reached at both 1400 KC and 700 KC as instructed above.

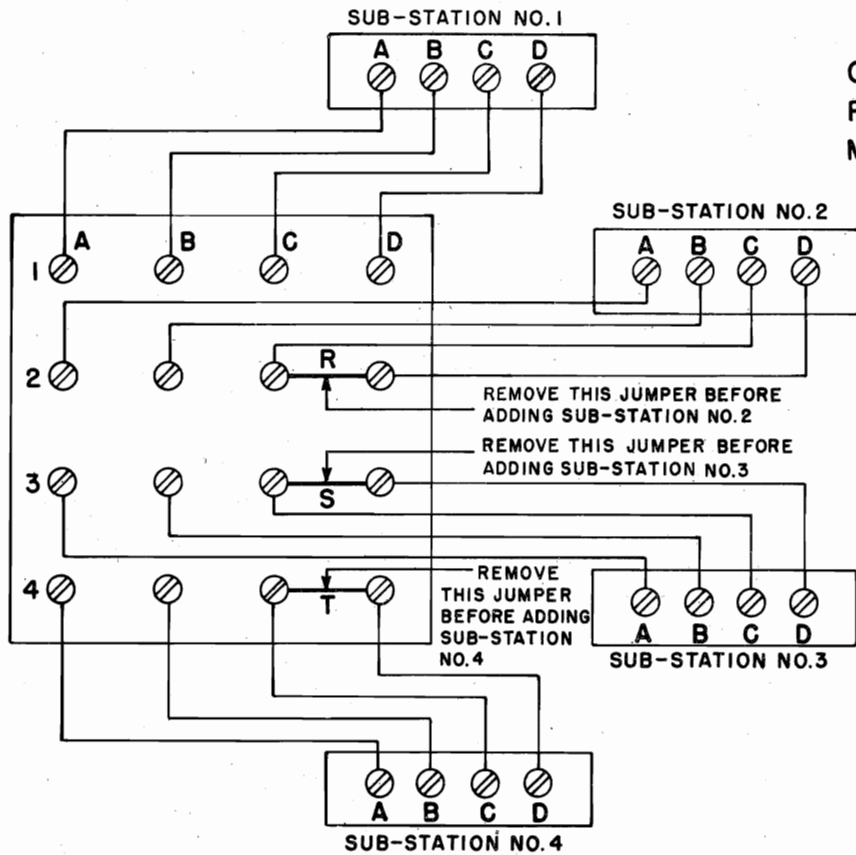
DRIVE CORD REPLACEMENT

Turn the tuner to the fully open position. Use a new cord 41" long and tie one end to the tension spring. Fasten the other end of the tension spring to the drive pulley. Pass cord through slot in pulley ring; add spring tension and continue one and one-half turns counterclockwise over top of pulley. Then pass cord around idler pulley A, starting over top and going around clockwise. Pass cord over idler pulley B, starting over top and going around counter clockwise. Wind one full turn counterclockwise around drive mechanism. Then wind one full turn counterclockwise around drive pulley, pass through slot in pulley and tie string to tension spring. Cut off excess string. Attach dial pointer to cord.



MODEL 76RU

ELECTRONIC LABORATORIES, INC.



TO CONNECT TWO OR MORE SUB-STATIONS

The Model 76RU Radio-Utiliphone is supplied, by the manufacturer, set up to operate one sub-station. If more than one sub-station is to be installed, be sure to read all instructions before starting to connect the stations.

Terminal board on the 76RU, is marked 1, 2, 3, 4, and A, B, C, D. The numbers 1, 2, 3, and 4 indicate stations, the letters A, B, C and D indicate the four terminals which are to be used for connections to the sub-stations.

Stations must be connected in sequence as marked. IF ONLY ONE STATION IS TO BE USED, IT MUST BE CONNECTED TO THE SET OF TERMINALS MARKED "1".

THE SAME WIRE MUST BE CONNECTED BETWEEN TERMINALS HAVING THE SAME MARKINGS:-

- Terminal 1A (on Model 76RU) to Terminal A on No. 1 Sub-Station
 - Terminal 1B (on Model 76RU) to Terminal B on No. 1 Sub-Station
 - Terminal 1C (on Model 76RU) to Terminal C on No. 1 Sub-Station
 - Terminal 1D (on Model 76RU) to Terminal D on No. 1 Sub-Station
- Be certain that jumpers R, S, and T are in place per diagram.

LINE VOLTAGE

Model 76RU Radio Utiliphone operates only on a power supply of 105-125 volts AC, 50 to 60 cycles, or 105-125 volts DC. If in doubt about your line voltage, check with your local power company before connecting the Radio-Utiliphone.

If there seems to be an excessive amount of hum when operating the radio on AC, reverse the position of the line plug in the socket.

On DC operation, if the radio does not operate within one minute after it is connected, reverse the position of the line plug in the socket.

Model 7S Sub-Station requires no electrical power connection.

LOCATION

If two units are located in the same room and are too close together, they may "sing" due to acoustic feedback. By experimenting, it is possible to change the position of the units so that this feedback is eliminated.

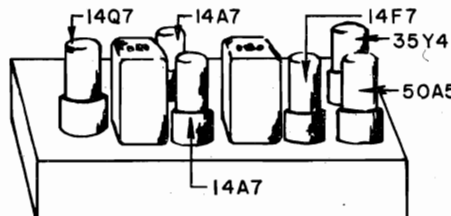
TUBES AND DIAL LAMP

The type and position of tubes are shown in illustration.

All tubes and the dial lamp MUST be in the socket to operate the radio-utiliphone.

CAUTION - If a dial lamp burns out, it should be replaced at once. A hole in the bottom of the cabinet provides access to the dial lamp so that it may be replaced without removing chassis from the cabinet.

Use only a #47 dial lamp.



INSTALLATION
CONNECTION, MODEL 76RU
RADIO-UTILIPHONE AND
MODEL 7S SUB-STATIONS

Model 76RU Radio-Utiliphone and Model 7S Sub-Station are interconnected by using the four-conductor wire furnished. (Additional lengths, up to approximately 500 feet may be used. This is available in 50 foot lengths.) The wire supplied with the equipment is color coded for convenience in making connections. Connections on each unit are made to screws on the terminal boards provided. (See connection diagram.)

The terminal board on the Sub-Station is located on the back of the cabinet, and on the radio-utiliphone, it is located on the back of the chassis inside of the cabinet. Remove four screws in the corners of the back cover. The back cover may then be pulled away from the cabinet far enough to permit access to the terminal board.

Wires must be clean and free of insulation before making connections. To insure a good connection, the wire should be wrapped completely around the screw terminal. Screw should then be tightened so that wires are held securely in place. Faulty connections of any kind may interfere with operation.

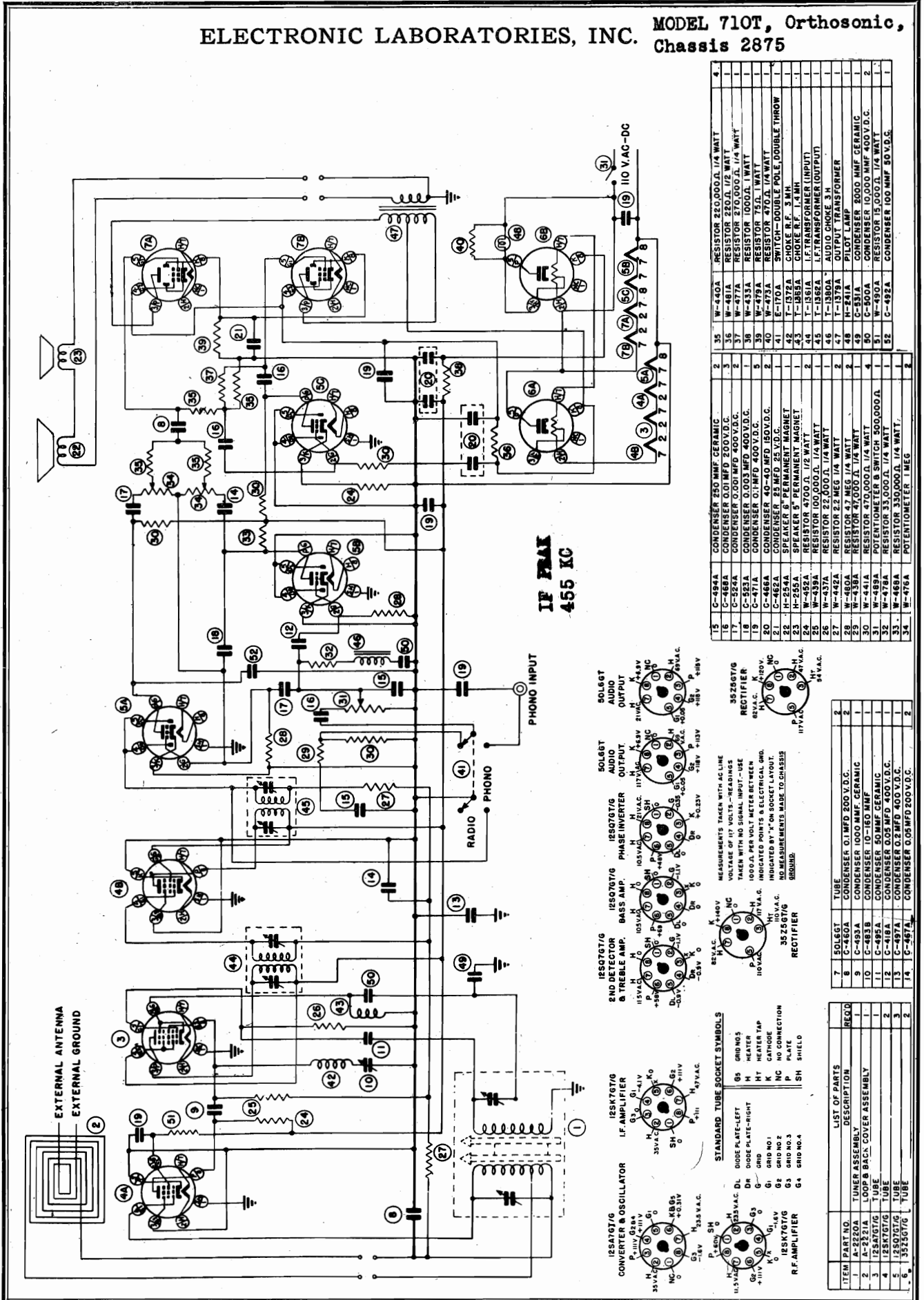
TO CONNECT ONE SUB-STATION

Sub-Stations must always be connected in sequence as marked on the terminal board. If two sub-stations are used, they must be connected to the terminals marked "1" and "2". Before connecting station No. 2, remove jumper "R" (refer to connection diagram). Then connect wires between terminals #2A, #2B, #2C, and #2D and Terminals A, B, C, and D of No. 2 sub-station. IF ONE STATION IS LATER REMOVED, THE REMAINING STATION MUST THEN BE CONNECTED TO THE TERMINALS MARKED "1", AND JUMPER "R" MUST BE REPLACED.

Three sub-stations must be connected to terminals #1, #2 and #3. Before connecting station #3, remove jumper "S" (refer to connection diagram). Then connect wires between terminals #3A, #3B, #3C and #3D, and terminals A, B, C, and D of No. 3 sub-station. If the third station is later removed, the two remaining stations must be connected to terminals marked "1" and "2", and jumper "S" must be replaced.

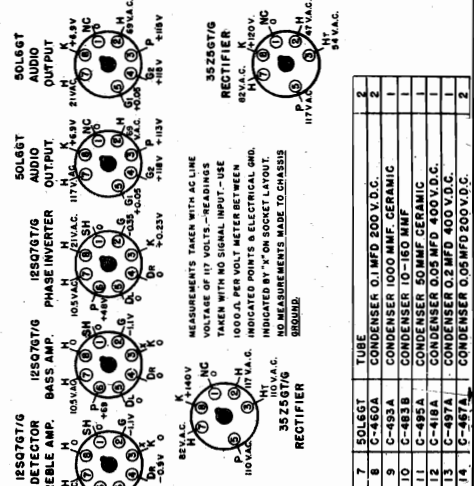
Before connecting station No. 4, remove jumper "T" (refer to connection diagram). Then connect wires between terminals #4A, #4B, #4C, and #4D, and terminals A, B, C, and D of No. 4 sub-station. If fourth station is later removed, the three remaining stations must be connected to terminals #1, #2 and #3, and jumper "T" must be replaced.

ELECTRONIC LABORATORIES, INC. MODEL 710T, Orthosonic, Chassis 2875



IF FRAX
455 KC

15	C-4944	CONDENSER 250 MMF CERAMIC	2	35	W-450A	RESISTOR 320,000 Ω 1/4 WATT	4
16	C-468A	CONDENSER 0.01 MFD 200V D.C.	3	37	W-491A	RESISTOR 250 Ω 1/2 WATT	1
17	C-524A	CONDENSER 0.001 MFD 400V D.C.	2	38	W-477A	RESISTOR 270,000 Ω 1/4 WATT	1
18	C-523A	CONDENSER 0.003 MFD 400V D.C.	1	39	W-479A	RESISTOR 1000 Ω 1 WATT	1
19	C-471A	CONDENSER 0.1 MFD 400V D.C.	5	40	W-473A	RESISTOR 75 Ω 1/4 WATT	1
20	C-466A	CONDENSER 40-40 MFD 150V D.C.	2	41	E-170A	SWITCH-DOUBLE POLE, DOUBLE THROW	1
21	C-462A	CONDENSER 25 MFD 25 V.D.C.	1	42	T-1572A	CHOKER R.F. 5 MH	1
22	H-254A	SPEAKER 8" PERMANENT MAGNET	1	43	T-1565A	CHOKER R.F. 1.4 MH	1
23	H-255A	SPEAKER 5" PERMANENT MAGNET	2	44	T-1582A	I.F. TRANSFORMER (INPUT)	1
24	W-315A	RESISTOR 100,000 Ω 1/2 WATT	1	45	T-1590A	I.F. TRANSFORMER (OUTPUT)	1
25	W-316A	RESISTOR 22,000 Ω 1/4 WATT	1	46	T-1590A	OUTPUT TRANSFORMER	1
26	W-442A	RESISTOR 2.2 MEG 1/4 WATT	2	47	W-490A	PILOT LAMP	1
27	W-480A	RESISTOR 47 MEG 1/4 WATT	1	48	C-331A	CONDENSER 2000 MMF CERAMIC	1
28	W-438A	RESISTOR 470,000 Ω 1/4 WATT	1	49	C-300A	CONDENSER 10,000 MMF 400V D.C.	2
29	W-441A	RESISTOR 470,000 Ω 1/4 WATT	4	50	C-490A	RESISTOR 15,000 Ω 1/4 WATT	1
30	W-488A	POTENTIOMETER 8 SWITCH 500,000 Ω	1	51	W-490A	RESISTOR 10,000 Ω 1/4 WATT	1
31	W-478A	RESISTOR 33,000 Ω 1/4 WATT	1	52	C-492A	CONDENSER 100 MMF 50V D.C.	1
32	W-468A	RESISTOR 330,000 Ω 1/4 WATT	1				
33	W-468A	POTENTIOMETER 1 MEG	2				



ITEM	PART NO.	DESCRIPTION	RECD
1	A-2220A	TUNER ASSEMBLY	1
2	A-2221A	LOOP B BACK COVER ASSEMBLY	1
3	12SQ7GT/6	TUBE	1
4	12SK7GT/6	TUBE	2
5	12SQ7GT/6	TUBE	1
6	50L6GT/6	TUBE	2

MODEL 710T

ELECTRONIC LABORATORIES, INC.

DIAL Standard Broadcast Band. 540 to 1620 Kilocycles. Calibrated in channel numbers. Add a zero to the dial number to obtain the kilocycle number.

VOLUME, ON-OFF Turn knob to the right to turn radio on. A click will be heard - wait 30 seconds for tubes to heat. Continue to turn the knob to the right to increase the volume.

This control acts as a master volume control after treble and bass response has previously been set by the treble and bass controls. If the treble and bass controls are both turned completely off (counter-clockwise) there will be no volume to the final amplifier and therefore no sound will be heard.

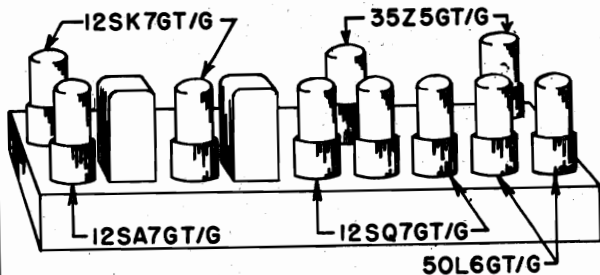
TUNING Turn knob until desired station is heard. Rotate slowly back and forth until signal is strongest and clearest. Reduce or increase signal by using the volume control.

TUBES AND DIAL LAMP The type and position of tubes are shown in illustration.

All tubes and the dial lamp MUST be in the socket to operate the radio.

CAUTION - If a dial lamp burns out, it should be replaced at once. A hole in the bottom of the cabinet provides access to the dial lamp so that it may be replaced without removing chassis from the cabinet.

Use only a No. 47 dial lamp



MECHANICAL ALIGNMENT:- The following mechanical adjustments should be made before alignment:

1. Rotate shaft of tuning unit until carriage is against top stop position.
2. Space oscillator coil slug 1-5/32" out from top of oscillator coil form.
3. Space R.F. coil slug 1-29/64" out from top end of R.F. coil winding.
(Note:-The distance 1 and 2 should be measured from mounted end of the slug)
4. Adjust screw on trimmer of wave trap towards open position so that condenser plates are open at least 1/32".

BASS This control adjusts the volume output from the bass amplifier. For balanced reception, this control should be turned completely on (clockwise). If less than normal is desired, the bass response can be lowered by turning the knob counter-clockwise until desired response is obtained.

TREBLE This control adjusts the volume output from the treble amplifier. For balanced reception, this control should be turned completely on (clockwise). If less treble response than normal is desired, or if unusually noisy reception conditions are encountered, this control should be turned counter-clockwise until desired response is obtained.

TREBLE AND BASS CONTROLS Since these controls actually regulate the volume output of separate channels, it should be noted that if both bass and treble controls are turned to the off position, there will be no output from the speaker regardless of the position of the master volume control.

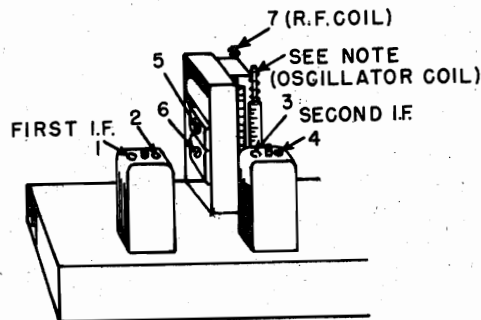
ANTENNA A High Q Loop Antenna is built into the cabinet of the Electronic Model 710T Orthosonic Radio. No other antenna is usually required for reception of local or powerful stations. Since directional effects are obtained by using only the built-in loop antenna, the signal pickup may be increased and interference from nearby stations decreased, by changing the position of the radio until the signal is at a maximum.

LINE VOLTAGE

Electronic Model 710T Orthosonic Radio operates only on a power supply of 105-125 volts A.C. 50 to 60 cycles, or 105-125 volts D.C. If in doubt about your line voltage, check with your local power company before connecting the radio.

If there seems to be an excessive amount of hum when operating the radio on A.C., reverse the position of the line plug in the socket.

On D.C. operation, if the radio does not operate within one minute after it is connected, reverse the position of the line plug in the socket.



CONTROLS



ELECTRONIC LABORATORIES, INC.

I.F. ALIGNMENT PROCEDURE

1. Feed I.F. frequency from the signal generator through a 0.01 mfd condenser to the control grid of the R. F. tube.
2. No signal will be heard unless trimmer condenser under chassis is unscrewed and reduced from original setting.
3. Turn volume control full on.
4. Make preliminary I.F. adjustment with signal level approximately 50 Mv.
5. Tune I.F. trimmers for maximum signal, reducing I.F. signal input to coupling loop to keep output voltage less than 0.7 V.
6. When maximum output has been secured, adjust trimmer condenser in the I.F. trap by turning clockwise to the minimum signal.

R.F. ALIGNMENT PROCEDURE

1. Volume control full on.
2. Adjust tuning unit to top stop position.
3. Feed 1620 kc signal into external loop. Hold audio output below 0.7 V. Adjust the oscillator trimmer condenser to maximum output.
4. Move slugs in by means of tuning dial so that pointer is approximately 1" from the stop end, and a signal received from the external loop on a frequency of 1400 kc. Adjust lower trimmer (R.F. trimmer) to maximum output. Reduce R.F. input to keep signal output voltage below 0.7 V.
5. Rotate tuning shaft until pointer is approximately 1" from the other end of the scale. Feed to the external loop a test signal at 700 kc. Adjust the R.F. coil slug by rotation in the Tinnerman nut to maximum output.

NOTE: Alternately adjust R.F. trimmer and R.F. slug until maximum output is reached at both 1400 kc. and 700 kc. as instructed in paragraphs C4 and C5.

CAUTION: Extreme care should be taken in the 700 kc. position to make sure that the tuner carriage is not moved by the adjusting tools or hand pressure on the slug screw. Carriage should not be held against the frame, but should be allowed to assume its normal position when adjusting the R.F. coil slug.

SPECIFICATIONS

Power consumption..... 60 Watts
 (At 117 volts AC Supply)
 Power Output- 3.5 Watts Max.
 2.5 Watts 10% Distortion
 Selectivity----45 KC Broad at
 1000 times Signal
 Intermediate Frequency..... 455 KC
 Speakers..... 4 1/2" PM Dynamic
 6" PM Dynamic
 Tuning Frequency Range.. 540 to 1620 KC
 Sensitivity (For .05 Watt output-external
 Antenna) 10 microvolts average

ALIGNMENT PROCEDURE

Volume Control-Maximum All Adjustments.

Signal Generator which will provide an accurately calibrated signal at test frequencies as listed.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

Output Indicating Meter; Non-Metallic Screwdriver.

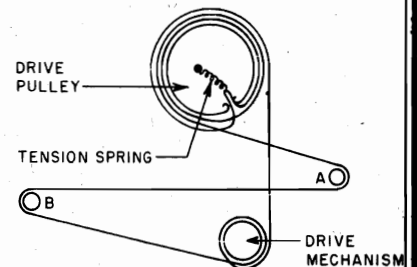
The equipment in column at right is required for Aligning:

Dummy Antennas-.01 mf., and 400 ohms.

FREQUENCY SETTING	SIGNAL GENERATOR		DUMMY ANTENNA	TUNER SETTING	TRIMMER ADJUSTMENT (SEE DIAGRAM)	NOTES
	ANTENNA CONNECTION	COUPLING				
I.F. 455 KC	Grid of RF tube 12SK7 GTG	Ground generator to chassis	0.01 mfd	Out	Adjust for Max. 1, 2, 3 and 4	No signal will be heard unless trimmer condenser under chassis is unscrewed and reduced from original setting
I.F. 455 KC	Grid of RF tube 12SK7 GT/G	Ground generator to chassis	0.01 mfd	Out	Trim condenser under chassis for Min. output.	If it is found that regeneration prevails when the loop antenna is put in its normal position close to the tubes, then the under chassis trimmer is incorrectly set, and should be adjusted to prevent the regenerative condition.
1620 KC	Inductive Coupling to Loop	Loop coupling with leads brought out	400 ohms in series with Antenna & Gnd. leads	Out	Adjust Oso. #5 for Max. signal	
1400 KC	Inductive Coupling to Loop	Loop coupling with leads brought out	400 ohms in series with Antenna & Gnd. leads	Dial set for 1400KC	Adjust RF trimmer #6 for Max. Signal.	
700 KC	Inductive Coupling to Loop	Loop Coupling with leads brought out	400 ohms in series with Antenna & Gnd. leads	Dial set for 700KC	Adjust RF tuning core #7 for Max. Signal (care should be taken not to disturb carriage position of tuner)	Alternately adjust R.F. trimmer and R.F. slug until Maximum output is reached at both 1400 KC and 700 KC as instructed above.

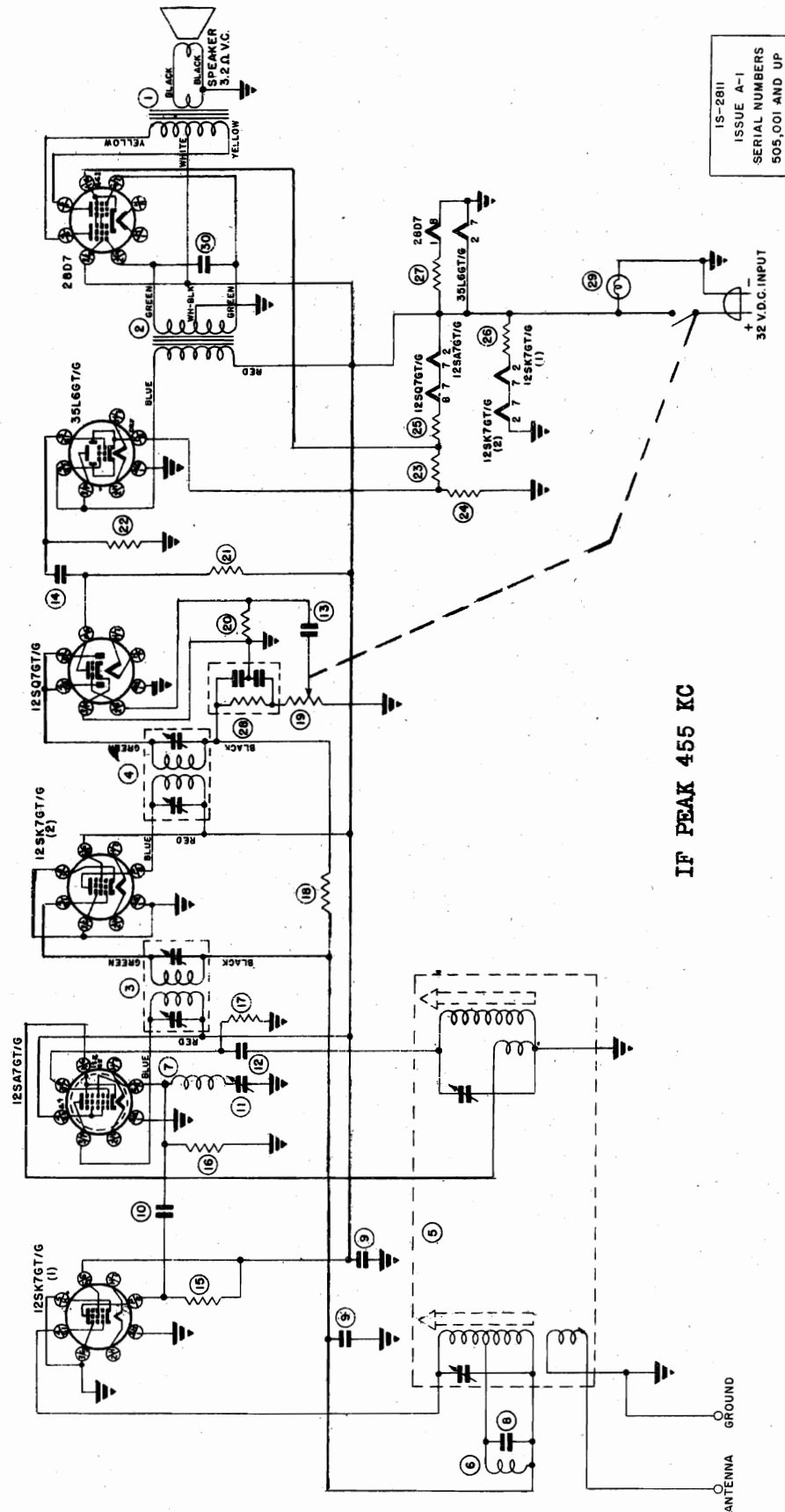
DRIVE CORD REPLACEMENT

Turn the tuner to the fully open position. Use a new cord 50" long and tie one end to the tension spring. Fasten the other end of the tension spring to the drive pulley. Pass cord through slot in pulley ring; add spring tension and continue one and one-half turns counterclockwise over top of pulley. Then pass cord around idler pulley A, starting over top and going around clockwise. Pass cord over idler pulley B, starting over top and going around counter clockwise. Wind one full turn counterclockwise around drive mechanism. Then wind one full turn counterclockwise around drive pulley, pass through slot in pulley and tie string to tension spring. Cut off excess string. Attach dial pointer to cord.



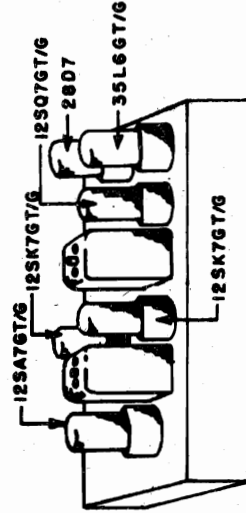
MODEL 2811

ELECTRONIC LABORATORIES, INC.



IF PEAK 455 KC

15-2811
ISSUE A-1
SERIAL NUMBERS
505,001 AND UP



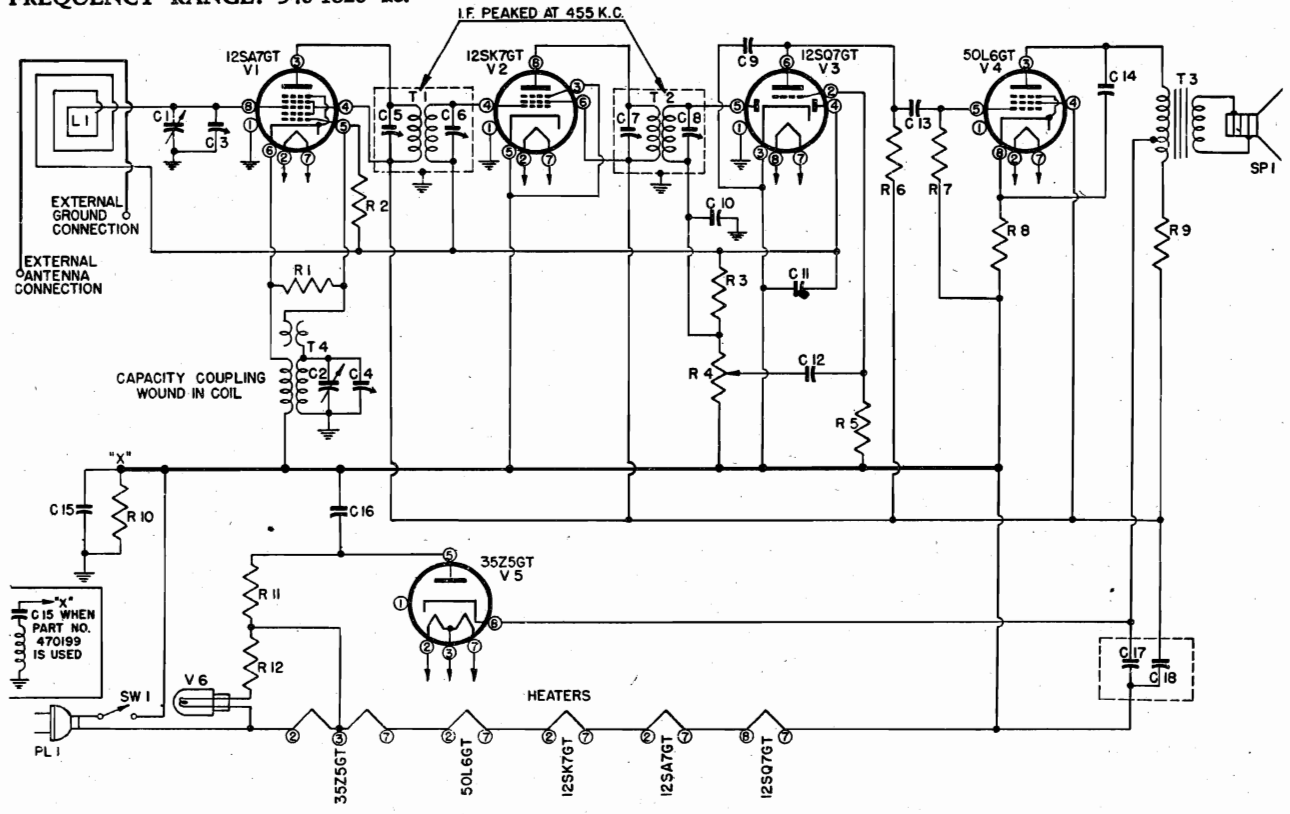
15	W-492A	RESISTOR 4700 Ω 1/2 WATT	1
16	W-442A	RESISTOR 2.2 MEG Ω 1/4 WATT	1
17	W-437A	RESISTOR 22,000 Ω 1/4 WATT	1
18	W-417A	RESISTOR 1 MEG Ω 1/2 WATT	1
19	W-444A	POTENTIOMETER & SWITCH 500,000 Ω	1
20	W-443A	RESISTOR 10 MEG Ω 1/4 WATT	1
21	W-440A	RESISTOR 220,000 Ω 1/4 WATT	1
22	W-441A	RESISTOR 470,000 Ω 1/4 WATT	1
23	W-78B	RESISTOR 5 Ω 1/2 WATT	1
24	W-494A	RESISTOR 22 Ω 1 WATT	1
25	W-175A	RESISTOR 15 Ω 2 WATT	1
26	W-493A	RESISTOR 47 Ω 1 WATT	1
27	W-190A	RESISTOR 10 Ω 2 WATT	1
28	A-2297A	DIODE FILTER UNIT	1
29	M-266A	DIAL LIGHT-36 VOLT	1
30	C-524A	CONDENSER 0.001 MFD 400 V.D.C.	1

ITEM	PART NO.	DESCRIPTION	REQ'D
1	T-1385A	OUTPUT TRANSFORMER	1
2	T-1366A	DRIVER TRANSFORMER	1
3	T-1361A	I.F. TRANSFORMER	1
4	T-1362A	I.F. TRANSFORMER	1
5	A-2309A	TUNER ASSEMBLY	1
6	T-1367A	CHOKES 304 MICROHENRIES	1
7	T-1372A	CHOKES 3 MILLIHENRIES	1
8	C-541A	CONDENSER 12 MMF CERAMIC	1
9	C-460A	CONDENSER 0.1 MFD 200 V.D.C.	2
10	C-493A	CONDENSER 1000 MMF-CERAMIC	1
11	C-483B	CONDENSER 10-160 MMF	1
12	C-495A	CONDENSER 50 MMF-CERAMIC	1
13	C-480A	CONDENSER 0.005 MFD 400 V.D.C.	1
14	C-468A	CONDENSER 0.01 MFD 200 V.D.C.	1

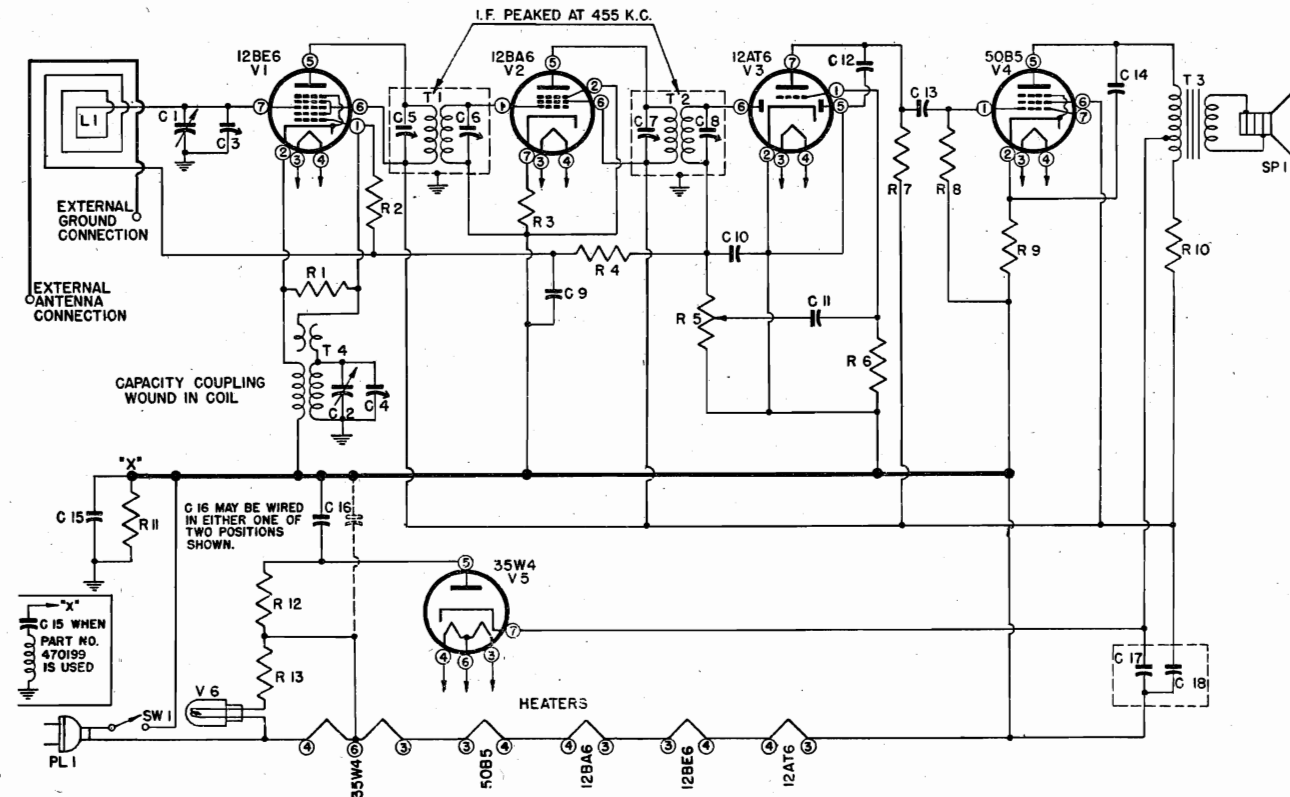
EMERSON RADIO & PHONO. CORP.

MODELS 503, 510, 510A, 520, 539
Chassis 120000, 120029, 120030,
120032, 120035, 120044

TYPE: Single-band superheterodyne.
FREQUENCY RANGE: 540-1620 kc.



Schematic Circuit Diagram of Chassis Models 120000, 120029, 120030, 120044



Schematic Circuit Diagram of Chassis Models 120032, 120035

MODELS 503, 510, 510A, 520, 539
 MODELS 507, 509, 518, 522, 535
 MODELS 525, 552
 MODELS 543, 544

EMERSON RADIO & PHONO. CORP.

ALL MODELS

An oscillator with frequencies of 455, 600 and 1425 kc is required.

An output meter should be connected across the primary or secondary of the output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Plug the receiver into the power supply outlet in such a way that the ground side of the power line is connected to the receiver B—.

Location of Coils and Trimmer Adjustments

The first i-f transformer is mounted on top of the chassis deck to the right of the variable condenser. The trimmers are accessible through holes in the top of the can.

The second i-f transformer is mounted on top of the chassis between the variable condenser and the speaker. The trimmers are accessible through holes in the top of the can.

The trimmer for the antenna and the trimmer for the oscillator coil are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil is located underneath the chassis. The loop antenna acts as the antenna coil.

The following voltage readings are d-c measurements taken from B— (line switch) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. Line voltage for these readings was 117 volts, 60 cycles, a.c. Measurements made with 117 volts d.c. will be lower than those given below. Take readings with the volume control set at minimum and the variable condenser closed.

TUBE	PIN NUMBER							
	1	2	3	4	5	6	7	8
12SA7			89	89	*—10			*—1.6
12SK7				*—1.6		89		89
12SQ7		*—0.7		*—1.6	—0.5	37.5		
50L6GT			110	89				6.2
35Z5GT				116		116		117
12BE6	*—8.0				92	92	*—1.3	
12BA6					92	92	1.7	
12AT6	*—0.6					*—0.45	*44	
50B5		5.65			110	92		
35W4	115						115	

* Not supplied separately.
 † Specify part number when ordering.

CABINET AND DIAL PARTS

MODEL--507, 509, 518, 522, 535

140015	Cabinet (Model 507)	531009	Drive pulley
140016	Cabinet (Model 509)	280003	Drive shaft
140034	Cabinet (Model 518)	520499	Dial backplate (Models 507, 509, 518, 522)
140007	Cabinet (Model 522)	520024	Dial backplate (Model 535)
140070	Cabinet (Model 535)	520350	Dial crystal, stamped (Models 507, 509, 522), or
450060	Back, molded (Model 507)	520190	Dial crystal, stamped (Models 507, 509, 522)
450080	Back, molded (Models 509, 518)	520440	Dial crystal (Model 518)
450050	Back, molded (Model 522)	520025	Dial crystal (Model 535)
560110	Back masonite (Model 507)	525080	Dial pointer (Models 507, 509, 518, 522)
560220	Back, masonite (Models 509, 518)	525130	Dial pointer (Model 535)
560120	Back, masonite (Model 522)	411040	Pointer hub (Model 535)
575047	Back, wood (Model 535)		
450000	Handle		
460140	Knob (Models 507, 518, 535)		
460470	Knob (Model 509)		
460150	Knob (Model 522)		

MODELS 503, 510, 510A, 520, 539

EMERSON RADIO & PHONO. CORP.

CHASSIS 12000, 120029, 120030, 120044

Schematic Symbol	†Part No.	DESCRIPTION	Schematic Symbol	†Part No.	DESCRIPTION
C1, C2	900170	Two-gang variable condenser (chassis 120000)	L1	700200	Loop antenna, or
C1, C2	900319	Two-gang variable condenser (chassis 120030 and 120044)	L1	700210	Loop antenna
C1, C2	900290	Two-gang variable condenser (chassis 120029)	*PL1		Plug, part of line cord
*C3, C4		Trimmers, part of variable condenser	R1	310810	22,000 ohms, ¼ watt resistor
*C5, C6, } C7, C8 }		Trimmers, part of i-f transformers	R2, R5	397000	15 meg., ½ watt resistor
C9	920170	0.001 mfd., 600 volt condenser	R3	321330	3.3 meg., ¼ watt resistor
C10	910000	0.00022 mfd. mica condenser	R4	390010	0.5 meg. volume control
C11	920040	0.1 mfd., 200 volt condenser	R6, R7	321130	470,000 ohms, ¼ watt resistor
C12	920010	0.002 mfd., 600 volt condenser	R8	340290	150 ohms, ½ watt resistor
C13, C14	920020	0.02 mfd., 400 volt condenser	R9	370490	1,000 ohms, 1 watt resistor
C15	920050	0.2 mfd., 200 volt condenser, or	R10	321050	220,000 ohms, ¼ watt resistor
C15	470199	0.2 mfd., 200 volt assembly (used only with midget i-f transformers 720525 and 720529)	R11	340050	15 ohms, ½ watt resistor
C16	920030	0.05 mfd., 400 volt condenser	R12	340010	10 ohms, ½ watt resistor
C17, C18	925009	50-50 mfd., 150 volt dual electrolytic condenser	SP1	180000	P.M. speaker
L1	700000	Loop antenna, or	*SW1		Line switch on volume control
			T1	720000	First i-f transformer, or
			T1	720525	First i-f transformer, midget
			T2	720100	Second i-f transformer, or
			T2	720529	Second i-f transformer, midget
			T3	734000	Output transformer
			T4	716010	Oscillator coil
				583010	Line cord

CHASSIS 120032, 120035

C1, C2	900319	Two-gang variable condenser	R1	310810	22,000 ohms, ¼ watt resistor
*C3, C4		Trimmers, part of variable condenser	R2, R6	397000	15 meg., ½ watt resistor
*C5, C6, } C7, C8 }		Trimmers, part of i-f transformers	R3	340310	180 ohms, ½ watt resistor
C9	920040	0.1 mfd., 200 volt condenser	R4	321290	2.2 meg., ¼ watt resistor
C10	910000	0.00022 mfd. mica condenser	R5	390010	0.5 meg. volume control
C11	920010	0.002 mfd., 600 volt condenser	R7, R8	321130	470,000 ohms, ¼ watt resistor
C12	920170	0.001 mfd., 600 volt condenser	R9	340290	150 ohms, ½ watt resistor
C13, C14	920020	0.02 mfd., 400 volt condenser	R10	370490	1,000 ohms, 1 watt resistor
C15	920050	0.2 mfd., 200 volt condenser, or	R11	321050	220,000 ohms, ¼ watt resistor
C15	470199	0.2 mfd., 200 volt assembly (used only with midget i-f transformers 720525 and 720529)	R12	340050	15 ohms, ½ watt resistor
C16	920030	0.05 mfd., 400 volt condenser	R13	340010	10 ohms, ½ watt resistor
C17, C18	925009	50-50 mfd., 150 volt dual electrolytic condenser	SP1	180000	P.M. speaker
L1	700000	Loop antenna, or	*SW1		Line switch on volume control
L1	700210	Loop antenna	T1	720000	First i-f transformer, or
*PL1		Plug, part of line cord	T1	720525	First i-f transformer, midget
			T2	720100	Second i-f transformer, or
			T2	720529	Second i-f transformer, midget
			T3	734000	Output transformer
			T4	716010	Oscillator coil
				583010	Line cord

CABINET AND DIAL PARTS

* Not supplied separately.

† Specify part numbers when ordering

807000	Pilot light	520470	Dial crystal, printed (Chassis 120030, 120035)
280103	Drive shaft	460140	Knob (Model 503)
520019	Dial backplate, 320° dial numbers (Chassis 120000)	460470	Knob (Models 510, 539)
520500	Dial backplate, 180° dial numbers (Chassis 120029)	460150	Knob (Model 520)
412600	Dial backplate, plain (Chassis 120035, 120030)	450230	Ivory plastic front, square holes, (Model 520)
410004	Dial backplate, plain (Chassis 120032, 120044)	450250	Ivory plastic front, round holes, (Model 520)
520513	Dial face, paper (Chassis 120032, 120044)	450330	Black plastic front, square holes, (Model 510)
525010	Pointer (Chassis 120000, 120029)	450350	Black plastic front, round holes, (Model 510)
525090	Pointer (Chassis 120030, 120032, 120035, 120044)	140001	Cabinet (Model 503)
520080	Dial crystal (Chassis 120000, 120029, 120032, 120044)	140000	Cabinet (Model 520)
		140005	Cabinet (Model 510, 510A)
		140069	Cabinet (Model 539)

The color coding of the i-f transformer leads is as follows:

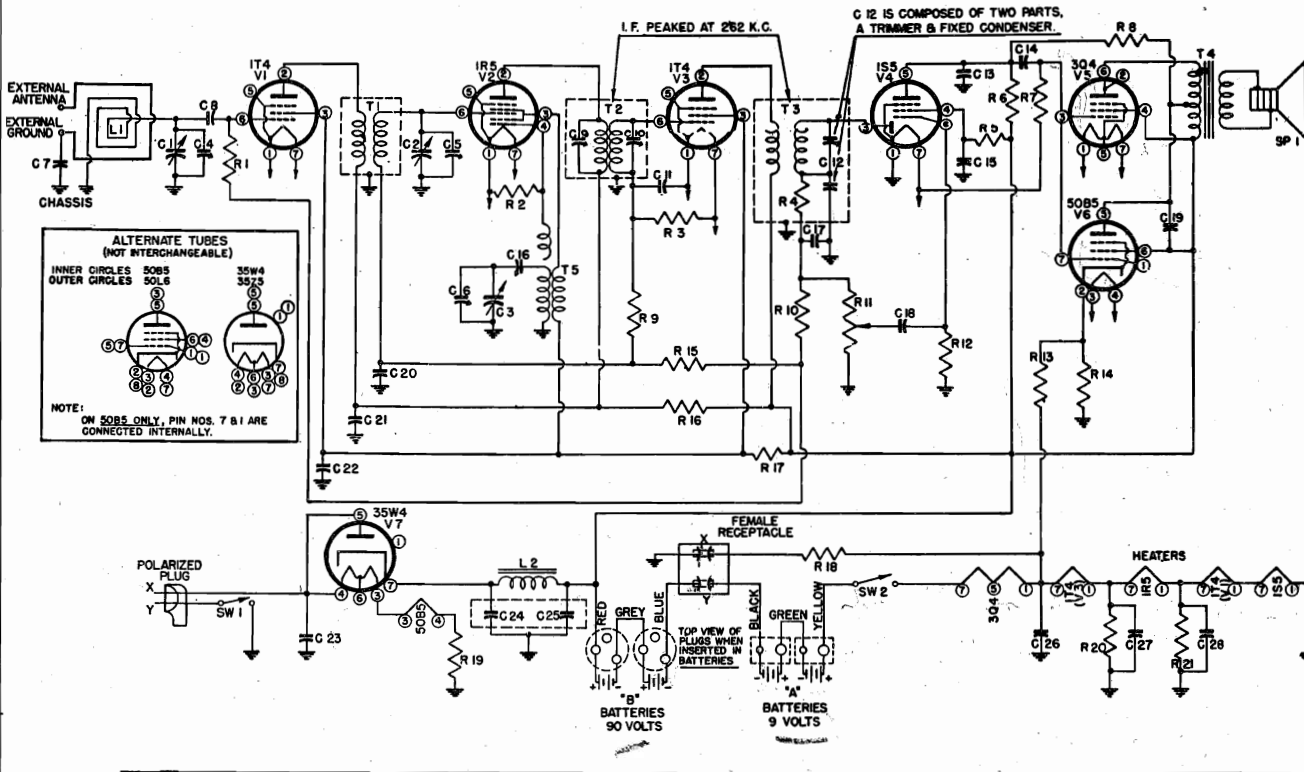
Grid—green
Grid return—black

Plate—blue
B—red

Chassis 120000, 1200029, 120030, 120044 use metal or glass tubes. Chassis 120032 and 120035 use miniature tubes. Model 510A only uses chassis 120035.

MODEL 505
Chassis 120020

EMERSON RADIO & PHONO. CORP.



Schematic Circuit Diagram Model 505, Chassis 120020

Chassis 120020

C1, C2, C3	900080	Three-gang variable condenser	R2	310970	100,000 ohms, 1/4 watt resistor
*C4, C5, C6		Trimmers, part of variable condenser	*R4		47,000 ohms, 1/4 watt resistor
C7, C18	920010	0.002 mfd., 600 volt condenser	R6, R7	321130	470,000 ohms, 1/4 watt resistor
C8, C11	920060	0.05 mfd., 200 volt condenser	R8	311250	1.5 meg., 1/4 watt resistor
*C9, C10		Trimmers, part of first i-f transformer	R10	321290	2.2 meg., 1/4 watt resistor
*C12		Trimmer and fixed condenser, part of second i-f transformer	R11	390020	0.5 meg. volume control
C13	910050	0.0004 mfd. mica condenser	R12	321450	10 meg., 1/4 watt resistor
C14, C21	920020	0.02 mfd., 400 volt condenser	R13	310130	33 ohms, 1/4 watt resistor
C15, C19	920090	0.01 mfd., 400 volt condenser	R14	310730	10,000 ohms, 1/4 watt resistor
C16	900110	Padding condenser	R16	340630	3,900 ohms, 1/2 watt resistor
C17	910010	0.00011 mfd. mica condenser	R17	340770	15,000 ohms, 1/2 watt resistor
C20, C22, C28	920100	0.02 mfd., 200 volt condenser	R18	340510	1,200 ohms, 1/2 watt resistor
C23	920030	0.05 mfd., 400 volt condenser	R19	394110	213 ohms, 6 watt resistor
C24, C25	925050	20-40 mfd., 150 volt dual electrolytic condenser	R20	310570	2,200 ohms, 1/4 watt resistor
C26	925090	100 mfd., 25 volt electrolytic condenser	R21	310450	680 ohms, 1/4 watt resistor
C27	920110	0.25 mfd., 100 volt condenser	SP1	180006	P.M. speaker
L1	700090	Loop antenna	*SW1		Line switch on volume control
L2	737010	Filter choke	*SW2		Battery switch on volume control
R1, R3, R5, R9	311330	3.3 meg., 1/4 watt resistor	T1	713000	R.F. coil
			T2	720170	First i-f transformer
			T3	720410	Second i-f transformer
			T4	734140	Output transformer
			T5	716030	Oscillator coil

The cabinet is designed to house the complete set of batteries. The battery complement should be as follows:

Battery Type	Number Required	Eveready Part No.	Rayovac Part No.	Burgess Part No.
4 1/2 volt "A"	2	746 (plug-in type)	P83A or EM-83 (plug-in type)	3G (plug-in type)
45 volt "B"	2	482 Minimax (plug-in type)	—	—

EMERSON RADIO & PHONO. CORP.

MODELS 505, 523
Chassis 120020, 120041

An oscillator with frequencies of 262, 600 and 1425 kc is required.

An output meter should be connected across the primary or secondary of the output transformer for observing maximum response.

Always use as weak a test signal as possible, turning down the output of the test oscillator as the alignment of the receiver progresses.

Plug the receiver into the power supply in such a way that the ground side of the power line is connected to the receiver B—.

Location of Coils and Trimmer Adjustments

The oscillator coil (T5) is located beneath the chassis. The trimmer for the oscillator (C6) is on the middle section of the variable condenser.

The interstage coil (T1) is the shielded coil located under the chassis. Its trimmer (C5) is on the front section of the variable condenser.

The trimmer for the loop antenna (C4) is on the last section of the variable condenser (the section nearest the loop).

The i-f transformers are mounted on top of the chassis. The first i-f transformer (T2) is mounted next to the loop. The second i-f transformer (T3) is mounted next to the dial.

The series paddler, C10 for chassis 120002 and C16 for chassis 120020 and 120041, is located on the chassis near the 1T4 tube.

I-f Alignment

Rotate the variable condenser to the minimum capacity position. Feed 262 kc to the converter grid and adjust the three i-f trimmers for maximum response. The signal should be fed through a 0.1 mfd. condenser.

Interstage Alignment

1. Set the dial indicator to 1425 kc, feed 1425 kc to the r-f grid, and adjust the oscillator and interstage trimmers for maximum response.
2. Set the dial indicator to 600 kc, feed 600 kc to the r-f grid, and adjust the oscillator padding trimmer by rocking in the signal for maximum response.
3. Repeat steps 1 and 2 until no further improvement is possible.

The color coding of the i-f transformer leads is as follows:

Grid—green

Grid return—black

Plate—blue

B+—red

CABINET AND DIAL PARTS

525090	Pointer	520200	Escutcheon (Model 523)
410929	Pointer hub	140002	Cabinet (Model 505)
531009	Drive pulley	140053	Cabinet (Model 523)
280133	Drive shaft	460470	Knob, black
520039	Dial backplate (Model 505)	460140	Knob, brown
520505	Dial backplate (Model 523)	450001	Handle, or
460040	Dial crystal (Model 505)	450280	Handle
520080	Dial crystal (Model 523)		

* Not supplied separately.

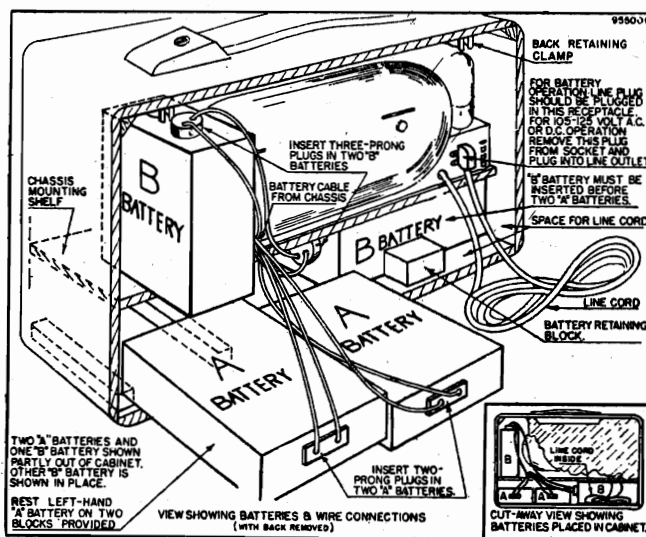
† Specify part numbers when ordering. When in doubt of chassis or model also include complete serial number.

Loop Alignment

Connect the test oscillator to a coil composed of three or four turns of wire wound in a loop approximately 12" in diameter. This coil should be held parallel to and in line with the receiver's loop at a distance of 15 to 20 inches.

1. Radiate a signal at 1425 kc, tune in the signal on the receiver, and adjust the loop trimmer for maximum response.
2. Radiate signal at 600 kc, tune in the signal on the receiver, and adjust the loose outside turn of the loop antenna for maximum response. This loose turn may be moved to either side of the center. Fasten it in the position which gives maximum response.
3. Repeat steps 1 and 2 until no further improvement is possible.

Battery Installation



External Antenna

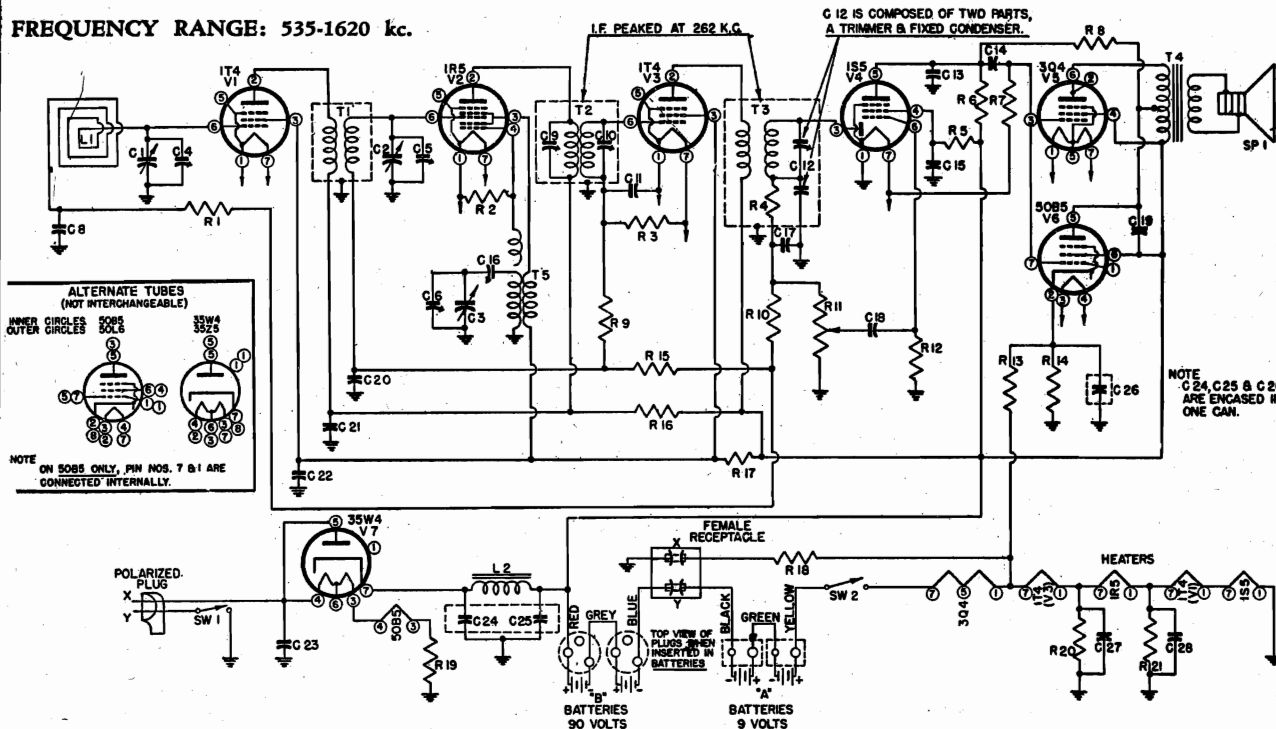
For loop antennas that do not have external antenna connection, wind one turn of insulated wire around or across the loop. Connect one end to an outside aerial. Connect the other end of a good ground or to chassis through a 0.002 mfd. condenser.

MODELS 505, 523
Chassis 120041

EMERSON RADIO & PHONO. CORP.

TYPE: Three-way (battery, a.c.-d.c.) portable superheterodyne.

FREQUENCY RANGE: 535-1620 kc.



Schematic Circuit Diagram Models 505-523, Chassis 120041

Chassis 120041

Schematic Symbol	†Part No.	DESCRIPTION	Schematic Symbol	†Part No.	DESCRIPTION
C1, C2, C3	900080	Three-gang variable condenser	*R4		47,000 ohms, ¼ watt resistor, part of second i-f transformer
*C4, C5, C6			R6, R7	321130	470,000 ohms, ¼ watt resistor
C8, C14, C20, C21, C22, C28	920020	0.02 mfd., 400 volt condenser	R8	311250	1.5 meg., ¼ watt resistor
*C9, C10			R10	321290	2.2 meg., ¼ watt resistor
C11	920060	0.05 mfd., 200 volt condenser	R11	390020	0.5 meg. volume control
*C12			R12	321450	10 meg., ¼ watt resistor
C13	910050	0.0004 mfd. mica condenser	R13	310130	33 ohms, ¼ watt resistor
C15, C19	920090	0.01 mfd., 400 volt condenser	R14	310730	10,000 ohms, ¼ watt resistor
C16	900110	Padding condenser	R16	340630	3,900 ohms, ½ watt resistor
C17	910010	0.00011 mfd. mica condenser	R17	340770	15,000 ohms, ½ watt resistor
C18	920010	0.002 mfd., 600 volt condenser	R18	340510	1,200 ohms, ½ watt resistor
C23	920030	0.05 mfd., 400 volt condenser	R19	394110	213 ohms, 6 watt resistor, or
C24, C25, C26	925210	Electrolytic condenser: C24, C25—20-40 mfd., 150V.; C26—100 mfd., 25 V.	R20	394170	213 ohms, 10 watt resistor
C27			920110	0.25 mfd., 100 volt condenser	R21	310570	2,200 ohms, ¼ watt resistor
L1	700233	Loop antenna	R2	310450	680 ohms, ¼ watt resistor
L2	737067	Filter choke	SP1	180012	P.M. speaker
R1, R3, R5, R9, R15	311330	3.3 meg., ¼ watt resistor	*SW1		Line switch on volume control
R2			310970	100,000 ohms, ¼ watt resistor	*SW2		Battery switch on volume control
			T1	713012	R.F. coil
			T2	720500	First i-f transformer, or
			T2	720510	First i-f transformer
			T3	720490	Second i-f transformer, or
			T3	720520	Second i-f transformer
			T4	734150	Output transformer
			T5	716030	Oscillator coil

Model 505 uses chassis 120002, 120020, 120041. Model 523 uses chassis 120041.

IMPORTANT—Where excessive tube burn-out is encountered, the 50B5 tube should be replaced *only* with a new Emerson tube bearing the designation 274 on the tube base.

POWER CONSUMPTION: 30 watts (line operation).

CURRENT DRAIN:

"A" Battery—0.053 amp.

"B" Battery—0.013 amp.

EMERSON RADIO & PHONO. CORP.

MODELS 505,523
MODELS 525,552

MODEL--505,523

The following voltage readings are d-c measurements taken with a line voltage of 117 volts, 60 cycles from B— (chassis) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. The readings with the volume control set at minimum and the variable condenser closed. All voltages are d.c. positive unless indicated otherwise. Voltages for 3Q4 are given for battery operation only. Readings for 50L6 and 35Z5 can be determined from 50B5 and 35W4 by referring to schematic diagram for proper pin connections.

Chassis 120002

TUBE TYPE	PIN NUMBER							
	1	2	3	4	5	6	7	8
1T4	1.2	88	56		1.2	*0.3	2.4	
1R5	2.4	88	56	-8	2.4	*1.5	3.7	
1T4	3.7	98	56		3.7	*2.3	4.9	
1S5			*0.3	*19	*50	*0.2	1.2	
3Q4	4.9	92	*1.1	98	4.9	92	4.9	
117N7			92	*1.1	98	6.25		125

Chassis 120020

TUBE TYPE	PIN NUMBER						
	1	2	3	4	5	6	7
1T4	1.32	90	50		1.32	*-0.2	2.55
1R5	2.55	90	50	*7.0	2.55		3.85
1T4	3.85	98	50		3.85	*1.9	5.25
1S5			*0.35	*24	*46	*0.1	1.32
3Q4	6.1	88	*1.2	90	7.6	88	9.0
50B5	1.2	6.6	83AC	33AC	90	98	*1.2
35W4	1.32		83AC	117AC	117AC	108AC	129

Chassis 120041

TUBE TYPE	PIN NUMBER						
	1	2	3	4	5	6	7
1T4	1.32	90	50		1.32	*-0.2	2.55
1R5	2.55	90	50	*7.0	2.55		3.85
1T4	3.85	98	50		3.85	*1.9	5.25
1S5			*0.35	*24.0	46.0	*0.1	1.32
3Q4	6.1	88	*1.2	90	7.6	88	9.0
50B5	1.2	6.6	33AC	83AC	90	98.0	1.2
35W4			83AC	117AC	117AC	108AC	129

MODEL-- 525,552

VOLTAGE ANALYSIS

The following voltage readings are d-c measurements taken from B— (line switch) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. Line voltage for these readings was 117 volts, 60 cycles, a.c. Take readings with the volume control set at minimum and the variable condenser closed.

TUBE	PIN NUMBER							
	1	2	3	4	5	6	7	8
12SA7			89	89	*-10			*-1.6
12SK7				*-1.6		89		89
12SQ7		*0.7		*-1.6	-0.5	37.5		
50L6GT			110	89				6.2
35Z5GT				116		116		117

CABINET AND DIAL PARTS

807000	Dial light	520080	Crystal
507217	Dial light socket	520200	Escutcheon
531059	Drive pulley	140052	Cabinet (Model 525)
280103	Drive shaft	140102	Cabinet (Model 552)
520500	Dial backplate	460470	Knob
525010	Dial pointer	430300	Knob, with indicator dot

† Specify part numbers when ordering.
* Not supplied separately.

POWER CONSUMPTION:

30 watts for the receiver.
20 watts for the phono motor.

The color coding of the i-f transformer leads is as follows:

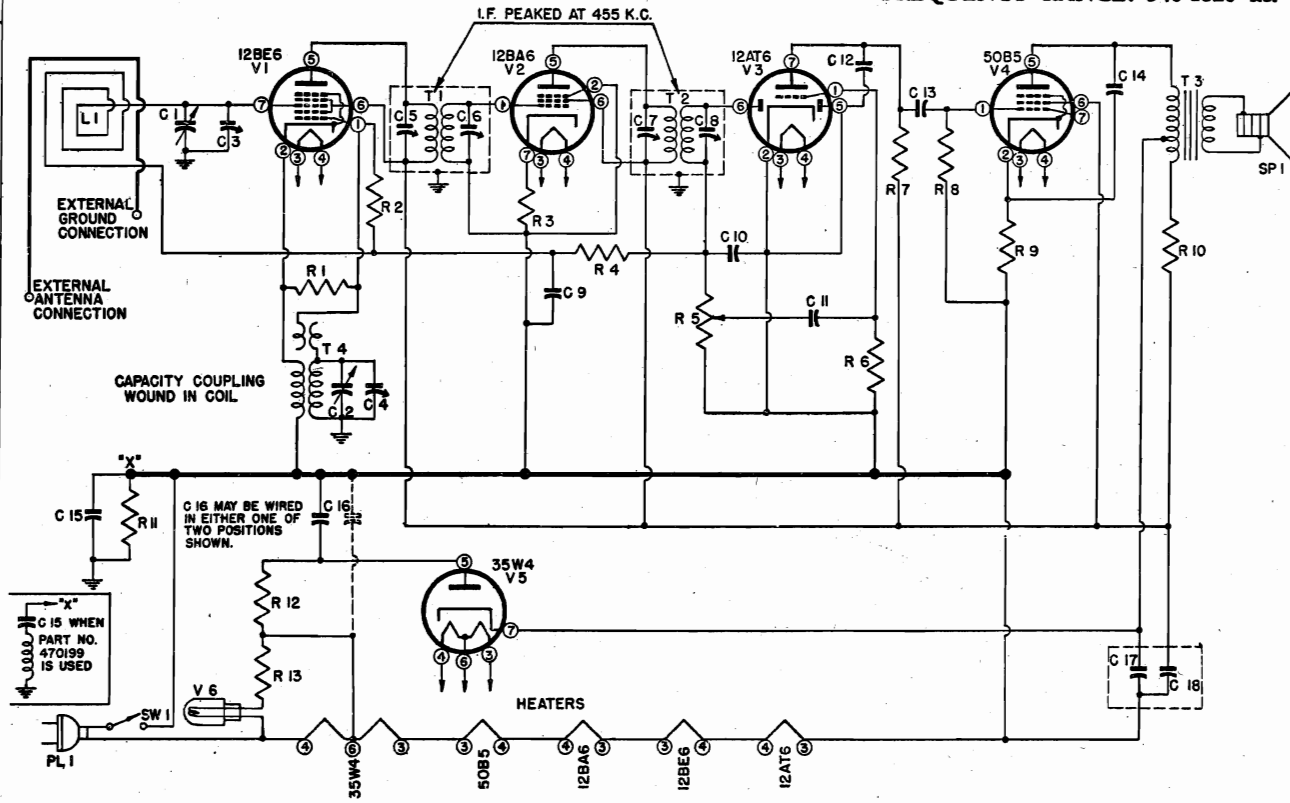
Grid return—black Plate—blue
Grid—green B—red

MODELS 507, 509, 518, 522, 535
Chassis 120004, 120045

EMERSON RADIO & PHONO. CORP.

TYPE: Single-band superheterodyne.

FREQUENCY RANGE: 540-1620 kc.



Schematic Circuit Diagram for Chassis 120004 and 120045

CHASSIS 120004 AND 120045

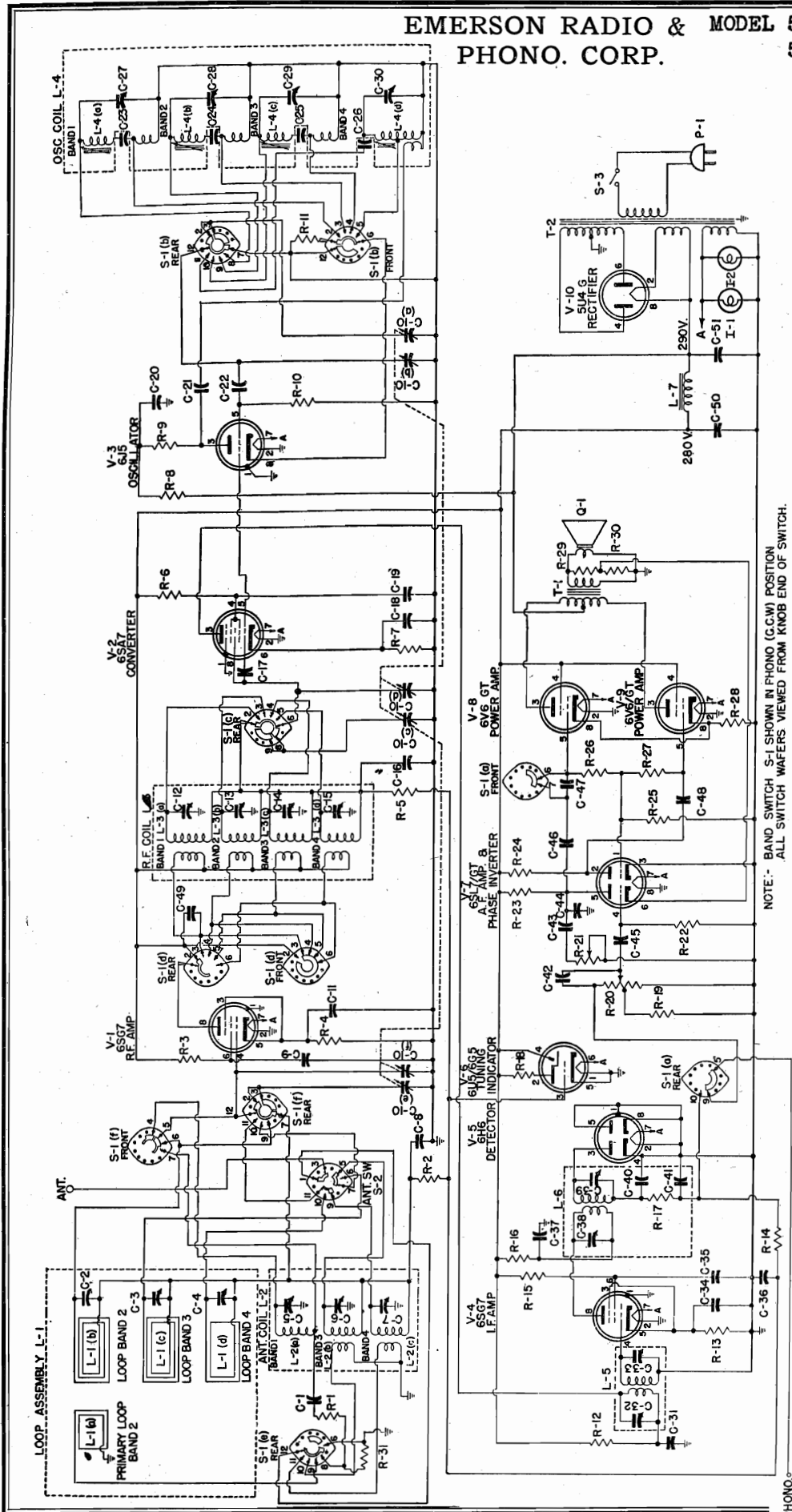
C1, C2	900160	Two-gang variable condenser	R1	310810	22,000 ohms, 1/4 watt resistor
*C3, C4		Trimblers, part of variable condenser	R2, R6	397000	15 meg., 1/2 watt resistor
*C5, C6, C7, C8		Trimblers, part of i-f transformers	R3	340310	180 ohms, 1/2 watt resistor
C9	920040	0.1 mfd., 200 volt condenser	R4	321290	2.2 meg., 1/4 watt resistor
C10	910000	0.00022 mfd. mica condenser	R5	390000	0.5 meg. volume control
C11	920010	0.002 mfd., 600 volt condenser	R7, R8	321130	470,000 ohms, 1/4 watt resistor
C12	920240	0.0005 mfd., 600 volt condenser	R9	340290	150 ohms, 1/2 watt resistor
C13, C14	920020	0.02 mfd., 400 volt condenser	R10	370490	1,000 ohms, 1 watt resistor
C15	920050	0.2 mfd., 200 volt condenser (Used when T1 and T2 are 720000 and 720100 respectively), or	R11	321050	220,000 ohms, 1/4 watt resistor
C15	479199	0.2 mfd., 200 volt condenser (Used when T1 and T2 are 720525 and 720529 respectively)	R12	340050	15 ohms, 1/2 watt resistor
C16	920030	0.05 mfd., 400 volt condenser	R13	340010	10 ohms, 1/2 watt resistor
C17, C18	925009	50-50 mfd., 150 volt dual electrolytic condenser, or	SP1	180000	P.M. speaker
C17, C18	925000	30-50 mfd., 150 volt dual electrolytic condenser	*SW1		Line switch on volume control
L1	700000	Loop antenna, or	T1	720000	First i-f transformer, or
L1	700200	Loop antenna	T1	720525	First i-f transformer, midget
*PL1		Power plug, part of line cord	T2	720100	Second i-f transformer, or
			T2	720529	Second i-f transformer, midget
			T3	734000	Output transformer
			T4	716010	Oscillator coil
				807000	Pilot light, Mazda No. 47
				507090	Pilot light socket
				583010	Line cord

The color coding of the i-f transformer leads is as follows:

Grid—green
Grid return—black

Plate—blue
B+—red

EMERSON RADIO & MODEL 524, Chassis 120011
PHONO. CORP. 524-2, Chassis 120022



NOTE: BAND SWITCH S-1 SHOWN IN PHONO (C.C.W.) POSITION
ALL SWITCH WAFERS VIEWED FROM KNOB END OF SWITCH.

TYPE OF TUBES:

- 2—6SG7, pentode r-f amplifier and i-f amplifier
- 1—6SA7, pentagrid modulator
- 1—6J5, triode oscillator
- 1—6H6, diode detector, a.v.c
- 1—6SL7, dual triode audio amplifier and inverter
- 2—6V6GT, beam power push-pull output
- 1—5U4G, rectifier
- 1—6U5/6G5, tuning indicator

POWER SUPPLY: 50-60 cycle A.C.

VOLTAGE RATING:

- Model 524—105-125 volts
- Model 524-2—105-125 volts and 210-250 volts
- POWER CONSUMPTION: 100 watts

TYPE: Four band superheterodyne.

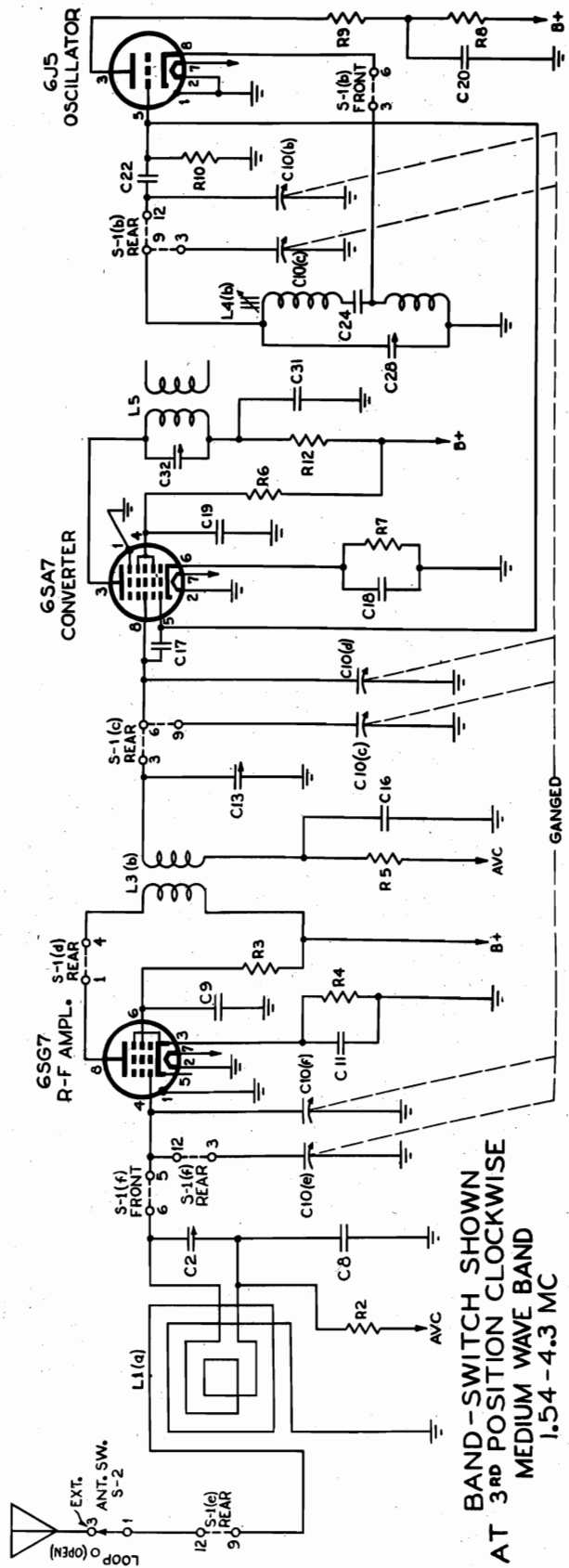
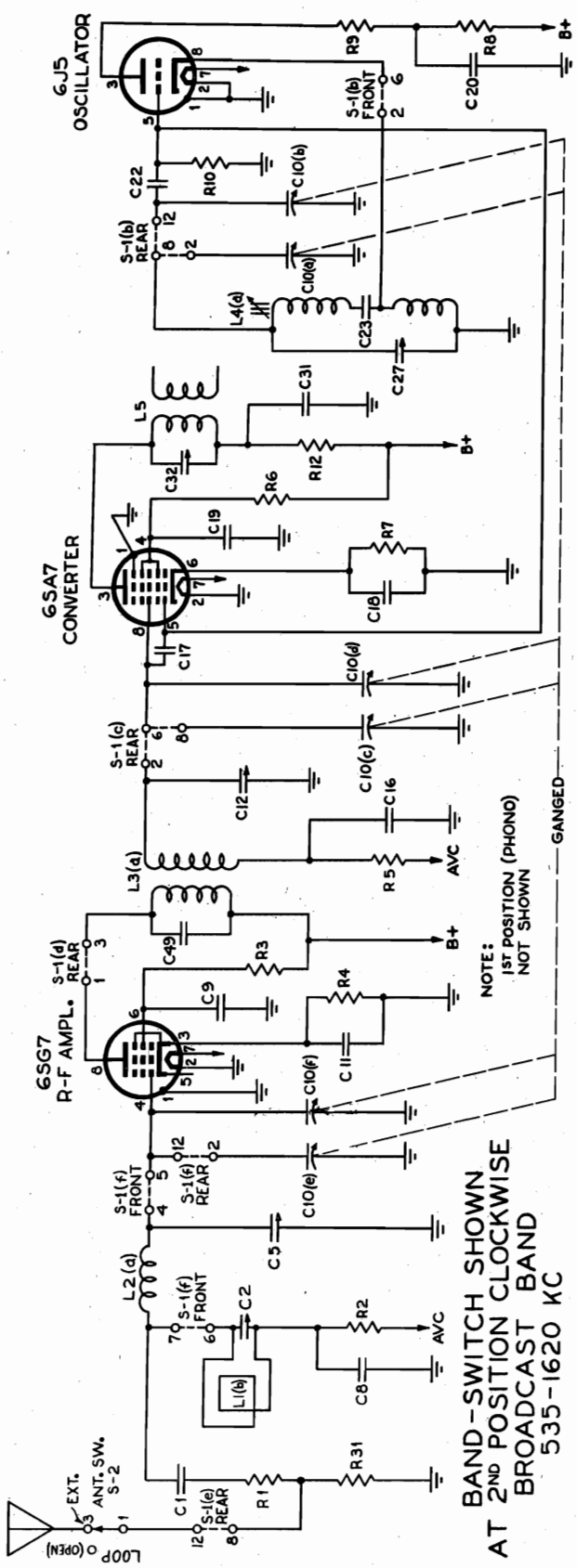
FREQUENCY RANGE:

- Broadcast—535-1620 Kilocycles (185-560 Meters)
- Medium Wave—1.54-4.3 Megacycles (69.8-195 Meters)
- Short-Wave—4.15-10.4 Megacycles (28.9-72.3 Meters)
- Short-Wave—10.1-22.7 Megacycles (13.2-29.7 Meters)

"clarified schematics"

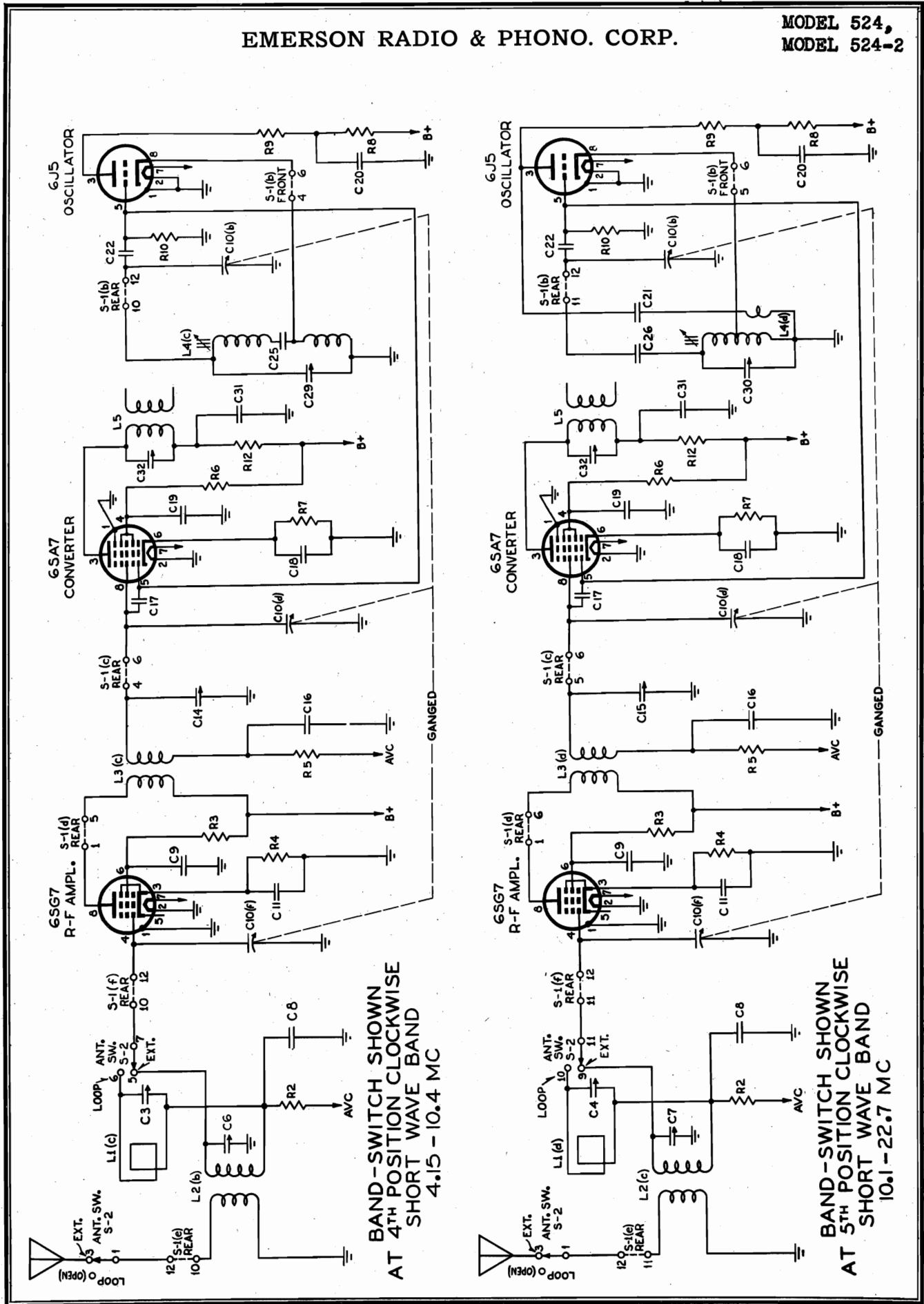
MODEL 524
MODEL 524-2

EMERSON RADIO & PHONO. CORP.



EMERSON RADIO & PHONO. CORP.

MODEL 524,
MODEL 524-2



BAND-SWITCH SHOWN
AT 4TH POSITION CLOCKWISE
SHORT WAVE BAND
4.15 - 10.4 MC

BAND-SWITCH SHOWN
AT 5TH POSITION CLOCKWISE
SHORT WAVE BAND
10.1 - 22.7 MC

MODEL 524
MODEL 524-2

EMERSON RADIO & PHONO. CORP.

ADJUSTMENTS

R-f Alignment

A signal generator or oscillator is required, containing the following radio frequencies, amplitude modulated:

- 455 kc for intermediate frequencies
- Band 1—600 kc, 1000 kc, 1500 kc
- Band 2—1600 kc, 2.5 mc, 4 mc
- Band 3—4.5 mc, 6 mc, 10 mc
- Band 4—11 mc, 13 mc, 22 mc

An output meter should be connected across the voice coil of the speaker (3.5 ohms).

Always use as weak a test signal as possible when aligning receiver.

1. For Band 1 (540-1620 kc): Set rear antenna and loop switch to antenna position. Apply strong 1500 kc signal through 200 mfd. dummy antenna to antenna binding post in cabinet back. Set pointer to 1500 kc on dial and adjust oscillator trimmer to maximum on output meter. Reduce signal to normal output in the output meter and adjust r-f trimmer and antenna trimmer to maximum on output meter. Set pointer to 600 kc. apply 600 kc signal and adjust iron core to maximum on output meter by "rocking" variable condenser slightly to "track" oscillator with antenna and r-f. With 1500 kc applied, reset pointer at 1500 kc, and readjust only the oscillator trimmer.

Location of Coils and Trimmer Adjustments

The first i-f transformer is adjacent to the 6SG7 i-f tube, V-4. The trimmers are accessible through the top of the shield can.

The second i-f transformer is adjacent to the 6H6 tube. The trimmers are accessible through the top of the shield can.

The antenna transformer for all bands is located at the rear of the chassis behind the variable condenser. Trimmers for three bands are located on the top of the transformer for external antenna operation. For loop operation, the trimmers are located on the loop accessible from the back of the cabinet.

The r-f and amplifier transformer is located on the side of the chassis toward the rear. Adjustments for all four bands are located on the top of the shield can.

The oscillator transformer is located at the side of the chassis toward the front. There are two adjustments on this stage for each band. Four iron cores protrude from the top of the shield and four trimmer adjustments are located on the side of the shield.

2. Bands 2, 3 and 4: Repeat same procedure as on Band 1 using following frequencies for alignment:

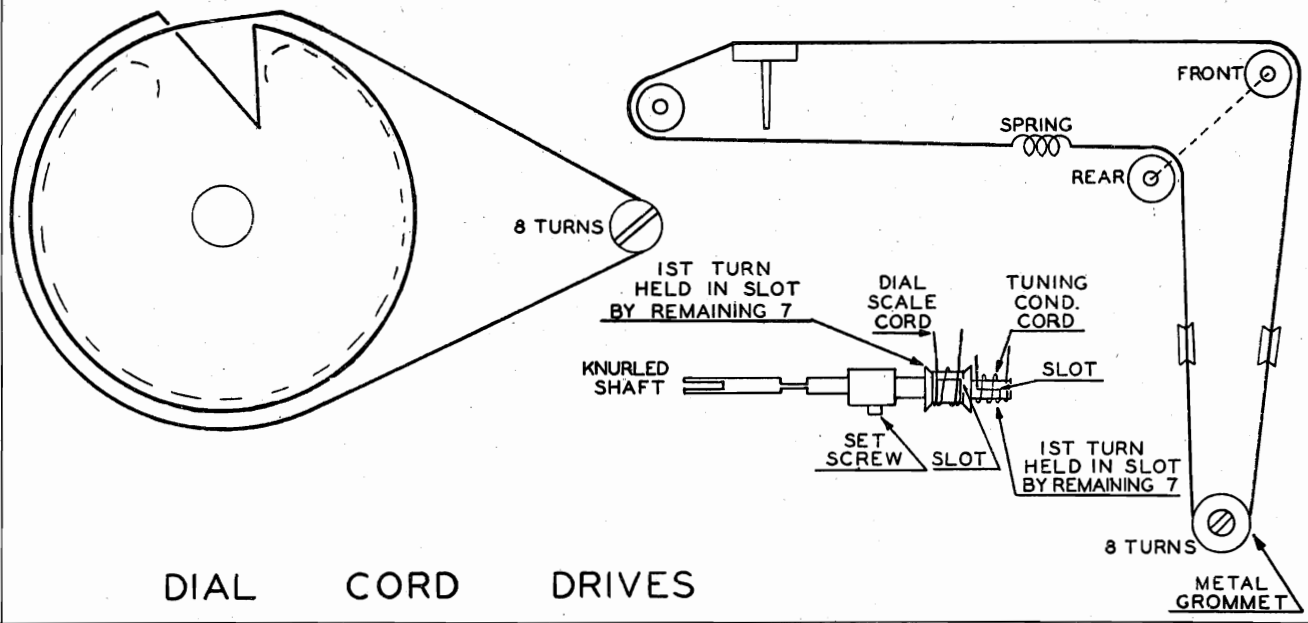
	High frequency	Low frequency
Band 2	4 mc	1.7 mc
Band 3	10 mc	5 mc
Band 4	20 mc	11 mc

3. For loop circuit adjustments operate antenna-loop switch to loop position and adjust trimmers on loop at high-frequency alignment points of each band. Use a few turns of wire about six to eight inches in diameter, connected to oscillator and placed approximately 18 inches away from receiver loop as coupling device to radiate a signal into loop. It is not necessary to readjust r-f or oscillator for loop circuit adjustment since they do not change from antenna adjustment indicated above.

I-f Alignment

1. Set variable condenser to highest frequency and range switch to broadcast position.
2. Apply 455 kc to converter stator terminal in center section of variable condenser.
3. Adjust all four trimmers of the two i-f transformers to maximum on output meter.

4. It should be noted that oscillator frequency on all bands is 455 kc (i-f frequency) above carrier frequency as indicated on dial scale. Stator of each gang of variable condenser is composed of two separate sections. The two sections are connected in parallel on Bands 1 and 2. Bands 3 and 4 use only largest section.



EMERSON RADIO & PHONO. CORP.
REPLACEMENT PARTS LIST

MODEL 524
MODEL 524-2

Schematic Symbol	†Part No.	DESCRIPTION	Schematic Symbol	†Part No.	DESCRIPTION
C1	910180	0.001 mfd., 500 volt mica condenser	L1	700110	Loop assembly
*C2, C3, } C4		Trimmers, part of loop assembly	L2	710020	Antenna coil
*C5, C6, } C7		Trimmers, part of antenna coil	L3	713010	R-F coil
C8, C16	920060	0.05 mfd., 200 volt condenser	L4	716110	Oscillator coil
C9, C19, } C35, C43, } C46, C48	920210	0.01 mfd., 600 volt condenser	L5	720330	First i-f transformer
C10a, b, } c, d, e, f } C11, C18, } C34	900200	Three-gang variable condenser	L6	720340	Second i-f transformer
*C12, C13, } C14, C15 } C17	920040	0.1 mfd., 200 volt condenser	L7	737030	Filter choke
C20	915040	0.68 mmfd., 500 volt ceramic condenser	P1	583180	Line cord and plug
C21	925030	16 mfd., 300 volt electrolytic condenser	Q1	180024	P.M. speaker
C22, C42, } C44, C49 }	910170	0.003 mfd., 500 volt mica condenser	R1	310430	560 ohms, ¼ watt resistor
C23	915030	0.00056 mfd. silver mica condenser	R2, R5, } R25	321050	0.22 meg., ¼ watt resistor
C24	915020	0.0015 mfd. silver mica condenser	R3, R15	370910	56,000 ohms, 1 watt resistor
C25	915010	0.003 mfd. silver mica condenser	R4, R13	320290	150 ohms, ¼ watt resistor
C26	915000	0.0068 mfd. silver mica condenser	R6	397080	22,000 ohms, 2 watt resistor
*C27, C28, } C29, C30 }	915030	0.00056 mfd. silver mica condenser	R7	310350	270 ohms, ¼ watt resistor
C31, C37	920270	0.05 mfd., 600 volt condenser	R8, R9	340650	4,700 ohms, ½ watt resistor
*C32, C33	920090	Trimmers, part of oscillator coil	R10	310810	22,000 ohms, ¼ watt resistor
C36	920090	0.01 mfd., 400 volt condenser	R11	320730	10,000 ohms, ¼ watt resistor
*C38, C39	920090	Trimmers, part of first i-f transformer	R12, R31	320650	4,700 ohms, ¼ watt resistor
*C40, C41	920090	Trimmers, part of second i-f transformer	R14	321210	1 meg., ¼ watt resistor
C45	920230	50 mmfd. condenser, part of second i-f transformer	R16	310650	4,700 ohms, ¼ watt resistor
C47	920240	0.005 mfd., 600 volt condenser	*R17		4,700 ohms, ¼ watt resistor, part of second i-f transformer
C50	925010	40 mfd., 400 volt electrolytic condenser	*R18		1 meg., ¼ watt resistor, part of tuning indicator socket cable
C51	925220	40 mfd., 400 volt electrolytic condenser	R19	310830	27,000 ohms, ¼ watt resistor
I1, I2	807020	Pilot light, Mazda No. 44	R20	390070	0.5 meg., ½ watt volume control
			R21	390360	0.5 meg., ½ watt volume control, or
			R21	390080	0.5 meg., ½ watt volume control
			R22	321450	10 meg., ¼ watt resistor
			R23, R24	351050	0.22 ohms, ½ watt resistor
			R26, R27	311050	0.22 ohms, ¼ watt resistor
			R28	394140	180 ohms, 2 watt wire-wound resistor
			R29	320410	470 ohms, ¼ watt resistor
			R30	310070	18 ohms, ¼ watt resistor
			S1	510280	7-wafer, 5-position band switch
			S2	510290	3-pole double throw antenna switch
			*S3		Line switch, part of volume control R20
			T1	734160	Output transformer
			T2	730000	Power transformer (Chassis 120011)
			T2	730010	Power transformer (Chassis 120022)

CABINET AND DIAL PARTS

140004	Cabinet	280043	Drive shaft pulley
620030	Knob	411361	Dial bracket
620012	Knob, with indicator dot	520006	Dial glass
587040	Drive cord spring	470035	Dial bracket assembly (left)
525110	Pointer	470032	Dial bracket assembly (right)
280023	Drive shaft	507219	Dial light assembly
280033	Clutch shaft		

* Not supplied separately.

† Specify part numbers when ordering. When in doubt of chassis or model also include complete serial number.

VOLTAGE ANALYSIS

The following voltage readings are d-c measurements taken from B— (line switch) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings. Readings indicated by an asterisk (*) are a.c. Line voltage is 117.5 volts, 60 cycles a.c. Set volume control at minimum and variable condenser to 1000 kc.

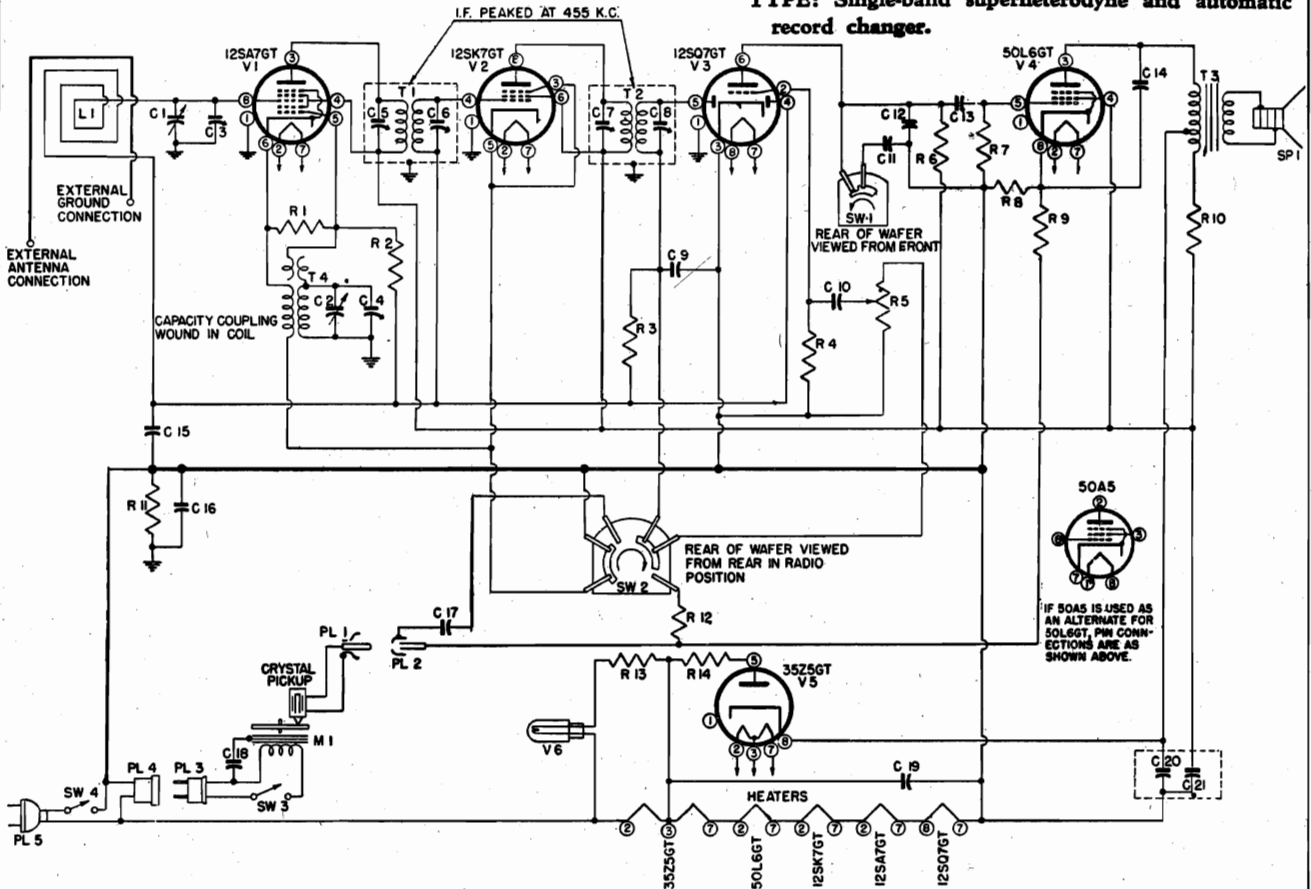
TUBE	PIN NUMBER							
	1	2	3	4	5	6	7	8
6SG7 (V1)			1.6		1.6	130	*6.3	280
6SA7			275	90	-0.02	2.4	*6.3	
6J5			215		-0.02		*6.3	
6SG7 (V4)			1.5		1.5	120	*6.3	280
6H6			-0.04				*6.3	
6SL7		70		-0.04	60			*6.3
6V6 (V8, V4)			285	280			*6.3	17
5U4G		290		*285		*285		290

Voltage readings for 6U5/6G5 measured at lead terminals are as follows: black—0; green—-0.04; red—280; brown—0; black—6.3.

MODELS 525,552
Chassis 120037

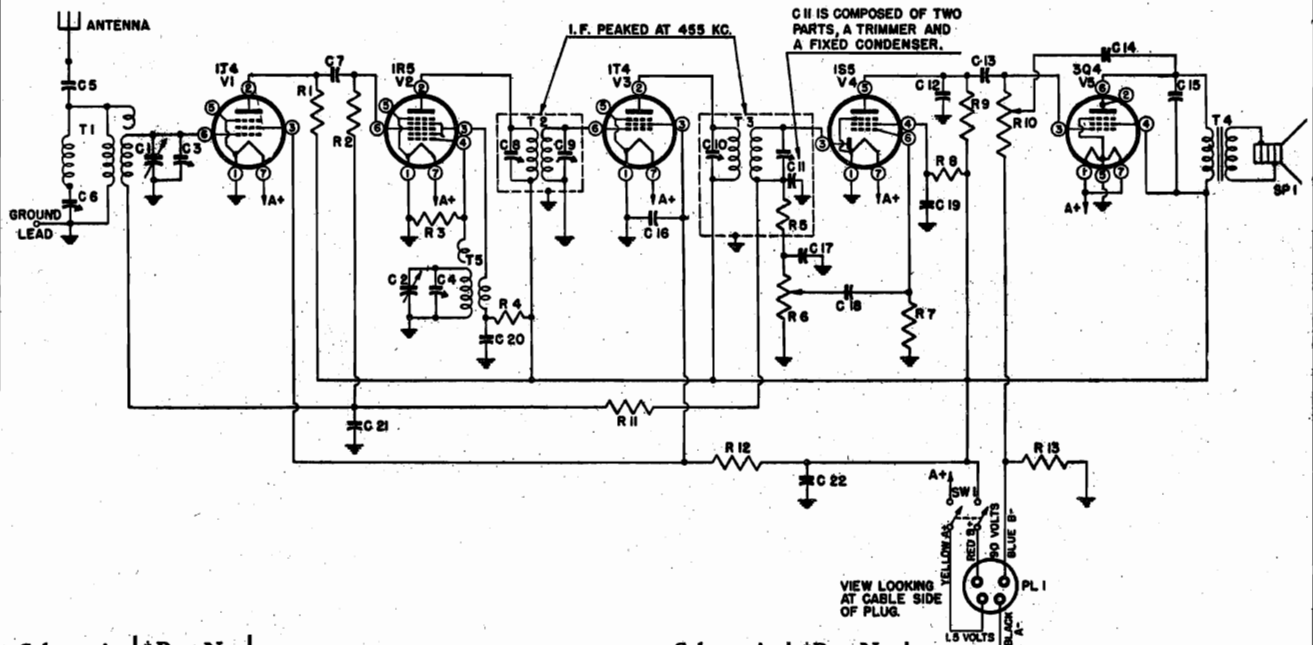
EMERSON RADIO & PHONOGRAPH CORP.

TYPE: Single-band superheterodyne and automatic record changer.



Schematic Symbol	Part No.	DESCRIPTION	Schematic Symbol	Part No.	DESCRIPTION
C1, C2	900290	Two-gang variable condenser	PL2	508010	Pickup socket
*C3, C4		Trimmmers, part of variable condenser	*PL3		Polarized male plug, part of record changer
*C5, C6, C7, C8 }		Trimmmers, part of i-f transformers	PL4	585070	Female plug and cable
C9	910000	0.00022 mfd. mica condenser	*PL5		Power plug, part of line cord
C10	920010	0.002 mfd., 600 volt condenser	R1	310810	22,000 ohms, 1/4 watt resistor
C11	920515	0.002 mfd., 400 volt condenser	R2, R4	397000	15 meg., 1/2 watt resistor
C12	920240	0.0005 mfd., 600 volt condenser	R3	321330	3.3 meg., 1/4 watt resistor
C13, C14	920020	0.02 mfd., 400 volt condenser	R5	390010	0.5 meg. volume control
C15	920040	0.1 mfd., 200 volt condenser	R6, R7	321130	470,000 ohms, 1/4 watt resistor
C16	920050	0.2 mfd., 200 volt condenser (used only when T1 and T2 are 720000 and 720100 respectively)	R8	340290	150 ohms, 1/2 watt resistor
C17, C19	920030	0.05 mfd., 400 volt condenser	R9	321290	2.2 meg., 1/4 watt resistor
C18	922090	0.05 mfd., 400 volt condenser (used up to serial No. 8,550,551), or	R10	370490	1,000 ohms, 1 watt resistor
C18	922101	0.05 mfd., 400 volt condenser (used after serial No. 8,550,551)	R11	321050	220,000 ohms, 1/4 watt resistor
C20, C21	925267	30-50 mfd., 150 volt dual electrolytic condenser (used up to serial No. 8,550,551), or	R12	321210	1 meg., 1/4 watt resistor
C20, C21	925110	30-50 mfd., 150 volt dual electrolytic condenser (used after serial No. 8,550,551)	R13	340010	10 ohms, 1/2 watt resistor
L1	700000	Loop antenna, or	R14	340050	15 ohms, 1/2 watt resistor
L1	700200	Loop antenna, or	SP1	180000	P.M. speaker
L1	700210	Loop antenna	SW1	510130	Tone control switch
M1	819019	Automatic record changer	SW2	510390	Phono-radio switch
PL1	505040	Connector plug	*SW3		Motor switch, part of record changer
			*SW4		Line switch on volume control
			T1	720000	First i-f transformer, or
			T1	720525	First i-f transformer
			T2	720100	Second i-f transformer, or
			T2	720529	Second i-f transformer
			T3	734200	Output transformer
			T4	716010	Oscillator coil

EMERSON RADIO & PHONO. CORP. MODELS 531, 532, 533 Chassis 120040



Schematic Symbol	†Part No.	DESCRIPTION	Schematic Symbol	†Part No.	DESCRIPTION
C1, C2	900070	Two-gang variable condenser	R2	321130	470,000 ohms, ¼ watt resistor
*C3, C4		Trimmers, part of variable condenser	R3	320970	100,000 ohms, ¼ watt resistor
C5, C15	920170	0.001 mfd., 600 volt condenser	*R5		47,000 ohms, ¼ watt resistor, part of second i-f transformer
*C6		Trimmer, part of antenna transformer	R6	390180	0.5 meg. volume control
C7, C12	910000	0.00022 mfd. mica condenser	R7	321450	10 meg., ¼ watt resistor
*C8, C9, C10		Trimmers, part of i-f transformer	R8, R11	321330	3.3 meg., ¼ watt resistor
*C11		Trimmer and fixed condenser, part of second i-f transformer	R9	321210	1 meg., ¼ watt resistor
C13, C16, C19, C20	920100	0.02 mfd., 200 volt condenser	R10	390280	0.4 meg. tone control
C14	910250	0.00005 mfd. mica condenser	R12	310770	15,000 ohms, ¼ watt resistor
C17	910010	0.00011 mfd. mica condenser	R13	310410	470 ohms, ¼ watt resistor
C18	920515	0.002 mfd., 400 volt condenser	SP1	180008	P.M. speaker
C21	920040	0.1 mfd., 200 volt condenser	SW1	510401	Battery switch, or
C22	925003	16 mfd., 150 volt electrolytic condenser	SW1	510001	Battery switch
PL1	585311	Battery plug and cable assembly, or	T1	710001	Antenna transformer and trap
PL1	585312	Battery plug and cable assembly	T2	720530	First i-f transformer
R1, R4	310730	10,000 ohms, ¼ watt resistor	T3	720531	Second i-f transformer
			T4	734203	Output transformer
			T5	716001	Oscillator coil

* Not supplied separately.

† Specify part numbers when ordering.

Battery replacement — Replace battery pack with one of the following types: Eveready No. 748 or No. 758, Rayovac No. AB82, Burgess No. 17GD60, General No. 60D10L, or Bright Star No. 6105.

MODELS 531, 532, 533

EMERSON RADIO & PHONOGRAPH CORP.

The following voltage readings are d-c measurements from tube socket pin to chassis. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. All voltages are positive unless otherwise indicated.

TUBE	PIN NUMBER						
	1	2	3	4	5	6	7
1T4(V1)		55	52	82		*-3	1.5
1R5		82	57	*-11.0		*-4	1.5
1T4(V3)		82	52			*-4	1.5
1S5		-6.2	*-45	*18	10	*-3	1.5
3Q4		80.0	*-6.2	82	1.5	80	

An oscillator with frequencies of 455, 600, and 1425 kc is required.

An output meter should be connected across the primary or secondary of the output transformer for observing maximum response.

Always use as weak a test signal as possible, turn down the output of the test oscillator as the alignment of the receiver progresses.

I-f and Trap Alignment

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 455 kc to the grid (pin 6) of the 1R5 tube through a 0.1 mfd. condenser.
3. Adjust the four i-f trimmer screws (C8, C9, C10, C11) for maximum response. Feed 455 kc to the antenna through a standard dummy antenna (a 0.002 mfd. condenser may be used as a substitute) and adjust the wave-trap trimmer for minimum response.

The color coding of the i-f transformer leads is as follows:

- Grid—green
- Grid return—black
- Plate—blue
- B+—red

Location of Coils and Trimmer Adjustments

The oscillator coil (T5) is located beneath the chassis. The trimmer for the oscillator (C4) is on the front section of the variable condenser.

The trimmer for the antenna (C3) is on the rear section of the variable condenser.

The i-f transformers are mounted on top of the chassis. The first i-f transformer (T2) is mounted in back of the speaker. The second i-f transformer (T3) is mounted next to the output transformer.

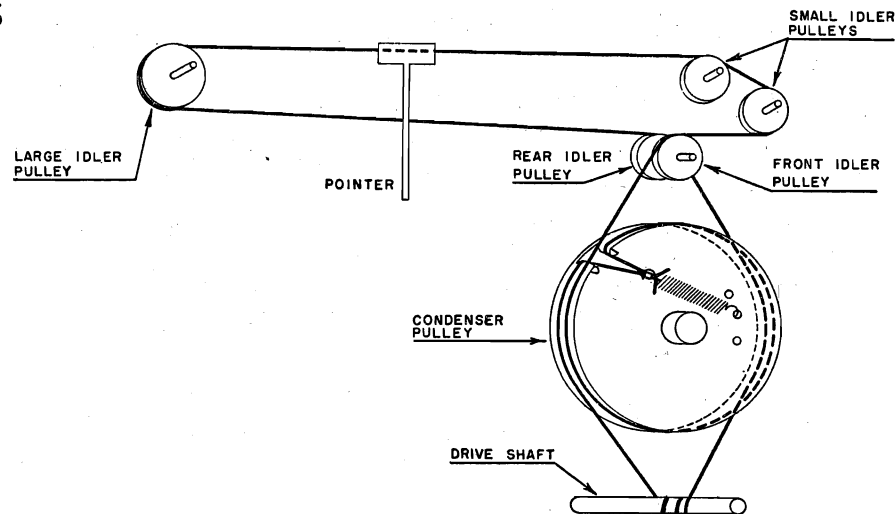
The 455 kc wave-trap is part of the antenna coil assembly, which is located on the underside of the chassis.

R-f Alignment

Feed 1620 kc through a standard broadcast dummy antenna to the antenna lead (A 0.0002 mfd. condenser may be used as a substitute). Adjust oscillator trimmer (C4). Move pointer to 1425 kc and feed 1425 kc signal. Adjust antenna trimmer (3C) for maximum response.

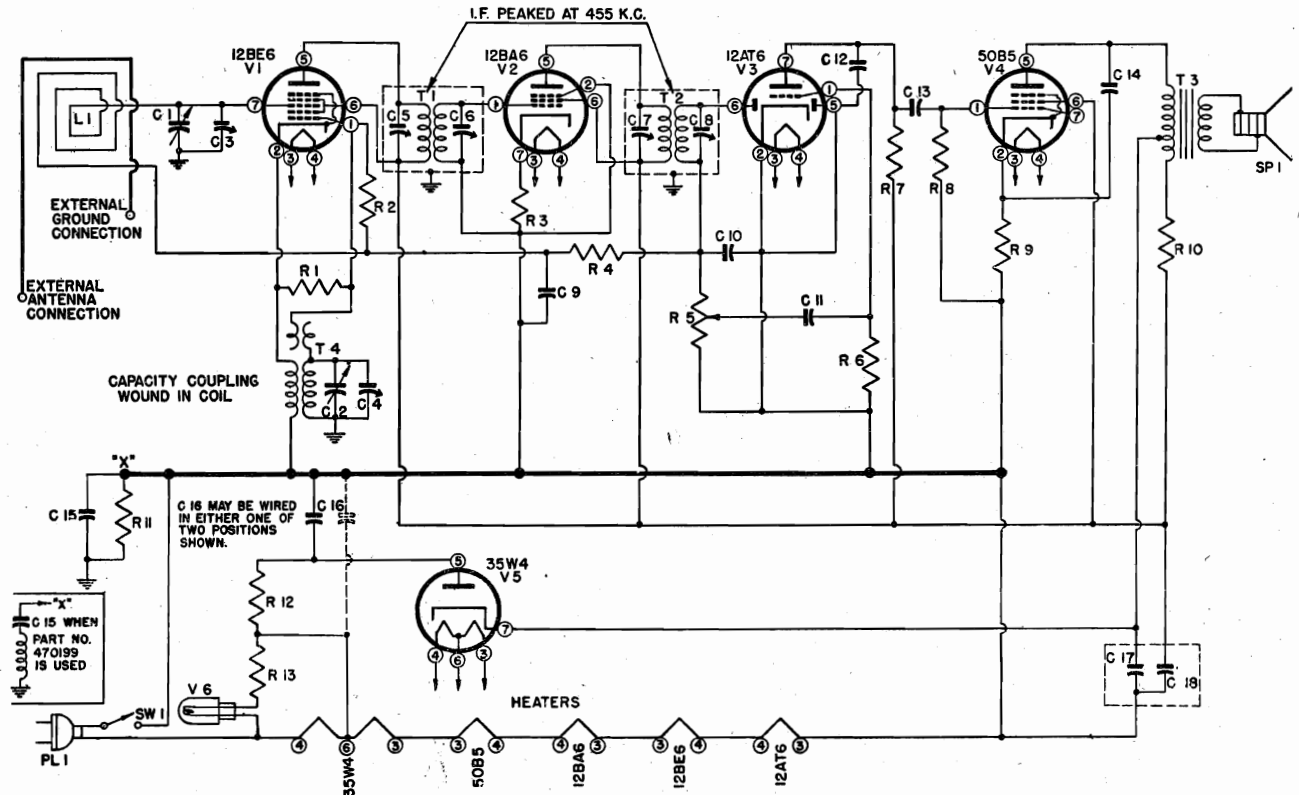
CABINET AND DIAL PARTS

560190	Rear cover (Model 533)
280313	Drive shaft
520360	Dial backplate
520450	Dial Glass
525012	Dial pointer
140062	Cabinet (Model 531)
140029	Cabinet (Model 532)
140051	Cabinet (Model 533)
460140	Knob (Model 531)
460470	Knob (Model 532, 533)
560200	Rear cover (Model 532)



CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS.

EMERSON RADIO & PHONOGRAPH CORP. MODELS 543,544 Chassis 120046



Schematic Circuit Diagram Chassis 120046

CHASSIS 120046

C1, C2	900013	Two-gang variable condenser	R2, R6	397000	15 meg., 1/2 watt resistor
*C3, C4		Trimmers, part of variable condenser	R3	340310	180 ohms, 1/2 watt desistor
*C5, C6, C7, C8		Trimmers, part of i-f transformers	R4	321290	2.2 meg., 1/4 watt resistor
C9	920040	0.1 mfd., 200 volt condenser	R5	390015	0.5 meg. volume control
C10	910000	0.00022 mfd. mica condenser	R7, R8	321130	470,000 ohms, 1/4 watt resistor
C11	920010	0.002 mfd., 600 volt condenser	R9	340290	150 ohms, 1/2 watt resistor
C12	920240	0.0005 mfd., 600 volt condenser	R10	370490	1,000 ohms, 1 watt resistor
C13, C14	920020	0.02 mfd., 400 volt condenser	R11	321050	220,000 ohms, 1/4 watt resistor
C15	920050	0.2 mfd., 200 volt condenser (used when T1 and T2 are 720000, and 720100 respectively), or	R12	340050	15 ohms, 1/2 watt resistor
C15	470199	0.2 mfd., 200 volt assembly (used when T1 and T2 are 720525 and 720529 respectively)	R13	340010	10 ohms, 1/2 watt resistor
C16	920030	0.05 mfd., 400 volt condenser	SP1	180000	P.M. speaker
C17, C18	925009	50-50 mfd., 150 volt dual electrolytic condenser	*SW1		Line switch on volume control
L1	700000	Loop antenna	T1	720000	First i-f transformer, or
*PL1		Power plug, part of line cord	T1	720525	First i-f transformer, midget
R1	310810	22,000 ohms, 1/4 watt resistor	T2	720100	Second i-f transformer, or
			T2	720529	Second i-f transformer, midget
			T3	734000	Output transformer
			T4	716010	Oscillator coil
				583010	Pilot light
				807000	Line cord
				507090	Pilot light socket

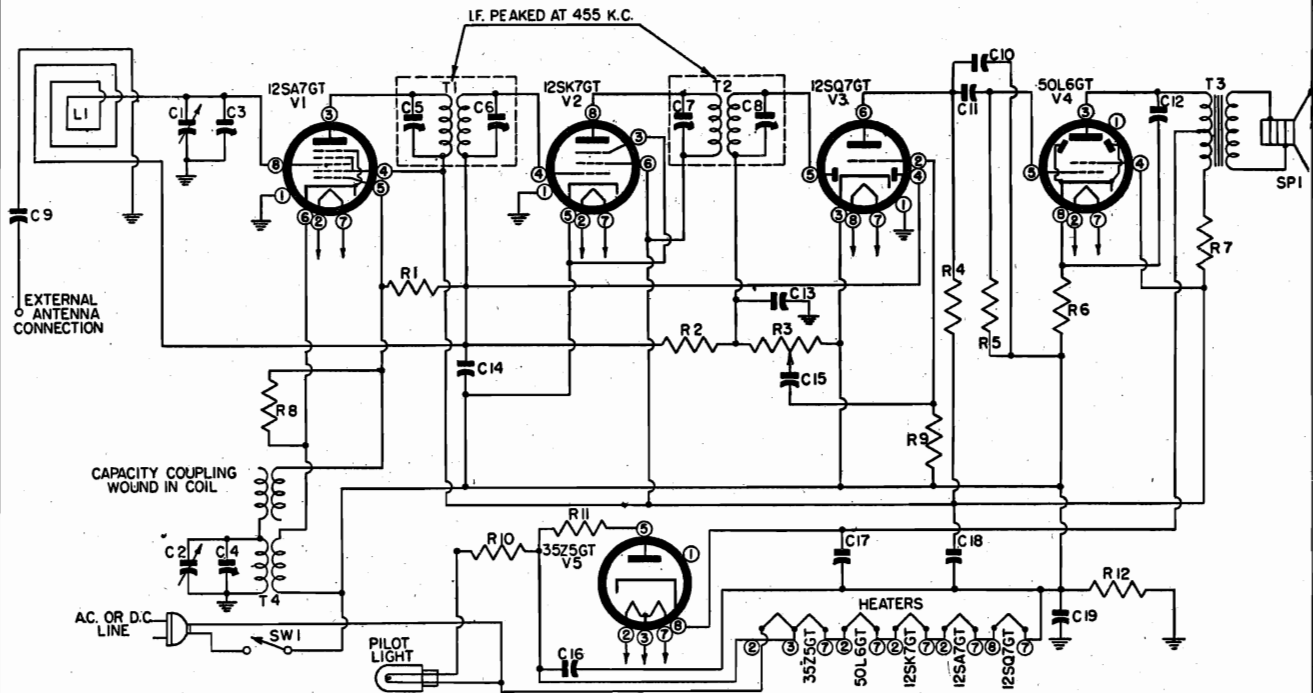
CABINET AND DIAL PARTS

280024	Drive shaft	140082B	Cabinet, black
520033	Dial face	410090	Metal grille
525015	Dial pointer	520034	Dial crystal
140080B	Cabinet, ivory	460470	Knob

MODELS 543,544
Chassis 120052

EMERSON RADIO & PHONOGRAPH CORP.

TYPE: Single-band superheterodyne.
FREQUENCY RANGE: 540-1620 kc.



Schematic Circuit Diagram Chassis 120052

CHASSIS 120052

Schematic Symbol	†Part No.	DESCRIPTION	Schematic Symbol	†Part No.	DESCRIPTION
C1, C2	900160	Two-gang variable condenser	R3	390015	0.5 meg. volume control
*C3, C4		Trimmer, part of variable condenser	R4, R5	321130	470,000 ohms, ¼ watt resistor
*C5, C6, C7, C8		Trimmers, part of i-f transformers	R6	340290	150 ohms, ½ watt resistor
C9, C15	920010	0.002 mfd., 600 volt condenser	R7	370490	1000 ohms, 1 watt resistor
C10	920240	0.0005 mfd., 600 volt condenser	R8	310810	22,000 ohms, ¼ watt resistor
C11, C12	920020	0.02 mfd., 400 volt condenser	R10	340010	10 ohms, ½ watt resistor
C13	910000	0.00022 mfd. mica condenser	R11	397040	15 ohms, 1 watt wire-wound resistor
C14	920040	0.1 mfd., 200 volt condenser	R12	321050	220,000 ohms, ¼ watt resistor
C16	920030	0.05 mfd., 400 volt condenser	SP1	180000	P.M. speaker
C17, C18	925000	30-50 mfd., 150 volt dual electrolytic condenser	*SW1		Line switch on volume control
C19	920050	0.02 mfd., 200 volt condenser	T1	720000	First i-f transformer
L1	700000	Loop antenna, or	T2	720100	Second i-f transformer
L1	700200	Loop antenna	T3	734000	Output transformer
R1, R9	397000	15 meg., ¼ watt resistor	T4	716010	Oscillator coil
R2	321330	3.3 meg., ¼ watt resistor		583010	Line cord
				807000	Pilot light
				507090	Pilot light socket

† Specify part numbers when ordering.
* Not supplied separately.

The color coding of the i-f transformer leads is as follows:

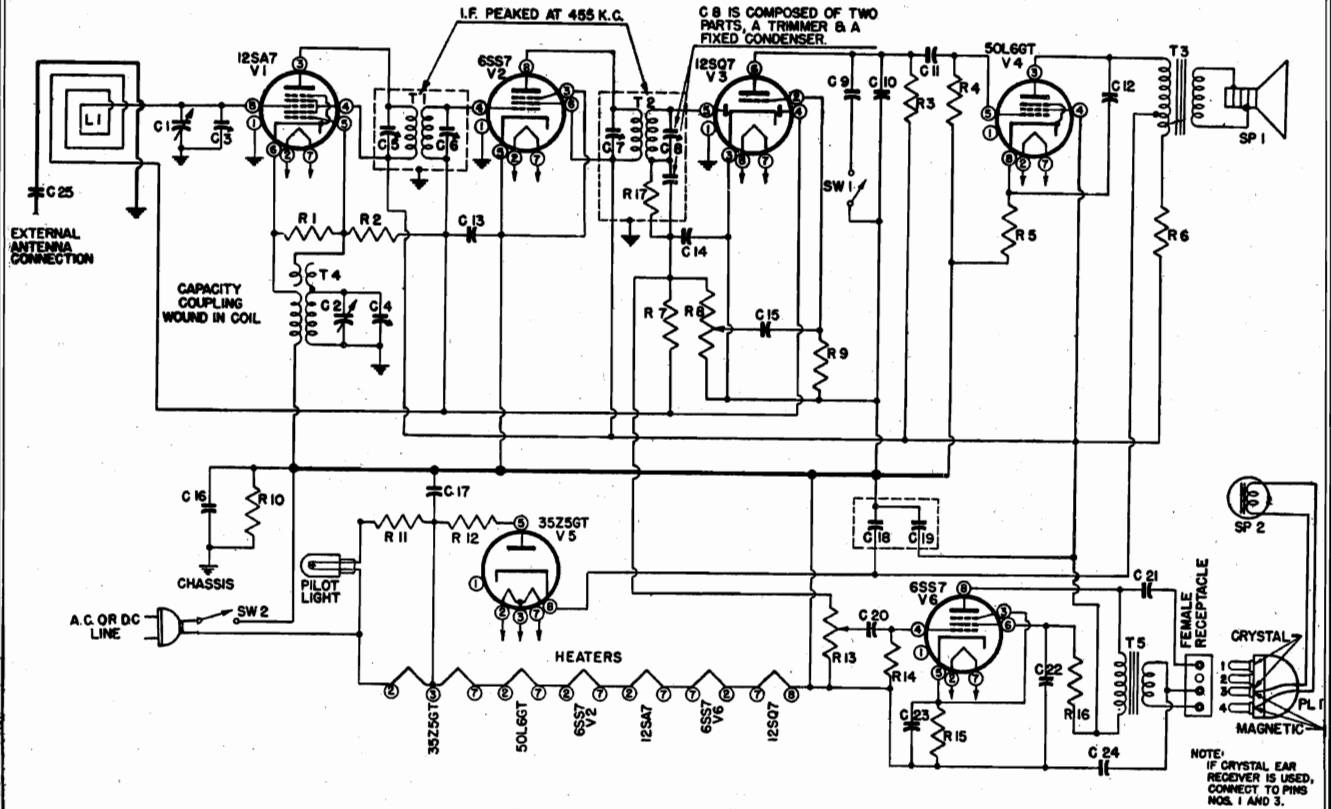
Grid—green Plate—blue
Grid return—black B+—red

EMERSON RADIO & PHONOGRAPH CORP.

MODELS 1002,1003
Chassis 129003

TYPE: Single-band superheterodyne with hearing aid receiver.

FREQUENCY RANGE: 540-1620 kc.



Schematic Symbol	†Part No.	DESCRIPTION	Schematic Symbol	†Part No.	DESCRIPTION
C1, C2	900070	Two-gang variable condenser	R13	390180	0.5 meg. volume control (sets below 8,767,450), or
*C3, C4		Trimmers, part of variable condenser	R13	390014	2 meg. volume control (sets 8,767,450 and higher)
*C5, C6, C7, C8		Trimmers, part of i-f transformers	R15	340410	470 ohms, ½ watt resistor
C9, C15, C20, C25	920010	0.002 mfd., 600 volt condenser	R16	351050	220,000 ohms, ½ watt resistor (sets below 8,767,450), or
C10	920240	0.0005 mfd., 600 volt condenser	R16	340970	100,000 ohms, ½ watt resistor (sets 8,767,450 and higher)
C11, C12, C21	920020	0.02 mfd., 400 volt condenser	SP1	180008	P.M. speaker
C13	920040	0.1 mfd., 200 volt condenser	SP2	829001	Telex ear receiver (name imprinted), or
C14	910010	0.00011 mfd. mica condenser	SP2	829002	American Earphone ear receiver (no imprint)
C16	920050	0.2 mfd., 200 volt condenser	SW1	510120	Tone control switch
C17, C24	920030	0.05 mfd., 400 volt condenser	*SW2		Line switch on volume control
C18, C19	925011	50-50 mfd., 150 volt dual electrolytic condenser	T1	720380	First i-f transformer
C22	920060	0.05 mfd., 200 volt condenser	T2	720390	Second i-f transformer
C23	925180	10 mfd., 25 volt electrolytic condenser	T3	734080	Output transformer (used with speaker)
L1	700000	Loop antenna	T4	716070	Oscillator coil (sets below 8,767,450), or
R1	340810	22,000 ohms, ½ watt resistor	T4	716005	Oscillator coil (sets 8,767,450 and higher)
R2, R9	397000	15 meg., ½ watt resistor	T5	734001	Output transformer (used with ear receiver)
R3, R4	351130	470,000 ohms, ½ watt resistor		807000	Pilot light
R5	340290	150 ohms, ½ watt resistor		507215	Pilot light socket
R6	370490	1000 ohms, 1 watt resistor		583150	Line cord
R7, R14	351330	3.3 meg., ½ watt resistor			
R8	390190	0.5 meg. volume control			
R10	351050	220,000 ohms, ½ watt resistor			
R11	340010	10 ohms, ½ watt resistor			
R12	340050	15 ohms, ½ watt resistor			

MODELS 1002, 1003

EMERSON RADIO & PHONOGRAPH CORP.

An oscillator with frequencies of 455, 600 and 1425 kc is required.

An output meter should be connected across the primary or secondary of the output transformer for observing maximum response.

Always use as weak a test signal as possible when aligning the receiver.

Plug the receiver into the power supply outlet in such a way that the ground side of the power line is connected to the receiver B—

R-f Alignment

1. Connect the oscillator to a coil composed of three or four turns of wire wound in a circle approximately 12" in diameter. This coil should be held parallel to and in line with the loop antenna of the receiver at a distance of 15 to 20 inches.
2. Radiate a signal at 1425 kc, set the dial indicator to 1425 kc, and adjust the trimmers on the variable condenser (C3, C4) for maximum response.
3. Radiate a 600 kc signal and tune in the signal on the receiver. Adjust the loose outside turn of the loop antenna for maximum response. This loose turn may be moved to either side of the center. Fasten it in the position which gives maximum response.
4. Repeat steps 2 and 3 until no further improvement is evident.

Location of Coils and Trimmer Adjustments

The first i-f transformer (T1) is mounted on top of the chassis deck at the rear and to the right of the variable condenser. The trimmers (C5, C6) are accessible through holes in the top of the can.

The second i-f transformer (T2) is mounted on top of the chassis to the right of the speaker. The trimmers (C7, C8) are accessible through holes in the top of the can.

The trimmer for the antenna (C3) and the trimmer for the oscillator coil (C4) are located on the variable condenser. The trimmer on the front section is for the oscillator coil.

The oscillator coil (T4) is located underneath the chassis. The loop antenna acts as the antenna coil.

I-f Alignment

1. Rotate the variable condenser to the minimum capacity position.
2. Feed 455 kc to the converter grid (stator of the r-f section of the variable condenser) and adjust the four i-f trimmers (C5, C6, C7, C8) for maximum response.

The color coding of the i-f transformer leads is as follows:

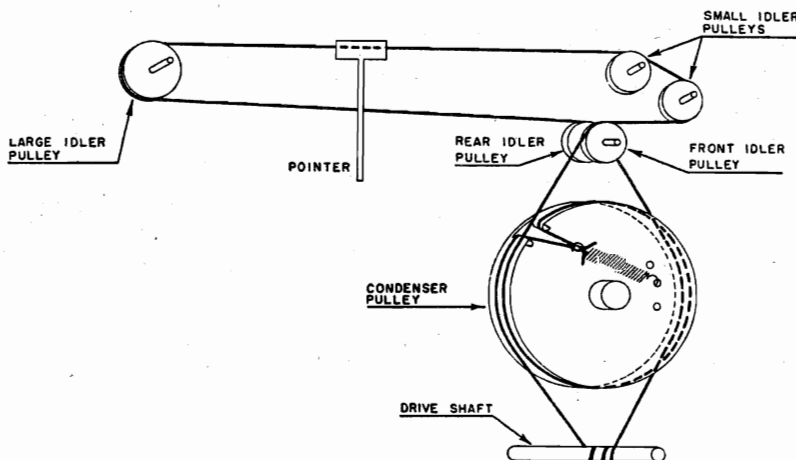
Grid—green Plate—blue
 Grid return—black B+—red

The following voltage readings are d-c measurements taken from B— (line switch) to the indicated tube-socket pin. A 1000 ohms-per-volt meter should be used for all readings except those indicated by an asterisk (*), which should be taken with a d-c vacuum-tube voltmeter. Line voltage for these readings was 117 volts, 60 cycles, a.c. Measurements made with 117 volts d.c. will be lower than those given below. Take readings with the volume control set at minimum and the variable condenser closed.

TUBE	PIN NUMBER							
	1	2	3	4	5	6	7	8
12SA7			89	89	*.10			*.1.6
6SS7 (V2)				*.1.6		89		89
12SQ7		*.0.7		*.1.6	*.0.5	*52.0		
50L6GT			110	89				6.2
35Z5GT				116				117
6SS7 (V6)			1.4		1.4	*40.0		89

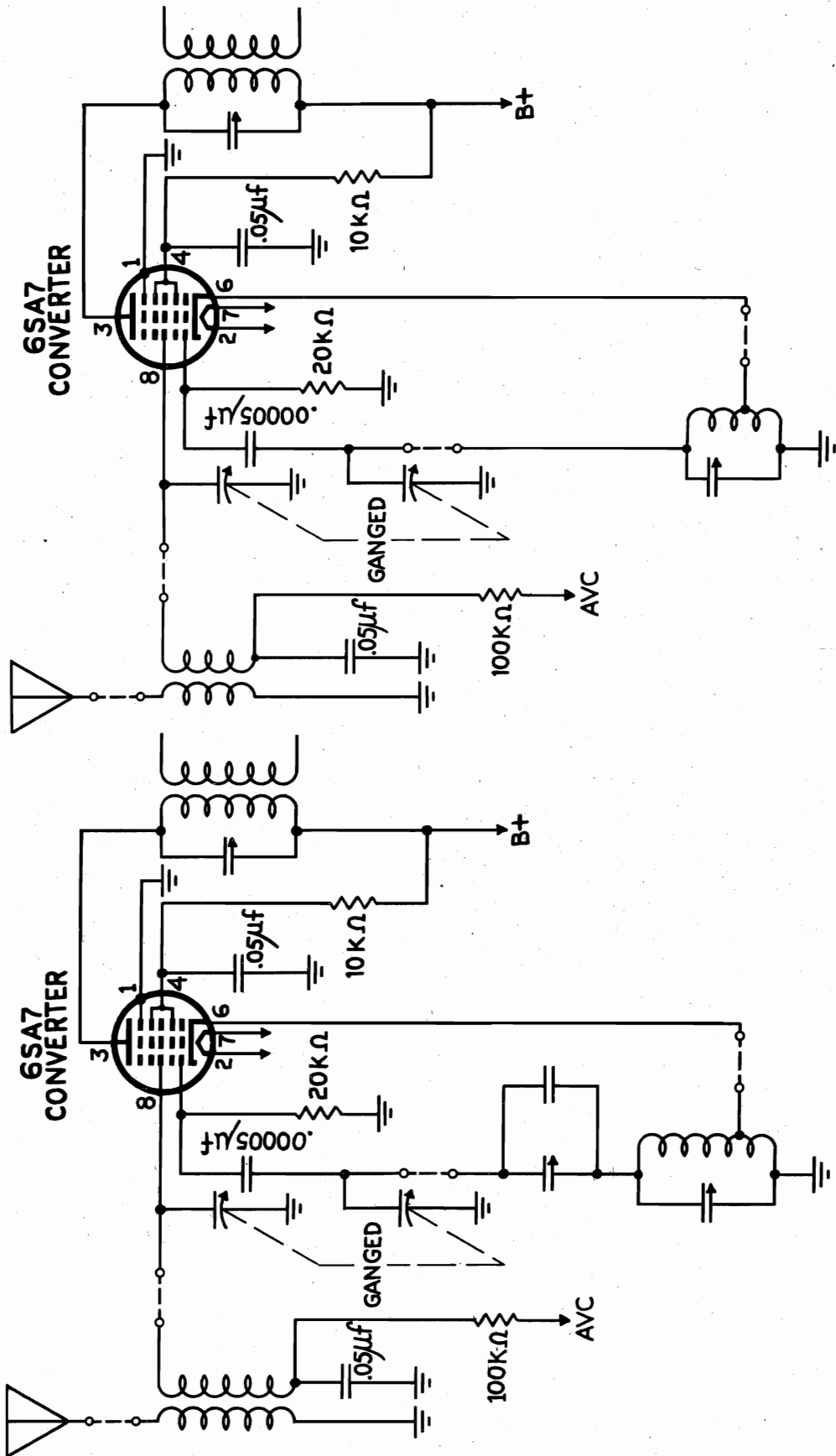
CABINET, DIAL AND ACCESSORY PARTS

- 520480 Dial backplate
- 280313 Drive shaft
- 520450 Dial glass
- 525012 Pointer
- 140029 Cabinet (Model 1002)
- 560101 Cabinet back (Model 1002)
- 460470 Knob (Model 1002)
- 140054 Cabinet (Model 1003)
- 460140 Knob (Model 1003)
- 470222 Plug and cable with ear receiver, complete
- 585315 Plug and cable (for ear receiver 829001)
- 585122 Plug and cable (for ear receiver 829002)
- 508115 Socket for ear receiver plug
- 460005 Ear mold, or
- 460006 Ear mold
- 505057 Plug, less cover and screw
- 505058 Plug cover
- 204116 Machine screw
- 470220 Under-pillow speaker, with plug
- 829003 Under-pillow speaker, less plug



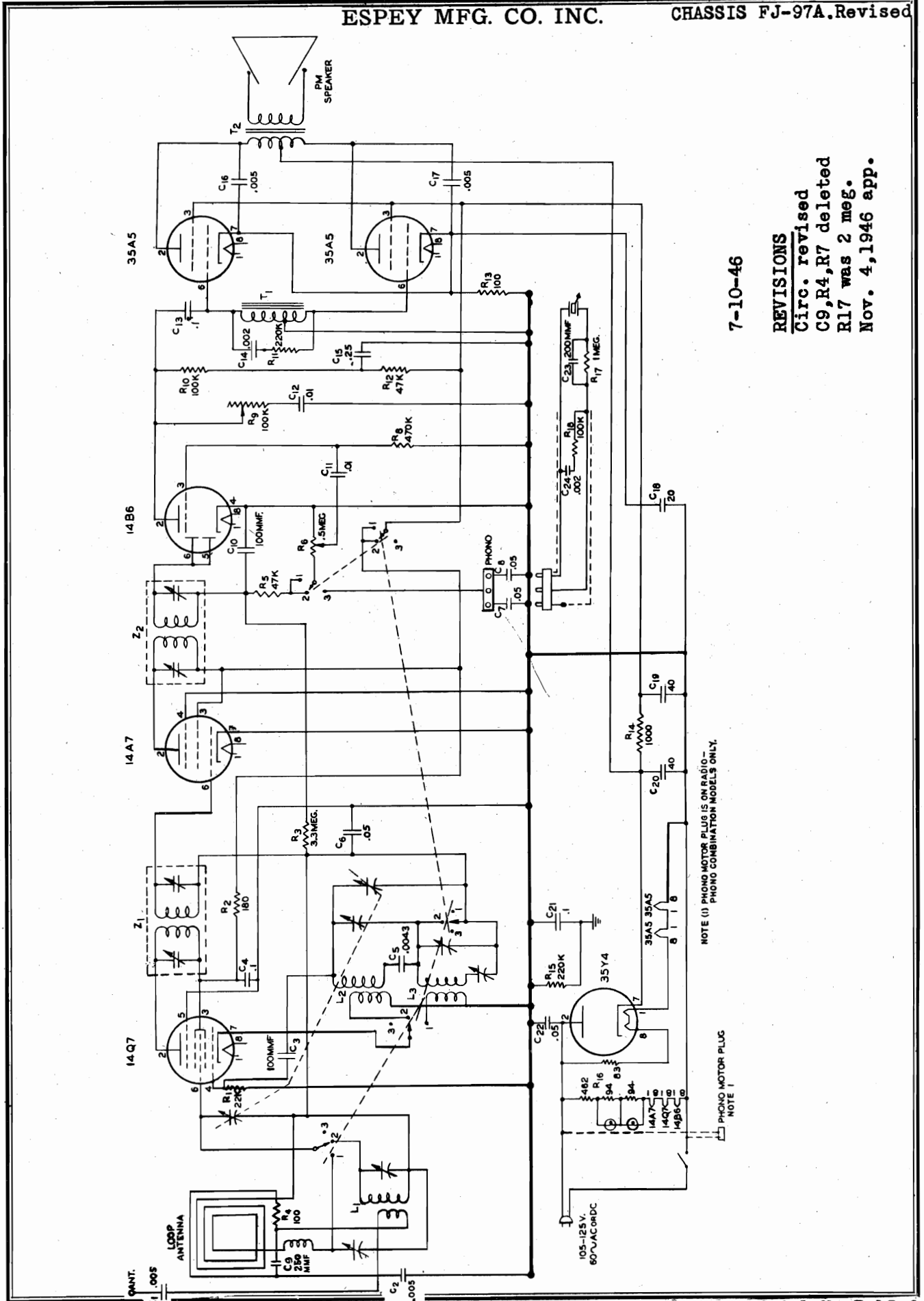
CUT-AWAY VIEW SHOWING METHOD OF STRINGING PULLEYS.

"clarified schematics"



BAND - SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
550-1700 KC.

BAND - SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
SHORT WAVE BAND
4.7-20 MC.



7-10-46

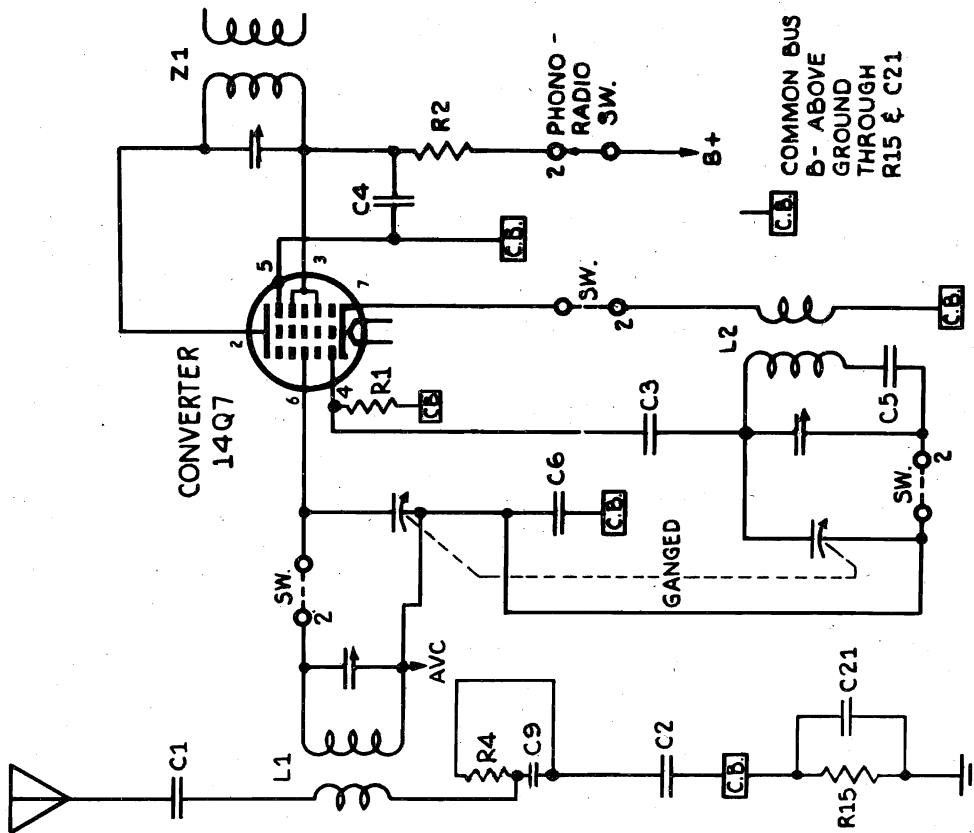
REVISIONS
 Circ. revised
 C9, R4, R7 deleted
 R17 was 2 meg.
 Nov. 4, 1946 app.

NOTE (1) PHONO MOTOR PLUG IS ON RADIO-
 PHONO COMBINATION MODELS ONLY.

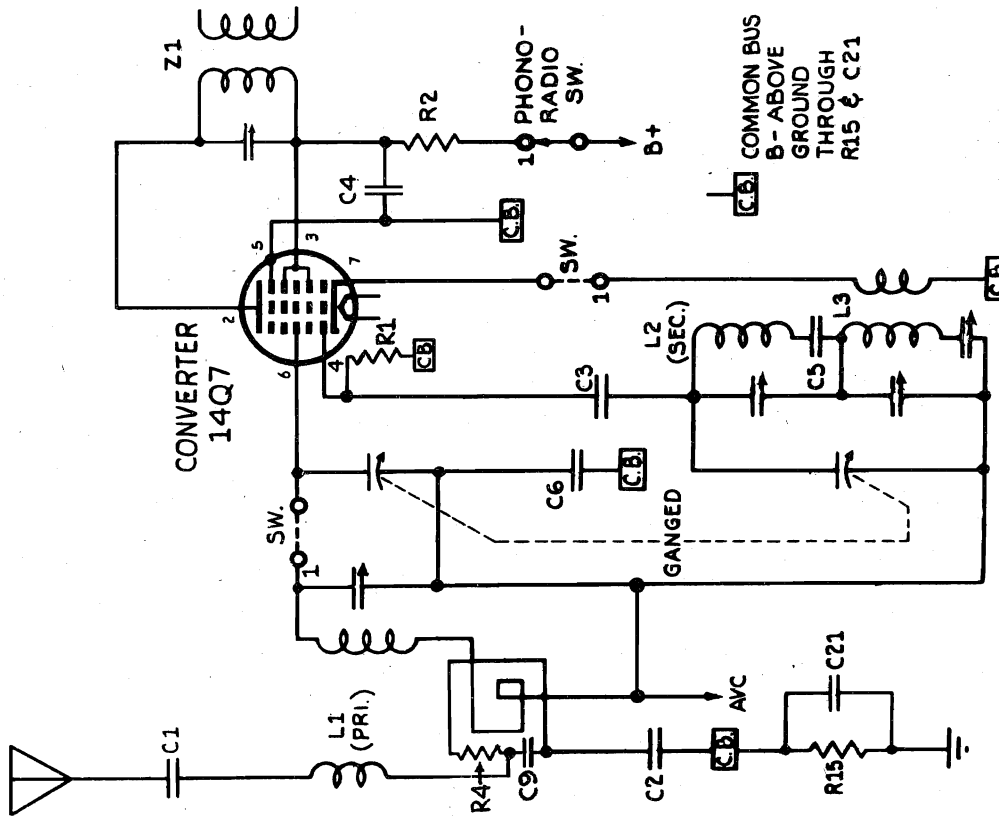
PHONO MOTOR PLUG
 NOTE 1

"clarified schematics"

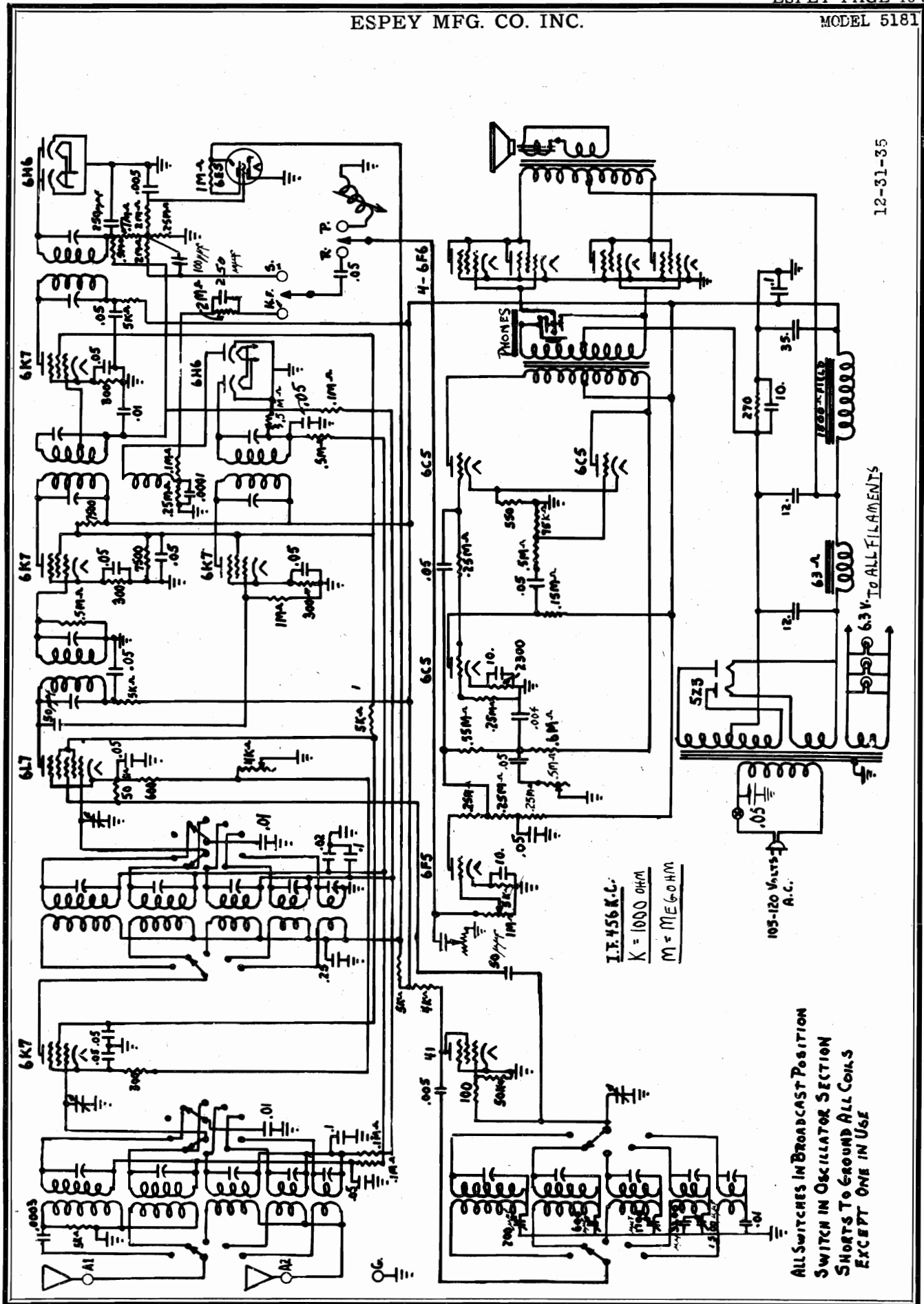
ESPEY MFG. CO. INC.



BAND - SWITCH SHOWN
AT 2ND POSITION.
SHORT WAVE BAND
5.5 - 18 MC.

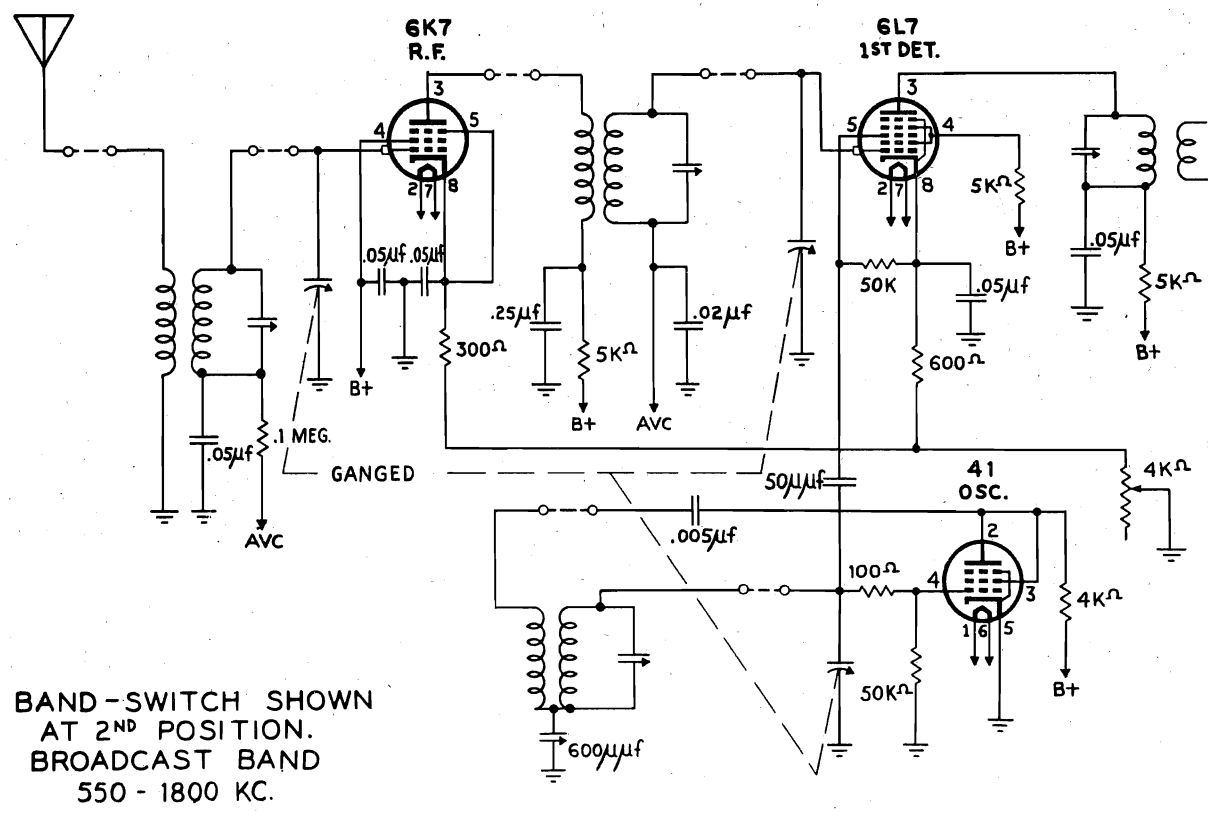
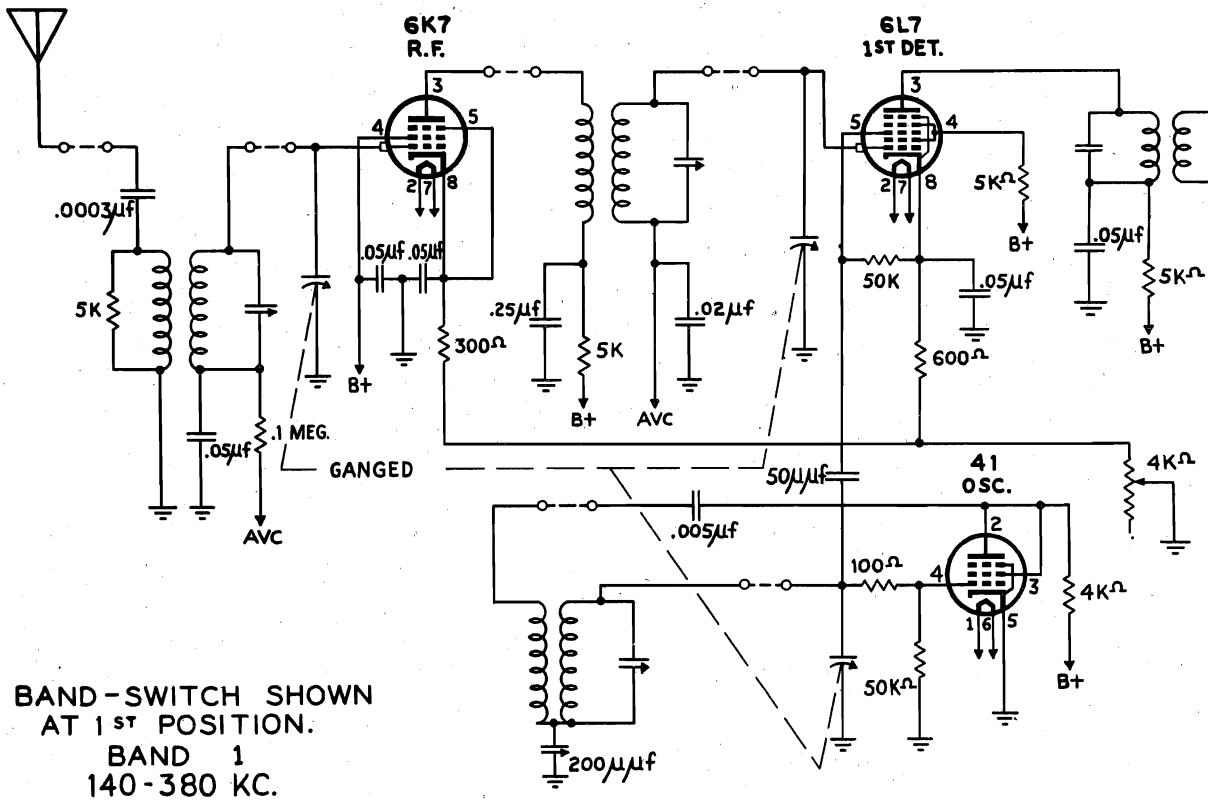


BAND - SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND



12-31-35

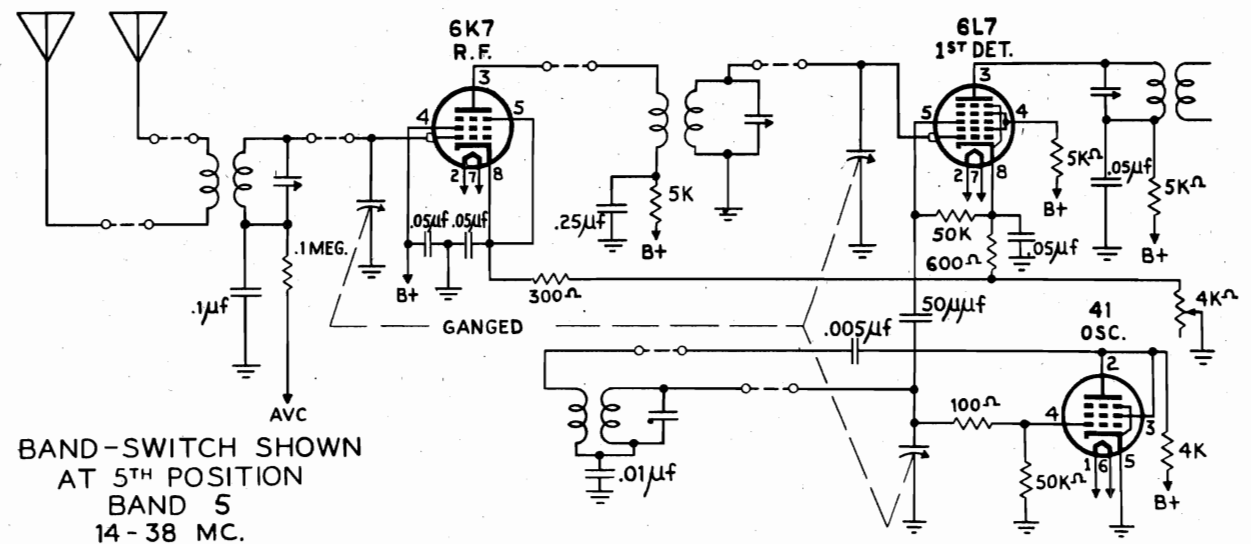
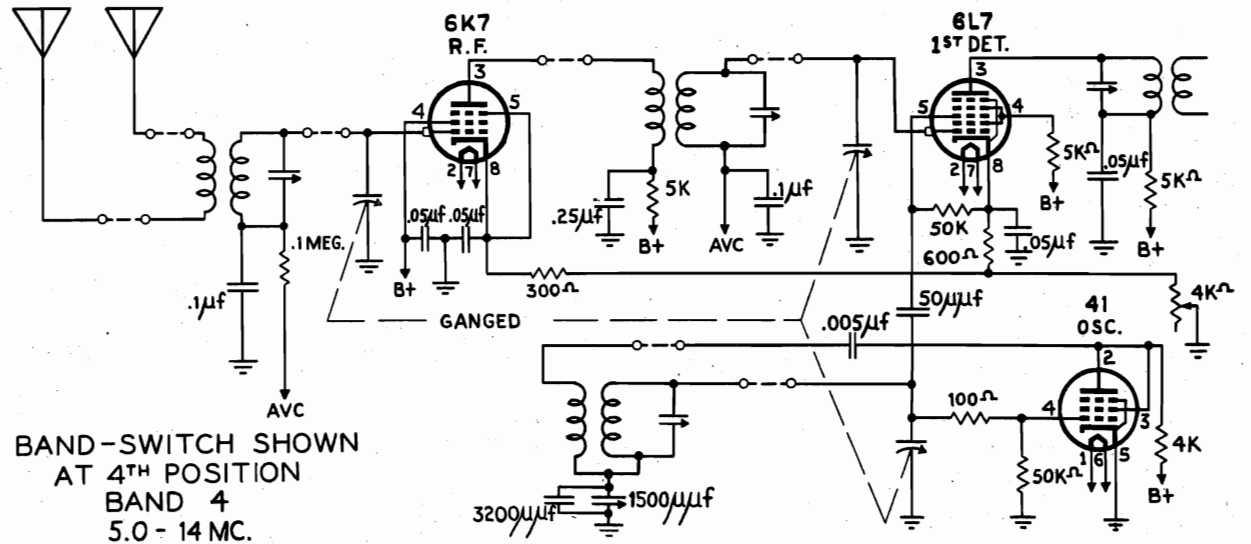
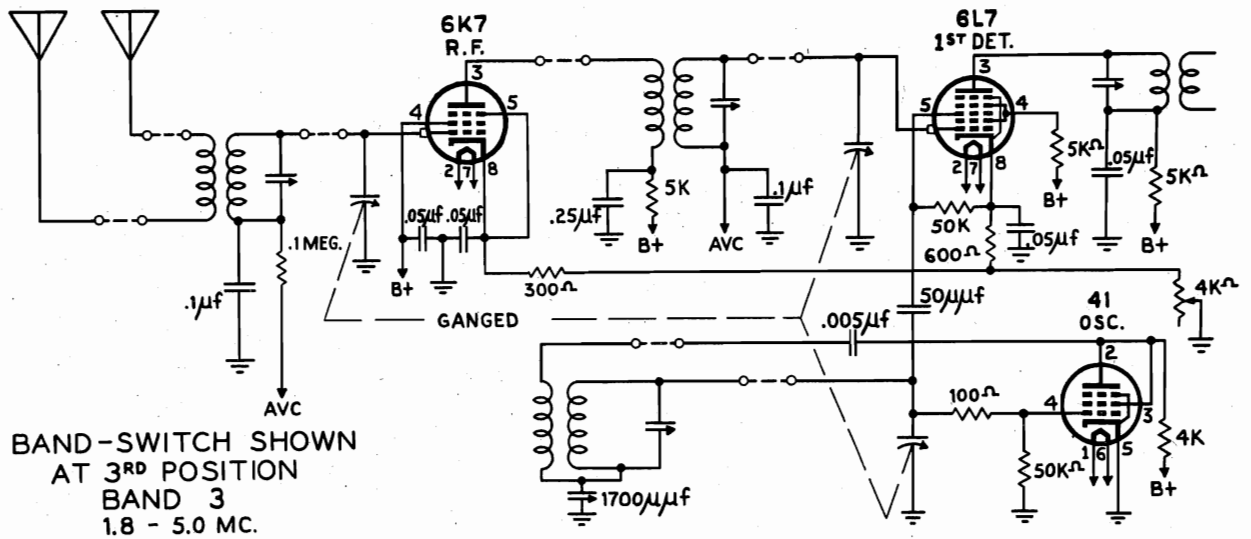
"clarified schematics"

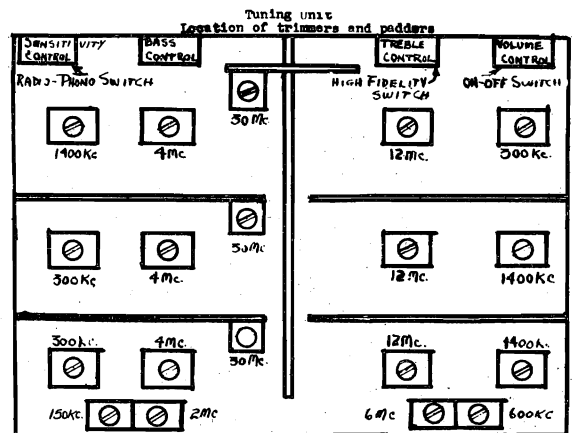
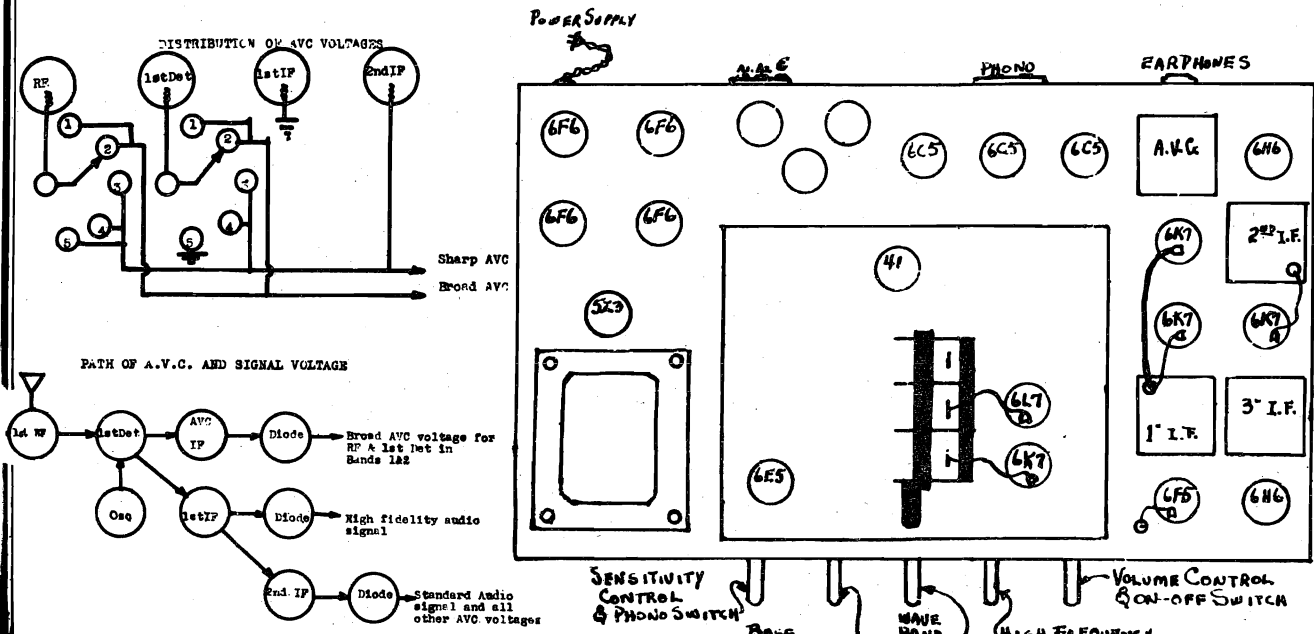


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ESPEY MFG. CO. INC.

MODEL 5181





Location of trimmers and padders

Numerals indicate frequencies at which the various trimmers and padders are adjusted.

Alignment with Output Meter

- Short either side of the broadcast R. F. coil trimmer to ground. Remove the first detector (6L7) grid cap and apply a 456 K. C. modulated signal. The fidelity switch must be in the sharp position (left). Remove the oscillator tube (41). Align the trimmers of the third, second and first I. F. transformers for maximum output in the order given.
 - Amplified A. V. C. and Band 2 adjustment:
Put the cap back on the 6L7. Place the 41 in its socket. Set dial at 1400 K. C. Feed 1400 K. C. signal from the generator to the set. Adjust oscillator, R. F. and antenna trimmers for maximum signal. Remove the short from the Broadcast R. F. coil trimmer being careful not to alter the setting of either the set or generator. Set both A. V. C. I. F. trimmers for minimum output. Now turn dial to 600 K. C. and feed a 600 K. C. signal from generator and adjust padder while rocking variable slightly back and forth for best adjustment. Repeat 1400 adjustment.
- ADJUSTMENT OF OTHER BANDS
- Band 1
Oscillator, R. F., and antenna trimmers are adjusted at 300 K. C. The padder is adjusted at 150 K. C. Repeat 300 K. C. adjustment.
- Band 3
Oscillator, R. F., and antenna trimmers are adjusted at 4 M. C. The padder is adjusted at 2 K. C. Repeat 4 M. C. adjustment.

Socket Voltage Readings

Tubes	Heater Volts	Meter 1000 ohms per volt				Cathode Current ma.
		S. G.	Cathode	Plate	Cathode	
No Signal						
6K7 R. F.	6.3	76	1.7	230	6	
6L7 1st Det.	6.3	76	2.2	220	4	
41 Osc.	6.3	0	160	17		
6K7 1st I. F.	6.3	90	2.4	230	8	
6K7 2nd I. F.	6.3	90	2	210	7	
6K7 A.V.C.	6.3	90	2.2	230	7	
6F5 1st Audio	6.3		.8	70	2	
6C5 Phase Inverter	6.3		2.1	65	1	
6E5 2nd Audio	6.3		6.6	230	6	
6F5 3rd Audio	6.3	Bias 38 V	0	340	22	
5X3 Rectifier	5		350	400-400	140	
6E5 Tuning Eye	6.3		0	90	3	

Voltage Rating: 105-125 Volts A. C. 50-60 Cycles

Power Consumption: 160 Watts

Type and Number of Tubes: 4-6K7, 4-6F6, 3-6C5, 2-6H6, 1-5Z3, 1-6F5, 1-6L7, 1-6E5, 1-41

Frequency Ranges: Band 1 140-380 K. C.
Band 2 550-1800 K. C.
Band 3 1800-5000 K. C.
Band 4 5000-14,000 K. C.
Band 5 14,000-38,000 K. C.

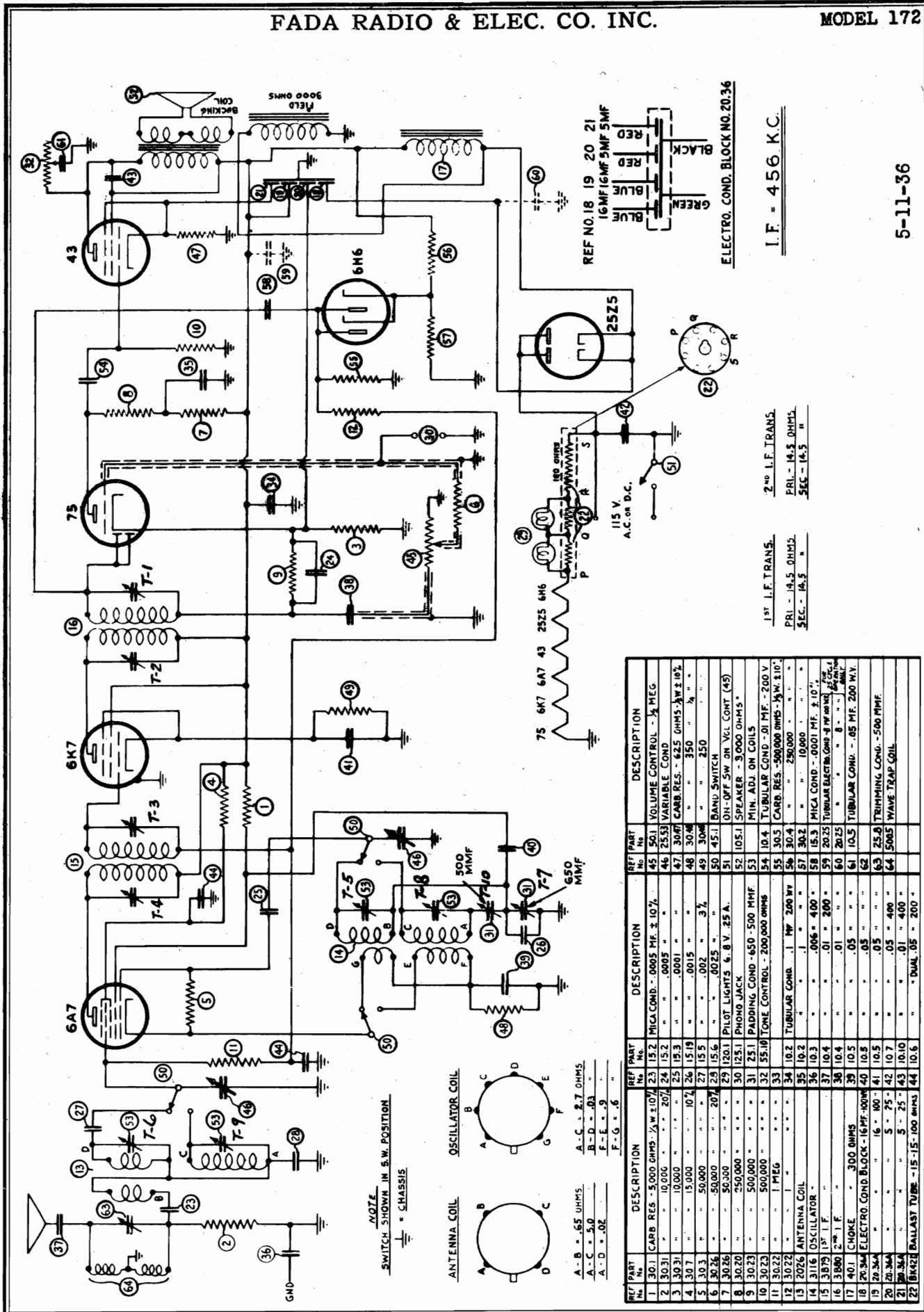
Alignment Frequencies: 150, 300, 456, 600, 1400, 2000, 4000, 6000, 16,000, 30,000 K. C.

- Band 4
Oscillator, R. F., and antenna trimmers are adjusted at 12 M. C. The padder is adjusted at 6 M. C. Repeat 12 M. C. adjustment.
- Band 5
Oscillator, R. F., and antenna trimmers are adjusted at 30 M. C. The padder on this band is fixed.

It is of the utmost importance when making all adjustments to keep the output of the generator just high enough to give a readable deflection on the output meter. If strong signals are used in alignment, your adjustments will be of very little value. This does not apply to the amplified A. V. C. adjustments where a strong signal is necessary.

FADA RADIO & ELEC. CO. INC.

MODEL 172



REF NO 18 19 20 21
16MF16MF 5MF 5MF
BLACK
RED
RED
BLUE
BLUE
GREEN

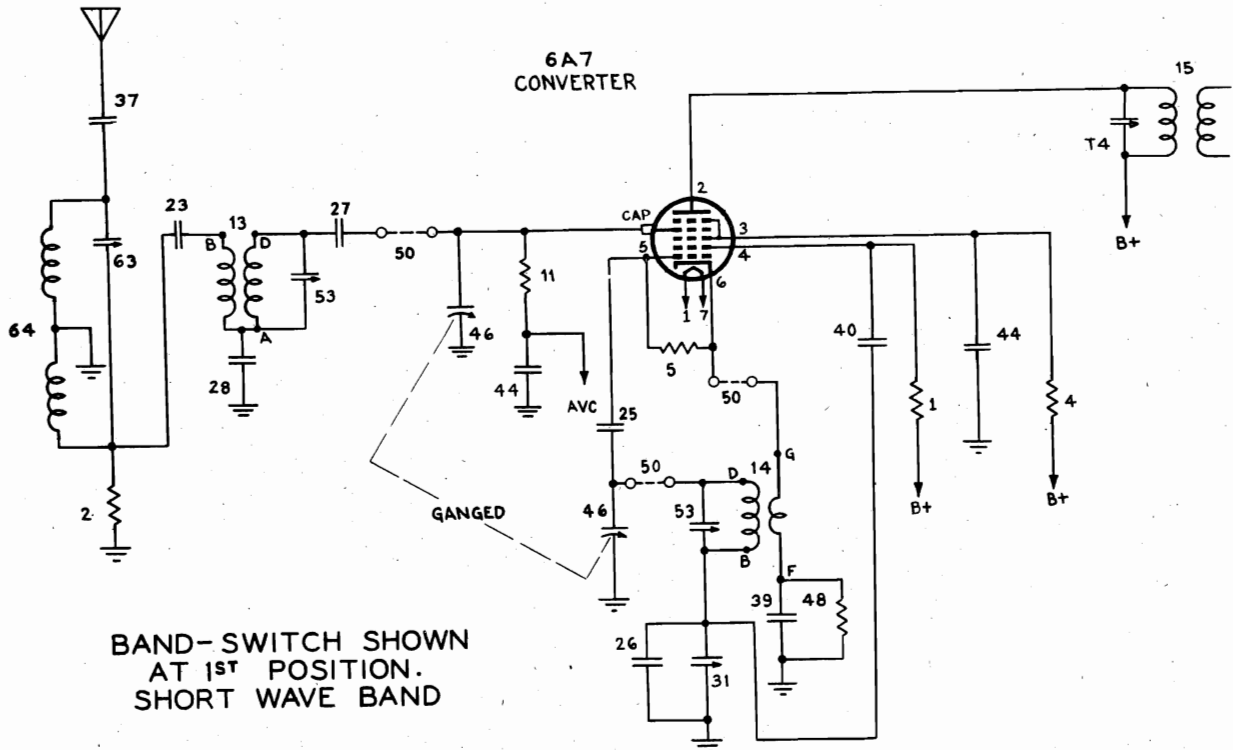
ELECTRO. COND. BLOCK NO. 20-36

I.F. = 456 K.C.

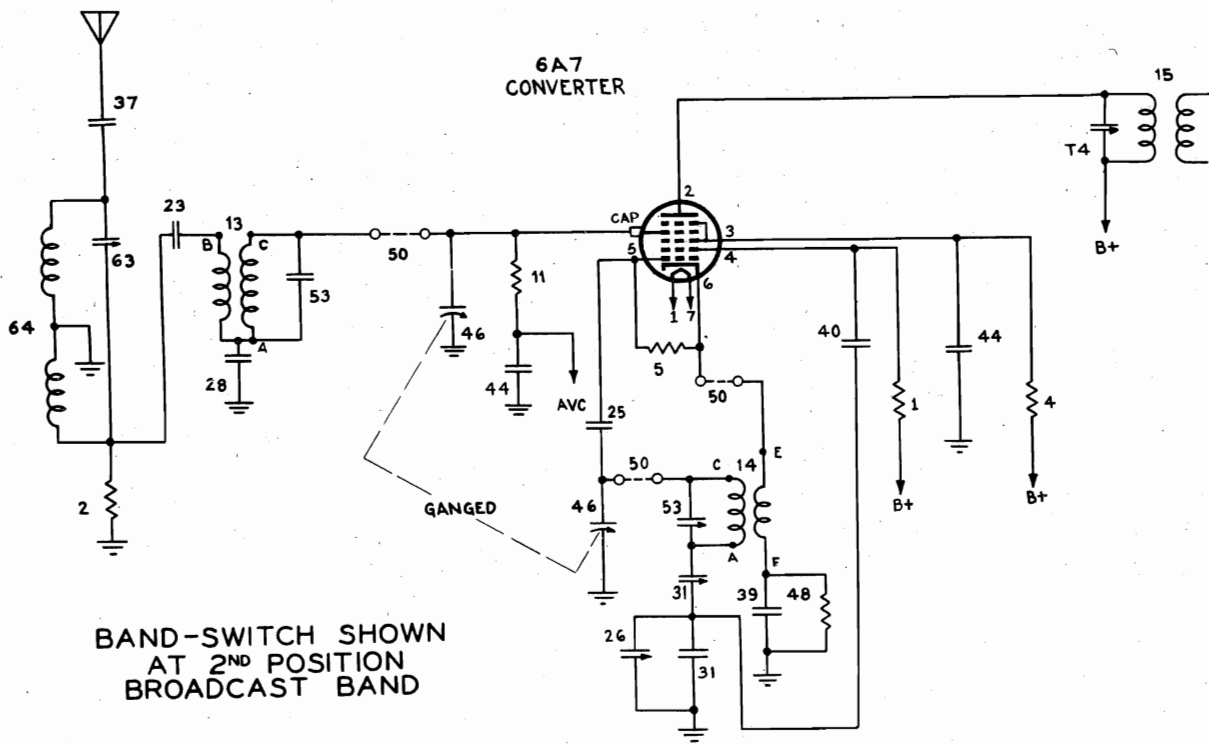
1ST I.F. TRANS. PRI. - 14.5 OHMS. SEC. - 14.5 "
2ND I.F. TRANS. PRI. - 14.5 OHMS. SEC. - 14.5 "

REF PART No.	DESCRIPTION	REF PART No.	DESCRIPTION	REF PART No.	DESCRIPTION
1	30.1 CARB RES - 5000 OHMS - 1/2 W ± 10%	23	15.2 MICA COND. - .0005 MF. ± 10%	45	50.1 VOLUME CONTROL - 1/2 MEG.
2	30.31 - 10.000 "	24	15.2 " "	46	25.53 VARIABLE COND.
3	30.31 - 10.000 "	25	15.3 " "	47	30.07 CARB RES. - 625 OHMS - 1/2 W ± 10%
4	30.7 - 15.000 "	26	15.3 " "	48	30.48 CARB RES. - 350 "
5	30.3 - 50.000 "	27	15.5 " "	49	30.48 CARB RES. - 250 "
6	30.26 - 50.000 "	28	15.6 " "	50	45.1 BAND SWITCH
7	30.26 - 50.000 "	29	120.1 PILOT LIGHTS 6.8 V. 25 A.	51	115 V. A.C. OR D.C.
8	30.20 - 250.000 "	30	125.1 PHONO JACK	52	105.1 SPEAKER - 3000 OHMS
9	30.23 - 500.000 "	31	25.1 PADDING COND. - 650 - 500 MMF	53	10.4 MIN. ADJ. ON COILS
10	30.23 - 500.000 "	32	55.1 TONE CONTROL - 200,000 OHMS	54	10.4 TUBULAR COND. - 0.1 MF. - 200 V
11	30.22 - 1 MEG.	33	10.2 TUBULAR COND. - 1 MF. 200 V	55	30.3 CARB RES. - 500,000 OHMS - 1/2 W. ± 10%
12	30.22 - 1 MEG.	34	10.2 " "	56	30.4 " "
13	20.76 ANTENNA COIL	35	10.2 " "	57	30.2 " "
14	31.15 OSCILLATOR	36	10.3 " "	58	15.3 MICA COND. - .0001 MF. ± 10%
15	38.79 1 ST I.F.	37	10.4 " "	59	20.25 TUBULAR ELECTRO. COND. - 2 MF. ± 10% ± 10% ± 10% ± 10%
16	3.886 2 ND I.F.	38	10.4 " "	60	20.25 " "
17	40.1 CHOKE - 300 OHMS	39	10.5 " "	61	10.5 TUBULAR COND. - .05 MF. 200 V
18	20.34 ELECTRO. COND. BLOCK - 16 MF. 100V	40	10.5 " "	62	25.0 TRIMMING COND. - 500 MMF
19	20.34 " "	41	10.7 " "	63	50.0 WAVE TRAP COIL
20	20.34 " "	42	10.7 " "	64	50.05 " "
21	20.34 " "	43	10.10 " "		
22	1K22 BALLAST TUBE - 15-15-100 OHMS	44	10.6 " "		

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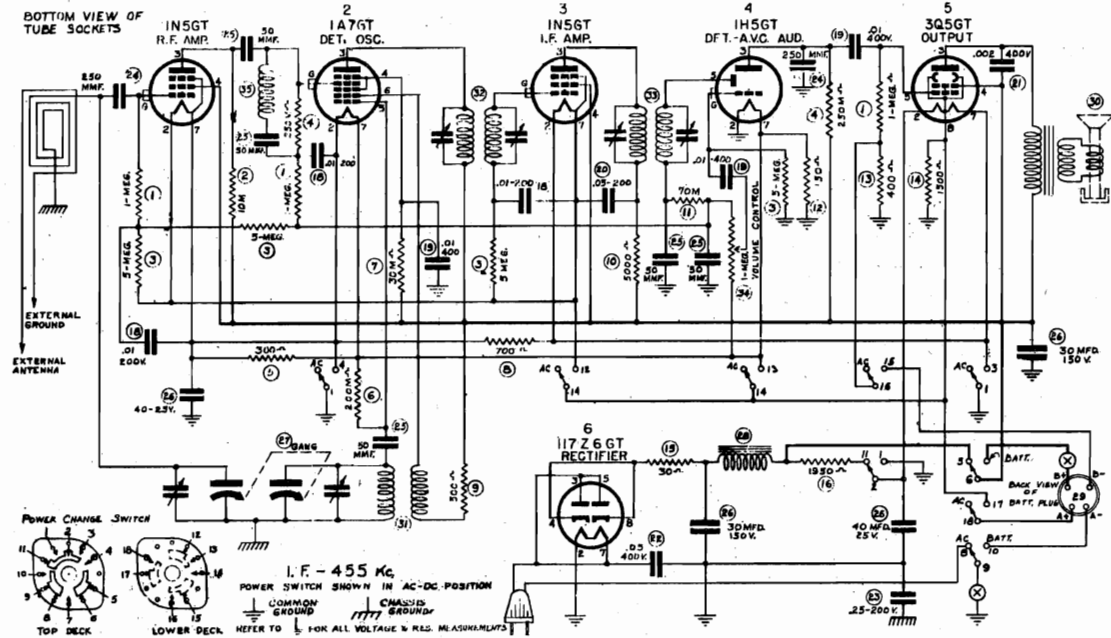
BAND-SWITCH SHOWN AT 1ST POSITION. SHORT WAVE BAND



BAND-SWITCH SHOWN AT 2ND POSITION BROADCAST BAND

FARNSWORTH TELEV. & RADIO CORP.

MODEL BT-68



WATTS
VOLTAGE

AT 117 VOLTS A.C.
A.C.

30
105-125

Ref. No.	Old Part No.	New Part No.	DESCRIPTION	List Price
1	771-24	77218	1 Meg 1/2 Watt	\$.15
2	771-14	77212	10 M Ohms 1/2 Watt	.15
3	773-27	77272	4.7 Megs 1/2 Watt	.15
4	773-21	77216	220 M Ohms 1/2 Watt	.15
5	77-90	77260	330 Ohms 1/2 Watt	.15
6	77-89	77216	220 M Ohms 1/2 Watt	.15
7	77-85	77267	33 M 1/2 Watt	.15
8	77-83	77262	1000 Ohms 1/2 Watt	.15
9	77-94	77261	470 Ohms 1/2 Watt	.15
10	77-93	77211	4700 Ohms 1/2 Watt	.15
11	77-88	77214	100 M Ohms 1/2 Watt	.15
12	774-1	77234	150 Ohms 1/2 Watt Wire Wound	.15
13	77-81	77261	470 Ohms 1/2 Watt	.15
14	771-10	77263	1500 Ohms 1/2 Watt	.15
15	77-79	77257	33 Ohms 1/2 Watt	.15
16	77-86	77086	1950 Ohms 5 Watt	.50
17	253-2	25215	.1 Mfd. 600 V.	.15
18	25-94	25194	.01 Mfd. 600 V.	.15
19	255-1	25194	.01 Mfd. 600 V.	.15
20	256-1	25196	.05 Mfd. 600 V.	.15
21	255-4	25185	.002 Mfd. 600 V.	.15
22	255-2	25196	.05 Mfd. 600 V.	.25
23	256-3	25054	.25 Mfd. 200 V.	.25
24	253-2	25187	250 M. M. F. Mica	.15
25	253-5	25193	50 M. M. F. Mica	.15
26	25-61	25061	Elec. Condenser 2-30 Mfd.—150 V., 2-40 Mfd. 25 V.	1.60
27	26-64	26064	Gang Tuning Condenser	2.40
28	38-202	38202	Choke	.90
29	80-70	80070	Battery Plug	.10
30	81-70	81070	Speaker and Output Transformer	4.30
31	38-197	38197	Oscillator Coil	.50
32	38-199	38199	1st. I. F. Transformer	1.30
33	38-201	38201	2nd. I. F. Transformer	1.60
34	78-27	78027	Volume Control 1 Meg	1.10
35	38-198	38198	Wave Trap Coil	.45
	90-43	90043	Power Change Switch	1.50
	59-66	59066	Knobs	.15
	31-89	31089	Dial Scale	.20
	11-83	11083	Dial Pointer	.15
	27-137	27137	Line Cord	.35
	56-411	56411	Escutcheon	1.35

Prices subject to change without notice.

THIS SIX TUBE AC-DC OR FIVE TUBE BATTERY OPERATED PORTABLE RECEIVER HAS A BUILT IN LOOP ANTENNA. AN OUTSIDE ANTENNA MAY BE CONNECTED BY LOOSENING THE SCREW IN THE LOWER RIGHT HAND CORNER OF THE BACK COVER. A GROUND SHOULD BE CONNECTED TO THE SCREW IN THE LOWER LEFT HAND CORNER WHEN AN OUTSIDE ANTENNA IS USED.

ALIGNMENT

A SIGNAL GENERATOR CALIBRATED AT 455 Kc., 1400 Kc., AND 1730 Kc., IS NECESSARY TO PROPERLY ALIGN THIS RECEIVER. AFTER ALIGNING THE I.F. STAGES, REPLACE RECEIVER IN CABINET AND FASTEN LOOP IN NORMAL POSITION BEFORE ALIGNING THE R.F. END THROUGH THE OPENINGS IN THE END OF THE CABINET. THESE OPENINGS ARE CLOSED BY SNAP FASTENERS. THE OSCILLATOR TRIMMER IS NEAREST THE FRONT PANEL AND THE LOOP TRIMMER IS DIRECTLY BEHIND IT.

TABULATION FOR ALIGNMENT

STEPS	USE IN SERIES WITH GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED	TO OBTAIN
1.	.02MFD IN EACH LEAD CONNECT HIGH SIDE OF GENERATOR TO GRID CAP OF 1A7G TUBE	455 Kc.	QUIET POINT	2ND I.F. TRIMMERS 1ST I.F. TRIMMERS	TOP OF I.F. TRANS.	MAXIMUM OUTPUT
2.	LOOP**	1730 Kc.	MINIMUM	OSCILLATOR TRIMMER*	SEE NOTE BELOW	
3.	LOOP**	1400 Kc.	1400 Kc. & ROCK GANG	LOOP TRIMMER*		

*SEE PRECEEDING PARAGRAPH FOR LOCATION OF TRIMMERS.

**LOOP TO CONSIST OF FIVE TO TEN TURNS OF INSULATED WIRE WOUND ON A THREE OR FOUR INCH FORM TO BE CLOSELY COUPLED TO THE LOOP ANTENNA IN THE RECEIVER.

SUGGESTED BATTERY 1 GENERAL 60A-4L 1 RAY-O-VAC AB-87
1 BURGESS 6FA-60

VOLTAGE AND RESISTANCE DATA

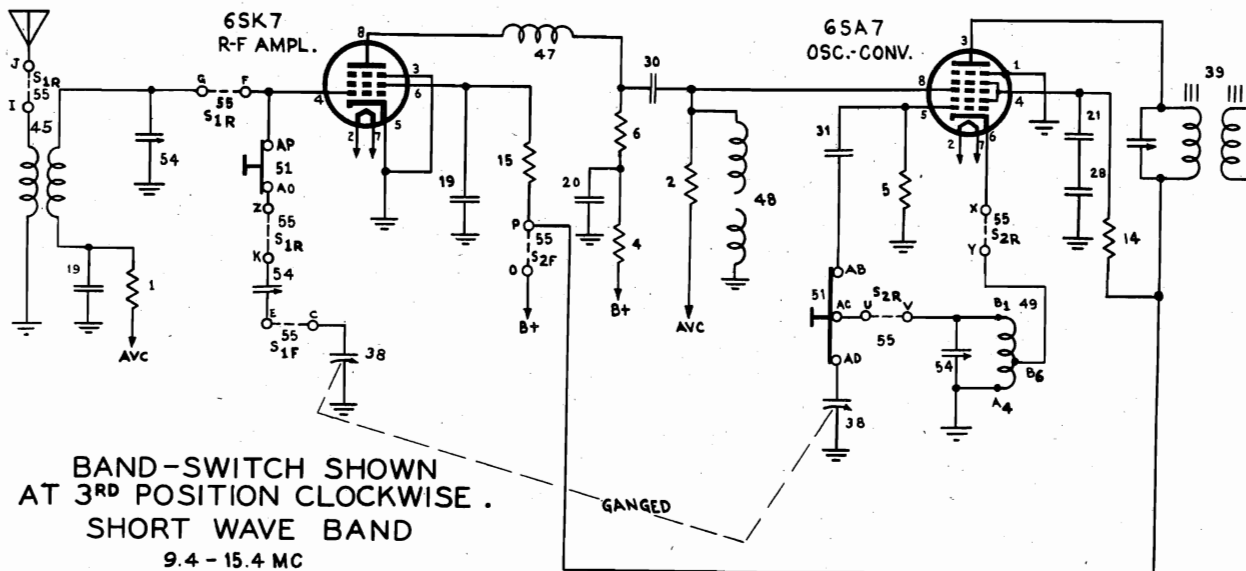
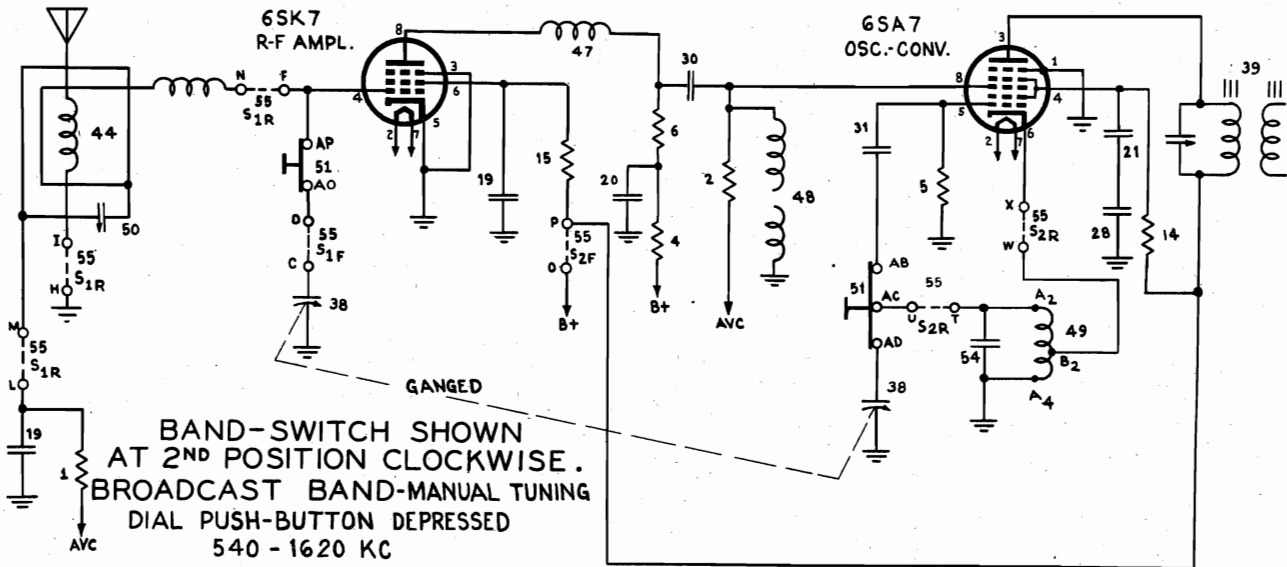
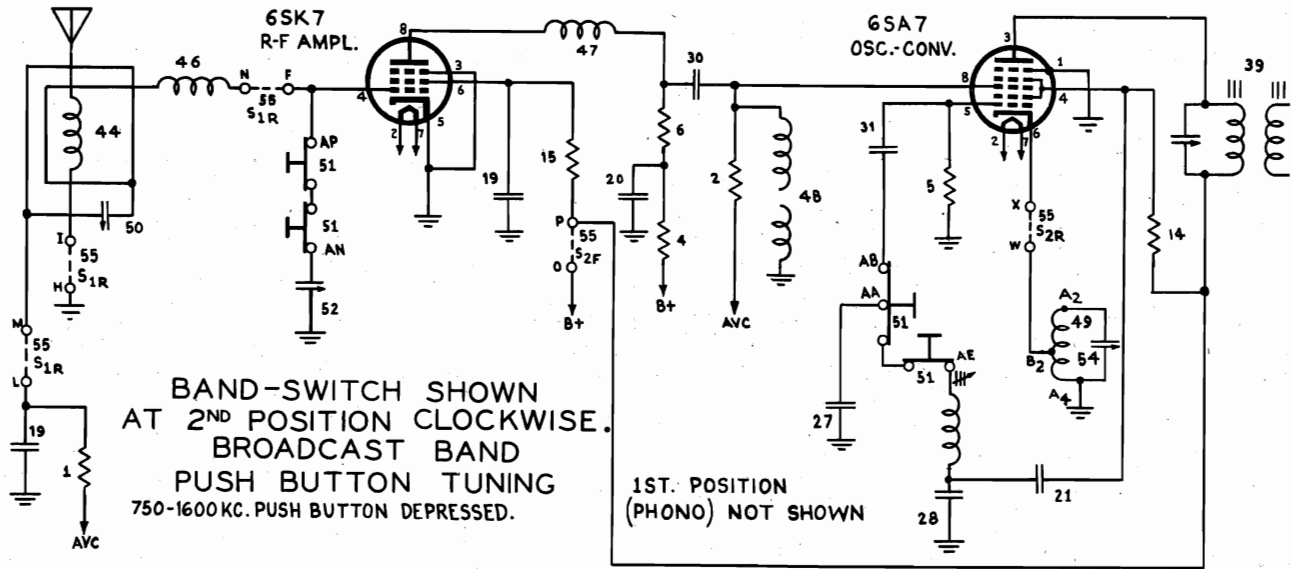
	1	2	3	4	5	6	7	8	Cap.
1 - 1N5GT									
Volts	open	4.2	97	100	0	16	2.8	open	1.8
Res.	open	61	3500	2500	0	6 meg.	40	open	1.5 meg.
2 - 1A7GT									
Volts	open	2.8	100	64	1.8	100	1.4	100	1.8
Res.	open	40	2500	2500	200M	2500	22	2500	1.5 meg.
3 - 1N5GT									
Volts	0	5.6	100	100	open	0	4.2	open	0
Res.	open	80	2500	2500	0	0	61	0	5 meg.
4 - 1H5GT									
Volts	open	0	47	0	0	47	1.4	open	0
Res.	open	0	1 meg.	0	1 meg.	1 meg.	22	open	5 meg.
5 - 3Q5GT									
Volts	open	8.4	93	100	0	open	5.6	9	
Res.	open	9.5	2500	2000	1 meg.	open	80	75	
6 - 117Z6GT									
Volts	open	117 AC	117 AC	123	117 AC	0	0	123	
Res.	open	500	500	2500	500	0	0	2500	

NOTES: On d-c voltage readings meter should have internal resistance of at least 10 megohms. Readings taken with no signal. Line voltage 117 V. A. C.

"clarified schematics"

PAGE 16-4 FARNSWORTH

MODELS EK-081, EK-082, FARNSWORTH TELEV. & RADIO CORP.
EK-083, EK-681



EQUIPMENT AND PROCEDURE FOR ALIGNMENT

To properly align this receiver, a signal generator calibrated at 455 Kc., 1000 Kc., 1500 Kc., 1620 Kc., 9.7 Mc., 15 Mc., and 15.4 Mc; and also an output indicator are required. All adjustments should be made with the volume control set for maximum volume, keeping the generator output as low as possible to prevent A.V.C. action and false readings.

The loop should be placed in the approximate position relative to chassis as when the chassis is installed in the cabinet.

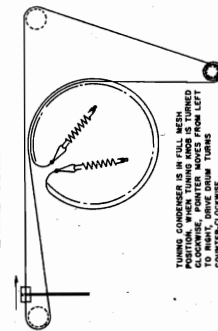
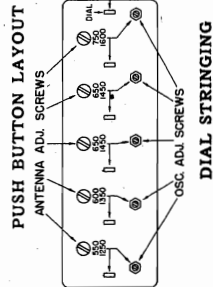
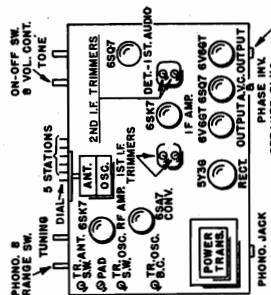
Connect the low side of the generator to the ground (black) wire and the high side of the generator to the antenna (red) wire.

CAUTION—Tighten S.W. oscillator trimmer screw for maximum capacity, then unscrew to second peak. Two peaks are usually found on the S.W. oscillator trimmer—one at 16.3 Mc., and one at 15.4 Mc. The lower frequency (15.4 Mc.) is used.

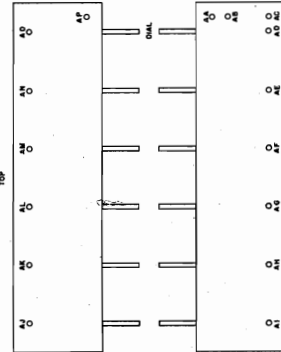
STEPS	USE IN SERIES WITH ANTENNA	SET GENERATOR AT	SET GENERATOR AT	ADJUST AT	LOCATED	TO OBTAIN
SET VOLUME CONTROL AT MAXIMUM						
1						
2	I. F.	455 Kc.	MINIMUM	2nd. I.F. TRIMMERS	TOP 2nd. I.F. TRANS.	
3	250 MMFD.			1st. I.F. TRIMMERS	TOP 1st. I.F. TRANS.	
4	BROAD-CAST	1620 Kc.		B.C. OSC. TRIMMER	See Chassis Layout	
5		1500 Kc.		ANT. TRIMMER	ON LOOP	
SET POINTER AT 1000 Kc. AND CHECK POINTER CALIBRATION						
7		15.4 Mc.	MINIMUM	S.W. OSC. TRIMMER**		
8	400 Ohms	15 Mc.	15 Mc. Rock Gang	S.W. ANT. TRIMMER	See Chassis Layout	
9		9.7 Mc.	9.7 Mc. Rock Gang	S.W. ANT. PADDER		
10	**See Caution above.					

- PUSH BUTTON SET UP**
- A Signal Generator should be used to prevent buttons being set up on wrong stations.
1. Remove the button escutcheon, exposing five pairs of adjusting screws. The small screw adjusts the oscillator and the large screw adjusts the antenna. (See PUSH BUTTON LAYOUT.)
 2. Select the pair of adjustment screws covering the frequency of a wanted station.
 3. Press the "Dial" button and manually tune in the desired station frequency.
 4. Press the button selected for this frequency.
 5. Adjust the lower screw of the pair selected for this frequency until the signal is heard most clearly.
 6. Adjust the upper screw of the same pair until maximum volume is secured.
 7. Press dial button, making certain original frequency is still tuned-in; check results on button just set up. If it is the same, proceed with the next button, until all are set up.
 8. Recheck settings and correct any drift due to interaction between adjacent coils.

CHASSIS LAYOUT



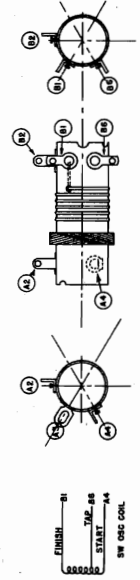
PUSH BUTTON TUNER SWITCH



Refer. No.	Part No.	DESCRIPTION
1	77214	100 M Ohms
2	77216	220 M Ohms
4	77262	1000 Ohm
5	77265	22 M Ohms
6	77268	22 M Ohms
7	77270	470 M Ohms
8	77213	47 M Ohms
9	77270	2.2 Megohm
10	77274	10 Megohm
11	77218	10 Megohm
12	77218	10 Megohm
13	77013	10 M Ohms 2 Watt
14	77013	10 M Ohms 1 Watt
15	77069	22 M Ohms 2 Watt
16	77304	1000 Ohm 2 Watt
17	77243	2700 Ohm 4.7 Watt Molded
19	25196	.05 Mfd. Tubular 600 Volts
20	25196	.05 Mfd. Tubular 600 Volts
21	25183	.005 Mfd. Tubular 600 Volts
22	25215	.1 Mfd. Tubular 600 Volts
23	25185	.002 Mfd. Tubular 600 Volts
24	25184	.002 Mfd. Tubular 600 Volts
25	25215	.02 Mfd. Tubular 600 Volts
26	25215	.02 Mfd. Tubular 600 Volts
27	25213	.1350 Mfd. Silver Mica Capacitor
28	25213	.1350 Mfd. Silver Mica Capacitor
29	25188	100 Mmf. Mica
30	25188	47 Mmf. Mica
31	25193	47 Mmf. Mica
32	25192	.005 Buffer 600 Volts
33	25192	.005 Buffer 600 Volts
34	25213	1350 Mfd. Silver Mica Capacitor
35	25213	1350 Mfd. Silver Mica Capacitor
36	78057	Volume Control
37	78072	Tone Control
38	26194	Gang Capacitor
39	38485	1st. I. F. Transformer
40	38486	2nd. I. F. Transformer
41	38486	2nd. I. F. Transformer
42	81126	Output Transformer
43	38546	Loop Antenna
44	38542	Short Wave Antenna Coil
45	38794	Antenna Loading Coil
46	38544	Peaking Coil
47	38544	Peaking Coil
48	38543	S.W. Trap
49	38543	S.W. Trap
50	28032	B.C. Oscillator Coil Ass'y.
51	80118	Antenna Trimmer
52	26175	Push Button Switch
53	38405	P. B. Trimmer Strip
54	38405	P. B. Trimmer Strip
55	60175	Antenna Plug
56	80252	Antenna Plug
57	94104	Antenna Socket
58	94224	60 Cycle Power Transformer for 681 COY
59	11210	Phono Ant. Socket
60	11210	Phono Ant. Socket
	27118	Universal Line Cord
	80239	Rectifier Octal Socket
	80139	Molded Octal Socket
	22147	Phono Pickup Cable for EK-081 and EK-083
	31273	Phono Pickup Cable for EK-082
	31273	Phono Pickup Cable for EK-082
	04065	Dial Background
	561397	Escutcheon
	07373	Dial Pointer
	59134	Knob
	43108	Dial Lamp (Model 44) 6 V., 250 Ma
	43108	Dial Lamp (Model 44) 6 V., 250 Ma
	17019	Drive Drum
	59249	Push Button Escutcheon
	59030	Push Button Escutcheon
	41101	Station Call Letter Tabs
	H-224	Phono Needle Packing for EK-081
	H-224	Phono Needle Packing for EK-081
	H-225	Cabinet and Packing for EK-082
	H-225	Cabinet and Packing for EK-082
	H-227	Cabinet and Packing for EK-083

The Service Department policy is to furnish 1/2 watt 5% carbon resistors tubular condensers.

BROADCAST AND S. W. OSC. COILS



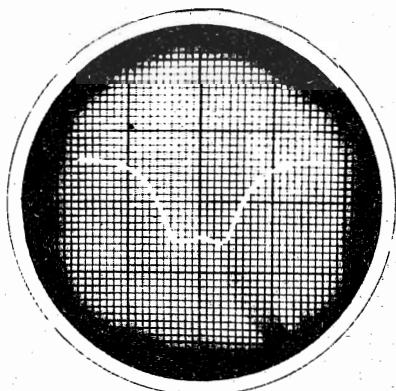
MODELS GK-140. FARNSWORTH TELEV. & RADIO CORP.
 GK-141,
 GK-142, GK-143, GK-144,
 Preliminary

FM GAIN MEASUREMENTS

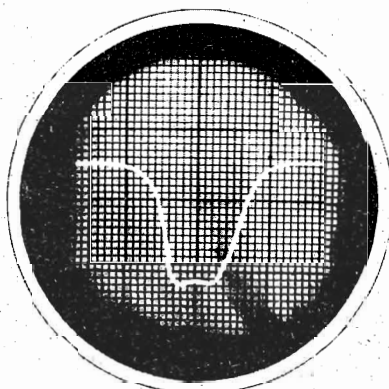
EQUIPMENT REQUIRED

FM Signal Generator, modulated at 400 cycles, 22.5 Kc deviation.
 Output Meter.
 Output meter connected across secondary of out-put transformer, 4 ohms impedance. Signal generator connected at gang capacitor. Volume control, Bass control and Treble control at maximum.

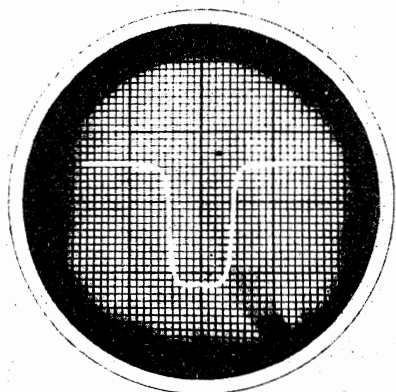
SIGNAL GENERATOR TO	DUMMY	MICROVOLTS INPUT	OUTPUT	GAIN
Ant.	330 ohms	20	.5 watt	1.5X
RF	.1 Mfd.	30	.5 watt	
Conv. Grid	.1 Mfd.	130	.5 watt	4.33X



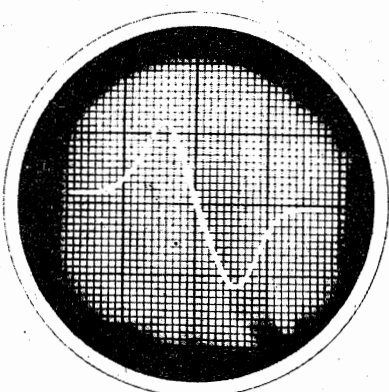
(1)



(2)



(3)



(4)

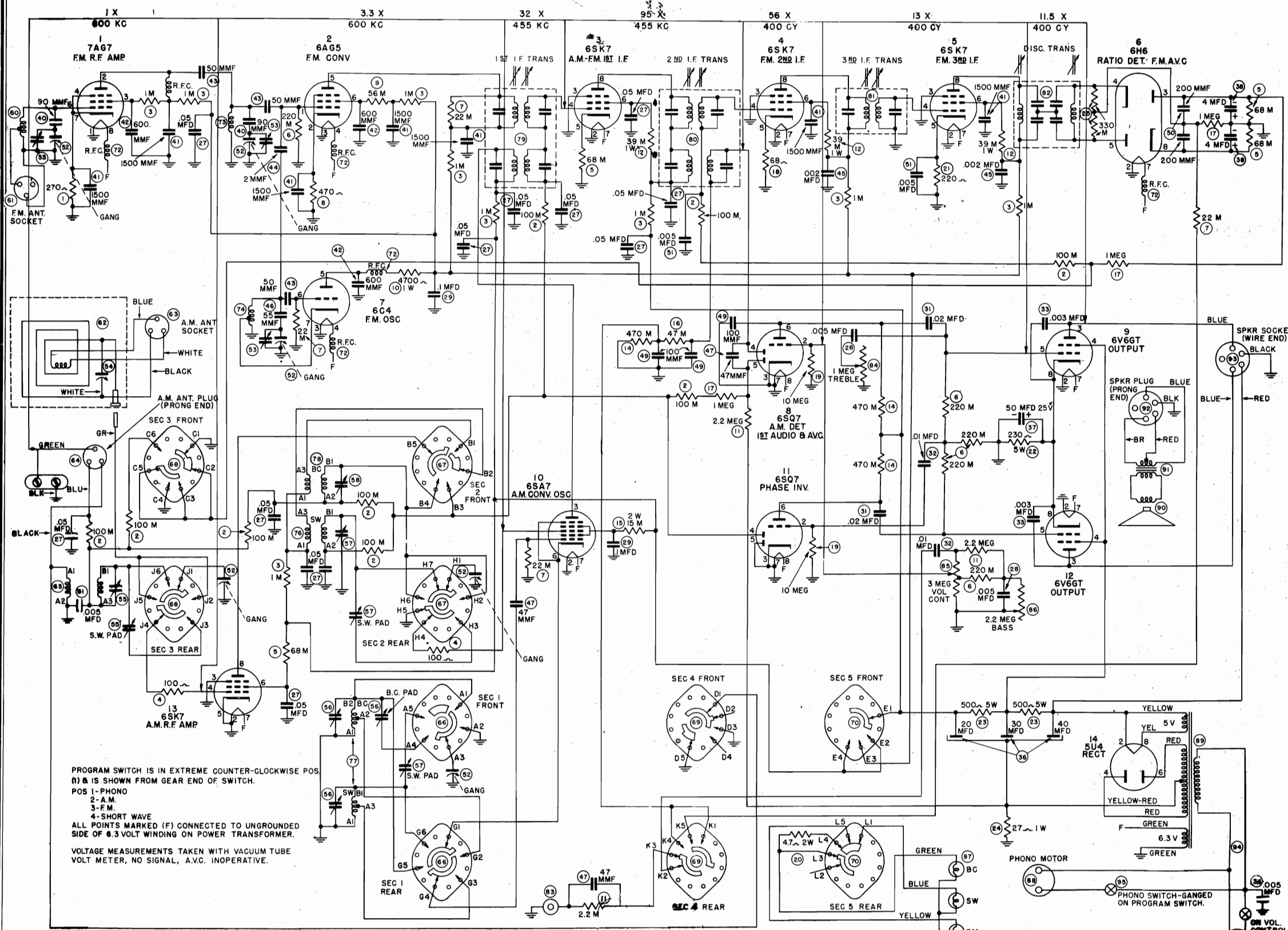
F-M
 ALIGNMENT
 OSCILLOGRAMS

These curves were obtained under ideal conditions and show curves to be expected. They should be duplicated as nearly as practicable.

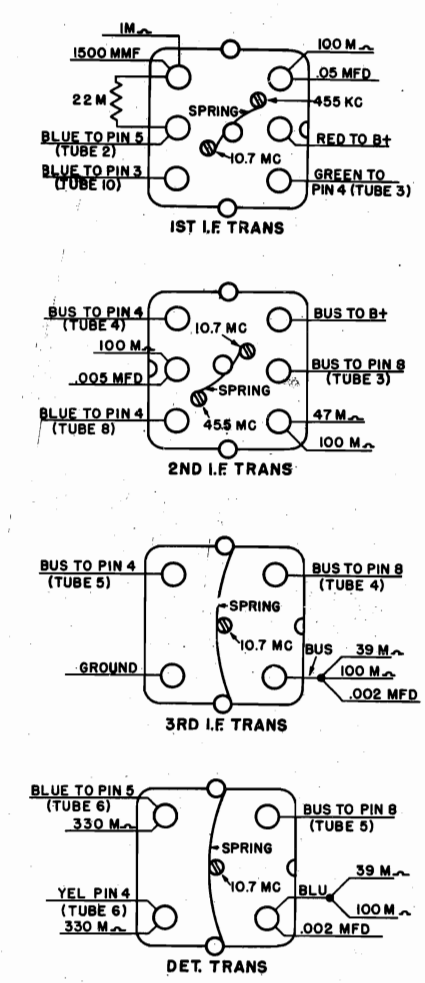
FARNSWORTH TELEV. & RADIO CORP.

MODELS GK-140, GK-141, GK-142, GK-143, GK-144, Preliminary

VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE	VOLTAGE	RESISTANCE
10	1-8	10	1.220M	10	1.0	10	1.0	10	1.0	10	1.0	10	1.0	10	1.0	10	1.0	10	1.0
3350	1.1NF	30	2.470	30	26.3AC	30	2.2	30	2.2	30	2.2	30	2.2	30	2.2	30	2.2	30	2.2
48	4.870	30	46.3AC	30	4-2.7	30	4.1MEG	40	4-2.7	40	4.1MEG	40	4.1MEG	40	4.1MEG	40	4.1MEG	40	4.1MEG
30	3.885	30	3.885	30	3.885	30	3.885	30	3.885	30	3.885	30	3.885	30	3.885	30	3.885	30	3.885
60	6.085	30	6.085	30	6.085	30	6.085	30	6.085	30	6.085	30	6.085	30	6.085	30	6.085	30	6.085
72	7.270	70	7.270	70	7.270	70	7.270	70	7.270	70	7.270	70	7.270	70	7.270	70	7.270	70	7.270
86.3 AC	8.6	8250	8.6	8250	8.6	8250	8.6	8250	8.6	8250	8.6	8250	8.6	8250	8.6	8250	8.6	8250	8.6



BOTTOM VIEW OF I.F. CANS

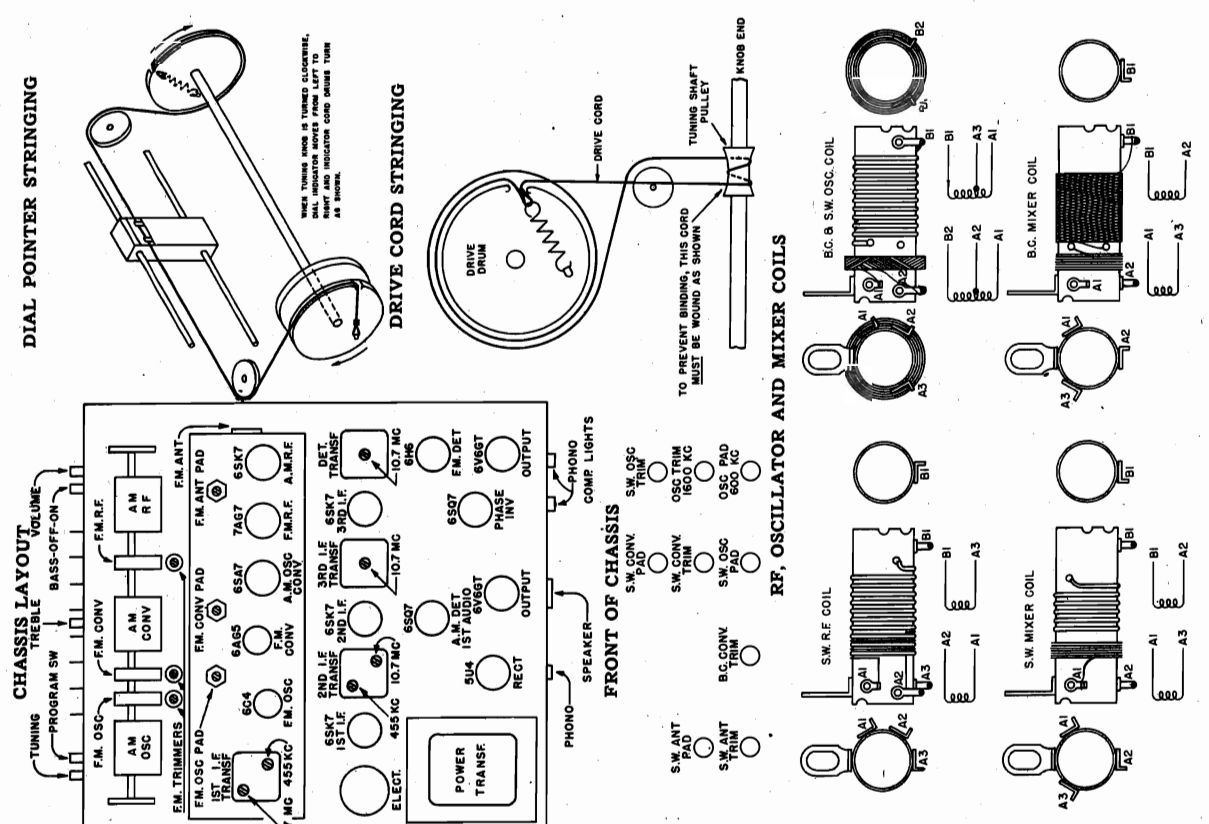
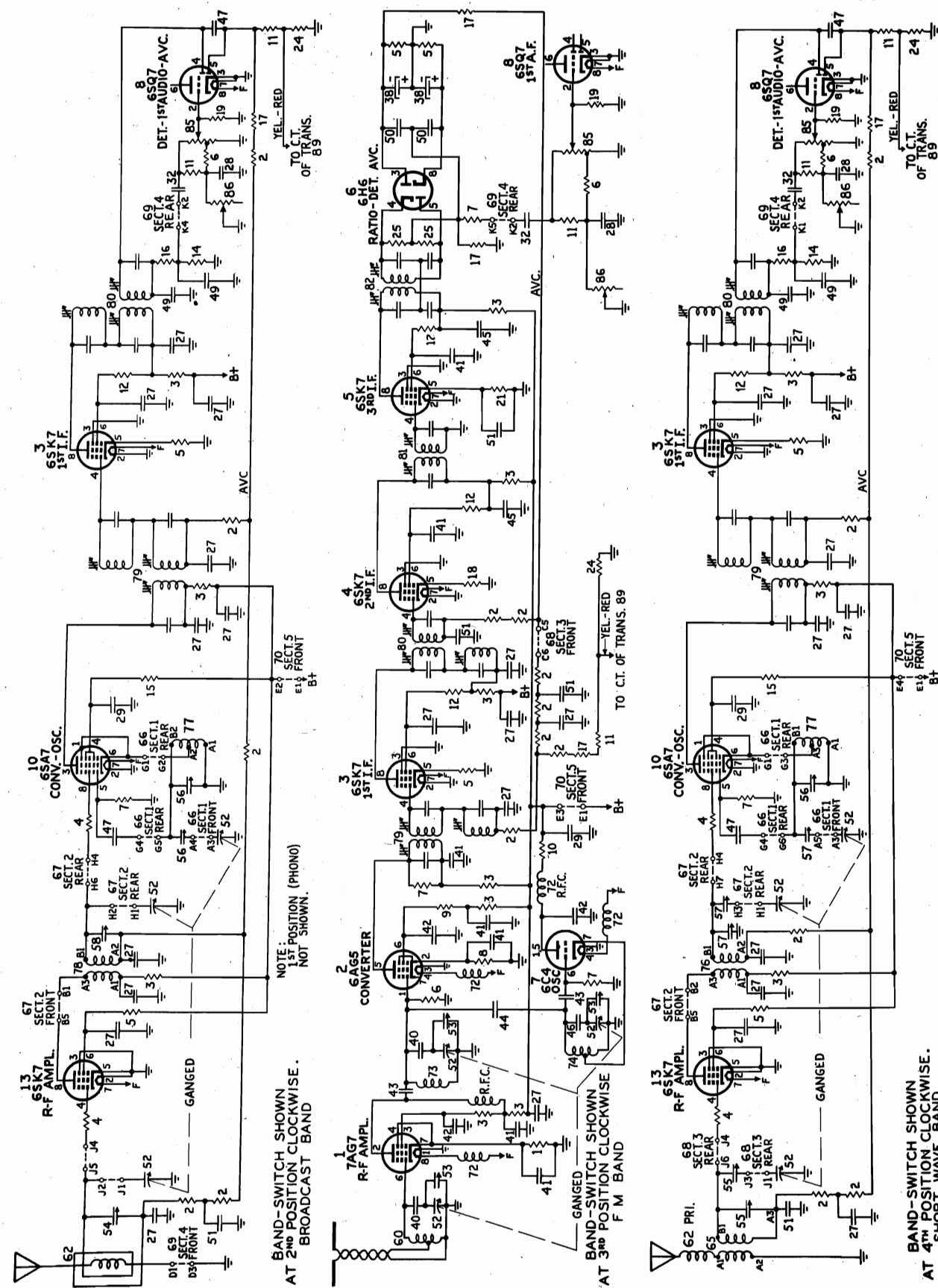


PROGRAM SWITCH IS IN EXTREME COUNTER-CLOCKWISE POS. (1) & IS SHOWN FROM GEAR END OF SWITCH.

POS 1-PHONO
 2-A.M.
 3-F.M.
 4-SHORT WAVE

ALL POINTS MARKED (F) CONNECTED TO UNGROUNDED SIDE OF 6.3 VOLT WINDING ON POWER TRANSFORMER.

VOLTAGE MEASUREMENTS TAKEN WITH VACUUM TUBE VOLT METER, NO SIGNAL, A.V.C. INOPERATIVE.



TABULATION FOR AM ALIGNMENT

STEPS	CONNECT GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	TO OBTAIN
1					Set Tone and Volume Controls at Maximum
2	Grid Conv. tube	455 Kc	Quiet Point		2nd. I.F. Slugs
3					1st. I.F. Slugs
4					BC Osc. Trimmer
5	RF of GANG	1500 Kc	1500 Kc		BC Mixer Trimmer
6					Osc. Padder *
7					Check dial calibration at several frequencies. If not reasonably correct, adjust oscillator padder. See Note 1
8	Ext. Ant. Binding Post	1500 Kc	1500 Kc		Loop Trimmer

*Through RMA dummy antenna.
* This adjustment should be made while gang is rocked.

SHORT WAVE RF

STEPS	CONNECT GENERATOR	SET GENERATOR AT	SET GANG AT	ADJUST	TO OBTAIN
9					Place Band Switch in Short Wave position.
10					SW Osc. Trimmer See Note 2
11					SW Conv. Trimmer
12	External Antenna				SW Ant. Trimmer
13					SW Osc. Padder
14					SW Conv. Padder
15					SW Ant. Padder
16					Recheck Steps 10 to 15 inclusive.

NOTE 1. After any adjustment of oscillator padder, repeat steps 4, 5 and 6.
NOTE 2. Set oscillator trimmer to maximum capacity, then slowly loosen trimmer until 2nd signal is heard.

FARNSWORTH TELEV. & RADIO CORP.

MODELS
GK-140, GK-141,
GK-142, GK-143, GK-144,
Preliminary

SETTING STATION TUNING BUTTONS
Allow the set to warm up for about one-half hour before beginning to set the push buttons.

Make a list of the eight stations to be set up. Move the program switch to proper band for the station to be set-up.

Select a push button for this station. Remove the push button, exposing the push button lock screw.

Loosen this lock screw with a screw driver. Tune in the desired station with the manual tuning knob.

Push the push button shaft all the way in with the screw driver engaged in the slot in the lock-screw.

Alignment of AM Bands

EQUIPMENT REQUIRED

A calibrated signal generator having fundamental frequencies from 455 Kc to 15 MC. In addition to the signal generator a crystal calibrator is a great convenience.

The indicating device for showing correct alignment may be a high resistance A.C. voltmeter, a vacuum tube voltmeter or a Cathode Ray oscilloscope.

The A.C. voltmeter can be used either across the voice coil of the loud speaker or if the meter range is high enough, from plate to plate in the output stage (don't forget a condenser (0.1 Mfd.) to keep

Firmly tighten the push button locking screw. **CAUTION**—Do not use a large handle screw driver as damage may result. We recommend type of screw driver used for knob setscrew.

Continue setting each button the same way. After all the stations are set up, replace the push buttons and place the station call letter tab found in the call letter kit on the proper button.

CAUTION

When setting up push buttons it is well to select a time when the stations are not carrying "Chain" programs as adjustments might be made on the wrong stations.

the D.C. out of the meter).

Special care must be employed when aligning the short wave band, for the adjustment of the shunt trimmer affects the adjustment of the series pad. At the high frequency end of the band it is possible to peak the oscillator trimmer (and the pad at the low frequency end) at the image so in the alignment instructions we have indicated the fundamental frequency and the correct oscillator setting for the image so by resetting the signal generator it is possible to see if the alignment is correctly made. In each case, the image is found at a frequency 910 Kc. higher than the fundamental.

Oscilloscope Alignment FM Band

FM IF ALIGNMENT

1. Equipment Required: Oscilloscope, 10.7 MC sweep generator, voltmyst, and RF signal generator.

2. Set band switch in FM position.

3. Make connection from vertical deflection amplifier of oscilloscope to pin #3 of 6H6 discriminator tube. Make certain that the 4MFD electrolytic condenser is disconnected from this same circuit. It is necessary that the lead to the oscilloscope be shielded, of low total capacity, and connection to receiver isolated by means of a 1 meg. resistor.

4. Connect sweep generator to last FM IF grid through a .1 MFD coupling capacitor.

5. Load primary of discriminator transformer with resistor of approximately 39000 ohms. Back out secondary slug (top slug) as far as it will turn. Align primary (bottom slug) to obtain curve similar to figure 1. This does not constitute a final alignment of discriminator, but is a convenient expedient to assist in I.F. alignment.

6. Shift connection of sweep signal generator to the grid of the second FM IF tube. **NOTE:** As alignment moves from stage to stage, reduce input instead of reducing oscilloscope gain.

7. Align third FM IF transformer for a symmetrical flat top pattern. (Fig. 2).

8. Shift signal generator to the grid of the first IF tube.

9. Align second IF transformer in same manner as described in Section 7. **Note:** that the width of the nose of the curve is the same as before, but the sides have become steeper, as in Fig. 3.

10. Connect the signal generator to the grid of the converter tube grid in series with 10,000 ohm resistor and a .1MFD capacitor, or loosely couple by stray capacity of an insulated wire.

11. Align first FM IF transformer in the same manner as in Section 7. **Note:** that the sides of the curve have further steepened, but that the nose of the curve has flattened approximately the same width as in Fig. 3.

12. Connect 4 MFD electrolytic capacitor that was previously disconnected, and take off load resistor on discriminator primary.

13. Connect oscilloscope to audio output terminal of discriminator. There are several points where contact can be made and can be identified as the circuit connected to the terminal on the terminal board (nearest the discriminator transformer) to which the shielded lead is connected.

Alternate FM IF Alignment Procedure

Equipment necessary: RF Signal Generator and Vacuum tube voltmeter.

1. Connect V.T.V.M. from ground to audio lead of ratio detector (discriminator). Connect generator tuned to 10.7 mc. to grid of third FM IF tube through 0.1MFD capacity. Use minimum signal necessary for good indication in all following:

2. Turn secondary slug of ratio detector transformer (top slug) out as far as it will turn.

3. Tune primary for maximum output.

4. Connect generator to grid of second FM IF tube.

5. Tune primary and secondary of third FM IF transformer for maximum output.

14. With sweep signal input to converter grid, align discriminator transformer for conventional discriminator pattern, as in Fig. 4.

15. Connect signal generator to converter tube grid through .1MFD capacitor. An unmodulated signal input of 65 microvolts at 10.7 Mc should develop .55 volt rise on the AVC line with voltohmmyst connected to AVC line through 1 megohm resistor.

6. Connect generator to grid of first FM IF tube.

7. Tune primary and secondary of second FM IF transformer for maximum output.

8. Connect generator to converter grid through 10,000 ohm resistor and 0.1 MFD capacitor.

9. Tune primary and secondary of first FM IF transformer for maximum output.

10. Tune secondary of ratio detector transformer for zero or minimum output.

11. The FM IF system should now be aligned. Tuning the signal generator equal amounts on each side 10.7 mc should produce equal deflections of opposite polarity on the VTVM. Deflections unequal by more than 10 per cent or so indicate inaccurate alignment.

FM RF Alignment

8. Set tuning controls so dial pointer calibrates at the equivalent of half way between channels 200 and 201.

9. Apply 88 MC signal.

10. Adjust oscillator, converter, and antenna slugs to maximum output.

11. Repeat operations 3 to 10 inclusive. **NOTE:** The degree of adjustment required in the tuning of the oscillator slug will determine the number of times operations 3 to 10 must be repeated until no further gain in sensitivity is obtained.

12. Carefully tune across the entire FM band for the observance of the dead or weak spots that may be a resultant of improper alignment or defective components. This can be determined by carefully noting the degree of receiver noise, that is, high noise generally is accompanied by good sensitivity.

1. Equipment Required:
a. RF Signal Generator. Range 88 to 108 MC.
b. Output Meter.
c. Insulated Screw Driver.

2. Connect RF signal generator in series with 400 ohm carbon resistor to "high" side of FM antenna socket. Connect output meter across voice coil of speaker.

3. Set tuning control for pointer to calibrate at the equivalent of half way between channels 300 and 301.

4. Apply 108 MC Signal.

5. Set converter and antenna trimmers at minimum capacity.

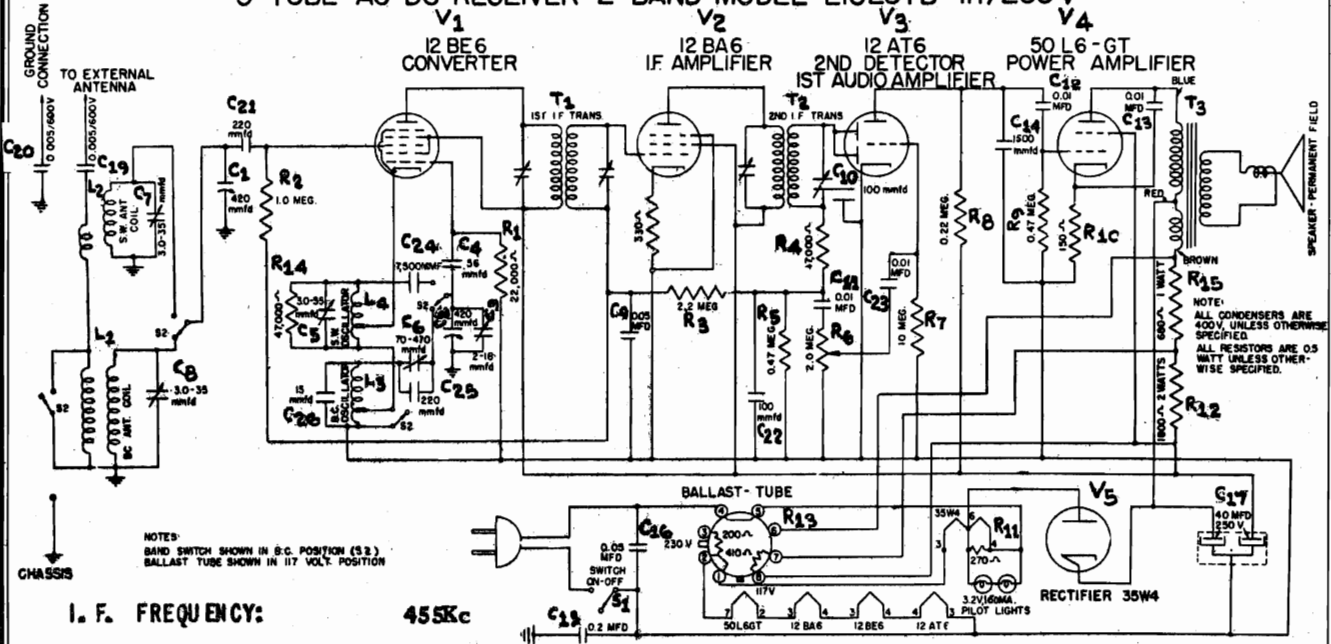
6. Adjust oscillator trimmer by tuning from maximum capacity to first signal that is heard, and peak for maximum output.

7. Adjust antenna and converter trimmers for maximum output.

POWER OUTPUT RATING:
VOICE COIL IMPEDANCE:
POWER REQUIREMENTS:
TUNING RANGES:
ANTENNA:

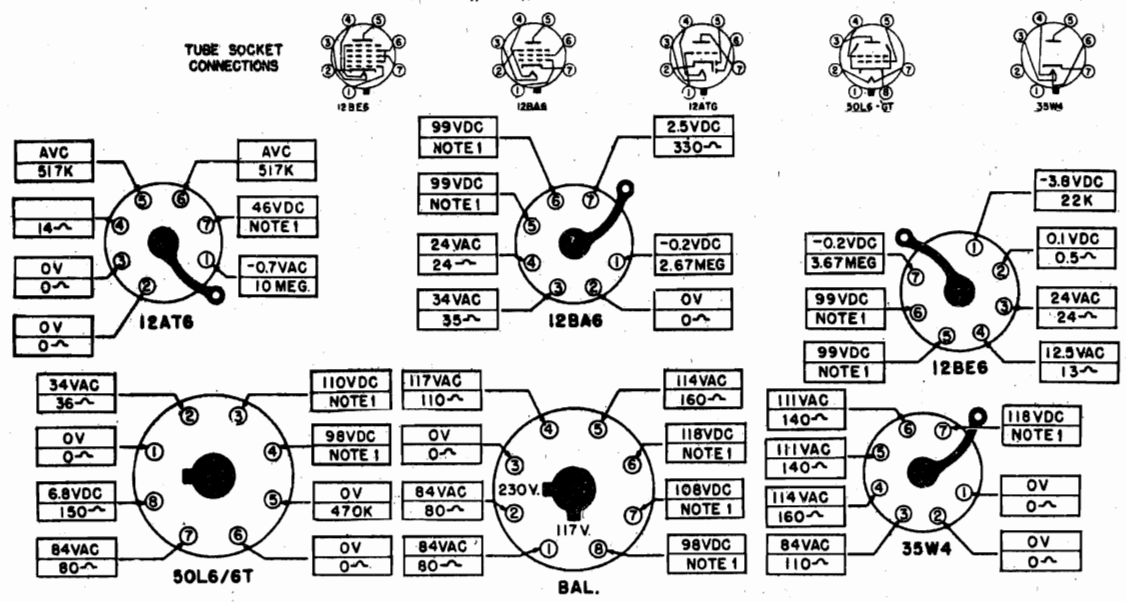
For 105-125 v. operation:
 Undistorted 1.1 watts; maximum 1.5 watts. For 210-250 v. operation:
 undistorted 1.9 watts; maximum 2.8 watts.
 3.2 ohms at 400 cycles.
 30 Watts at 105-125 volts 50-60 cycles AC, or 105-125 volts DC.
 60 Watts at 210-250 volts, 50-60 cycles AC, or 210-250 volts DC.
 Broadcast Band 540-1600 kilocycles (555-188 m)
 International Short Wave Band 6-18 megacycles (50-16.65 m).
 External.

5 TUBE AC-DC RECEIVER-2 BAND-MODEL E1025TB-117/235 V



NOTES:
 BAND SWITCH SHOWN IN S.C. POSITION (S2)
 BALLAST TUBE SHOWN IN 117 VOLT POSITION

I. F. FREQUENCY: 455Kc

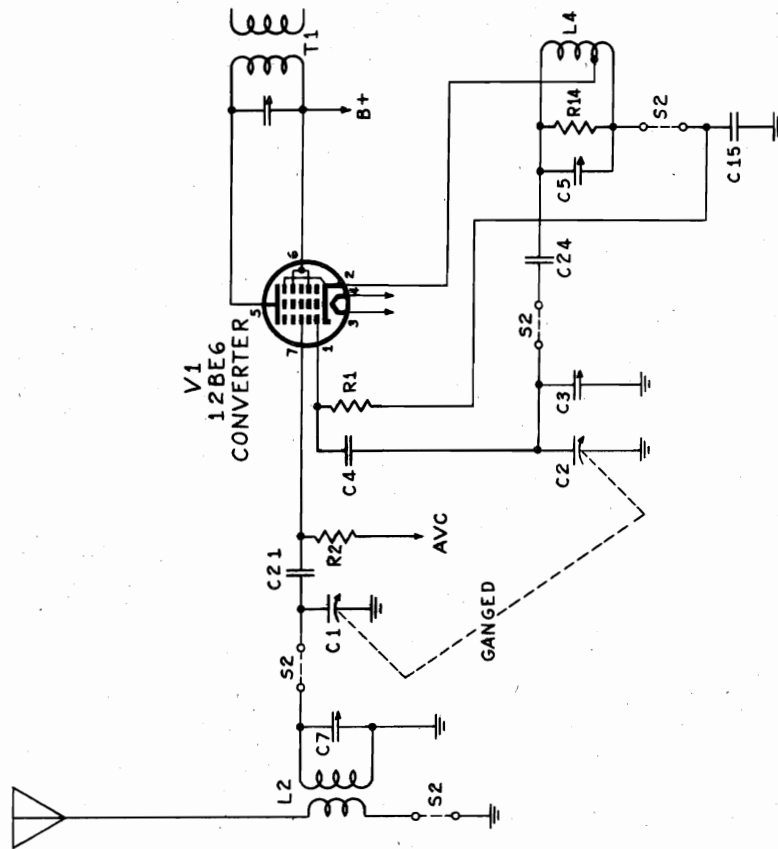


NOTE 1: RESISTANCE READINGS AT THESE POINTS WILL VARY SINCE THEY ARE IN SERIES WITH THE LEAKAGE RESISTANCE OF THE ELECTROLYTIC CONDENSERS WHICH IS SUBJECT TO CHANGE.

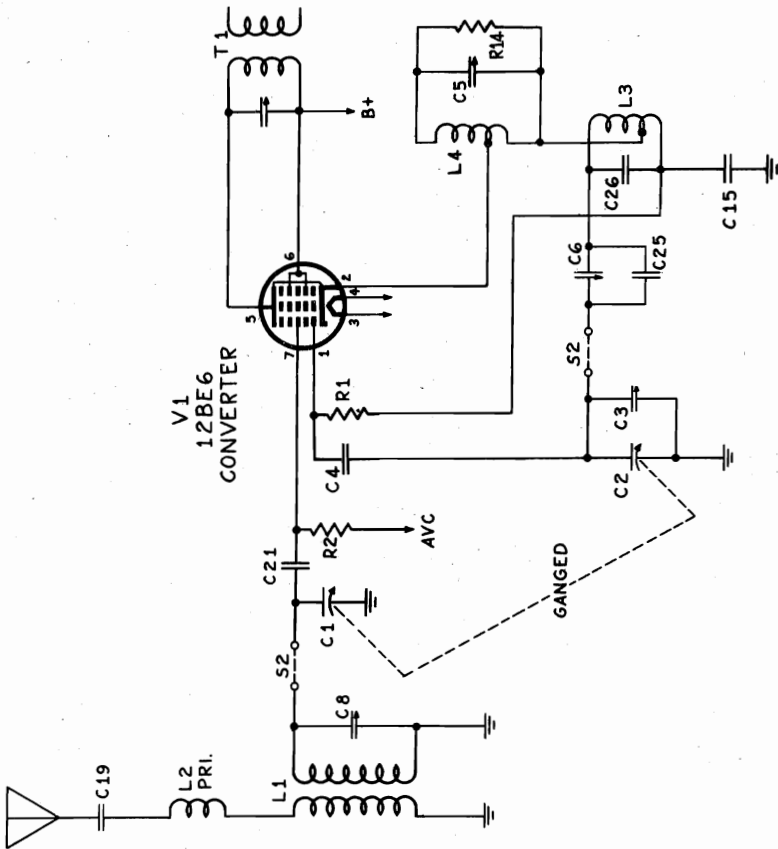
Voltage and Resistance Analysis Chart

Resistance readings at these points will vary since they are in series with the leakage resistance of the electrolytic condensers which is subject to changes. All D.C. measurements were made with a meter having a sensitivity of 20,000 ohms per volt. Ac measurements taken at 1000 ohms per volt. Measured values are from socket pin to circuit ground (pin #3 of 12AT6 socket). Tolerances of component values make possible a variation of 20% in readings indicated in chart. Socket connections are shown as bottom views.

"clarified schematics"



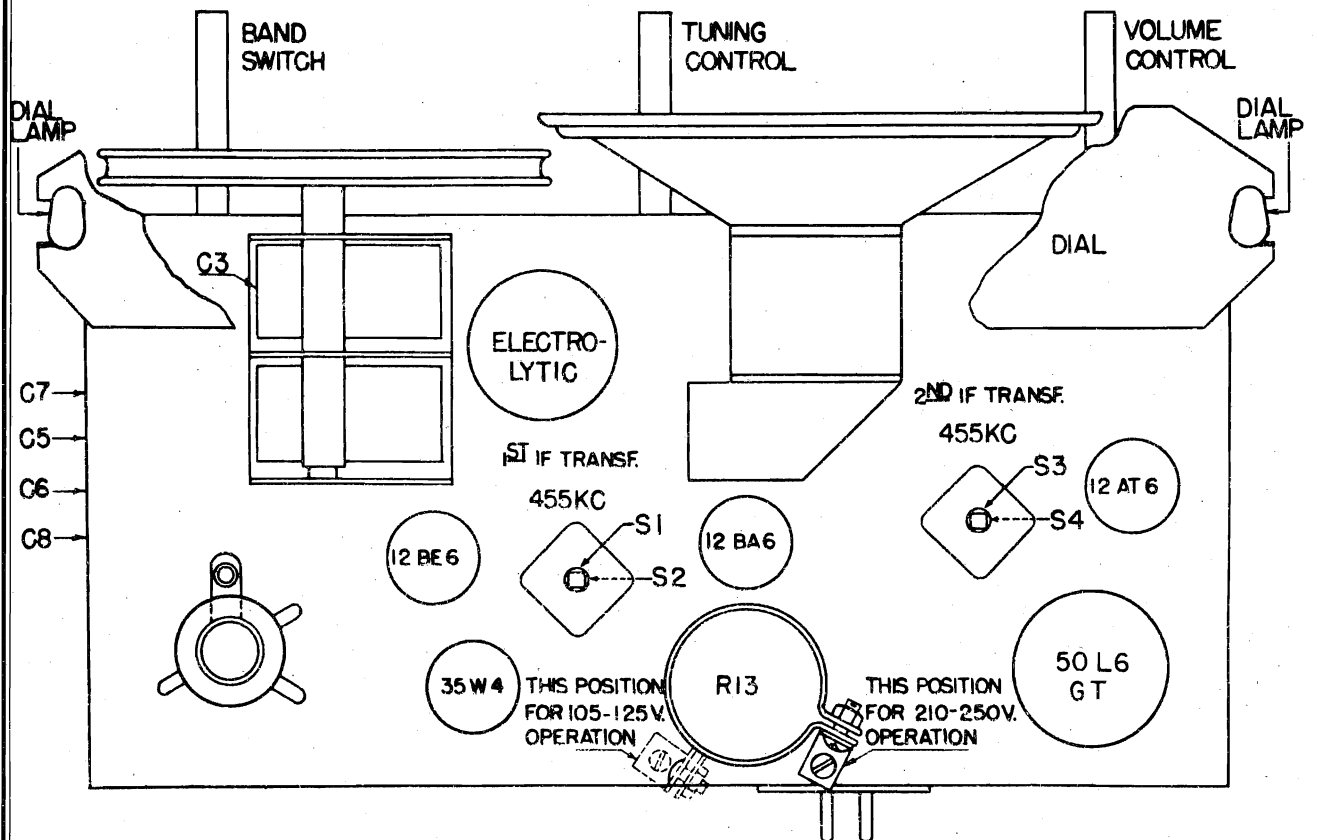
BAND-SWITCH SHOWN
AT 2ND POSITION
SHORT WAVE BAND
6-18 MC.



BAND-SWITCH SHOWN
AT 1ST POSITION
BROADCAST BAND
540-1600 KC.

ALIGNMENT INSTRUCTIONS

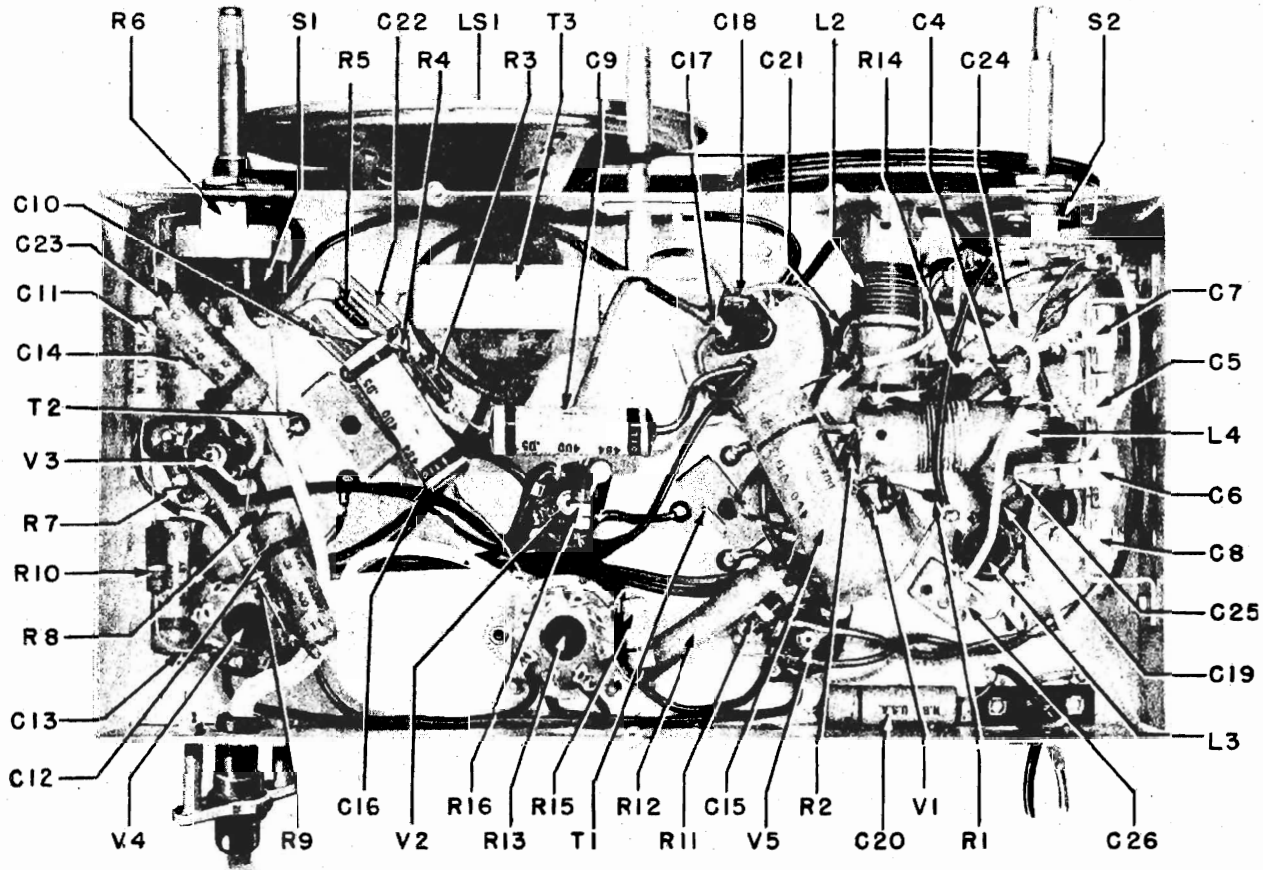
Punch marks are provided on the dial back plate at 600 Kc, 900 Kc, 1500 Kc and 1600 Kc for alignment purposes.
 With tuning condenser fully open, set dial pointer to the 1600 Kc punch mark.
 Connect output meter across voice coil terminals on speaker frame.
 Connect low side of signal generator lead through a .1 mfd coupling condenser to chassis ground.
 Connect high side of generator through proper dummy antenna to external antenna lead.
 Keep signal generator output at lowest practical level and make the following adjustments for maximum output meter reading in each case.



Top View of Chassis Showing Alignment Adjustment Positions

ALIGNMENT CHART

DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	ADJUSTMENT POINTS
.1 MFD	455 Kc	B.C.	Tuning Condenser Fully Open	S1, S2, S3, S4
200 MMFD	1600 Kc	B.C.	Tuning Condenser Fully Open	C3
200 MMFD	1500 Kc	B.C.	1500Kc	C8
200 MMFD	600 Kc	B.C.	Rock at 600 Kc	C6
200 MMFD	900 Kc	B.C.	900 Kc	Check Osc. Crossover
400 CHMS	18 Mc	S.W.	Tuning Condenser Fully Open	C5
400 CHMS	17 Mc	S.W.	1500 Kc	C7



SCHEMATIC NO. OF PART

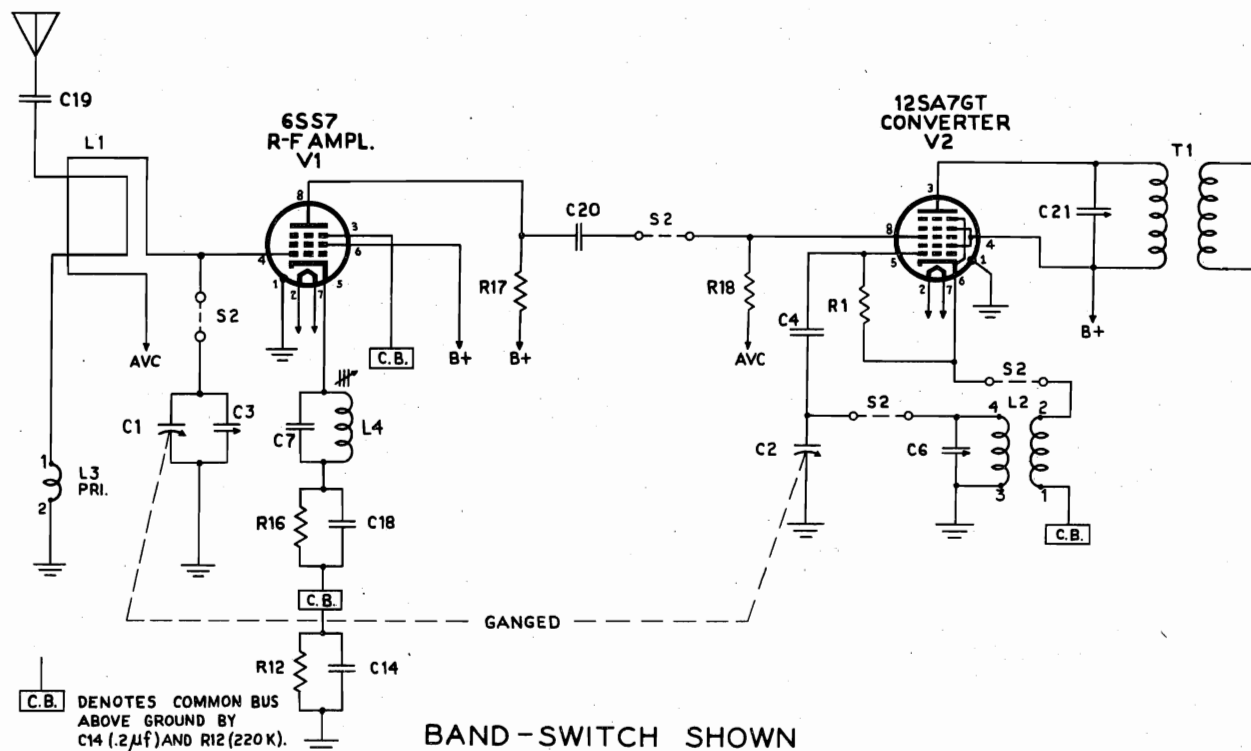
DESCRIPTION

SCHEMATIC NO. OF PART

DESCRIPTION

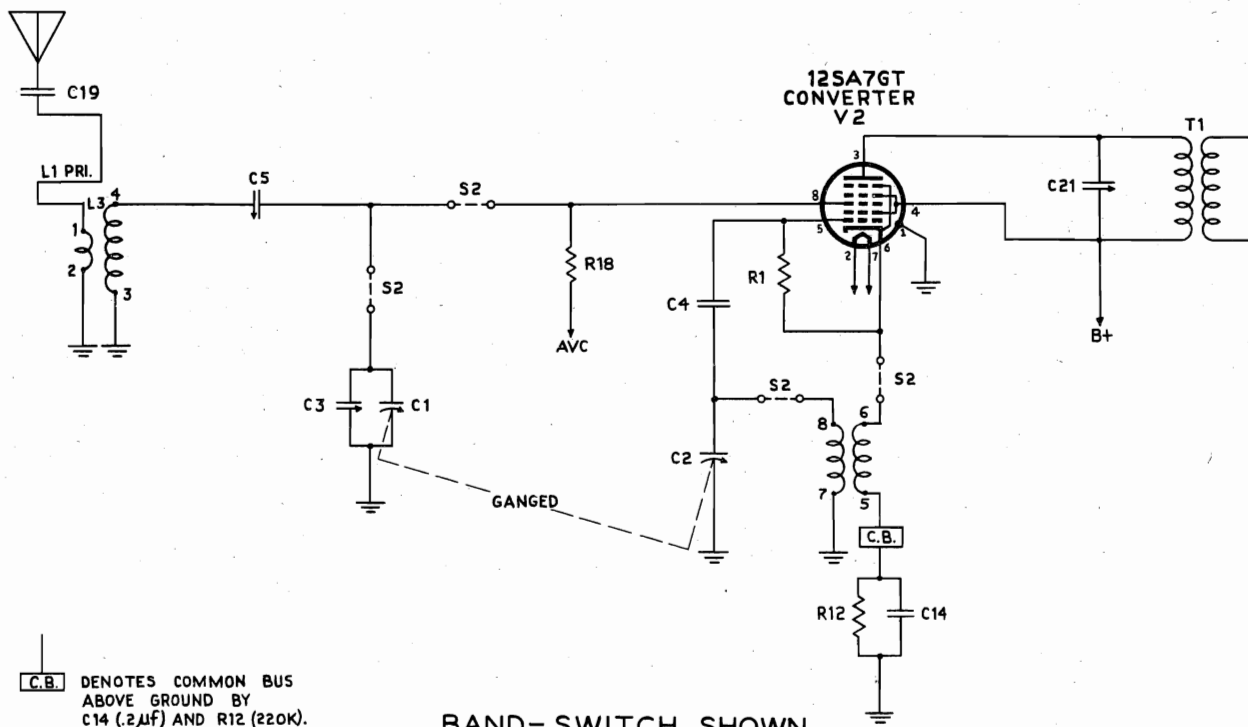
C1	2 Gang Variable	C23	.01 mfd., Paper, Tubular, 400 V D.C. Working
C2	Part of C1	C24	7500 mmfd., mica, 10% 500 V D.C. Working
C3	Part of C2	C25	220 mmfd., mica, 10% 500 V D.C. Working
C4	56 mmfd Mica 10% 500 V D.C. Working	C26	15 mmfd., mica, 10% 500 V D.C. Working
C5	Compression Trimmer 3.0-35 mmfd	11, 12	3.2 V 160 MA. Miniature Bayonet Base
C6	Compression Trimmer 70-470 mmfd (Part of C5)	L1	Pri. Inductance 3600 uh, Sec. Inductance 203.5 uh 1%
C7	Compression Trimmer 3.0-35 mmfd (Part of C5)	L2	Sec. Inductance 1.5 uh, 3%
C8	Compression Trimmer 3.0-35 mmfd (Part of C5)	L3	Sec. Inductance, 98.5 uh, 1%
C9	.05 mfd., Tubular, Paper, 400 V D.C. Working	L4	Sec. Inductance, 1.4 uh, 3%
C10	100 mmfd Ceramic, 20%, (Part of T2)	LS1	5" P.M., 3.2 ohm V.C.
C11	.01 mfd., Paper, Tubular, 400 V D.C. Working	R1	22000 ohms, 20% 1/2 watt carbon
C12	.01 mfd., Paper, Tubular, 400 V D.C. Working	R2	1.0 megohm, 20% 1/2 watt carbon
C13	.01 mfd., Paper, Tubular, 400 V D.C. Working	R3	2.2 megohm, 20% 1/2 watt carbon
C14	.0015 mfd., Paper, Tubular, 400 V D.C. Working	R4	47000 ohms, 20% 1/2 watt carbon (Part of T2)
C15	.2 mfd., Paper, Tubular, 400 V D.C. Working	R5	0.47 megohm, 20% 1/2 watt carbon
C16	.05 mfd, Paper, Tubular, 400 V D.C. Working	R6	2.0 megohm, Taper 0.2 megohm at 1/2 rotation, with "ON-OFF" Switch
C17	Electrolytic 2 Section Common Cathode 40 mfd. 250 DCV, Sect. 1	R7	10.0 megohm, 20% 1 1/2 watt carbon
C18	40 mfd. 250 DCV, Sect. 2	R8	0.22 megohm, 20%, 1/2 watt carbon
C19	Part of C17	R9	0.47 megohm, 20%, 1/2 watt carbon
C20	.005mfd., Paper, Tubular 600 V D.C. Working	R10	150 ohms, 10%, 1/2 watt carbon
C21	.005 mfd., Paper, Tubular 600 V D.C. Working	R11	270ohms, 10%, 1/2 watt carbon
C22	100 mmfd, mica, 20% 500 V D.C. Working	R12	1800ohms, 5%, 2 watt carbon
		R13	410/200 ohms
		R14	47000 ohms, 20%, 1/2 watt carbon
		R15	680 ohms, 5%, 1 watt carbon
		R16	330 ohms, 10%, 1/2 watt carbon
		S1	Part of R6
		S2	Wafer Switch
		T1	Double Tuned, 455 Kc
		T2	Double Tuned, 455 Kc
		T3	Fri. Imp. 2500 ohms, Sec. Imp. 3.2 ohms, Humbucking Winding
		V1	12BE6
		V2	12BA6
		V3	12AT6
		V4	50L6-GT
		V5	35W4

"clarified schematics"



C.B. DENOTES COMMON BUS ABOVE GROUND BY C14 (.2μf) AND R12 (220K).

BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND 550-1600 KC



C.B. DENOTES COMMON BUS ABOVE GROUND BY C14 (.2μf) AND R12 (220K).

BAND-SWITCH SHOWN AT 2ND POSITION. SHORT WAVE BAND 5.6 - 15.5 MC

POWER REQUIREMENTS: 30 Watts at 105-125 Volts AC, 50-60 Cycles or 105-125 Volts DC.
TUNING RANGE: 2 Bands. American Broadcast 550-1600 Kc.
 International Short Wave 5.6-15.5 Mc.
ANTENNA: Built in loop with facilities for connection to external antenna.

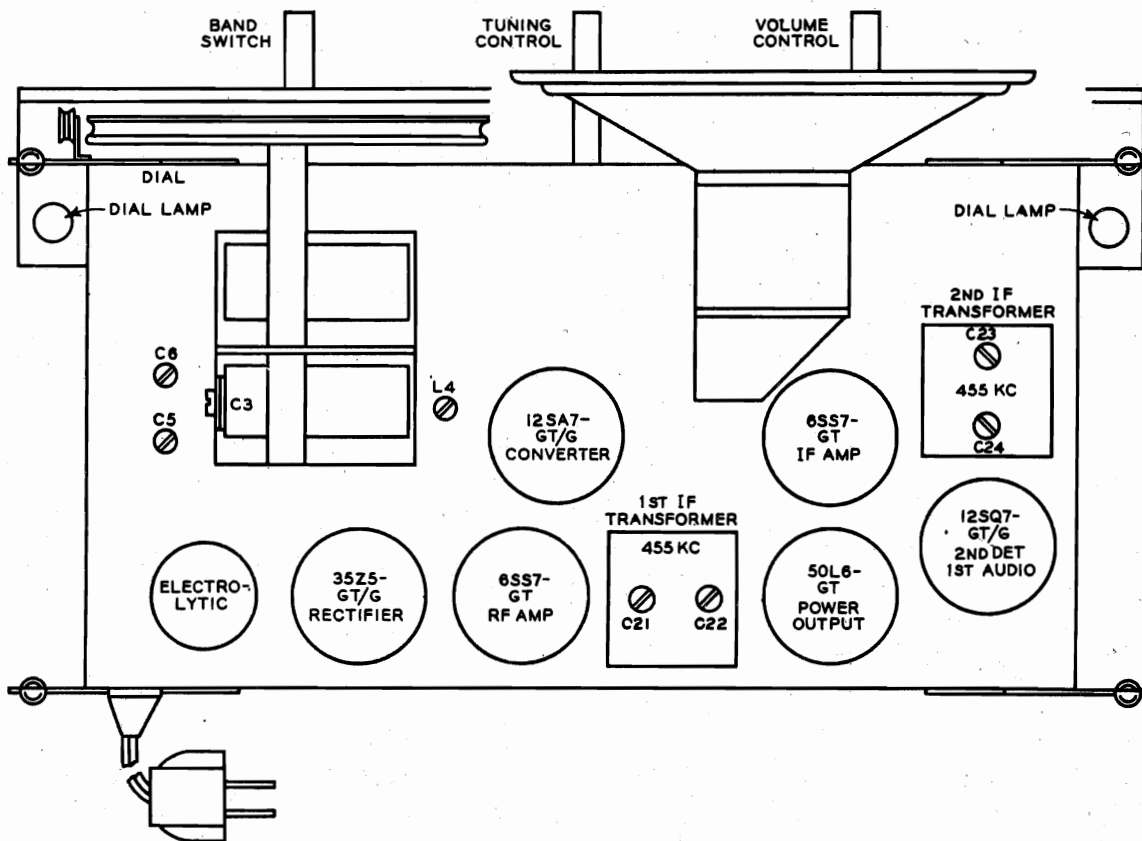


Fig. 1. Top View of Chassis showing Alignment Adjustment Positions.

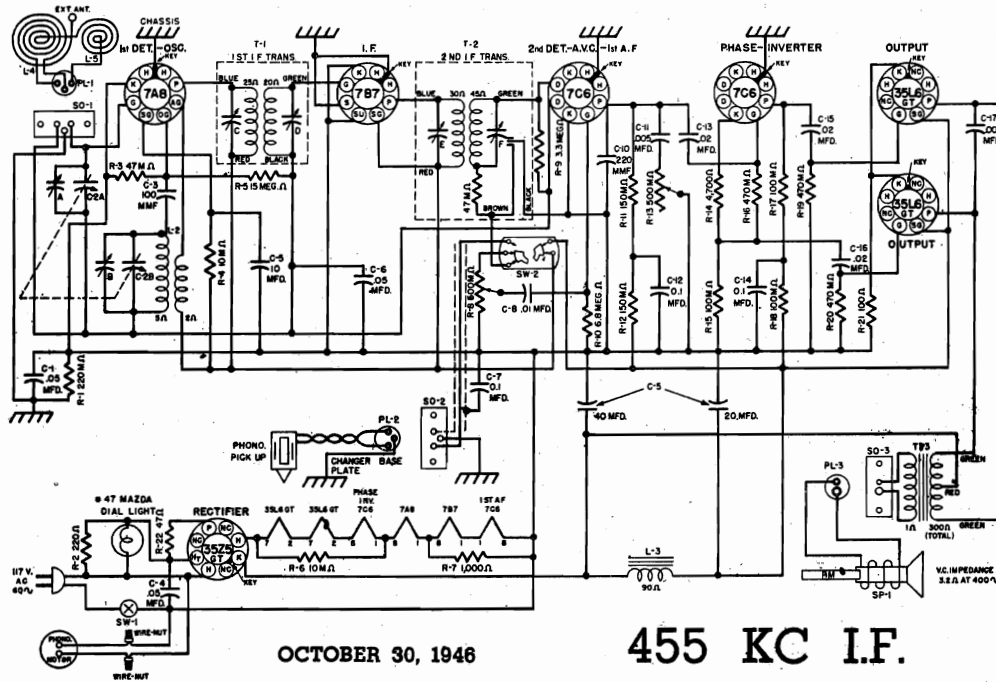
ALIGNMENT INSTRUCTIONS

Punch marks are provided on the dial back plate at 600 kc, 1000 kc, 1400 Kc and 1600 Kc for alignment purposes.
 With tuning condenser completely open, set dial pointer to 1600 Kc punch mark.
 Connect output meter across voice coil terminals on speaker frame.
 Connect low side of signal generator lead thru a 0.1 mfd coupling condenser to chassis ground.
 Connect high side of generator thru proper dummy antenna to the receiver external antenna connection.
 Keep signal generator output at lowest practical level and proceed according to table below.

ALIGNMENT CHART

DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	ADJUSTMENT POINTS	OUTPUT METER READING
0.1 MFD.	455 Kc	B.C.	Tuning Condenser Open	C24, C23, C22, C21	Max.
0.1 MFD.	455 Kc	B.C.	Tuning Condenser Open	L4	Min.
200 MMFD.	1600 Kc	B.C.	Tuning Condenser Open	C6	Max.
200 MMFD.	1400 Kc	B.C.	1400 Kc	C3	Max.
200 MMFD.	600 Kc	B.C.	600 Kc	L1	Max.
				(Check, adjust if necessary)	
400 ohms	6 Mc	S.W.	6 Mc	C5	Max.

THE FIRESTONE TIRE & RUBBER CO.



OCTOBER 30, 1946

455 KC I.F.

ALL SOCKETS AND PLUGS SHOWN FROM PIN END VIEW
ALL SWITCHES SHOWN IN COUNTERCLOCKWISE POSITION, SHAFT END VIEW

SYMBOL	PART NO.	DESCRIPTION	LIST PRICE	SYMBOL	PART NO.	DESCRIPTION	LIST PRICE
CAPACITORS							
C-1	BD410503	Capacitor—.05 Mfd., 400 volt.	.35	L-4, 5	D-57259	Loop Antenna assembly	\$1.00
C-2A, B	C-57243-1	Capacitor—Variable gang	4.50	L-2	B-56143	Coil—Oscillator assembly	*.00
C-3	BM74A101	Capacitor—Mica 100 Mmfd. ± 20%	.35	L-3	B-51726-1	Filter Choke, 80 ma.	2.00
C-4	BD410503	Capacitor—.05 Mfd., 400 volt.	.35	T-1	B-51010-3	Transformer—1st I.F.	2.00
C-5	A-56154	Capacitor—Electrolytic. 40-20-10 Mfd., 150 volt.	1.60	T-2	B-51011-3	Transformer—2nd I.F.	2.50
C-6	BD210503	Capacitor—.05 Mfd., 200 volt.	.30	T-3	B-57253-1	Transformer—Output	1.50
C-7	BD410104	Capacitor—.01 Mfd., 400 volt.	.40	OTHER ELECTRICAL PARTS			
C-8	BD410103	Capacitor—.01 Mfd., 400 volt.	.30	SW-1	B-56156-1	Switch—power part of R-8 and R-13.	1.00
C-10	BM74A221	Capacitor—Mica 220 Mmfd. ± 20%	.40	SW-2	C-57272	Switch—Radio-Phono	*.00
C-11	BD610302	Capacitor—.005 Mfd., 600 volt.	.30	SP-1	C-57271	Speaker—6" x 9" Permanent Magnet	*.00
C-12	BD410104	Capacitor—0-1 Mfd., 400 volt.	.40		A-6158	Lamp—Dial Mazda No. 47	.15
C-13	BD410203	Capacitor—.02 Mfd., 400 volt.	.30	MISCELLANEOUS PARTS			
C-14	BD410104	Capacitor—0-1 Mfd., 400 volt.	.40	B-57275-1	Background for dial	*.00	
C-15	BD410203	Capacitor—.02 Mfd., 400 volt.	.30	A-54848	Bushing—Strain relief (power cord)	.20	
C-16	BD410203	Capacitor—.02 Mfd., 400 volt.	.30	A-56155	Bushing—Tuning control shaft	*.00	
C-17	BD610502	Capacitor—.005 Mfd., 600 volt.	.30	E-57270-1	Cabinet	*.00	
RESISTORS							
R-1	BR17B224	Resistor—Carbon, 220,000 Ohms, ½ watt.	.15	B-51330-1	Channel rubber—mtg. for Dial scale	.04	
R-2	BR17C221	Resistor—Carbon, 220 Ohms, ½ watt.	.15	B-55402-1	Dial Cable assembly (includes clips at end of cable)	.25	
R-3	BR17B473	Resistor—Carbon, 47,000 Ohms, ½ watt.	.15	B-57269-1	Dial scale—plastic	*.00	
R-4	BR17B103	Resistor—Carbon, 10,000 Ohms, ½ watt.	.15	B-51427-2	Grommet—rubber; mtg. for variable gang	.05	
R-5	BR17B156	Resistor—Carbon, 15 Meg., ½ watt.	.15	B-51124-1	Knob—Volume & switch, tuning or radio-phonograph	.15	
R-6	BR17E103	Resistor—Carbon, 10,000 Ohms, ½ watt.	.15	B-56138-1	Knob—Tone Control	.15	
R-7	BR17B102	Resistor—Carbon, 1,000 Ohms, ½ watt.	.15	BN751V02	Palnut—No. ¾-32; for mtg., controls	.02	
R-8	B-56142-1	Control—Dual Potentiometer, with switch 500,000 Ohms, (V. C.)	2.25	BN770S02	Palnut—No. 10-24; for mtg., record changer	.01	
R-9	BR17B335	Resistor—Carbon, 3.3 Meg., ½ watt.	.15	A-57271	Plug—3 Prong—Phono pick-up connection	*.00	
R-10	BR17B685	Resistor—Carbon, 6.8 Meg., ½ watt.	.15	B-55130-9	Pointer	.15	
R-11	BR17B154	Resistor—Carbon, 150,000 Ohms, ½ watt.	.15	B-58069-1	Power Cord	.75	
R-12	BR17B154	Resistor—Carbon, 150,000 Ohms, ½ watt.	.15	BP934G02	Screw—No. 4 x ½"; for mtg., loop & back	.03	
R-13	B-56142-1	Control—500,000 Ohms, (T. C.) part of R-8	*.00	BP928N02	Screw—No. 8 x 1 ½"; for mtg., chassis	.03	
R-14	BR17B472	Resistor—Carbon, 4,700 Ohms, ½ watt.	.15	BS016S09	Screw—No. 10-24 x 1"; for mtg., record changer	.04	
R-15	BR17B104	Resistor—Carbon, 100,000 Ohms, ½ watt.	.15	A-56136	Shaft—tuning control	.20	
R-16	BR17B474	Resistor—Carbon, 470,000 Ohms, ½ watt.	.15	A-54726	Socket—octal base	.20	
R-17	BR17B104	Resistor—Carbon, 100,000 Ohms, ½ watt.	.15	A-54900	Socket—local base	.25	
R-18	BR17B104	Resistor—Carbon, 100,000 Ohms, ½ watt.	.15	A-57273	Socket—3 Prong; Phono pick-up & loop antenna	.20	
R-19	BR17B474	Resistor—Carbon, 470,000 Ohms, ½ watt.	.15	A-57258	Socket—2 Prong; speaker connection	.20	
R-20	BR17B474	Resistor—Carbon, 470,000 Ohms, ½ watt.	.15	A-6182-5	Socket—dial lamp (with leads)	.15	
R-21	BR16C101	Resistor—Carbon, 100 Ohms, ± 10% ½ watt.	.15	A-51331	Spring—Mtg., for channel rubbers	.10	
R-22	BR17G470	Resistor—Carbon, 47 Ohms ± 20% 2 watt.	.30	A-51787	Spring—dial cable tension	.07	
				A-50147	Spring—conical; for mtg., record changer	.10	
				BF13NT05	Washer—flat; for mtg., record changer	.02	
				B-50156-1	Washer—rubber; for mtg., record changer	.04	
				A-54492	Washer—"C"; tuning shaft	.02	
				A-1089	Washer—cup; variable gang mtg.	.05	
				B-50964-3	Washer—phono motor power connection	.03	

MODEL 4-A-17

THE FIRESTONE TIRE & RUBBER CO.

FREQUENCY RANGE:

540-1600 KC.

POWER SUPPLY

117 volts
60 cycles A.C.
55 watts (including changer)

POWER OUTPUT:

Undistorted—1.6 watts
Maximum —2.2 watts

SPEAKER:

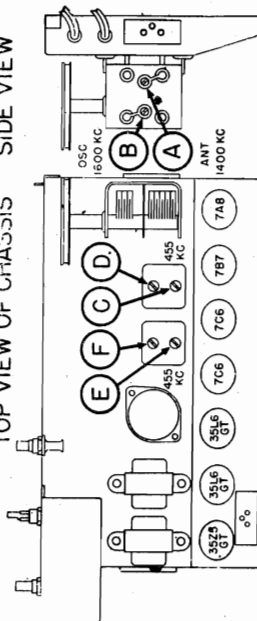
6 x 9 elliptical type PM
Voice coil impedance—
3.2 ohms at 400 cycles

1. The chassis, record changer and loop should remain in their normal position in the cabinet when making loop adjustment.
2. With the gang condenser fully meshed, dial pointer should be in the position indicated by the last division below 55 on the dial. If it is set incorrectly, slide pointer along dial cord to correct position.
3. Connect output meter across speaker voice coil.
4. Connect the ground of signal generator to B-.
5. Set volume control at maximum volume position and use a weak signal from the signal generator.
6. Radio-Phono switch in Radio position.

NOTE: For best results, it is advisable to use an isolation transformer between the 117 V. AC line and AC input to receiver.

DUMMY ANT.	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER LETTER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
0.1 Mid. Condenser	7A8 Grid	455 KC	Any point where it does not affect the signal	F-E D-C	2nd IF 1st IF	Adjust for maximum output. Then repeat adjustment.
0.1 Mid. Condenser	7A8 Grid	1620 KC	Gang condenser completely out of mesh.	B	Oscillator	Adjust for maximum output.
RMA Loop		1400 KC	Tuned to 1400 kc Generator signal	A	Loop Antenna	Adjust for maximum output.

TOP VIEW OF CHASSIS SIDE VIEW



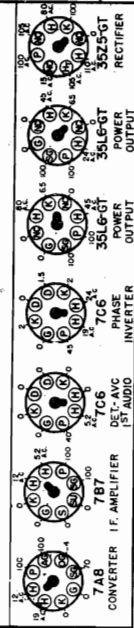
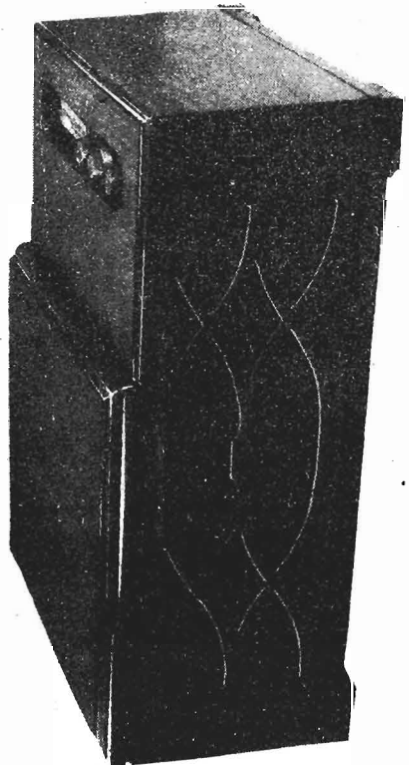
SOCKET VOLTAGES

MEASURED WITH VOLTMETER HAVING SENSITIVITY OF 1000 OHMS PER VOLT
TONE CONTROL IN CLOCKWISE POSITION
VOLUME ON FULL WITH NO SIGNAL

RADIO-PHONO SWITCH IN RADIO POSITION DIAL TUNED TO 540 KC

BOTTOM VIEW OF CHASSIS

117 VOLT 60 CYCLE AC POWER SUPPLY USED FOR THESE MEASUREMENTS.
ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS.

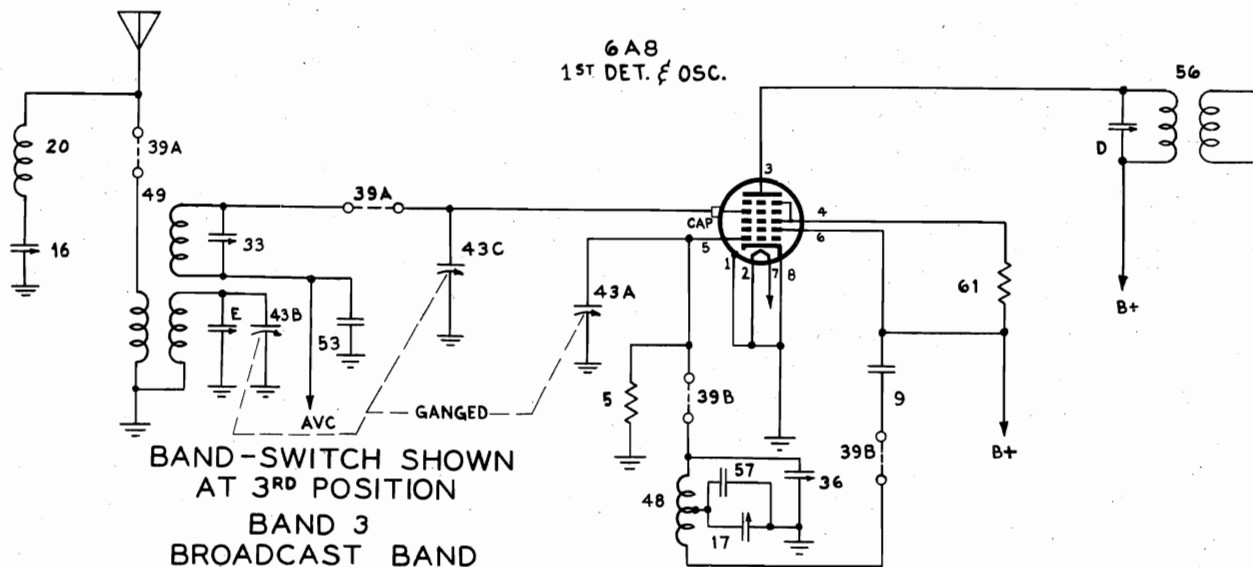
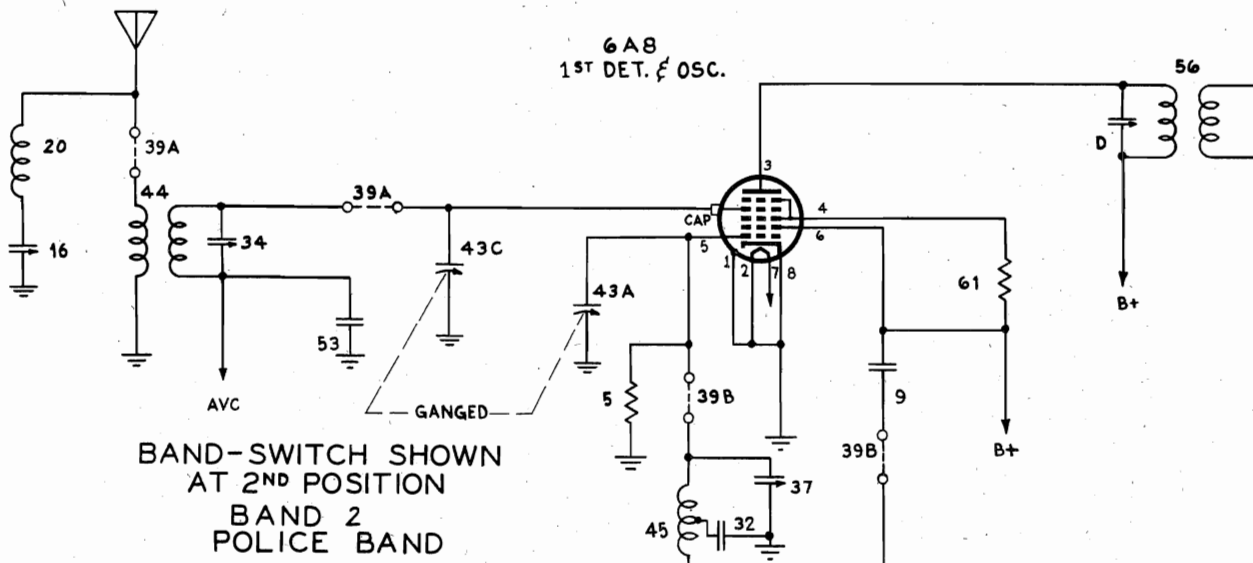
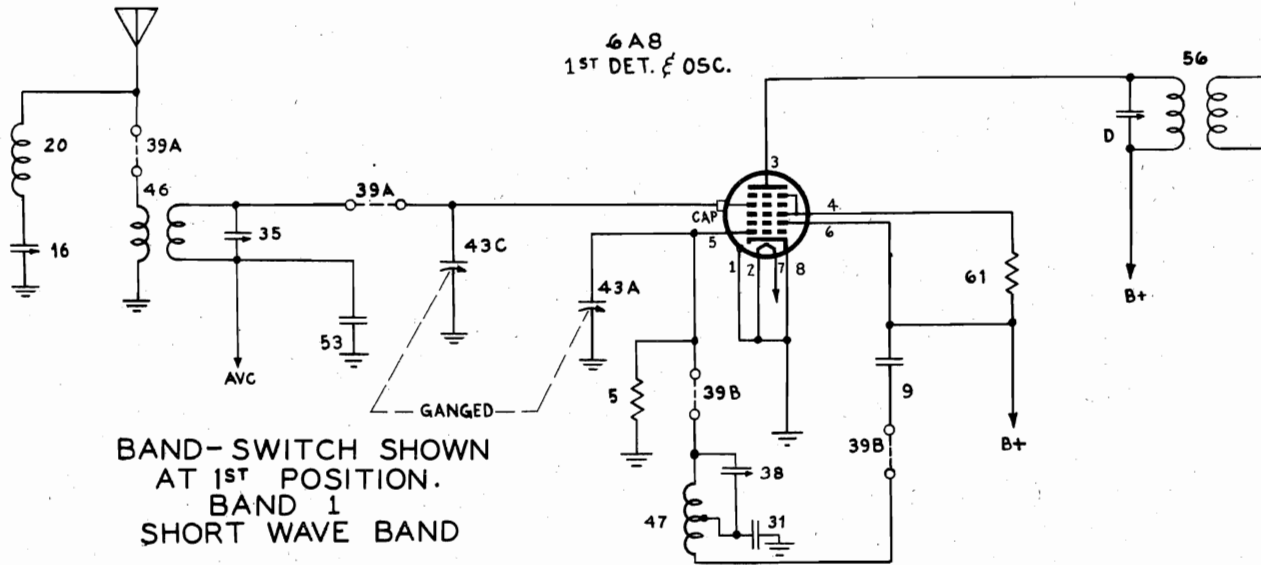


REAR OF CHASSIS

"clarified schematics"

PAGE 16-4 FIRESTONE

MODELS 7379-1, 7405-3, THE FIRESTONE TIRE & RUBBER CO.
7406-1



THE FIRESTONE TIRE & RUBBER CO.

89423... Dial scale 1.80
89432... Escutcheon for tuning eye60

PARTS LIST

Diagram Part Number	Description	List Price
1	E-247-A 8-inch Dynamic Speaker	\$9.00
2	IMPORANT Fuse, 1 ampere (USE THIS SIZE ONLY)	.....
3-4	83072... resistor ohm 1/4 watt carbon	.....
5	83080... 51,000 ohm 1/4 watt carbon resistor	.....
6-7	83278... Pilot lamp, 6-8 volt resistor	.....
8	83286... 21,000 ohm 1/4 watt carbon resistor	.....
9-10-11	83539... 250 mmfd. mica condenser	.....
12	83783... 100,000 ohm 1/4 watt carbon resistor	.....
13	83776... .012 mfd. 1,000 V. shielded condenser	.....
14-15	84235... 1.1 meg. 1/4 watt carbon resistor	.....
16	85285... Wave trap trimmer	.....
17	85286... Adding trimmer	.....
18	85291... Ground screw	.....
20	86014... Wave trap coil	.....
21-22	88026... .02 mfd. 400 volt paper condenser	.....
23	89826... .004 mfd. 750 volt paper condenser	.....
24	88030... .01 mfd. 400 V. paper condenser	.....
25	88046... .1 mfd. 150 V. paper condenser	.....
26	88189... .05 mfd. 200 volt paper condenser	.....
27	88463... 70 ohm 1 watt carbon resist.	.....
29	88465... 25 ohm 1/4 watt wire wound resistor	.....
30	88468... 2nd I.F. transformer	.....
31	88472... 3850 mmfd. mica condenser	.....
32	88473... 1230 mmfd. mica condenser	.....
33-35	88477... Trimmer condenser	.....
39A-39B	88480... Range switch	.....
40	88481... Power transformer, 115 V. 60 cycle	.....
40	88216... Power transformer, 100 to 240 V.—25 to 133 cycles.....	11.50
41A	88487... Volume control (250,000 ohm) A.C. line switch.....	\$1.25
41B	88488... Volume control (500,000 ohm) A.C. line switch.....	.50
42A to C	88493... Antenna coil (police).....	5.85
44	88499... Antenna coil (police).....	.85
45	88501... Oscillator coil (police).....	.65
46	88502... Antenna coil (S.W.).....	.80
47	88504... Oscillator coil (S.W.).....	.50
48	88506... Oscillator coil (B.C.).....	.55
49	88510... 150,000 ohm 1/4 watt carbon resistor	.....
50	88511... 150,000 ohm 1/4 watt carbon resistor	.....
51	88512... 16 mfd. 400 volt electrolytic condenser	.....
52	88532... 210,000 ohm 1/4 watt carbon resistor	.....
53	88584... (low loss) 150 volt condenser	.....
54	88613... 30 ohm 1/4 watt wire wound resistor	.....
55	88529... On-put transformer (on R-247-A speaker)	.....
56	88466... Pilot lamp socket	.....
40	88216... Pilot lamp socket	.....
57	88954... 345 mmfd. mica condenser.....	11.50
58	88643... 25 mfd. 300 V paper condenser.....	.25
59-60	89751... 11,000 ohm 1 watt carbon resistor	.....
61	89753... 11,000 ohm 1/4 watt carbon resistor	.....
62	89755... 4 mfd. 250 volt electrolytic condenser	.....

Prices Subject To Change Without Notice

tune detuning No. 10 and retuning the dial until the output meter deflection is a maximum.

Band No. 3 Calibration and Alignment

Turn the range switch to the extreme counterclockwise position. Be sure the D and G terminals on the antenna terminal strip are connected together.
Set the test oscillator to 16 MC. and turn the receiver dial pointer to exactly 16 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 11 for maximum output. Check to see that it has been adjusted to the proper peak by tuning the receiver to approximately 15.1 MC. A repeat signal should be heard at this point. If none is present, even with greatly increased oscillator output, retune the receiver to 16 MC. and adjust trimmer No. 11 to the proper peak with the trimmer screw farther out.

Carefully tune the receiver to the signal and adjust trimmer No. 12 to a peak. Then try to increase the output by detuning the trimmer slightly and retuning the dial until a maximum output meter deflection is secured. Check the adjustment by tuning the receiver to the image at about 15.1 MC. The image should be much weaker than the 16 MC. signal. If the signal at 15.1 MC. dial setting is equal to or stronger than the 16 MC. signal, trimmer No. 12 is not set to the proper peak. Turn the trimmer in a turn or so, then readjust as above.

MISCELLANEOUS PARTS NOT SHOWN ON CIRCUIT DIAGRAM

Part Number	Description	List Price
67590	Flat steel mtg. washer	.....\$0.01
84428	Rubber chassis mtg. bushing	......03
85743	10 x 1 1/2 chassis mtg. screw	......01
84805	Pol. type cable & plug	......20
85066	G.D.A. terminal strip	......20
85321	Ground connector for G.D.A. strip	......01
88056	Fuse mounting	......16
88057	Fuse cover	......06
88075	Speaker socket	......12
88076	Speaker cable & plug	......12
88424	Knob; range switch control	......22
89425	Knob; tuning eye control	......22
89426	Knob; volume control	......20

TUNING DRIVE AND DIAL PARTS

Part Number	Description	List Price
83278	Dial lamp	.....\$0.15
88564	Pointer and stud assembly	......12
88743	Dial drive shaft	......15
88744	Dial drive gear	......06
88745	Dial ring and receiver spring (for edge lighting)	......90
88748	Dial disc and bushing assembly	......30
88956	Escutcheon with glass	.....1.65
88958	No. 2 x 1/8 R.H. wood screw for escutcheon (each)	......01
89283	Pilot lamp socket	......02
89284	Pilot lamp shield	......02
89285	Dial background	......12

Broadcast Band Calibration and Alignment

With the gang condenser in full mesh, the dial pointer should be on the white horizontal line below 580 KC. on the dial scale.

Turn the range switch to the extreme clockwise position and connect the test oscillator output to the A and G terminals of the receiver with a 400 ohm carbon resistor in series with the A terminal and the oscillator output.

Adjust the test oscillator to exactly 1,500 KC. and turn the receiver dial pointer to 1,500 KC. on the tuning dial. To calibrate the dial, adjust trimmer No. 5 for maximum output.

Carefully tune the receiver to the signal and adjust trimmers Nos. 6 and 7 for maximum output.

Adjust the test oscillator to 600 KC. and tune the receiver to the signal. Adjust trimmer No. 8 for maximum output. Then try to increase the output meter reading by detuning No. 8 slightly and retuning the receiver dial. If the output goes down, detune the trimmer in the opposite direction. Continue detuning the trimmer and retuning the receiver dial until maximum output meter deflection is secured. This operation is commonly known as "rocking" and when performed as described will give maximum selectivity and sensitivity even though dial may be slightly off calibration at 600 KC.

Wave-Trap Adjustment

The wave-trap adjusting trimmer, No. 13, is located on the back of the chassis. Leave the test oscillator connected to the A and G terminals through a 400 ohm resistor and set the oscillator at 456 KC. Then adjust the wave-trap trimmer No. 13 for minimum output. If some particular station with a frequency near 456 KC. causes code interference, it may be desirable to adjust the wave-trap on the actual frequency of the interfering station.

Check the adjustment of trimmers 5, 6, and 7 at 1,500 KC.

Band No. 2 Calibration and Alignment

Turn the range switch to the center position. Adjust the test oscillator to exactly 5.0 MC. and turn the receiver dial pointer to exactly 5.0 MC. on the tuning dial.

To calibrate the dial, adjust trimmer No. 9 for maximum output. If two peaks are found, the proper one is that with the trimmer screw farthest out.

Carefully tune the receiver to the signal and adjust trimmer No. 10 for maximum output. Then try to increase the output by detuning No. 10 slightly and retuning the receiver dial. Con-

CALIBRATION AND ALIGNMENT

Aligning Equipment

For proper alignment, an output meter and an accurately calibrated oscillator with a tuning range from 456 KC. to 16 MC. are required.

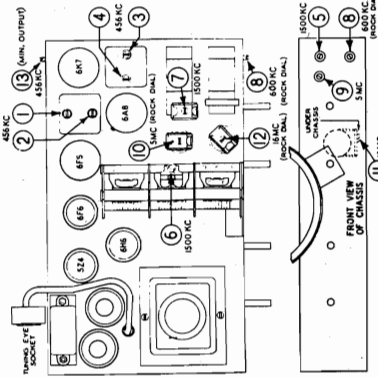
Connect the output meter from the plate of the output tube to chassis. A convenient point to make the plate connection is to the yellow wire on the speaker socket.

Aligning the I. F. Amplifier

Turn the volume control to maximum volume position and keep it in this position throughout the entire alignment procedure. Turn the range switch to the broadcast position (fully clockwise).

Connect the test oscillator output leads to the 6A8 control grid and chassis with a .1 mfd. condenser in series with the oscillator output. Set the oscillator to exactly 456 KC. Set the receiver dial at any point where it has no tuning effect on the oscillator signal.

Adjust the four I.F. trimmers Nos. 1, 2, 3 and 4, for maximum output meter deflection, then repeat the trimmer adjustment.

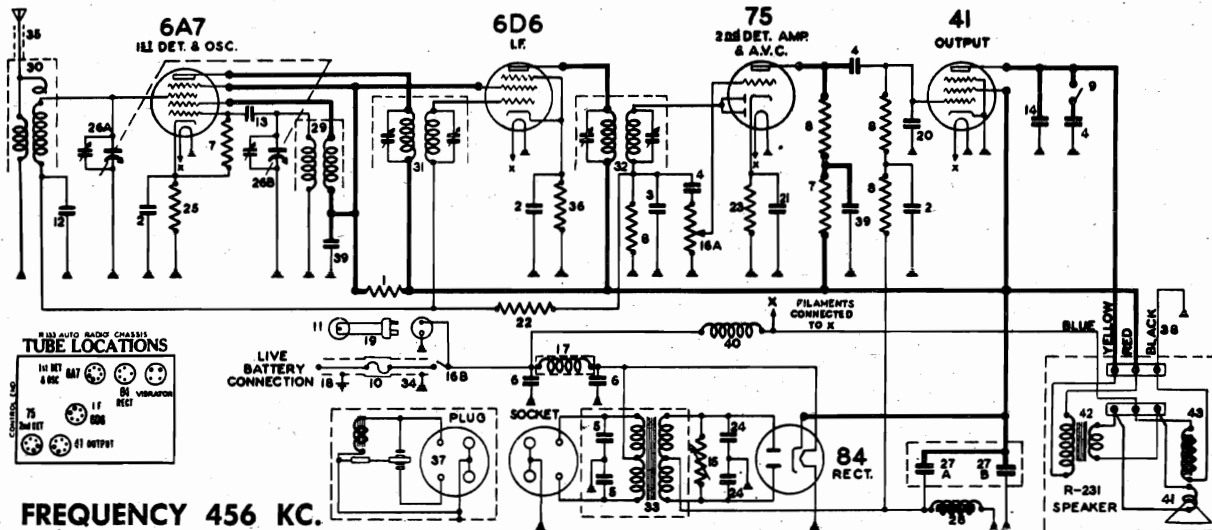


TRIMMER LOCATIONS

Trimmer Number	Alignment Frequency
1	456 KC.
2	456 KC.
3	456 KC.
4	456 KC.
5	1500 KC.
6	1500 KC.
7	1500 KC.
8	600 KC.
9	5 MC.
10	5 MC.
11	16 MC.
12	16 MC.
13	456 KC.

MODEL 7383-4

THE FIRESTONE TIRE & RUBBER CO.



I.F. FREQUENCY 456 KC.

Diag. No.	Part No.	DESCRIPTION	List Price
1	66875	16,000 ohm 1 watt carbon resistor	\$.050
2	81630	.1 mfd. 100 volt paper condenser	.30
3	81812	.00051 mfd. mica condenser	.25
4	83007	.02 mfd. 600 volt paper condenser	.35
5	83058	.25 mfd. 100 volt paper condenser	.35
6	83063	.5 mfd. 100 volt paper condenser	.45
7	83080	51,000 ohm 1/4 watt resistor	.20
8	83082	260,000 ohm 1/4 watt resistor	.20
9	83179	Tone Control switch	.30
10	83207	Fuse	.05

Diag. No.	Part No.	DESCRIPTION	List Price
11	83278	Pilot lamp	\$.015
12	83353	.05 mfd. 100 volt paper condenser	.30
13	83539	.00026 mfd. mica condenser	.25
14	83706	.006 mfd. 600 volt condenser	.35
15	83725	0-500,000 globar resistor	.45
16A	83728	{ Volume control }	1.20
16B				{ On-Off Switch }
17	83730	R. F. Choke	.25
18	83777	Battery lead and fuse housing	.50
19	83778	Light cable and plug assembly	.50

Diag. No.	Part No.	DESCRIPTION	List Price
20	83783	.00011 mfd. mica condenser	\$.016
21	83803	12 mfd. 15 volt electrolytic condenser	.80
22	84235	1.1 meg. 1/4 watt resistor	.20
23	84240	4000 ohm 1/4 watt resistor	.20
24	84850	.03 mfd. 750 volt paper condenser	.25
25	84888	300 ohm 1/2 watt resistor	.20
26A } 26B }	84958	{ Two-gang variable condenser } { with shaft coupling }	4.50
27A } 27B }				84961	{ 4 mfd. 400 volt electro-lytic condenser } { 8 mfd. 400 volt electro-lytic condenser }	2.50
28	84962	Filter choke	1.25
29	84963	Oscillator coil assembly	1.00
30	84969	Antenna coil and shield assembly	1.25
31	84972	1st I.F. transformer assembly	2.75
32	84974	2nd I.F. transformer assembly	2.75
33	84975	Power transformer	3.50
34	84977	Battery lead and cap* (to chassis)	.34
35	84978	Antenna lead	.40
36	84979	250 ohm 1/2 watt resistor	.15
37	84995	Vibrator	5.00
38	85027	Speaker cable	.30
39	85029	.1 mfd. 300 volt paper condenser	.40
40	85048	Filament R.F. Choke	.25
41	85376	Diaphragm and voice coil assembly	2.00
42	85378	Output transformer	2.00
43	85379	Field coil	1.25

Part No.	DESCRIPTION	List Price
17166	Mounting nut	\$.005
83144	15,000 ohm spark plug suppressor	.35
83145	10,000 ohm distributor suppressor	.35
83319	Fuse insulator tube	.02
83737	Top cover knurled nuts	.06
84981	Tube shield section	.08
84982	Tube shield section (slotted)	.08
84983	Spring ring	.02
84984	Case assembly (less covers)	3.50
84987	Speaker grille cloth	.12
84990	Single hole mounting plate	.80
84991	Bottom cover	1.00
84992	Top cover	1.00
85012	Mounting bolt	.06
85026	Dash support washer	.05
15214	Long mtg. strap screw No. 10-32x1 1/4"	\$.01
81214	Flexible casing set screw	.02
83919	Bezel and glass assembly	.50
83920	Pilot light button assembly	.25
84067	Steering column mtg. bracket	.25
84484	Knob (volume and tuning)	.14
85000	Remote control head (less shafts)	6.00
85011	Complete accessories for installation	5.00
85016	Dial face	.25

FLEXIBLE SHAFTS

Part No.	DESCRIPTION	List Price
84996	Tuning shaft, 24 inches long	\$1.50
84998	Volume control shaft, 24 inches long	1.50
85104	Tuning shaft, 36 inches long	2.00
85105	Volume control shaft, 36 inches long	2.00
85107	Tuning shaft, 30 inches long	2.00
85108	Volume control shaft, 30 inches long	2.00

THE FIRESTONE TIRE & RUBBER CO.

POWER SUPPLY PROTECTIVE RESISTOR

The filter system and the rectifier tube are protected against breakdown during the warming-up period by the Globar resistor (No. 15 in the circuit diagram) which is connected across the high voltage secondary of the power transformer. This resistor drops rapidly in resistance as the voltage across it rises, so that it acts as a load on the power transformer during the warm-up period and keeps the voltage below the danger point until the tubes are heated and take their normal current. Because of its unique voltage characteristics, the Globar resistor cannot be tested with an ordinary ohmmeter, since it will show a resistance of several megohms.

CALIBRATION AND ALIGNMENT

A good modulated oscillator and a sensitive output meter are necessary for the proper calibration and alignment of this receiver. The output of the oscillator must be adjustable to give a very weak signal which will not actuate the A.V.C. of the receiver. The output meter must be sensitive enough to give sufficient reading with such a weak signal.

The output meter should be connected from the 41 plate to ground through a .25 mfd. condenser or across the voice coil, depending upon its sensitivity. A convenient point at which to connect to the 41 plate is the yellow lead terminal on the speaker terminal strip.

During all calibration and alignment adjustments, keep the volume control full on.

I. F. ALIGNMENT

The I.F. trimmers are located on the top of the I.F. transformers and may be reached by removing the top cover. The modulated oscillator should be set to exactly 456 K.C. and connected from the 6A7 control grid to ground. Adjust the oscillator output to give about half-scale reading of the output meter. Tune the set to make certain that no station or signal is tuned in since this would affect the output meter reading. Adjust all four I.F. trimmers to give maximum output reading.

In adjusting the I.F. transformer trimmers, it is desirable to use a bakelite screw driver or one having only a small metal tip. After the I.F. trimmers have been aligned once, go back and repeat the procedure, since any adjustment of one will affect the others to some extent.

R. F. ALIGNMENT

With the test oscillator set to approximately 1400 KC., tune the set very carefully for maximum output.

Adjust the output of the test oscillator to the minimum value which will give sufficient output meter deflection. Adjust the trimmer nearest to the shaft end of the gang condenser to give maximum output meter reading.

DIAL CALIBRATION

The dial of the Auto Radio is calibrated in kilocycles except that the last two zeros have been omitted. Inasmuch as changes in the position of the flexible shafts may cause the calibration to vary, the set should be calibrated when the arrangement of the shafts has been completed. Calibration is accomplished as follows:

Tune in a station of known frequency between 800 and 1100 KC. Insert a screw driver in the slotted end of the dial shaft projecting through the back of the control head. Hold the tuning control knob so that the station remains tuned in properly and by turning the screw driver adjust the dial pointer so that it indicates the exact station frequency.

If the set is badly out of calibration, such that it calibrates correctly at one part of the dial but not at another, it is necessary to adjust the oscillator shunt trimmer as explained below. In order to reach this trimmer the chassis will have to be removed from the case as follows.

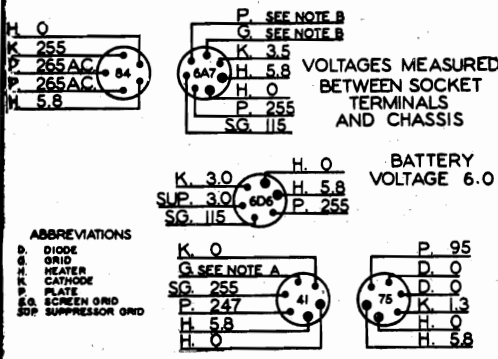
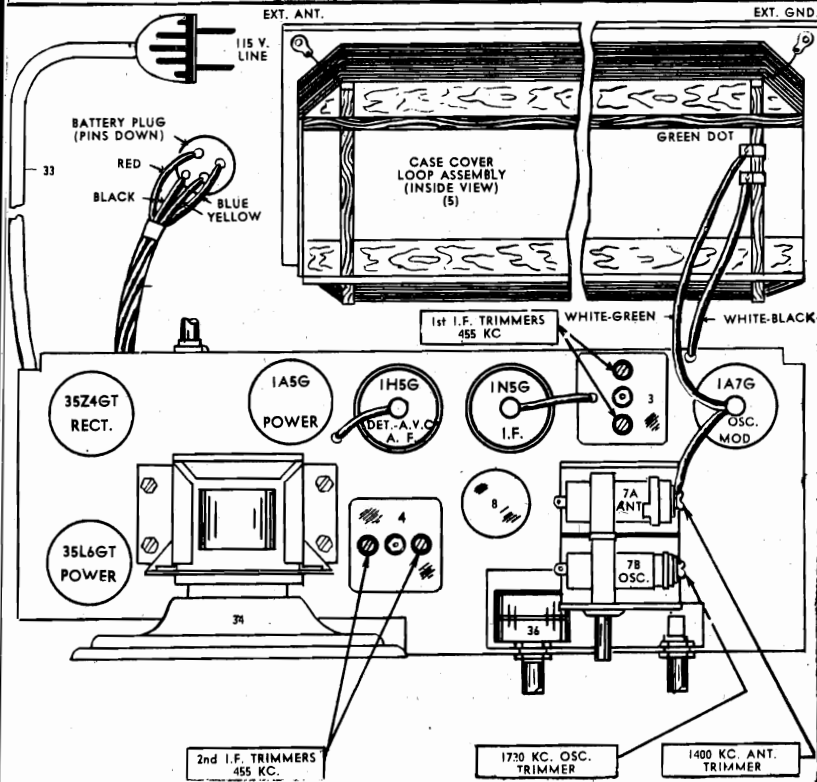
- (1) Remove the flexible shafts and dismount the receiver.
- (2) Remove the four terminals of the speaker cable from the speaker.
- (3) Remove the black antenna lead from the coil and unsolder the coil shield grounding braid.
- (4) Remove the blue dial light lead from the socket terminal.
- (5) Remove the yellow tone control lead from the tone control switch.
- (6) Remove the six slotted chassis fastening screws and slide the chassis out of the case.

Connect a .00025 mfd. condenser in series with the output lead of the test oscillator and the antenna lead lug on the antenna coil and connect the ground lead of the test oscillator to the chassis. Set the test oscillator to exactly 600 KC. Tune the radio set to maximum volume and set the dial to read exactly 6.0 (600 KC.). Then set the test oscillator to exactly 1400 KC. Turn the tuning knob until the dial pointer indicates 14.0 (1400 KC.). Adjust the oscillator shunt trimmer (on the gang condenser second from the control end) until the meter indicates maximum output. Then adjust the other gang condenser trimmer as directed under the R.F. alignment.

MODEL 7402-6
MODEL 7383-4

THE FIRESTONE TIRE & RUBBER CO.

MODEL 7402-6			MODEL 7402-6			MODEL 7402-6			MODEL 7383-4					
Illus. No.	Part No.	Part Name	Description	List Price	Illus. No.	Part No.	Part Name	Description	List Price	Illus. No.	Part No.	Part Name	Description	List Price
1	11824	Cable	Battery with four prong plug	\$.35	29	9018	Resistor	Carbon 150 Ohm 1/2 Watt	\$.10	30	1408	Resistor	Wire Wound, Flexible 25 Ohm 1 1/2 Watt	.19
2	10832	Choke	Filter	.85	31	10858	Resistor	Wire Wound, Flexible 200 Ohm 2 Watt	.22	32	11823	Resistor	Wire Wound 1700 and 20 Ohm	.45
3	10768	Coil	1st I.F. Transformer	1.05	33	11825	Resistor	Line Cord	.90	34	11821	Speaker	P.M. Dynamic 5"	4.00
4	10769	Coil	2nd I.F. Transformer	1.10	35	11815	Switch	Voltage Selector	.90	36	11112	Vol. Control	With D.P.S.T. Switch	.90
5	11830	Loop	Antenna Assembly complete with frame	1.75	<p style="text-align: center;">MISCELLANEOUS PARTS</p> <p>11304 Bulb 6-8 Volt .150 Amp. Type No. 47 \$0.10</p> <p>11816 Dial Scale Calibrated Scale ..... .40</p> <p>8184 Dial Cord 9" of 18 Lb. Drive Cord ..... .10</p> <p>10679 Dial Pointer For Dial ..... .15</p> <p>11084 Dial Shaft Drive Shaft ..... .15</p> <p>8117 Dial Shaft "C" Washer Retainer Washer ..... .02</p> <p>11818 Dial Crystal For Dial ..... .25</p> <p>11819 Dial Plate Metal Front Plate over Dial ..... .40</p> <p>10884 Indicator Plate ... Marked "AC-DC"—"OFF"—"BATT" ... .10</p> <p>10787 Knob For Tuning and Volume Controls ..... .08</p> <p>10907 Knob For Voltage Selector Control ..... .10</p> <p>10850 Plug 4 Prong for Battery ... .10</p>									
6	11813	Coil	Oscillator	.65										
7	11814	Condenser	Tuning Two Gang	1.65										
8	11822	Condenser	Tubular Dry Electrolytic (40-40) Mfd. 150 Volt & 20 Mfd. 25-Volt)	1.15										
9	9981	Condenser	Tubular .2 Mfd. 200 Volt	.29										
10	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20										
11	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20										
12	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19										
13	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19										
14	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19										
15	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17										
16	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17										
17	10762	Condenser	Tubular .002 Mfd. 400 Volt	.19										
18	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18										
19	9458	Condenser	Mica .00025 Mfd.	.21										
20	9458	Condenser	Mica .00025 Mfd.	.21										
21	7934	Condenser	Mica .0001 Mfd.	.21										
22	2705	Resistor	Carbon 2 Megohm 1/2 Watt	.19										
23	7998	Resistor	Carbon 1 Megohm 1/2 Watt	.19										
24	2673	Resistor	Carbon 750,000 Ohm 1/2 Watt	.19										
25	6984	Resistor	Carbon 500,000 Ohm 1/2 Watt	.19										
26	3534	Resistor	Carbon 75,000 Ohm 1/2 Watt	.19										
27	9693	Resistor	Carbon 5,000 Ohm 1/2 Watt	.19										
28	6875	Resistor	Carbon 250 Ohm 1/2 Watt	.19										



BOTTOM VIEW OF CHASSIS

MODEL 7383-4

IMPORTANT: Use high resistance voltmeter of 1000 ohms per volt. Readings will vary depending upon range of meter. Make allowance for battery voltage variations.

NOTE A: The actual bias on the grid of the 41 tube is -23 volts which must be measured from chassis to the ungrounded filter choke terminal. Due to the high resistance of the grid leak, the voltmeter will show only about -1 volt at the grid.

NOTE B: The oscillator grid voltage varies from about -3 at 1500 KC. to -5.0 at 530 KC. The oscillator anode voltage may vary from 115 at 1500 KC. to 120 at 530 KC.

MODEL 7396-1

THE FIRESTONE TIRE & RUBBER CO.

the set screw in the knob shaft, and by rotating the knob shaft, turn the pointer until it indicates the frequency of the station which has been tuned in. Then re-tighten the set screw and replace the knob.
If the set is used with a dash control head other than that for the Ford, calibrate as follows:

Turn the knob to the right as far as it will go, and then turn it to the end in the other direction. It is necessary to continue to turn the knob after the dial pointer reaches the end stop, until the knob will turn no farther. If the set is badly out of calibration, so that when the dial reads correctly at the low frequency end, it is off at the high frequency end, it will be necessary to adjust the oscillator shunt trimmer as explained below. The oscillator shunt trimmer is located on the oscillator section of the gang condenser which can be reached when the receiver bottom cover is removed. Connect a .00025 mfd. mica condenser in series with the output of the test oscillator and the antenna lead of the receiver. This condenser is essential to the proper adjustment of the antenna stage. Set the test oscillator to exactly 600 KC. Tune the receiver to maximum output. If the control head is of the steering column or Ford dash control type, calibrate at the low end of the dial by setting the pointer to read exactly 60 (600 KC.).

Set the test oscillator to exactly 1400 KC. Turn the gang condenser by means of the tuning knob until the dial pointer indicates 140 (1400 KC.). Adjust the oscillator shunt trimmer (on gang condenser section third from shaft end) for maximum output. Adjust the two trimmers nearest the shaft end as explained under R.F. alignment.

R. F. ALIGNMENT

With the test oscillator set to approximately 1400 KC., tune the set very carefully for maximum output.

Adjust the output of the test oscillator to the minimum value which will give sufficient output-meter deflection. Adjust the two trimmers nearest to the shaft end of the gang condenser to give maximum output meter reading.

CALIBRATION AND ALIGNMENT

A good modulated oscillator and a sensitive output meter are necessary for proper calibration and alignment of the R.F. and I.F. stages of this receiver. The output of the test oscillator must be adjustable to give a very weak signal which will not actuate the A.V.C. of the receiver. The output meter must be sensitive enough to give sufficient reading with such a weak signal.

The output meter may be conveniently connected between the chassis and the yellow lead terminal on pilot light and tone control lead socket. You will find that the yellow lead is connected through an .02 mfd. condenser to the plate of the 41 output tube. However, if the output meter is suitable, it should be connected across the speaker voice coil. During all calibration and alignment adjustments, keep the volume control full on.

I. F. ALIGNMENT

The I.F. trimmers are located on top of the I.F. transformers which may be reached by removing the receiver top cover. Pull out the antenna plug. The test oscillator should be set to exactly 177.5 KC. and connected from the control grid of the 77 to ground. Adjust the test oscillator output to give about half-scale reading of the output meter. Tune the set to make certain that no station signal is tuned in, since this would affect the output meter reading. Adjust all three I.F. trimmers to give maximum output reading.

In adjusting the I.F. transformer trimmers, it is desirable to use a bakelite screw driver or one having only a small metal tip. After the I.F. trimmers have been aligned once, go back and repeat the procedure, since any adjustment of one will affect the others to some extent.

DIAL CALIBRATION

The dial of the control head is calibrated in kilocycles except that one zero is omitted. Sets using the steering column control head or the Ford dash control head are calibrated as follows:

Tune in a station of known frequency between 800 and 1100 KC. Loosen the set screw in the right hand knob and remove the knob. Loosen

PARTS LIST

Diag. No.	Part No.	Description	List Price
1	66023	60,000 ohm 1 watt carbon resistor	\$0.25
2	67303	2,000 ohm 1/4 watt carbon resistor	.25
3	83080	51,000 ohm 1/4 watt carbon resistor	.25
4	83082	260,000 ohm 1/4 watt carbon resistor	.25
5	83539	260 mmfd. mica condenser	.20
6	84198	110,000 ohm 1/4 watt carbon resistor	.25
7	84235	1.1 megohm 1/4 watt carbon resistor	.30
8	84298	10,000 ohm 1/4 watt carbon resistor	.20
9	84833	701 mfd. mica condenser	.25
10	84833	701 mfd. mica condenser	.25
11	85296	Pilot lamp (58 volt (Dayonet base))	.15
12	88026	.02 mfd. 400 volt paper condenser	.30
13	88156	Vibrator	3.50
14	88170	10 mfd. 25 volt electrolytic condenser	.35
15A	88171	Volume control 500,000 ohm	.80
15B	88171	Line switch	1.20
16	88172	Antenna Filter	.35
17	88173	50 mmfd. mica condenser	1.20
18	88181	R. F. choke coil	.40
19	88183	R. F. choke coil (to vibrator)	.25
20	88185	.006 mfd. 600 volt paper condenser	.35
21	88187	.01 mfd. 1500 volt paper condenser	.40
22	88189	.05 mfd. 200 volt paper condenser	.35
23	88191	1 mfd. 300 volt paper condenser	.35
24	88193	.25 mfd. 150 volt paper condenser	.35
25	88195	.5 mfd. 150 volt paper condenser	.50
26	88203	600 ohm 1/4 watt carbon resistor	.15
27	88204	210 ohm 1/4 watt carbon resistor	.15
28	88206	.0021 mfd. mica condenser	\$.035
29	88210	Filter choke	1.25
30	88213	Power transformer	3.50
31	88222	1st I.F. transformer	2.75
32	88223	2nd I.F. transformer	2.60
33	88233	110 mmfd. mica condenser	.25
34	88234	Oscillator coil and shield assembly	1.50
35	88239	"A" filter	1.00
36	88250	R.F. coil and shield assembly	1.50
37A	88256	Electrolytic condenser	2.40
37B	88256	4 mfd. 350 volt electrolytic condenser	2.40
38	88257	9,500 ohm 1/4 watt carbon resistor	.15
39 A to C	88258	Three gang variable condenser	6.00
40	88274	Field coil and housing (for R-245-A spr.)	2.50
41	88276	Output transformer	2.00
42	88285	1.25 mfd. 160 volt paper condenser	.80
43	88289	R.F. choke (to filaments)	.20
44	88298	.25 mfd. 150 volt paper condenser (low reactance)	.40
45	88312	Antenna coil and shield assembly (iron core)	2.00
46	88327	Antenna cable and plug	1.10
47	88328	Diaphragm and shell assembly (R-245-A spr.)	2.10
48	88339	Pilot light and tone control cable with plug	.90

Control head less shell, knobs and shafts 3.50
Fuse, 10 amperes05
Battery lead and fuse housing50

PARTS NOT SHOWN ON CIRCUIT DIAGRAM

Part No.	Description	List Price
12412	Split lockwasher for receiver mounting	\$.02
17166	Hex nut for receiver mounting 1/4" - 13	.05
84990	Receiver mounting plate	.60
85012	Receiver mounting bolt, 1/4" - 13x2"	.06
88326	Complete accessories for installation	3.28
88336	Shakeproof lockwasher for receiver mounting	.04
88336	Large flat washer for receiver mounting	.04

MISCELLANEOUS PARTS

88319	Fuse insulator tube	.02
83777	Battery lead and fuse housing	.50
88169	Vibrator shield	.35
88161	Tube shield half section (short)	.08
88162	Tube shield half section (long)	.08
88164	Tube shield cap (long)	.06
88165	Tube shield cap (short)	.06
88297	Speaker mounting screw No. 8 - 32 special head	.02
88319	Self tapping screw No. 8 x 1/4" for receiver cover mtg.	.02
88321	Receiver case assembly (less covers)	5.00
88327	Antenna cable	1.10
88330	Receiver case cover with tube location label	1.00
88350	Interference filter condenser with bracket, .5 mfd., 150 V.	.70

STEERING COLUMN CONTROL HEAD PARTS

88333	Shell for control head (right-hand mounting)	.50
88334	Bracket for control head mounting	.50
88337	Shell mounting screw No. 1 - 72 R.H.M.S.	.01
88338	Knob for control head	\$.025
88339	Pilot light and tone control cable with plug and socket	.90
88385	Extra length pilot light and tone control cable with plug and socket (43")	1.00
88410	Shell for control head (left-hand mounting)	.50

FLEXIBLE SHAFTS

88406	18" tuning and volume control shaft	2.00
88407	24" tuning and volume control shaft	1.50
88408	30" tuning and volume control shaft	2.00
88409	36" tuning and volume control shaft	2.00

SPECIAL ACCESSORIES

88422	Ford distributor condenser	.70
88430	Distributor suppressor	.35
88431	Dome light filter	1.00
88431	Shielded loom with connector tip for antenna lead-in	.40

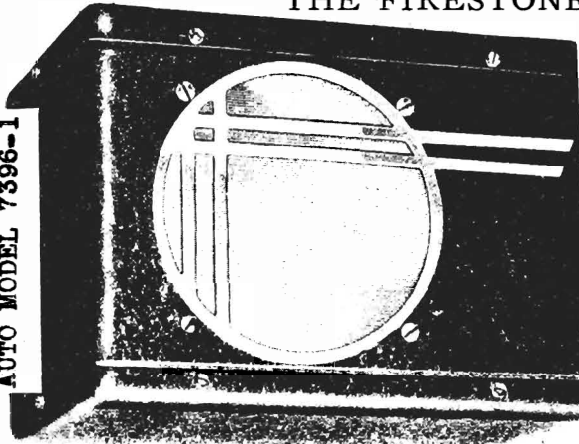
Prices subject to change without notice.

CEILING PRICES—A retail outlet must not sell at prices higher than those allowed herein may not be charged by any retailer if his ceiling on any item is below the prices herein.

THE FIRESTONE TIRE & RUBBER CO.

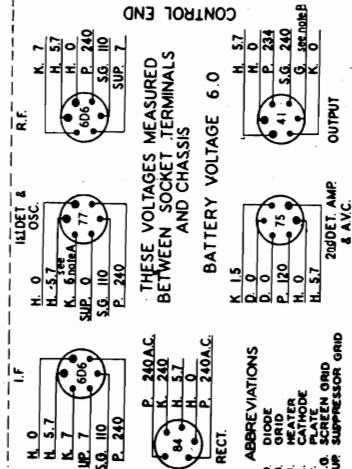
MODEL 7403-1
MODEL 7396-1

AUTO MODEL 7396-1



SOCKET VOLTAGES

BOTTOM VIEW



Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT, THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. con-

denser. The ground on the test oscillator should be connected to the ground buss, indicated in circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Remove the chassis from the cabinet and set on a bench, taking care that no metal is near the loop. Do not make this setup on a metal bench.

Connect the test oscillator to the antenna of the set through a 200 mmfd. (.0002) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

Diag No.	Part No.	Description	Price	Diag Part No.	Description	Price
C-9	N-1376	.02 mfd. 400 V.	.....\$ 0.35	R-10	N-1264 500,000 Ohm .5 W.	20%
C-10	N-3658	{ 40 mfd. 150 W. V. } { 40 mfd. 150 W. V. }	.....\$ 1.10	R-11	N-3663 150 Ohm .5 W.	10%
C-11	N-1346	.05 mfd. 400 V.	.....\$ .40	R-12	N-1377 200,000 Ohm .5 W.	20%
C-12	N-1346	.05 mfd. 400 V.	.....\$ .40	R-13	N-3819 1,200 Ohm 1 W.	10%
C-13	N-3080	.22 mfd. 200 V.	.....\$ .70	R-14	N-1742 25 Ohm .5 W.	20%
C-14	N-1345	.05 mfd. 200 V.	.....\$ .40	R-15	N-3869 30 Ohm 1 W.	10%
R-1	N-3814	15,000 Ohm .5 W.	.....\$ .20	R-16	N-1377 200,000 Ohm .5 W.	20%
R-2	N-3964	2,000 Ohm .5 W.	.....\$ .20	R-17	N-1262 1 Megohm .5 W.	20%
R-3	N-1260	50,000 Ohm .5 W.	.....\$ .20	R-18	N-3784 Antenna Loop Coil	.90
R-4	N-1627	20,000 Ohm .5 W.	.....\$ .20	R-19	N-3298 Oscillator Coil	.70
R-5	N-1263	10 Megohm .5 W.	.....\$ .20	R-20	N-3816 1st I.F. Transformer	1.20
R-6	N-1682	3 Megohm .5 W.	.....\$ .20	R-21	N-3804 2nd I.F. Transformer	1.20
R-7	N-1460	30,000 Ohm .5 W.	.....\$ .20	R-22	N-3782 Output Transformer	1.00
R-8	N-4076	0.5 Megohm Volume Control	.....\$ 2.25	R-23	N-3781 5" P. M. Speaker	3.75
R-9	N-2189	4 Megohm .5 W.	.....\$ .20	R-24	N-4025 2 Gang Condenser	3.00
N-1958	Rubber line cord	.....\$ 0.45	N-4054	Dial scale (glass)	.....\$ .80	
N-3812	Wood dowel spacers—loop mounting	.....\$ .10	N-4055	Dial background plate	.....\$ .80	
N-3795	Screw—6-32x2 1/4" round head	.....\$ .12	N-4053	Dial pointer	.....\$ .50	
N-3642	Washer—fibre—chassis mounting	.....\$ .10	N-3787	Dial drive shaft	.....\$ .50	
N-4687	Cabinet back	.....\$ .65	N-3238	Dial drive shaft bushing	.....\$ .40	
N-4749	Knobs	.....\$ .20	N-3243	"C" Washer—dial drive shaft retainer	.....\$ .07	
N-4386	Clips—dial scale fastening	.....\$ .10	N-2655	Dial drive string	.....\$ .10	
N-4696	Speaker baffle	.....\$ .16	N-3925	Dial drive spring	.....\$ .10	
N-4697	Grille cloth	.....\$ .22	N-4075	Dial lamp socket	.....\$ .50	

IMPORTANT: Use a high resistance voltmeter of 1000 ohms per volt. Make allowances for battery voltage variation.

NOTE A: The cathode voltage of the 77 varies from 6 to 10 volts, depending on the gang condenser setting.

NOTE B: The grid bias on the 41 output tube is —18 volts, measured from the chassis to the ungrounded filter choke terminal.

MODEL 7403-1

THE FIRESTONE TIRE & RUBBER CO. MODEL 7402-6, Roamer

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment, check tuning dial adjustment by: turn gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle to correct position.

Use an accurately calibrated test oscillator with some type of output measuring device.

BEFORE ALIGNING, PLACE LOOP AN-

TENNA AND THE BATTERY IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to terminals on bottom of cabinet back.

Couple test oscillator to receiver loop by:

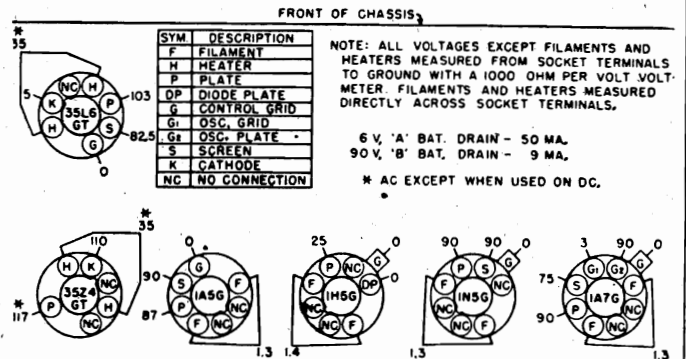
- (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three-inch form and attach across output of test oscillator.
- (b) Place test oscillator loop near set loop—**BE SURE THAT NEITHER MOVES WHILE ALIGNING.**

Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below—and:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
(1) Exactly 1730 K.C.	Exactly 1730 K.C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1730 K.C. oscillator trimmer for maximum output.
(2) Approx. 1400 K.C.	Exactly 1400 K.C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K.C. antenna trimmer for maximum output.
I. F. Any point where no interfering signal is received	455 K.C.	.02 MFD condenser	High side to grid terminal of 1A7G tube Low side to chassis DO NOT REMOVE CAP.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.

SHOULD THE RECEIVER FAIL TO OPERATE CHECK FOR:

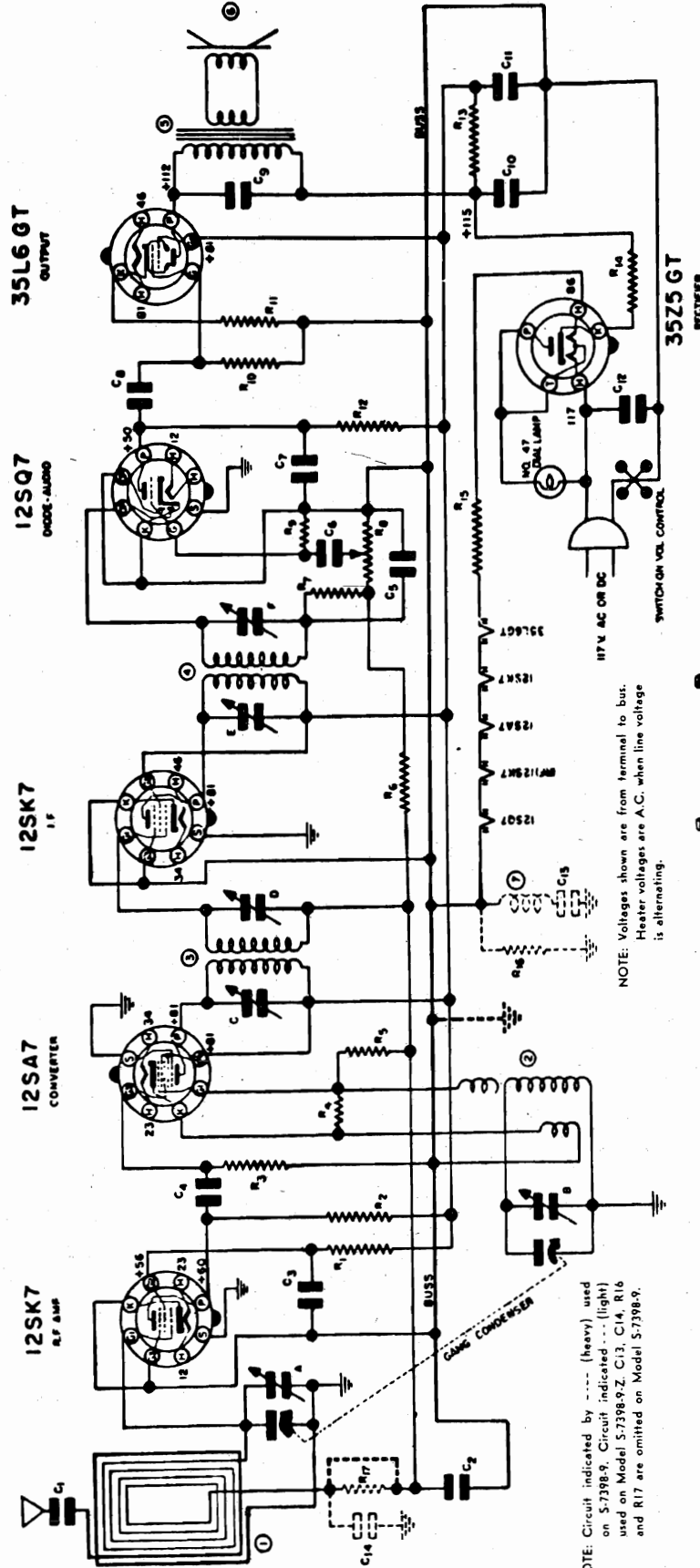
1. Weak battery.
2. A defective tube.
3. Tubes not properly inserted in tube sockets.
4. Grid caps not properly inserted on grid terminals on top of tubes.
5. Set may not be in correct position—rotate radio to point of greatest volume.
6. If set is being operated in an isolated district, an external aerial may be required.

A NOTICEABLE REDUCTION IN RECEIVER VOLUME, assuming that all tubes are in good condition, can generally be attributed to a low battery that should be replaced.



MODEL 7403-1, Brilliantone

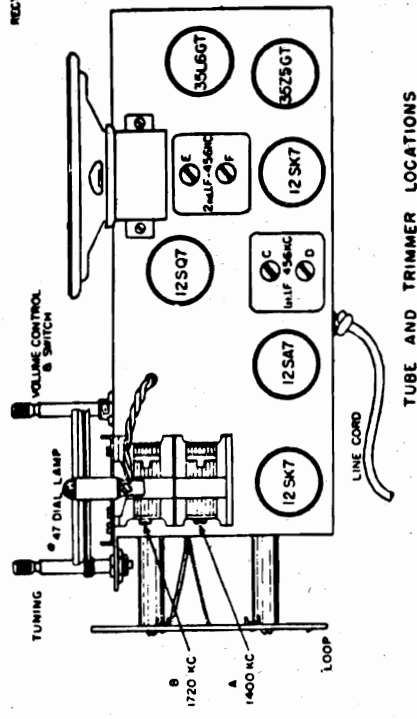
THE FIRESTONE TIRE & RUBBER CO.



I.F.—456 K.C.

6 TUBE A.C.-D.C.
SUPERHETERODYNE
SINGLE BAND

DECEMBER 9, 1941



TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 1720 Kilocycles (KC) (174 to 560 Meters) and includes the popular 1712 KC police channel.

GROUND

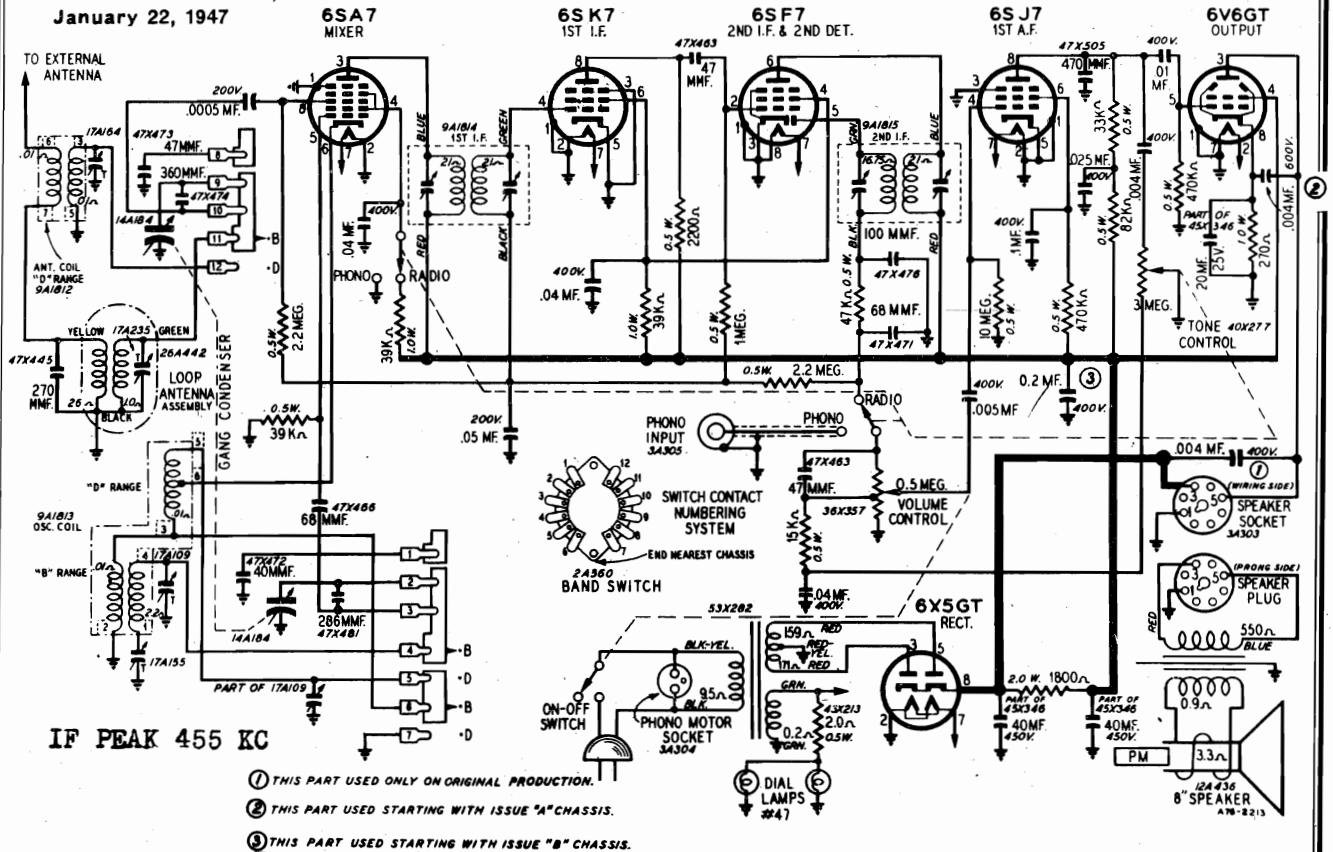
No ground connection should be used when operating this receiver. The receiver gets its ground connection through the power line and any external connection to the chassis may cause a short circuit and consequent damage.

NOTE: Circuit indicated by ---- (heavy) used on S-7398-9. Circuit indicated - - - (light) used on Model S-7398-9-Z. C13, C14, R16 and R17 are omitted on Model S-7398-9.

GAMBLE-SKOGMO INC.

MODELS 43-7601, 43-7601A,
43-7601B
MODEL 43-7602

January 22, 1947



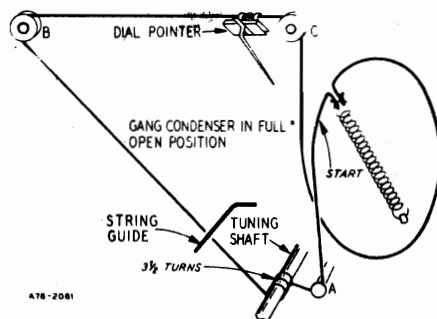
SUBSTITUTE PARTS LIST

The following parts are used in some receivers only. Check part number on part before ordering and order part originally used in receiver.

- 40X282 Tone Control (Substitute for 40X277)
- 25X1539 Radio-Phono. Switch Lever (When 40X282 is used)
No. 6-32 x 5/16" Slab Hd. Set Screw (Mtg. 25X1539)
- 2A161 D.P.D.T. Switch (When 40X282 is used)

DRIVE CORD REPLACEMENT

To install a new drive cord, turn the large drive pulley until the gang condenser is completely unmeshed. Hook one end of the new drive cord to the tension spring and fasten the other end of the tension spring to the tab on the drive pulley. Pass the cord through the slot in the rim of the drive pulley and run it 1/4 turn counterclockwise around the pulley. Pass it around the Idler stud A and wind three turns clockwise around the tuning shaft with the turns progressing away from the chassis. Run the string behind the string guide, around pulleys B and C, down and under the large drive pulley, then counterclockwise around the pulley to the slot in the rim. Hook the end of the cord to the end of the tension spring and turn the tuning shaft a few turns to remove any slack in the cord.



SPECIFICATIONS

6 Tube Superheterodyne, including rectifier tube
 Power Consumption..... 40 w. normal, 60 w. phono operating (at 117 v. A.C.)
 Selectivity..... 40 kc. broad at 1,000 times signal
 Intermediate Frequency..... 455 kc.
 Speaker..... 8 inch P.M. dynamic
 Tuning Frequency Range..... B range, 540-1,600 kc.; D range, 9-15.5 meg.
 Sensitivity..... B range, 9 mv. avg.; D range, 20 mv. avg.
 (for 0.5 w. output with external antenna)
 Power Supply..... 105-125 v. 60 cycles only
 Power Output..... 4 w. maximum 2.3 w., 10% harmonics
 Record Changer..... Plays ten 12 inch or twelve 10 inch

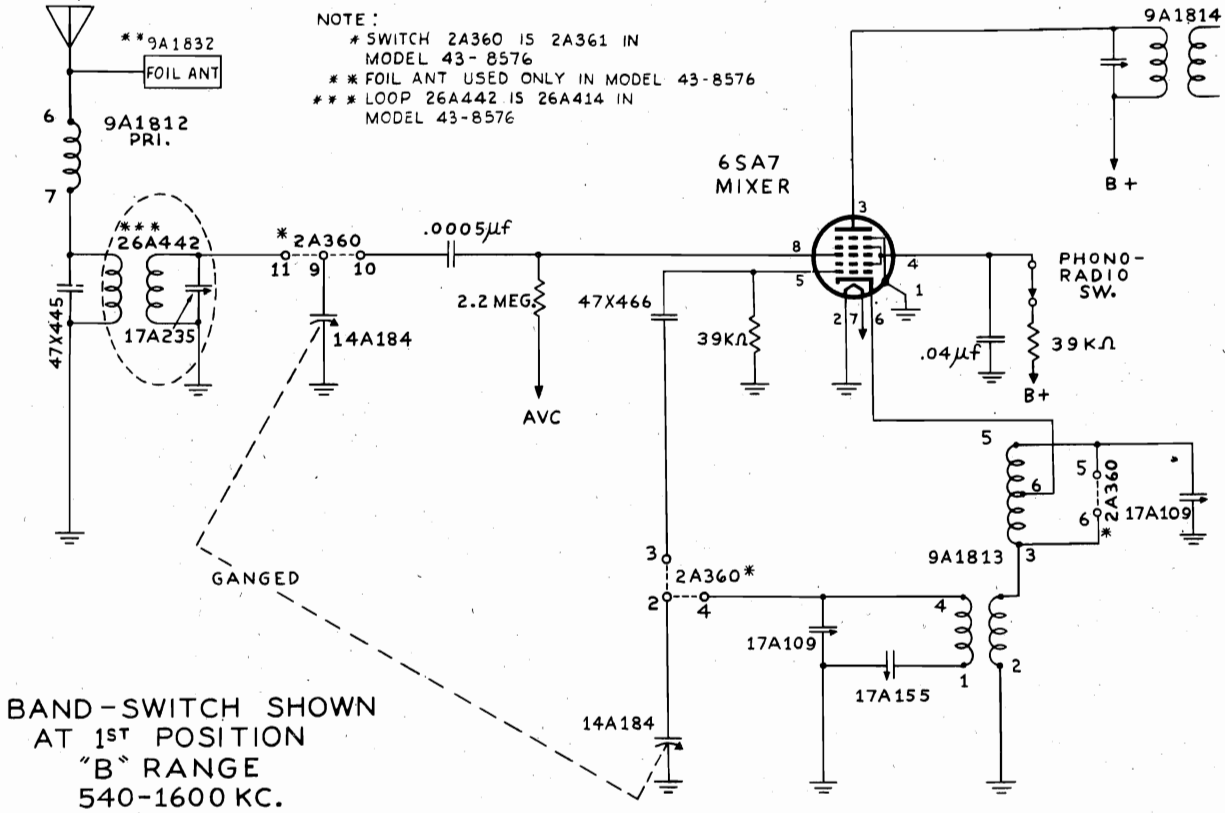
CIRCUIT DESCRIPTION

The automatic record changer is connected to the rear of the chassis through jacks marked "Phono" and "Phono Motor." The "Phono" jack is switched in or out of the audio circuit by a switch controlled by the tone control knob. This switch also shorts out the r-f signal when it is turned to the phono position.

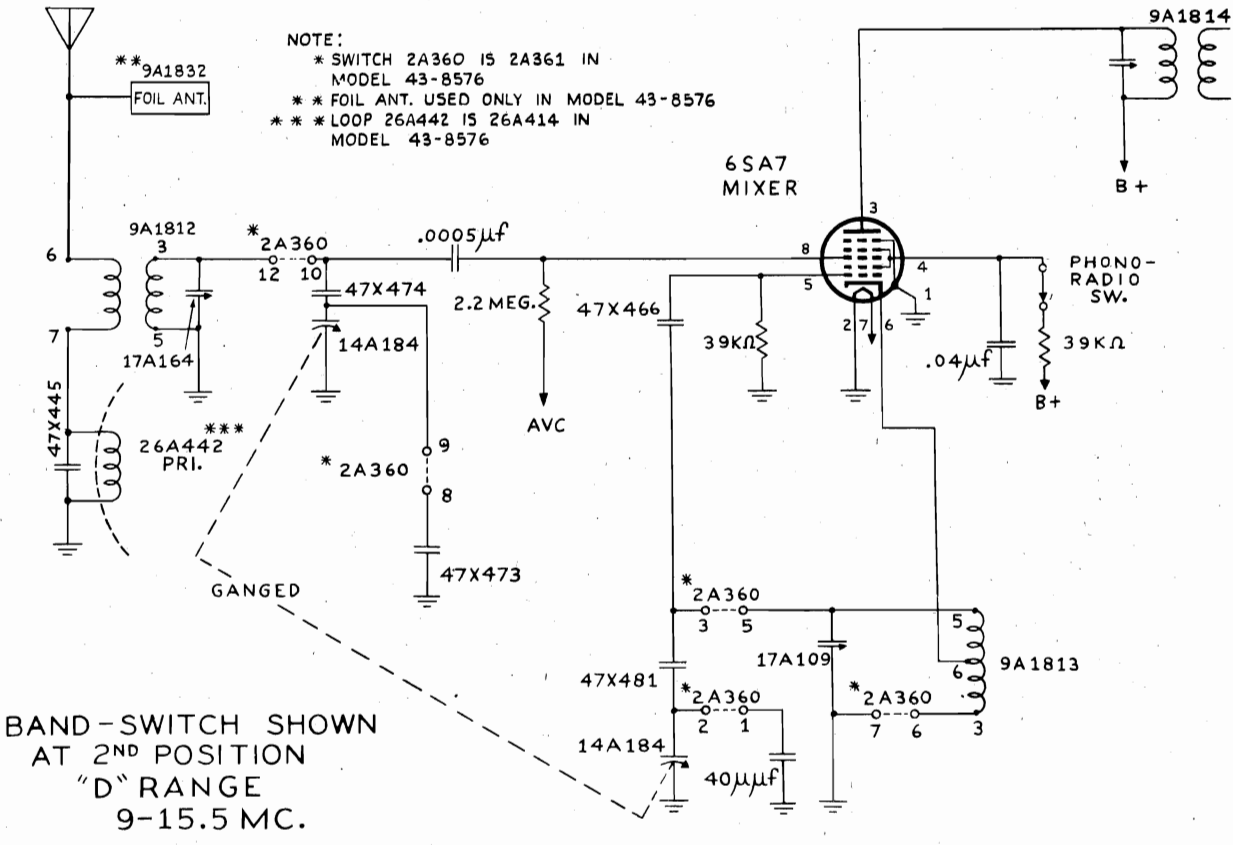
"clarified schematics"

MODELS 43-7601, 43-7601A, 43-7601B, GAMBLE-SKOGMO INC.
 MODEL 43-7602
 MODEL 43-8576

NOTE:
 * SWITCH 2A360 IS 2A361 IN MODEL 43-8576
 ** FOIL ANT USED ONLY IN MODEL 43-8576
 *** LOOP 26A442 IS 26A414 IN MODEL 43-8576

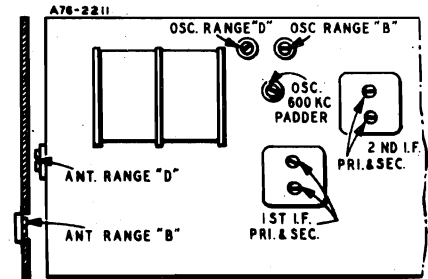
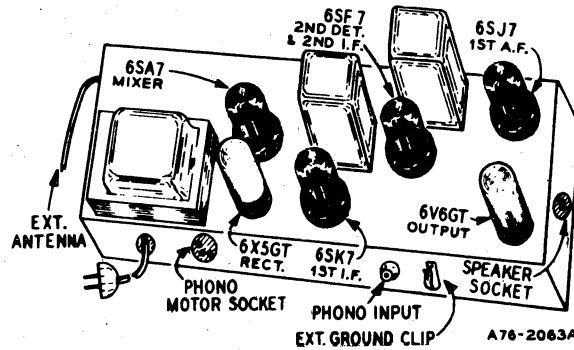


NOTE:
 * SWITCH 2A360 IS 2A361 IN MODEL 43-8576
 ** FOIL ANT. USED ONLY IN MODEL 43-8576
 *** LOOP 26A442 IS 26A414 IN MODEL 43-8576



GAMBLE-SKOGMO INC.

MODELS 43-7601, 43-7601A,
43-7601B
MODEL 43-7602



ALIGNMENT PROCEDURE

Volume Control—Maximum all adjustments.
Connect radio chassis to signal generator with a short heavy lead.
Allow chassis and signal generator to "heat up" for several minutes.
The following equipment is required for aligning:

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

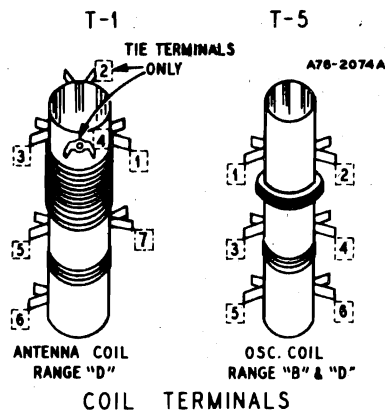
Output Indicating Meter—Non-metallic screwdriver.

Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F. RANGE B	455 Kc.	Grid of 6SA7 Pin 8	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (Pri.) and (Sec.) 1st I.F. (Pri.) and (Sec.)
	1,620 Kc.	Antenna Lead	100 mmf	B Range	Turn Rotor to Full Open	Oscillator Range B
	1,400 Kc.	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output Set Pointer to 1,400 Kc. (See Note A)	Antenna Range B
	600 Kc.	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Oscillator (600 Kc. Padder) Rock Rotor See Note B
Repeat above steps at 1,620 and 600 Kc. until readjusting the oscillator. Range B Trimmer causes no further improvement of output.						
RANGE D	15,600 Kc.	Antenna Lead	400 ohm	D Range	Turn Rotor to Full Open	Oscillator Range D
	14,000 Kc.	Antenna Lead	400 ohm	D Range	Tune Rotor to Max. Output	Antenna Range D Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet.					
	1,400 Kc.	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Antenna Range B

NOTE A—Set pointer at the 1,400 KC. mark on the dial scale. Attach pointer to drive cord.

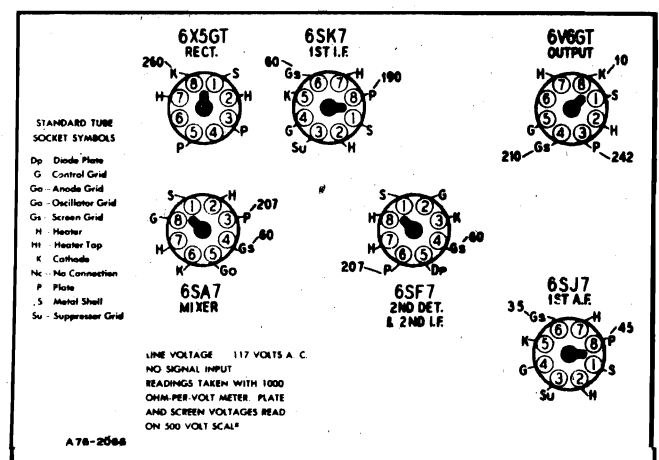
NOTE B—Turn Rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.



CIRCUIT CHANGES

Issue A chassis differ from the original production by the use of a .004 mf 600 volt tubular capacitor connected between the plate and cathode of the output tube instead of the .004 mf 400 volt tubular capacitor originally connected across the primary of the output transformer.

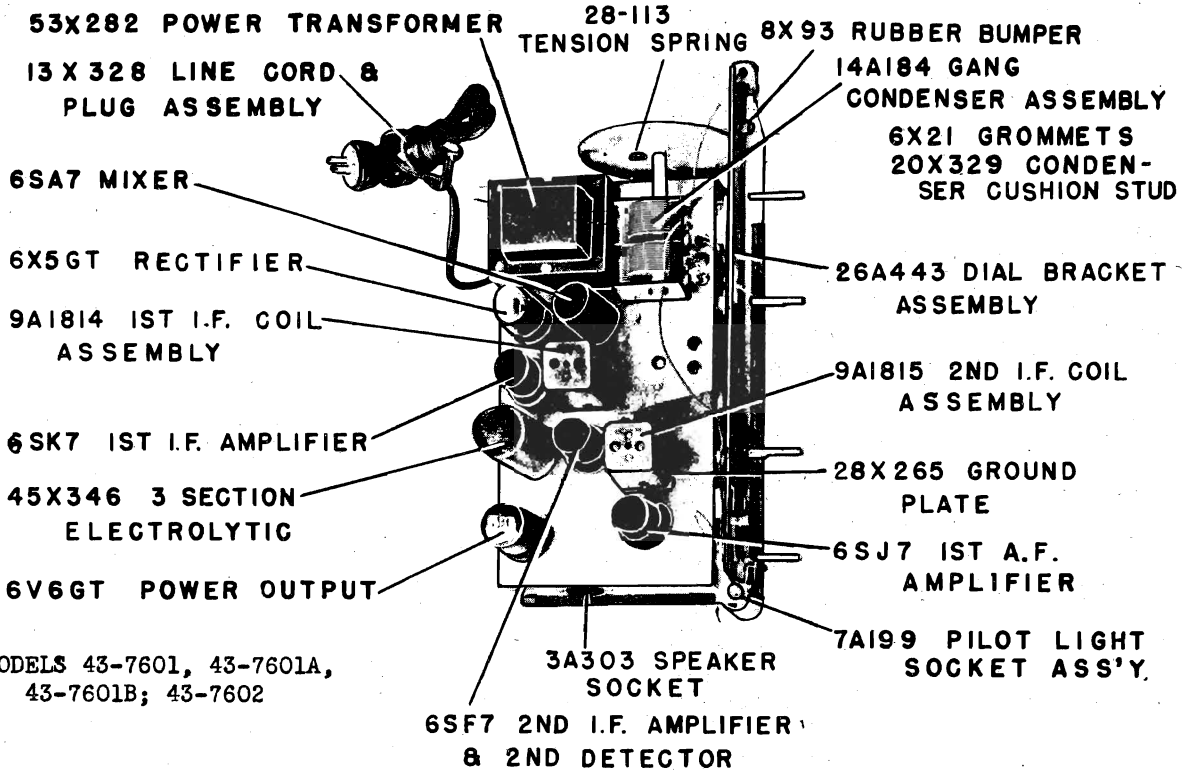
Issue B chassis differ from issue A chassis by the addition of a .2 mf 400 volt tubular capacitor connected from B — to chassis ground as an R-F filter.



MODELS 43-7601, 43-7601A,
43-7601B

GAMBLE-SKOGMO INC.

MODEL 43-7602



MODELS 43-7601, 43-7601A,
43-7601B; 43-7602

C.45X346 3 SECTION ELECTROLYTIC

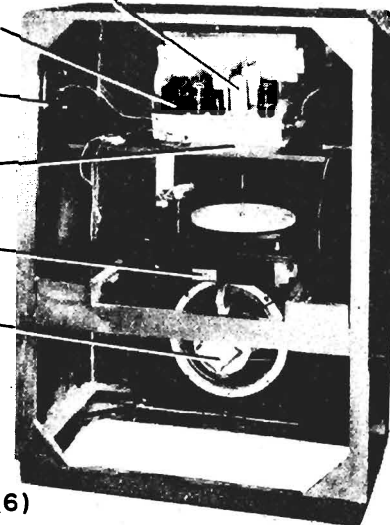
53X282 POWER TRANSFORMER

26A442 LOOP ANTENNA

27X56 BOTTOM PLATE

57X184 LOCKING PLATE

12A436 8" PM SPEAKER



5X163 POINTER

10A579 KNOB

10A581 KNOB

58X616 DIAL GLASS

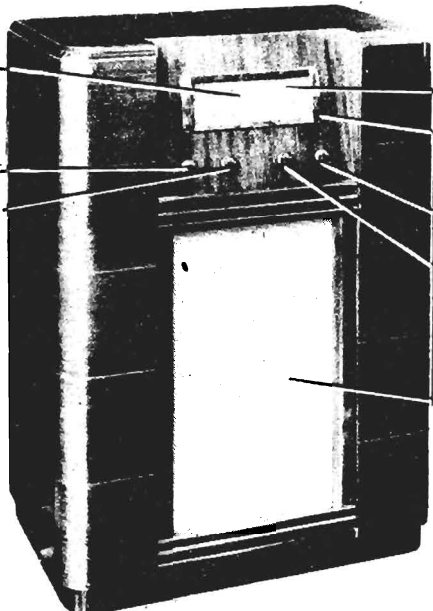
4X353 ESCUTCHEON
2 X 3 8" SCREW (6)

10A578 KNOB

10A583 KNOB

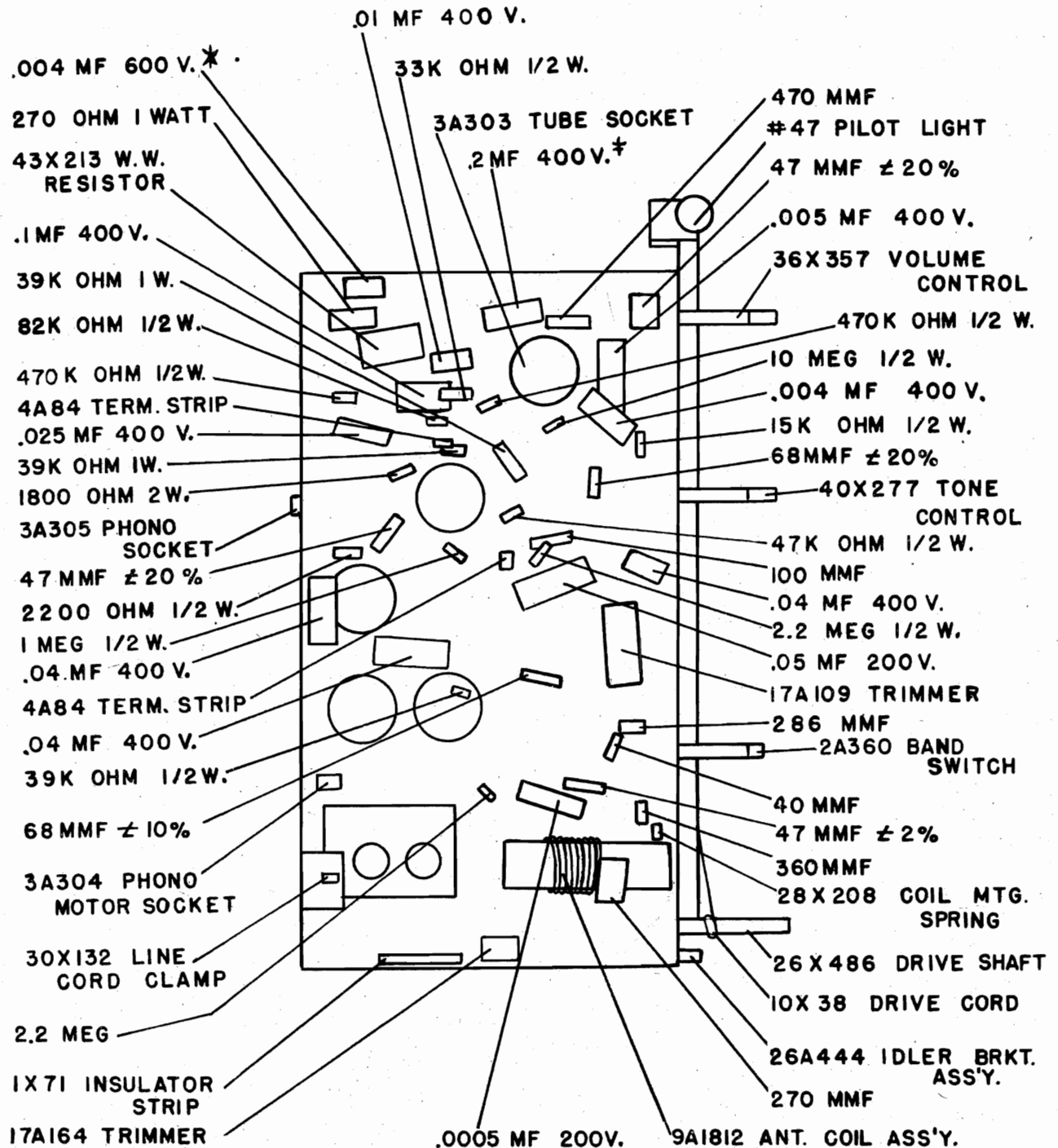
14X371 GRILLE CLOTH

MODELS 43-7601, 43-7601A,
43-7601B



GAMBLE-SKOGMO INC.

MODELS 43-7601, 43-7601A,
43-7601B
MODEL 43-7602



‡ USED STARTING
ISSUE "B" CHASSIS

* REPLACES .004 MF 400V,
STARTING ISSUE "A" CHASSIS

SUBSTITUTE PARTS LIST

The following parts are used in some receivers only. Check part number on part before ordering and order part originally used in receiver.

- 40X282 Tone Control (Substitute for 40X277)
- 25X1539 Radio-Phono. Switch Lever (When 40X282 is used)
No. 6-32 x 5/16" Slab Hd. Set Screw (Mtg. 25X1539)
- 2A161 D.P.D.T. Switch (When 40X282 is used)

MODEL 43-7602

GAMBLE-SKOGMO INC.

4 X 990 ESCUTCHEON
#2 X 3/8" WOOD
SCREW (4)

10A 622 KNOB

10A 621 KNOB

#758 CABINET

14 X 407
GRILLE CLOTH

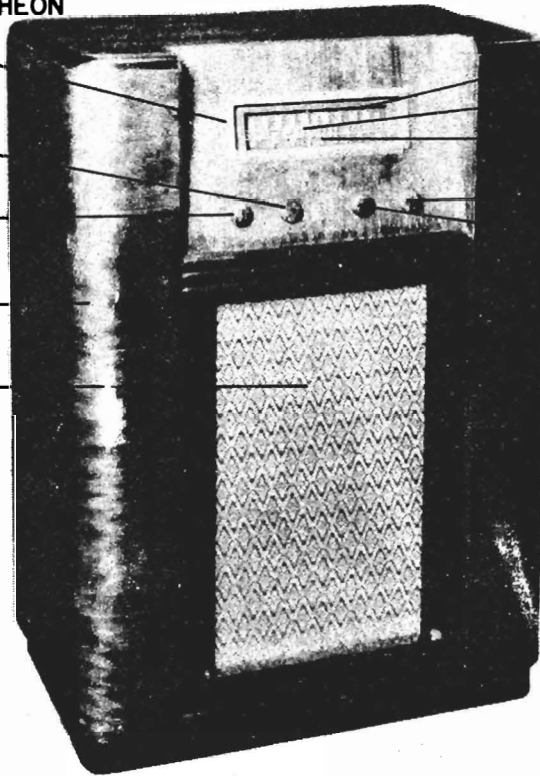
58 X 684 DIAL GLASS

15 X 162 POINTER

58 X 615 DIAL BACKGROUND

10A 620 KNOB

10A 623 KNOB



SHURE PICKUP CARTRIDGE
P30-1.

FRONT VIEW

26A 442 LOOP ANTENNA ASSEMBLY

17A 234 TRIMMER #16 X 5/8" FLAT
HEAD BLUED FINISH NAIL (4)

#10 X 1/2 P.K. TYPE "Z" SCREW (4)
19 X 8 FLAT WASHER (4) MTG. CHASSIS
27 X 56 BOTTOM PLATE

WEBSTER CHANGER MODEL #50

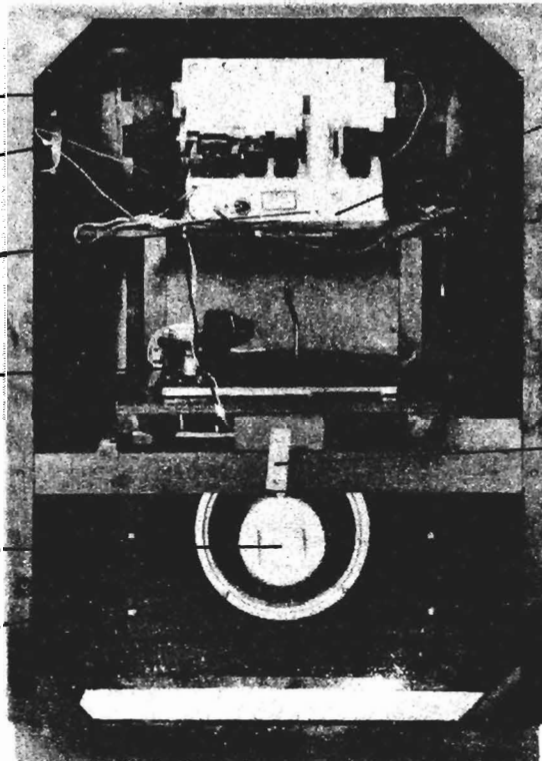
12A 441 10" P.M. SPEAKER

#10 X 3/4" WASHER HEAD, WOOD
SCREW (STEEL)

30 X 138
FAHNSTOCK
CLIP

3 X 328
LINE CORD
AND PLUG

57 X 184
LOCKING
PLATE



REAR VIEW

GAMBLE-SKOGMO INC.

MODEL 43-8160

ALIGNMENT PROCEDURE

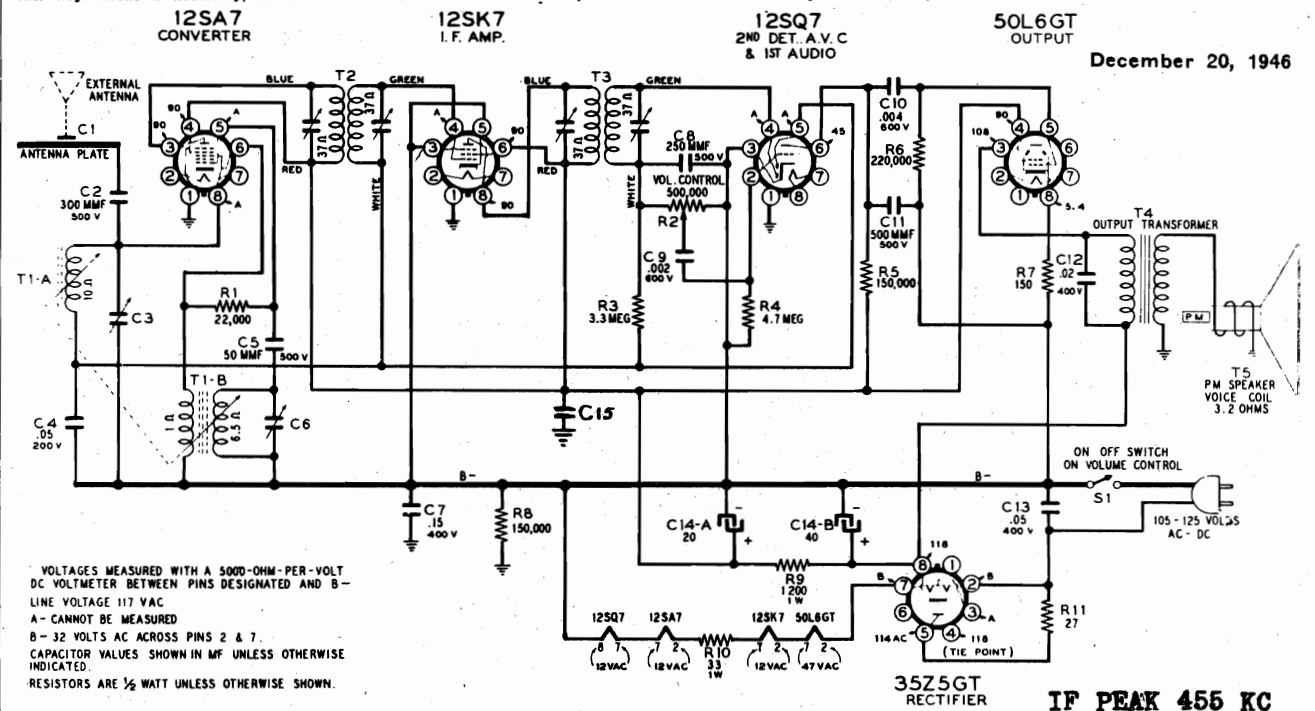
Output meter across 3.2-ohm output load.
Volume control at maximum for all adjustments.

Align for maximum output.
Reduce input as needed to keep output near 0.4 volts.

FREQUENCY	SIGNAL GENERATOR COUPLING CAPACITOR	CONNECTION TO RADIO	GROUND CONNECTION	TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)
455 kc	.1 mf	Metal-antenna plate	12SQ7 Pin 3 (B-)	Iron cores all the way out	Trimmers on output and input I.F. cans
1720 kc	.1 mf	Metal antenna plate	12SQ7 Pin 3	Iron cores all the way out	Oscillator trimmer C6
1720 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Iron cores all the way out	Antenna trimmer C3
1400 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Turn dial to 1400 kc	Adjust position of antenna coil (see coil assembly view)
1720 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Turn dial to 1720 kc	Antenna trimmer C3*

*After the antenna coil has been tracked at 1400 kc, it is necessary to check the antenna trimmer C3 again at 1720 kc. If no appreciable change in trimmer adjustment is necessary, the coil is in track. If the trimmer requires

considerable change, the position of the antenna coil at 1400 kc must be readjusted. These two adjustments should be made several times, until no trimmer adjustment is required at 1720 kc.



VOLTAGES MEASURED WITH A 5000-OHM-PER-VOLT DC VOLT-METER BETWEEN PINS DESIGNATED AND B-
LINE VOLTAGE 117 VAC
A- CANNOT BE MEASURED
B- 32 VOLTS AC ACROSS PINS 2 & 7.
CAPACITOR VALUES SHOWN IN MF UNLESS OTHERWISE INDICATED.
RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SHOWN.

SCHMATIC DIAGRAM LEGEND

- | | | |
|----------------------------------------|------------------------------|-----------------------------|
| C 1 Antenna plate, walnut color | 20 mf. x 150 v. | R 8 150,000 ohms 1/2 w. 20% |
| C 1 Antenna plate, ivory color | Electrolytic 60 mf. x 150 v. | R 9 1,200 ohms 1 w. 10% |
| C 2 300 mmf. 20% mica | 40 mf. x 150 v. | R 10 33 ohms 1 w. 10% |
| C 3 Dual trimmer 74-136 mmf. (antenna) | for 25 cycles | R 11 27 ohms 1/2 w. 10% |
| C 4 .05 mf. 200 v. 25% | | |
| C 5 .05 mf. 400 v. 25% | | |
| C 6 95-175 mmf. (oscillator) | | |
| C 7 .15 mf. 400 v. 25% | | |
| C 8 250 mmf. 20% mica | | |
| C 9 .002 mf. 600 v. 25% | | |
| C 10 .004 mf. 600 v. 25% | | |
| C 11 500 mmf. 20% mica | | |
| C 12 .02 mf. 400 v. 25% | | |
| C 13 .05 mf. 400 v. 25% | | |
| C 14-A, B Electrolytic 40 mf. x 150 v. | | |

RESISTORS

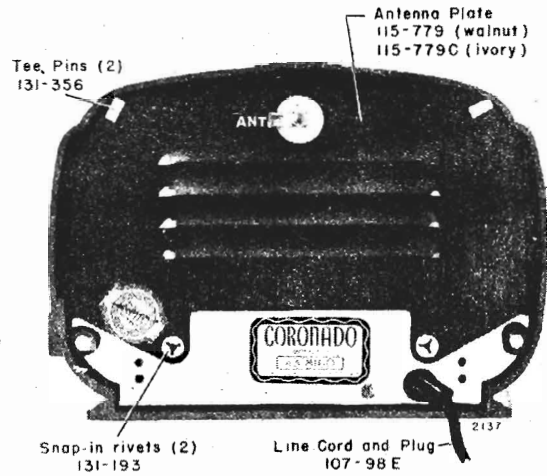
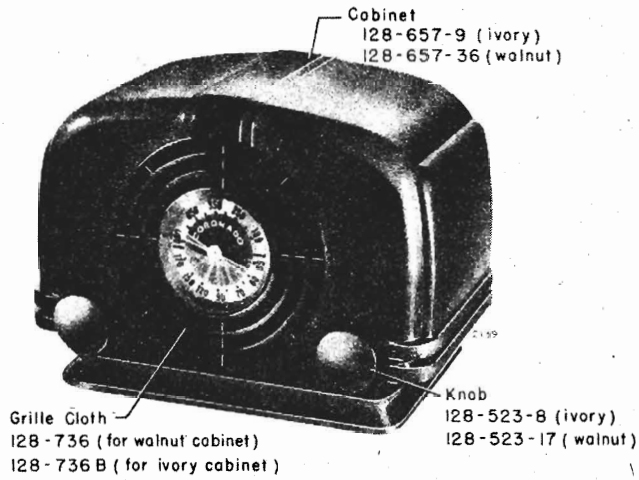
- | |
|-------------------------------------------------|
| R 1 22,000 ohms 1/2 w. 10% |
| R 2 Volume control, 500,000 ohms, on-off switch |
| R 3 3.3 megohms 1/2 w. 20% |
| R 4 4.7 megohms 1/2 w. 20% |
| R 5 150,000 ohms 1/2 w. 20% |
| R 6 220,000 ohms 1/2 w. 20% |
| R 7 150 ohms 1/2 w. 10% |

MISCELLANEOUS

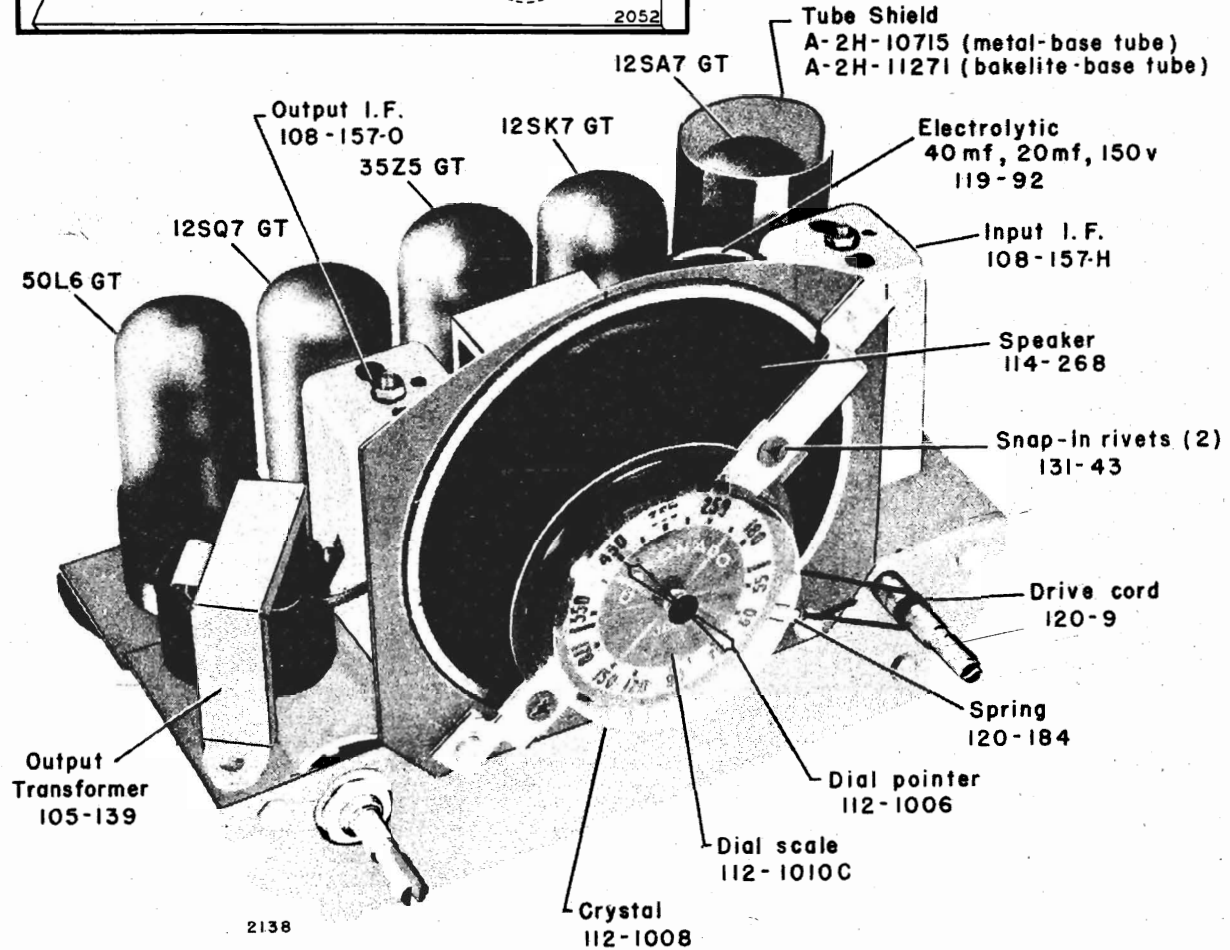
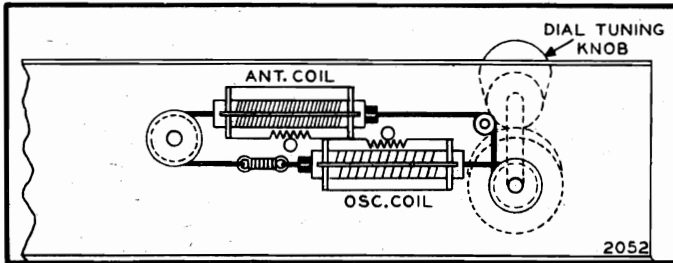
- | |
|----------------------------------------------------------------------------------|
| T1A, B Permeability tuning unit complete, including antenna and oscillator coils |
| T2 Input I.F. coil complete in can. Range of trimmers: 39-73 mmf. each |
| T3 Output I.F. coil complete in can. Range of trimmers: 39-73 mmf. each |
| T4 Output transformer |
| T5 Speaker 4 inch P.M. voice coil impedance, 3.2 ohms |

MODEL 43-8160

GAMBLE-SKOGMO INC.



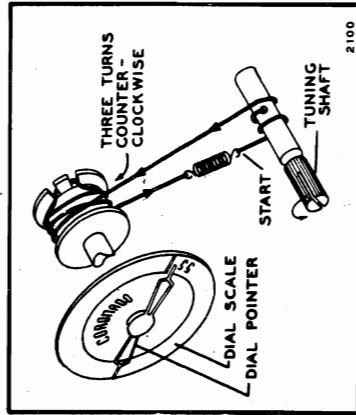
SLUG TUNER



SPECIFICATIONS

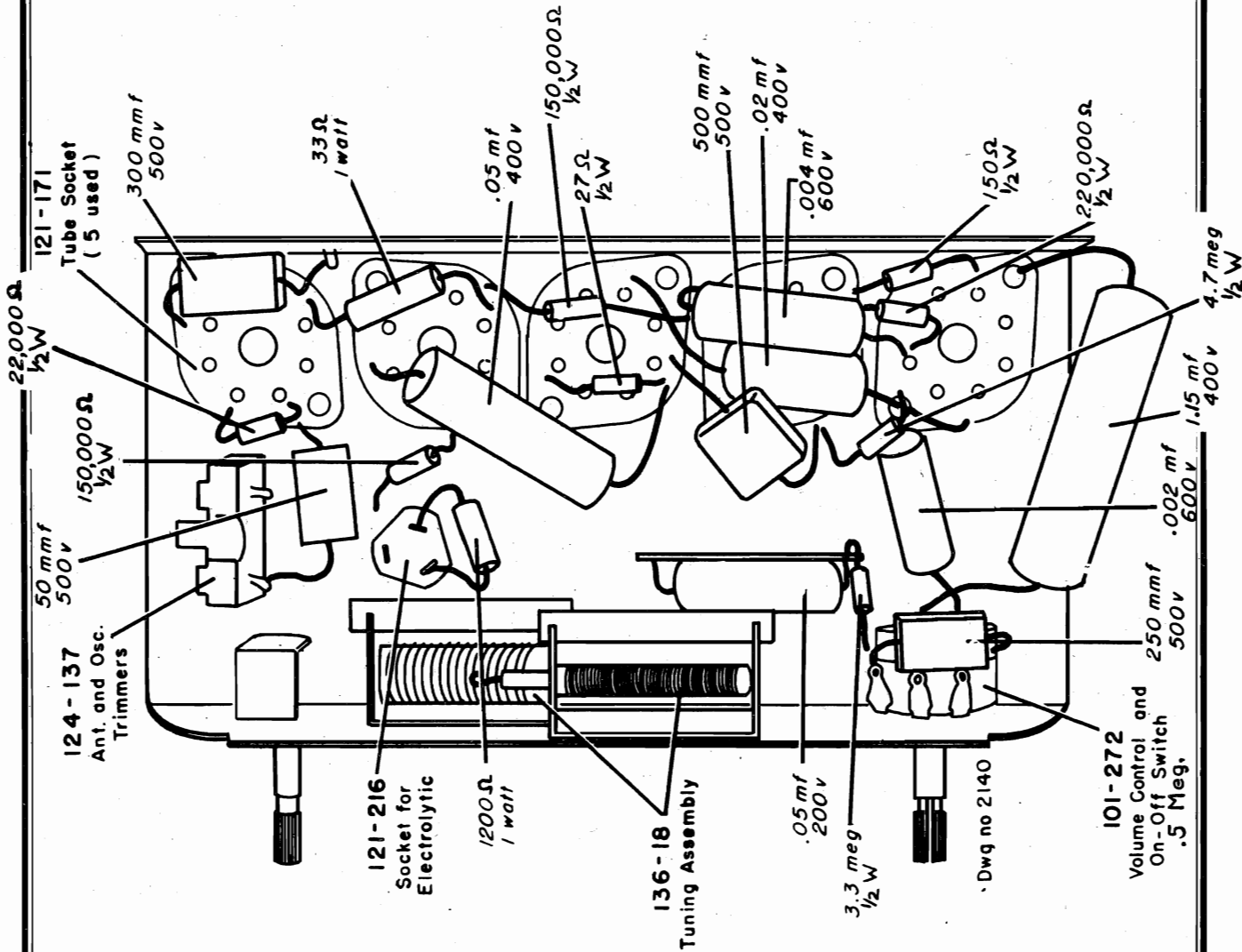
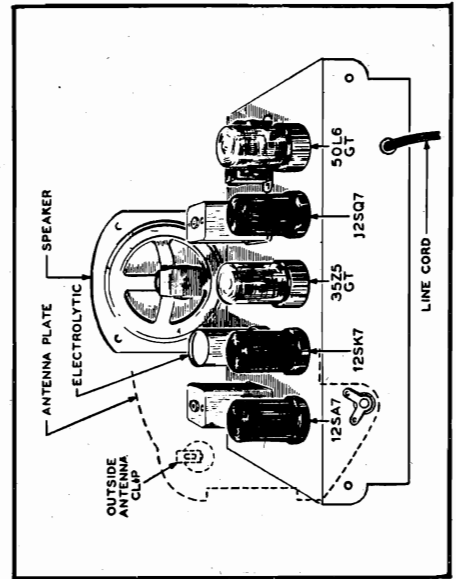
5 Tube Superheterodyne, including rectifier tube
 Power Consumption.....28 w.
 0.80 w. undistorted, 1.5 w. maximum
 Power Output.....
 Selectivity.....71 kc. broad at 1,000 times signal at 1,000 kc.
 Antenna.....Self-contained plate antenna.
 Also provision for connection of external antenna.
 Intermediate Frequency.....455 kc.
 Speaker.....4 inch P.M., voice coil impedance, 32 ohms
 Tuning.....Two permeability-tuned circuits
 Sensitivity.....40 mv. avg. for 50 mw. output
 Frequency Range.....540 to 1,720 kc.
 Power Supply.....105 to 125 v., A.C.-D.C., 50-60 cycle

DRIVE CORD REPLACEMENT



1. Turn tuning shaft counter-clockwise.
2. Re-string as shown.
3. Adjust pointer so that the band is covered properly when turning the tuning shaft back and forth.

CHASSIS VIEW



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning.

An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output indicating Meter—Non Metallic Screwdriver.

Dummy Antennas—I.R.E.

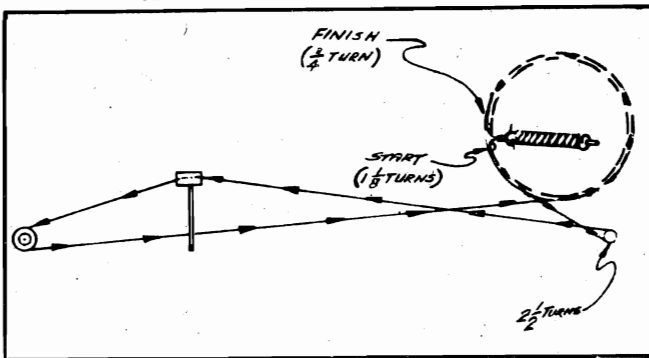
	SIGNAL GENERATOR		DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS
	FREQUENCY SETTING	CONNECTION AT RADIO			
I.F. (See Note A)	455 kc	Apply signal to the converter grid 12SA7 through a .05MFD Condenser	I.R.E. Dummy Antenna	Turn rotor to full open	2nd I.F. (Pri.) & (Sec.) 1st I.F. (Pri.) & (Sec.) Adjust for maximum output
R.F. Alignment	1720 kc	Antenna Lead	I.R.E. Dummy Antenna	Turn rotor to full open	C17B Antenna Trimmer
	1500 kc	Antenna Lead	I.R.E. Dummy Antenna	Set Pointer to 1500 kc (See Note B)	Tune C17A for maximum output

NOTE A—Connect an output meter across the voice coil.

NOTE B—Set pointer at the 1500KC mark on the dial scale. Attach pointer to drive cord.

DRIVE CORD REPLACEMENT

The drive cord can be replaced by carefully following the drawing showing cord replacement. Care should be taken to follow arrows showing start and finish.



FRONT OF CHASSIS

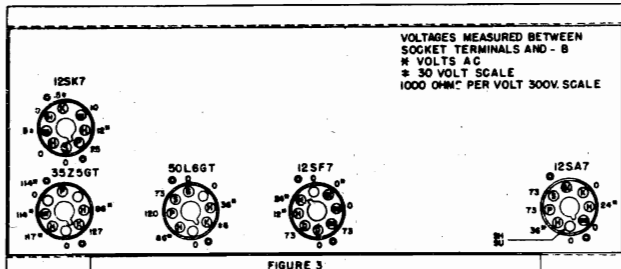


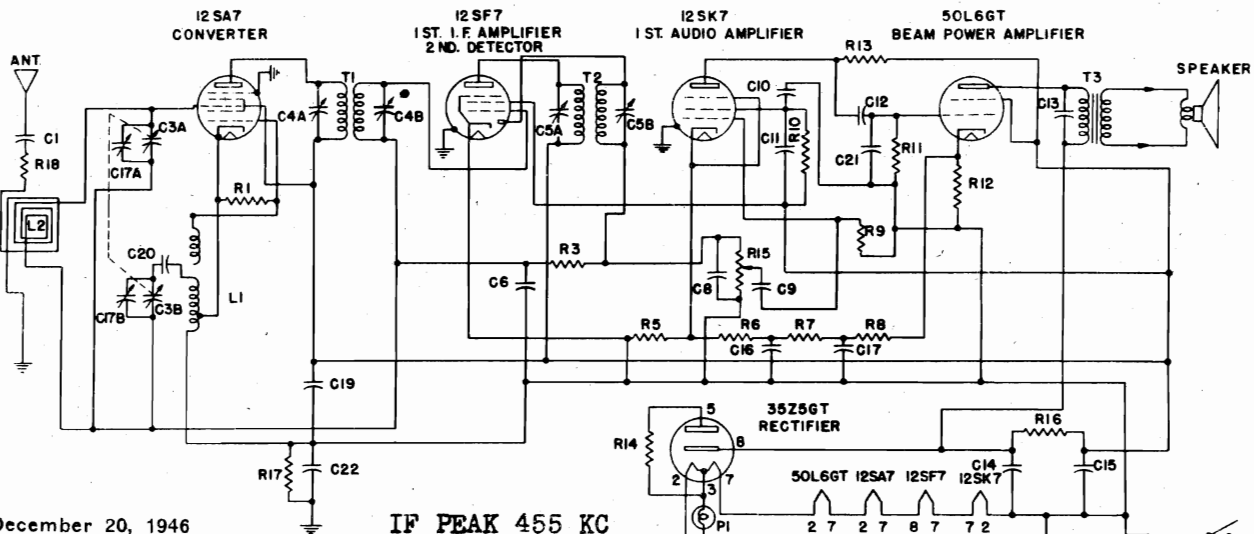
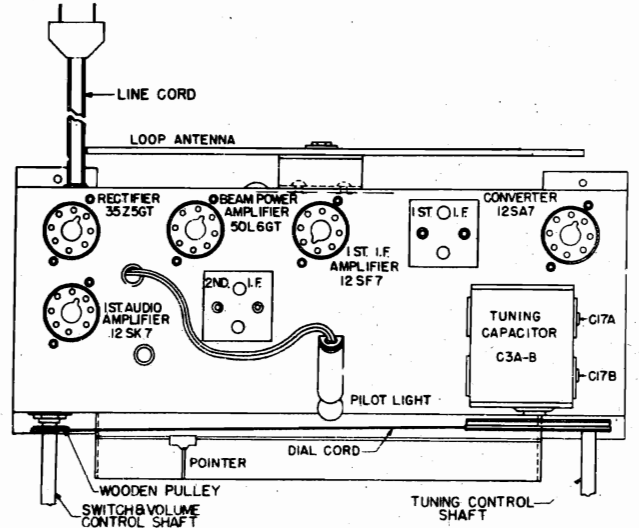
FIGURE 3

BOTTOM VIEW OF CHASSIS

AC LINE VOLTS-117 MAX VOLUME GANG CLOSED NO SIGNAL

SPECIFICATIONS

- 5 Tube Superheterodyne, including rectifier tube
- Power Consumption..... 28 w. (at 117 v. A.C.)
- Power Output..... 1.5 w. maximum 1 w., 10% harmonics
- Selectivity..... 65 kc. broad at 1,000 times signal
- Intermediate Frequency..... 455 kc.
- Speaker..... 5/8 inch P.M. dynamic
- Tuning Frequency Range..... 540 to 1,700 kc.
- Sensitivity..... .85 mv. avg. (for 0.5 w. output with external antenna)



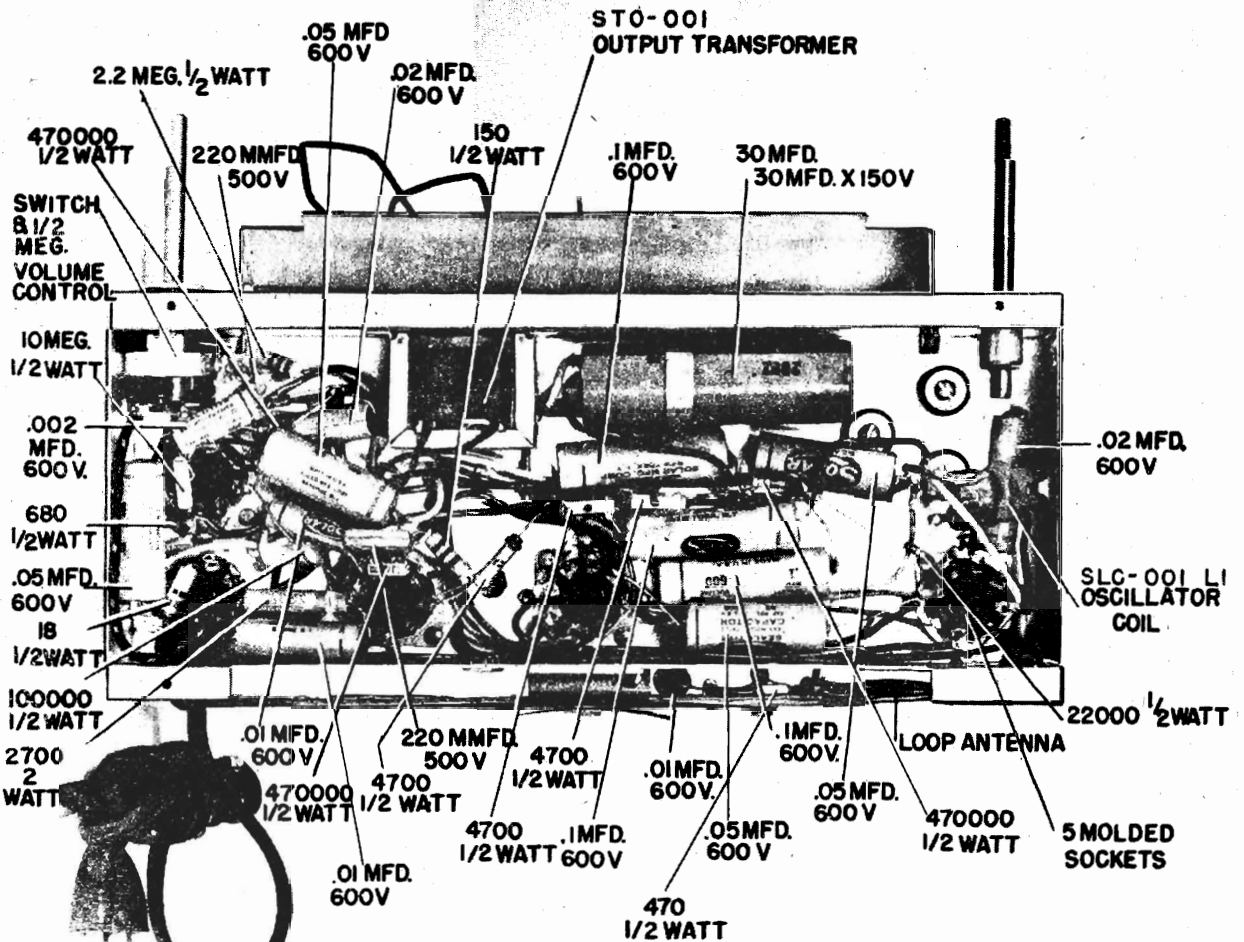
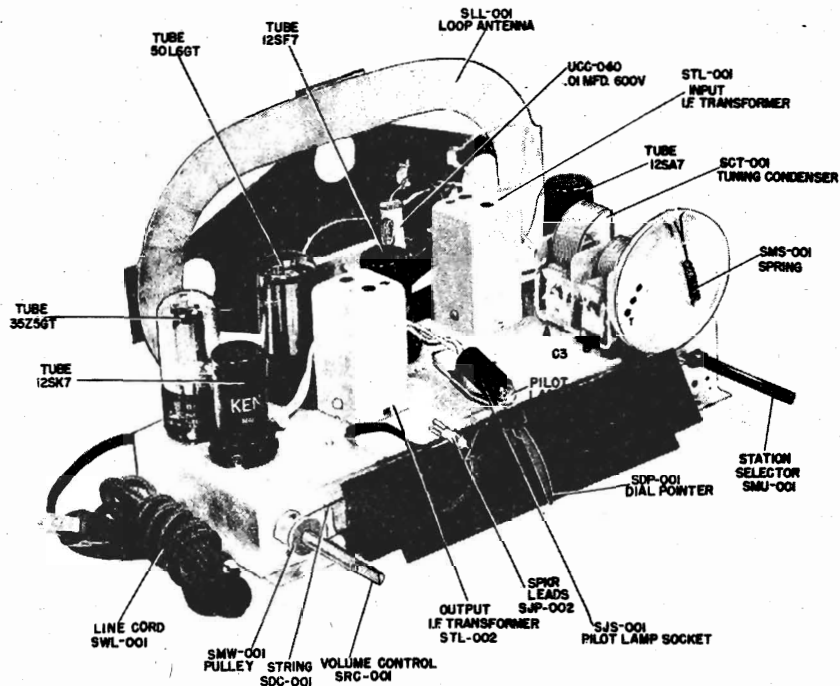
December 20, 1946

IF PEAK 455 KC

28 WATTS

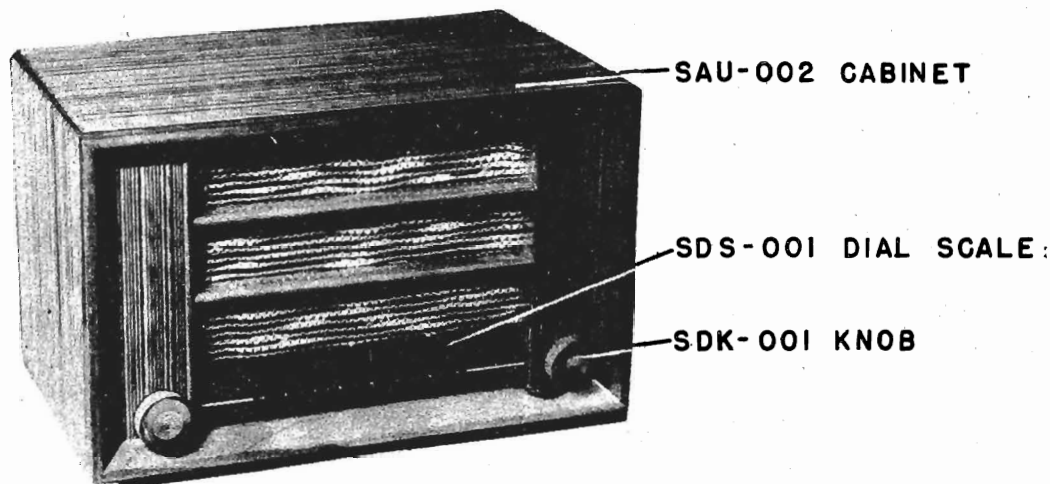
GAMBLE-SKOGMO INC.

MODEL 43-8437



MODEL 43-8437

GAMBLE-SKOGMO INC.

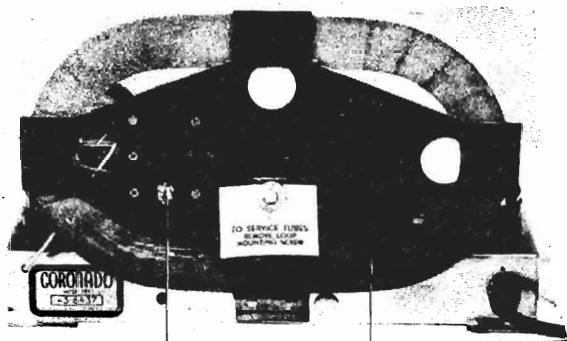
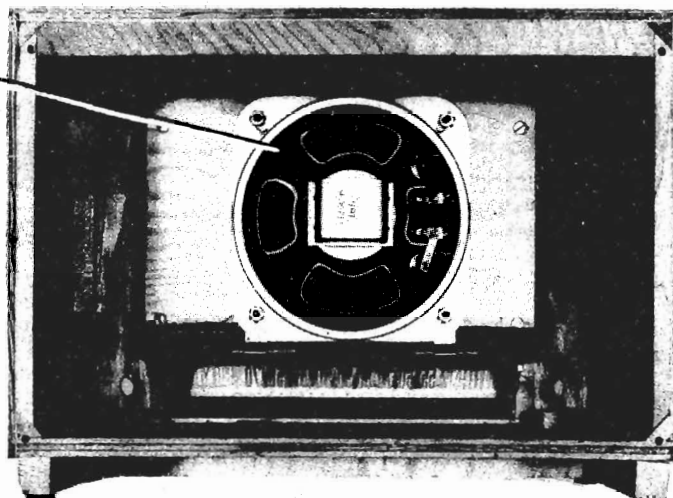


SAU-002 CABINET

SDS-001 DIAL SCALE:

SDK-001 KNOB

UOP-526 SPEAKER

EXTERNAL
ANTENNALOOP
ANTENNA**PRECAUTION**

If the signal generator is A-C operated, use an isolating transformer between the power supply and radio receiver power input. The use of an isolating capacitor is not recommended, as A-C through the capacitor will introduce hum modulation and/or create the possibility of a burned-out signal generator attenuator.

REMOVAL OF CHASSIS FROM CABINET

In order to remove the chassis from the cabinet, pull off the two control knobs, remove the four push pins holding the cabinet-back in place, and take out the four chassis mounting bolts from the bottom of the cabinet. When the chassis has been loosened, disconnect the two clips which connect the chassis to the speaker. The chassis can now be removed from the cabinet.

SCHEMATIC DIAGRAM LEGEND**RESISTORS**

R 1	220,000 ohm carbon, ½ watt
R 3	2.2 megohm carbon resistor, ½ watt
R 5	680 ohm carbon resistor, ½ watt
R 6	4,700 ohm carbon resistor, ½ watt
R 7	4,700 ohm carbon resistor, ½ watt
R 8	4,700 ohm carbon resistor, ½ watt
R 9	10 megohm carbon resistor, ½ watt
R10	470,000 ohm carbon resistor, ½ watt
R11	470,000 ohm carbon resistor, ½ watt
R12	150 ohm carbon resistor, ½ watt
R13	100,000 ohm carbon resistor, ½ watt
R14	18 ohm carbon resistor, 1 watt
R15	500,000 ohm carbon resistor, ½ watt
R16	2,700 ohm carbon resistor, 2 watt
R17	470,000 ohm carbon resistor, ½ watt
R18	470 ohm carbon resistor, ½ watt

CONDENSERS

C 1	.01 mfd. paper capacitor
C 2	47 mmfd. mica capacitor
C 3A	Antenna section
C 3B	Oscillator section
C 6	.05 mfd. paper capacitor
C 8	22 mmfd. mica capacitor
C 9	.002 mfd. paper capacitor
C10	.05 mfd. paper capacitor
C11	.02 mfd. paper capacitor
C12	.01 mfd. paper capacitor
C13	.01 mfd. paper capacitor
C14	30 mfd. 150 v. electrolytic capacitor
C15	30 mfd. 150 v. electrolytic capacitor
C16	.1 mfd. paper capacitor

C17A	Antenna trimmer
C17B	Oscillator trimmer
C18	.05 mfd. paper capacitor
C19	.05 mfd. paper capacitor
C20	.02 mfd. paper capacitor
C21	22 mmfd. mica capacitor
C22	.1 mfd. paper capacitor

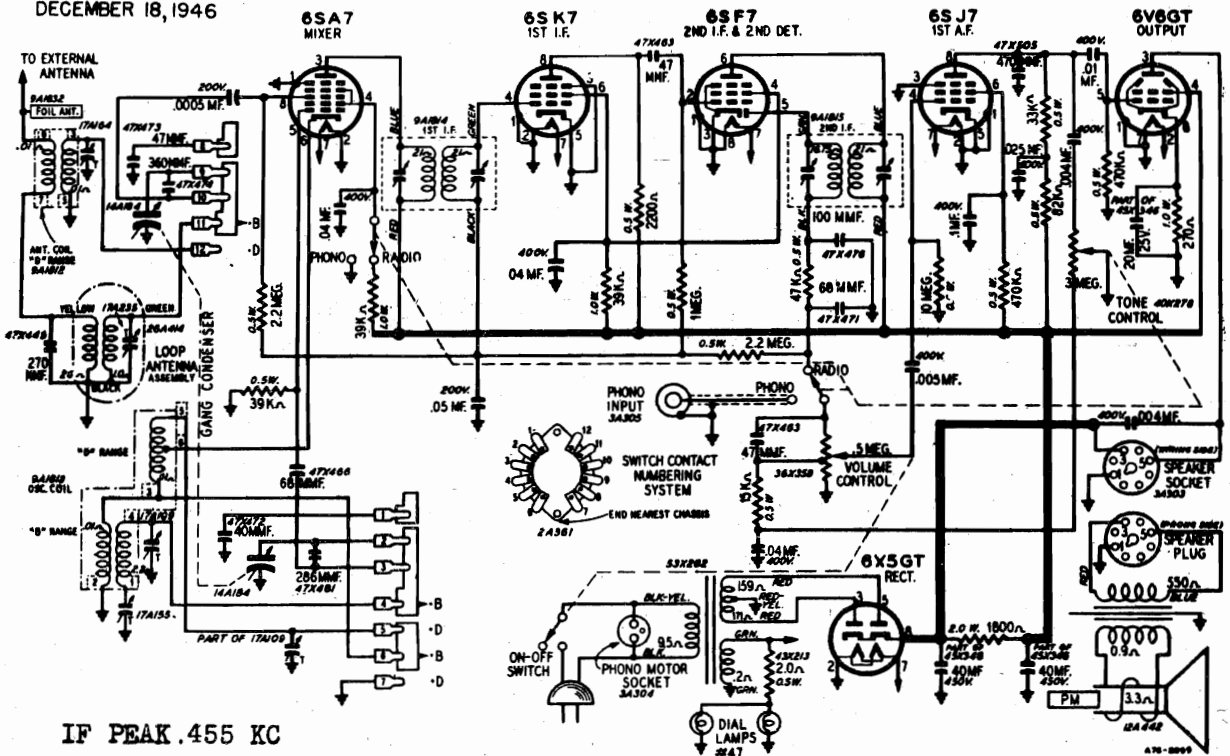
MISCELLANEOUS

L1	Oscillator coil
L2	Antenna loop
T1	1st I.F. transformer
T2	2nd I.F. transformer
T3	Output transformer
P1	Pilot light—Mazda No. 51

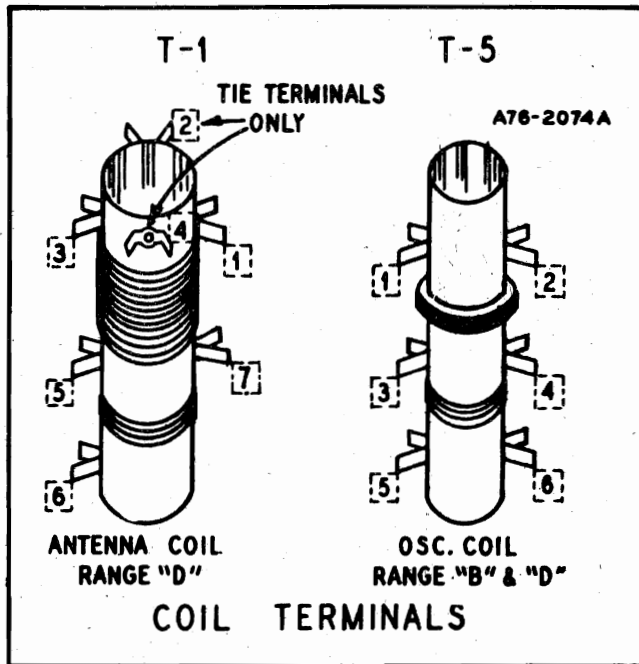
GAMBLE-SKOGMO INC.

MODEL 43-8576

DECEMBER 18, 1946



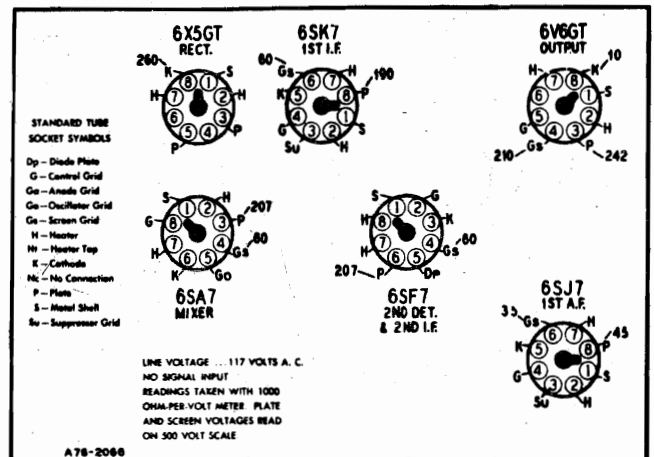
IF PEAK .455 KC



CIRCUIT DESCRIPTION

The circuit and tube complement of the receiver are as follows: 1-6SA7 1st Detector and Oscillator, 1-6SK7 1st I-F Amplifier, 1-6SF7 2nd I-F Amplifier and 2nd Detector, 1-6SJ7 1st Audio Amplifier, 1-6V6GT Power Output, 1-6X5GT Rectifier. Two No. 47 dial lamps are used for dial illumination.

A jack is provided at the rear of the chassis for record player or other special service connections. This jack is switched in or out of the audio circuit with a switch controlled by the tone control knob that also shorts out the r-f signal when it is turned to the phono position.



SPECIFICATIONS

- 6 Tube Superheterodyne, Including Rectifier Tube
- Speaker.....6" PM Dynamic
- Intermediate Frequency.....455 Kc.
- Selectivity.....40 Kc. Broad at 1,000 Times Signal
- Sensitivity (For 0.5 Watt Output, with External Antenna)
 - B Range.....9 Microvolts Av.
 - D Range.....20 Microvolts Av.
- Power Consumption (at 117 Volts AC).....40 Watts (normal)
- Power Output.....
 - 4 Watts, Maximum 2.3 Watts, 10% Harmonics
- Tuning Frequency Range
 - B Range.....540-1600 Kilocycles
 - D Range.....9-15.5 Megacycles

MODEL 43-8576

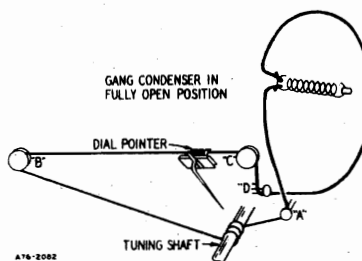
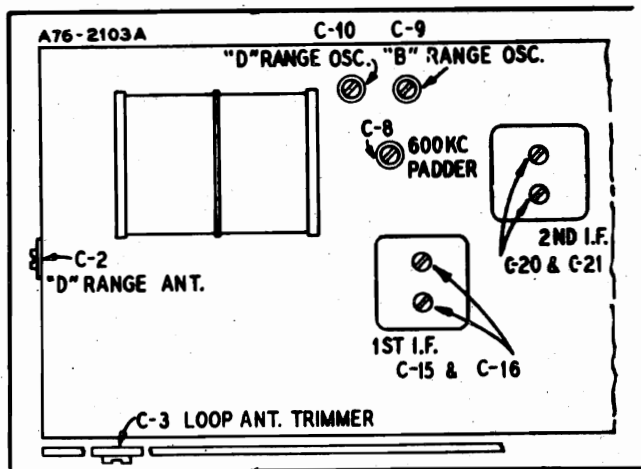
GAMBLE-SKOGMO INC.

REMOVAL OF CHASSIS FROM CABINET

After the cabinet back has been taken off, it is necessary to disconnect the white lead from the foil antenna mounted in the top of the cabinet and to loosen the screw and remove the black lead fastened to the lower left rear corner of the chassis. The chassis may then be pulled from the cabinet.

DRIVE CORD REPLACEMENT

When installing a new drive cord, turn the large drive pulley until the gang condenser plates are fully unmeshed. Hook one end of the new drive cord to the tension spring and hook the tension spring to the tab on the large drive pulley. Pass the cord through the slot in the drive pulley rim and continue one-fourth turn counterclockwise around the drive pulley. Then pass the cord around idler stud A (see illustration) and wind three turns clockwise around the tuning shaft with the turns progressing away from the chassis. Pass the cord over pulleys B and C and around idler stud D. Wrap the cord one-half turn counterclockwise around the large drive pulley and hook the end of the drive cord to the tension spring. It may be necessary to unhook the tension spring from the drive pulley in order to attach the cord, after which it should be again hooked to the drive pulley and the tuning shaft turned a few turns in order to take up the slack in the drive cord.



ALIGNMENT PROCEDURE

Volume Control—Maximum. All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All-Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output indicating Meter—Non-Metallic Screw-driver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

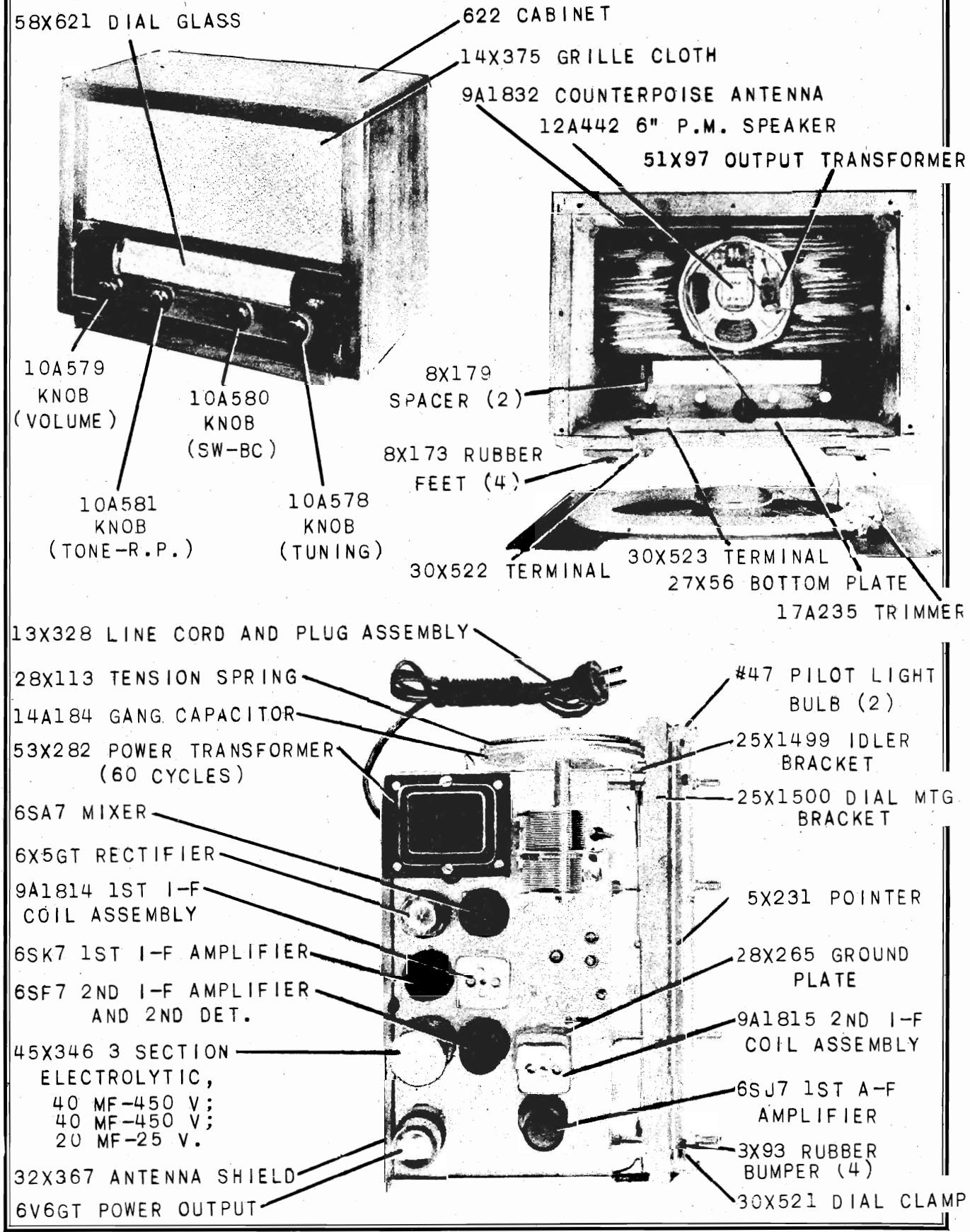
	SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I.F.	455 Kc.	Grid of 6SA7 Pin 8	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C20) & (C21) 1st I.F. (C15) & (C16)
RANGE B	1,620 Kc.	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1,400 Kc.	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output Set Pointer to 1,400 Kc. (See Note A)	Ant. Range B (C3)
	600 Kc.	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Oscillator (C8) Rock Rotor See Note B
Repeat above steps at 1,620 and 600 Kc. until readjusting the oscillator Range B Trimmer (C9) causes no further improvement of output.						
RANGE D	15,600 Kc. 14,000 Kc.	Antenna Lead Antenna Lead	400 ohm 400 ohm	D Range D Range	Turn Rotor to Full Open Tune Rotor to Max. Output	Oscillator Range D (C10) Ant. Range D (C2)
LOOP RANGE B	1,400 Kc.	Reassemble chassis in cabinet. Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Rock Rotor—See Note B Ant. Range B (C3)

NOTE A—Set pointer at the 1,400 Kc. mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn Rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

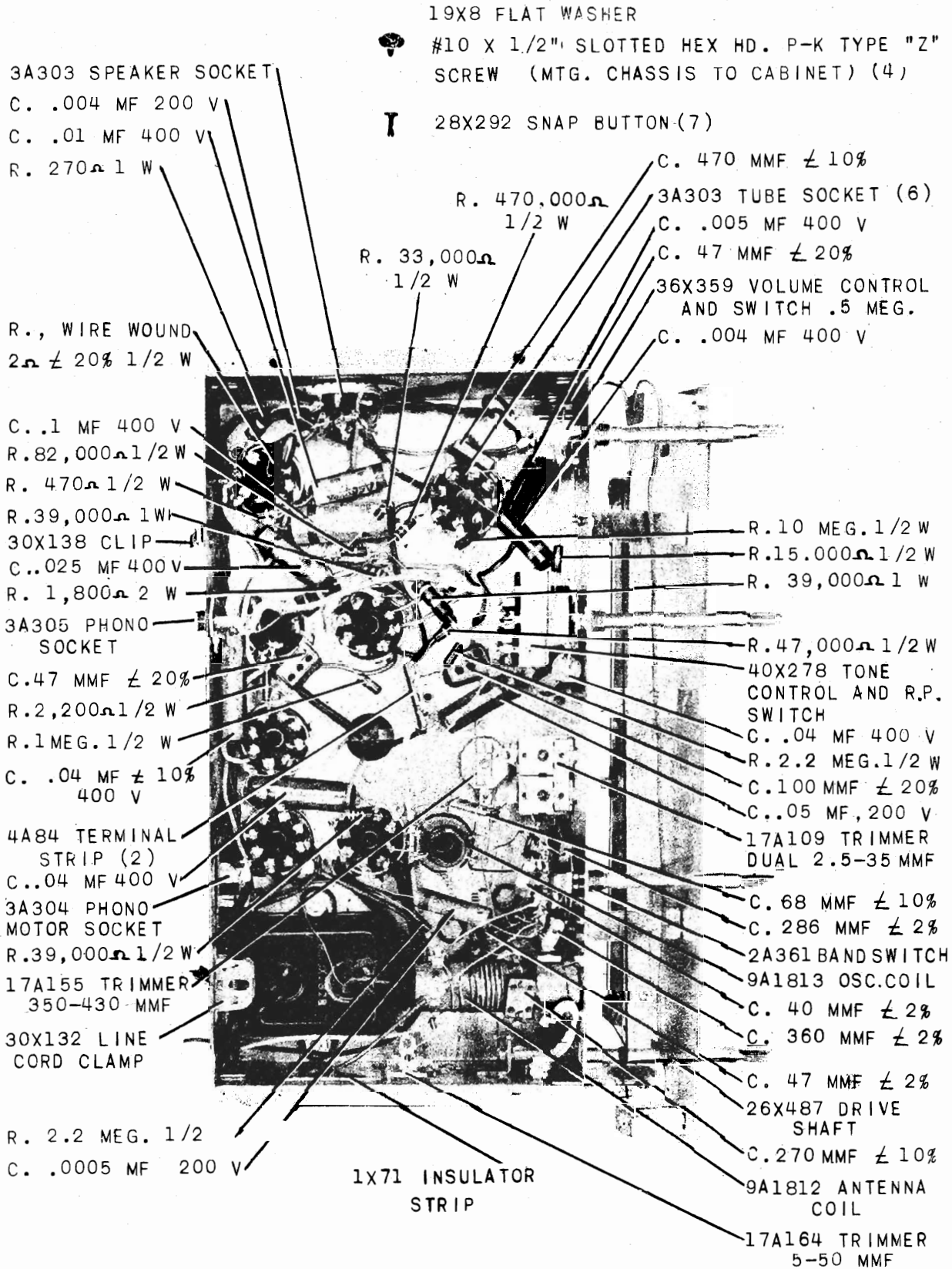
GAMBLE-SKOGMO INC.

MODEL 43-8576



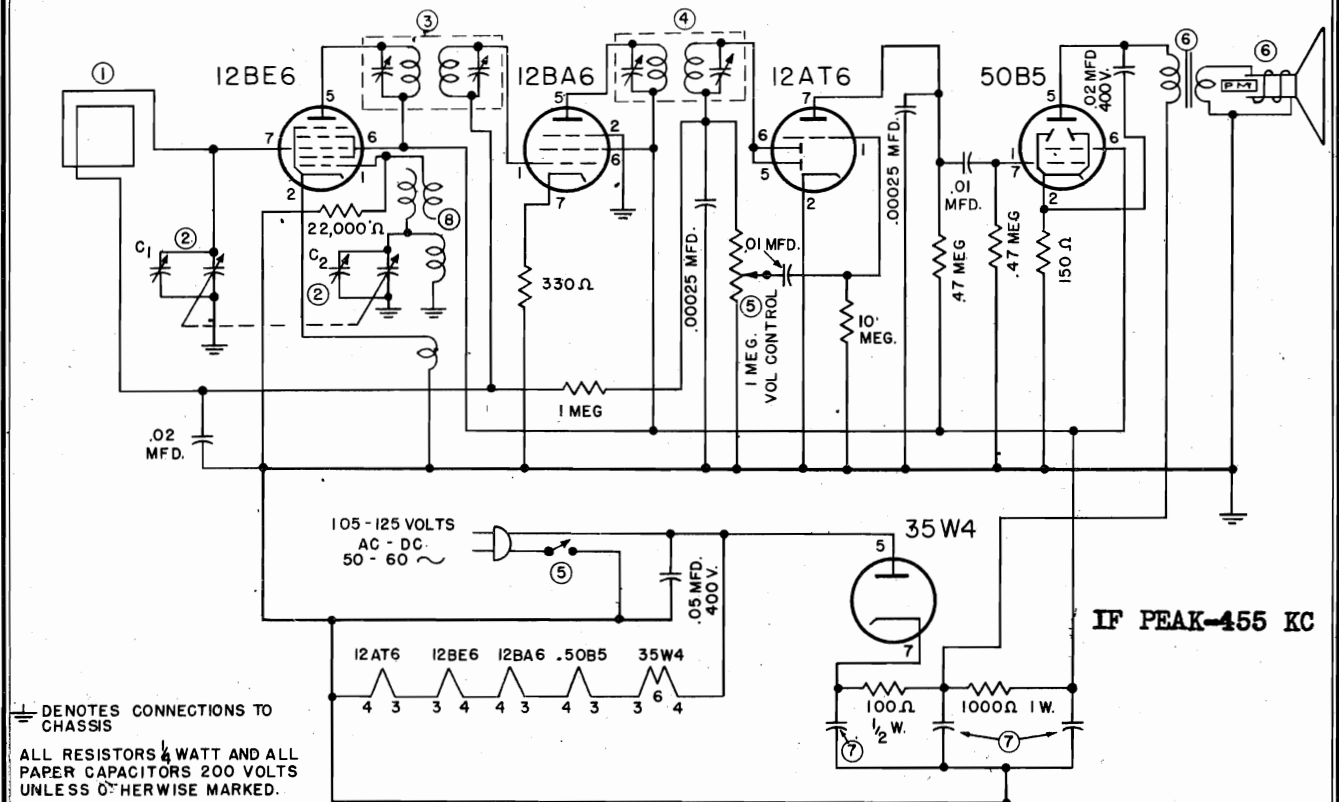
MODEL 43-8576

GAMBLE-SKOGMO INC.



GAROD ELECTRONICS CORP.

The Ensign
MODEL 5A1



⊥ DENOTES CONNECTIONS TO CHASSIS
ALL RESISTORS 1/2 WATT AND ALL PAPER CAPACITORS 200 VOLTS UNLESS OTHERWISE MARKED.

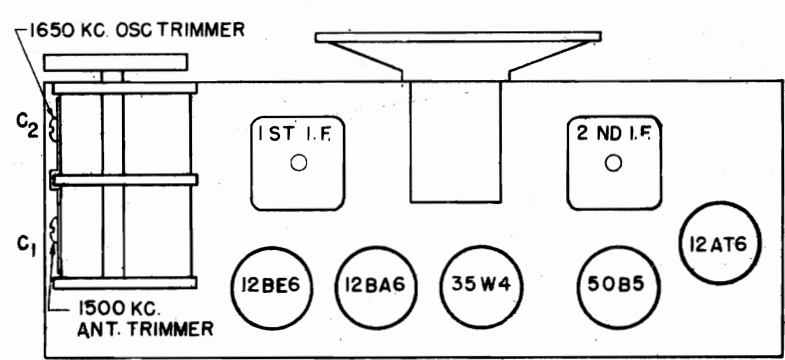
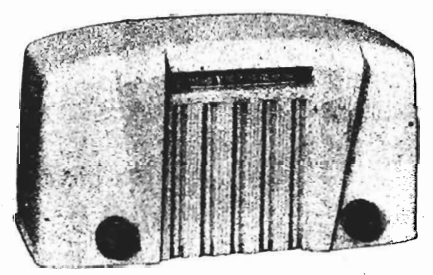
- ① 1.443 LOOP ASSEMBLY
- ② 2.200. 2 GANG VARIABLE COND.
- ③ 1.259 1ST I.F. TRANSFORMER
- ④ 1.259 2ND I.F. TRANSFORMER
- ⑤ 8.200-9 OR 8.200-4 VOLUME CONTROL & SWITCH
- ⑥ 30.303 P.M. 4" SPEAKER & OUTPUT TRANS.
- ⑦ 5.415-2 ELECTROLYTIC CAP. 20-20-20MFD.
- ⑧ 1.444-1 OSCILLATOR COIL

2-47

LINE VOLTAGE: This receiver is designed for operation on 105-125 Volts, 50-60 Cycles, either Alternating or Direct Current (AC-DC).

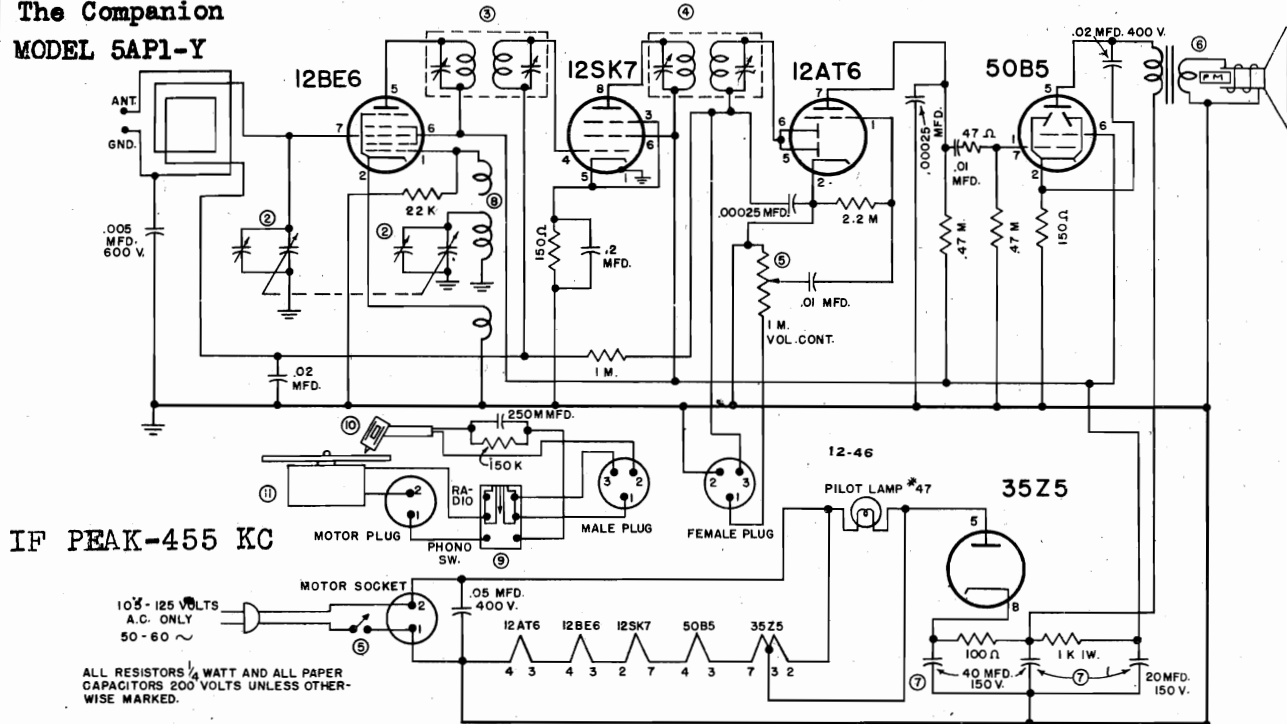
POWER CONSUMPTION: 30 Watts.

TUNING RANGE: Broadcast: 540 to 1650 Kilocycles (180 to 555 meters).



The Ensign
MODEL 5A1
 The Companion
MODEL 5AP1-Y

GAROD ELECTRONICS CORP.



IF PEAK-455 KC

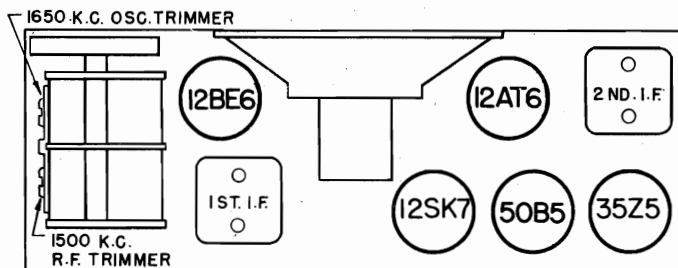
ALIGNMENT - MODELS 5A1 and 5AP1-Y

Should it become necessary at any time to check the alignment of this receiver, proceed as follows:

MODEL 5AP1-Y

- ① 1.410 LOOP ASSEMBLY
- ② 2.200 2 GANG VARIABLE CONDENSER
- ③ 1.259 1ST. I.F. TRANSFORMER
- ④ 1.259 2ND. I.F. TRANSFORMER
- ⑤ 8.201-2 VOL. CONTROL & SWITCH
- ⑥ 30.301 P.M. 4" SPEAKER & OUTPUT TRANS.
- ⑦ 5.400-8 ELECTROLYTIC CAP. 40-40-20MFD
- ⑧ 1.402-2 OSCILLATOR COIL
- ⑨ 11.207 D.P.D.T. SWITCH
- ⑩ 36.104 PHONO PICKUP
- ⑪ 36.108 PHONOMOTOR & TURNTABLE

- (1) Set the Signal Generator to 455 KC and connect to the stator lug on the rear section of the Variable Capacitor. Connect the Signal Generator Ground lead to the chassis. Connect a suitable output meter across the Speaker Voice Coil Connections. Turn the Volume Control to the maximum position. Turn the Variable Capacitor to the extreme clockwise position.
- (2) Adjust the trimmers located at the top of the first and second I. F. Transformers for maximum output as indicated on the Output Meter.
- (3) Loosely couple the Signal Generator lead to the Loop and set to 1650 KC.
- (4) With the Variable Capacitor set at the extreme clockwise position, tune in the 1650 KC signal by means of the Oscillator Trimmer on the Variable Capacitor (front section).
- (5) Set the Signal Generator to 1500 KC and turn the Tuning Control so that this frequency is indicated on the dial. Adjust the Antenna Trimmer on the Variable Capacitor (rear section) for maximum output. No other adjustments are necessary.



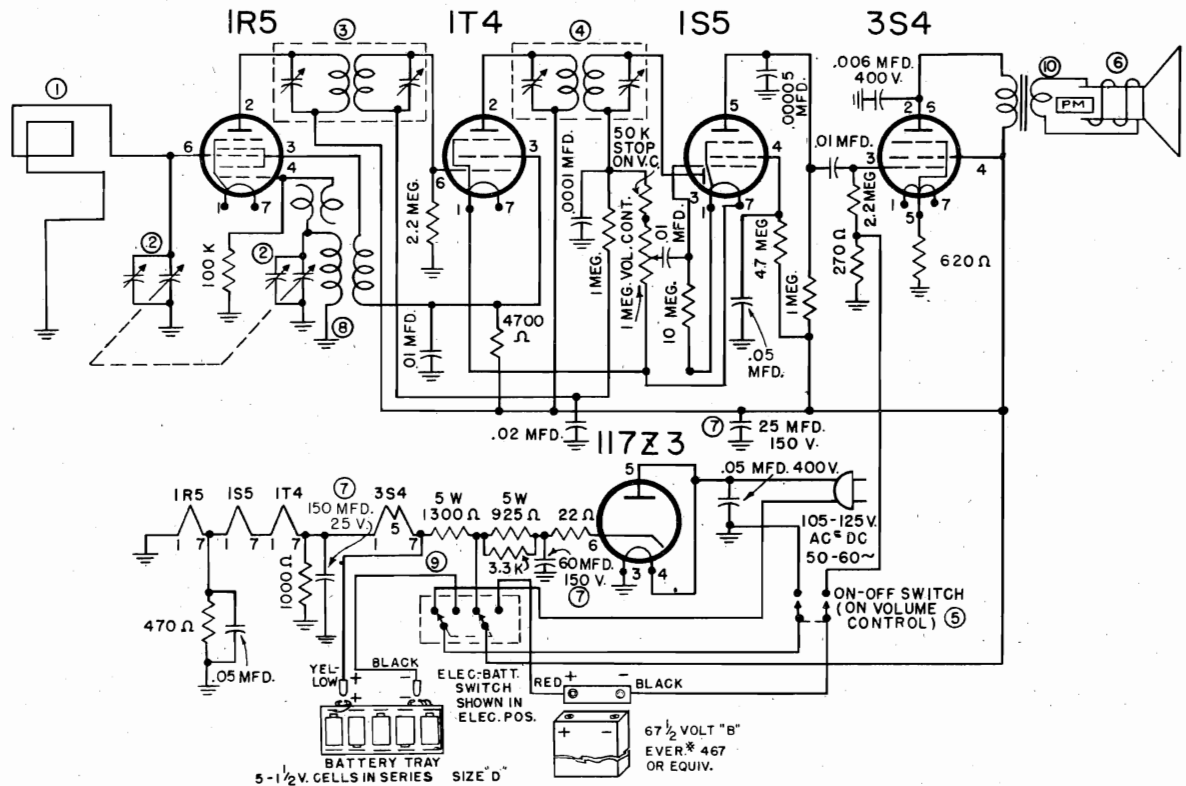
LINE VOLTAGE: 105-125 Volts,
 60 Cycles, Alternating Current (AC) only.

POWER CONSUMPTION: 45 Watts.

TUNING RANGE: Broadcast: 540 to 1650
 Kilocycles (180 to 555 meters).

GAROD ELECTRONICS CORP.

MODELS 5D-3, 5D-3A



ALL RESISTORS 1/4 WATT AND ALL PAPER CAPACITORS 200 VOLTS UNLESS OTHERWISE MARKED.

K = KILOHMS
I. F. = 455 K C.

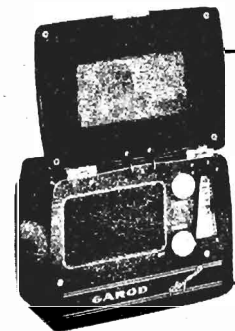
- ① 1.437 LOOP ANTENNA
- ② 2.203 2 GANG VARIABLE CONDENSER
- ③ 1.412 1ST I.F. TRANSFORMER
- ④ 1.413 2ND I.F. TRANSFORMER

- ⑤ 8.200-2 VOLUME CONTROL & SWITCH
- ⑥ 30313 4" P.M. SPEAKER
- ⑦ 5.400-3 ELECTROLYTIC CAP. 60-25-150
- ⑧ 1.414 OSCILLATOR COIL MFD.
- ⑨ 11.207 ELECTRIC-BATTERY SWITCH
- ⑩ 9.205 OUTPUT TRANSFORMER

-3-47

THE FOLLOWING CHANGES IN PARTS ARE MADE FOR MODEL 5D-3

- ① 1.405 LOOP ANTENNA
- ⑥ 30302 3 1/2" P.M. SPEAKER
- ⑨ 11.200 ELECTRIC-BATTERY SWITCH



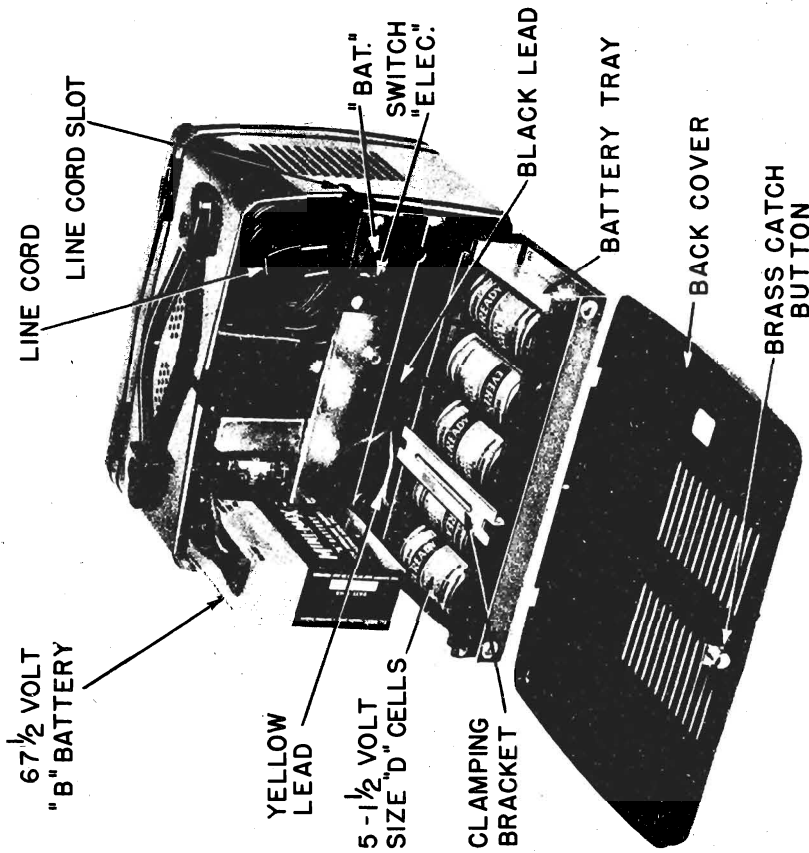
BATTERY OR LINE VOLTAGE: This receiver is designed for operation on 105-125 volts, 50-60 cycles either Alternating or Direct Current (AC-DC) and also from self contained batteries.

POWER CONSUMPTION: 20 Watts on Electric Operation.

BATTERY REQUIREMENTS: The following batteries are required for battery operation:

QUANTITY	TYPE	MANUFACTURER
5	1 1/2 volt "A"	Eveready #950, Burgess #2 or equivalent.
1	67 1/2 volt "B"	Eveready #467, Burgess #XX45 or equivalent.

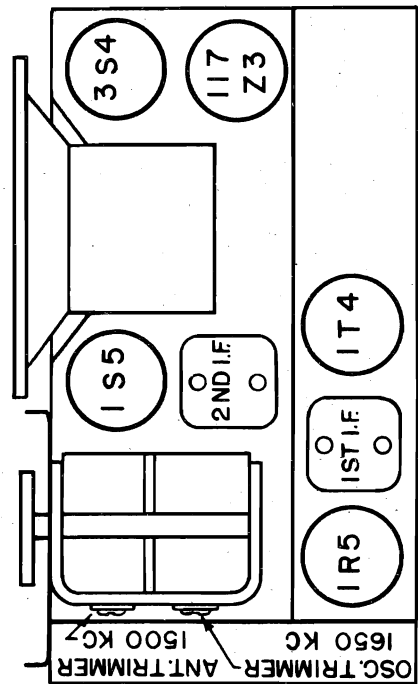
TUNING RANGE: Broadcast 540 to 1650 Kilocycles (180 to 555 meters).



MODEL 5D-3A REAR VIEW
SHOWING BATTERIES REMOVED FROM CABINET

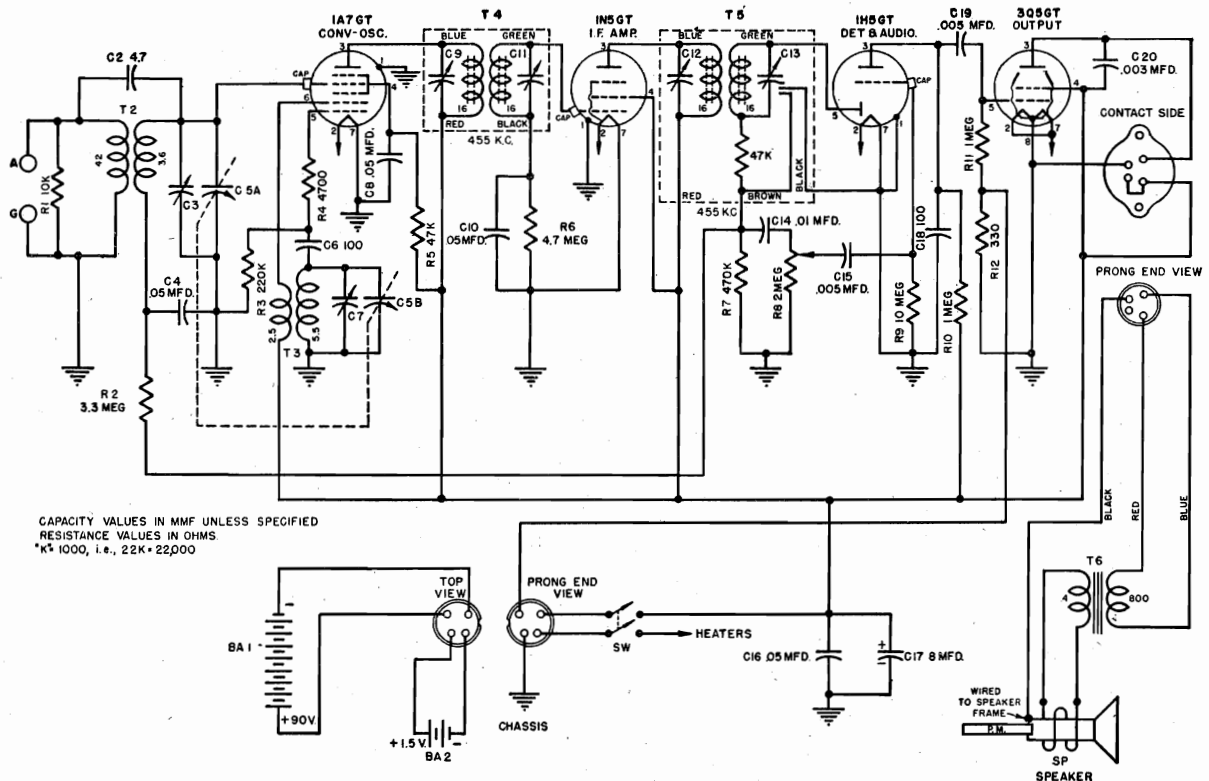
ALIGNMENT: (Electric Operation) Receiver removed from cabinet. Should it become necessary at any time to check the alignment of this receiver, proceed as follows:

- (1) Set the Signal Generator to 455 KC and connect to the stator lug (front section) of variable capacitor. Extend the loop leads and solder to the lug connecting green wire from Ant. Section of variable capacitor and chassis. Connect the Signal Generator ground lead to the chassis. Connect a suitable output meter across the Speaker Voice Coil Connections. Turn the Volume Control to the maximum position. Turn the variable capacitor to the extreme counter clockwise position (minimum capacity).
- (2) Adjust the trimmers located at the top of the first and second I. F. transformers for maximum output as indicated on the output meter.
- (3) Loosely couple the Signal Generator lead to the Loop (open position) and set to 1650 KC.
- (4) With the variable capacitor set at the extreme counter clockwise position (minimum capacity), tune in the 1650 KC signal by means of the oscillator trimmer on the variable capacitor (rear section).
- (5) Set the Signal Generator to 1500 KC and turn the tuning control so that this frequency is indicated on the dial. Adjust the antenna trimmer on the variable capacitor (front section) for maximum output.
- (6) Install the chassis into cabinet and check the dial calibration. If further adjustment is required, remove the two plug buttons on the side of the cabinet adjacent to the variable capacitor and adjust the oscillator trimmer as required. Adjust the antenna trimmer for maximum output and replace plug buttons.



GENERAL ELECTRIC CO.

MODEL 180



PART NO.	SYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION
UNIVERSAL REPLACEMENT PARTS			SPECIALIZED REPLACEMENT PARTS		
UCC-011	C4, 8, 10	CAPACITOR—.05 mfd., 200 v., paper	RAB-5001		BACK—Cabinet back
UCC-028	C16	CAPACITOR—.05 mfd., 400 v., paper	RAV-5001		CABINET—Model 180 cabinet
UCC-037	C20	CAPACITOR—.003 mfd., 600 v., paper	RCE-5001	C17	CAPACITOR—8 mfd., 150 v., electrolytic
UCC-039	C15, 19	CAPACITOR—.005 mfd., 600 v., paper	RCT-5001	C5A, 5B	CAPACITOR—Tuning condenser
UCC-040	C14	CAPACITOR—.01 mfd., 600 v., paper	RCU-5002	C2	CAPACITOR—4.7 mmf., mica
UCU-1028	C6, 18	CAPACITOR—100 mmf., mica	RDC-5001		CORD—Drive cord
UOP-629	SP	SPEAKER—6 1/2 in. permanent magnet	RDE-5001		ESCUTCHEON—Dial escutcheon assembly
UOX-001		CONE—Replacement speaker cone	RDF-5001		WASHER—Felt washer for knobs
URD-037	R12	RESISTOR—330 ohm, 1/2 w., carbon	RDK-5001		KNOB—Volume or tuning knob
URD-065	R4	RESISTOR—4700 ohm, 1/2 w., carbon	RDM-5001		FLAG—Off-On indicator flag
URD-073	R1	RESISTOR—10,000 ohm, 1/2 w., carbon	RDP-5001		POINTER—Plastic dial pointer
URD-089	R5	RESISTOR—47,000 ohm, 1/2 w., carbon	RDW-5001		GLASS—Dial glass
URD-105	R3	RESISTOR—220,000 ohm, 1/2 w., carbon	RDX-5001		BRACKET—Dial bracket and pulley assembly
URD-113	R7	RESISTOR—470,000 ohm, 1/2 w., carbon	RHC-5001		CLIP—Off-On indicator retaining clip
URD-121	R10, 11	RESISTOR—1 meg., 1/2 w., carbon	RJS-5001		SOCKET—Octal tube socket
URD-133	R2	RESISTOR—3.3 meg., 1/2 w., carbon	RJS-5002		SOCKET—Speaker socket
URD-137	R6	RESISTOR—4.7 meg., 1/2 w., carbon	RLA-5001		COIL—Antenna coil
URD-145	R9	RESISTOR—10 meg., 1/2 w., carbon	RLC-5001	T2	COIL—Oscillator coil
			RMB-5001	T3	BEARING—Dial drive shaft supporting bearing
			RMC-5001		CAM—Off-On indicator cam
			RMU-5001		SHAFT—Dial drive shaft
			RRC-5001	R8, S3	VOLUME CONTROL—2 meg. vol. control and switch
			RTL-5001	T5	TRANSFORMER—2nd i-f transformer
			RTL-5002	T4	TRANSFORMER—1st i-f transformer
			RTO-5001	T6	TRANSFORMER—Output transformer
			RWX-5501		CABLE ASSEMBLY—Battery cable
			RYM-5001		CHART—Dial calibration chart



MODEL 180

GENERAL ELECTRIC CO.

POWER SUPPLY AND REQUIREMENTS:

(1.5 volts "A", 90 volts "B" pack)

Burgess	17GD60
Ray-O-Vac	AB-82
Eveready	748 or 758
General	60 DL-11L

OPERATING FREQUENCIES:

Broadcast Band	540-1710 kc
I-F Amplifier	455 kc

POWER OUTPUT:

Undistorted	0.15 watt
Maximum	0.27 watt

LOUDSPEAKER:

Type	Alnico P.M.
Outsider Cone Diameter	6 in.
Voice Coil Impedance (400 cycles)	3.2 ohms

TUBE COMPLEMENT:

Oscillator-Converter	Type 1A7GT
I-F Amplifier	Type 1N5GT
Detector-Audio	Type 1H5GT
Power Output	Type 3Q5GT

ALIGNMENT CHART

Step	Connect Test Oscillator To	Test Oscillator Setting	Pointer Setting On Radio	Adjust For Max. Output
1	1N5GT IF grid in series with .05 mfd.	455 KC	550 KC	1st IF trans. trimmers
2	1A7GT Conv. grid in series with .05 mfd.	455 KC	550 KC	2nd IF trans. trimmers
3	To Ant. Post through 200 mmf. dummy and to Grd. Post.	1500 KC	1500 KC	C7* (osc.) and C3 (R-F)

*Rock gang condenser when making alignment.

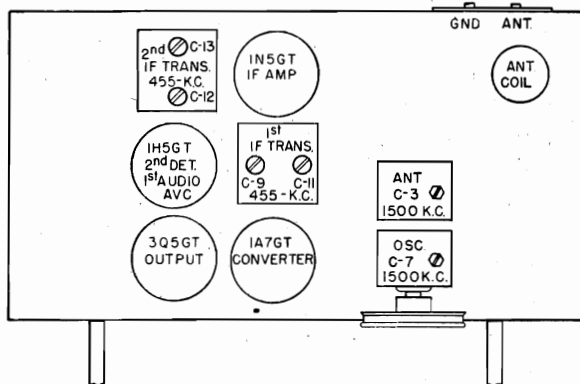
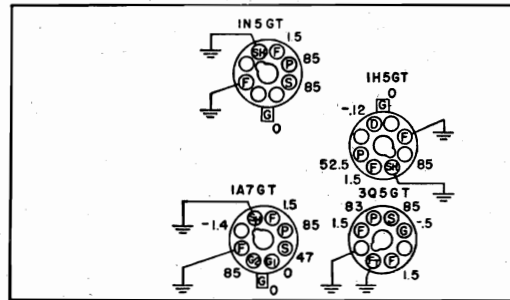


Fig. 1. Tube and Trimmer Location

RSM-1

REAR OF CHASSIS



BOTTOM VIEW OF CHASSIS

MEASUREMENTS TAKEN ON 20,000 OHMS PER VOLT METER. MEASURED FROM PIN TO CHASSIS. 1.5 V "A"-90 V "B" BATTERY PACK. NO SIGNAL INPUT. VOLUME CONTROL AT MAXIMUM.

Fig. 2. Socket Voltage Diagram

STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed may have tolerances of 20%. Readings taken with low signal input so that AVC is not effective.

- (1) R-F Stage Gains.
 - Antenna post to 1A7GT grid 6.6 at 1000 kc
 - 1A7GT grid to 1N5GT grid 46 at 1000 kc
 - 1A7GT grid to 1N5GT grid 60 at 455 kc
 - 1N5GT grid to 1H5GT diode plates 80 at 455 kc
- (2) Audio Gain.
 - .06 volt at 400 cycles across volume control (R8) with control set at maximum will give approximately .05 watts output across speaker voice coil.
- (3) D-C voltage developed across oscillator grid resistor (R2) averages 7 volts at 1000 kc.
- (4) Socket Pin Voltages.

Figure 2 shows voltages from all tube pins to B-. Voltage readings much lower than those specified may help localize defective components or tubes.

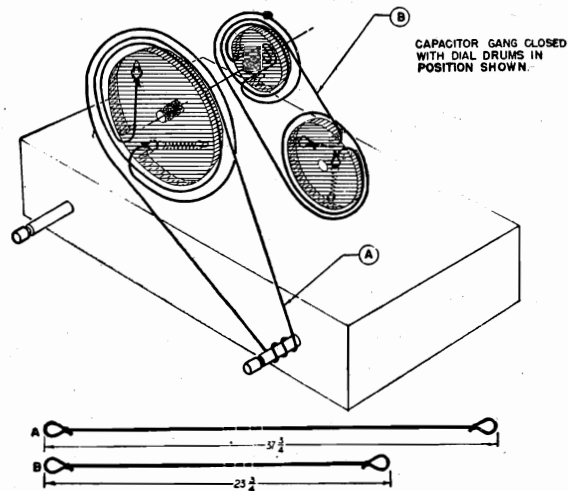
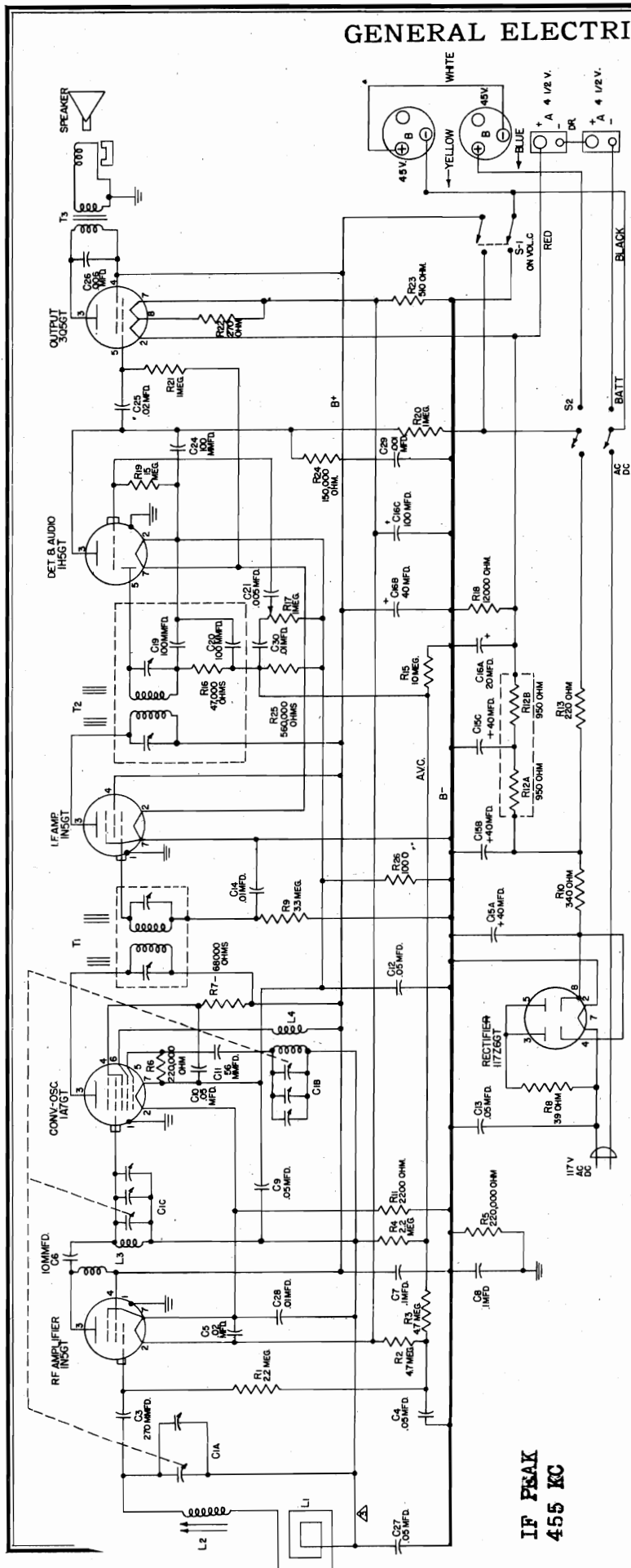


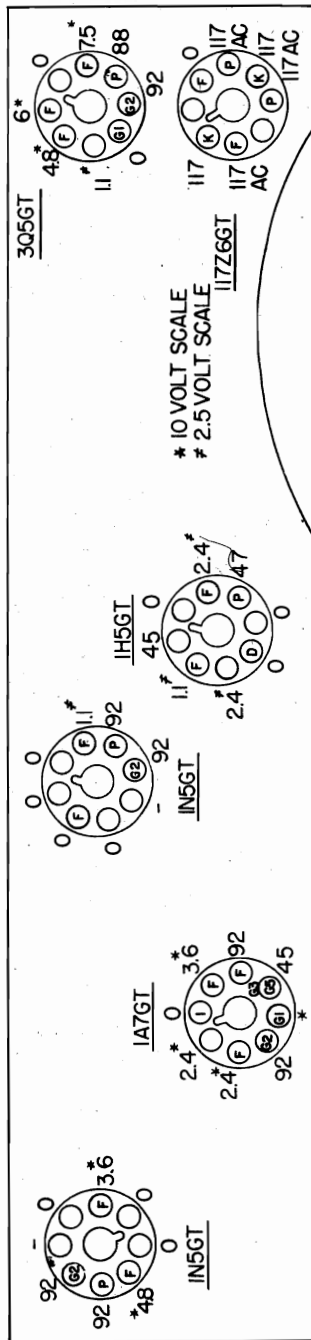
Fig. 3. Dial Stringing

GENERAL ELECTRIC CO.

MODEL 254



CONDITIONS OF TEST
 MEASUREMENTS TAKEN WITH 20,000 OHMS PER VOLT METER
 READINGS TAKEN BETWEEN SOCKET PIN 8 & B-
 A-C LINE VOLTS = 117 V.
 SWITCH S2 IN AC-DC POSITION



BOTTOM VIEW OF CHASSIS

MODEL 254

GENERAL ELECTRIC CO.

POWER SUPPLY:

(AC-DC Operation)
 Voltage.....105-125 volts
 Frequency (on a-c).....50-60 cycles
 Power Consumption.....18 watts
 (Battery Operation)
 2-4½-volt "A" Batteries.. Eveready No. 746 or equivalent
 2-45-volt "B" Batteries... Eveready No. 482 or equivalent

OPERATING FREQUENCIES:

Broadcast Band.....540-1620 kc
 I-F Amplifier.....455 kc

POWER OUTPUT:

Undistorted.....0.15 watts
 Maximum.....0.27 watts

LOUDSPEAKER:

Type.....Alnico PM
 Outside Cone Diameter.....5¼ in.
 Voice Coil Impedance (400 cycles).....3.2 ohms

TUBE COMPLEMENT:

R-F Amplifier.....1N5GT
 Oscillator-Converter.....1A7GT
 I-F Amplifier.....1N5GT
 Detector-Audio.....1H5GT
 Power Output.....3Q5GT
 Rectifier.....117Z6GT

ELECTRICAL CIRCUIT ALIGNMENT

ALIGNMENT FREQUENCIES:

R-F.....1620, 1500 kc and 600 kc
 I-F.....455 kc

EQUIPMENT REQUIRED:

1. Test oscillator with tone modulation
2. A-C output meter
3. .05 mfd. paper capacitor
4. Insulated screwdriver

PROCEDURE—GENERAL. 1. The alignment procedure is given in table form. All i-f and r-f alignments may be made with the chassis removed from the cabinet. The location of the i-f and r-f adjustments is shown in Figure 1.

2. Adjustment of L2 is accomplished by loosening the lock washer and turning the slug with a screwdriver. Retighten the lock washer, being careful not to turn the slug.

3. For accurate frequency calibration, set the test oscillator at 1000 kc, and turn the dial to tune in maximum a 1000-kc signal. Set pointer to read 100 on the dial, making sure the gang condenser does not turn. This adjustment should be made only after all steps on the alignment chart are carried out.

4. The output meter should be connected across the voice coil terminals on the speaker. The low side of the test oscillator output should be connected to the chassis ground; the high side of the oscillator output should be connected as indicated in the alignment chart. During the entire alignment procedure, the volume control should be at its maximum (clockwise) position. The test oscillator should be attenuated so that the output meter reading doesn't exceed ½ volt.

5. For alignment of the oscillator and r-f trimmers, the input signal should be inductively coupled to the radio

loop antenna by connecting a 4-turn, 6-inch diameter loop of bell wire across the signal generator output terminals, and then locate the loop about one foot from the radio loop antenna. To prevent possible errors in peak readings, the position of the loop with respect to the radio loop antenna should not be changed during any one set of adjustments.

ALIGNMENT CHART

Step	Connect Test Oscillator to	Test Oscillator Setting	Pointer Setting on Radio	Adjustment for Maximum Output
1	1N5GT I-F grid in series with .05 mfd	455 kc	550 kc	2nd I-F Trans. (T2) Trimmers
2	1A7GT Conv. grid in series with .05 mfd	455 kc	550 kc	1st I-F Trans. (T1)
3	Repeat Steps 1 and 2			
4	Inductively coupled	1620 kc	Max. freq. cond. open	CIB OSC
5	Inductively coupled	1500 kc	1500 kc	C1A Ant. C1C RF
6	Inductively coupled	600 kc	600 kc	L2 Ant. Loading Coil
7	Inductively coupled	1500 kc	1500 kc	C1A Ant. C1C RF
8	Recheck Steps 5, 6, and 7			

STAGE GAIN AND VOLTAGE CHECKS

Stage gain by vacuum tube voltmeter or similar measuring devices may be used to check circuit performances and isolate trouble. The gain values listed may have tolerances of 20 per cent. Readings should be taken with low signal input so that the AVC is not effective.

(1) **RF STAGE GAINS.**

1N5GT r-f grid to 1A7GT grid.....25 at 1000 kc
 1A7GT grid to 1N5GT i-f grid.....25 at 1000 kc
 1A7GT grid to 1N5GT i-f grid.....30 at 455 kc
 1N5GT i-f grid to 1H5GT diode plate.....65 at 455 kc

(2) **AUDIO GAIN.**

.06 volt at 400 cycles across volume control (R17) with control set at maximum will give approximately .05 watt output across speaker voice coil.

(3) **DC voltage developed across oscillator grid resistor (R6) averages 13 volts at 1000 kc.**

(4) **SOCKET PIN VOLTAGES.**

Figure 3 shows voltages from all tube pins to B-. Voltage readings much lower than those specified may help localize defective components or tubes.

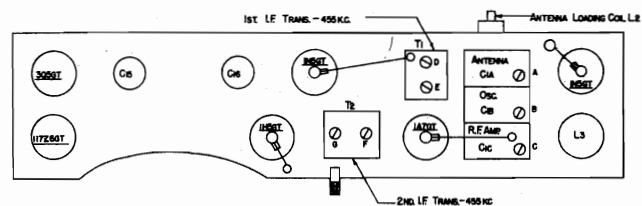


Fig. 1. Tube and Trimmer Location

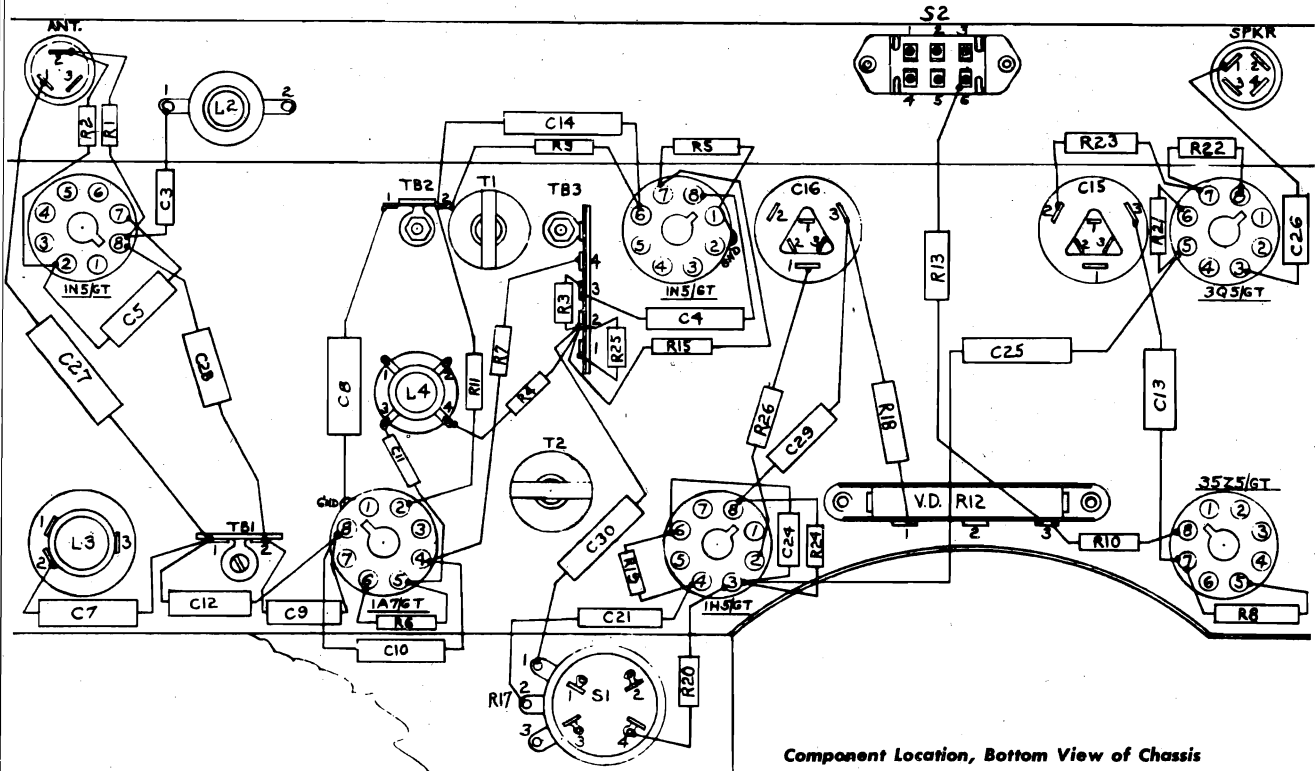
GENERAL ELECTRIC CO.

MODEL 254

REPLACEMENT PARTS LIST—MODEL 254

CAT. NO.	SYMBOL	DESCRIPTION	CAT. NO.	SYMBOL	DESCRIPTION
SPECIALIZED REPLACEMENT PARTS (CONT'D)			UNIVERSAL REPLACEMENT PARTS		
SCE-021	C15A, B, C	CAPACITOR—40 mf., 150 v.; 40 mf., 150 v.;	UCC-018	C29	CAPACITOR—0.001 mfd., 400 v., paper
SCT-010	C1A, B, C	CONDENSER—Tuning condenser, pulley,	UCC-025	C14, 28, 30	CAPACITOR—0.01 mfd., 400 v., paper
		and trimmers	UCC-030	C7, 8	CAPACITOR—0.1 mfd., 400 v., paper
SDC-002		CORD—Dial cord	UCC-039	C21, 26	CAPACITOR—0.005 mfd., 400 v., paper
SDK-036		KNOB—Control knob	UCC-041	C5, 25	CAPACITOR—0.02 mfd., 600 v., paper
SDP-003		POINTER—Dial pointer	UCC-045	C4, 9, 10,	CAPACITOR—0.05 mfd., 600 v., paper
SDS-012		SCALE—Dial scale		12, 13, 27	
SDW-003		WINDOW—Dial scale window	UCU-1004	C6	CAPACITOR—10 mmfd., 500 v., mica
SDX-006		DRIVE—Dial drive assembly	UCU-1022	C11	CAPACITOR—56 mmfd., 500 v., mica
SJJ-009		CONNECTOR—Female speaker connector	UCU-1028	C24	CAPACITOR—100 mmfd., 500 v., mica
SJJ-010		CONNECTOR—Female antenna connector	UCU-1038	C3	CAPACITOR—270 mmfd., 500 v., mica
SJP-007		CONNECTOR—Male 2-contact "A" battery	UOP-546		LOUDSPEAKER—5¼-inch PM speaker
		connector	UOX-008		CONE—Replacement cone
SJP-008		CONNECTOR—Male 3-contact "B" battery	URD-049	R26	RESISTOR—1000 ohms, ½ w., carbon
		connector	URD-057	R11	RESISTOR—2200 ohms, ½ w., carbon
SJP-009		CONNECTOR—Male speaker connector, 4-	URD-093	R7	RESISTOR—68,000 ohms, ½ w., carbon
		contact	URD-101	R24	RESISTOR—150,000 ohms, ½ w., carbon
SJS-031		SOCKET—Octal tube socket	URD-105	R5, 6	RESISTOR—220,000 ohms, ½ w., carbon
SJS-035		SOCKET—Octal tube socket	URD-113	R25	RESISTOR—470,000 ohms, ½ w., carbon
SLA-002	L2	COIL—Antenna loading coil	URD-121	R20, 21	RESISTOR—1 meg., ½ w., carbon
SLB-002	L3	COIL—R-F transformer	URD-129	R1, 4	RESISTOR—2.2 meg., ½ w., carbon
SLC-011	L4	COIL—Oscillator coil	URD-133	R9	RESISTOR—3.3 meg., ½ w., carbon
SLL-003	L1	BEAM-A-SCOPE—Loop antenna assembly	URD-137	R2, 3	RESISTOR—4.7 meg., ½ w., carbon
SMS-012		SPRING—Dial cord spring	URD-145	R15	RESISTOR—10 meg., ½ w., carbon
SMS-013		SPRING—Indicator spring	URD-149	R19	RESISTOR—15 meg., ½ w., carbon
SMX-014		TRIGGER—Trigger bushing assembly	URE-033	R13	RESISTOR—200 ohms, 1 w., carbon
SRC-044	R17, S1	VOLUME CONTROL—1.0 meg., potentiom-	URE-035	R22	RESISTOR—270 ohms, 1 w., carbon
		eter and switch	URE-1042	R23	RESISTOR—510 ohms, 1 w., carbon
SRW-024	R12A, B	RESISTOR—1900 ohms, CT, 5 w., w.w.	URF-075	R18	RESISTOR—12,000 ohms, 2 w., carbon
SRW-025	R8	RESISTOR—39 ohms, 5 w., w.w.			
SRW-026	R10	RESISTOR—340 ohms, 5 w., w.w.			
SSS-009	S2	SWITCH—Battery-line selector slide switch	SAT-001		CABINET—Tan finish cabinet
STL-009	T1	TRANSFORMER—1st I-F transformer	SCE-020	C16A, B, C	CAPACITOR—20 mf., 150 v.; 40 mf., 150 v.;
STL-010	T2	TRANSFORMER—2nd I-F transformer			100 mf., 50 v.; electrolytic
STO-007	T3	TRANSFORMER—Output transformer			
SWL-006		CORD—Power cord			

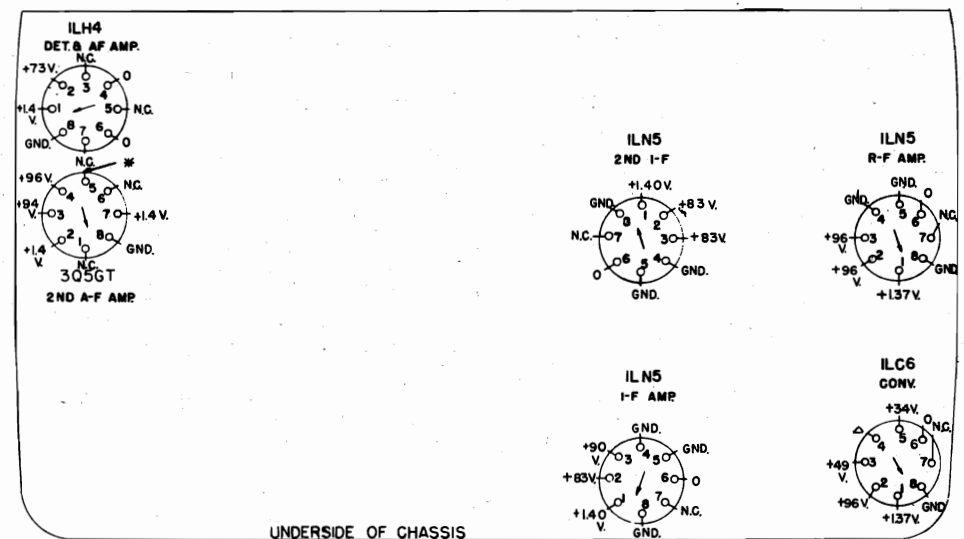
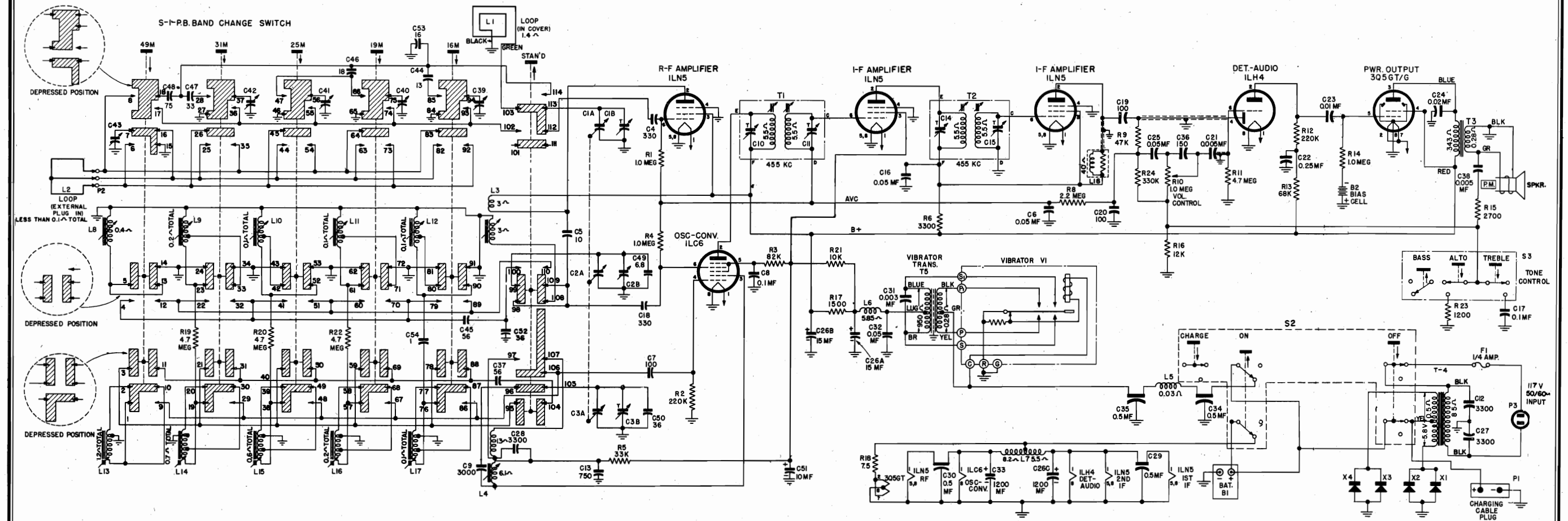
SPECIALIZED REPLACEMENT PARTS



Component Location, Bottom View of Chassis

GENERAL ELECTRIC CO.

MODEL 260

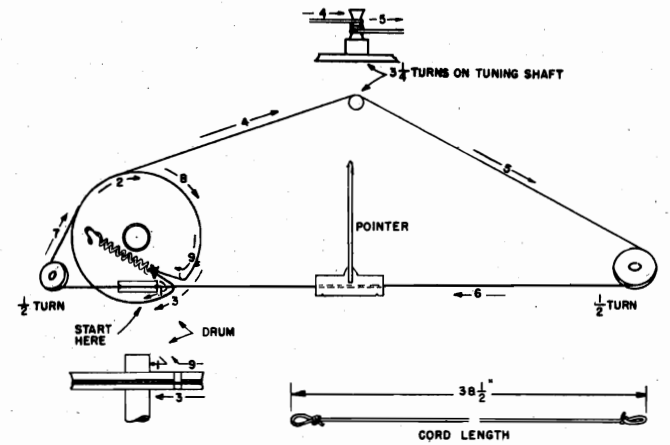


UNDERSIDE OF CHASSIS

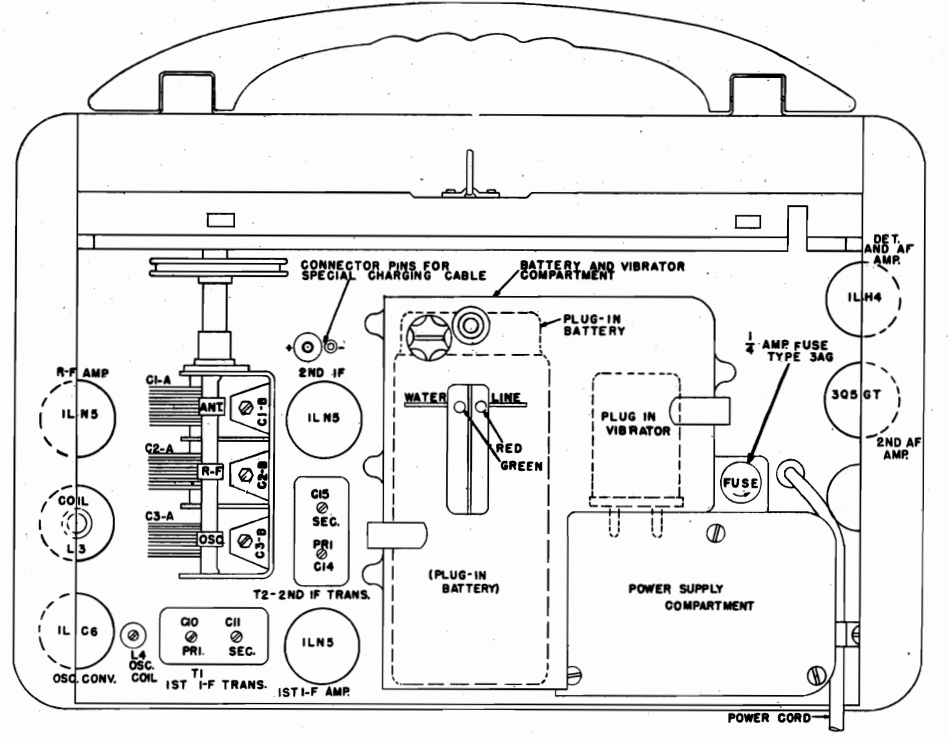
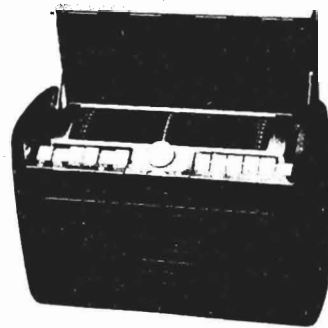
CONDITIONS OF TEST:
 ALL MEASUREMENTS D-C
 MEASUREMENTS MADE TO GROUND
 MEASUREMENTS MADE WITH 20,000 OHM/VOLT METER
 LINE VOLTAGE 117 V- BATTERY FULLY CHARGED
 VOL. CONTROL MAX. CLOCKWISE
 TONE CONTROL TREBLE POSITION
 RECEIVER OPERATING ON BROADCAST BAND

NC - NOT CONNECTED TO TUBE
 * - 4.5V IF MEASURED WITH V.T.M.
 CENTER POST ON ALL LOGCAL TUBES IS GROUNDED
 Δ READING AFFECTED BY INSTRUMENT

Socket Voltage Diagram



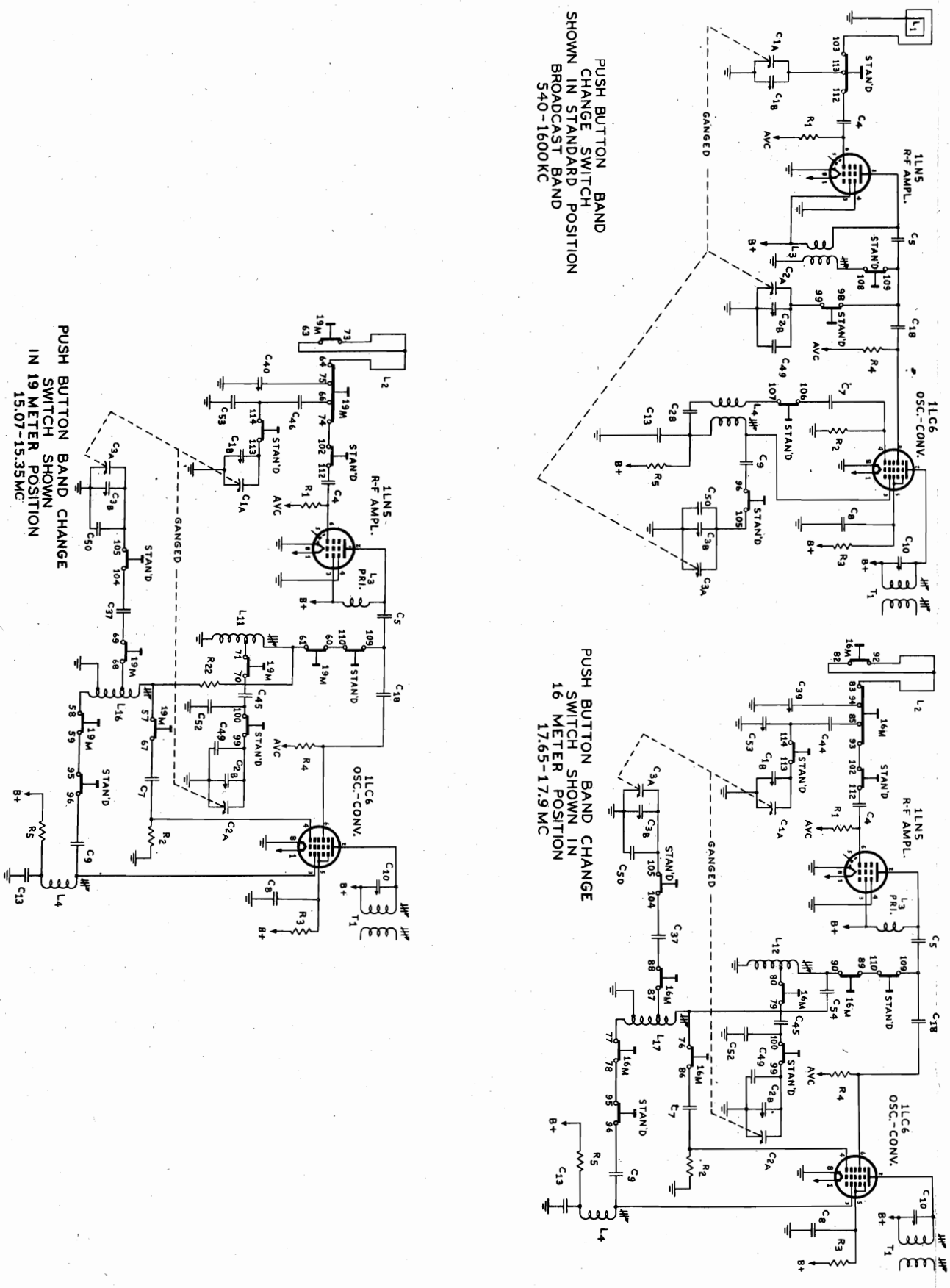
Dial Stringing Diagram



Tube and Trimmer Location

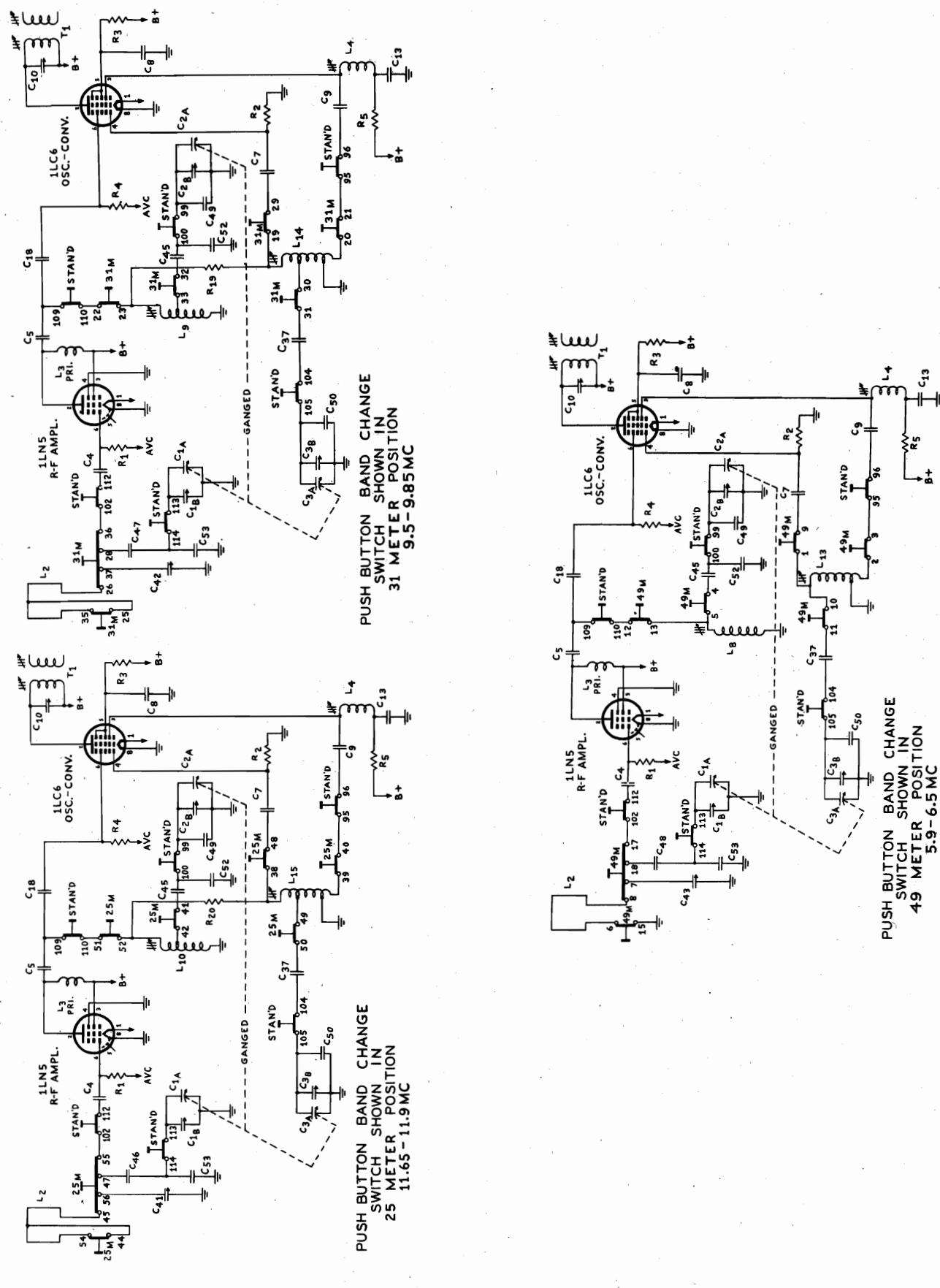
GENERAL ELECTRIC CO.

MODEL 260



GENERAL ELECTRIC CO.

MODEL 260



ELECTRICAL CIRCUIT ALIGNMENT

1. EQUIPMENT REQUIRED.

1. Signal Generator with Audio Tone Modulation.
2. A-c output meter, 1 or 1½ volts full scale, 1000 ohms/volt.
3. Insulated screwdriver.

2. ALIGNMENT PROCEDURE.

1. General.—The alignment procedure is given in table form for convenience. Reference is made to Figures 3, 5, and 6 for the trimmer locations. The low side of the signal generator should be connected to the chassis of the receiver for i-f alignment; the high side should be connected as indicated in the Alignment Chart. A meter or some other suitable indicating device must be connected to the output of the receiver. Two methods for connecting an output meter are given in later paragraphs.

When aligning the receiver, the Volume Control on the receiver should be turned to its maximum position and the TREBLE push button should be depressed. The output signal of the signal generator should be kept as low as possible at all times; the reading of a meter connected across the voice coil leads of the receiver should be kept below ½ volt by changing the signal generator output. If the signal level is too high, the AVC becomes effective and alignment errors may result.

The following paragraphs give greater details regarding the connection of the output meter and the signal generator to the receiver during alignment.

2. Connecting the Output Meter.—In aligning the receiver, some means for indicating differences in the output voltage will be required. Either of the following methods is satisfactory. The first requires more disassembly of the receiver case than the second, but the second requires additional test equipment.

Method 1.—A satisfactory method for indicating differences in output is to connect a rectifier-type a-c meter of 1 or 1½ volts full scale deflection across the speaker voice coil terminals. To gain access to the speaker, remove the front panel from the radio as previously described. Connect a lead to the green lead that connects to the ungrounded side of the speaker voice coil. Thread this lead through into the rear compartment. The front panel is reinstalled in place so that the stray capacities in the set will be the same as when the set is operating normally. Connect the meter between this lead and ground. A convenient ground connection may be obtained by removing the push-button band change switch escutcheon, and connecting a clip lead to the exposed chassis.

STAGE GAINS AND VOLTAGE CHECKS

Stage gain measurements may be made with a vacuum tube voltmeter to check circuit performance and to locate stages which are not operating properly. The gain values listed may have a tolerance of 20%.

1. R-F and I-F Stage Gains.

- R-F amplifier grid (6) to converter grid (6)..... 8.0 at 1000 kc
- R-F amplifier grid (6) to converter grid (6)..... 6.0 at 6100 and 9600 kc
- R-F amplifier grid (6) to converter grid (6)..... 5.0 at 11.8, 15.2 and 17.8 mc
- Converter grid (6) to 1st IF grid (6)..... 26 at 455 kc
- Converter grid (6) to 1st IF grid (6)..... 15 at 1000 kc
- Converter grid (6) to 1st IF grid (6)..... 15 at 6100 kc, 9600 kc, 11.8 mc, 15.2 mc, and 17.8 mc
- 1st IF grid (6) to 2nd IF grid (6)..... 69 at 455 kc
- 2nd IF grid (6) to diode plates..... 3.9 at 455 kc

2. Audio Gain.

The power output across the speaker voice coil should be approximately 50 milliwatts with a 400 cps audio signal of 0.07 volts applied across the volume control, R10 (volume control maximum—TREBLE push button depressed).

3. Oscillator Grid Bias.

The d-c voltage developed across the oscillator grid leak (R2) averages 6.5 volts at 1000 kc.

Method 2.—The following is an alternate method which eliminates the necessity of removing the front panel of the set, but which requires additional test equipment. Make an indicating device by connecting a 4- to 6-inch diameter magnetic speaker or the high-impedance leads from the output transformer of a good p-m dynamic speaker to the terminals of a rectifier-type microammeter with a full scale deflection of 100 microamperes or less. For convenience, the meter and speaker may be mounted in a small box in such a way that the meter will be visible when the speaker is placed in front of the speaker on the receiver being aligned.

To use this device, place its speaker in front of and about an inch away from the speaker of the receiver being aligned. The meter will then deflect in proportion to the intensity of the sound produced by the speaker, and therefore may be used as an output meter. The meter must not be moved during alignment.

3. Connecting the Signal Generator.—For aligning the i-f transformers, the output of the signal generator should be coupled through a 0.05 mf. capacitor to the grid (pin 6) of the 1LC6 oscillator-converter tube. This may be accomplished easily by connecting the capacitor to the stator of C2-A, the middle section of the tuning gang, as this stator is connected to the converter grid through a blocking condenser. The low side of the signal generator output should be connected to the chassis ground to complete the circuit.

For aligning the oscillator, r-f, and loop circuits, the r-f signal should be inductively coupled by means of a three- or four-turn, 6-inch diameter, loop of bell wire across the signal generator output terminals. The loop should be located about one foot from the radio cover, with cover open for broadcast alignment, and about one foot away from the external loop when making the shortwave band alignment. To prevent possible errors in peak-readings, the position of the loop with respect to the receiver should not be changed during any one set of adjustments.

4. Alignment Suggestions.—The dial pointer should fall under the extreme left end mark on the dial scale when the gang condenser is fully closed. If necessary, move the dial pointer along the dial drive cord until such registration is obtained.

To gain access to the shortwave oscillator tuning slugs, L13 through L17, remove the snap cover from the bottom of the receiver. The short-wave antenna and converter trimmers are accessible when the push-button band-change switch escutcheon (right-hand side) is removed. When aligning the trimmers on the gang condenser (for broadcast band alignment), close the cabinet back cover and make the adjustments through the snap button openings in the back cover.

The oscillator operates on the high frequency side of the signal on all bands. With this method of operation, and with the dial set at an alignment point, the image response should be heard when the signal generator is tuned to a frequency 910 kc higher than the alignment frequency.

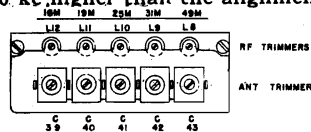
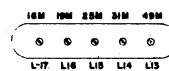


Fig. 5. RF and Antenna Trimmer Location

Fig. 6. Oscillator Trimmer Location



OSC. TRIMMERS

ALIGNMENT CHART

Depress Treble Push Button
Turn Volume Control to Maximum

Step	Sig. Gen. Setting	Connect Signal Generator to	Depress Push Button	Dial Scale Setting	Adjust
1	455 kc	Stator of C-2A in series with .05 mf	Standard	Below 550 kc	2nd i-f (T2) trimmers for max.
2	455 kc	Stator of C-2A in series with .05 mf	Standard	Below 550 kc	1st i-f (T1) trimmers for max.
3	1500 kc	Inductively coupled	Standard	1500 kc	**C-3B, C-2B, and C-1B for max. in sequence given
4	580 kc	Inductively coupled	Standard	580 kc	* L4 and L3 for max.
5	R e p e a t S t e p 3				
6	6.1 mc	Inductively coupled	49 M	6.1 mc	L13 for max.
7	6.1 mc	Inductively coupled	49 M	6.1 mc	* L8 and C43 for max.
8	9.6 mc	Inductively coupled	31 M	9.6 mc	L14 for max.
9	9.6 mc	Inductively coupled	31 M	9.6 mc	* L9 and C42 for max.
10	11.8 mc	Inductively coupled	25 M	11.8 mc	L15 for max.
11	11.8 mc	Inductively coupled	25 M	11.8 mc	* L10 and C41 for max.
12	15.22 mc	Inductively coupled	19 M	15.22 mc	L16 for max.
13	15.22 mc	Inductively coupled	19 M	15.22 mc	* L11 and C40 for max.
14	17.8 mc	Inductively coupled	16 M	17.8 mc	L17 for max.
15	17.8 mc	Inductively coupled	16 M	17.8 mc	* L12 and C39 for max.

* Alternately peak circuits to obtain peak while rocking gang condenser.

** Remove snap buttons on back cover to permit these adjustments and close back cover while aligning.

NOTE.—The oscillator operates on the high frequency side of the signal on all bands.

BATTERY INFORMATION

The receiver uses a 2-volt Willard Radio Battery No. 25-2 or equivalent. It has a 25 ampere-hour capacity and should be cared for in the same manner as any other storage battery.

Charge Indicator

The degree of charge of the battery can be determined by raising the back cover of the radio and referring to the charge ball indicators visible through the hole in the metal battery case.

If the battery is fully charged, two indicator balls will be visible at the surface of the liquid in the battery. When the battery discharges, these ball indicators will sink and disappear in the following order:

1. Green indicator sinks when approximately 20 per cent of battery capacity has been discharged.
2. The red ball sinks when battery is 80 per cent discharged.

On charge, the balls rise or float in the reverse order and the charge may be stopped when both balls appear in the opening.

To Charge Battery

The battery is charged by merely plugging the receiver power cord in the rated a-c power outlet and depressing the CHARGE push button. Frequent check should be made of the charge indicator and when both indicator balls are visible, the battery is adequately charged. Charging the battery after all indicator balls are visible will not harm the battery except that it will evaporate the water faster. A completely discharged battery will be restored usually within 20 to 30 hours.

When operating the receiver from the a-c house current, the battery floats or is being charged at a slow rate. Thus, if you wish to operate the receiver at the same time that you are charging even a fully discharged battery, plug the power cord in the a-c receptacle and depress the ON push button. Prolonged operation in this manner usually will cause the battery potential to stabilize at some voltage determined by the line voltage and the characteristics of the charging circuit components. The degree of charge obtainable with this method of operation likewise is dependent on the line voltage and the characteristics of the charging circuit components.

Battery Operating Instructions

1. Add distilled or tap water in the filler cap at sufficiently frequent intervals to keep liquid level at indicator mark as viewed through opening in battery case. **DO NOT OVER-FILL** as this impairs the nonspill feature.

2. Whenever possible, it is best not to allow the battery to become discharged to the extent that both indicators disappear.

However, if both indicators have sunk, the battery should be recharged immediately or within 24 hours.

3. A battery will continually discharge at a slow rate even when not in use. For this reason, monthly checks should be made of the charge condition, and the battery should be placed on charge when necessary. This will prevent damage to the battery such as freezing during cold weather.

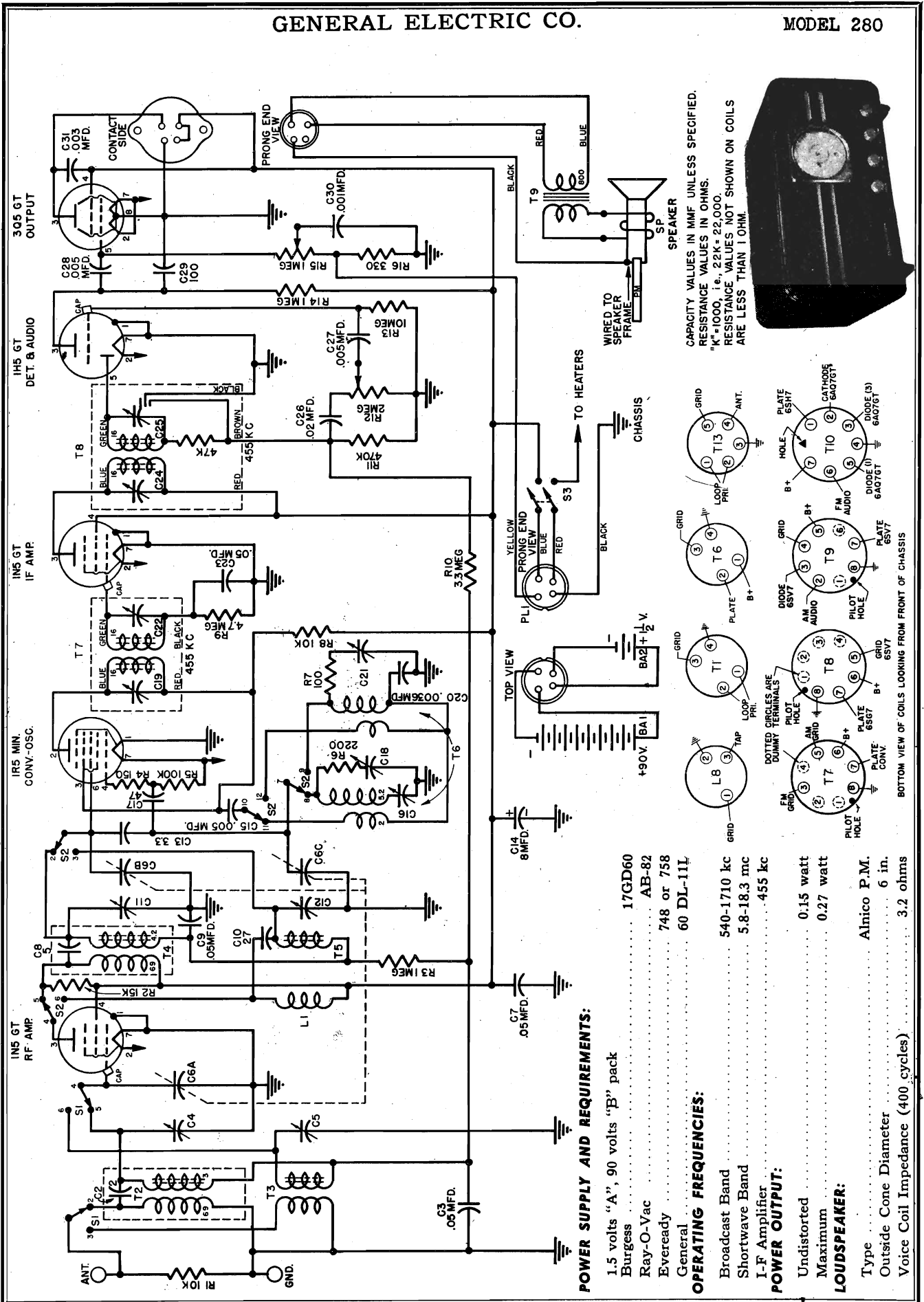
BATTERY INSTALLATION

The following instructions should be carefully followed in installing a battery, or replacing an old one:

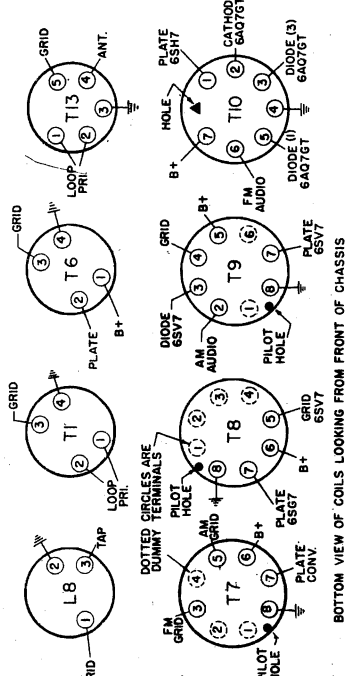
1. Remove new battery from packing carton.
2. If needed, add water to bring liquid level to indicator mark on battery container. **Do not overfill.**
3. Raise back cover on radio, remove battery case cover. The latter is removed by unclipping the two catches. Pry off cover.
4. Unplug old battery if present, and replace with new battery.
5. Place battery on charge, if necessary, as described in a previous paragraph, until both indicators are showing in the opening in the case cover.

GENERAL ELECTRIC CO.

MODEL 280



CAPACITY VALUES IN MMF UNLESS SPECIFIED.
RESISTANCE VALUES IN OHMS.
"K"=1000, i.e., 22K=22,000.
RESISTANCE VALUES NOT SHOWN ON COILS
ARE LESS THAN 1 OHM.



POWER SUPPLY AND REQUIREMENTS:

- 1.5 volts "A", 90 volts "B" pack
- Burgess 17GD60
- Ray-O-Vac AB-82
- Eveready 748 or 758
- General 60 DL-11L

OPERATING FREQUENCIES:

- Broadcast Band 540-1710 kc
- Shortwave Band 5.8-18.3 mc
- I-F Amplifier 455 kc

POWER OUTPUT:

- Undistorted 0.15 watt
- Maximum 0.27 watt

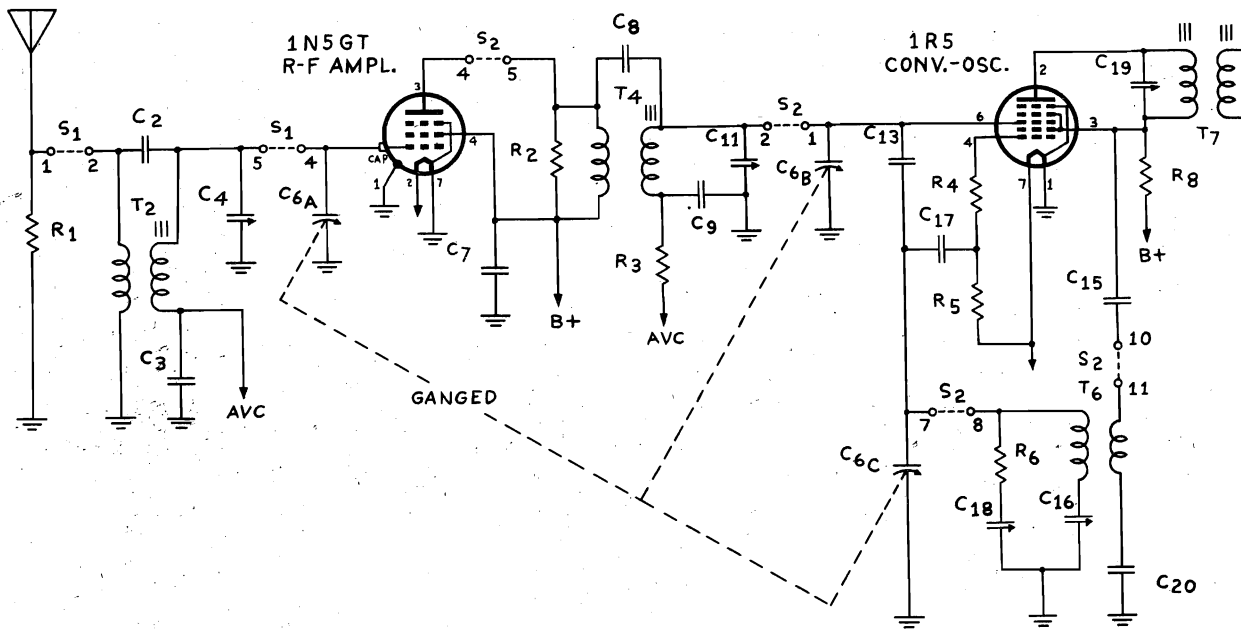
LOUDSPEAKER:

- Type Alnico P.M.
- Outside Cone Diameter 6 in.
- Voice Coil Impedance (400 cycles) 3.2 ohms

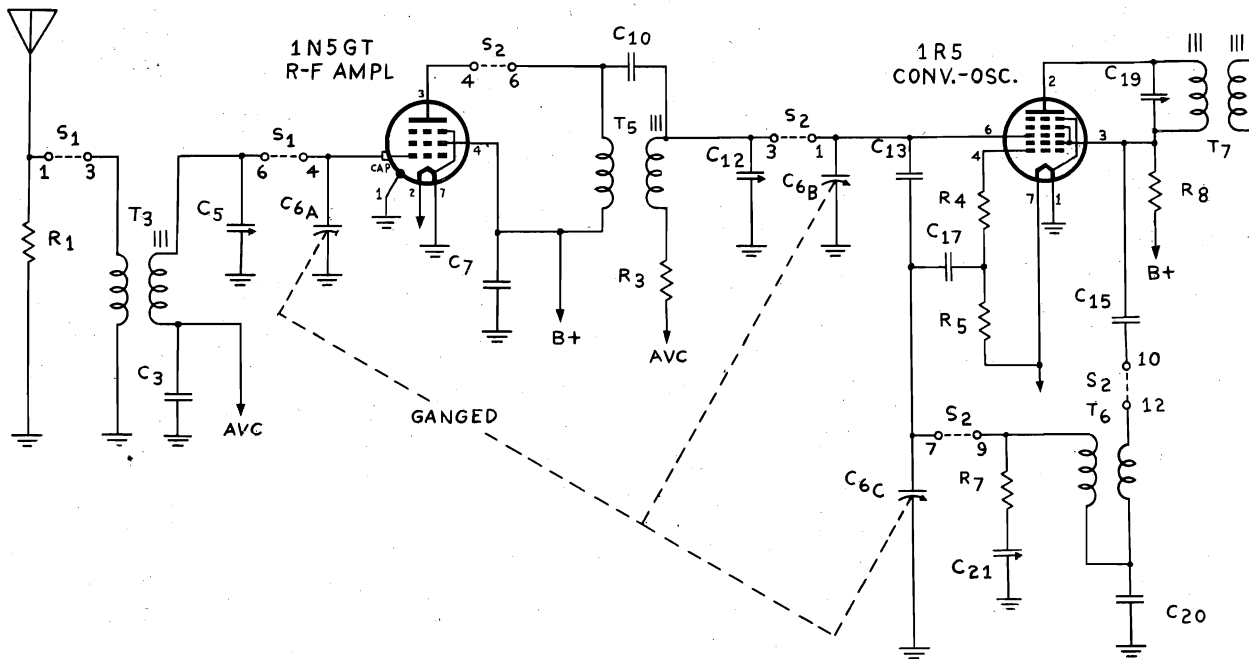
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MODEL 280

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BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
540-1710 KC



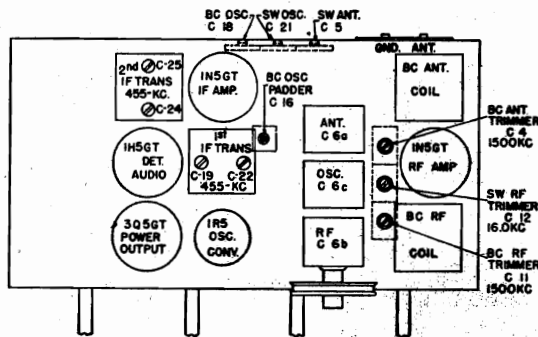
BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE
SHORT WAVE BAND
5.8-18.3 MC

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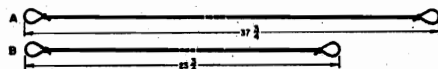
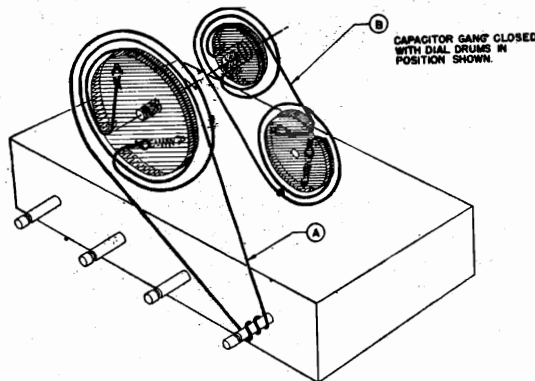
MODEL 280

ELECTRICAL CIRCUIT ALIGNMENT

PROCEDURE—GENERAL. 1. Connect output meter across loud speaker voice coil terminals.
 2. Keep radio volume control at maximum and attenuate test oscillator signal output for low output meter reading.
 3. All trimmer adjustments are made with the chassis removed from the cabinet.

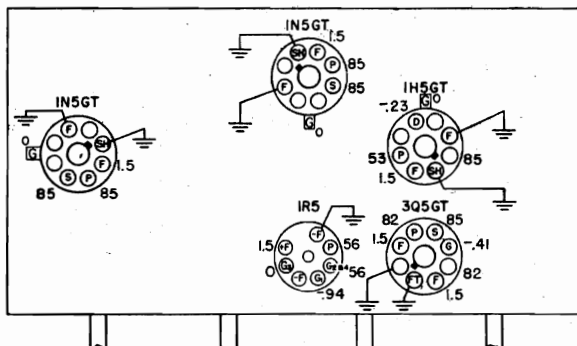


Tube and Trimmer Location



Dial Stringing

REAR OF CHASSIS



BOTTOM VIEW OF CHASSIS

MEASUREMENTS TAKEN ON 20,000 OHMS PER VOLT METER. MEASURED FROM PIN TO CHASSIS. 1.5 V "A" - 90V "B" BATTERY PACK. NO SIGNAL INPUT VOLUME CONTROL AT MAXIMUM.

Socket Voltages

ALIGNMENT CHART

Step	Connect Test Oscillator To	Test Oscillator Setting	Pointer Setting On Radio	Adjust For Max. Output
1	1N5GT IF grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	1st IF transformer trimmers
2	1R5 conv. grid in series with .05 mfd.	455 KC	"BC" Band 550 KC	2nd IF transformer trimmers
3	1N5GT RF grid in series with .05 mfd.	1710 KC	HF End	C18 (osc.)
4	1N5GT RF grid in series with .05 mfd.	1500 KC	1500 KC	C11 (conv.)
5	1N5GT RF grid in series with .05 mfd.	600 KC	600 KC	* **C16 (osc. padder)
6	Antenna Post in series with 200 mmf.	1500 KC	1500 KC	C4 (RF)
7	1N5GT RF grid in series with .05 mfd.	18.3 MC	HF End	C21 (osc.)
8	Antenna Post in series with 400 ohms.	16.0 MC	16.0 MC	* C12 and C5 (Conv. and R-F)

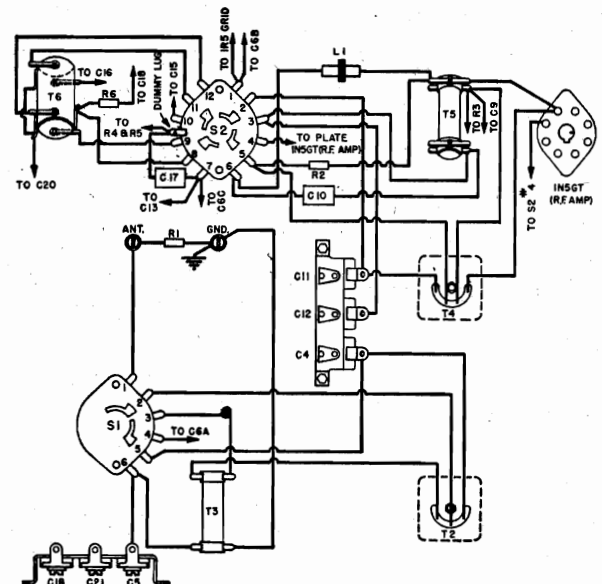
*Rock Gang condenser when making alignment.
 **Repeat steps 3 and 4 for best results.

STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed may have tolerances of 20%. Readings taken with low signal input so that AVC is not effective.

- (1) R-F Stage Gains.
 - Antenna post to 1N5GT r-f grid 3 at 1000 kc
 - 1N5GT r-f grid to 1R5 10 at 1000 kc
 - 1R5 grid to 1N5GT i-f grid 46 at 1000 kc
 - 1R5 grid to 1N5GT i-f grid 60 at 455 kc
 - 1N5GT grid to 1H5GT i-f diode plates 80 at 455 kc
- (2) Audio Gain.
 - .06 volt at 400 cycles across volume control (R12) with control set at maximum will give approximately .05 watts output across speaker voice coil.
- (3) D-C voltage developed across oscillator grid resistor (R5) averages 8 volts at 1000 kc.
- (4) Socket Pin Voltages.

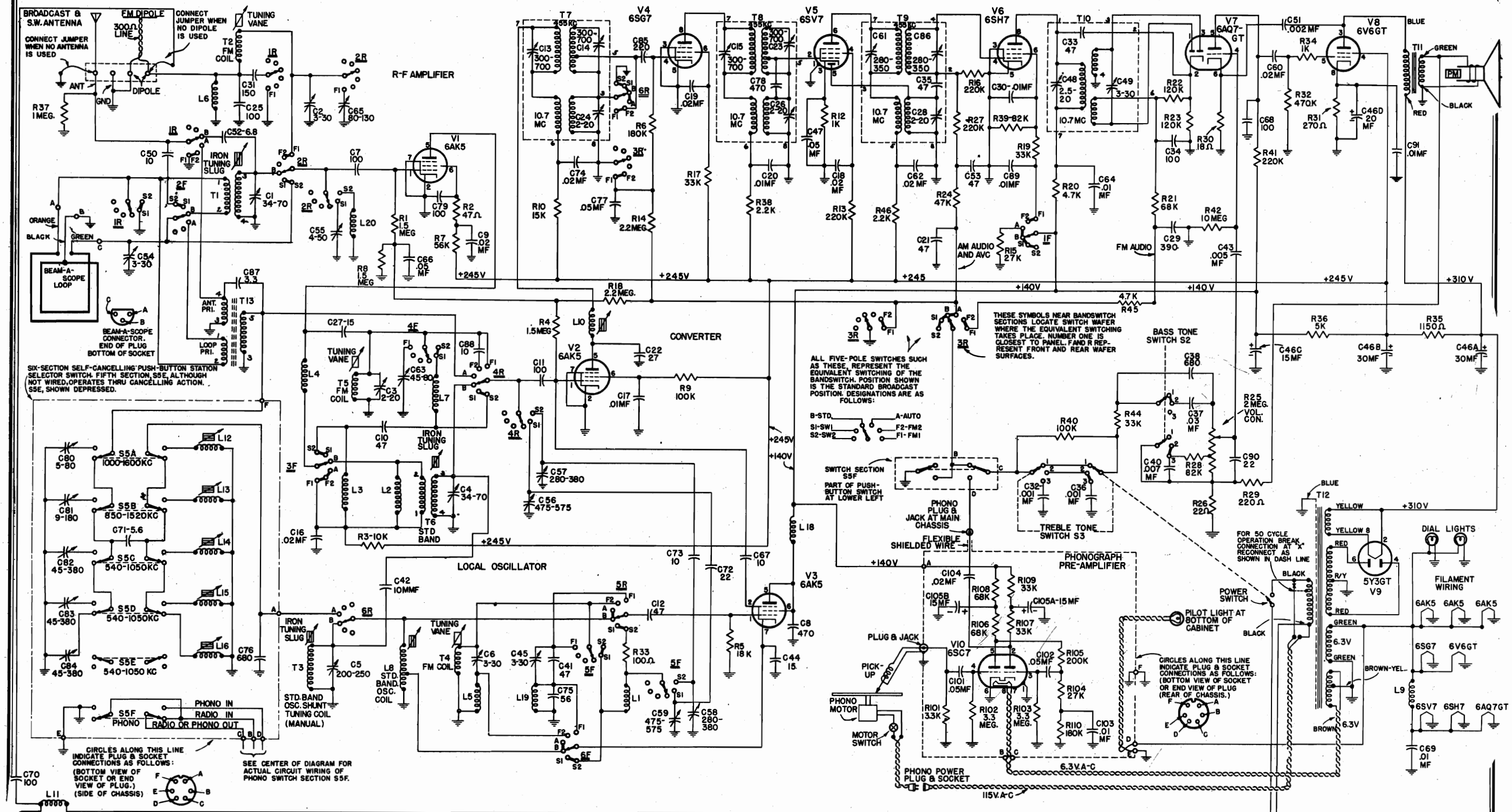
Figure 5 shows voltages from all tube pins to B-. Voltage readings much lower than those specified may help localize defective components or tubes.



Switch Wiring

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MODEL 417



ELECTRICAL RATING (INPUT):

Rating A5	Rating A6
Voltage..... 100-125	100-125
Frequency..... 50 cycles	60 cycles
Wattage..... 105	105

OPERATING FREQUENCIES:

Standard Band.....	540 to 1600 kc
Short Wave 1.....	9.4 to 9.9 mc
Short Wave 2.....	11.6 to 12.1 mc
Frequency Modulation 1.....	42 to 50 mc
Frequency Modulation 2.....	88 to 108 mc
AM I-F Frequency.....	455 kc
FM I-F Frequency.....	10.7 mc

POWER OUTPUT (117 volts line):

Undistorted.....	4.0 watts
Maximum.....	5.5 watts

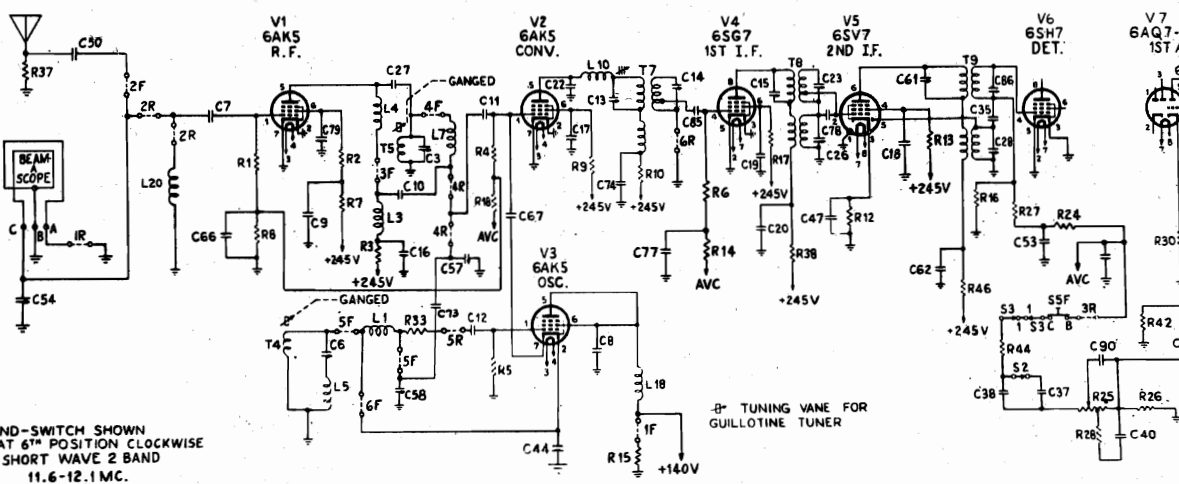
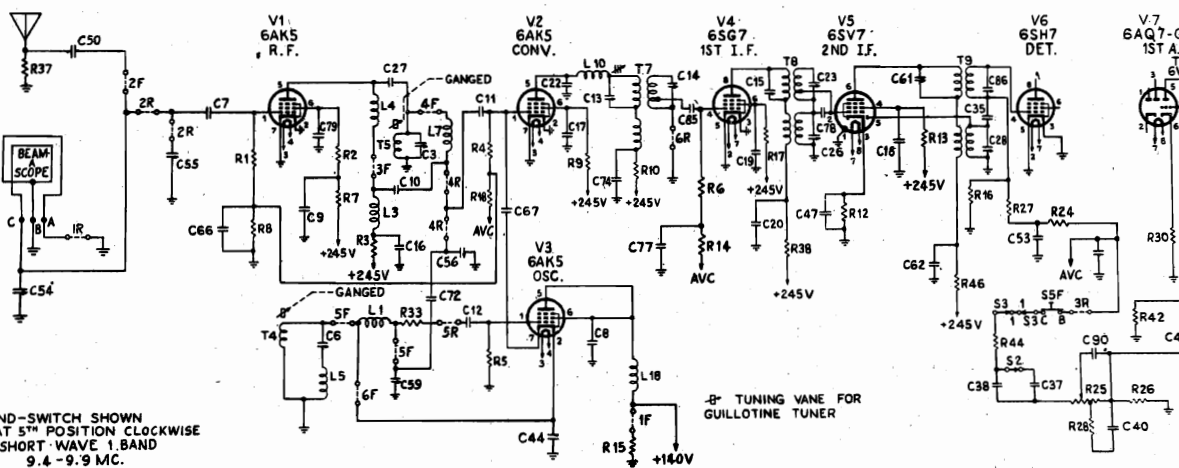
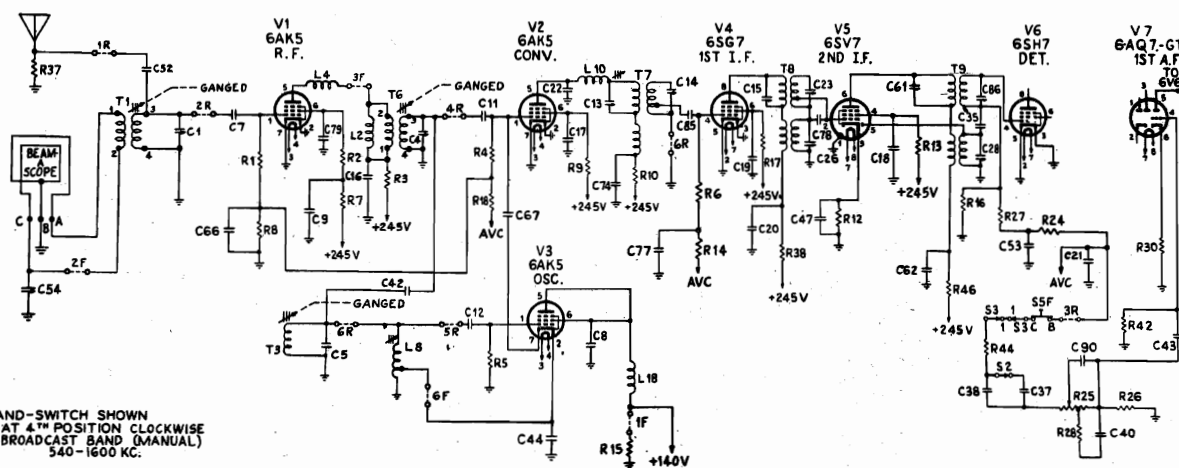
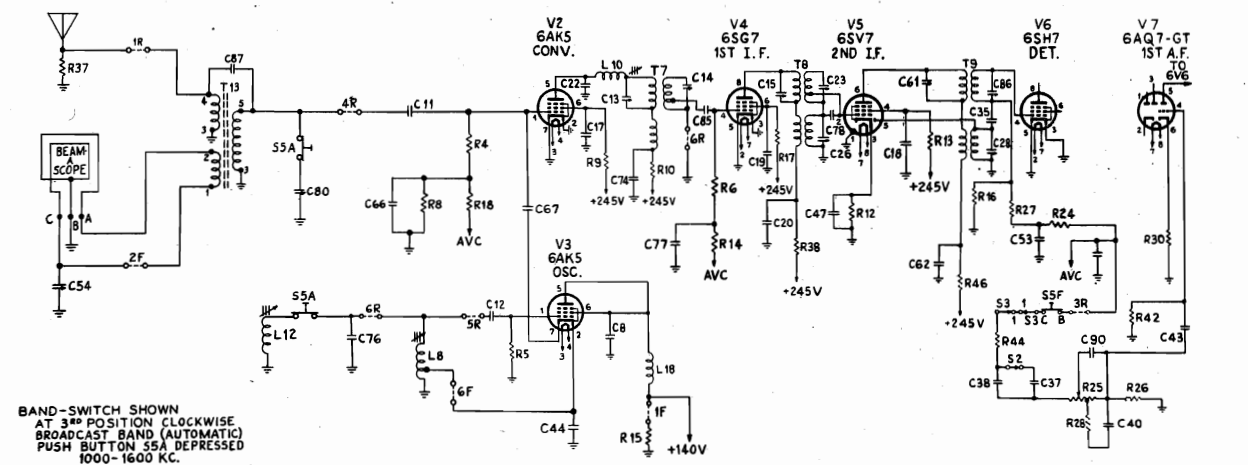
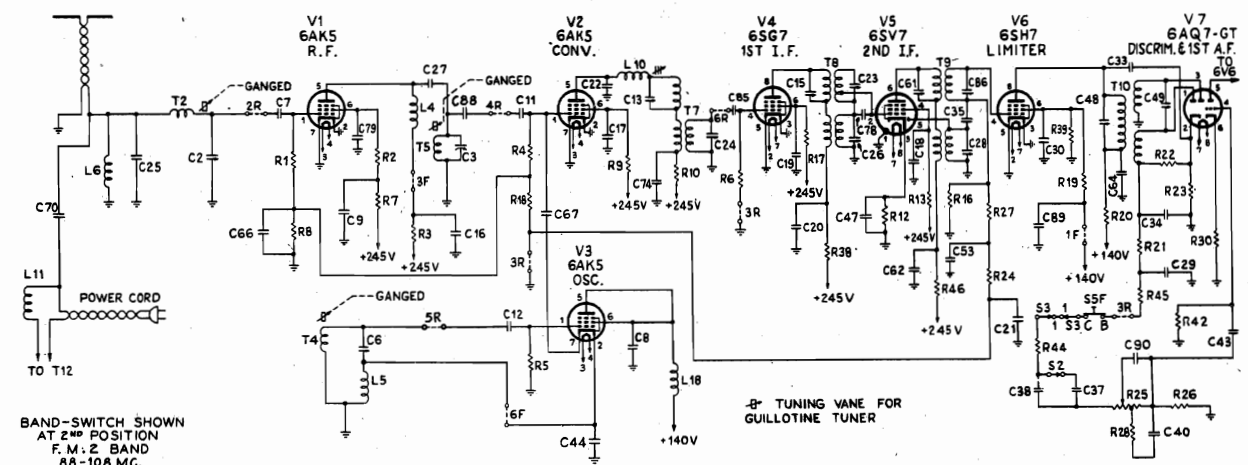
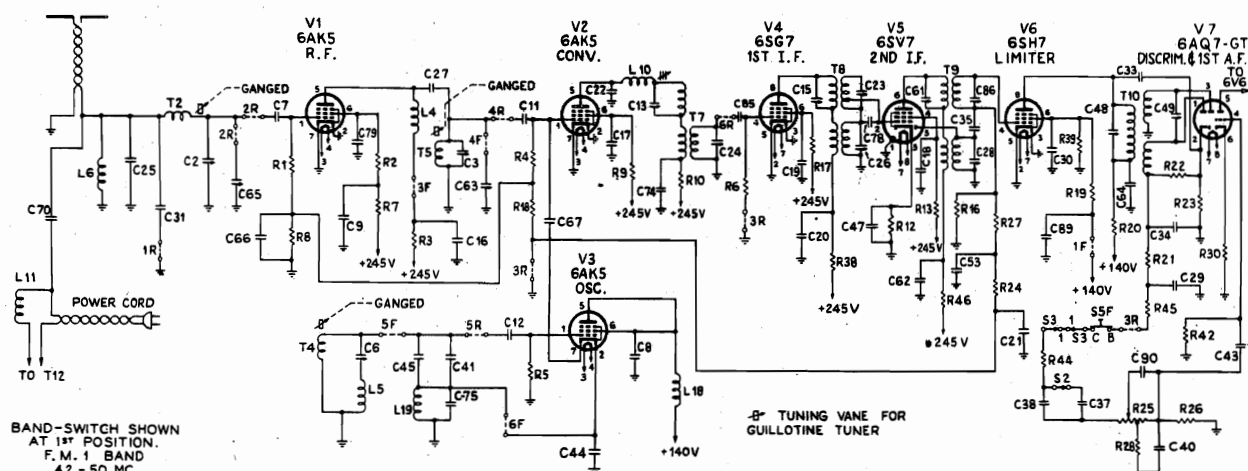
LOUDSPEAKER:

Type.....	Alnico PM
Size.....	12 inches
Voice Coil Impedance (400 cps).....	8 ohms

PHONOGRAPH PICK-UP:

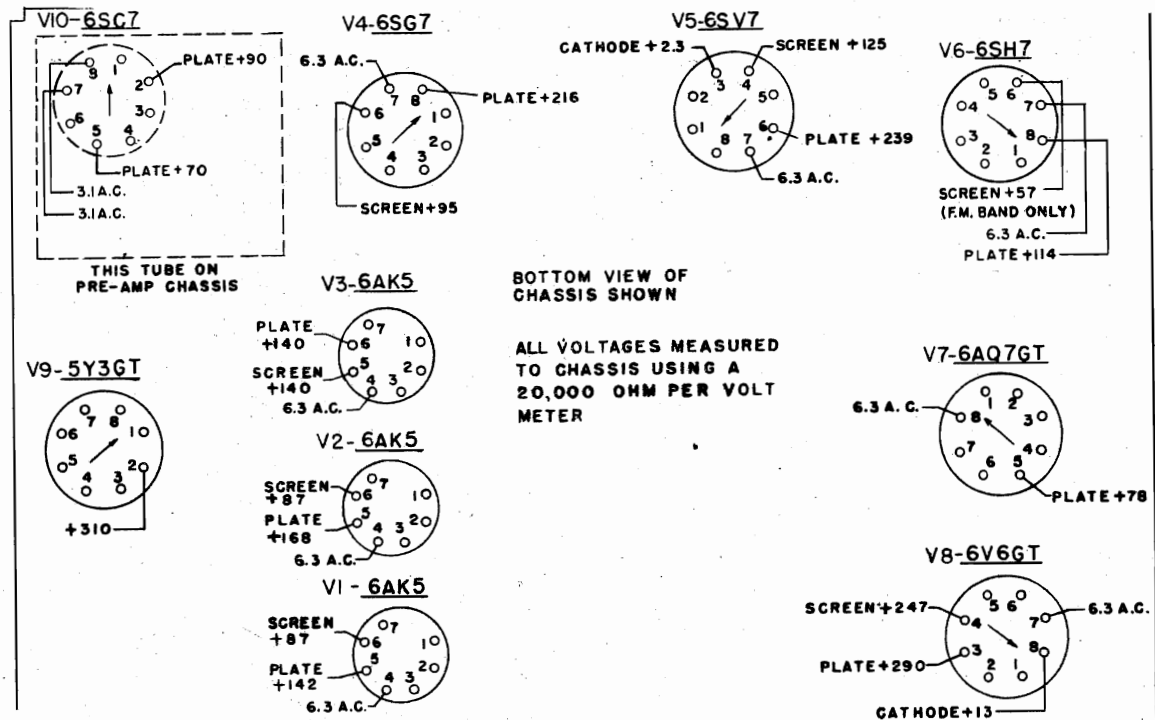
Type..... Variable Reluctance

D-C Resistance..... 250 ohms



GENERAL ELECTRIC CO.

MODEL 417



BOTTOM VIEW OF CHASSIS SHOWN

ALL VOLTAGES MEASURED TO CHASSIS USING A 20,000 OHM PER VOLT METER

STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed may have tolerances of 20%. Readings taken with low signal so that AVC is not effective.

(1) R-F and I-F Stage Gains

- Signal applied through IRE dummy antenna:
- Antenna post to V1 grid 4 @ 1000 kc
- Antenna post to V1 grid 2 @ 9.6 mc
- Antenna post to V1 grid 2 @ 11.8 mc
- Signal applied through 300-ohms, including signal generator impedance:
- Dipole terminals to V1 grid 1.5 @ 45 mc
- Dipole terminals to V1 grid 2 @ 98 mc
- These checks with oscillator tube (V3) removed:
- V1 grid to V2 grid 13 @ 1000 kc
- V1 grid to V2 grid 6 @ 9.6 mc
- V1 grid to V2 grid 9 @ 11.8 mc
- V1 grid to V2 grid 13 @ 45 mc
- V1 grid to V2 grid 10 @ 98 mc

- These checks with oscillator tube (V3) removed:
- V2 grid to V4 grid 23 @ 455 kc
- V2 grid to V4 grid 37 @ 10.7 mc

- V4 grid to V5 grid 23 @ 455 kc
- V4 grid to V5 grid 58 @ 10.7 mc
- V5 grid to V6 grid 40 @ 455 kc
- V5 grid to V6 grid 17 @ 10.7 mc

(2) Audio Gain

.07 volts at 400 cps across volume control with control set at maximum will give approximately 1/2 watt output across the speaker voice coil.

(3) Oscillator Grid Bias

- D-c voltage developed across R5 (average):
- 13 v. @ 1000 kc 2.7 v. @ 11.8 mc
- 2.7 v. @ 9.6 mc 5.5 v. @ 45 mc
- 7 v. @ 98 mc

(4) Socket Pin Voltages

Fig. 8 shows typical tube pin voltages. All readings should be made from the pins to ground unless otherwise indicated.

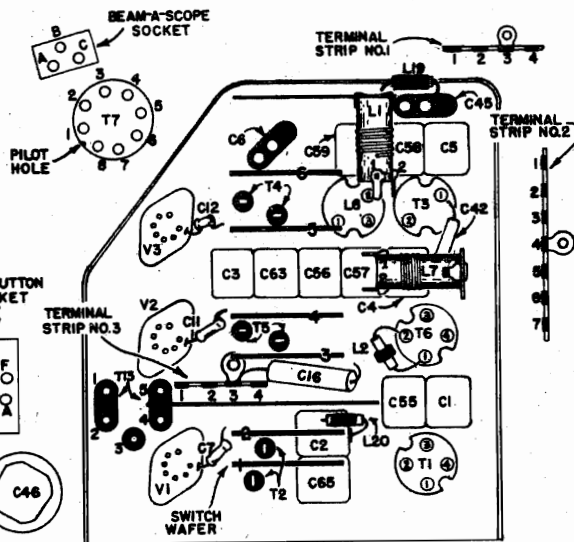
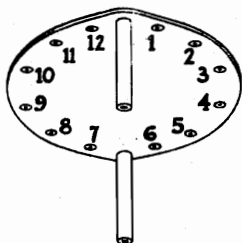


Figure 4—Physical Location of Components Listed in Band Switch Wiring Table



—Identification of Switch Lugs
—Set Inverted and Viewed from Panel

MODEL 417

GENERAL ELECTRIC CO.

ALIGNMENT

EQUIPMENT REQUIRED:

1. Test Oscillator with tone modulation. (See Table.)
2. D-C Voltmeter or Microammeter. (See notes 2 and 3.)
3. A-C Voltmeter, 2-volts. (See note 6.)
4. Insulated hex wrench, $\frac{1}{4}$ ". (See steps 1, 10, 13.)
5. 01 MF Paper Capacitor. (See steps 1 to 5.)

7. 400-ohm, $\frac{1}{2}$ watt resistor. (See steps 16 to 21.)

7. 200 mmf. mica capacitor. (See steps 22 to 28.)

Important detailed instructions and references in connection with the alignment table which follows are keyed in by means of column 7, headed "See Note." The notes are included in numerical order after the table. They are important—refer to them carefully.

ALIGNMENT TABLE

Step	Signal Generator Frequency	Signal Input Point	Band Switch	Dial Setting	Adjust	See Note	Remarks
1	10.7 mc	6SH7 grid thru .01 mf	FM1	.....	C49 for zero**	1, 2	Adjust C49 for <i>zero</i> meter reading. Apply 1 volt signal input.
2	See last column	6SH7 grid thru .01 mf	FM1	.....	Signal Generator	1, 2,	Detune signal generator to point of <i>maximum</i> meter reading.
3	As in step 2	6SG7 grid thru .01 mf	FM1	.....	Peak C48	1, 2	
4	10.7 mc	6SV7 grid thru .01 mf	FM1	.....	Peak C28	1, 3	6AQ7GT tube removed from its socket.
5	10.7 mc	6SG7 grid thru .01 mf	FM1	.....	Peak C26	1, 3	6AQ7GT tube removed from its socket.
6	10.7 mc	Conv. grid directly	FM1	.....	Peak C24 & L10	1, 3, 4	6AQ7GT tube removed from its socket.
7	455 kc	Conv. grid directly	STD	.....	Peak C86 & C61	5, 6	
8	455 kc	Conv. grid directly	STD	.....	Peak C15 & C23	5, 6	
9	455 kc	Conv. grid directly	STD	.....	Peak C13 & C14	5, 6	
10	88 mc	DIPOLE terminals	FM2	88 mc—6.8 to 6.9 in.*	Peak C6**	1, 3, 7, 10	Set dial accurately—then adjust C6.
11	98 mc	DIPOLE terminals	FM2	For max. output	Peak C3	1, 3, 8	Tune dial for maximum output, then peak C3 while rocking dial.
12	98 mc	DIPOLE terminals	FM2	Do not change	Peak C2	1, 3	
13	43 mc	DIPOLE terminals	FM1	43 mc—6 to 6.1 in.*	Peak C45**	1, 3, 7	Set dial accurately—then adjust C45.
14	46 mc	DIPOLE terminals	FM1	For max. output	Peak C63	1, 3, 8	Tune dial for maximum output, then peak C63 while rocking dial.
15	46 mc	DIPOLE terminals	FM1	Do not change	Peak C65	1, 3	
16	11.8 mc	Antenna thru 400-ohms	SW2	11.8 mc—4.5 to 4.6 in.*	Peak C58	5, 6, 7, 10	Set dial accurately—then adjust C58.
17	11.8 mc	Antenna thru 400-ohms	SW2	Do not change	Peak C57	5, 6, 8	Peak C57 while rocking dial.
18	11.8 mc	Antenna thru 400-ohms	SW2	Do not change	Peak C54	5, 6	C54 is located on back apron of chassis.
19	9.6 mc	Antenna thru 400-ohms	SW1	9.6 mc—4.5 to 4.6 in.*	Peak C59	5, 6, 7, 10	Set dial accurately—then adjust C59.
20	9.6 mc	Antenna thru 400-ohms	SW1	Do not change	Peak C56	5, 6, 8	Peak C56 while rocking dial.
21	9.6 mc	Antenna thru 400-ohms	SW1	Do not change	Peak C55	5, 6	
22	1620 kc	Antenna via 200 mmf	STD	Extreme right-hand position	Peak C5	5, 6	

* Important! See Note 7.

** Use insulated hex wrench, $\frac{1}{4}$ "

GENERAL ELECTRIC CO.

ALIGNMENT TABLE (Cont'd)

Step	Signal Generator Frequency	Signal Input Point	Band Switch	Dial Setting	Adjust	See Note	Remarks
23	1620 kc	Antenna via 200 mmf	STD	Extreme right-hand position	Peak C4	5, 6	
24	1620 kc	Antenna via 200 mmf	STD	Extreme right-hand position	Peak C1	5, 6	
25	1500 kc	Antenna via 200 mmf	STD	1500 kc—1.4 to 1.5 in.*	Osc. Coil T3 iron slug	5, 6, 7, 9	T3 iron slug is the rear one on the left side. Adjust for peak.
26	1000 kc	Antenna via 200 mmf	STD	For max. output	Conv. coil T6 iron slug	5, 6, 9	T6 iron slug is the center one on the left side. Adjust for peak.
27	1000 kc	Antenna via 200 mmf	STD	Do not change	R-F coil T1 iron slug	5, 6, 9	T1 iron slug is the front one on the left side. Adjust for peak.
28	580 kc	Antenna via 200 mmf	STD	For max. output	Peak L8	5, 6, 8	Peak L8 while rocking dial.
29							Repeat steps 22 to 28.

* Important! See Note 7.

Notes in Connection with Alignment Table

- Use unmodulated signal.
- Connect 20,000-ohm-per-volt meter from junction of R21 and C29 to chassis. Use ten-volt scale. (Steps 1-3.)
- Connect 20,000-ohm-per-volt meter from grid pin 4 of 6SH7 to chassis with a 200,000-ohm resistor in series. The resistor must be connected directly to the grid so that capacity loading will be negligible and so that the meter is isolated from the i-f signal voltage. Keep signal generator output down so that the meter indicates not more than one volt at the grid (5 micro-amperes through 200,000-ohms). (Alignment steps 4 to 6, 10 to 15.)
- Connect signal generator directly to the converter grid at some convenient point. The generator lead must be shielded up to this connection so that not more than 1/16 inch of exposed lead exists. Ground the shield solidly by clamping it firmly to the chassis or a shield as close to the connection as possible. (Steps 6-9.)
- Use 400-cycle modulation. (Steps 7 to 9, 16 to 28.)
- Connect a standard output meter across speaker voice coil. Turn volume control fully on. Keep signal generator output down so that the meter indicates not more than 1/2 watt output (2 volts) during alignment. (Steps 7 to 9, 16 to 28.)
- If dial scale is not available, index pointer as follows: Turn pointer to right-hand limit of travel. Mark the dial back plate at a reference edge of the pointer slider. Then set pointer by turning dial knob until the indicated dimension exists between the reference edge and the mark.
- "Rocking" consists of adjusting the indicated adjuster while turning the dial a small amount back and forth through peak output. The object is to find the maximum peak. Rocking is necessary and is permissible only when interlocking circuits are being adjusted.
- The main tuning iron slugs are suspended from the left side of the tuning "elevator." They are individually adjustable by loosening the locknut and turning the supporting screw into which the suspending wire is soldered.
- Two oscillator settings will give response. The higher frequency response point is the correct one; the other is the image. If in doubt, start with the trimmer screw loosened completely and adjust for the first response.

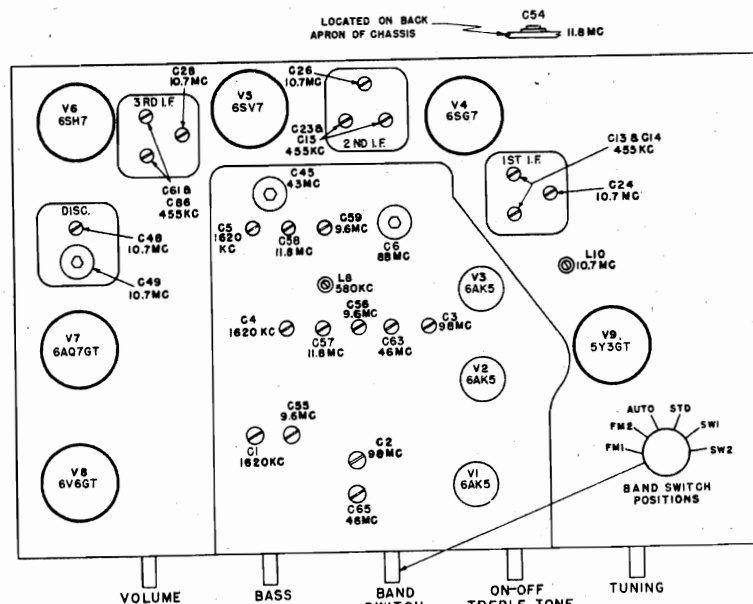
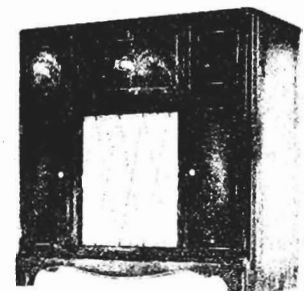


Figure 7—Location of Tubes and Adjusters

TUBE COMPLEMENT:

- R-F Amplifier 6AK5
- Converter 6AK5
- Oscillator 6AK5
- 1st I-F Amplifier 6SG7
- 2nd I-F Amplifier 6SV7
- FM Limiter—AM Detector 6SH7
- Discriminator—1st A-F Amplifier 6AQ7-GT
- Power Amplifier 6V6GT
- Phono Pre-Amplifier 6SC7
- Rectifier 5Y3GT
- Dial Lamp (2) GE No. 44
- Pilot Lamp (bottom of cabinet) GE No. 47



MODEL 417

GENERAL ELECTRIC CO.

WIRING OF BAND SWITCH

(Wire length given from end to end before stripping)

SECTION 4

SECTION 1

At this lug—	—connect this—	—the other end of which is connected to this—
1	Insulated wire, 5" lg.	Antenna transformer T13, terminal 4
2	a. Insulated wire, 11½" lg. b. Insulated wire, 2" lg. c. Capacitor C50	Antenna terminal at rear of chassis Switch section 1, lug 6 Switch section 2, lug 1
3	Capacitor C52	Switch section 2, lug 3
4	a. Insulated wire, 1½" lg. b. Insulated wire, 14" lg. c. Insulated wire, 5½" lg.	Antenna transformer T1, terminal 1 Beam-a-scope plug, terminal A Antenna transformer T13, terminal 2
5	a. Short bare bus b. Resistor R15	Ground lug on C65 Switch section 1, lug 11
6	See lug 2b, above	
7	Insulated wire, 11" lg.	Terminal strip 1, lug 4
8	Capacitor C31	Front terminal of T2
9	a. Insulated wire, 9" lg. b. Insulated wire, 7" lg.	Terminal strip 2, lug 5 Filter capacitor, C46C
11	See lug 5b, above	

SECTION 2

At this lug—	—connect this—	—the other end of which is connected to this—
1	See section 1, lug 2c	
3	a. Insulated wire, 2½" lg. b. See section 1, lug 3	Trimmer C1, lug nearer T1
4	Insulated wire, 1½" lg.	Trimmer C55, lug nearer T1
5	Coil L20	Ground lug on trimmer C2
6	Short bare bus	Trimmer C65, left-hand terminal*
7	Short bare bus	Trimmer C2, left-hand terminal*
8	Capacitor C7	Tube socket V1, pin 1
9	Insulated wire, 4" lg.	Antenna transformer T13, terminal 1
10	Insulated wire, 3½" lg.	Antenna transformer T1, terminal 2
11**	Insulated wire, 11½" lg.	Beam-a-scope plug, terminal C

SECTION 3

At this lug—	—connect this—	—the other end of which is connected to this—
1	Shielded wire, 8¾" lg.	Terminal strip 2, lug 6
2	Insulated wire, 1½" lg.	Switch section 3, lug 12
3	a. Insulated wire, 2½" lg. b. Capacitor C16 c. Choke L3	Converter coil T6, terminal 1 Ground lug on terminal strip 3 Switch section 3, lug 11
4	Insulated wire, 7½" lg.	Terminal strip 2, lug 3
5	Insulated wire, 1⅝" lg.	Converter coil T6, terminal 2
6	Short bus with spaghetti	Chassis
7	Short bare bus	Terminal strip 3, lug 4
10	Shielded wire, 10½" lg.	Terminal strip 2, lug 2
11	a. See lug 3c, above b. Capacitor C10	Switch section 4, lug 3
12	a. See lug 2, above b. Shielded wire, 7¾" lg.	Push-button socket, Terminal B

At this lug—	—connect this—	—the other end of which is connected to this—
1	a. Insulated wire, 5½" lg. b. Insulated wire, 7½" lg.	Antenna transformer T13, terminal 5 Push-button socket, terminal F
2	Insulated wire, 2½" lg.	Trimmer C4, lug nearer T6
3	a. See Section 3, lug 11b b. Short bus with spaghetti c. Short jumper	Coil L7, terminal 2 (toward front) Switch Section 4, lug 4 (adjacent)
4	See lug 3c, directly above	
5**	Short bare bus	Trimmer C63, lug nearer front
6	Capacitor C88	Tuner T5, left-hand terminal*
7	Short bare bus	Tuner T5, left-hand terminal
8	Capacitor C11	Tube socket V2, pin 1
9	a. Capacitor C72 b. Insulated wire, 2½" lg.	Section 5, lug 11 Trimmer C56, front terminal
10	a. Capacitor C73 b. Insulated wire, 2½" lg.	Section 5, lug 12 Trimmer C57, front terminal
12	Bus with spaghetti, 2½" lg.	Coil L7, terminal 1

SECTION 5

At this lug—	—connect this—	—the other end of which is connected to this—
1	a. Bus with spaghetti, 1¼" lg. b. Resistor R33	Coil L1, terminal 1 Section 5, lug 4
2	a. Insulated wire, 3" lg. b. Insulated wire, 1⅝" lg.	Coil L8, terminal 1 Section 6, lug 4
4	See Section 5, lug 1b	
5	Bus with spaghetti, 3" lg.	Coil L1, terminal 2
6	a. Bus with spaghetti, 3" lg. b. Bus with spaghetti, 1½" lg.	Capacitor C45, left-hand terminal* Section 5, lug 10
7**	Short bare bus	Tuner T4, left-hand terminal*
8	Capacitor C12	Tube socket V3, pin 1
9	Insulated wire, 4" lg.	Trimmer C5, lug nearer T3
10	a. See Section 5, lug 6b b. Capacitor C41	Section 6, lug 6
11	a. Insulated wire, 3¾" lg. b. See Section 4, lug 9a	Trimmer C59, lug nearer front
12	a. Insulated wire, 3¾" lg. b. See Section 4, lug 10a	Trimmer C58, lug nearer front

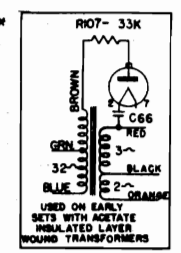
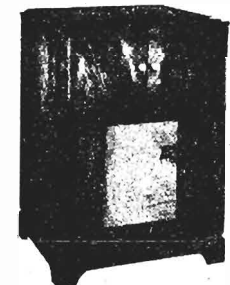
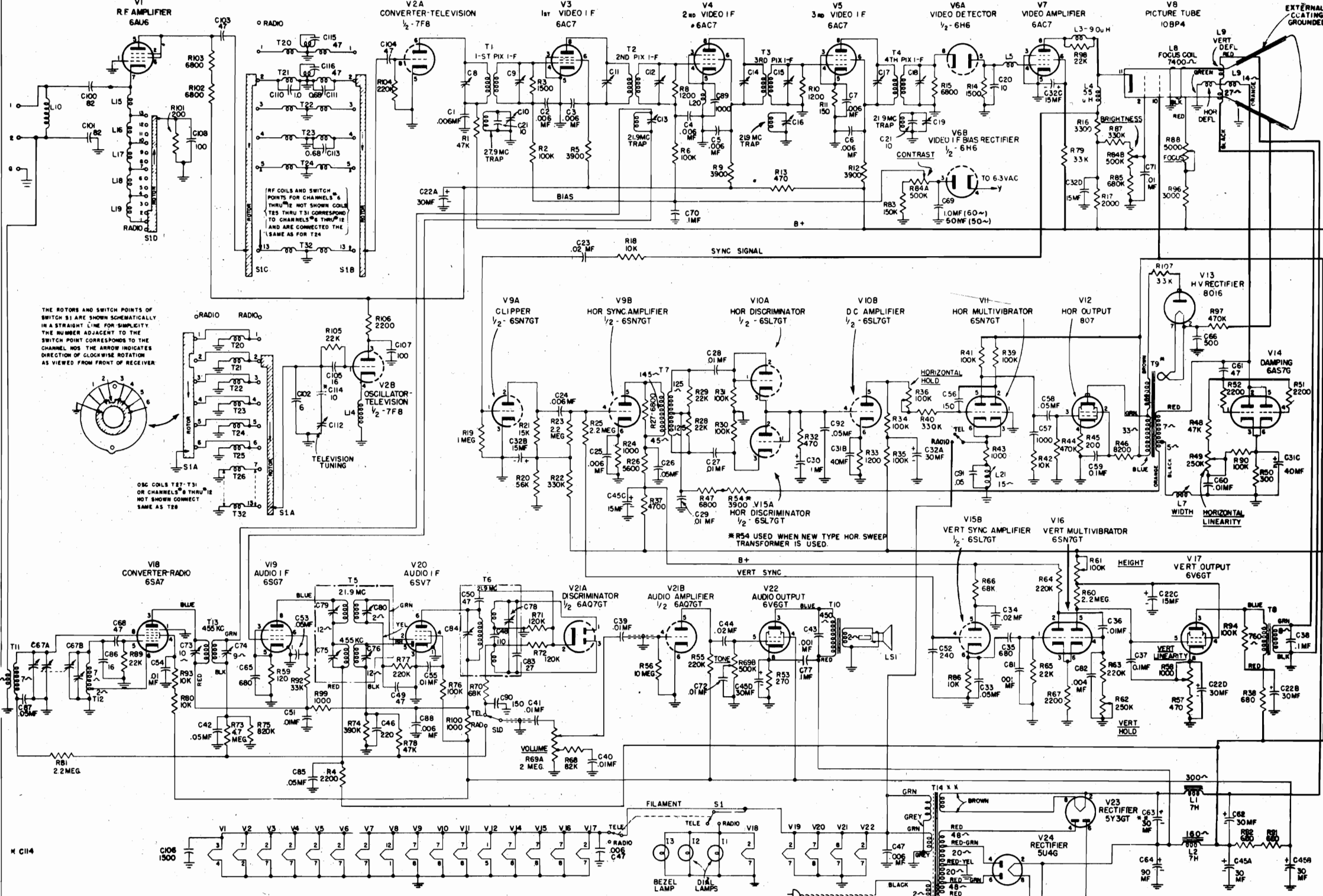
SECTION 6

At this lug—	—connect this—	—the other end of which is connected to this—
1	Insulated wire, 4½" lg.	I-F transformer T7, terminal 8
2	Bus with spaghetti, 1½" lg.	Coil L1, terminal 2
4	See Section 5, lug 2b	
5	Insulated wire, 12" lg.	Push-button socket, terminal A
6	a. Bus with spaghetti, 2" lg. b. Capacitor C75 c. See section 5, lug 10b	Trimmer C45, center terminal Ground at C59
7	Short bare bus	Trimmer C6, center terminal
8	Bare bus, 1" lg.	Tube socket V3, pin 7
9	Insulated wire, 2¼" lg.	I-F transformer T7, terminal 5
10	Insulated wire, 2¼" lg.	I-F transformer T7, terminal 3
12	Insulated wire, 3½" lg.	Coil L8, terminal 3

* Looking from front, chassis inverted.
** Double lug (front and rear) soldered together.

GENERAL ELECTRIC CO.

Frequency	50, 60 cps	60 cps
Voltage	105-125 v.	105-125 v.
Wattage (Radio)	85	85
Wattage (Television)	215	215



- INTERMEDIATE FREQUENCIES:**
 Television Video (carrier freq. equivalent) 26.4 mc
 Television Audio 21.9 mc
 Radio 455 kc
- AUDIO POWER OUTPUT:**
 Undistorted 3 watts
 Maximum 4.5 watts
- LOUDSPEAKER:**
 Type Alnico "PM" Dynamic
 Size 12 inches
 Voice Coil Impedance (400 cycles) 3.2 ohms
- PICTURE SIZE:**
 Height 6 inches
 Width 8 inches
- ANTENNA REQUIREMENTS:**
 Type Folded Dipole
 Impedance 300 ohms

CAUTION NOTICE

THE REGULAR B+ VOLTAGES ARE DANGEROUS AND PRECAUTIONS SHOULD BE OBSERVED WHEN THE CHASSIS IS REMOVED FROM THE CABINET FOR SERVICE PURPOSES. THE HIGH VOLTAGE SUPPLY (8000 v.) AT THE PICTURE TUBE ANODE WILL GIVE AN UNPLEASANT SHOCK BUT DOES NOT SUPPLY ENOUGH CURRENT TO GIVE A FATAL BURN OR SHOCK. HOWEVER, SECONDARY HUMAN REACTIONS TO OTHERWISE HARMLESS SHOCKS HAVE BEEN KNOWN TO CAUSE INJURY. SINCE THE HIGH VOLTAGE IS OBTAINED FROM THE B+ VOLTAGE, CERTAIN PORTIONS OF THE HIGH VOLTAGE GENERATING CIRCUIT ARE DANGEROUS AND EXTREME PRECAUTIONS SHOULD BE OBSERVED.

THE PICTURE TUBE IS HIGHLY EVACUATED AND IF BROKEN, GLASS FRAGMENTS WILL BE VIOLENTLY EXPELLED. IF IT IS NECESSARY TO CHANGE THE PICTURE TUBE, USE SAFETY GOGGLES AND GLOVES.

R-F FREQUENCY RANGE:

Selector Switch Position	Freq. Range	Picture Carrier	Sound Carrier
Radio	540-1600 kc		
No. 1	44- 50 mc	45.25	49.75
No. 2	54- 60 mc	55.25	59.75
No. 3	60- 66 mc	61.25	65.75

No.	Freq. Range	Picture Carrier	Sound Carrier
No. 4	66- 72 mc	67.25	71.75
No. 5	76- 82 mc	77.25	81.75
No. 6	82- 88 mc	83.25	87.75
No. 7	174- 180 mc	175.25	179.75
No. 8	180- 186 mc	181.25	185.75
No. 9	186- 192 mc	187.25	191.75
No. 10	192- 198 mc	193.25	197.75
No. 11	198- 204 mc	199.25	203.75
No. 12	204- 210 mc	205.25	209.75
No. 13	210- 216 mc	211.25	215.75

GENERAL ELECTRIC CO.

MODEL 801

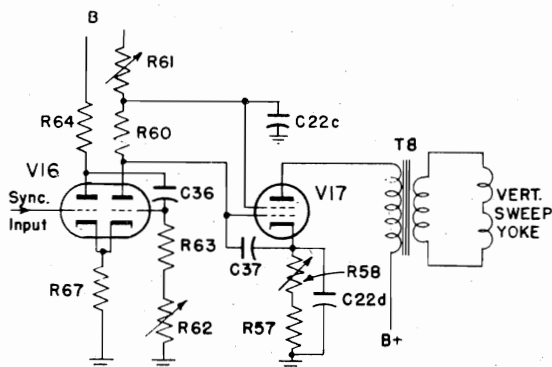


Fig. 7. Vertical Sweep Output

This "kick" voltage is shown in the wave shape shown as a-b in Figure 6. This voltage is generated in the primary winding and is further increased by an additional winding added to the transformer which connects to the rectifier tube plate of V13. The rectifier tube, V13, is a Type 8016 which derives its filament voltage from the horizontal sweep transformer T9 by a single turn around the transformer. Because of the high frequency which is rectified, a 500 mmf capacitor is more than sufficient for filtering purposes.

9. LOW VOLTAGE POWER SUPPLY—Two rectifiers are used to supply the required plate current for the television and radio receiver. A Type 5U4G tube, V24, supplies the bulk of the current and makes use of combination inductive and resistance type filter. A Type 5V4G or 5Y3G tube, V23, is used to supply higher voltage to the horizontal output, horizontal multivibrator, and the cathode ray tube 1st anode. This is followed by a choke filter. All filament supply leads except for tubes V19, V20, V21, V22 and the rectifier filaments pass through the band switch so that tubes may be switched ON or OFF when switching from radio to television.

CIRCUIT ALIGNMENT

GENERAL—A complete alignment of the Model 801 television receiver consists of the following individual alignment procedures. These are listed below in the correct sequence of alignment. However, any one alignment may be performed without the necessity of realignment of any one of the other sectional alignments.

1. Broadcast i-f amplifier
2. Broadcast r-f amplifier
3. Television i-f traps
4. Television sound i-f amplifier
5. Video i-f amplifier
6. Oscillator adjustments
7. Television r-f amplifier

The alignment procedure is in table form on pages 8 through 11. The following paragraphs are important suggestions to be followed when attempting alignment and should be read thoroughly before alignment is attempted.

TEST EQUIPMENT REQUIREMENTS—To provide the over-all alignment as outlined above, the following test equipment is required.

1. **Cathode Ray Oscilloscope**—This scope should preferably have a 5-inch screen and should preferably have good high frequency response, which will be useful in making waveform voltage measurements on pages 20 and 21.

2. **Signal Generator**—This signal generator must have good frequency stability and be accurately calibrated. It should be capable of covering the following frequency ranges with tone modulation where desired.

- (a) 455 kc for broadcast
- (b) 550-1600 kc for broadcast
- (c) 21.9 mc for video i-f trap
- (d) 27.9 mc for video i-f trap
- (e) 23.0 mc for video i-f marker
- (f) 25.65 mc for video i-f marker
- (g) 26.4 mc for video i-f marker
- (h) 44-110 mc and 174-238 mc for oscillator adjustment and markers for the r-f channel bandwidth measurements.

3. **R-F Sweep Generator**—This should give approximately 0.1-volt output with adjustable attenuation of the output. The output should be flat over wide frequency variations. The frequency coverage should be:

- (a) 20 to 30 mc, with 10 mc sweep width
- (b) 40 to 90 mc, with 25 mc sweep width
- (c) 170 to 220 mc, with 25 mc sweep width

4. **Output Meter**—An output meter with a voltage range 0-2.5 volts a-c.

ALIGNMENT SUGGESTIONS—With the exception of the broadcast i-f and r-f trimmers and the FM sound i-f discriminator trimmers, all alignment adjustments are performed from the underside of the chassis. Remove the chassis from the cabinet and turn it on its side with the power transformer down. This is the only safe position in which the chassis will rest and leave all adjustments accessible. The following suggestions apply to each individual alignment procedure.

1. **Broadcast I-F Alignment**—(a) Although the oscilloscope is recommended in the table for indicating the output voltage during alignment, an output meter may be connected across the speaker voice coil as an alternate output indicating device. When this is used, the volume control should be set for maximum volume and then attenuate the signal generator output so as not to cause audio overload.

(b) Use a 200 mmf mica capacitor or standard RMA dummy between the high side of the signal generator and the signal input point, as indicated in the Alignment Table.

2. **Broadcast R-F Alignment**—Apply signal generator input to one of dipole input terminals through a 200 mmf mica capacitor as in (1) above. An output meter may be used in place of the oscilloscope for indicating output. First adjust oscillator trimmer by tuning gang condenser to minimum capacity and aligning oscillator trimmer for maximum with a 1620 kc input signal. Next with 1500 kc input signal, tune in signal, set pointer to 1500 kc calibration then align r-f trimmer for maximum output.

3. **Video I-F Trap Alignment**—The video i-f traps are used to attenuate the sound i-f of the same and adjacent channels from being detected and reproduced as sound bar interference on the picture tube. Misalignment of these traps results in the interference pattern, as shown in Figure 31.

Set the contrast control about half-way up. Turn the Station Selector to channel 13. Connect the oscilloscope through a 10,000-ohm resistor, to the top of the 3300-ohm video load resistor, R16.

Connect the output of an accurately calibrated signal generator with tone modulation to the grid of the converter tube, V2A, through a 200 mmf mica capacitor. The alignment frequencies are:

- T1 (C10)—27.9 mc
- T2 (C13)—21.9 mc
- T3 (C16)—21.9 mc
- T4 (C19)—21.9 mc

The trimmers should be aligned for minimum output, care being taken to get the lowest possible indication at the output. The input signal should be attenuated below saturation of the i-f amplifier tubes at start, then raised as signal is attenuated during alignment.

4. **Television Sound I-F Alignment**—Since the television sound i-f amplifier transformer is slightly overcoupled, alignment by a sweep generator is recommended. Connect the generator through a 200 mmf capacitor to grid (4) of V3. For alignment, connect the oscilloscope through a 100,000 ohm isolating resistor across capacitor C49.

For step 1, insert a 21.9 mc marker signal from an unmodulated signal generator into the same point of input as the sweep generator. This input from the signal generator should be very loosely coupled by clipping the signal generator through insulation to the grid (4) of V3.

Keep the input of the sweep generator low enough so that the sound i-f amplifier does not overload. Check by increasing the output of the sweep; the response curve on the scope should increase in size proportionally. Set Contrast Control to half-advanced position.

The response curve of the amplifier at the grid return of V20 should appear as in Figure 8A.

For discriminator alignment the secondary trimmer, C78, of T6 is aligned by using a tone modulated 21.9 mc signal and listening to the tone at the loudspeaker. The trimmer is adjusted for minimum tone signal output. If the sweep is used for the secondary trimmer alignment, the cross-over should be symmetrical about a 21.9 mc marker and should be a straight line between the alternate peaks, as shown in Figure 8B. Reconnect oscilloscope across the top of the volume control.

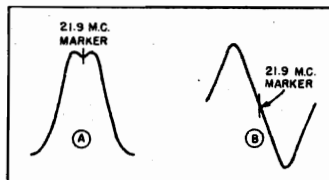


Fig. 8. T-V Audio I-F Curves

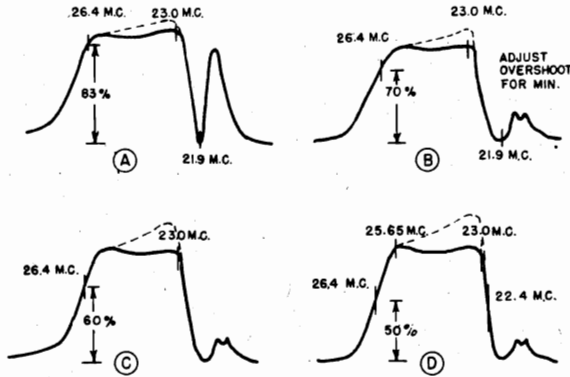


Fig. 9. Video I-F Alignment Curves

With the same sweep input as in step 1, adjust the primary trimmer, C84, of T6 for maximum peak-to-peak amplitude of the positive and negative peaks as shown in Figure 8B.

5. **Video I-F Alignment**—The video i-f amplifier uses transformers which are coupled and loaded to give the proper band-pass characteristic. Before attempting alignment of the video i-f, the sound i-f traps should be aligned as in (3), then do not touch these trimmers when making the video i-f alignment.

Stage-by-stage alignment should be performed so as to duplicate the curves, as shown in Figures 9A, B, C, and D. The markers are used to establish the correct bandwidth and frequency limits.

The trap formed by L20 and C89 in the cathode of V4 is used to reduce the overshoot of the 21.9 mc traps. Adjust the spacing of turns comprising L20 by either pushing them together or separating them so as to give a minimum amplitude to the overshoot.

Connect the sweep generator to the tube grid preceding the transformer to be aligned. Adjust the sweep width for a minimum of 10 mc about the center frequency of the video i-f. The marker frequencies are supplied by a signal generator and sufficient marker signal may be supplied in most cases by merely connecting the high side of the signal generator to the television chassis.

The primary of the transformer preceding the grid where the signal is applied will act as a trap putting a hole in the alignment curves as viewed on the scope unless it is short circuited or detuned. It may be detuned readily by connecting a 100 to 200 mmf capacitor across the primary trimmer or place a temporary short circuit across the primary trimmer. **Be sure to remove this capacitor after the stage is aligned.**

Keep the input of the sweep generator low so as not to overload the video i-f amplifier.

The response curves shown are obtained on an oscilloscope at the junction of L4 and R16. Use a 10,000 resistor in series with the input lead to the oscilloscope.

The contrast control should be advanced approximately to its half-advanced position.

The Selector Switch should be turned to radio position and a temporary jumper put across filament switch wafer so as to keep the television tube filaments lit while in this radio position. If a television position is used, the i-f curve will be affected by the interaction from the r-f coil in the converter tube grid. **NOTE**—When jumper is used, remove B+ from r-f assembly by disconnecting external lead to terminal (2) of r-f assembly, see Fig. 12.

6. **Oscillator Adjustment**—The oscillator coil must be adjusted so that the Television Tuning Condenser, C112, will tune the sound carrier of the television signal at the middle of its range. Set the condenser, C112, to mid-position. Then adjust oscillator coil for channels No. 1 through No. 6 by spreading turns to raise frequency or compressing turns to lower frequency. For channels No. 7 through No. 13, the oscillator coil consists of a single turn. Adjust these coils by spreading the gap to lower frequency or closing the gap to raise frequency in the leads of the coil which run to the terminals.

Apply the signal generator with tone modulation to the antenna input terminals and set the generator to the sound carrier frequency for the channel under alignment. The signal generator must be very accurately calibrated. This can be done by beating its output against a known channel carrier or use a station operating on the channel and tune in the sound.

For output indication, advance the volume control about to mid-position so that the tone modulation or audio modula-

tion on the channel station may be heard through the loud-speaker.

The oscillator coil is located on the coil form or assembly nearest to the front of the switch assembly and is wound of heavier wire than the other coils. This is shown in Figure 10. 7. **R-F Coil Alignment**—The r-f coil assembly is designed for stable, band-pass operation and under normal conditions will seldom require adjustment. In cases where it is definitely known that alignment is necessary (such as when the present coil is damaged and has been changed), do not attempt the adjustment unless suitable equipment is available. When tubes V1 or V2 are changed, alignment of r-f and oscillator may be necessary.

The minimum requirements for correct r-f alignment is to provide the correct band width, and for the response curve to be centered within the limit frequencies shown for each of the individual bands, as shown in Figure 11. It is also necessary that the curve be adjusted for maximum amplitude consistent with correct band width. To provide these minimum requirements, the r-f coils are overcoupled in a very similar manner to the video i-f transformers. However, instead of adjusting capacity to tune the coils, the inductance is varied by moving a few turns. Coupling is also adjustable by moving the entire coil either away from or toward the adjacent coil on the form.

The physical assembly of the coils in the band switch locates the r-f amplifier plate coil at the rear of the switch and the oscillator coil towards the front end. Two types of coils are used—the Channel No. 1 and No. 2 coils have an additional link circuit between the grid and plate coils to provide better image rejection of the FM band (88 to 108 mc) signals on these two channels. These links are tuned by means of two copper rings which are moved along the coil forms for adjustments.

The input sweep signal is applied to the antenna terminal board at the r-f unit. The 300-ohm cable between the antenna terminal board and r-f amplifier input must be disconnected at the r-f unit when making r-f alignment. The marker signal

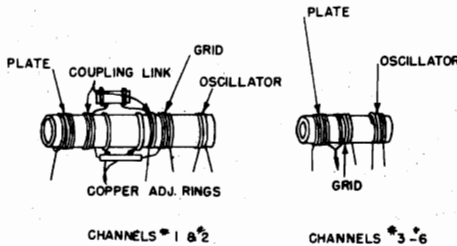


Fig. 10. R-F Coil Assembly

generator may be coupled loosely to the antenna input terminals.

The output r-f response curve is taken off at the junction of R1 and C1. The Contrast Control should be set for minimum for all r-f alignment.

For channels No. 1 and No. 2, the r-f coil should be aligned to give approximately the curve shown in Figure 11A. The high frequency end of curve (at S marker) may be peaked slightly higher than the low frequency end of curve, but the low frequency end should never be aligned with more amplitude than the high frequency end. The markers should be located on the inside of the humps of the curves, the video marker (P) preferably being inside slightly farther than the sound marker (S). Adjustment of the bandwidth is made by moving the plate coil closer to the grid coil or vice-versa. In most cases the sliding of the copper rings will give both the required bandwidth and frequency adjustment. Spread

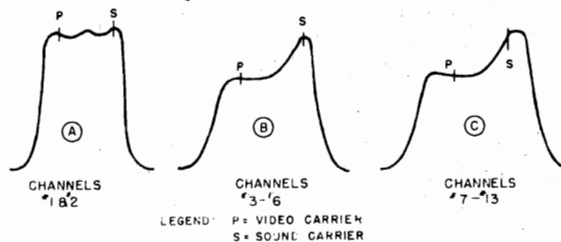


Fig. 11. R-F Alignment Curves

GENERAL ELECTRIC CO.

MODEL 801

or squeeze turns in plate and grid coils if the frequency cannot be obtained by sliding the rings. Spreading turns results in a raising of the frequency; while squeezing turns lowers the frequency.

For the remainder of the channels, the adjustment of the plate coil in relation to the grid coil changes the bandwidth while the spreading or squeezing of the plate and grid coil turns results in the raising or lowering of frequency. Only when the plate and grid coils are tuned to the same frequency will the amplitude be greatest with the correct bandwidth. The outside peaks of the r-f response curve should be aligned to the carrier markers. In general it is desirable to have a slight rise on the high frequency (sound carrier) side of the curve, however the rise should not exceed approximately 30 per cent of the low frequency side. A low frequency rise in the response curve is not desirable and must be avoided, as a picture with poor definition will result if this is done.

The upper channel coils (No. 11, No. 12, and No. 13) may have the plate winding reversed from the winding direction of the plate coil of the other transformers. If this is the case, the bandwidth will be increased by separating the plate and grid coils and vice-versa. This condition can be determined by inspection or by the effect on the curve when making the alignment.

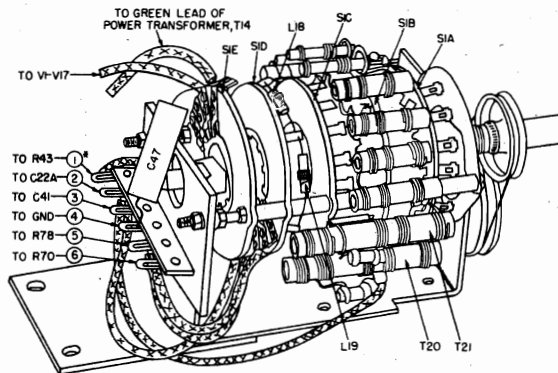


Fig. 12. R-F Coil & Switch Assembly

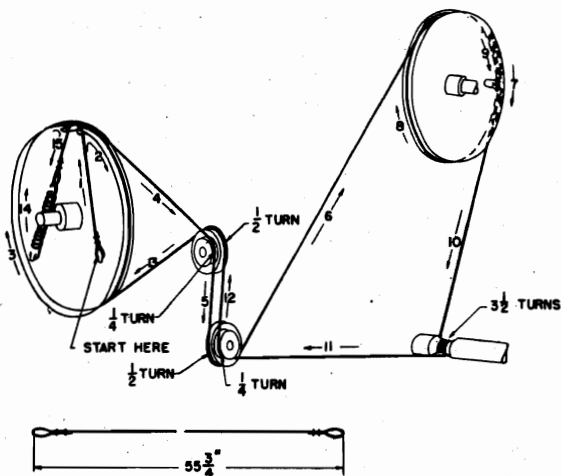


Fig. 15. Radio Tuning, Dial Drive Stringing

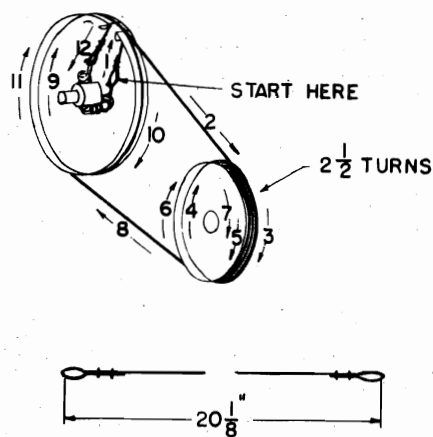


Fig. 16. Television Tuning, Drive Stringing

MISCELLANEOUS INSTALLATION AND SERVICE ADJUSTMENTS

REPLACEMENT OF PICTURE TUBE

To remove the picture tube from the television chassis, remove the picture tube socket and then untape and slide off the ion trap adjustment assembly. The ion trap can be removed readily, if the gap in the assembly is pulled apart slightly with the fingers while attempting to slide it. Loosen the two set screws partially that clamp the left side of the picture tube mounting strap, then slide the strap backward from the top-front rim of the picture tube until the rim of the tube is free from the strap. Carefully pull the tube out through the focus and deflection coils.

To replace a picture tube the reverse procedure should be followed, being careful never to force the picture tube if it sticks or fails to slip into place readily. Investigate and remove the source of the trouble. The picture tube should be oriented so that the anode cap is adjacent to the H.V. rectifier, V13, and the high voltage lead.

Wipe the screen surface of the tube to remove finger marks and dust. **PRECAUTION**—Do not handle, remove, or install a picture tube unless shatterproof goggles and heavy gloves are worn.

ION TRAP ADJUSTMENT

The ion trap may be approximately located as shown in Figure 17; however its final adjustment must be made with the television receiver operating.

The approximate adjustment requires that the gaps in the two magnets be lined up with the break in the rubber holder.

NOTE—Some ion traps have been magnetized so that it is necessary to rotate the small magnet at 180 degrees to this normal position. Then slide the assembly onto the picture tube neck so that the ion trap assembly slit is at the bottom or top (dependent upon picture tube) and lines up with pin #12 or #6. Slide the assembly forward on the picture tube until it is about the position shown in the illustration. **NOTE**—The wider of the two magnets should be located at the rear or the base end of the picture tube. The final following steps should be taken with the television receiver operating:

1. With Brilliance control advanced, turn ion trap assembly so that gap in rubber holder is faced up or down and lines up with either pin #6 or pin #12. Whichever way gives some illumination, is the correct approximate orientation of assembly. If the tube V16 is removed, it will be found much easier to adjust for maximum illumination since the resultant thin line will illuminate even though the magnets are considerably out of adjustment.

2. Move assembly back and forth and rotating it while viewing screen, adjust for maximum brightness.

3. If illuminated area gets very bright, reduce brightness with control and repeat step 2. If tube V16 was removed as suggested in Step 1, replace it before proceeding with step 4.

4. If any shadowing of the tube neck is present after completing step 3, rotate the small (front) magnet to correct shadow and repeat step 2 and 3. **NOTE**—Badly out-of-line focus coils can also cause neck shadowing. The focus coil should be symmetrical and straight before starting the ion trap adjustment.

MODEL 801

GENERAL ELECTRIC CO.

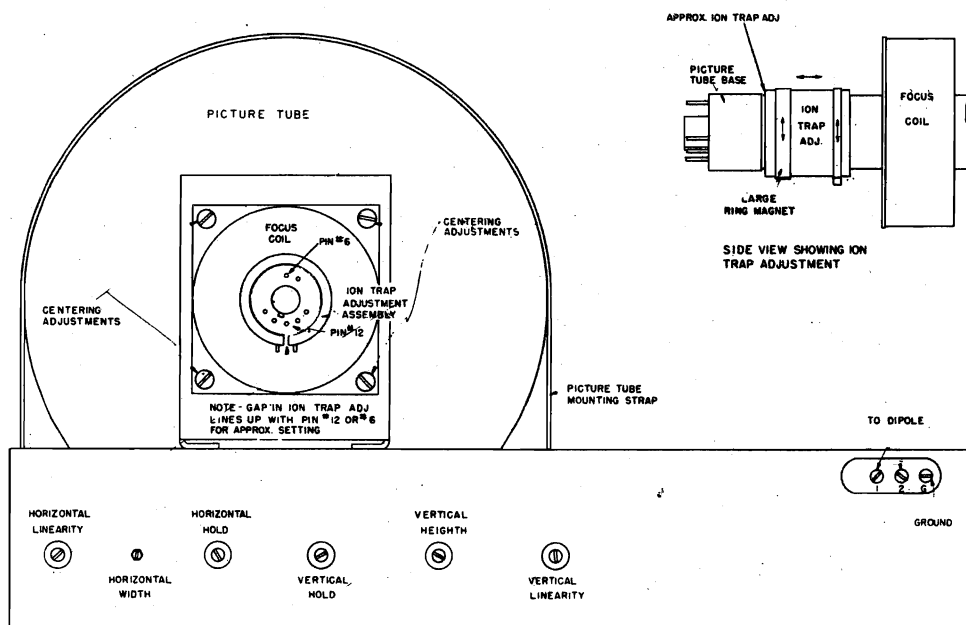


Fig. 17. Location of Installation Adjustment Controls

CENTERING (FOCUS COIL) ADJUSTMENT

The four focus coil adjustment screws should all be tightened sufficiently so that the springs are always under tension. Too loose pressure on the springs will result in the picture centering being unstable. These adjustments are not readily available with the back cover in place unless a long screwdriver is used. Since each screw adjustment reacts in both the horizontal and vertical directions, a maladjustment in the centering may have to be corrected by the adjustment of one to four screws.

DEFLECTION YOKE ADJUSTMENT

Three set screws permit the deflection yoke to be loosened, permitting limited turning in either direction. If the picture does not line up horizontally or square with the picture tube mask, rotate the yoke until this condition is remedied, then tighten the set screws.

HORIZONTAL (HOLD) OSCILLATOR SPEED ADJUSTMENT

The horizontal hold control is a preset adjustment on the rear of the chassis which is used to adjust the speed. In late production receivers, a tuned circuit consisting of L21 and C91 was added to the horizontal oscillator cathode circuit to stabilize the horizontal hold operation. For complete alignment both controls must be adjusted. Check operation first as follows:

Check on Alignment—With a normal television signal being received, free from excessive noise, turn the horizontal hold control to the position where the picture locks in horizontally and passes the following tests:

1. With a picture being received, switch the Station Selector to a channel having no program and then back to the desired channel. The picture should immediately lock into position.
2. With a picture being received, turn the television receiver power "off" for two or three seconds and then turn it back "on" again. The picture should come into synchronization within ten seconds after the picture tube has been illuminated.
3. Turn the Station Selector to the "radio" position and allow the television receiver to transfer for two or three minutes to Broadcast reception, and then return to the television channel transmitting a picture. The picture should synchronize within ten seconds after the picture tube becomes illuminated with receivers not equipped with L21. Receivers with L21 should sync immediately upon showing raster.
4. Turn power off for three or four minutes and then turn "ON." The picture should lock-in horizontally within ten seconds after the raster becomes illuminated.

Minor Adjustments—If the receiver does not have the tuned circuit consisting of L21 and C91 in the cathode of the horizontal multivibrator, V11, the horizontal hold control, R36, should be adjusted until the above checks can be satisfactorily accomplished. If attempted adjustment of the hold control will not permit all the above checks to be met when the tuned circuit is incorporated, then make the adjustment as outlined under "Complete Realignment."

Complete Realignment—Tune in a television signal for optimum sound and adjust for normal contrast.

1. Adjust the Horizontal Hold control to the center of its range.
2. Remove tube V9, and then adjust the iron core of L21 until the picture is approximately synchronized (held in frame) in the horizontal direction.
3. Replace tube V9 and then adjust the Horizontal Hold control until the picture passed all tests as outlined in "Check on Alignment."

VERTICAL (HOLD) OSCILLATOR SPEED ADJUSTMENT

This control, R62, is used to lock the picture in synchronism with the transmitted picture in the vertical direction. When the control is maladjusted the picture will slide vertically out-of-frame or lock out-of-frame, giving overlapping vertical images or even double images in the vertical direction. After the picture is locked in vertically on a normal picture, reduce the contrast control until the picture is barely visible, then readjust the control until the picture holds in frame.

HORIZONTAL LINEARITY AND WIDTH CONTROL

These controls react on each other so that when one control is adjusted the other may have to be. The adjustment of the linearity control should only be made on a test pattern signal. First, obtain the correct width by adjusting the width control, L7, until the picture extends approximately $\frac{1}{8}$ -inch outside the edge of the mask on both sides. Next, adjust the Horizontal Linearity control, R49, until the test pattern is symmetrical in the left and right direction. A slight readjustment of the Width control may now be necessary, as well as touching up of the centering adjusting screws.

VERTICAL LINEARITY AND HEIGHT CONTROL

The Height control, R61, is adjusted until the picture extends approximately $\frac{1}{8}$ inch outside the edge of the mask on both top and bottom. Next, adjust the Vertical Linearity control, R58, until the test pattern is symmetrical from top to bottom. Readjustment of the Height and Vertical Hold controls as well as the centering adjustments may be necessary.

GENERAL ELECTRIC CO.

MODEL 801

PRODUCTION CHANGES

The following production changes have taken place up to the time that this service data was compiled. In most cases the change can not be accurately identified with the serial number of the chassis. The order of listing below does not indicate the chronological order of the change.

1. **Power Transformer, T14 and V23**—The original transformer, T14, supplied, gave insufficient B+ voltage (385 volts) when using a Type 5Y3GT rectifier tube, V23. This resulted in a low anode voltage of 7500 volts for the picture tube. To increase this voltage, a Type 5V4G tube was substituted for the 5Y3G tube, V23. At approximately serial number 2500, a new transformer T14 having Stock No. RTP-040 was substituted, which gave the correct B+ voltage of 415 volts when a Type 5Y3G tube was used as V23. This B+ voltage gives an anode voltage to the picture tube of 8500 volts.

2. **Television Tuning Trimmer C112**—For approximately the first 2000 receivers, the tuning trimmer C112 did not quite have the correct tuning range, making it necessary to add a fixed 10 mmf. capacitor C114 in series with it. The shunt capacitor C102 had a value of 4.7 mmf. Later production trimmer, C114, has the correct range. With this new value of trimmer, the shunt capacitor C112 was changed to 6.0 mmf. This shunt capacitor in a few receivers was merely a 5.0 mmf., while in most it will consist of two capacitors; a 5 mmf. and a 1.0 mmf. capacitor in parallel. The early production trimmer has a $\frac{1}{4}$ -in. O.D. shaft, while the late production trimmer is slightly larger and has a $\frac{3}{8}$ -in. O.D. shaft.

3. **Tone Control, R69B**—The tone control R69B, on early production receivers was connected in series between the Volume Control R69A, movable arm, and C39. C72 was a 680 mmf. capacitor from C39 to ground. Hum in the audio dependent upon the tone control setting necessitated a revision as shown in the schematic.

4. **Tuned Circuit, L20 and C89**—The capacitor, C89, was originally 240 mmf. and the coil, L20, was fixed-tuned and wound on a resistor form. This was later changed to 1000 mmf. and the coil turns were reduced and made variable, resulting in a higher Q circuit. This change permitted adjustment of the trap as described in the alignment procedure.

5. **Resistor, R87**—This resistor was changed from 100,000 ohms to 330,000 ohms to prevent excessive beam current in the picture tube, V8. This excessive beam current caused the high voltage to be reduced when the Brilliance control was advanced to maximum with the result that the control reduced brightness at end of its clockwise travel instead of increasing brightness.

6. **Resistor, R47**—This resistor has been changed from $\frac{1}{2}$ -watt to a 1-watt size. In some cases, the original $\frac{1}{2}$ -watt resistor dissipation is exceeded, especially if the Width control iron core is nearly all the way in the coil, resulting in a reduction in the resistance value. This reduced resistance changes the waveshape across C29 so much that the horizontal multivibrator may lock in at half frequency or not lock at all. It may also result in the resistor burning out.

7. **Change in Horizontal Output Transformer, T9**—A new design horizontal output transformer, T9, was used in late production receivers. This may be identified by the fact that it has two windings instead of the single winding design, as characterized the early production receivers. When the late production transformer is used, a 3900-ohm, 1-watt resistor must be added in series to the existing 6800-ohm, 1-watt resistor, R47. *Do not use a single 1-watt resistor for this.* The capacitor, C66, should be returned to ground when the new type transformer is used.

8. **Horizontal Multivibrator Cathode Switching**—After the first 150 receivers were built, a shorting contact was added to the filament wafer of the Station Selector switch so as to stop the horizontal multivibrator as soon as the Station Selector was switched to "Radio" position. This connects the multivibrator cathode to ground through the filament circuit when switching to "Radio" so that "birdies" are not heard on the broadcast band as the television tubes cool off after switching from television to radio reception.

9. **Screen Resistor, R79**—This resistor was changed from an original 47,000 ohms to 33,000 ohms. This reduces the operating d-c voltage on the plate of V7, and gives greater brightness.

10. **Addition of C21**—A fixed 10 mmf. mica capacitor, C21, was added across C10 so that the trimmer C10 would peak at the center of its range.

11. **Change in R63**—The 330,000 ohm resistor, R63, was changed to 220,000 ohms so that the Vertical Hold control will operate near its mid-adjustment position.

12. **Removal of R95**—To correct a transient which appeared in the vertical retrace as a white line at the top of the picture, the 2200 ohm resistor, R95, in series with capacitor, C37, was removed. The potentiometer, R58, was reconnected as a variable resistance as shown on the schematic.

13. **Value Change of C52**—The original capacity of C52 was 47 mmf. To improve vertical interlace, this capacitor was changed to 240 mmf.

14. **Addition of Tuned Circuit, L21 and C91**—A 15.75 kc tuned circuit was added to the cathode of the horizontal multivibrator, V11. This stabilizes the horizontal AFC circuit to the extent that it prevents picture wiggles on noise pulses and echoes. With this addition, the 240 μ f capacitor, C56, should be changed to 150 mmf. and the 150,000 ohm resistor, R40, should be increased to 330,000 ohms. This prevents a white line at the left-center of the picture which may result with installation of L21-C91. With addition of L21, the capacitor, C30, was changed from a 40 mfd to a 1.0 mfd, and C92 was changed from 1.0 mfd to a .05 mfd.

15. **Connection of Primary of T11**—On early production receivers the primary of T11 was connected to a mid-tap on choke L10. This connection caused a resonant condition to develop which affected the lower television bands. This was corrected temporarily by shunting a 47 mmf. capacitor between the midtap of L10 and ground. Later the primary of T11 was connected to the junction of L10 and C101 as shown on the schematic.

50-CYCLE OPERATION

The supplement schematic diagram, Figure 18, shows the wiring of the power transformer, T14, through the special terminal board installed. Also, it shows the addition of capacitors C98 and C99 required for additional filtering. The changes involved in changing from 60-cycle to 50-cycle operation are listed below:

1. The 50-cycle power transformer, T14, is separated from the chassis and installed on a mounting plate at the base of the cabinet.

2. All filament and high voltage leads are extended on the transformer and terminated at the chassis proper in a terminal board. The connection of these leads through this terminal board is shown in Figure 18. All leads are twisted.

3. A 90 mfd. capacitor, C98, is shunted across C62. A 90 mfd. capacitor, C99, is shunted across C45-A.

4. The bias supply filter capacitor, C69, is changed to a 50 mfd. capacitor.

5. Filament leads to V6, V7, V9, V10, V11, V12, V14, V15, V16, and V17 are twisted. The ground connection is made at one point only for this series of tubes, and the high side is connected through the filament wafer of the band switch.

TROUBLE SHOOTING

The following is a listing of possible troubles and their cures. This is not intended as a comprehensive coverage of all possible failures but serves to point out some of the more difficult troubles that may be experienced. From time to time this information will be expanded as information becomes available.

I. NO RASTER ON PICTURE TUBE

(a) Ion trap adjustment incorrectly made. Assembly on backward or improperly oriented. See ion trap adjustment under "Miscellaneous Preset and Service Adjustments."

(b) Check for waveform at output of T9. If present, the trouble is probably in the Type 8016 rectifier tube or filter circuit. Check for open in high voltage winding of T9. If the V13 tube filament glows yellow, high-voltage is being generated and the trouble will possibly exist in the picture tube, V8.

(c) If there is no waveform at output of T9, check operation of 807, V12, V7, and multivibrator V11 by oscilloscope waveform measurement.

(d) Check that high voltage anode cap is contacting the anode terminal of V8.

SOCKET VOLTAGE CHART

NOTE—All d-c measurements taken by a 20,000 ohm/volt meter. Station selector switch at Channel No. 1 unless noted. Contrast control at maximum, Brilliance at minimum.

SYM. BOL	TUBE TYPE	PLATE		SCREEN		CATHODE		GRID		PLATE SCREEN M.A.	NOTES
		PIN VOLTS	PIN VOLTS	PIN VOLTS	PIN VOLTS	PIN VOLTS	PIN VOLTS	PIN VOLTS	PIN VOLTS		
V1	6AU6	5	140	6	140	7	1.3	1	0	7.2	—
V2A	7F8	6	115	—	—	5	0	8	-4.5*	2.5	* Measured with V.T.V.M.
V2B		3	180	—	—	4	0	1	0	10	—
V3	6AC7	8	150	6	150	5	0	4	-2*	14	* Measured on 50 v scale
V4	6AC7	8	160	6	160	5	0	4	-2*	15	* Measured on 50 v scale
V5	6AC7	8	170	6	170	5	2	4	0	14	3
V6A	6H6	5	0	—	—	8	0	—	—	4	—
V6B		3	-8.5	—	—	4	6.3AC	—	—	0	—
V7	6AC7	8	150	6	125	5	0	4	0	15	3.7
V8	10BP4	CAP	8300*	10	415	11	150	2	90	—	—
V9A	6SN7GT	2	12.5	—	—	3	0	1	-1	.2	—
V9B		5	110*	—	—	6	11	4	6	10	—
V10A	6SL7GT	2	-95	—	—	3	0.5	1	-9.5	0	—
V10B		5	42.5	—	—	6	0.5	4	0.5	1	—
V11A	6SN7GT	5	170	—	—	6	6	4	-25	2.5	—
V11B		2	135	—	—	3	6	1	0	2.9	—
V12	307	CAP	415	2	345	4	22	3	-10	76	13
V13	8016	CAP	—	—	—	2	8300*	—	—	—	—
V14	6AS7GT	2 & 5	0	—	—	3 & 6	10	1 & 4	-15	—	—
V15A	6SL7GT	2	0.5	—	—	3	7.5	1	0.5	0	—
V15B		5	105	—	—	6	10	4	4	1	—
V16A	6SN7GT	2	30	—	—	3	1.5	1	0	.7	—
V16B		5	14.5	—	—	6	1.5	4	4.5	.1	—
V17	6V6GT	3	195	4	135	8	23.5	5	14.5	20	1.85
V18*	6SA7	3	200	4	80	8	0	6	0	3	8.5
V19	6SG7	8	200	6	110	5	1	4	0	10	4
V20	6SV7	6	195	4	88	2	-0.5	3	0	9.7	1.7
V21A	6AQ7GT	1 & 3	0	—	—	2	0	—	—	0	—
V21B		5	75	—	—	6	0	4	0	1	—
V22	6V6GT	3	230	4	200	8	10	5	0	41.5	4.5
V23	5Y3GT	4 & 6	315AC	—	—	2	425	—	—	85*	* Cathode current
V24	5U4G	4 & 6	240AC	—	—	2	250	—	—	160*	* Cathode current.

- NO RASTER ON PICTURE TUBE (Cont'd)**
 - Open Brightness control, R83B, R87, or R85.
 - No. B+ voltage at junction L4 and L3.
 - If only two or three thousand volts are generated, check deflection yoke, L9, and Width control, L7, for continuity.
- RASTER NORMAL, NO PICTURE OR SOUND**
 - Oscillator V2B defective, or oscillator coil resonates out of band.
 - Defective antenna or lead-in.
 - Converter, r-f amplifier, or first video i-f amplifier stage defective.
- PICTURE NORMAL, NO SOUND**
 - 21.9 mc audio i-f amplifier, discriminator, or audio amplifier defective.
 - Oscillator V2B off frequency.
 - Defective speaker.
- RASTER NORMAL, SOUND NORMAL, NO PICTURE**
 - Video i-f amplifier (after 1st i-f) inoperative.
 - Resistor R83 defective, or C91 defective or open.
 - Screen by-pass C32C open or shorted.
- NORMAL PICTURE AND SOUND, NO HORIZONTAL OR VERTICAL SYNC.**
 - Check for signal input waveform at grid (1) of V9A. Defective V9A or plate circuit components.
 - Operation of receiver with Contrast control advanced too far.
- PICTURE NORMAL, NO VERTICAL SYNC.**
 - Check grid of V15B for normal waveform.
 - Check speed of vertical multivibrator. Should be capable of free running speed less than 60 cps.
 - Check V15B circuit components.
- PICTURE NORMAL, NO HORIZONTAL SYNC.**
 - Check AFC transformer, T7.
 - Check alignment of L21 and C91.
 - Check socket voltages and waveforms of V10B and V11.
 - Check resistor R47 for correct value.
- NO VERTICAL OR NO HORIZONTAL DEFLECTION**
 - Check waveform and socket voltages of output and multivibrator sections of respective sweep circuits.
 - Check output transformer and yoke for continuity.
- ONE OR MORE HORIZONTAL WHITE LINES AT TOP OF PICTURE**
 - Check for Production Change #12.
- RIPPLE ON EDGE OF PICTURE**
 - Reflections on antenna lead-in.
 - Instability of horizontal AFC circuit. See Production Change #14.
 - Defective capacitor, C30.
- RASTER EDGE NOT STRAIGHT—KEYSTONING**
 - Defective yoke transformer.
 - Improperly adjusted ton trap adjustment assembly.
- PICTURE JUMPY**
 - Operation at too high contrast control setting.
 - Move regular rate sideways, check capacitor C30, R33 or C91. Picture change #14.
 - If left of picture litters, change 801 sweep tube, V12.
 - Noisy sweep or sync circuit tubes.
- POOR INTERLACE OF VERTICAL SWEEP**
 - Check Production Change #13.
- POOR PICTURE DETAIL**
 - Mismatch in antenna or lead-in.
 - Missalignment of i-f or r-f circuits.
 - Defective chokes L3, L4 or L5 in video amplifier.
 - Make sure that focus control operates on both sides of proper focus point.
 - Overload of video amplifier, check contrast control operation.
- PICTURE CANNOT BE CENTERED**
 - Move focus coil back by loosening all four adjustment screws.
- FOCUS CONTROL AT END OF TRAVEL**
 - Short out resistor, R96.
 - Check for correct B+ voltages.

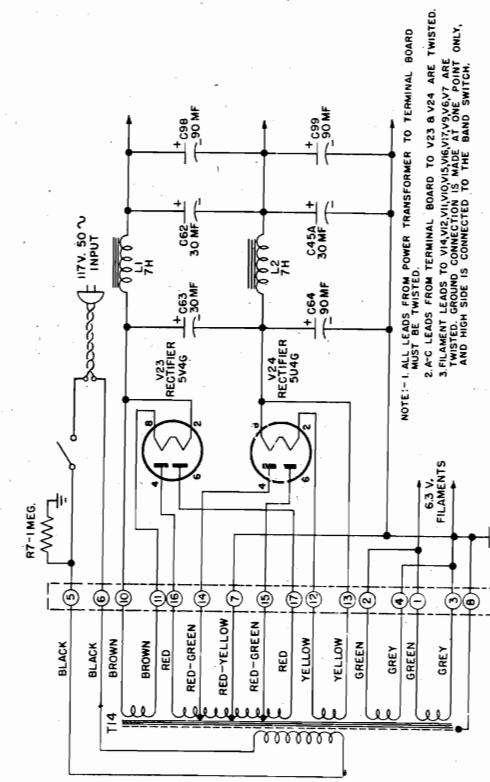


Fig. 18. Schematic Changes for 80-cycle Operation

GENERAL ELECTRIC CO.

MODEL 801

ALIGNMENT TABLE (CONT'D)

STEP NO.	SIGNAL GENERATOR FREQUENCY	SIGNAL SWEEP GENERATOR FREQUENCY	CONNECT OSCILLOSCOPE TO CHASSIS & SWITCH	STATION SELECTOR SWITCH	DIAL SETTING	ADJUST	REMARKS
(5) VIDEO I-F AMPLIFIER ALIGNMENT							
1	23.0 mc & 26.4 mc marker	20-30 mc sweep	Junction of L4 and R16	Channel #13	—	C17 and C18 for max. amplitude, bandwidth, and correct positioning of markers.	Shunt C14, T3 primary trimmer with a 100 mmf capacitor. See Fig. 9A.
2	23.0 mc & 26.4 mc marker	20-30 mc sweep	Junction of L4 and R16	Channel #13	—	C14 and C15 for max. amplitude, bandwidth, and correct positioning of markers.	Remove 100 mmf capacitor from C14 and shunt C11, T2 primary trimmer, with it. See Fig. 9B.
3	23.0 mc & 26.4 mc marker	20-30 mc sweep	Junction of L4 and R16	Channel #13	—	Adjust L20 for minimum overshoot	See Fig. 9B. Either spread or squeeze turns together to give minimum amplitude of overshoot.
4	23.0 mc & 26.4 mc marker	20-30 mc sweep	Junction of L4 and R16	Channel #13	—	C11 and C12 for max. amplitude, bandwidth, and correct positioning of markers	Remove 100 mmf capacitor from C11 and shunt C11, T2 primary trimmer, with it. See Fig. 9C.
5	23.0 mc & 26.4 mc marker	20-30 mc sweep	Junction of L4 and R16	Channel #13	—	Readjust L20 for minimum overshoot	See Fig. 9C. Repeat procedure as in step 3, except for point of signal input.
6	23.0 mc, 26.4 mc, & 25.65 mc	20-30 mc sweep	Junction of L4 and R16	Radio*	—	C8 and C9 for max. amplitude, bandwidth, and correct positioning of markers	Remove 100 mmf capacitor from C8. See Fig. 9D. * Jump filament wafer switch with clip lead so that tube filaments will be lit. Remove B+ from r-f assembly.

(6) OSCILLATOR COIL ADJUSTMENT

1	49.75 mc with tone modulation	—	Antenna terminals	Channel #1	—	Turns of osc. coil, T20.	Make sure that C112 is at mid-position of travel. Use sound output as indicator.
2	59.75 mc with tone modulation	—	Antenna terminals	Channel #2	—	Turns of osc. coil, T21.	Same as for Step #1.
3	65.75 mc with tone modulation	—	Antenna terminals	Channel #3	—	Turns of osc. coil, T22.	Same as for Step #1.
4	71.75 mc with tone modulation	—	Antenna terminals	Channel #4	—	Turns of osc. coil, T23.	Same as for Step #1.
5	81.75 mc with tone modulation	—	Antenna terminals	Channel #5	—	Turns of osc. coil, T24.	Same as for Step #1.
6	87.75 mc with tone modulation	—	Antenna terminals	Channel #6	—	Turns of osc. coil, T25.	Same as for Step #1.
7	179.75 mc with tone modulation	—	Antenna terminals	Channel #7	—	Lead gap of oscillator coil, T26.	Same as for Step #1.

ALIGNMENT TABLE

Before attempting the following tabular alignment procedure, read the preceding section "ALIGNMENT SUGGESTIONS".

STEP NO.	SIGNAL GENERATOR FREQUENCY	SIGNAL SWEEP GENERATOR FREQUENCY	CONNECT OSCILLOSCOPE TO CHASSIS & SWITCH	STATION SELECTOR SWITCH	DIAL SETTING	ADJUST	REMARKS
(1) BROADCAST I-F ALIGNMENT							
1	455 kc with tone modulation	Not Used	Junction C41 & R69A	Radio	550 kc	C75 & C76 for max. output	
2	455 kc with tone modulation	Not Used	Junction C41 & R69A	Radio	550 kc	C73 & C74 for max. output	
(2) BROADCAST R-F ALIGNMENT							
1	1500 kc modulation	Not Used	Ant. terminal thru 200 mmf	Radio	—	C57B osc. trimmer for maximum output	* Tune gang condenser to minimum capacity setting.
2	1500 kc modulation	Not Used	Ant. terminals thru 200 mmf	Radio	1500 kc**	C67A r-f trimmer for maximum output	** If pointer does not fall on the 1500 kc calibration when the 1500 kc signal is tuned in, also tune gain on dial cord until it does.
(3) TELEVISION I-F TRAP ALIGNMENT							
1	21.9 mc with tone modulation	Not Used	Junction L4 & R16	Channel #13	—	C19 on T4 for minimum output	Connect 10,000 ohms in series with oscilloscope input lead.
2	21.9 mc with tone modulation	Not Used	Junction L4 & R16	Channel #13	—	C16 on T3 for minimum output	
3	21.9 mc with tone modulation	Not Used	Junction L4 & R16	Channel #13	—	C13 on T2 for minimum output	
4	27.9 mc with tone modulation	Not Used	Junction L4 & R16	Channel #13	—	C10 on T1 for minimum output	
(4) TELEVISION SOUND I-F AMPLIFIER ALIGNMENT							
1	21.9 mc unmodulated	21.9 mc with 2 mc sweep width	Junction of R77 & C49	Channel #13	—	C79 & C80 for max. amplitude and symmetry try at 21.9 mc	Detune C84 on T6; then adjust C79 & C80 for max. amplitude and symmetry as shown in Fig. 8A.
2	21.9 mc with tone modulation	Not Used	Grid (4) of V3	Channel #13	—	C78 for minimum tone output	With volume control half-way, adjust C78 for minimum tone output.
3	Not Used	21.9 mc with 2 mc sweep width	Junction of C41 and R69A	Channel #13	—	C84 for max. peak to peak amplitude	Peak trimmer so that the positive and negative peaks have max. peak to peak amplitude. See Fig. 8B.
4	Repeat steps 2 and 3.						

MODEL 801

GENERAL ELECTRIC CO.

ALIGNMENT TABLE (CONT'D)

STEP NO.	SIGNAL GENERATOR FREQUENCY	SIGNAL POINT	CONNECT SCOPE TO CHASSIS &	STATION SWITCH	DIAL TUNING	ADJUST	REMARKS	STEP NO.	SIGNAL GENERATOR FREQUENCY	SIGNAL POINT	CONNECT SCOPE TO CHASSIS &	STATION SWITCH	DIAL TUNING	ADJUST	REMARKS
(6) OSCILLATOR COIL ADJUSTMENT (Cont'd)															
8	185.75 mc with tone modulation	Antenna terminals	—	Channel #8	—	Lead gap of oscillator coil, T27.	Same as for Step #1.	5	Markers 175.25 mc & 181.75 mc	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #5	—	For max. amplitude and for recommended response	See Fig. 11B for resultant alignment curve.
9	191.75 mc with tone modulation	Antenna terminals	—	Channel #9	—	Lead gap of oscillator coil, T28.	Same as for Step #1.	6	Markers 175.25 mc & 181.75 mc	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #6	—	For max. amplitude and for recommended response	See Fig. 11B for resultant alignment curve.
10	197.75 mc with tone modulation	Antenna terminals	—	Channel #10	—	Lead gap of oscillator coil, T29.	Same as for Step #1.	7	Markers 175.25 mc & 179.75 mc	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #7	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
11	203.75 mc with tone modulation	Antenna terminals	—	Channel #11	—	Lead gap of oscillator coil, T30.	Same as for Step #1.	8	Markers 181.25 mc & 185.75 mc	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #8	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
12	209.75 mc with tone modulation	Antenna terminals	—	Channel #12	—	Lead gap of oscillator coil, T31.	Same as for Step #1.	9	Markers 187.25 mc & 191.75 mc	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #9	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
13	215.75 mc with tone modulation	Antenna terminals	—	Channel #13	—	Lead gap of oscillator coil, T32.	Same as for Step #1.	10	Markers 193.25 mc & 197.75 mc	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #10	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
(7) R-F COIL ALIGNMENT															
1	Markers 45.25 mc & 49.75 mc	Channel #1 Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #1	—	For max. amplitude and for recommended response	See Fig. 11A for resultant alignment curve.	11	Markers 209.25 mc & 208.75 mc	Channel #11 Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #11	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
2	Markers 55.25 mc & 59.75 mc	Channel #2 Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #2	—	For max. amplitude and for recommended response	See Fig. 11A for resultant alignment curve.	12	Markers 205.25 mc & 209.75 mc	Channel #12 Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #12	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
3	Markers 61.25 mc & 65.75 mc	Channel #3 Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #3	—	For max. amplitude and for recommended response	See Fig. 11B.	13	Markers 211.25 mc & 215.75 mc	Channel #13 Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #13	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
4	Markers 67.25 mc & 71.75 mc	Channel #4 Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #4	—	For max. amplitude and for recommended response	See Fig. 11B for resultant alignment curve.								

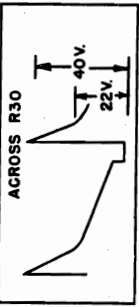


Fig. 40. Discriminator Voltage (Osc. Synced at Half of Hor. Sweep Speed)

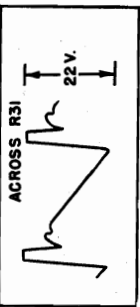


Fig. 41. Discriminator Voltage (Osc. Synced at Half of Hor. Sweep Speed)

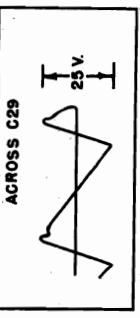


Fig. 39. A.L.C. Sawtooth (Osc. Synced at Half of Hor. Sweep Speed)

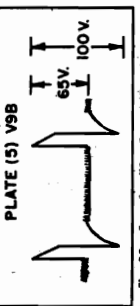


Fig. 38. Sync Amplifier Output (Osc. Synced at Half of Hor. Sweep Speed)



Fig. 37. Clipper Output (Osc. Synced at Half of Vert. Sweep Speed)

WAVEFORM MEASUREMENTS
 The waveforms shown in Figures 35 through 38 represent measurements on the Model 801 receiver. The measurements indicated in the figures are for a normal picture with correct Contrast, Height, Width and Linearity. Most measurements must be made when a signal is being received.
 An oscilloscope where the vertical deflection amplifier has been adjusted for a normal picture with correct Contrast, Height, Width and Linearity. Most measurements must be made when a signal is being received.

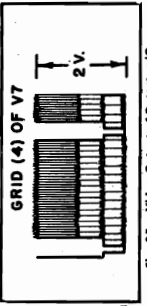


Fig. 35. Video Output of Detector (Osc. Synced at Half of Vert. Sweep Speed)

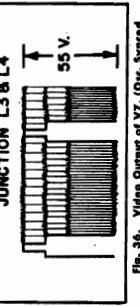
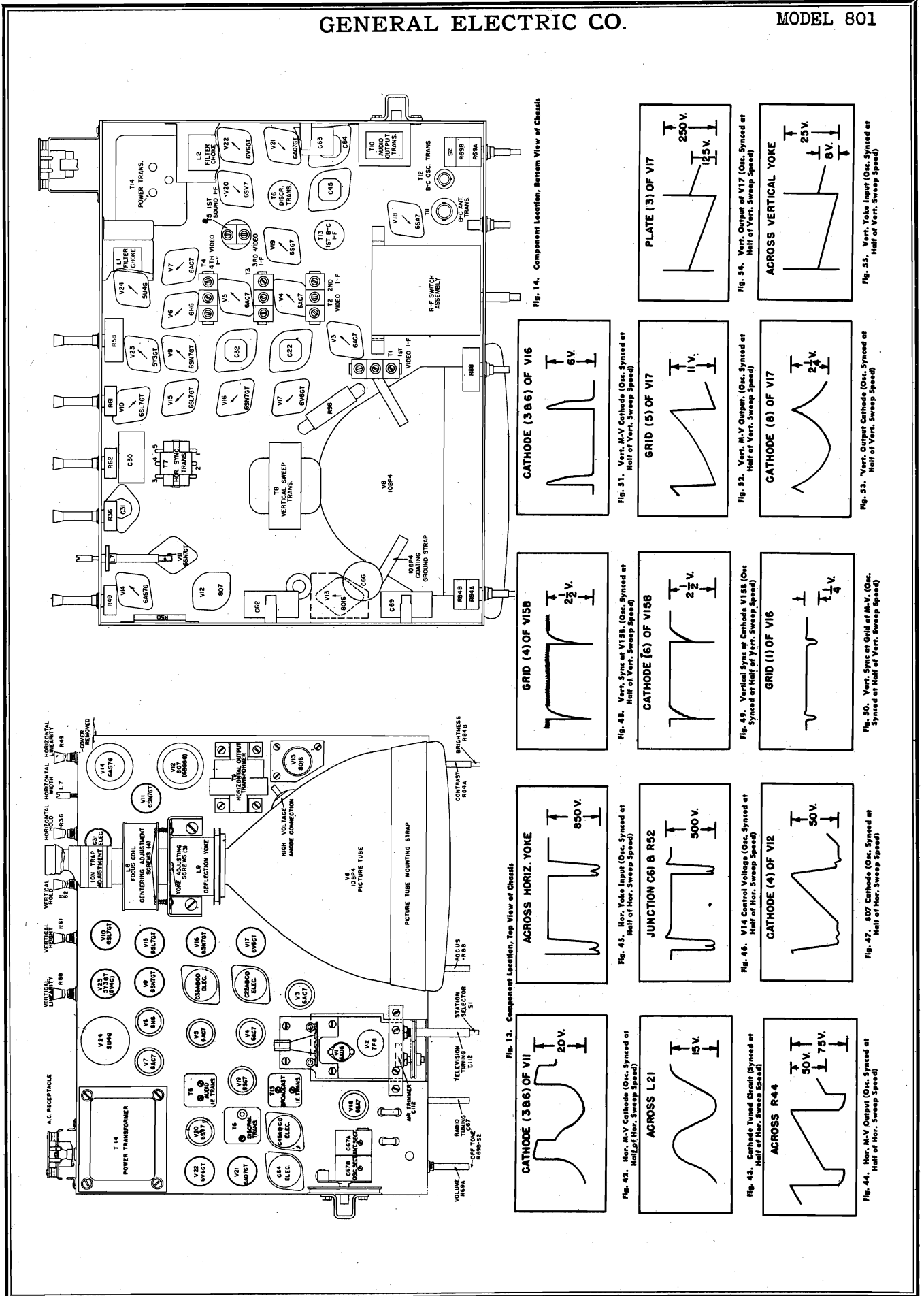


Fig. 36. Video Output of V7 (Osc. Synced at Half of Vert. Sweep Speed)

GENERAL ELECTRIC CO.

MODEL 801



MODEL 801

GENERAL ELECTRIC CO.

UNIVERSAL REPLACEMENT PARTS

UCC-011	C42, 87	CAPACITOR—.05 mfd., 200 v., paper
UCC-017	C30, 69	CAPACITOR—1.0 mfd., 200 v., paper (C69 for 60-cycle receiver only)
UCC-025	C27, 28	CAPACITOR—.01 mfd., 400 v., paper
UCC-035	C43, 81	CAPACITOR—.001 mfd., 600 v., paper
UCC-040	C36, 39, 40, 41, 51, 54, 55, 60, 71, 79, 72	CAPACITOR—.01 mfd., 600 v., paper
UCC-041	C23, 34, 44	CAPACITOR—.02 mfd., 600 v., paper
UCC-045	C26, 33, 53, 58, 85, 92	CAPACITOR—.05 mfd., 600 v., paper
UCC-048	C37, 38, 59, 70, 77	CAPACITOR—.10 mfd., 600 v., paper
UCU-520	C50	CAPACITOR—47 mmf., mica
UCU-1014	C83	CAPACITOR—27 mmf., mica
UCU-1048	C35, 65	CAPACITOR—680 mmf., mica
UCU-1052	C57, 89	CAPACITOR—1000 mmf., mica
UCU-1504	C20, 21	CAPACITOR—.0 mmmf., mica
UCU-1520	C49, 21, 68	CAPACITOR—47 mmf., mica
UCU-1526	C100, 101	CAPACITOR—82 mmf., mica
UCU-1532	C90, 56	CAPACITOR—150 mmf., mica
UCU-1536	C46	CAPACITOR—220 mmf., mica
UCU-2538	C52	CAPACITOR—240 mmf., mica
UCW-1020	C103, 104	CAPACITOR—47 mmf., ceramic
UCW-1026	C86, 105	CAPACITOR—16 mmf., ceramic
UCP-2009	LS1	CONE—Replacement speaker cone assembly
UOY-005	R59	RESISTOR—120 ohms, 1/2 w., carbon
URD-027	R11	RESISTOR—150 ohms, 1/2 w., carbon
URD-029	R24, 43, 99, 100	RESISTOR—1000 ohms, 1/2 w., carbon
URD-049	R4, 51, 52, 67	RESISTOR—2200 ohms, 1/2 w., carbon
URD-073	R18, 42, 86	RESISTOR—10,000 ohms, 1/2 w., carbon
URD-077	R21	RESISTOR—15,000 ohms, 1/2 w., carbon
URD-081	R65, 89, 28, 29	RESISTOR—22,000 ohms, 1/2 w., carbon
URD-085	R92	RESISTOR—33,000 ohms, 1/2 w., carbon
URD-089	R78, 79	RESISTOR—47,000 ohms, 1/2 w., carbon
URD-091	R20	RESISTOR—50,000 ohms, 1/2 w., carbon
URD-093	R66, 70	RESISTOR—68,000 ohms, 1/2 w., carbon
URD-095	R68	RESISTOR—82,000 ohms, 1/2 w., carbon
URD-097	R2, 6, 94, 39, 41, 76	RESISTOR—100,000 ohms, 1/2 w., carbon
URD-099	R71, 72	RESISTOR—120,000 ohms, 1/2 w., carbon
URD-101	R83	RESISTOR—150,000 ohms, 1/2 w., carbon
URD-105	R55, 77, 63, 64	RESISTOR—220,000 ohms, 1/2 w., carbon
URD-109	R22, 87, 40	RESISTOR—330,000 ohms, 1/2 w., carbon
URD-111	R74	RESISTOR—390,000 ohms, 1/2 w., carbon
URD-113	R44, 97	RESISTOR—470,000 ohms, 1/2 w., carbon
URD-117	R85	RESISTOR—680,000 ohms, 1/2 w., carbon
URD-119	R75	RESISTOR—820,000 ohms, 1/2 w., carbon
URD-121	R7, 19	RESISTOR—1.0 meg., 1/2 w., carbon
URD-129	R23, 25, 81, 60	RESISTOR—2.2 meg., 1/2 w., carbon
URD-137	R73	RESISTOR—4.7 meg., 1/2 w., carbon
URD-145	R56	RESISTOR—10.0 meg., 1/2 w., carbon
URD-1041	R32, 57	RESISTOR—470 ohms, 1/2 w., carbon
URD-1051	R33, 8, 10	RESISTOR—1200 ohms, 1/2 w., carbon
URD-1053	R14, 3	RESISTOR—1500 ohms, 1/2 w., carbon
URD-1069	R15, 27	RESISTOR—6800 ohms, 1/2 w., carbon
URD-1097	R34, 35	RESISTOR—100,000 ohms, 1/2 w., carbon
URE-035	R53	RESISTOR—270 ohms, 1 w., carbon
URE-045	R38	RESISTOR—680 ohms, 1 w., carbon
URE-065	R37	RESISTOR—4700 ohms, 1 w., carbon
URE-067	R26	RESISTOR—5600 ohms, 1 w., carbon
URE-089	R1, 48	RESISTOR—47,000 ohms, 1 w., carbon
URE-097	R90	RESISTOR—100,000 ohms, 1 w., carbon
URE-1056	R17	RESISTOR—2000 ohms, 1 w., carbon
URE-1063	R5, 9, 12, 54	RESISTOR—3900 ohms, 1 w., carbon
URF-041	R13	RESISTOR—470 ohms, 2 w., carbon
URF-045	R82, 91	RESISTOR—680 ohms, 2 w., carbon
URF-071	R46	RESISTOR—8200 ohms, 2 w., carbon
URF-073	R80, 93	RESISTOR—10,000 ohms, 2 w., carbon
URF-1061	R16	RESISTOR—3300 ohms, 2 w., carbon

SPECIALIZED REPLACEMENT PARTS

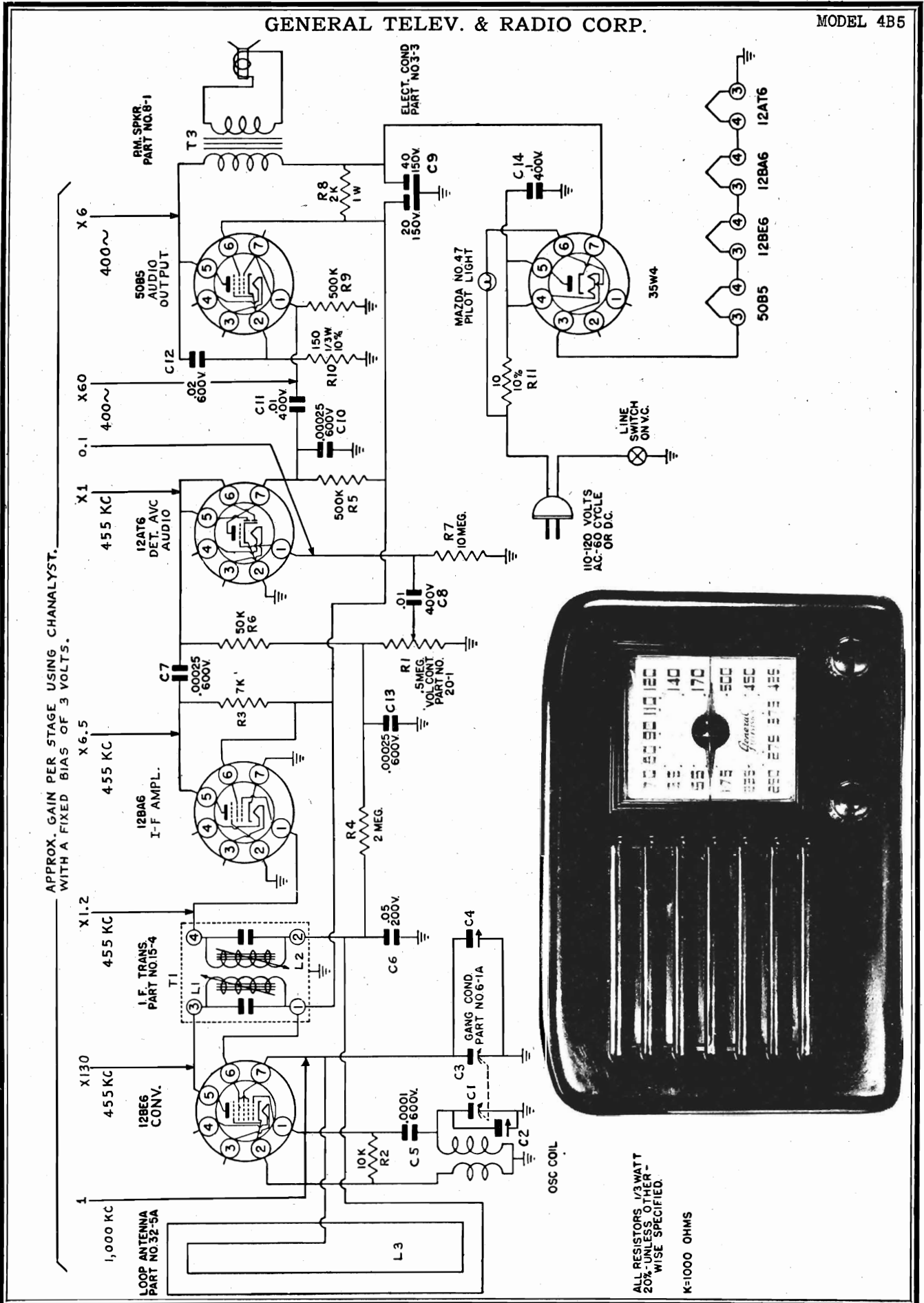
RAB-040		BACK—Cabinet back cover
RAV-001		BEZEL—Pilot light bezel, bottom of cabinet
RAL-033		CABINET—Model 801 cabinet (less hardware)
RCC-002	C1, 2, 3, 4, 5, 6, 7, 24, 25, 47, 88	CAPACITOR—.006 mfd., 600 v., paper
RCC-038	C82	CAPACITOR—.004 mfd., 600 v., paper
RCE-017	C64	CAPACITOR—90 mfd., 450 v., electrolytic
RCE-018	C31A, B, C	CAPACITOR—40 mfd., 40 mfd., 40 mfd., 25 v., electrolytic
RCE-019	C45A, B, C, D, 22A, B, C, D	CAPACITOR—30 mfd., 30 mfd., 15 mfd., 450 v.; 30 mfd., 15 v., electrolytic
RCE-020	C32A, B, C, D	CAPACITOR—30 mfd., 15 mfd., 15 mfd., 15 mfd., 450 v., electrolytic
RCE-021	C62, 63	CAPACITOR—30 mfd., 300 v., electrolytic
RCE-048	C69	CAPACITOR—50 mfd., 25 v., electrolytic (used on 50-cycle receivers only)
RCN-001	C110	CAPACITOR—1 mmf., miniature
RCN-002	C11, 113	CAPACITOR—.068 mmf., miniature
RCN-003	C66	CAPACITOR—500 mmf., electrofilm
RCS-001	C9L	CAPACITOR—.05 mfd., 200 v., paper
RRC-023	R84A, B	POTENTIOMETER—500,000 ohms, 1/2 w., (Brightness control); 500,000 ohms, 1/2 w., (Contrast control)
RRC-024	R58	POTENTIOMETER—1000 ohms, 2 w., w.w., (Vertical Linearity)
RRC-025	R88	POTENTIOMETER—5000 ohms, 4 w., w.w., (Focus control)
RRC-034	L7	CHOKE—Variable choke (Horizontal size)
RRD-1032	R101	RESISTOR—200 ohms, 1/2 w., carbon
RRD-1057	R106	RESISTOR—2200 ohms, 1/2 w., carbon
RRD-1081	R105	RESISTOR—22,000 ohms, 1/2 w., carbon
RRD-1097	R30, 31	RESISTOR—100,000 ohms, 1/2 w., carbon
RRD-1105	R104	RESISTOR—220,000 ohms, 1/2 w., carbon
RRE-1069	R102, 103, 47	RESISTOR—6800 ohms, 1 w., carbon
RRW-011	R50	RESISTOR—300 ohms, 7.4 w., wirewound
RRW-012	R56	RESISTOR—400 ohms, 7.4 w., wirewound
RTD-003	T6	TRANSFORMER—FM i-f discriminator
RTL-023	T1	TRANSFORMER—1st video i-f transformer

SPECIALIZED REPLACEMENT PARTS (Cont'd)

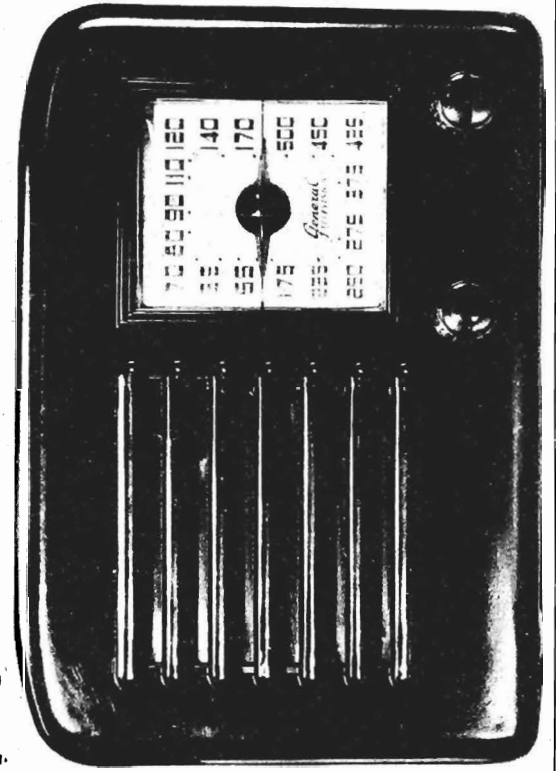
RCT-013	C67A, B	CONDENSER—2-section broadcast tuning condenser
RCW-2001	C102	CAPACITOR—5 mmf., ceramic
RCW-026	C106	CAPACITOR—1500 mmf., ceramic
RCW-1028	C107, 108	CAPACITOR—100 mmf., ceramic
RCY-015	C112	CONDENSER—Television tuning condenser
RDC-029		CORD—Television tuning drive cord
RDC-027		CORD—Broadcast dial cord
RDD-007		HUB AND DRUM ASSEMBLY—On Broadcast dial
RDD-008		DRUM AND SHAFT ASSEMBLY—For Broadcast dial
RDD-009		DRUM—Dial drive pointer drum and shaft assembly for B-C tuning
RDK-071		KNOB—Control knob for Radio Tuning or Focus
RKD-072		KNOB—Control knob for Television Tuning
RKD-073		KNOB—Control knob for Station Selector
RDK-074		KNOB—Control knob for Volume or Contrast
RDE-075		KNOB—Control knob Off-Tone or Brightness
RDL-002		LIGHT—Pilot light, Mazda No. 44, 6-8 v., 0.25 A., frosted for B-C tuning scale
RDM-006		MASK—Picture tube mask
RDP-023		POINTNER—Broadcast dial pointer and hub assembly
RDS-034		GLASS—Broadcast dial glass
RDW-004		GLASS—Picture tube safety glass
RDX-028		SCALE—Broadcast dial scale assembly
RHC-008		CLIP—Clip for holding tubular capacitors
RHG-006		GROMMET—Power cord grommet
RHM-016		CLIP—B-C oscillator coil clip
RHM-028		CLIP—B-C r-f coil clip
RHX-018		HARDWARE—Hardware for mounting gang condenser
RJC-001		PIN—Speaker lead contact pin
RJC-007		CONNECTOR—High voltage anode connector for picture tube
RJJ-005		RECEPTACLE—A-C receptacle (male) on chassis
RJP-015		PLUG—A-C plug (on back cover)
RJS-012		PLATE—Mounting plate for electrolytic capacitor (small size)
RJS-030		SOCKET—Octal base tube socket
RJS-037		PLATE—Mounting plate for electrolytic capacitor (large size)
RJS-041		SOCKET—Miniature tube socket for 6AU6
RJS-042		SOCKET—Loctal tube socket for 7F8
RJS-057		TUBE SOCKET—5-pin socket for 807
RJS-058		SOCKET—Tube socket for picture tube
RJS-059		SOCKET—Dial scale pilot lamp socket
RJS-064		SOCKET—Bezel pilot lamp socket
RJX-014		SWITCH—R-f coil assembly completely wired and aligned (including tubes)
RLA-007		TRANSFORMER—B-C antenna transformer
RLC-012		TRANSFORMER—B-C oscillator transformer
RLD-001		COIL—Deflection coil
RLF-005		CHOKE—7 h., 75 ma. filter choke
RLF-006		CHOKE—7 h., 140 ma. filter choke
RLF-008		COIL—Focus coil
RLF-009		CHOKE—Broadcast choke coil
RLI-003		CHOKE—R-F amplifier cathode choke
RLI-006		CHOKE—R-F amplifier cathode choke
RLI-007		CHOKE—90 uh. video choke
RLI-008		CHOKE—55 uh. video choke
RLI-009		CHOKE—Video detector choke
RLI-011		COIL—R-F and oscillator coil (Band 7)
RLI-012		COIL—R-F and oscillator coil (Band 8)
RLI-013		COIL—R-F and oscillator coil (Band 9)
RLI-014		COIL—R-F and oscillator coil (Band 10)
RLI-015		COIL—R-F and oscillator coil (Band 11)
RLI-016		COIL—R-F and oscillator coil (Band 12)
RLI-017		COIL—R-F and oscillator coil (Band 13)
RLI-019		CHOKE—Oscillator cathode choke
RLI-031		CHOKE—Cathode choke assembly
RLM-003		COIL—R-F and oscillator coil (Band 3)
RLM-004		COIL—R-F and oscillator coil (Band 4)
RLM-005		COIL—R-F and oscillator coil (Band 5)
RLM-006		COIL—R-F and oscillator coil (Band 6)
RLM-008		COIL—R-F and oscillator coil (Band 1)
RLM-009		COIL—R-F and oscillator coil (Band 2)
RMB-009		BUSHING—B-C tuning shaft bushing
RMC-004		CLIP—Dial window clip
RMR-004		RUBBER—Channel rubber for dial
RMM-039		CUSHION—Picture tube cushion.
RMM-040		TRAP—Ion trap assembly
RMM-041		SHIELD—Tube base shield for 7F8 tube
RMM-042		SHIELD—Tube base shield for television tube
RMS-004		SPRING—Television tuning drive cord tension spring
RMS-109		SPRING—For focus coil assembly
RMS-110		STRAP—Safety strap for picture tube
RMS-111		SPRING—B-C drive cord tension spring
RMW-027		PULLEY—Idler pulley for B-C drive cord, 1/2 in. O. D.
RMW-035		PULLEY—Idler pulley for B-C drive cord, 1 1/2 in. O. D.
RMX-100		SHAFT—B-C tuning shaft assembly and "C" washer
RMX-101		SHAFT—Television tuning shaft and pulley assembly
RRC-020	R36, 61	POTENTIOMETER—100,000 ohms, 2 w., (Hor. Hold and Height)
RRC-021	R49, 62	POTENTIOMETER—250,000 ohms, 1/2 w., (Hor. Linearity and Vertical Hold)
RRC-022	R69A, B	POTENTIOMETER—2 meg., 1/2 w., (Volume control); 500,000 ohms, 1/2 w., (Tone control)
RTL-024	T2	TRANSFORMER—2nd video i-f transformer
RTL-025	T3	TRANSFORMER—3rd video i-f transformer
RTL-027	T13	TRANSFORMER—455 kc i-f transformer
RTL-033	T4	TRANSFORMER—4th video i-f transformer
RTL-034	T5	TRANSFORMER—Composite 455 kc and 10.7 mc i-f transformer
RTM-001	T7	TRANSFORMER—AFC synchronizing transformer
RTO-016	T8	TRANSFORMER—Vertical sweep output
RTO-017	T10	TRANSFORMER—Audio output transformer
RTO-032	T9	TRANSFORMER—Horizontal sweep output
RTP-037	T14	TRANSFORMER—Power transformer (50 cycles)
RTP-040	T14	TRANSFORMER—Power transformer (60 cycles)
RWL-004		CORD—Power cord
RWL-010		CORD—Power cord assembly, includes female plug

GENERAL TELEV. & RADIO CORP.

MODEL 4B5



APPROX. GAIN PER STAGE USING CHANALYST.
WITH A FIXED BIAS OF 3 VOLTS.



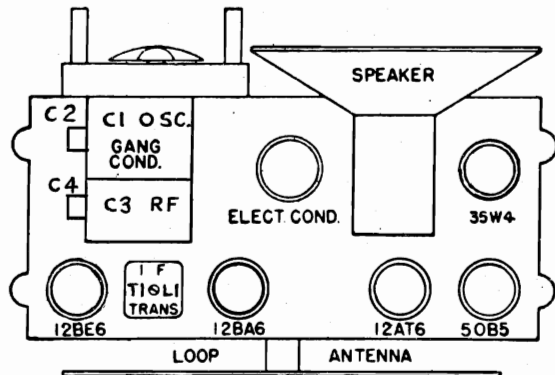
ALL RESISTORS 1/3WATT
20% UNLESS OTHER-
WISE SPECIFIED.

K=1000 OHMS

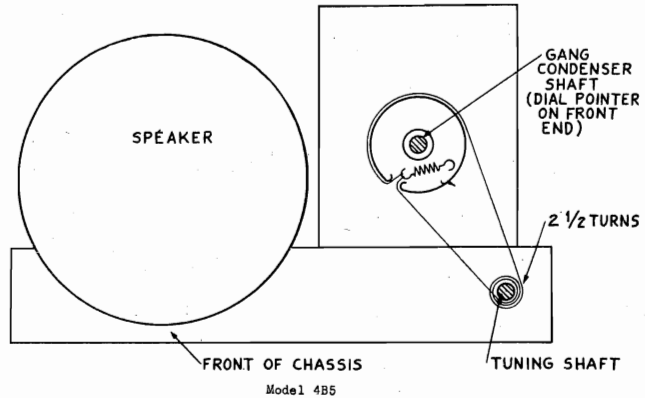
MODEL 4B5
 MODEL 5B5, MODEL 9A5,
 MODEL 23A6, MODEL 24B6,
 MODEL 25B5

GENERAL TELEV. & RADIO CORP.

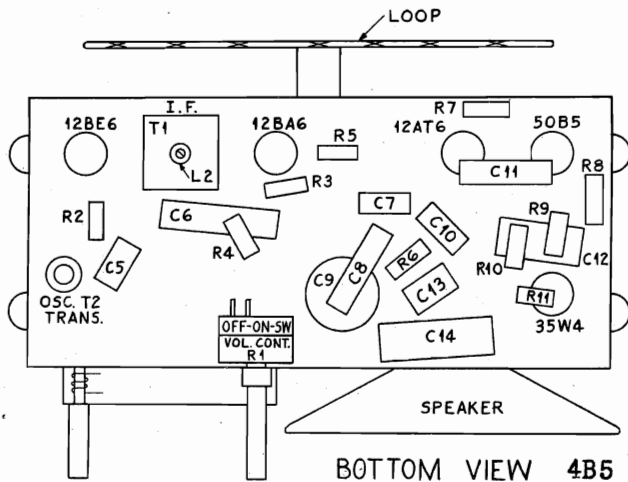
DIAL CORD DRIVE - MODELS 4B5, 5B5, 9A5,
 23A6, 24B6, 25B5



TUBE LAYOUT 4B5



Model 4B5



BOTTOM VIEW 4B5

SOCKET	PIN	VTVM	20,000Ω/P.V.	1,000Ω/P.V.	RESISTANCE
12BB6 CONV.	1	-6	-6	-6 ON 100V SCALE -3.5 ON 10V SCALE	10K
	2	0	0		0
	3	AC	AC	AC	45Ω
	4	AC	AC	AC	30Ω
	5	+82	+82	+82	OVER 5 MEGS
	6	+82	+82	+82	OVER 5 MEGS
	7	-1.0	-0.5	-0.2	3 MEGS
12BA6 I.F. AMPL.	1	-1.0	-0.5	-0.2	3 MEGS
	2	0	0	0	0
	3	AC	AC	AC	25Ω
	4	AC	AC	AC	15Ω
	5	+25	+24	+22	OVER 5 MEGS
	6	+82	+82	+82	OVER 5 MEGS
	7	0	0	0	0
12AT6 DET. AVO AUDIO	1	-0.5	-0.2	0	10 MEGS
	2	0	0	0	0
	3	0	0	0	0
	4	AC	AC	AC	15Ω
	5	-0.5	-0.2	0	500K
	6	-0.5	-0.2	0	500K
	7	+40	+38	+15	OVER 5 MEGS
50B5 AUDIO OUTPUT	1	0	0	0	500K
	2	+5	+5	+5	150Ω
	3	AC	AC	AC	85Ω
	4	AC	AC	AC	35Ω
	5	+120	+120	+120	OVER 5 MEGS
	6	+82	+82	+82	OVER 5 MEGS
	7	--	--	--	--
35W4 RECT	1	AC	AC	AC	110Ω
	2	--	--	--	--
	3	AC	AC	AC	85Ω
	4	AC	AC	AC	115Ω
	5	AC	AC	AC	115Ω
	6	AC	AC	AC	110Ω
	7	+125	+125	+125	OVER 5 MEGS

ALL VOLTAGE AND RESISTANCE MEASUREMENT MADE WITH RESPECT TO CHASSIS GROUND AND WITH A LINE VOLTAGE OF 116 V. A. C.

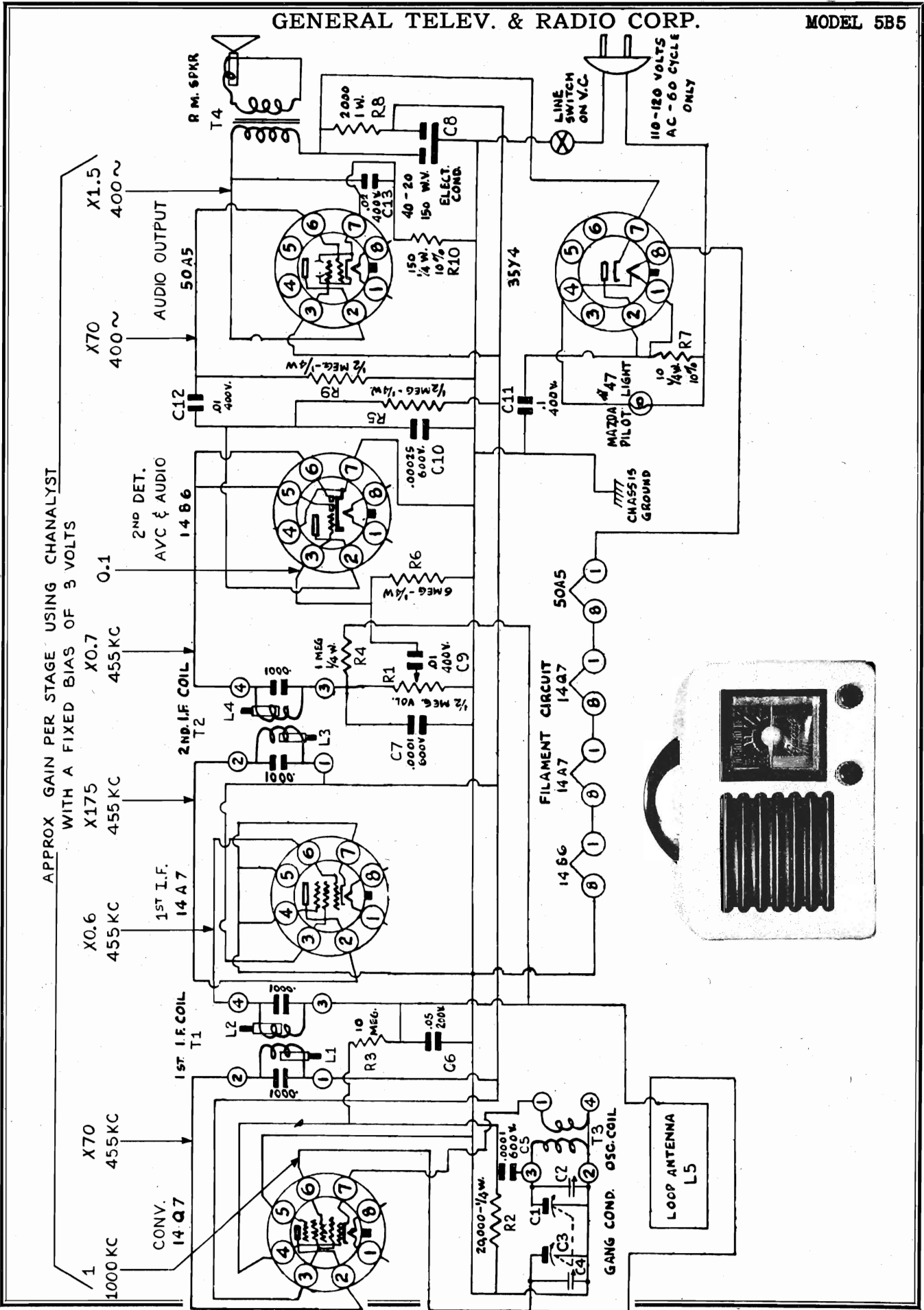
ALIGNMENT - 4B5

THE CHASSIS MUST BE REMOVED FROM THE CABINET IN ORDER TO ALIGN THE RECEIVER. CONNECT THE OUTPUT METER ACROSS THE VOICE COIL. CONNECT THE SIGNAL GENERATOR TO THE STANDARD HAZELTINE MODEL 1150 LOOP, AND COUPLE LOOSELY TO THE RECEIVER LOOP. SET THE RECEIVER VOLUME CONTROL AT MAXIMUM.

THE TUNING CONDENSER PLATES SHOULD BE FULLY MESHED WHEN THE DIAL POINTER IS AT THE INDEX MARK AT THE LOW FREQUENCY END OF THE DIAL. THE SIGNAL GENERATOR OUTPUT SHOULD BE SUFFICIENT TO GIVE HALF SCALE DEFLECTION ON THE LOWEST SCALE OF THE OUTPUT METER. SET THE SIGNAL GENERATOR TO 455 KC. ADJUST THE I.F. TUNING SLUGS FOR MAXIMUM METER DEFLECTION IN THE FOLLOWING SEQUENCE: L2, L1. SET THE GENERATOR AND RECEIVER TO 700 KC AND ADJUST OSCILLATOR TRIMMER C2 FOR MAXIMUM OUTPUT. SET THE GENERATOR AND RECEIVER TO 1400 KC AND ADJUST LOOP TRIMMER C4 FOR MAXIMUM OUTPUT.

GENERAL TELEV. & RADIO CORP.

MODEL 5B5

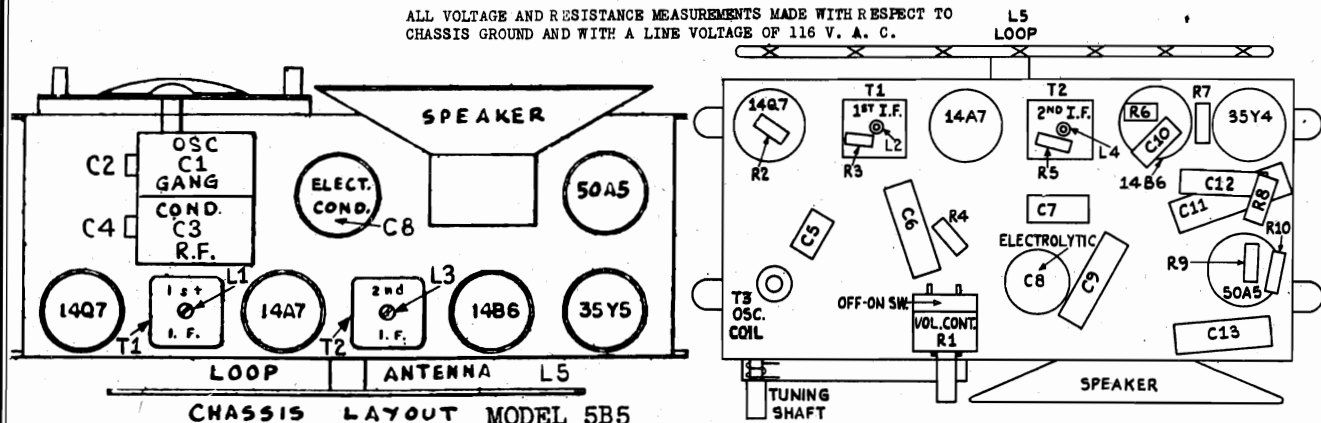


GENERAL TELEV. & RADIO CORP.

MODEL 5B5
 MODEL 9A5
 MODEL 24B6
 MODEL 23A6
 MODEL 25B5

		Model 5B5					
SOCKET	PIN	VTVM	20,000Ω/P.V.	1,000Ω/P.V.	RESISTANCE		
14Q7 CONV.	1	AC	AC	AC	40Ω		
	2	+86	+86	+86	OVER 5 MEGS		
	3	+86	+86	+86	OVER 5 MEGS		
	4	-12	-10	-7	20K		
	5	0	0	0	0		
	6	-1.5	-1.0	-0.2	1 MEG		
	7	0	0	0	1Ω		
	8	AC	AC	AC	25Ω		
14A7 I.F.	1	AC	AC	AC	15Ω		
	2	+86	+86	+86	OVER 5 MEGS		
	3	+86	+86	+86	OVER 5 MEGS		
	4	0	0	0	0		
	5	0	0	0	0		
	6	-1.5	-1.0	-0.2	1 MEG		
	7	0	0	0	0		
	8	AC	AC	AC	25Ω		
14B6 2ND DET. AVC AND AUDIO	1	AC	AC	AC	15Ω		
	2	+58	+52	+40 ON 100OV RANGE +12 ON 100V RANGE	OVER 5 MEGS		
	3	-1.0	-0.6	-0.13	5.5 MEGS		
	4	--	--	--	--		
	5	-1.0	-0.6	-0.3	400K		
	6	-1.0	-0.6	-0.3	400K		
	7	0	0	0	0		
	8	0	0	0	0		
50A5 AUDIO OUTPUT	1	AC	AC	AC	85Ω		
	2	+120	+120	+120	OVER 5 MEGS		
	3	+86	+86	+86	OVER 5 MEGS		
	4	--	--	--	--		
	5	--	--	--	--		
	6	0	0	0	OVER 5 MEGS		
	7	+5.0	+5.0	+5.0	150Ω		
	8	AC	AC	AC	35Ω		
35Y4 RECT.	1	AC	AC	AC	120Ω		
	2	AC	AC	AC	120Ω		
	3	--	--	--	--		
	4	AC	AC	AC	110Ω		
	5	AC	AC	AC	110Ω		
	6	AC	AC	AC	0		
	7	+125	+125	+125	OVER 5 MEGS		
	8	AC	AC	AC	85Ω		

ALL VOLTAGE AND RESISTANCE MEASUREMENTS MADE WITH RESPECT TO CHASSIS GROUND AND WITH A LINE VOLTAGE OF 116 V. A. C.



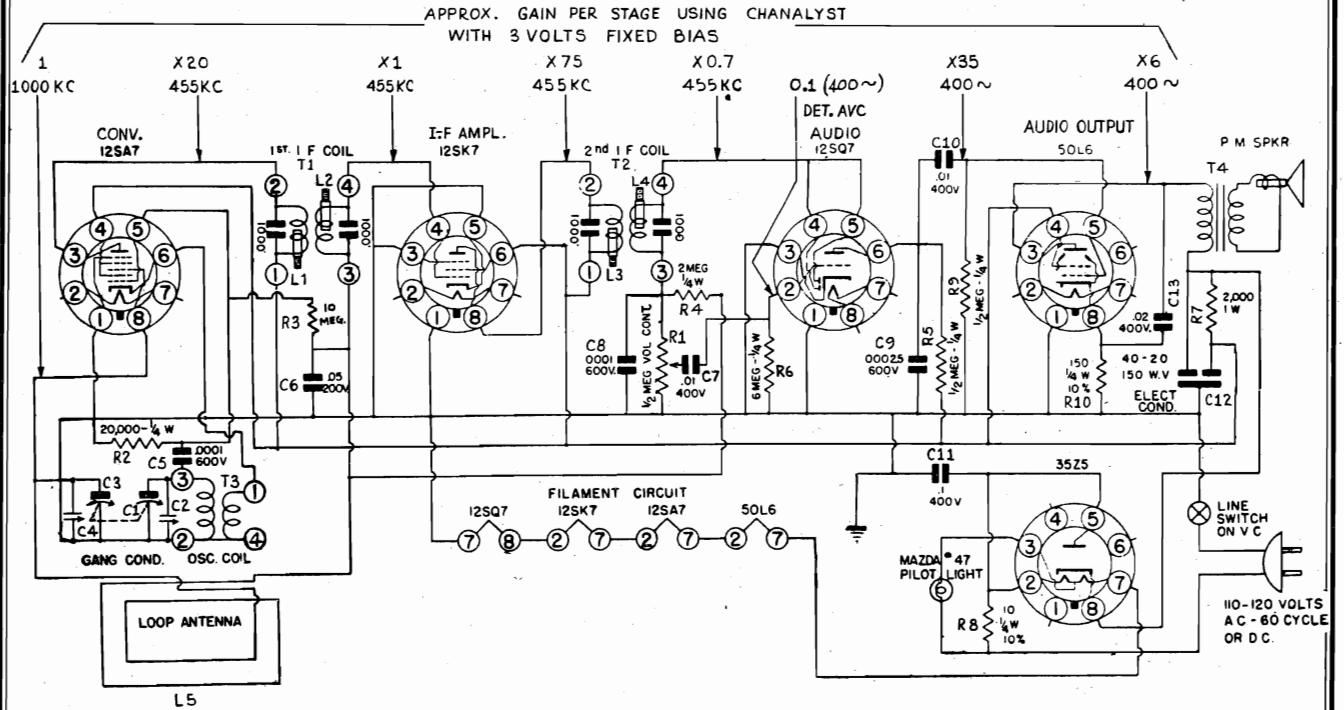
CHASSIS LAYOUT MODEL 5B5

BOTTOM VIEW MODEL 5B5

ALIGNMENT - MODELS 5B5, 9A5, 23A6, 24B6, 25B5

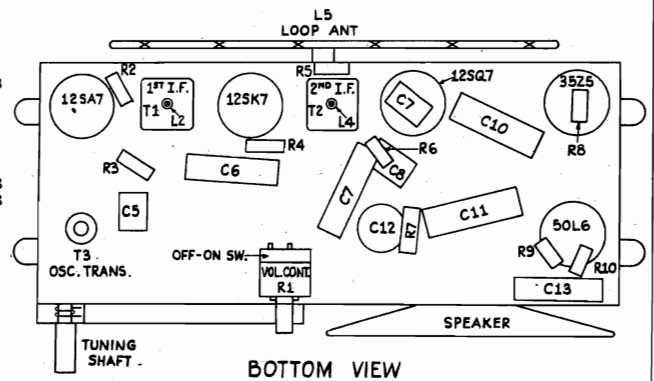
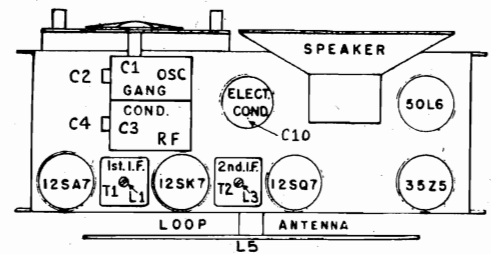
THE CHASSIS MUST BE REMOVED FROM THE CABINET IN ORDER TO ALIGN THE RECEIVER. CONNECT THE OUTPUT METER ACROSS THE VOICE COIL. CONNECT THE SIGNAL GENERATOR TO THE STANDARD HAZELTINE MODEL 1150 LOOP, AND COUPLE LOOSELY TO THE RECEIVER LOOP. SET THE RECEIVER VOLUME CONTROL AT MAXIMUM. THE TUNING CONDENSER PLATES SHOULD BE FULLY MESHED WHEN THE DIAL POINTER IS AT THE INDEX MARK AT THE LOW FREQUENCY END OF THE DIAL. THE SIGNAL GENERATOR OUTPUT SHOULD BE JUST SUFFICIENT TO OBTAIN HALF SCALE DEFLECTION ON THE LOWEST SCALE OF THE OUTPUT METER. SET THE SIGNAL GENERATOR TO 455 KC. ADJUST THE I.F. TUNING SLUGS FOR MAXIMUM OUTPUT IN THE FOLLOWING SEQUENCE: L4, L3, L2, L1. SET THE GENERATOR AND RECEIVER TO 1600 KC AND ADJUST OSCILLATOR TRIMMER C2 FOR MAXIMUM OUTPUT. SET THE GENERATOR AND RECEIVER TO 1400 KC AND ADJUST R.F. TRIMMER C4 FOR MAXIMUM OUTPUT.

GENERAL TELEV. & RADIO CORP.



SOCKET	PIN	V _{TM}	20,000 Ω /P2	1,000 Ω /P2	RESISTANCE
12SA7GT CONV	1	0	0	0	0
	2	AC	AC	AC	25 Ω
	3	+78	+78	+76	OVER 5 MEGS
	4	+78	+78	+76	OVER 5 MEGS
	5	-9	-8	-4.5	17K
	6	0	0	0	1 Ω
	7	AC	AC	AC	40 Ω
	8	-6	-2	-0.5	1.3 MEGS
12SK7GT I-F AMPL.	1	0	0	0	0
	2	AC	AC	AC	15 Ω
	3	0	0	0	0
	4	-2	-0.8	-0.4	1.3 MEGS
	5	0	0	0	0
	6	+78	+78	+76	OVER 5 MEGS
	7	AC	AC	AC	25 Ω
	8	+78	+78	+76	OVER 5 MEGS
12SQ7GT DET. AVC AUDIO	1	0	0	0	0
	2	-1	-0.8	-0.4	6MEGS
	3	0	0	0	0
	4	-1.5	-0.4	-0.2	400K
	5	-1.5	-0.4	-0.2	400K
	6	+48	+46	+12	OVER 5 MEGS
	7	AC	AC	AC	15 Ω
	8	AC	AC	AC	0
50L6GT AUDIO OUTPUT	1	0	0	0	0
	2	AC	AC	AC	40 Ω
	3	+115	+115	+115	OVER 5 MEGS
	4	+75	+75	+75	OVER 5 MEGS
	5	0	0	0	550K
	6	--	--	--	--
	7	AC	AC	AC	80 Ω
	8	+5	+5	+5	150 Ω
35Z5GT	1	--	--	--	--
	2	AC	AC	AC	120 Ω
	3	AC	AC	AC	110 Ω
	4	--	--	--	--
	5	AC	AC	AC	120 Ω
	6	AC	AC	AC	120 Ω
	7	AC	AC	AC	90 Ω
	8	+115	+115	+115	OVER 5 MEGS

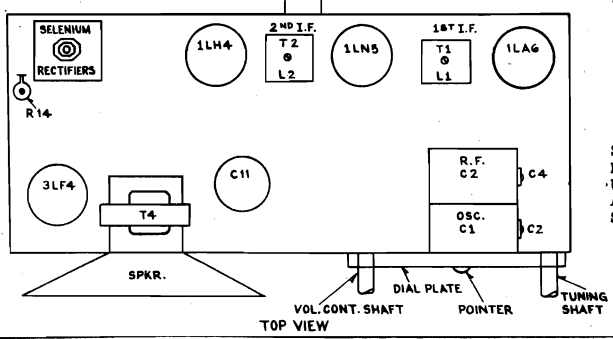
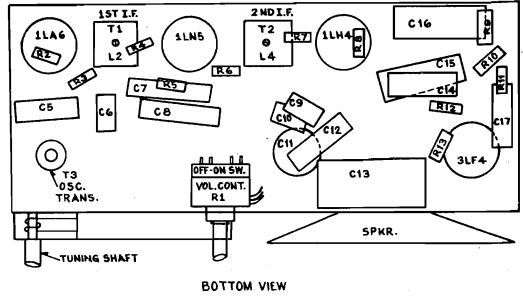
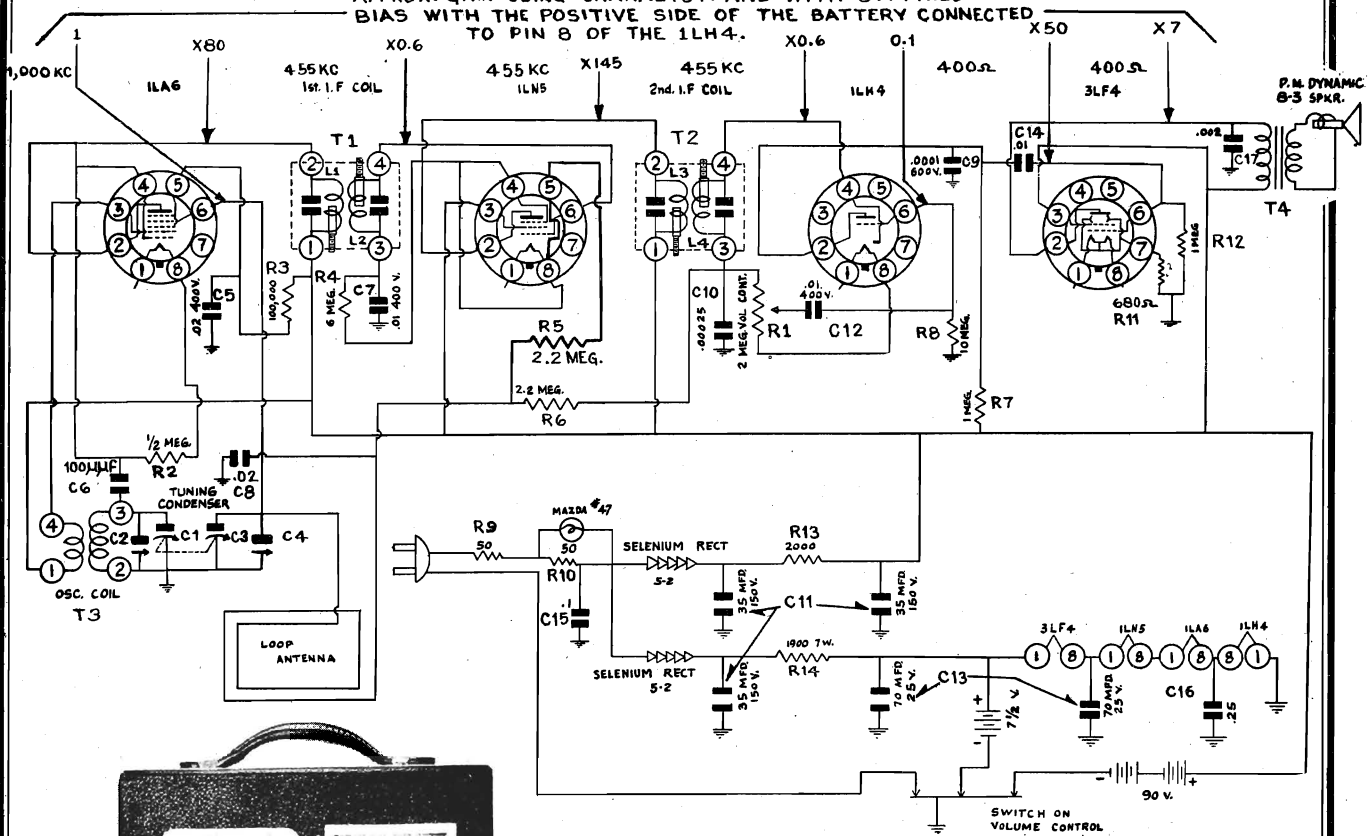
NOTE ALL VOLTAGE AND RESISTANCE MEASUREMENTS MADE WITH RESPECT TO CHASSIS GROUND AND WITH A LINE VOLTAGE OF 116 V. A. C.



MODEL 23A6

GENERAL TELEV. & RADIO CORP.

APPROX. GAIN USING CHANALYST. AND WITH -3V. FIXED BIAS WITH THE POSITIVE SIDE OF THE BATTERY CONNECTED TO PIN 8 OF THE 1LH4.



SOCKET	PIN	VTVM	20,000 Ω/P.V.	1,000 Ω/P.V.	RESISTANCE
1LA6	1	+3.5	+3.4	+3.4	24 Ω
	2	+100	+100	+100	500K TO 1 MEG
	3	+100	+100	+100	500K TO 1 MEG
	4	-2	-0.2	0	500K
	5	+40	+40	--	500K TO 1 MEG
	6	+0.5	+0.2	+32	1.5 MEG
	7	--	--	--	--
	8	+1.8	+1.7	+1.7	14 Ω
1LN5	1	+5.3	+5.2	+5.2	34 Ω
	2	+100	+100	+100	500K TO 1 MEG
	3	+100	+100	+100	500K TO 1 MEG
	4	+3.5	+3.4	+3.4	24 Ω
	5	+3.5	+3.4	+3.4	24 Ω
	6	+2.5	+0.2	0	6 MEGS
	7	+1.5	+0.2	0	1.5 MEGS
	8	+3.5	+3.4	+3.4	24 Ω
1LH4	1	0	0	0	0
	2	+56	+48	+8	1.5 MEG TO 2 MEGS
	3	+8.2	+8	+8	52 Ω
	4	+0.7	+0.2	0	1.2 MEGS
	5	--	--	--	--
	6	-0.2	0	0	10 MEGS
	7	--	--	--	--
	8	+1.8	+1.7	+1.7	14 Ω
3LF4	1	+8.2	+8	+8	52 Ω
	2	+98	+98	+96	500K TO 1 MEG
	3	+100	+100	+100	500K TO 1 MEG
	4	--	--	--	--
	5	+130	+130	+130	500K TO 1 MEG
	6	0	0	0	1.3 MEGS
	7	+6.6	+6.4	+6.4	44 Ω
	8	+5.3	+5.2	+5.2	36 Ω

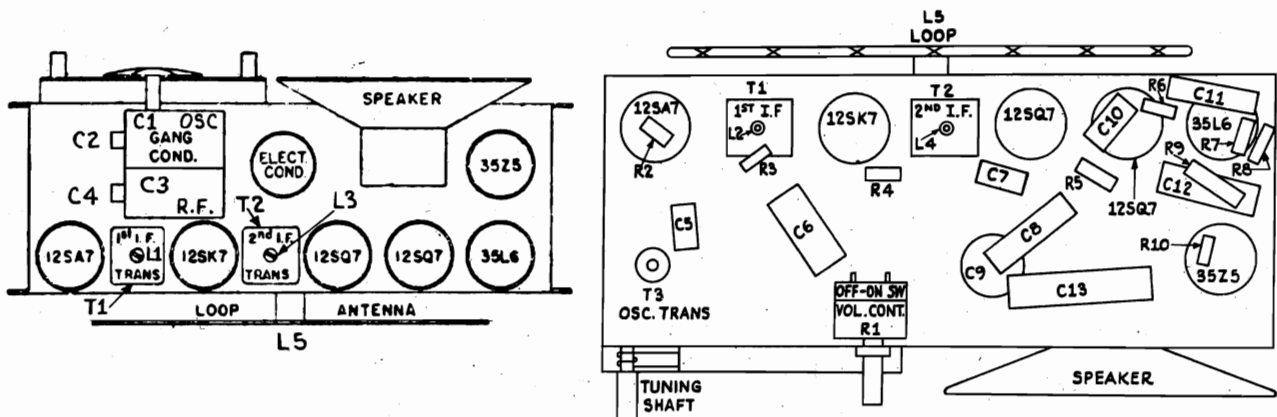
SELENIUM RECTIFIERS USED FOR A AND B SUPPLY

FILAMENT SUPPLY = 8.2 V. D. C.
PLATE SUPPLY = 130V

ALL VOLTAGE AND RESISTANCE MEASUREMENTS MADE WITH RESPECT TO CHASSIS GROUND AND WITH A LINE VOLTAGE OF 116 V. A. C.

MODEL 24B6

GENERAL TELEV. & RADIO CORP.



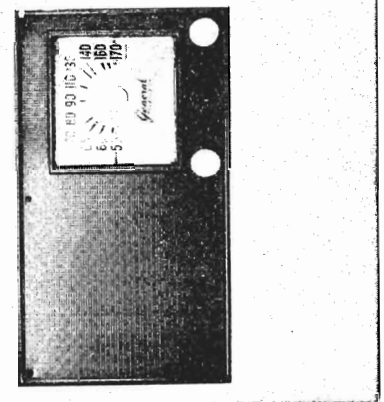
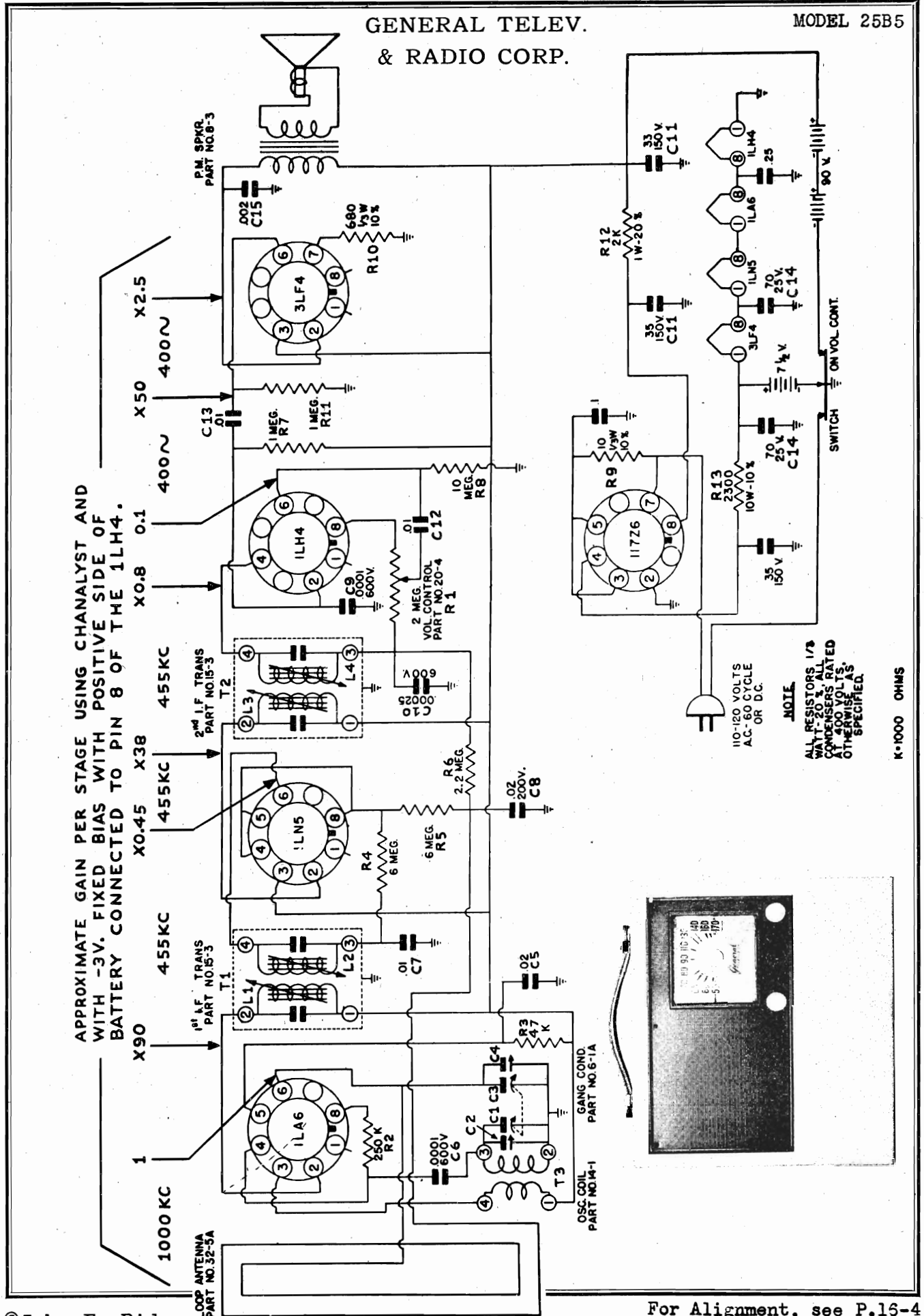
BOTTOM VIEW

SOCKET	PIN	VTVM	20,000 Ω /P.V.	1,000 Ω /P.V.	RESISTANCE
12SA7 CONV.	1	0	0	0	0
	2	AC	AC	AC	70
	3	+84	+84	+84	OVER 5 MEGS
	4	+84	+84	+84	OVER 5 MEGS
	5	-11	-10	-9 ON 100V SCALE -5 ON 10V SCALE	17K 1.2 Ω 70 Ω 1 MEG
12SK7 I-F AMPL	6	0	0	0	0
	7	AC	AC	AC	70 Ω
	8	-1.5	-0.6	-0.4	1 MEG
	1	0	0	0	0
	2	AC	AC	AC	30 Ω
	3	0	0	0	0
	4	-1.5	-0.6	-0.4	1 MEG
	5	0	0	0	0
12SQ7 DET AVC	6	+84	+84	+84	OVER 5 MEGS
	7	AC	AC	AC	45 Ω
	8	+84	+84	+84	OVER 5 MEGS
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	-0.5	-0.4	-0.2	450K
	5	-0.5	-0.4	-0.2	450K
12SQ7 AUDIO AMPL.	6	0	0	0	0
	7	AC	AC	AC	30 Ω
	8	AC	AC	AC	20 Ω
	1	0	0	0	0
	2	-0.8	-0.6	-0.2	9 MEG
	3	0	0	0	0
	4	0	0	0	0
	5	0	0	0	0
35L6 AUDIO OUTPUT	6	+52	+48	+14	OVER 5 MEG
	7	AC	AC	AC	15 Ω
	8	0	0	0	0
	1	0	0	0	0
	2	AC	AC	AC	55 Ω
	3	+125	+125	+125	OVER 5 MEGS
	4	+84	+84	+84	OVER 5 MEGS
	5	0	0	0	525K
35Z5 RECT.	6	--	--	--	--
	7	AC	AC	AC	90 Ω
	8	+4.5	+4.5	+4.5	150 Ω
	1	--	--	--	--
	2	AC	AC	AC	120 Ω
	3	AC	AC	AC	110 Ω
	4	AC	AC	AC	0
	5	AC	AC	AC	120 Ω
	6	AC	AC	AC	115 Ω
	7	AC	AC	AC	85 Ω
	8	+130	+130	+130	OVER 5 MEGS

ALL VOLTAGE AND RESISTANCE MEASUREMENTS MADE WITH RESPECT TO CHASSIS GROUND AND WITH A LINE VOLTAGE OF 116 V.A.C.

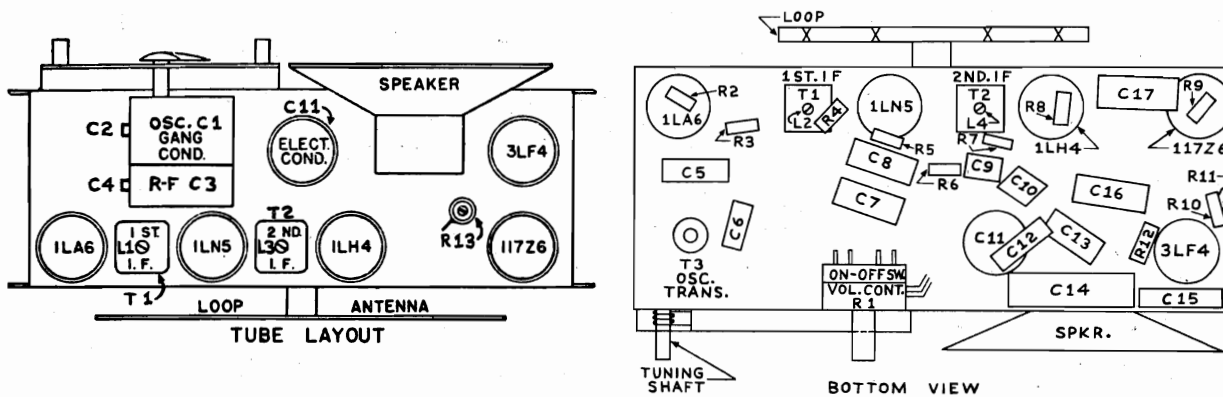
GENERAL TELEV. & RADIO CORP.

MODEL 25B5



MODEL 25B5

GENERAL TELEV. & RADIO CORP.

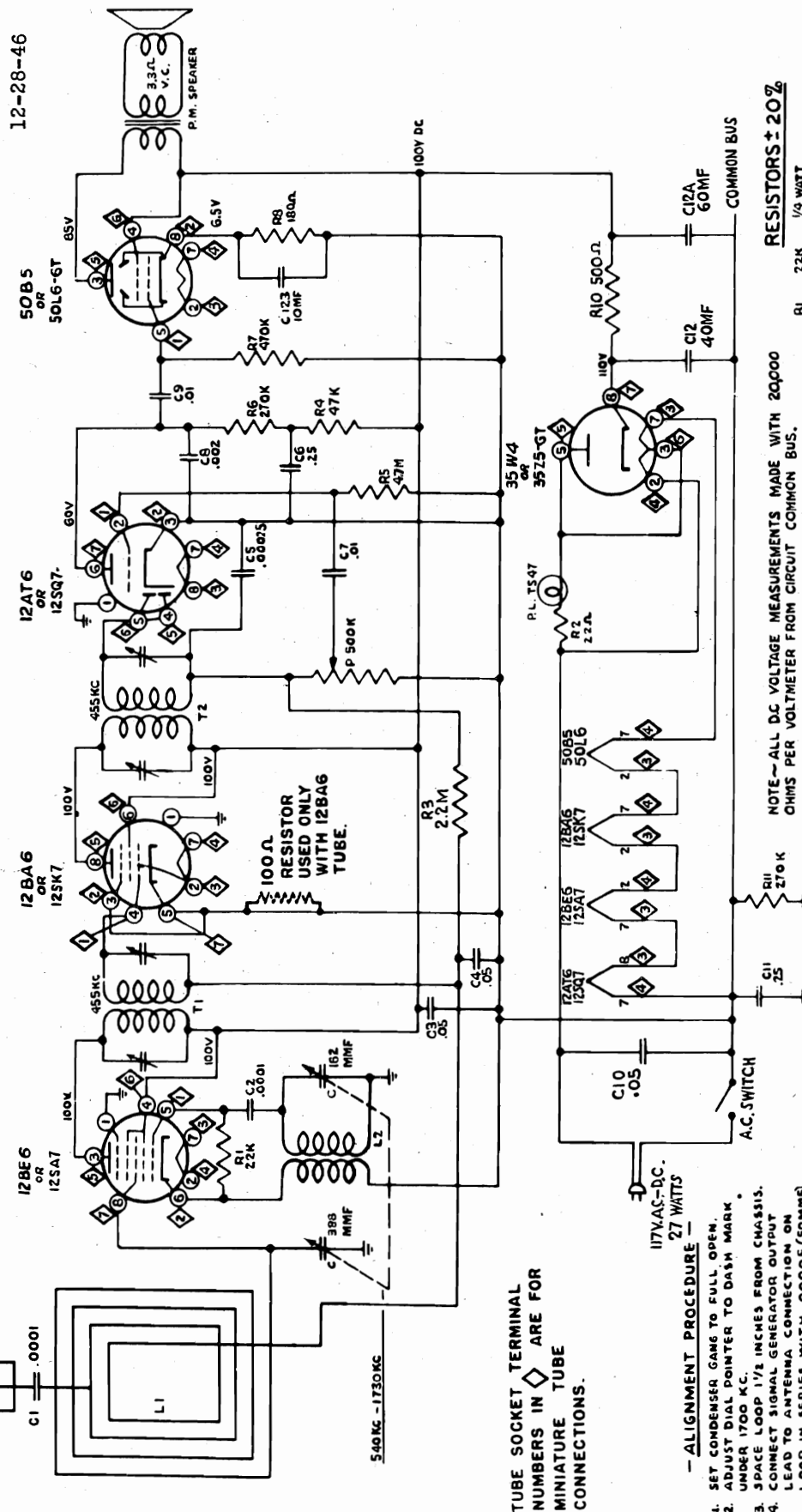


SOCKET	PIN	VTVM	20,000 Ω /P2	1,000 Ω /P2	RESISTANCE
1LA6 CONV.	1	+3.5	+3.4	+3.4	50 Ω
	2	+110	+110	+110	OVER 5 MEGS
	3	+110	+110	+110	OVER 5 MEGS
	4	-3	-0.6	0	280K
	5	+58	+57	+48	OVER 5 MEGS
	6	+1.3	0	0	2.7 MEGS
	7	--	--	--	--
	8	+1.7	+1.7	+1.7	30 Ω
1LN5 I-F AMPL	1	+4.8	+4.7	+4.7	60 Ω
	2	+110	+110	+110	OVER 5 MEGS
	3	+110	+110	+110	OVER 5 MEGS
	4	+3.3	+3.2	+3.2	50 Ω
	5	+3.3	+3.2	+3.2	50 Ω
	6	+2.5	0	0	6 MEGS
	7	+1.3	0	0	2.6 MEGS
	8	+3.4	+3.2	+3.2	50 Ω
1LH4 DET AVC AUDIO	1	0	0	0	0
	2	+62	+55	+40	OVER 5 MEGS
	3	+7.4	+7.1	+7.1	70 Ω
	4	+0.6	+0.2	0	1.5 MEGS
	5	0	0	0	0
	6	-0.4	0	0	8 MEGS
	7	--	--	--	--
	8	+1.7	+1.6	+1.6	30 Ω
3LF4 AUDIO OUTPUT	1	+7.3	7.2	7.2	70 Ω
	2	+107	+107	+107	OVER 5 MEGS
	3	+110	+110	+110	OVER 5 MEGS
	4	--	--	--	--
	5	+118	+118	+118	OVER 5 MEGS
	6	0	0	0	1 MEG.
	7	+6.2	+6	+6	55 Ω
	8	+5	+4.8	+4.8	50 Ω
117Z6GT RECT.	1	--	--	--	--
	2	0	0	0	0
	3	AC	AC	AC	250 Ω
	4	+125	+125	+125	2.5K
	5	AC	AC	AC	250 Ω
	6	--	--	--	--
	7	AC	AC	AC	240 Ω
	8	+142	+140	+140	OVER 5 MEGS

VOLTAGE AND RESISTANCE MEASUREMENTS MADE WITH RESPECT TO CHASSIS GROUND AND WITH A LINE VOLTAGE OF 116 V. A. C.

GILFILLAN BROS. INC.

MODELS 56A, 56B, 56C,
56D, 56E



12-28-46

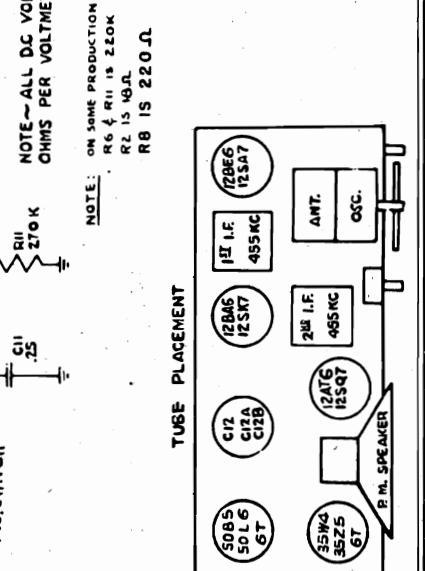
TUBE SOCKET TERMINAL NUMBERS IN \diamond ARE FOR MINIATURE TUBE CONNECTIONS.

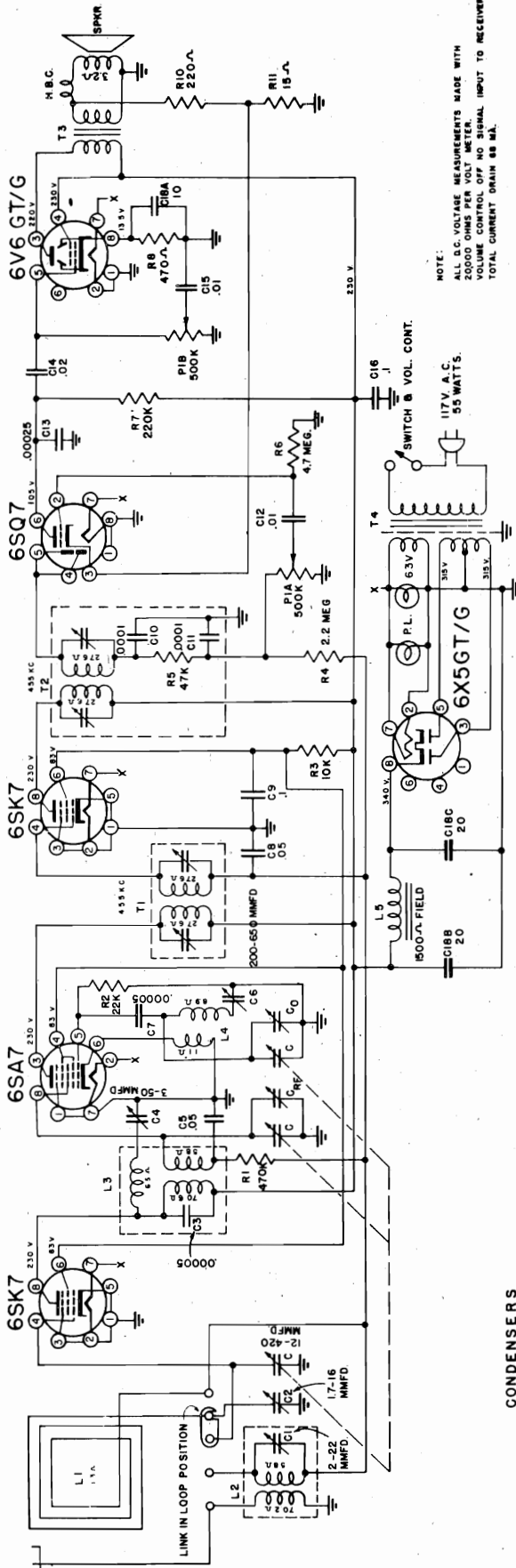
- ALIGNMENT PROCEDURE —
27 WATTS
1. SET CONDENSER GANG TO FULL OPEN.
 2. ADJUST DIAL POINTER TO DASH MARK UNDER 1700 KC.
 3. SPACE LOOP 1/2 INCHES FROM CHASSIS.
 4. CONNECT SIGNAL GENERATOR OUTPUT LEAD TO ANTENNA CONNECTION ON LOOP IN SERIES WITH .0005 (50MME) CONDENSER.
 5. SET SIGNAL GENERATOR TO 455 KC. THEN ADJUST I.F. TRIMMERS FOR PEAK RESPONSE INDICATED BY OUTPUT METER CONNECTED TO SPEAKER VOICE COIL TERMINALS. FINAL ADJUSTMENT MADE WITH VOLUME CONTROL FULL ON.
 6. SIGNAL GENERATOR OUTPUT FULL ON. SET SIGNAL GENERATOR TO 1500 KC. TURN TUNING KNOB TO SET POINTER ON 1500 KC. THEN ADJUST OSCILLATOR TRIMMER FOR MAXIMUM RESPONSE ON OUTPUT METER. NOW ADJUST I.F. TRIMMER FOR MAXIMUM INDICATION ON OUTPUT METER.
 7. INSTALL CHASSIS IN CABINET. MAKE CERTAIN LOOP RESTS AGAINST BACK OF CABINET.

NOTE: ON SOME PRODUCTION R2 IS 2.2K
R6 & R11 IS 2.0K
R8 IS 220Ω

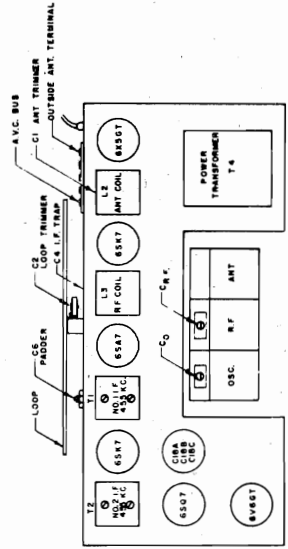
NOTE— ALL DC VOLTAGE MEASUREMENTS MADE WITH 20,000 OHMS PER VOLT METER FROM CIRCUIT COMMON BUS.

CONDENSERS	
C	CONDENSER GANG 800-1685
C1	.0001 MFD.
C2	500
C3	200
C4	200
C5	500
C6	200
C7	200
C8	200
C9	200
C10	200
C11	200
C12	150
C13	50
C14	60
C15	200
C16	50
C17	50
C18	50
C19	50
C20	50
C21	50
C22	50
C23	50
C24	50
C25	50
C26	50
C27	50
C28	50
C29	50
C30	50
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C89	50
C90	50
C91	50
C92	50
C93	50
C94	50
C95	50
C96	50
C97	50
C98	50
C99	50
C100	50





NOTE:
ALL D.C. VOLTAGE MEASUREMENTS MADE WITH
20000 OHMS PER VOLT METER.
VOLUME CONTROL OFF NO SIGNAL INPUT TO RECEIVER.
TOTAL CURRENT DRAIN 88 MA.



STEPS	ALIGNMENT PROCEDURE	
	TUNE TEST	ADJUST TRIMMERS FOR—
1	OSC. TO —	TURN RADIO DIAL TO —
2	455 KC	CONDENSER GANG NO. 1 & NO. 2
		ADJUST TO SET POINTER TO INDEX MARK ON DIALERS.
3	1600 KC	OSC. TRIMMER C ₂
		R.F. TRIMMER C ₁₁
4	600 KC	ANT. TRIMMER C ₁
		PADDER C ₆
5	REPEAT STEP 3	ROCK GANG.
6	DISCONNECT SIGNAL GENERATOR, CHANGE ANTENNA JUMPER FOR LOOP OPERATION, TUNE RADIO TO SOME STATION NEAR 800 KC AND ADJUST LOOP TRIMMER C ₂ (LOCATED ON LOOP) FOR MAXIMUM VOLT-METER READING	

CONDENSERS

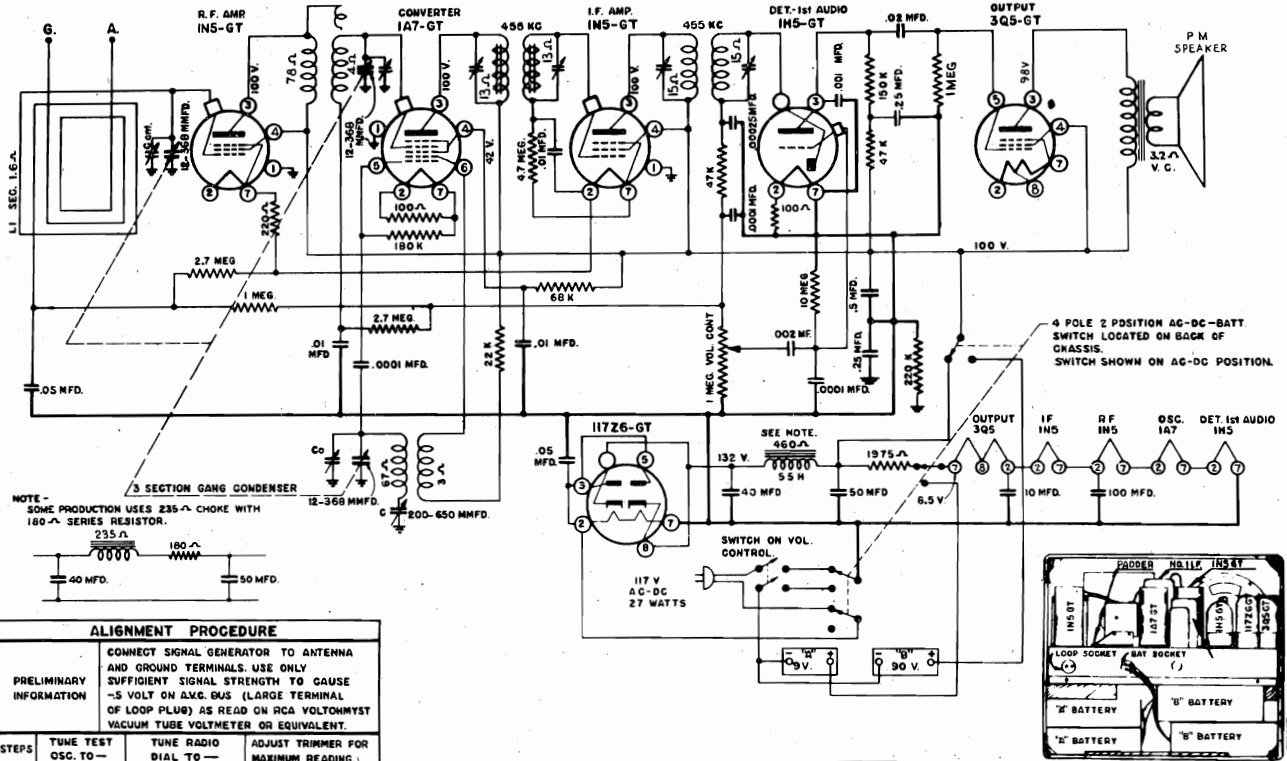
Code	Value	Material
C1	12-450 MMFD	56AM-450
C2	2-22 MMFD	TRIMMER
C3	50	MICA
C4	50	MICA
C5	50	MICA
C6	200-650 MMFD	TUBULAR
C7	50	MICA
C8	50	MICA
C9	50	MICA
C10	100	MICA
C11	100	MICA
C12	.01	TUBULAR
C13	500	MICA
C14	500	MICA
C15	500	MICA
C16	.01	MICA
C17	.1	MICA
C18	10	MICA
C19	10	MICA
C20	20	MICA
C21	20	MICA
C22	20	MICA
C23	20	MICA
C24	20	MICA
C25	20	MICA
C26	20	MICA
C27	20	MICA
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C29	20	MICA
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C45	20	MICA
C46	20	MICA
C47	20	MICA
C48	20	MICA
C49	20	MICA
C50	20	MICA
C51	20	MICA
C52	20	MICA
C53	20	MICA
C54	20	MICA
C55	20	MICA
C56	20	MICA
C57	20	MICA
C58	20	MICA
C59	20	MICA
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C91	20	MICA
C92	20	MICA
C93	20	MICA
C94	20	MICA
C95	20	MICA
C96	20	MICA
C97	20	MICA
C98	20	MICA
C99	20	MICA
C100	20	MICA

RESISTORS 10%

Code	Value	Material
R1	470K	1/2 WATT CARBON
R2	10K	"
R3	10K	"
R4	2.2 MEG	1/2 " WIRE WOUND 10%
R5	47K	" CARBON
R6	270 MEG	"
R7	470 ohms	"
R8	20 ohms	"
R9	20 ohms	"
R10	220 ohms	"
R11	15 ohms	"
R12	15 ohms	"
R13	15 ohms	"
R14	15 ohms	"
R15	15 ohms	"
R16	15 ohms	"
R17	15 ohms	"
R18	15 ohms	"
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R95	15 ohms	"
R96	15 ohms	"
R97	15 ohms	"
R98	15 ohms	"
R99	15 ohms	"
R100	15 ohms	"

GILFILLAN BROS. INC.

MODEL 66B, Series 2, Overland
MODEL 66B, Series 3, Overland



ALIGNMENT PROCEDURE

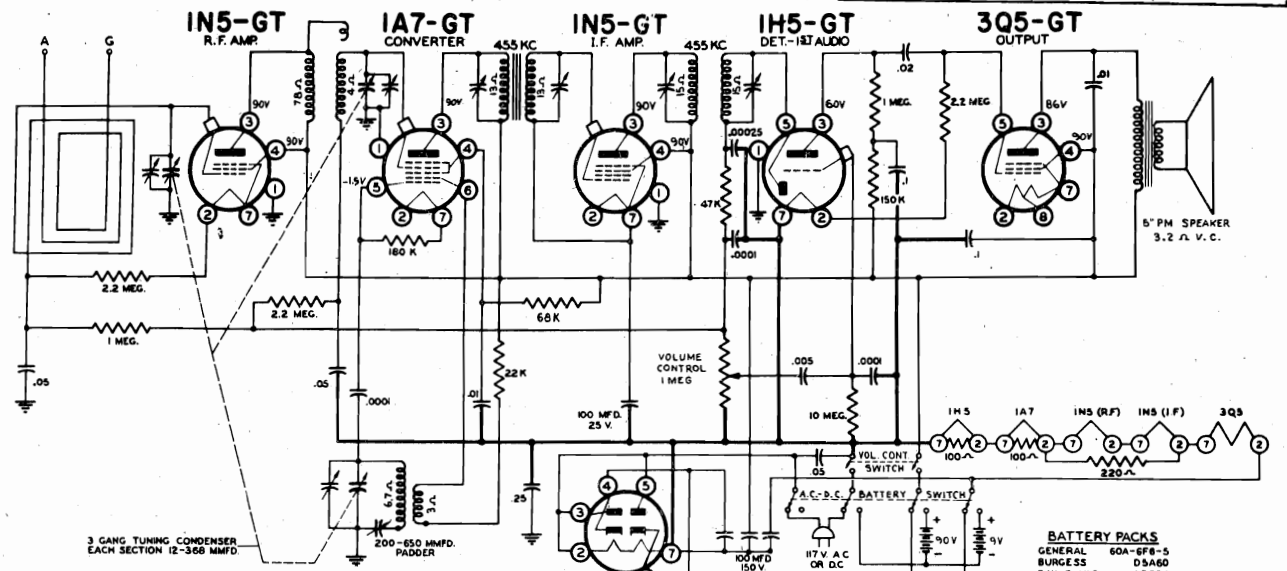
PRELIMINARY INFORMATION: CONNECT SIGNAL GENERATOR TO ANTENNA AND GROUND TERMINALS. USE ONLY SUFFICIENT SIGNAL STRENGTH TO CAUSE -5 VOLT ON A.C. BUS (LARGE TERMINAL OF LOOP PLUG) AS READ ON RCA VOLTHOMYST VACUUM TUBE VOLTMETER OR EQUIVALENT.

STEPS	TUNE TEST OSC. TO -	TUNE RADIO DIAL TO -	ADJUST TRIMMER FOR MAXIMUM READING.
1	455 KC	CONDENSER GANG FULLY MESHED SET POINTER HORIZONTAL	IF TRANSFORMERS T1 AND T2.
2	1600 KC	1600 KC	OSC TRIMMER C6 R.F. TRIMMER C7 ANT. TRIMMER C8
3	600 KC	600 KC	PADDER C WHILE ROCKING GANG
4	REPEAT STEP 2		
5	MOVE POINTER SLIGHTLY IF CALIBRATION CAN BE IMPROVED.		

THE OVERLAND - MODEL 66B
SERIES 2

THIS RADIO IS SUPPLIED WITH COMBINATION A-B BATTERY PACK FOR YOUR CONVENIENCE AN EXTRA BATTERY CABLE MAY BE OBTAINED FROM YOUR DEALER SO THAT YOU MAY MAKE BATTERY REPLACEMENTS BY MEANS OF SEPARATE "A" AND "B" BATTERIES. YOUR GILFILLAN PORTABLE RADIO HAS BEEN ESPECIALLY DESIGNED TO GIVE 200-250 HOURS OF BATTERY LIFE WHEN USED ON BATTERIES AN AVERAGE OF 6 HOURS PER DAY WHEN OPERATED ON AC OR DC HOUSE CURRENT YOUR BATTERIES ARE NOT USED.

MFR.	A-B PACKS NO.	"A" BATTERIES NO.	"B" BATTERIES NO.
GENERAL	60A-6F6-6	3M3	V30A OR F30A
BURGESS	05A60	63	M30
EVEREADY		746	482
RAY-O-VAC	AB994	P85A	P43Q
PHILCO	P841A	P100	P210



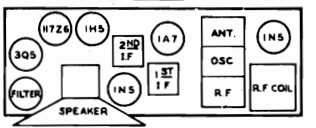
ALIGNMENT INSTRUCTIONS

- REMOVE CHASSIS, BATTERY AND LOOP FROM CABINET AND PLACE IN SAME RELATIVE POSITION AS RF SET WERE IN CABINET. LOOP MUST BE CLOSE TO BACK OF CHASSIS TO OBTAIN PROPER ALIGNMENT.
- CONNECT SIGNAL GENERATOR LEADS TO ANT.-GND POSTS ON LOOP; CONNECT AUDIO OUTPUT METER ACROSS VOICE COIL TERMINALS. DO NOT EXCEED .5 VOLT READING ON METER. ADJUST POINTER TO HORIZONTAL POSITION WITH GANG CLOSED.

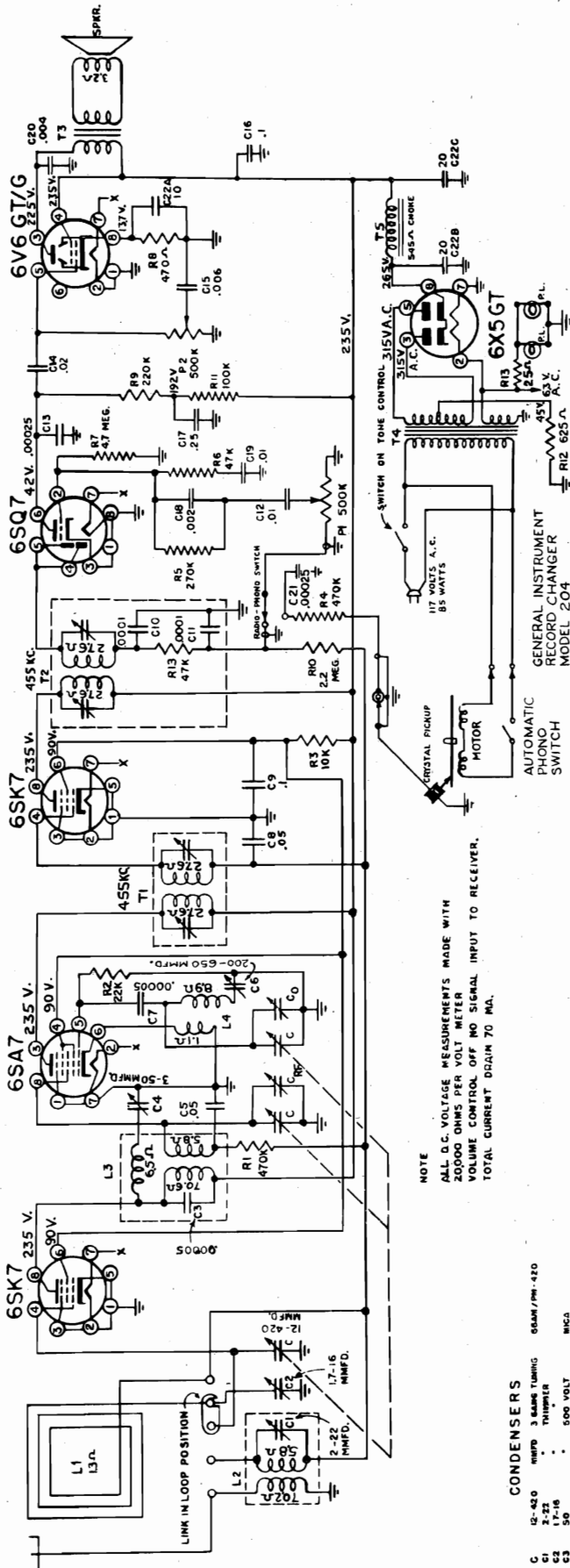
STEP	TUNE TEST OSCILLATOR TO	TUNE RADIO DIAL TO	ADJUST TRIMMERS FOR MAXIMUM OUTPUT READING
1	455 KC	1600 KC	I.F. TRANSFORMERS
2	1400 KC	1400 KC	OSC., R.F., ANT.
3	600 KC	600 KC	PADDER CONDENSER

IN SOME CASES IT IS IMPOSSIBLE TO OBTAIN SUFFICIENT ATTENUATION OF THE GENERATOR SIGNAL FOR ACCURATE ALIGNMENT. IN SUCH CASES THE GENERATOR SHOULD BE CONNECTED TO AN AUXILIARY LOOP PLACED A FOOT OR SO FROM THE RECEIVER LOOP.

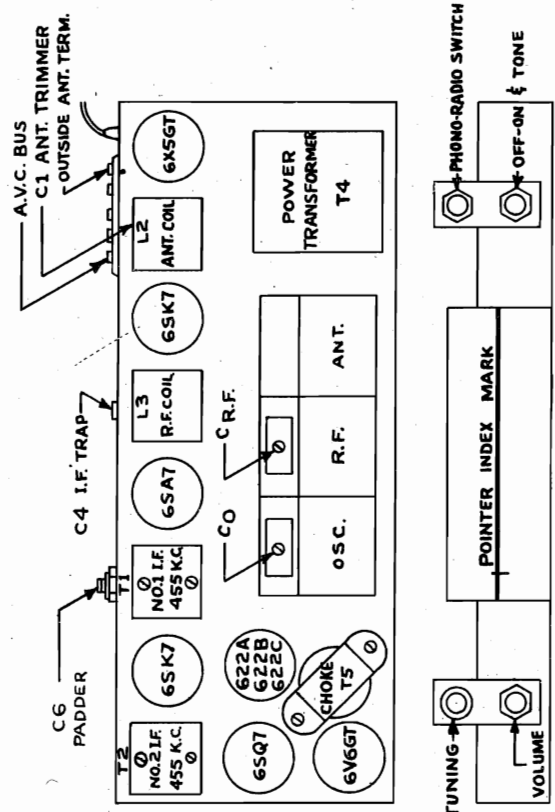
THE OVERLAND - MODEL 66B
THIRD SERIES



MODEL 66PM



NOTE
 ALL D.C. VOLTAGE MEASUREMENTS MADE WITH
 20000 OHMS PER VOLT METER
 VOLUME CONTROL OFF NO SIGNAL INPUT TO RECEIVER.
 TOTAL CURRENT DRAIN 70 MA.

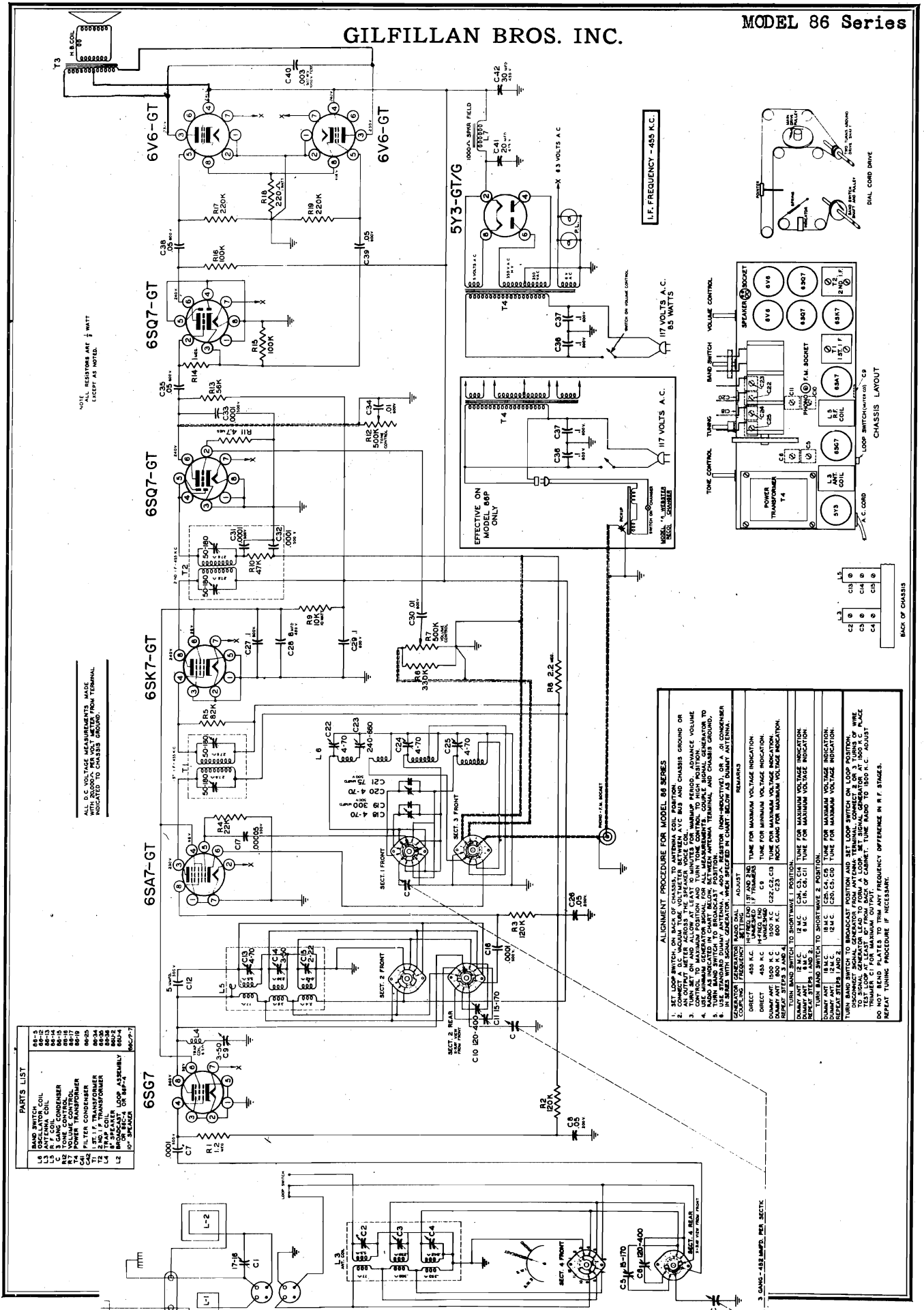


STEPS	ALIGNMENT PROCEDURE	TUNE RADIO	OSC. TO —	TURN RADIO DIAL TO —	CONDENSER GANG FULLY MESHED SET POINTER TO INDEX MARK ON DIALS.	TUBE TEST	ADJUST TRIMMERS FOR —
2	CONNECT JUMPER ON ANTENNA BINDING POST FOR OUTSIDE ANTENNA RECEPTION. CONNECT SIGNAL GENERATOR TO ANTENNA TERMINAL THRU A .0001 MFD. CONDENSER. USE MINIMUM GENERATOR SIGNAL ST. THAT A.X.C. VOLTMETER READING DOES NOT EXCEED FORTY THIRN APPROXIMATELY 1 VOLT. CONNECT RCA VOLTOHMTEST VACUUM TUBE VOLTMETER TO A.N.C. BUS	955 K.C.	MAX. READING	NO. 1. B. NO. 2 I.F. TRAP C4	INDEX MARK ON DIALS.	OSC. TRIMMER C ₀	MIN. READING
3		1500 K.C.				R.F. TRIMMER C ₁	
4		600 K.C.				ANT. TRIMMER C ₁	
5	REPEAT STEP 3					PADDER C6	
6	DISCONNECT SIGNAL GENERATOR, CHANGE ANTENNA JUMPER FOR LOOP OPERATION TUNE RADIO TO SOME STATION NEAR 1500 K.C. AND ADJUST LOOP TRIMMER C2 (LOCATED ON LOOP) FOR MAXIMUM VOLT-METER READING.					ROCK GANG. C ₁	

- CONDENSERS**
- C1-420 MFD 3.5MM TUNING TRIMMER 66M/PM-420
 - C2 500 VOLT TRIMMER MICA
 - C3 500 VOLT TRIMMER MICA
 - C4 500 VOLT TRIMMER MICA
 - C5 500 VOLT TRIMMER MICA
 - C6 500 VOLT TRIMMER MICA
 - C7 500 VOLT TRIMMER MICA
 - C8 500 VOLT TRIMMER MICA
 - C9 500 VOLT TRIMMER MICA
 - C10 500 VOLT TRIMMER MICA
 - C11 500 VOLT TRIMMER MICA
 - C12 500 VOLT TRIMMER MICA
 - C13 500 VOLT TRIMMER MICA
 - C14 500 VOLT TRIMMER MICA
 - C15 500 VOLT TRIMMER MICA
 - C16 500 VOLT TRIMMER MICA
- RESISTORS ± 20%**
- R1 470K 1/2 WATT CARBON
 - R2 22K 1/2 WATT CARBON
 - R3 500 OHM 1/2 WATT CARBON
 - R4 47K 1/2 WATT CARBON
 - R5 47K 1/2 WATT CARBON
 - R6 47K 1/2 WATT CARBON
 - R7 47K 1/2 WATT CARBON
 - R8 47K 1/2 WATT CARBON
 - R9 47K 1/2 WATT CARBON
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 - R96 47K 1/2 WATT CARBON
 - R97 47K 1/2 WATT CARBON
 - R98 47K 1/2 WATT CARBON
 - R99 47K 1/2 WATT CARBON
 - R100 47K 1/2 WATT CARBON

GILFILLAN BROS. INC.

MODEL 86 Series



NOTE: ALL RESISTORS ARE 1/2 WATT EXCEPT AS NOTED.

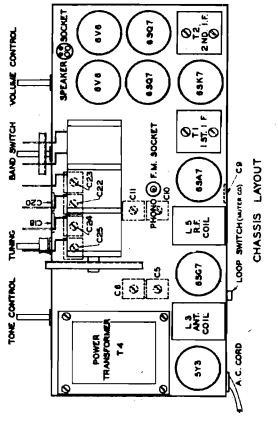
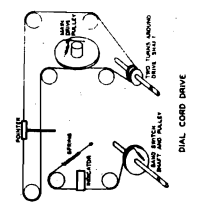
ALL D.C. VOLTAGE MEASUREMENTS MADE INDICATED TO CHASSIS GROUND.

PARTS LIST

88-2	BAND SWITCH
88-3	OSCILLATOR COIL
88-4	R.F. COIL
88-5	R.F. COIL
88-6	REAR TONE CONTROL
88-7	POWER TRANSFORMER
88-8	POWER TRANSFORMER
88-9	5Y3-GT/G
88-10	6S67
88-11	6SA7-GT
88-12	6SK7-GT
88-13	6SQ7-GT
88-14	6V6-GT
88-15	5Y3-GT/G
88-16	10" SPEAKER
88-17	10" SPEAKER
88-18	10" SPEAKER
88-19	10" SPEAKER
88-20	10" SPEAKER
88-21	10" SPEAKER
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88-97	10" SPEAKER
88-98	10" SPEAKER
88-99	10" SPEAKER
88-100	10" SPEAKER

ALIGNMENT PROCEDURE FOR MODEL 86 SERIES

1. SET LOOP SWITCH ON BACK OF CHASSIS TO ANTENNA COIL POSITION.
2. ADJUST ANTENNA COIL TO MAXIMUM VOLUME INDICATION.
3. CONTROL TO MAXIMUM POSITION AND TURN TONE CONTROL TO RIGHT POSITION TO MAXIMUM VOLUME INDICATION.
4. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
5. TURN BAND SWITCH TO BROADCAST POSITION (NON-INDUCTIVE) OR A.C. CONDENSER IN SERIES WITH SIGNAL GENERATOR WHEN SPECIFIED IN CHART BELOW AS DUMMY ANTENNA. TUNE FOR MAXIMUM VOLUME INDICATION.
6. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
7. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
8. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
9. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
10. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
11. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
12. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
13. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
14. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
15. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
16. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
17. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
18. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
19. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
20. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
21. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
22. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
23. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
24. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
25. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
26. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
27. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
28. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
29. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
30. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
31. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
32. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
33. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
34. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
35. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
36. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
37. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
38. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
39. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
40. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
41. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
42. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
43. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
44. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
45. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
46. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
47. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
48. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
49. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
50. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
51. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
52. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
53. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
54. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
55. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
56. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
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60. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
61. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
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63. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
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66. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
67. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
68. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
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70. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
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74. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
75. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
76. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
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84. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
85. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
86. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
87. BAND SWITCH TO SHORTWAVE 2 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
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98. BAND SWITCH TO SHORTWAVE 1 POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.
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100. BAND SWITCH TO BROADCAST POSITION AND SET LOOP SWITCH ON LOOP POSITION. TUNE FOR MAXIMUM VOLUME INDICATION.

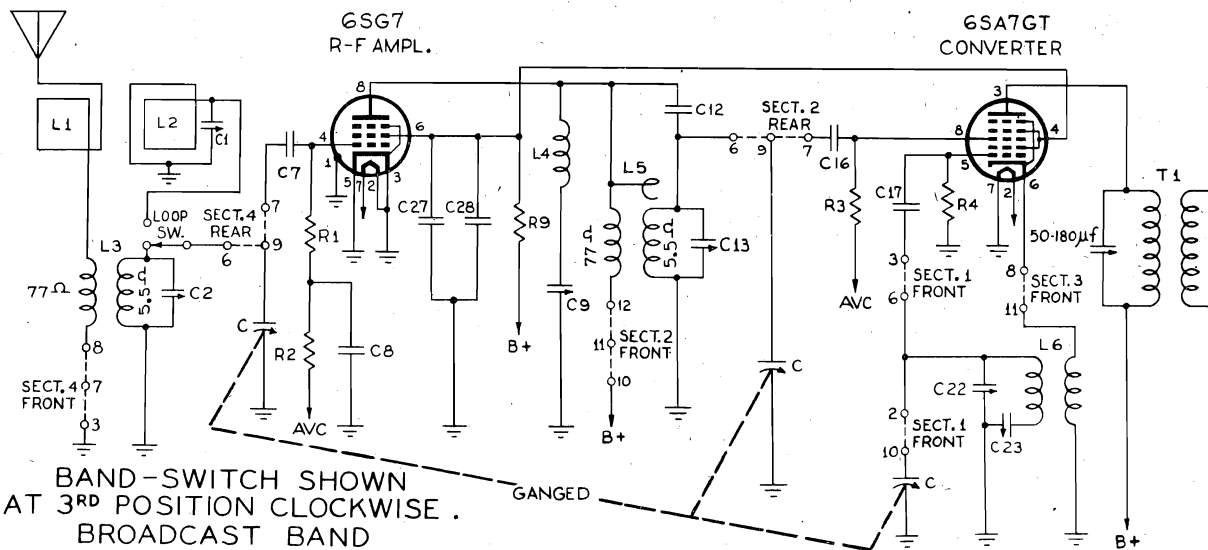
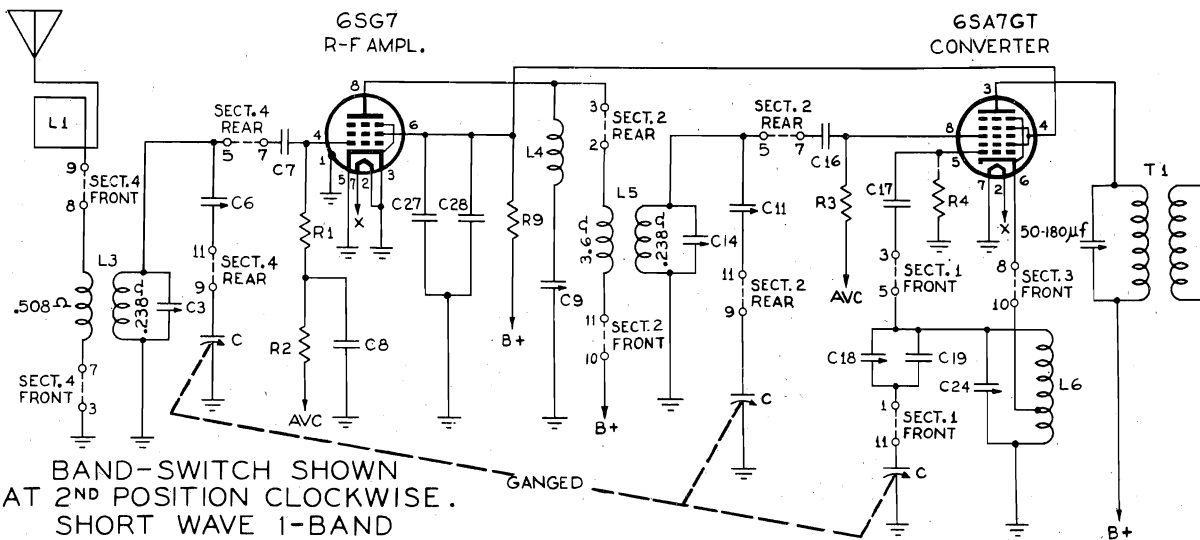
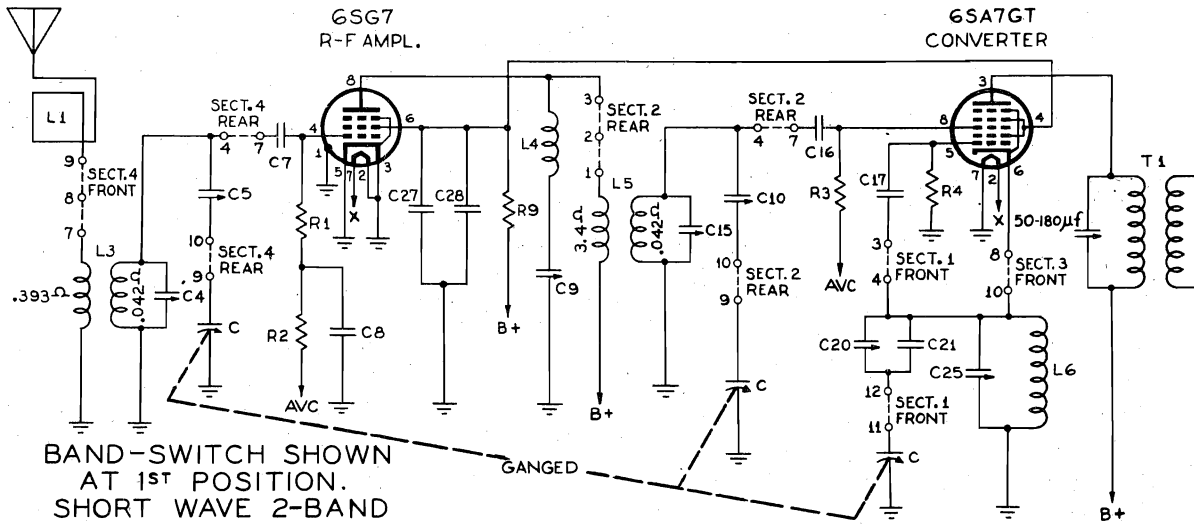


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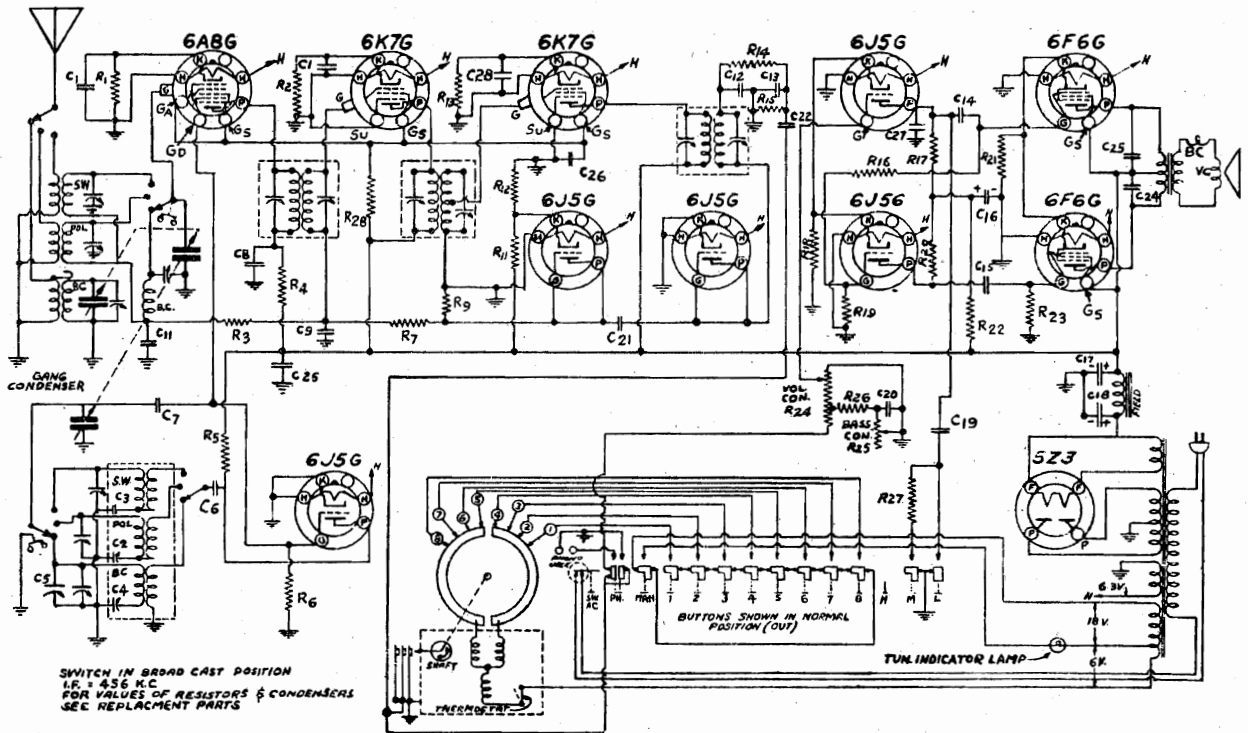
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C3	100K
C4	100K
C5	100K
C6	100K
C7	100K
C8	100K
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C10	100K
C11	100K
C12	100K
C13	100K
C14	100K
C15	100K
C16	100K
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C88	100K
C89	100K
C90	100K
C91	100K
C92	100K
C93	100K
C94	100K
C95	100K
C96	100K
C97	100K
C98	100K
C99	100K
C100	100K

MODEL 86 Series

GILFILLAN BROS. INC.



B. F. GOODRICH CO.



11A REPLACEMENT PARTS LIST

PAPER CONDENSERS

- C 1—P148 .05 Mfd. 200 V.
- C 2 Police Band Padder—
(.0008—.0016 Mfd.)
- C 4 Broadcast Band Padder—
(.003—.0006 Mfd.)
- C 6—P1322 .005 Mfd. 600 V.
- C 8—P276 .1 Mfd. 400 V.
- C 9—P148 .05 Mfd. 200 V.
- C11—P142 .1 Mfd. 200 V.
- C14—P334 .05 Mfd. 400 V.
- C15—P334 .05 Mfd. 400 V.
- C19—P334 .05 Mfd. 400 V.
- C20—P1322 .005 Mfd. 600 V.
- C22—P148 .05 Mfd. 200 V.
- C23—P1322 .005 Mfd. 600 V.
- C24—P1322 .005 Mfd. 600 V.
- C25—P276 .1 Mfd. 400 V.
- C26—P276 .1 Mfd. 400 V.
- C28—P148 .05 Mfd. 200 V.

MICA CONDENSERS

- C 3—P1683 .004 Mfd.
- C 7—P480 .0001 Mfd.
- C12—P480 .0001 Mfd.
- C13—P480 .0001 Mfd.
- C21—P1382 .00025 Mfd.
- C27—P480 .0001 Mfd.

ELECTROLYTIC CONDENSERS

- C16 } P1939 Dual Electrolytic
- C17 }
- C18—P1937 Electrolytic

ADJUSTABLE CONDENSERS

- P1918A Variable Condenser
- P2743 Gang Trimmer Strip
- P1682 Oscillator Padder Condensers

RESISTORS

- R 1—P140 500 Ohm ¼ Watt
- R 2—P1950 350 Ohm ¼ Watt 10%
- R 3—P139 250,000 Ohm ¼ Watt
- R 4—P481 3,000 Ohm ¼ Watt
- R 5—P673 10,000 Ohm ½ Watt
- R 6—P417 50,000 Ohm ¼ Watt
- R 7—P137 500,000 Ohm ¼ Watt
- R 9—P137 1,000,000 Ohm ¼ Watt
- R11—P2731 25,000 Ohm 1 Watt
- R12—P278 600 Ohm ¼ Watt
- R13—P1950 350 Ohm ¼ Watt
- R14—P417 50,000 Ohm ¼ Watt
- R15—P139 250,000 Ohm ¼ Watt
- R16—P1220 200,000 Ohm ¼ Watt
- R17—P166 25,000 Ohm ¼ Watt
- R18—P376 750 Ohm ¼ Watt
- R19—P258 15,000 Ohm ¼ Watt
- R20—P166 25,000 Ohm ¼ Watt
- R21—P2732 220 Ohm 2 Watt
- R22—P167 10,000 Ohm ¼ Watt
- R23—P139 250,000 Ohm ¼ Watt
- R24 Volume Control—
2,000,000 Ohms
- R25 Bass Control—
1,000,000 Ohms
- R26—P1217 60,000 Ohm ¼ Watt
- R27—P167 10,000 Ohm ¼ Watt
- R28—P165 25,000 Ohm ¼ Watt
- R29 Speaker Field—600 Ohm

TRANSFORMERS AND COILS

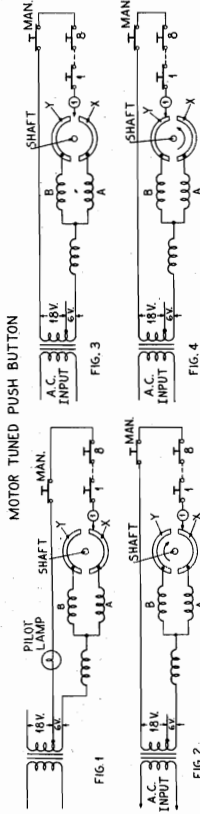
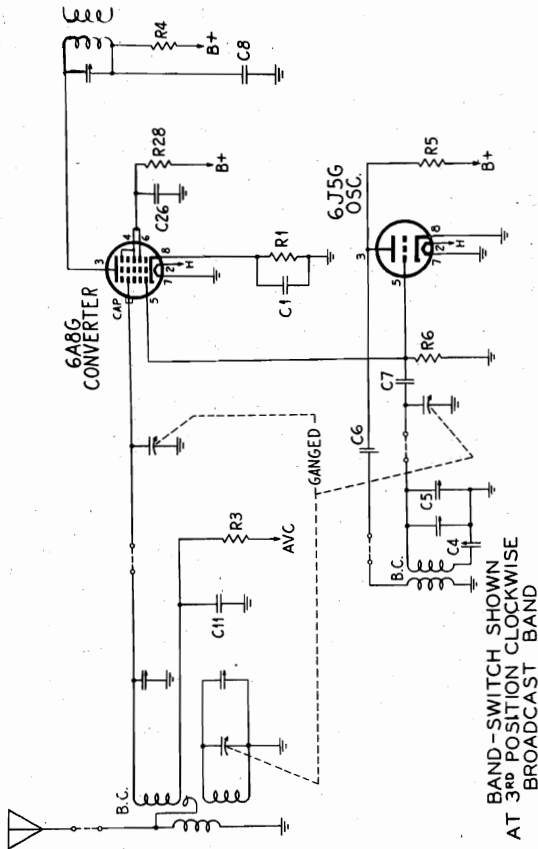
- P2710 Power Transformer
- P1930 1st I.F. Transformer
- P2704 2nd I.F. Transformer
- P2711 3rd I.F. Transformer
- G5794 Oscillator Coil Assembly
- G5310 Police and Short Wave Antenna
Coil
- G5347 Broadcast Antenna Coil

MISCELLANEOUS

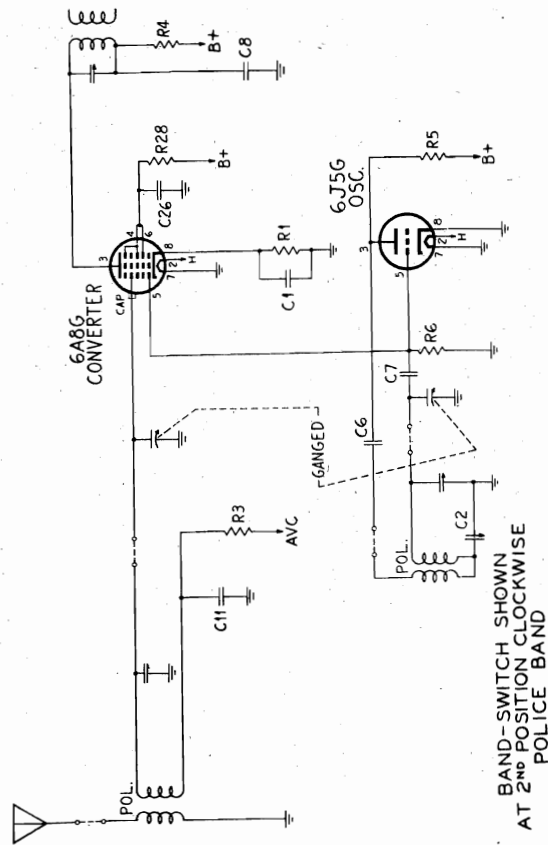
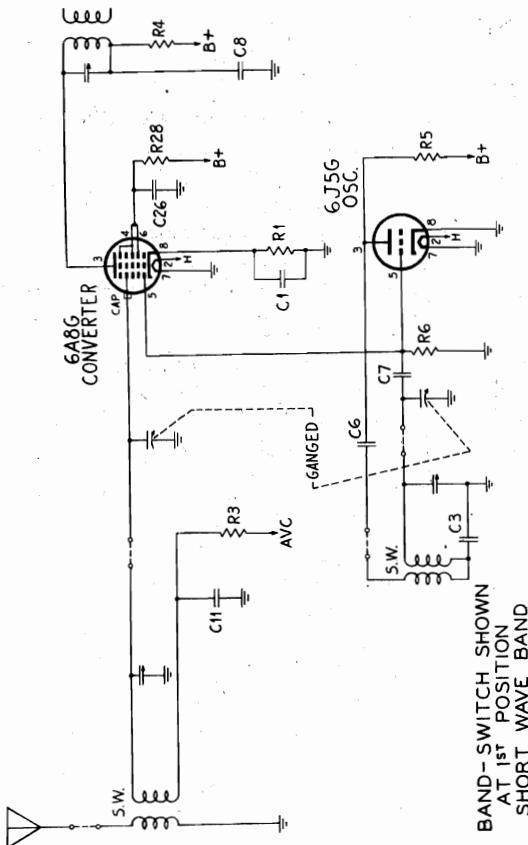
- P1928 Tube Socket
- P1153 5Z3 Socket
- P945 Speaker Socket
- P2705 Volume Control
- P2706 Bass Control
- G5788 Band Switch and Lead Assembly
- P929 A.C. Line Cord
- P1455 Tube Shield
- P1456 Tube Shield Base
- P2716 12" Dynamic Speaker
- P2694 Push Button Switch
- 3 Pilot Light Socket
- 1504 Pilot Light Bulb
- Electric Motor
- P2689 Rubber Drive Belt
- P2688 Dial Scale
- P2644 Dial Pointer
- G5462 Lower Segment Adjustment Bracket
and Contact
- G5463 Upper Segment Adjustment Bracket
and Contact

MODEL R-635

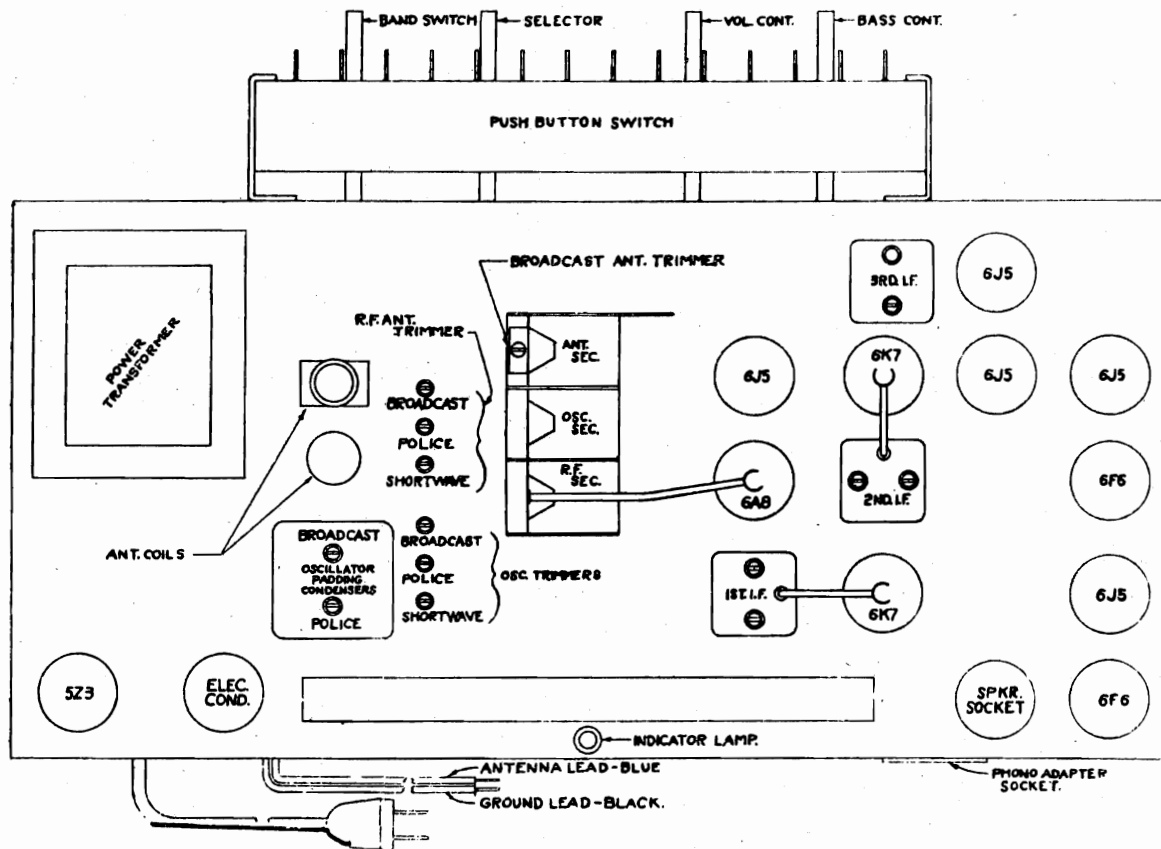
B. F. GOODRICH CO.



NOTES: FIGS. 1, 2, 3 AND 4 SHOW SCHEMATICALLY THE SETTING UP AND AUTOMATIC TUNING OF PUSHBUTTON NO. 1. THE OTHER PUSHBUTTONS FOLLOW THIS PATTERN BUT AREN'T SHOWN FOR CLARITY OF DIAGRAM. FIG. 1 SHOWS THE SETTING UP OF PUSHBUTTON 1, WITH THE MANUAL AND NO. 1 BUTTONS DEPRESSED. THE PILOT LAMP WILL LIGHT, BEING ENERGIZED ACROSS THE 6-Y. TAP THROUGH THE MOTOR WINDING (A), ROTOR PLATE X, CONTACT 1, AND THE PUSHBUTTONS. WHEN BUTTON NO. 1 IS ADJUSTED TO THE CORRECT FREQUENCY, THE PILOT LAMP GOES OUT BECAUSE CONTACT 1 IS THEN POSITIONED BETWEEN PLATES X AND Y, SIMILAR TO FIG. 3, WHICH BREAKS THE ELECTRICAL CONTACT. IN ORDER TO TUNE TO STATION 1 AUTOMATICALLY, PUSHBUTTON 1 IS DEPRESSED, ENERGIZING THE MOTOR ACROSS 18-V AS SHOWN IN FIG. 2. SINCE THE (A) WINDING IS ENERGIZED, THE MOTOR WILL TURN PLATES X AND Y IN DIRECTION OF ARROW SHOWN UNTIL CONTACT IS BROKEN, WHICH WILL OCCUR WHEN PLATES REACH POSITION SHOWN IN FIG. 3. IF THE MOTOR DOES NOT STOP FAST ENOUGH, THEN PLATES X AND Y, WHICH ARE MECHANICALLY GANGED BY THE SHAFT TO THE TUNING CAPACITORS, WILL TURN TOO FAR, PUTTING THE STATION OUT OF TUNE BUT IF THEY DO ROTATE TOO MUCH THEY MUST ASSUME THE POSITION SHOWN IN FIG. 4 WHICH THEN ENERGIZES THE OTHER (B) WINDING OF THE MOTOR, REVERSING THE DIRECTION OF ROTATION UNTIL IT COMES TO A STOP AT ITS CORRECTLY TUNED POSITION SHOWN IN FIG. 3.



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ALIGNMENT DATA AND SERVICING

GENERAL DATA

The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400, 1730, 1800, 4000, 5600, 6000, 16,000 and 18,100 KC and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE

The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band should always be the next procedure; after which, either or both of the Short Wave Bands may be aligned.

I.F. ALIGNMENT

With the wave switch in the Broadcast Band and the gang condenser set at minimum push in the white button until it locks. Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align the six I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT

Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and adjust the "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the "preselector" and "antenna" trimmer to maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver. **Note:** approximately the same sensitivity should be noted at this point as was at 1400 KC. The

signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the preselector of the R.F. section. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

POLICE BAND ALIGNMENT

The police band is adjusted by first replacing the .0002 dummy with a 400 ohm resistor and setting the generator to 5600 KC. With the gang set at minimum, adjust the "police oscillator trimmer" to receive this signal, then set the signal generator to 4000 KC and adjust "police antenna trimmer" to give maximum output. Next, set the oscillator to 1800 KC and "pad" the circuit of this frequency as described in the instructions for padding the broadcast circuits.

SHORT WAVE BAND ALIGNMENT

The short wave band is adjusted by setting the generator to 18,100 KC and with the gang at minimum, adjust the "short wave oscillator trimmer" to receive the signal. Set the generator at 16,000 KC, tune in the signal and adjust the "short wave antenna" trimmer to give maximum output. As there is no variable low frequency padding condenser on this band, the sensitivity of the receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested for defects as sometimes these components become subject to mechanical or electrical injuries, despite their rugged construction and liberal ratings.

MODEL R-635

B. F. GOODRICH

INSTRUCTIONS FOR ADJUSTMENT AND OPERATION OF THE ELECTRIC TUNER

It is very important to read the following instructions carefully before attempting to adjust the electric tuner.

The electric tuner is made up of three integral units:

PUSH BUTTON SWITCH: The push button switch consists of eight (8) brown push buttons flanked on either side by three (3) white push buttons.

SELECTOR MECHANISM: The selector mechanism is made up of the selector plate, eight (8) thumb screws, and the adjustment light bulb.

ELECTRIC MOTOR: The power for this tuner is provided by a small, efficient electric motor, of the brushless variety. It is fitted with an automatic clutch. The bearings and the oil retainer hold sufficient oil to lubricate the motor for a lifetime.

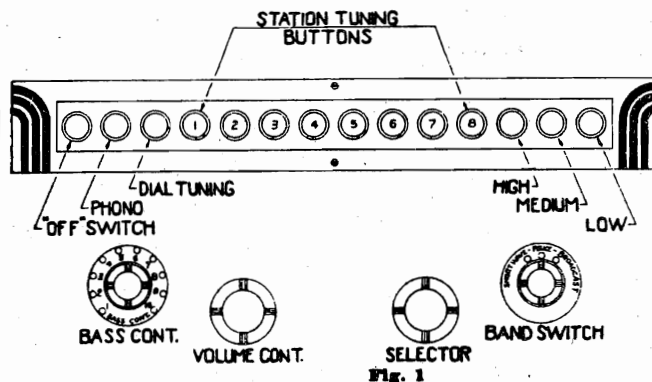


Fig. 1

SETTING UP STATIONS

The first step to take in adjusting the electric push button device incorporated into this receiver is to choose eight (8) of the most powerful local stations, stations which are free from excess fading. Turn on the receiver (broadcast band) and press in the dial tuning button; tune in the station of the lowest frequency, using the station selector knob. Now hold the dial tuning button in and press in button number one (1). (See Figure 1). Both buttons are now locked into place; a small pilot lamp located at the rear of the chassis will light up unless the thumb screw at the rear accidentally happens to be correctly set. Loosen thumb screw number one (See Figure 2 for order of thumb screws) enough to allow it to slide freely back and forth until the light goes out. Now tighten the thumb screw; the adjustment for the first station is now complete. Out of the station call letter sheet supplied remove the proper station call disc and insert into the recess of button number one. Push one of the clear celluloid discs into the recess also, over the station call disc. Now release button number one by pressing the dial tuning button in as far as it will go.

With the white button still in, tune in the station of the next highest frequency and holding the white button, press in button number two. Both buttons are now locked into place. Loosen thumb screw number two (see Figure 2) and slide back and forth until a point is reached at which the pilot lamp in the rear goes out; tighten the thumb screw. Insert the proper station call disc and celluloid disc into the window of button number two.

Follow this same procedure for the remaining stations, always choosing the station with the next highest frequency. After all eight (8) stations have been adjusted, check each adjustment by tuning in each station. Note: In the window above the white button, insert the word "OFF" found in the call letter sheet.

NOTE: In the recesses of the white push buttons insert the words found in the call letter sheet as shown in Figure 1.

HOW TO TUNE IN STATIONS USING THE ELECTRIC PUSH BUTTON TUNER

In order to operate the receiver satisfactorily—using the electric push button tuner, the dial tuning button must be in released position, that is, all the way out. To tune in a station, merely press the selector button which designates the station desired. Note: Should the station fail to come in clearly, check the adjustment by following the adjustment procedure described in the paragraph above.

To change from electric tuning to manual selecting, simply press in the dial tuning button. When the dial tuning button is in, the set may be tuned as a conventional receiver. Note: If it is desired to tune Short Wave or Police while the set is being operated with push buttons, it is not necessary to change over from push button tuning to manual tuning. Simply turn the band switch and proceed to tune with the selector knob. When the band switch is returned to broadcast, the station last selected by button will automatically tune in by itself.

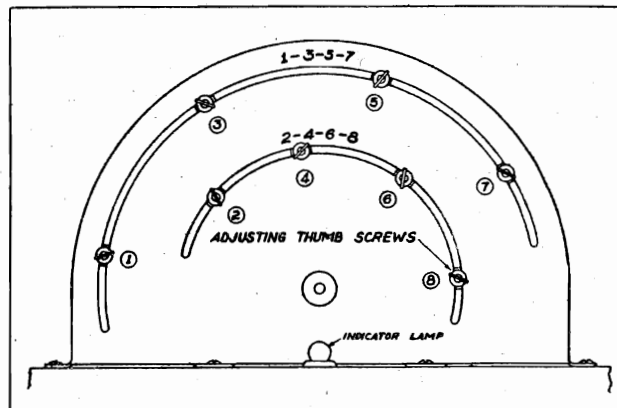
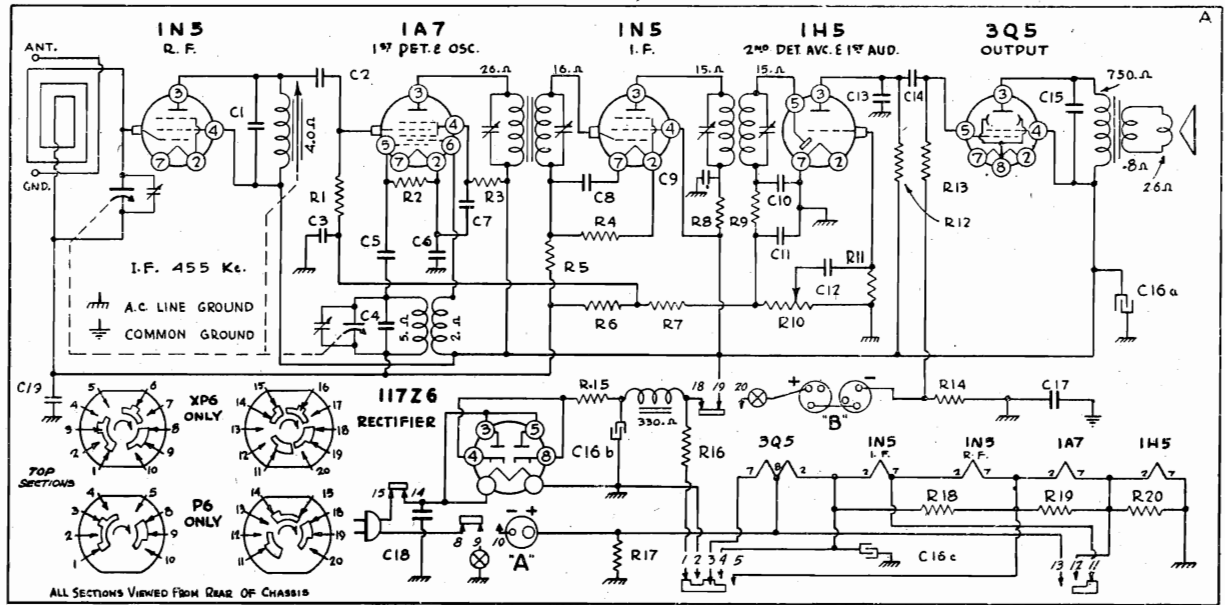


Fig. 2

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MODEL R-661



Late Model.

Power switch in line position. Common ground is chassis ground.

CONDENSERS

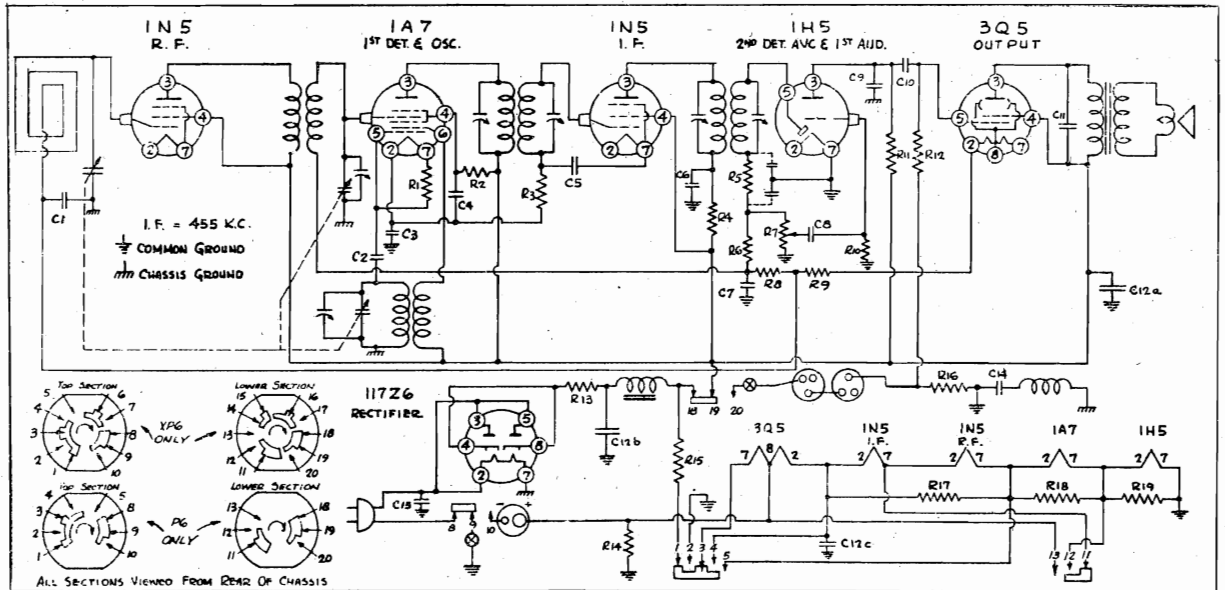
No.	Ohms	Watts
R1	100,000	1/2
R2	200,000	1/2
R3	5,000,000	1/2
R4	5,000,000	1/2
R5	5,000,000	1/2
R6	5,000,000	1/2
R7	3,000,000	1/2
R8	5,000	1/2
R9	70,000	1/2
R10	1,000,000	V.C.

No.	Ohms	Watts
R11	15,000,000	1/2
R12	1,000,000	1/2
R13	2,000,000	1/2
R14	400	1/2
R15	22	1/2
R16	2,150	5
R17	3,000	1/2
R18	500	1/2
R19	200	1/2
R20	110	1/2

RESISTORS

No.	Capacity (Mfd.)	Volts
C1	.000387	Silver Mica
C2	.00025	Mica
C3	.01	400
C4	.000015	Mica
C5	.000005	Mica
C6	.25	200
C7	.01	400
C8	.01	400
C9	.05	400
C10	.00005	In I.F. Can

No.	Capacity (Mfd.)	Volts
C11	.0001	Mica
C12	.01	400
C13	.00025	Mica
C14	.01	400
C15	.002	600
C16a	40.	150
C16b	30.	150
C16c	100.	25
C17	.1	400
C18	.05	400
C19	.05	200



Early Model.

RESISTORS

No.	Ohms	Watts
R1	200,000	1/2
R2	50,000	1/2
R3	5,000,000	1/2
R4	5,000	1/2
R5	70,000	1/2
R6	3,000,000	1/4
R7	1,000,000	V.C.
R8	5,000,000	1/2
R9	10,000,000	1/4
R10	15,000,000	1/2

No.	Ohms	Watts
R11	1,000,000	1/2
R12	2,000,000	1/2
R13	22-10%	1/2
R14	1,000	1/2
R15	2,150-10%	5
R16	400-10%	1/2
R17	500-10%	1/2
R18	200-10%	1/2
R19	110-10%	1/2

CONDENSERS

No.	Capacity (Mfd.)	Volts
C1	.05	200
C2	.00005	Mica
C3	.25	200
C4	.01	400
C5	.001	600
C6	.05	400
C7	.05	200
C8	.001	600

No.	Capacity (Mfd.)	Volts
C9	.00025	Mica
C10	.01	600
C11	.002	600
C12a	50. Elect.	150
C12b	30. Elect.	150
C12c	100. Elect.	25
C13	.05	400
C14	.2	200

1942

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MODEL R-661

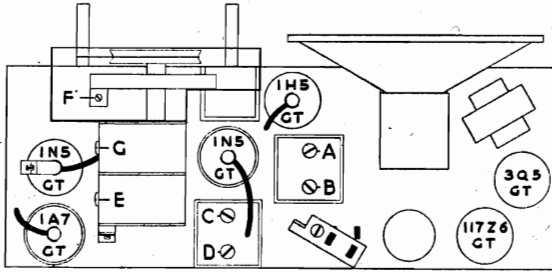


FIG. 1 TOP VIEW

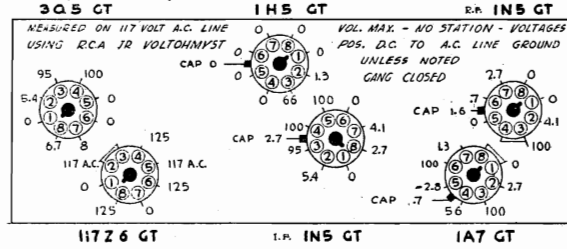


FIG. 2 VOLTAGE CHART

STEP	Connect Signal Generator to—	Dummy Antenna Between Radio and Generator	Set Generator Controls to—	Set Radio Controls to—	Adj. Following Trimmers to Max. Output
1	Grid 1A7 GT	.1	455 Kc	1600 Kc.	A, B, C, D, I, F.
2	Grid 1N5 GT	.1	1600 Kc.	1600 Kc.	E Osc.
3	Grid 1A7 GT	.1	1400 Kc.	1400 Kc.	F — R. F. (Gang Early) on (Slug Late)
4	Loop Radiator	Two feet from Radio No Connection	1400 Kc.	1400 Kc.	G Ant.

Use Aerometer or three turn loop in series with 400 ohm resistor 10" diameter on Signal Generator in Step 4.

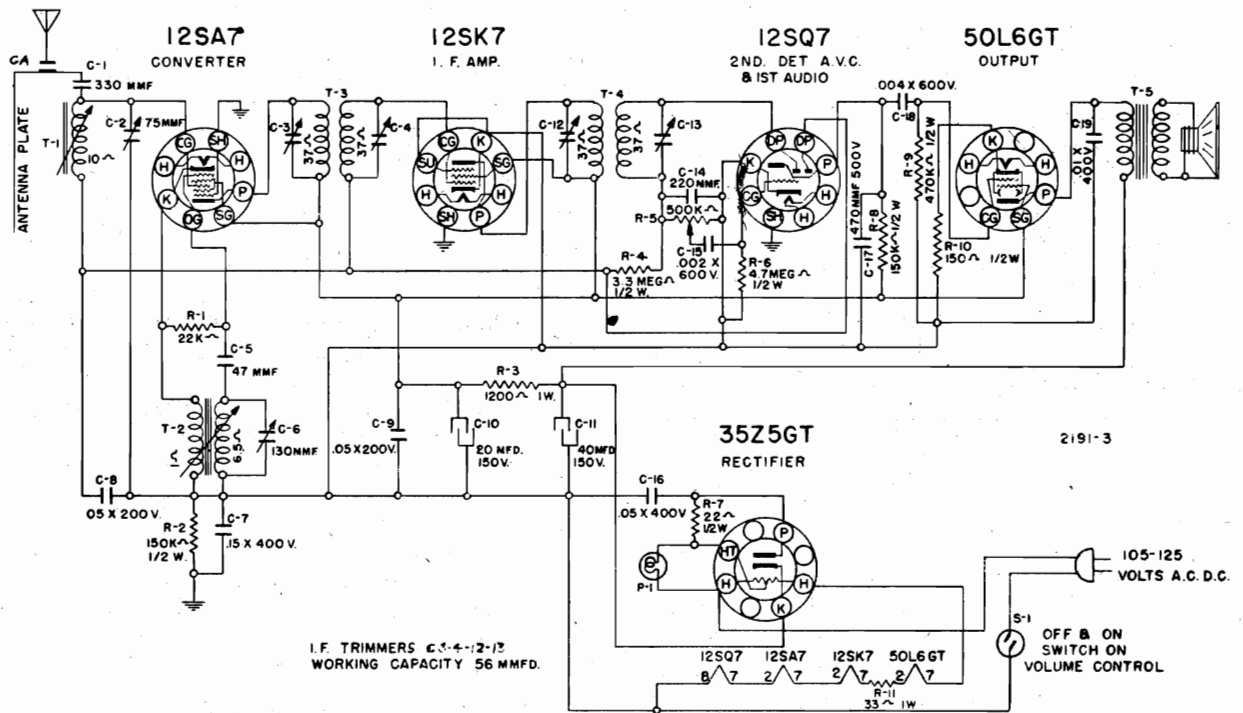
REPLACEMENT PARTS LIST

PAPER CONDENSERS		P3801 R20 110 ohm ½ w..... .20	
P1193 .002 mfd. 600 volt.....	.20	P3806 R19 200 ohm ½ w.....	.20
P164 .01 mfd. 400 volt.....	.25	P3816 R14 400 ohm ½ w.....	.20
P148 .05 mfd. 200 volt.....	.20	P3820 R18 500 ohm ½ w.....	.20
P334 .05 mfd. 400 volt.....	.40	P4856 R16 2,150 ohm 5 w	
P276 .1 mfd. 400 volt.....	.40	(wirewound).....	.60
P141 .25 mfd. 200 volt.....	.30	P3833 R17 3,000 ohm ½ w.....	.20
MICA CONDENSERS		P3836 R8 5,000 ohm ½ w.....	.20
P5209 .000015 mfd.....	.20	P3853 R3 50,000 ohm ½ w.....	.20
P1382 .00005 mfd.....	.20	P3857 R9 70,000 ohm ½ w.....	.20
P480 .0001 mfd.....	.20	P3860 R1 100,000 ohm ½ w.....	.20
P817 .00025 mfd.....	.20	P3864 R2 200,000 ohm ½ w.....	.20
P1599 .000367 mfd. silver.....	.65	P3882 R12 1,000,000 ohm ½ w.....	.20
or		P3883 R13 2,000,000 ohm ½ w.....	.20
P5200 .000367 mfd. special.....	.60	P4663 R7 3,000,000 ohm ½ w.....	.20
ELECTROLYTIC CONDENSERS		P3886 R4,R5,R6 5,000,000 ohm	
VARIABLE CONDENSERS		½ w.....	.20
VARIABLE RESISTORS		P3891 R11 15,000,000 ohm ½ w.....	.20
P4860A { 40 mfd. 150 volt } 1.60		MISCELLANEOUS	
{ 30 mfd. 150 volt }		P4583 Tube Socket.....	.20
{ 100 mfd. 25 volt }		P5206 Electrolytic Mounting	
VARIABLE RESISTORS		Base .....	.15
P4820 R10 1 meg. Volume control.....	1.25	P5194 Drive shaft.....	.20
TRANSFORMERS AND COILS		P1399 Horseshoe Washer	
G6543 R.F. Coil and Mtg. Bracket .....	.55	(for drive shaft) ½ doz. ....	.15
P5203 Oscillator Coil.....	.65	P2925 Takeup Spring.....	.15
P3967 Oscillator Coil (Early).....	.65	P1585 Snap button for scale	
P4818 1st I.F. Transformer.....	1.50	½ doz. ....	.15
P4819 2nd I.F. Transformer.....	1.70	P4435 Dial Pointer.....	.20
RESISTORS		P4816 Dial Background.....	.25
P5187 Gang Condenser, 2 gang.....	3.50	P4876 Knob .....	.20
P4817 Gang Condenser, 3 gang.....	3.50	P4695 Escutcheon	1.75
P5268 R15 22 ohm ½ w		P4833 Indicator disc .....	.20
(wirewound).....	.20	P929A Line cord.....	.65
		P3557 Lane cord clamp.....	.15
		P3017 Two-prong battery plug.....	.15
		P3016 Three-prong battery plug .....	.15
		P470 Grid clip.....	.05
		P3571 Tube shield.....	.15
		G6538 Drum and cam assembly.....	.30
		P5193 Left hand dial bracket.....	.20
		P6546 Lever arm assembly.....	.20
		P5005 Spring	
		P5032 Spacer } Lever mounting	
		P5197 Washer } hdw. ....	.10
		P931 Screw	
		P4979 Iron Slug.....	.40
		P5192 Right hand dial bracket.....	.25
		P4852 I.F. Shield.....	.20

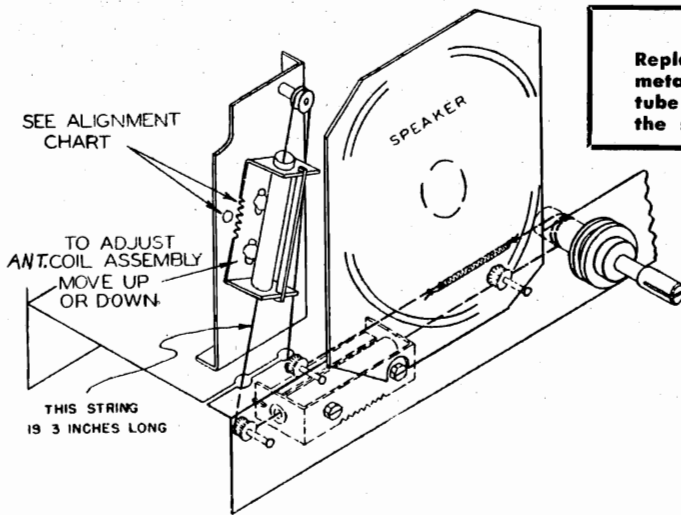
All prices quoted are list and subject to the usual trade discount.
 A handling charge of \$0.25 will be made on all orders under \$0.75 list.
 Shipments are F.O.B. our factory. When remitting in advance please include postage.
 Price are subject to change without notice.

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MODELS 500,501, Series A

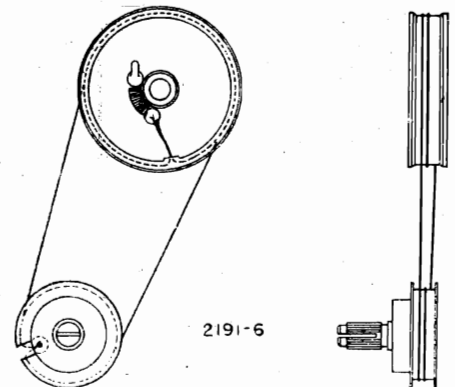


- CORRECTION:**— Pin 7 of 12SA7 tube goes to pin 7 of 12SQ7 tube. Pin 2 of 12SA7 tube goes to Pin 2 of 12SK7 tube.
- | | |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| POWER SUPPLY.....105 to 125 volts, DC or 50-60 cycle AC, 35 watts. | POWER OUTPUT.....800 milliwatts, undistorted. 1.0 watts maximum. |
| FREQUENCY RANGE.....545 to 1700 kc. | SENSITIVITY.....35 microvolts average for 50-milliwatt output. |
| INTERMEDIATE FREQ....455 kc. | SELECTIVITY.....75 kc. broad at 1000 times signal at 1000 kc. |
| TUNINGPermeability. | TUBE COMPLEMENT12SA7, converter
12SK7, I. F. amplifier
12SQ7, 2nd detector, AVC,
1st audio
50L6GT, output amplifier
35Z5GT, rectifier |
| ANTENNA.....Built-in plate type. Also provisions for external antenna. No ground required. | |
| SPEAKER.....4-inch; P.M.; voice coil impedance 3.2 ohms. | |



Coil Assembly View

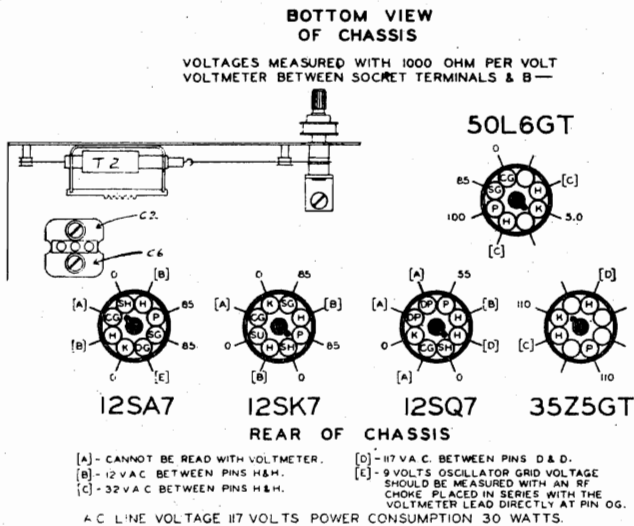
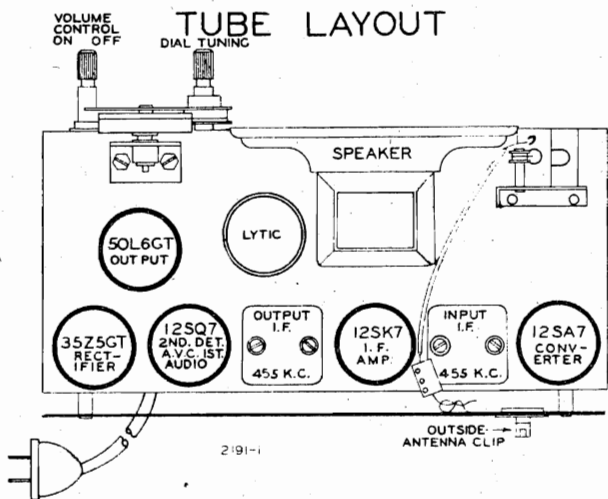
NOTE ON TUBE REPLACEMENT
 Replace a defective metal 12SK7 tube with another metal tube. Replace a glass 12SK7 tube with a metal tube or with an exact duplicate of the tube now in the set.



Dial Stringing View

MODELS 500, 501, Series A

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Chassis View

Voltage Chart

ALIGNMENT PROCEDURE

(Refer to Chassis View and Voltage Chart for location of trimmers)

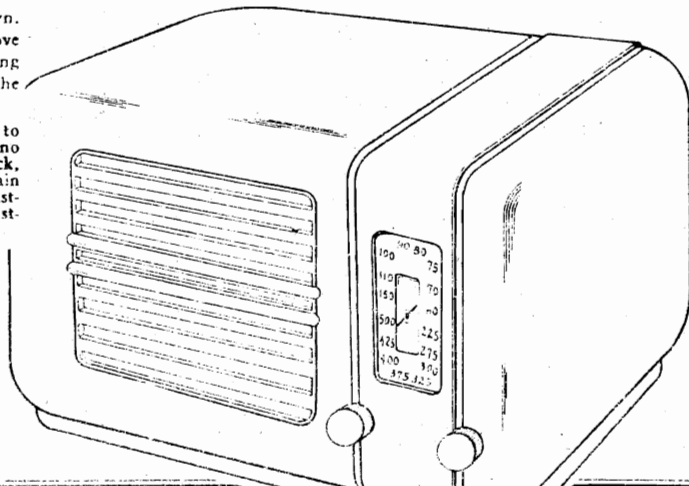
Output meter across 3.2-ohm output load.
 Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

- Volume control at maximum for all adjustments.
- Chassis must be removed from cabinet for proper alignment

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)
Frequency	Dummy Antenna	Connection to Radio	Ground Connection		
455 kc	.1 mf	Metal antenna plate	12SQ7 Pin 3	Iron cores all the way out	Trimmers on output and input I.F. cans
1720 kc	.1 mf	Metal antenna plate	12SQ7 Pin 3	Iron cores all the way out	Oscillator trimmer C6
1720 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Iron cores all the way out	Antenna trimmer C2
1400 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Turn dial to 1400 kc	Adjust position of ant. coil (see coil assembly view)
1720 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Turn dial to 1720 kc	Antenna trimmer C2

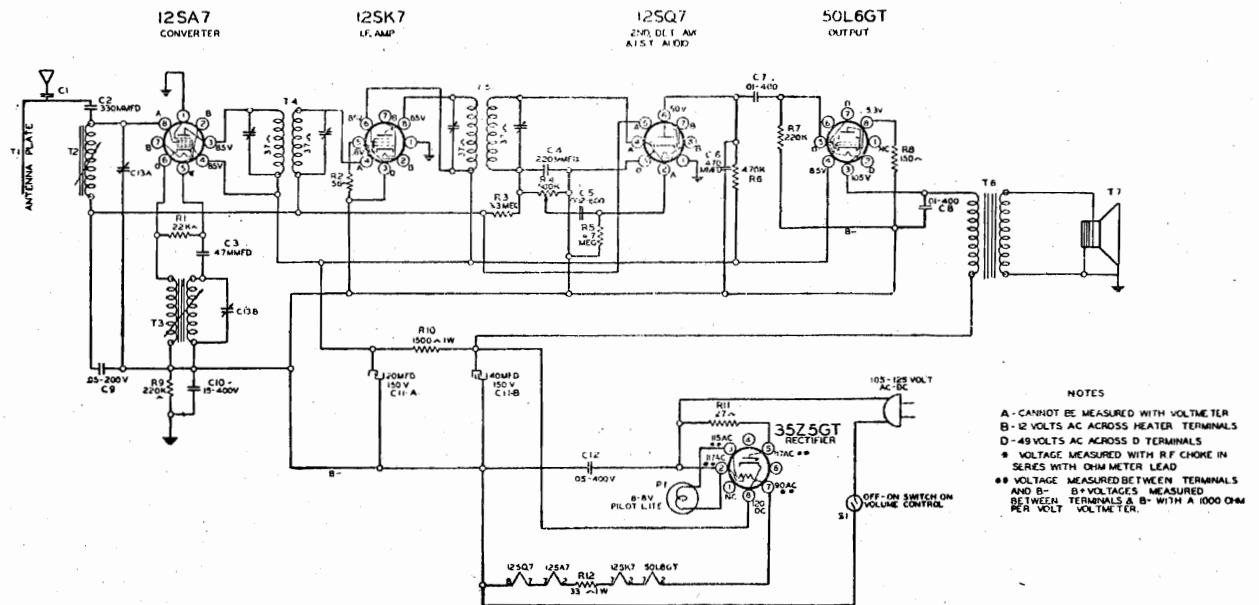
The antenna coil assembly is made so that it is movable up or down. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C2) adjustment again at 1720 Kc. If no appreciable change in trimmer adjustment is made the coil is in track. If the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1720 Kc.



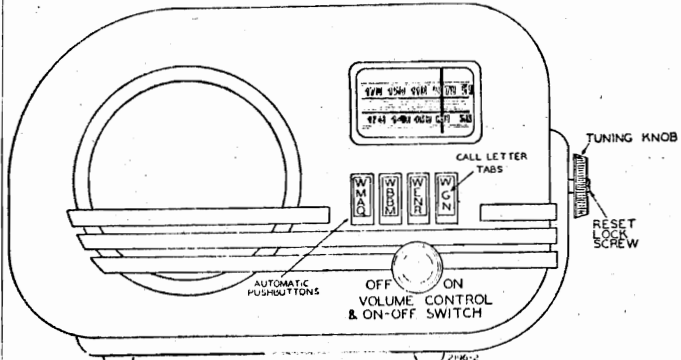
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MODELS 502,503, Series A



NOTES
 A - CANNOT BE MEASURED WITH VOLT METER
 B - 12 VOLTS AC ACROSS HEATER TERMINALS
 D - 49 VOLTS AC ACROSS D TERMINALS
 * VOLTAGE MEASURED WITH RF CHOKER IN SERIES WITH OHM METER LEAD
 ** VOLTAGE MEASURED BETWEEN TERMINALS AND B - B+ VOLTAGES MEASURED BETWEEN TERMINALS A & B - WITH A 1000 OHM PER VOLT VOLTMETER.

- POWER SUPPLY..... 105 to 125 volts, DC or 50-60 cycle AC, 35 watts.
- FREQUENCY RANGE..... 545 to 1700 kc.
- INTERMEDIATE FREQ.... 455 kc.
- TUNING..... Permeability.
- ANTENNA..... Built-in plate type. Also provisions for external antenna. No ground required.
- SPEAKER..... 5-inch; P.M.; voice coil impedance 3.2 ohms.
- POWER OUTPUT..... 800 milliwatts, undistorted. 1.2 watts maximum.
- SENSITIVITY..... 35 microvolts average for 50-milliwatt output.
- TUBE COMPLEMENT..... 12SA7, converter
 12SK7, I. F. amplifier
 12SQ7, 2nd detector, AVC, 1st audio
 50L6GT, output amplifier
 35Z5GT, rectifier



SETTING THE PUSHBUTTONS—The pushbuttons may be used, after proper adjustment, for the automatic tuning of any four stations on the standard broadcast band. They can be set up in any order.

1. Turn on the radio.
2. Push out the call letters of the four stations from the call-letter sheets supplied with this manual.
3. Insert one call-letter tab in the rectangular opening in the front of

each pushbutton, in any order. Press an acetate tab (supplied in small envelope) into each of the pushbuttons.

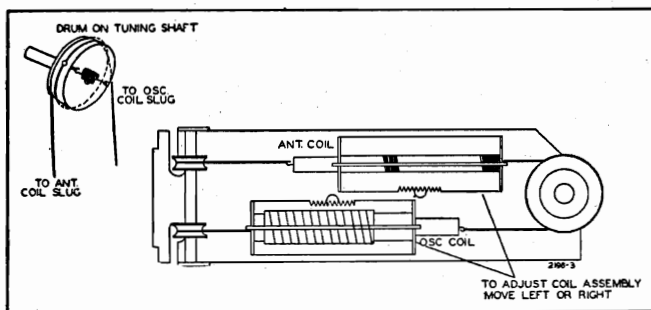
4. With the screwdriver supplied, check to see that the locking screw in the center of the tuning knob (see front view) is loose. If it is not, turn it several turns to the left (counterclockwise).
5. Press the first pushbutton down *all the way*. With one hand hold the button down firmly and with the other carefully tune in the

desired station. Release the pushbutton.

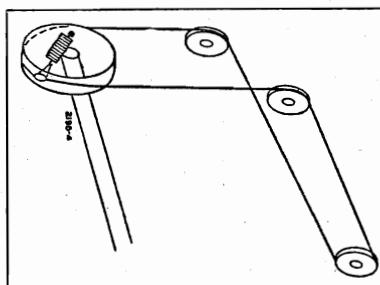
6. Follow this procedure for each of the three other buttons, setting each one for a different station.
7. Rotate the tuning knob on the side of the cabinet as far to the right as it will go. Tighten the locking screw in the center of the knob. **IT IS IMPORTANT THAT THIS SCREW BE TIGHTENED VERY FIRMLY.**
8. The pushbuttons are now properly set for automatic tuning. Any of the four stations may be tuned in simply by pressing the proper button down as far as it will go. If you wish to reset any of the buttons for a new station, loosen the locking screw, set the pushbutton as described above, and re-tighten the locking screw.

MODELS 502,503, Series A

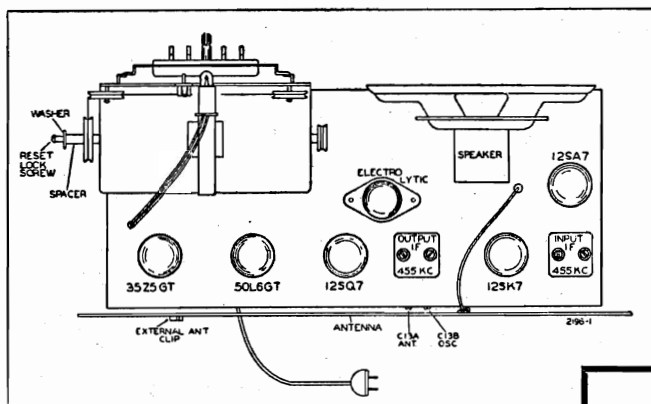
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Coil View



Dial Stringing View



Chassis View

DIAL LIGHT—If the dial lamp burns out the set should not be operated until a new lamp has been installed. Failure to heed this caution may result in a burned-out 35Z5GT tube. To replace the lamp, first remove the buttons which hold the back to the cabinet. The Chassis View illustration shows the location of the dial lamp. *Pull* the lamp bracket toward the rear of the radio. The lamp can now be removed and replaced. Use a 6- to 8-volt lamp, type T-47.

• NOTE ON TUBE REPLACEMENT

Replace a defective metal 12SK7 tube with another metal tube. Replace a glass 12SK7 tube with a metal tube or with an exact duplicate of the tube now in the set.

ALIGNMENT PROCEDURE

(Refer to Chassis View for location of trimmers)

Output meter across 3.2-ohm output load.
Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

- Volume control at maximum for all adjustments.
- Chassis must be removed from cabinet for proper alignment.

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)
Frequency	Dummy Antenna	Connection to Radio	Ground Connection		
455 kc	.1 mf	Metal antenna plate	12SQ7 Pin 3	Iron cores all the way out	Trimmers on output and input I.F. cans
1700 kc	.1 mf	Metal antenna plate	12SQ7 Pin 3	Iron cores all the way out	Oscillator trimmer C13-B
1700 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Iron Cores all the way out	Antenna trimmer C13-A
1400 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Turn dial to 1400 kc	Adjust position of ant. coil (see coil assembly view)
1700 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Iron cores all the way out	Antenna trimmer C13-A

The antenna coil assembly is made so that it is movable. When making the adjustment as given in the alignment procedure move the coil assembly very slowly. It can be moved by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.

After the antenna coil has been tracked at 1400 Kc. it is necessary to check the antenna trimmer (C13-A) adjustment again at 1700 Kc. If no appreciable change in trimmer adjustment is made the coil is in track, if the trimmer requires considerable change it will be necessary to again adjust the position of the antenna coil at 1400 Kc. These two adjustments should be tried several times until no change of trimmer adjustment is required at 1700 Kc.

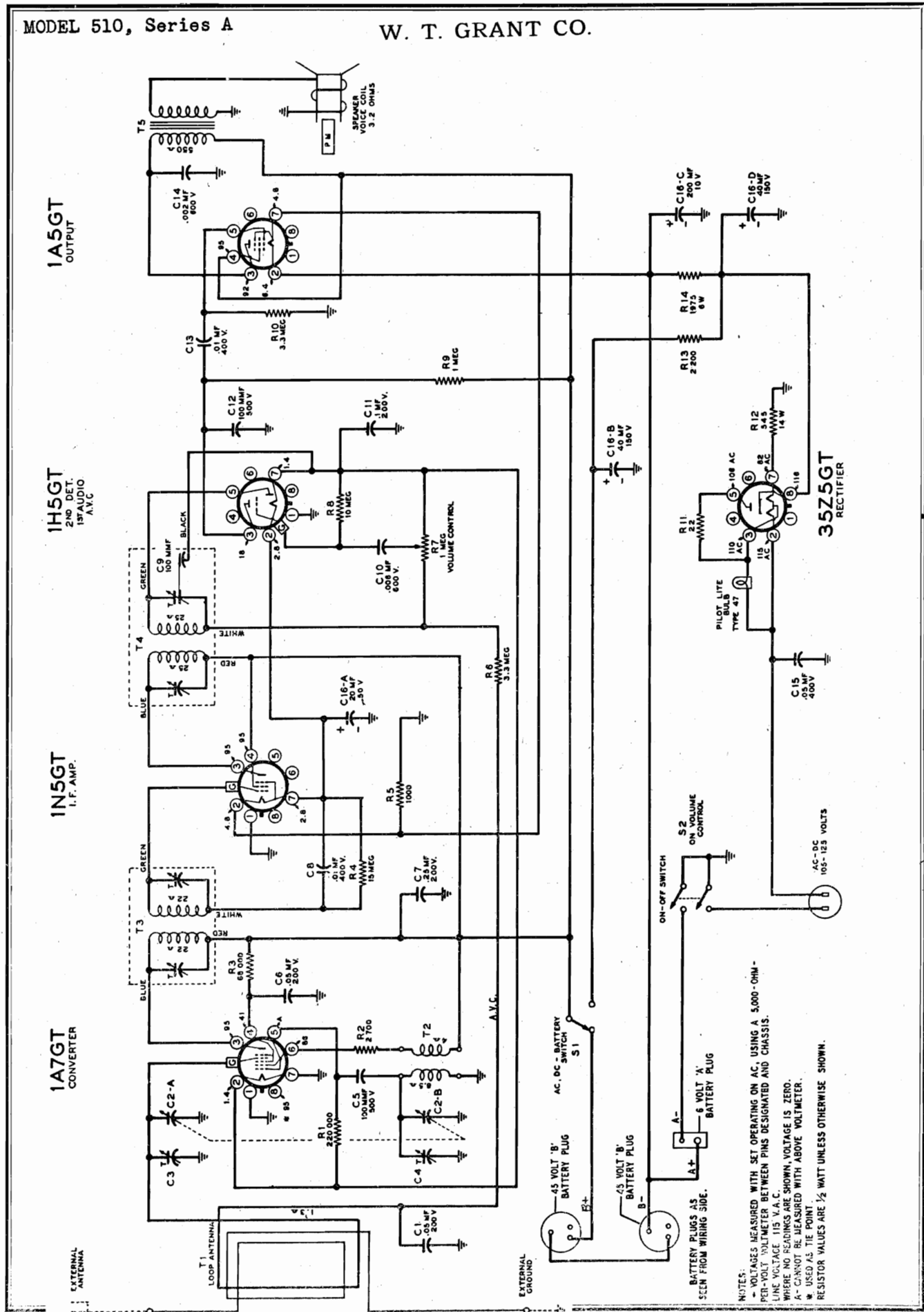
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MODELS 502, 503, Series A
MODELS 500, 501, Series A

Reference No.	Part No.	Description	Reference No.	Part No.	Description
Models 502 and 503—Series A					
C11-A	11992	Electrolytic—20 mf.; 40 mf x 150 volts	128162-8	Knob for Volum Control—Ivory	
C11-B		For use on 60 cycles	B-3B-10994-18	Tuning Knob—Walnut	
C11-A	11993	Electrolytic—40 mf.; 60 mf x 150 volts	B-3B-10994-9	Tuning Knob—Ivory	
C11-B		For use on 25 cycles	A-2H-10996	Reset Key	
C13-A	124151	Dual Trimmer—Ant. and OSC	120388	Locking Spring for Tuning Knob	
C13-B			A-3F-10995	Locking Screw	
C9	C-8D-10770	.05 Mf x 200 Volts—Tubular	128-292B-17	Molded Pushbuttons—Walnut	
C7, 8	C-8D-10761	.01 Mf x 400 Volts—Tubular	128-292B-8	Molded Pushbuttons—Ivory	
C12	C-8D-10813	.05 Mf x 400 Volts—Tubular	112784	Set of Station Call Letters	
C5	C-8D-10778	.002 Mf x 600 Volts—Tubular	112-606	Acetate Tabs	
C10	C-8D-10953	.15 Mf x 400 Volts—Tubular	TUNER PARTS		
C6	C-8F3-12	470 Mmf, 20% Mica	Cam Shaft		
C4	C-8F3-10	220 Mmf, 20% Mica	Brass Spacer		
C2	C-8F3-11	330 Mmf, 20% Mica	Thrust Collar		
C3	C-8F3-6	47 Mmf, 20% Mica	"C" Washer		
*RESISTORS					
R4	101-238	Volume Control (500 K) and Switch	Keywasher		
S1			Brass Spacer		
R4	A-10A-11306	Volume Control (500 K) and Switch	117528	Spring Washer	
S1			117604	Locking Collar	
R8	C-9B1-52	150 Ohms 1/2 Watt 10%	117610	Brass Spacer	
R7, 9	C-9B1-27	220K Ohms 1/2 Watt 20%	112602	Drum for Dial String	
R5	C-9B1-35	4.7 Megohms 1/2 Watt 20%	120285	Coiled Spring for Dial String	
R3	C-9B1-34	3.3 Megohms 1/2 Watt 20%	120214	Silk Line Dial String	
R1	C-9B1-78	22K Ohms 1/2 Watt 10%	115361	Lever with Roller	
R10	C-9B2-64	1500 Ohms 1 Watt 10%	120283	Return Spring for Lever	
R2	C-9B1-47	56 Ohms 1/2 Watt 10%	DIAL PARTS		
R12	C-9B2-4	33 Ohms 1 Watt 20%	Dial Scale		
R6	C-9B1-94	470K Ohms 1/2 Watt 10%	Crystal for Dial		
R11	C-9B1-43	27 Ohms 1/2 Watt 10%	Metal Clamp for Crystal		
COILS					
T4	108157L	Input I. F. Coil Complete in Can	112876	Dial Spacer for Pointer	
T5	108157N	Output I. F. Coil Complete in Can	112661	Brass Spacer for Pointer	
T2, T3	112877	Antenna and Oscillator Coil Tuning Assembly R-F. Choke	131277	Dial Bracket—with 3 Pulleys	
SOCKETS					
121210		Eight Prong Octal Socket	115453	Pointer	
121216		Bakelite Socket Base for Filter Condenser	112668	Brass Spacer for Pointer	
SPEAKER					
T7	114225	Five Inch P.M. Dynamic Speaker	Models 500 and 501—Series A		
T6	105108E	Output Transformer for Speaker	CAPACITORS*		
MISCELLANEOUS					
10798D		Line Cord and Plug	C18	C-8D-10788	.004 x 600 Volt Tubular Condenser
120389		Coiled Tension Spring (For Coil Assembly)	C19, C15	C-8D-10761	.01 x 400 Volt Tubular Condenser
P1	107249	6-8 Volt Pilot Lite Bulb—Type T47	C16	C-8D-10813	.05 x 400 Volt Tubular Condenser
107274		Socket Assembly for Pilot Lite	C8, C9	C-8D-10770	.05 x 400 Volt Tubular Condenser
107205		Insulating Shield for Pilot Lite Socket	C15	C-8D-10789	.002 x 600 Volt Tubular Condenser
134101		Rubber Feet for Bottom of Cabinet	C7	C-8D-10953	.15 x 400 Volt Tubular Condenser
T1, C1	128386-S-1	Back for Cabinet—Walnut	C10, C11	119-92	20 Mfd.—40 Mfd. x 150 Volt Elec. electrolytic (For 60 Cycle)
T1, C1	128-586-S	Back for Cabinet—Ivory	C2, C6	124100	Trimmer (Antenna; Oscillator)
131193		Snap-in Rivets to Fasten Back	C17	C-8F6-121	.00047 Mica Condenser
128333-18		Bakelite Cabinet—Dark Walnut	C14	C-8F3-10	.00022 Mica Condenser
128333-9		Bakelite Cabinet—Ivory Color	C5	C-8F3-11	.00033 Mica Condenser
128162-17		Knob for Volume Control—Walnut	C1	C-8F3-6	.000047 Mica Condenser
COILS					
T3-C3-C4	108157C	Input I.F. coil assembly complete	R4	C-9B1-34	3.3 megohm, 1/2 watt resistor
			R9	C-9B1-29	470M ohm, 1/2 watt resistor
			R2, R8	C-9B1-26	150M ohm, 1/2 watt resistor
			R10	C-9B1-52	150 ohm, 1/2 watt resistor
			R1	C-9B1-78	22M ohm, 1/2 watt resistor
			R6	C-9B1-35	4.7 megohm, 1/2 watt resistor
			R3	C-9B2-65	1200 ohm, 1 watt resistor
			R7	C-9B1-42	22 ohm, 1/2 watt resistor
			R11	C-9B2-44	33 ohm, 1 watt resistor
			R5, S1	101196	Volume control and on-off switch (500M ohm)
			T3-C3-C4	108157C	Input I.F. coil assembly complete

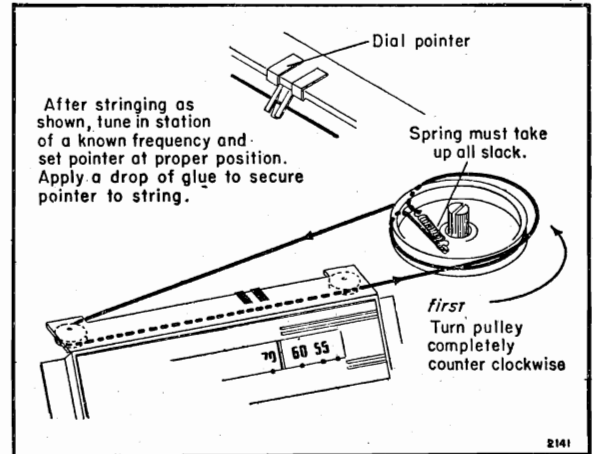
MODEL 510, Series A

W. T. GRANT CO.

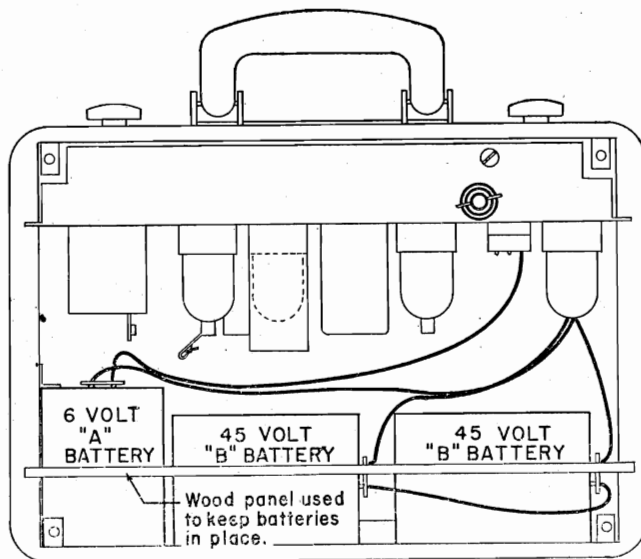


ELECTRICAL SPECIFICATIONS

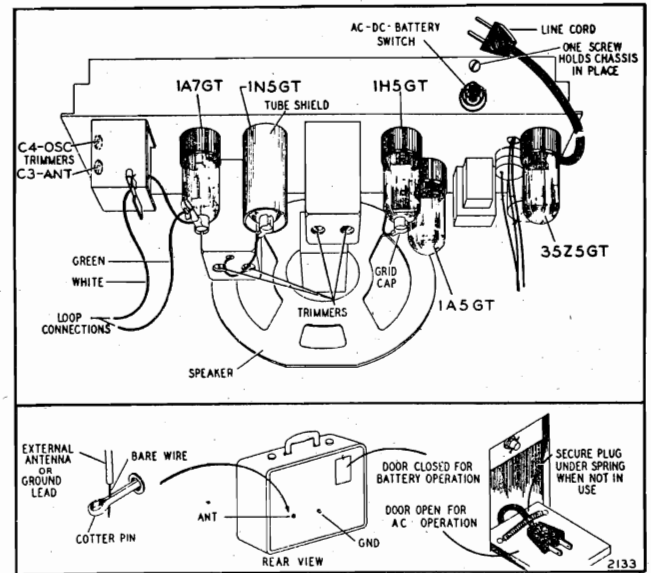
- Power Supply**..... 105 to 125 volts, DC or 50-60 cycle AC, 30 watts.
 Battery: A—6 volts, 58 ma.
 B—90 volts, 9 ma.
- Frequency Range**..... 530 to 1650 kc.
- Intermediate Freq.**..... 455 kc.
- Tuning**..... Two-gang capacitor.
- Antenna**..... Built-in loop. Provisions also for external antenna and ground.
- Speaker**..... 5-inch; P.M.; voice coil impedance 3.2 ohms.
- Power Output**..... 80 milliwatts undistorted.
 180 milliwatts maximum.
- Sensitivity**..... 30 microvolts average for 50-milliwatt output.
- Selectivity**..... 43 kc broad at 1000 times signal at 1000 kc.



Replacement of Dial Pointer Drive Cord



Battery Installation



Chassis View, Showing Tube Location

ALIGNMENT PROCEDURE

- Output meter across 3.2-ohm output load.
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc	.1 mf	1A7GT grid cap*	Chassis	Rotor full open (plates out of mesh)	Input and output trimmers on IF cans
1650 kc	.1 mf	1A7GT grid cap*	Chassis	Rotor full open (plates out of mesh)	Oscillator trimmer C4
1400 kc†	200 mmf	External antenna clip	External ground clip	1400 kc	Antenna trimmer C3

* If loop is not connected when making this adjustment, substitute a 1-megohm resistor across the loop leads.

† For this adjustment chassis should be remounted in cabinet and loop connected. Antenna trimmer can be reached through a hole in the side of the cabinet.

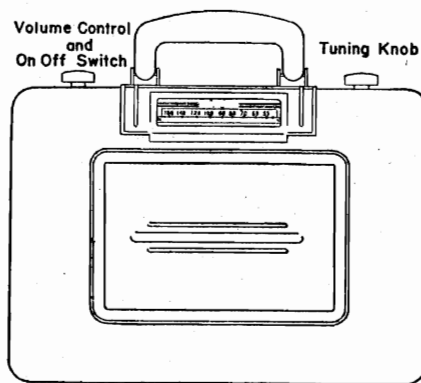
MODEL 510, Series A

W. T. GRANT CO.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
CAPACITORS			COILS AND TRANSFORMERS		
C2-A, C2-B, C3, C4	B-8A-10246	Two gang, including antenna and oscillator trimmers. Range of gang: 14-452 mmf (ant) and 10-198 (osc).	T1	B-13E-10250	Loop antenna assembly
C16-A-B-C-D	119-123	Electrolytic; 20 mf x 50 volts; 40 mf x 150 volts; 200 mf x 10 volts; 40 mf x 150 volts.	T2	A-13D-10239	Oscillator coil
C15	C-8D-10813	.05 mf x 400 volts tubular	T3	108201	Input I.F. transformer. Range of trimmers: 53-97 mmf each.
C14	C-8D-10789	.002 mf x 600 volts tubular	T4, C9	108200	Output I.F. transformer. Range of trimmers: 39-71 mmf each.
C11	C-8D-10771	.1 mf x 200 volts tubular	T5	105127	Output transformer
C1, C6	C-8D-10770	.05 mf x 200 volts tubular	MISCELLANEOUS		
C10	C-8D-10785	.006 mf x 600 volts tubular	114240B	Speaker, 5-inch, P.M.	
C7	C-8D-10775	.25 mf x 200 volts tubular	120406	"B"-battery cable assembly	
C8, C13	C-8D-10761	.01 mf x 400 volts tubular	120407	"A"-battery cable assembly	
C5, C12	C-8F3-8	.0001 mf x 500 volts 20% mica	121171	Tube socket	
C9	C-8F3-8	.0001 mf x 500 volts 20% mica (Part of 2nd I.F. coil assembly.)	125153	Line-battery switch	
RESISTORS*			120417	Spring for line-battery switch	
R1	C-9B1-27	220,000 ohms, 1/2 watt, 20%	107-363	Line cord and plug	
R2	C-9B1-67	2,700 ohms, 1/2 watt, 10%	115396B	Tube shield	
R3	C-9B1-84	68,000 ohms, 1/2 watt, 10%	B-6D-11301	Dial scale	
R4	C-9B1-302	15 megohms, 1/2 watt, 20%	112925	Diffuser	
R5	C-9B1-62	1,000 ohms, 1/2 watt, 10%	A-2M-7758	Snap-in rivets for diffuser and dial scale	
R6, R10	C-9B1-34	3.3 megohms, 1/2 watt, 20%	131-307	Cotter pin	
R7, S2	101252	▲ Volume control (1 megohm) and on-off switch	112922	Dial pointer	
R8	C-9B1-37	10 megohms, 1/2 watt, 20%	120-214	Drive cord for dial pointer (20")	
R9	C-9B1-31	1 megohm, 1/2 watt, 20%	120197	Spring for drive cord	
R11	C-9B1-42	22 ohms, 1/2 watt, 10%	107249	Pilot light, 6-8 volts, type T-47	
R12	130343	545 ohms, 14 watts, 5%	107362	Socket assembly for pilot light	
R13	C-9B1-66	2,200 ohms, 1/2 watt, 10%	128641	Cabinet back	
R14	130344	1,975 ohms, 6 watts, 5%	120410	Spring for securing line cord plug	
			112910-1	Escutcheon for dial	
			128643	Escutcheon for grille	
			128645	Knob, tuning	
			128647	Knob, volume	
			131253	Snap-in rivet, for trimmer hole	
			13448B	Rubber grommet for trimmer hole	
			112-928	Drive pulley	

*The values of the resistors and mica capacitors listed above are based on RMA standards. Due to conditions beyond our control, some receivers have been shipped with components of pre-standardized values. This receiver will operate equally well with components of either group. An illustration of the differences follows:

Pre-standardized value—200,000 ohms, 20%, 1/3 watt
 RMA value—220,000 ohms, 20%, 1/2 watt
 Pre-standardized value—50 mmf, 500 volts, 20%
 RMA value—47 mmf, 500 volts, 20%



BATTERY REPLACEMENT — Run-down batteries are indicated when (1) the volume cannot be brought up to the desired level; (2) the tone of the radio is "mushy" (not clear); or (3) reception fails completely. If you are in doubt as to whether the batteries are faulty, have your radio dealer check them for you.

If the batteries need replacement, get two 45-volt "B" batteries (size: 3 1/2" x 2 1/4" x 4 1/2") and one 6-volt "A" battery (size: 2 5/8" x 2 5/8" x 4").

PILOT LIGHT — If the pilot lamp burns out, the set should not be operated on AC or DC power until a new lamp has been installed. Failure to heed this caution may result in a burned-out 35Z5GT tube.

TUBES—Tubes which have weakened with age may cause poor or erratic reception; therefore have the tubes tested periodically and replace those which are weak. To remove the

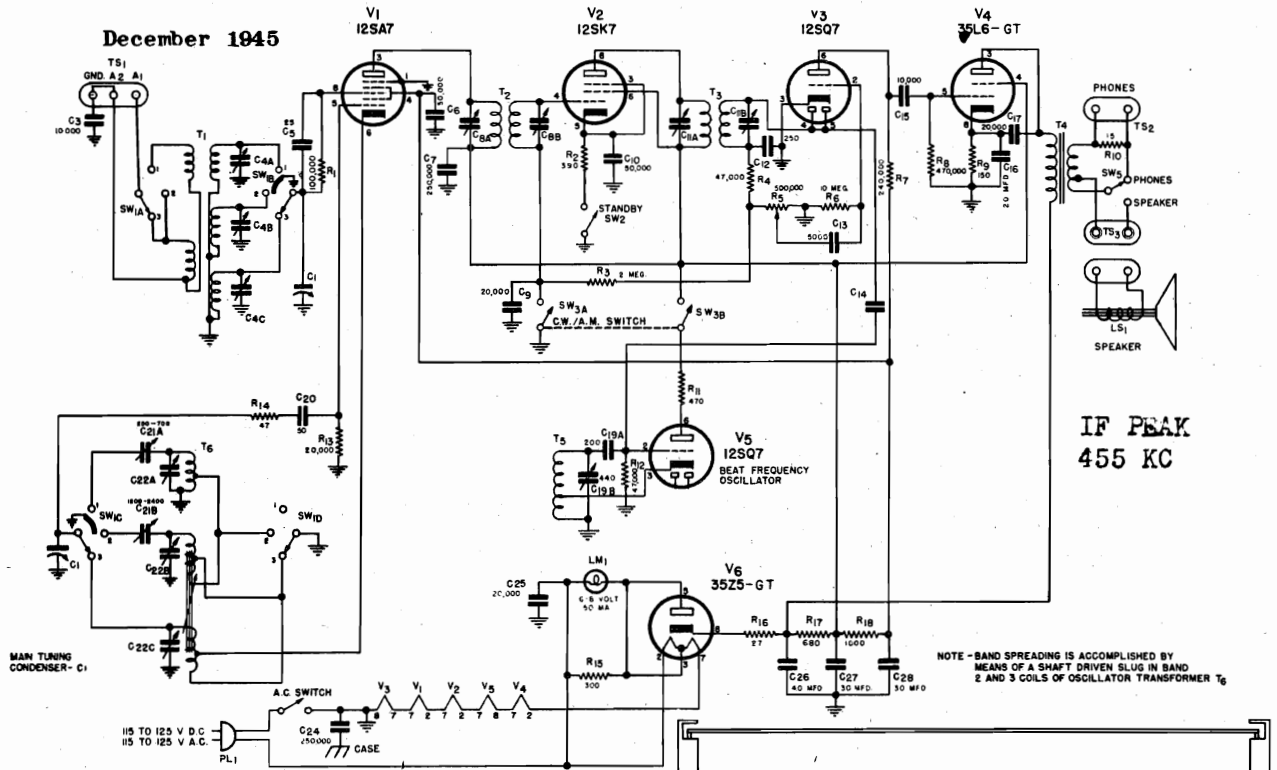
tubes, first remove the back of the cabinet. Pull the grid caps from the tops of the 1A7GT, 1N5GT, and 1H5GT tubes (see Chassis View). Then remove the tube shields where present. When removing a tube, rock it back and forth gently while pulling it out of its socket.

When replacing tubes, grid caps, and shields, refer to the Chassis View illustration to make sure that the replacements are properly made.

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MODEL EC-1B, Echophone

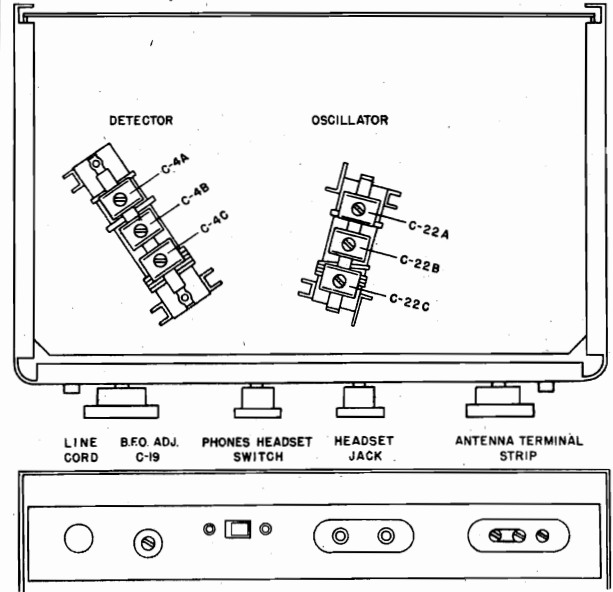
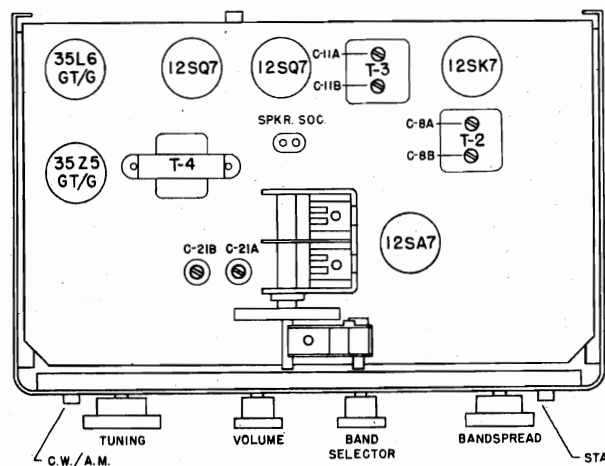
December 1945



IF PEAK
455 KC

NOTE - BAND SPREADING IS ACCOMPLISHED BY MEANS OF A SHAFT DRIVEN SLUG IN BAND 2 AND 3 COILS OF OSCILLATOR TRANSFORMER T₆

NOTE: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICRO-MICRO FARADS UNLESS OTHERWISE SPECIFIED.



Listed below in table form, are the alignment frequencies and adjustments necessary to align the receiver. CAUTION - Do not connect signal generator ground directly to the chassis, connect it to the "G" terminal of the antenna terminal strip.

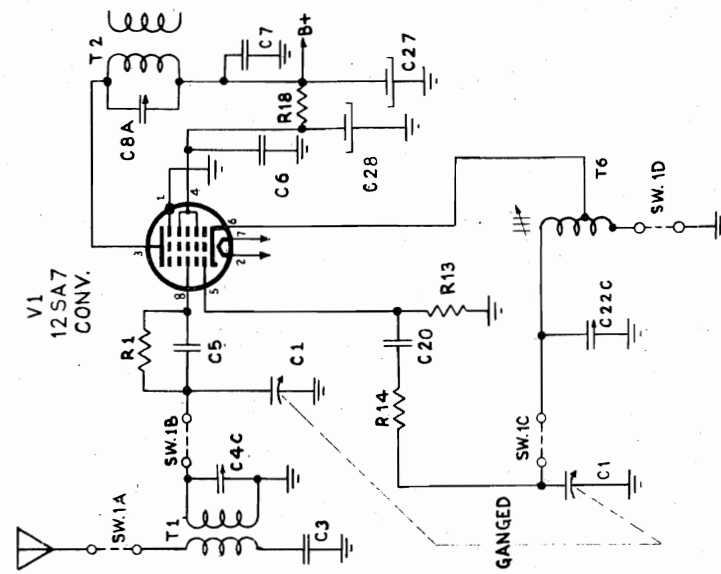
NOTE - Set BANDSPREAD dial at "0" before attempting alignment. (Slug should be between Band 1 and Band 2 coils.)

ALIGNMENT DATA

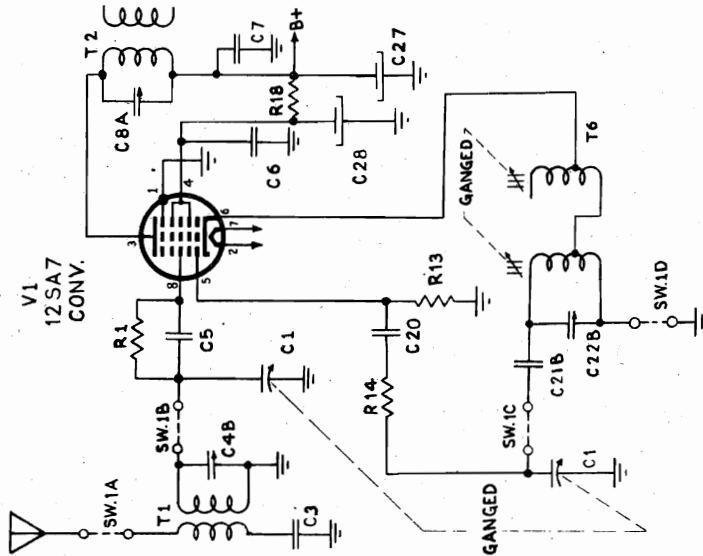
BAND	Signal Generator Frequency	Dummy Antenna	Adjust Pads	Adjust Trimmers
I-F	455 kc.	None	None	C-8A, C-8B, C-11A, C-11B
BFO	455 kc.	None	Adjust capacitor C-19 for zero beat.	
1	600 kc. 1800 kc.	330 ohm 330 ohm	C-21A None	None C-22A, C-4A
2	2.4 mc. 7.0 mc.	330 ohm 330 ohm	C-21B None	None C-22B, C-4B
3	No low frequency adjustment on this band. 28 mc.	330 ohm	None	C-22C, C-4C

MODEL EC-1B, Echophone

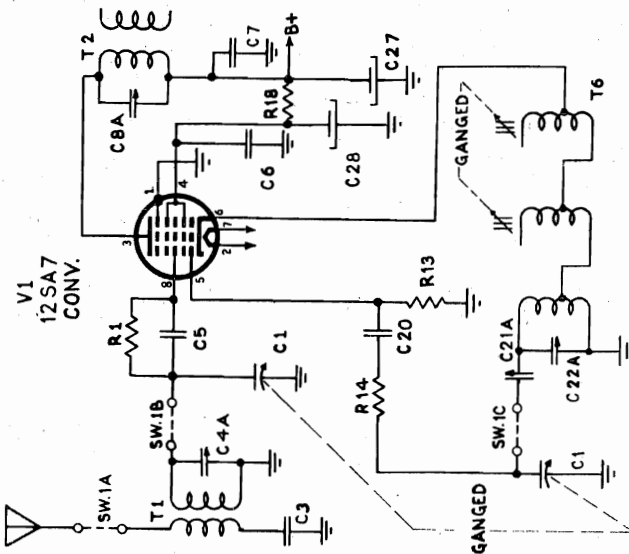
THE HALLICRAFTERS CO.



BAND-SWITCH SHOWN
AT 3RD POSITION CLOCKWISE
BAND 3



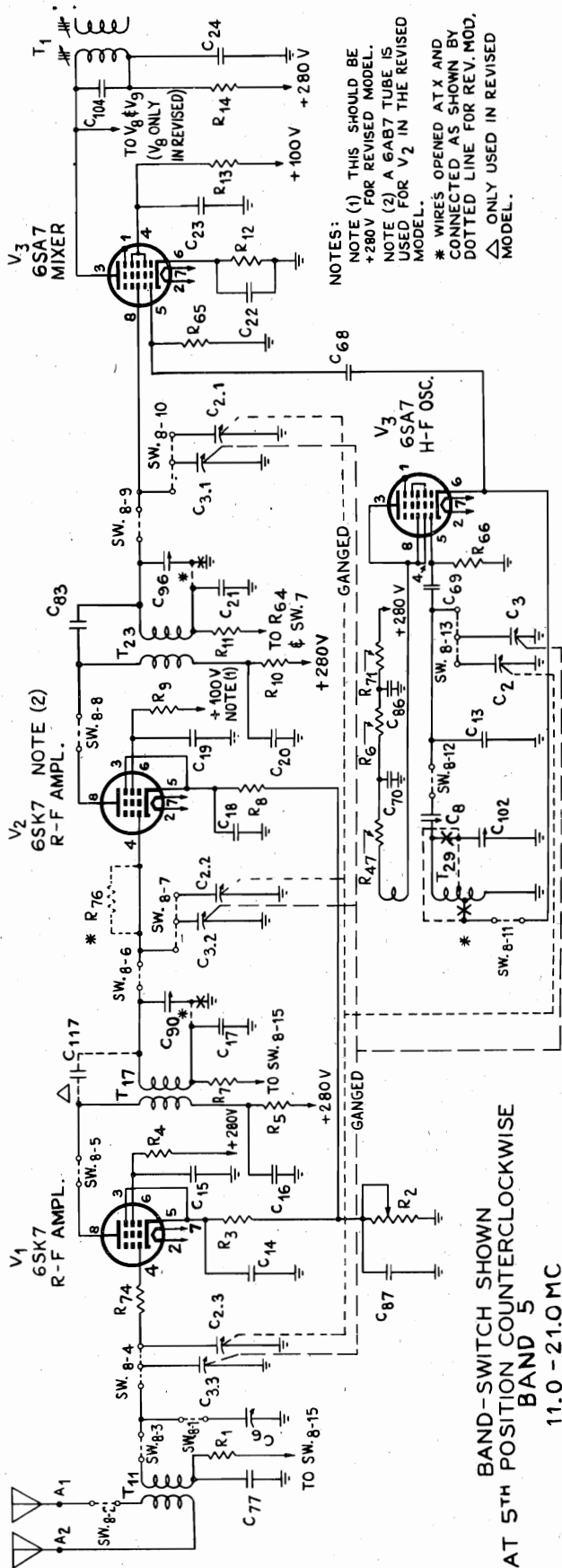
BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE
BAND 2



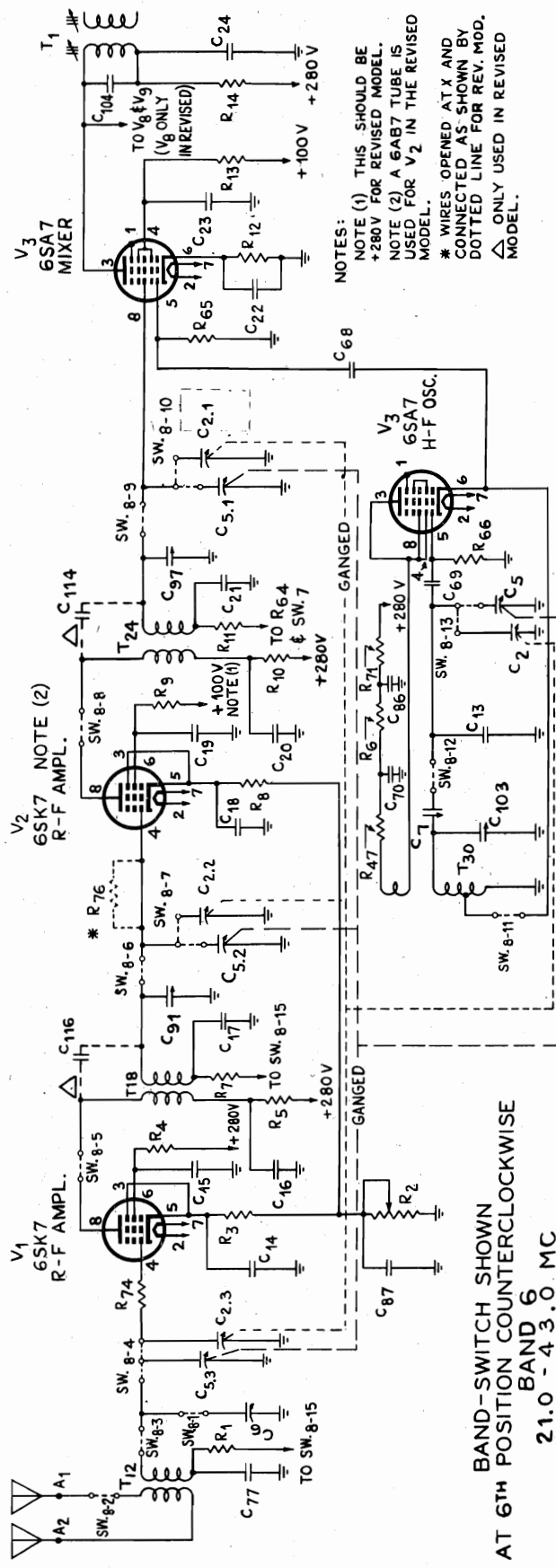
BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND

THE HALLICRAFTERS CO.

MODEL SX-28A,
Super Skyrider



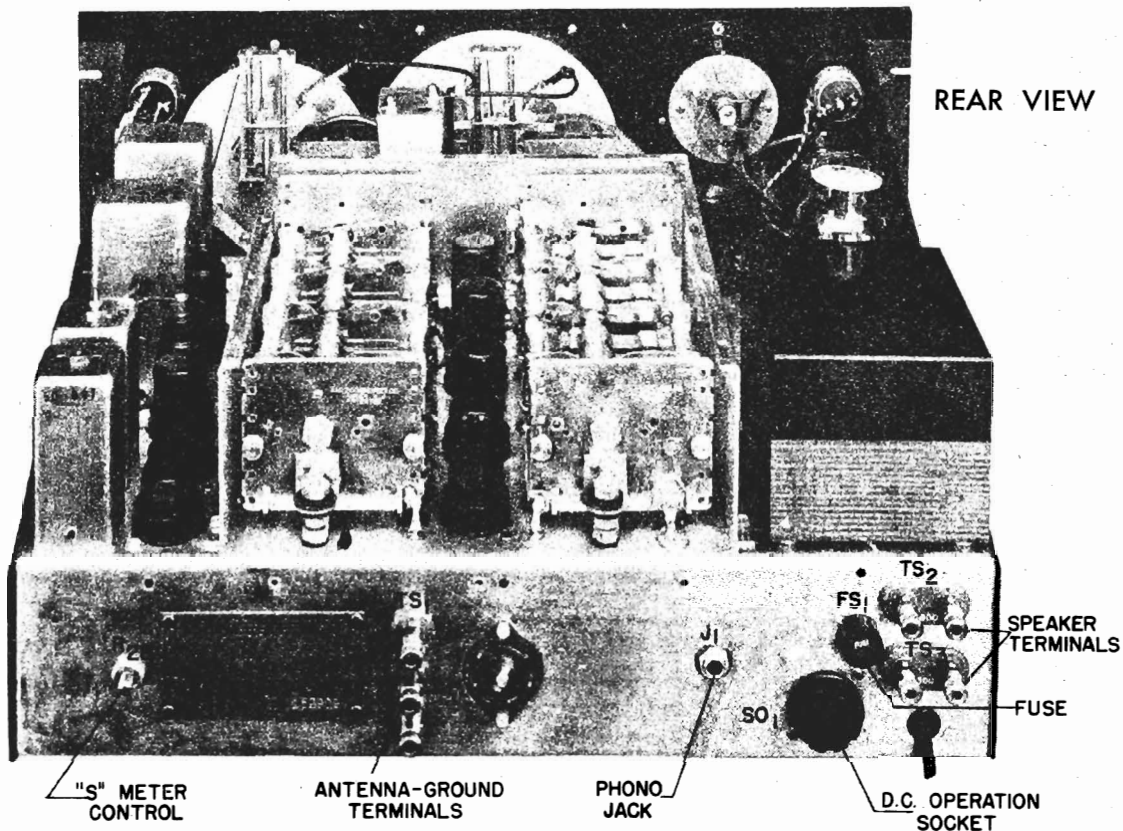
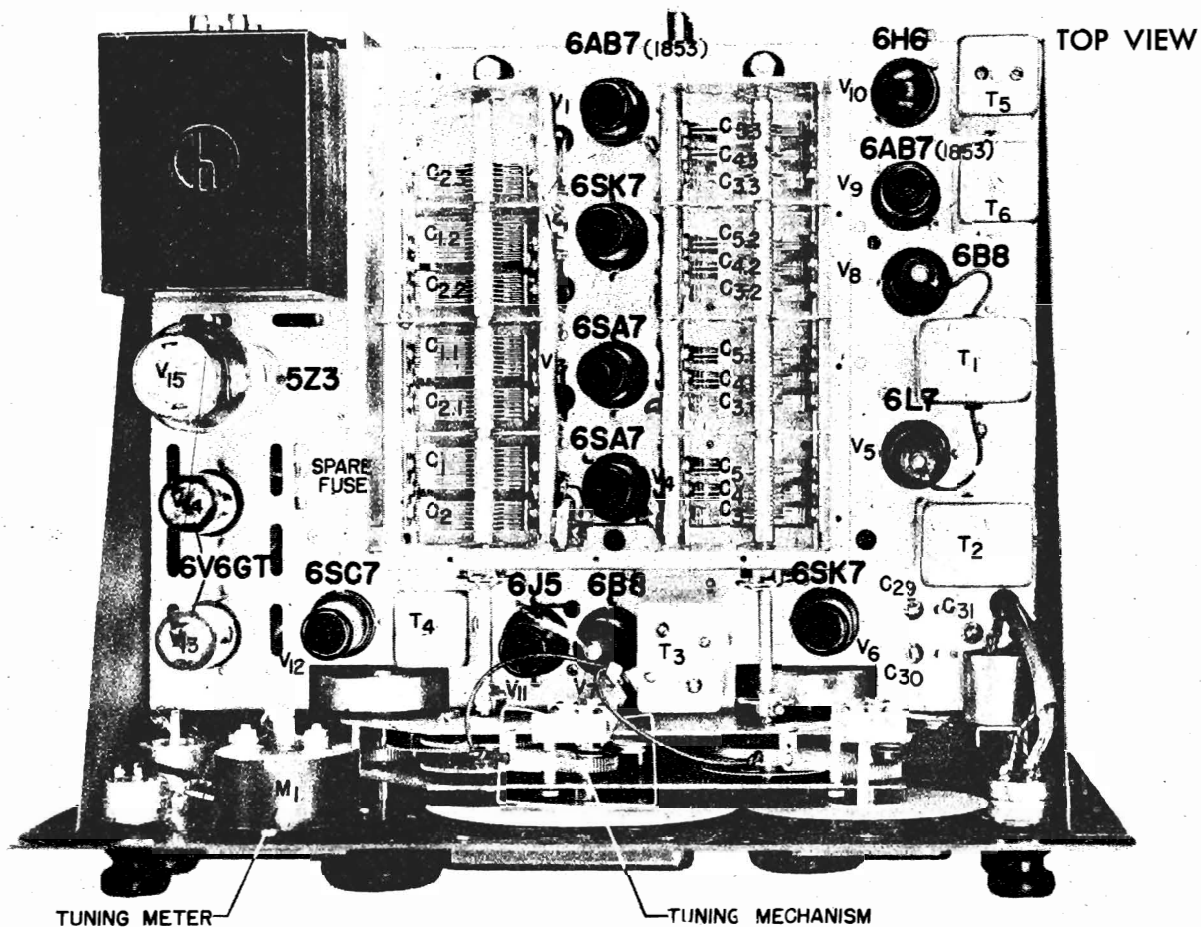
BAND-SWITCH SHOWN
AT 5TH POSITION COUNTERCLOCKWISE
BAND 5
11.0 - 21.0 MC



BAND-SWITCH SHOWN
AT 6TH POSITION COUNTERCLOCKWISE
BAND 6
21.0 - 43.0 MC

MODEL SX-28A,
Super Skyrider

THE HALLICRAFTERS CO.



THE HALLICRAFTERS CO.

MODEL SX-28A,
Super SkyriderTERMINALS AND CONNECTIONS ON
REAR OF RECEIVER

(1) SPEAKER

On the rear apron of the receiver's chassis appear two terminal strips for connecting either a 500 or 5000 ohm speaker to the receiver. Should a matching HALLICRAFTERS Bass-Reflex speaker be used with the receiver, it should be connected to the 5000 ohm terminals. The 500 ohm terminals can be connected to a speaker or other load of that impedance value.

(2) ANTENNA

To the terminals marked A1-A2 and G should be connected the antenna you have chosen to use with the model SX-28-A receiver.

Very satisfactory results throughout the tuning range of the SX-28-A will be obtained with a conventional inverted "L" Marconi type of antenna 75 to 100 feet long including lead-in. This antenna should be erected as high as possible and removed from surrounding objects. Be sure that the antenna is insulated from the ground at all points. When this type of antenna is used it is connected to terminal A-1. The jumper between A-2 and G should remain connected.

In the event a doublet antenna is used with the model SX-28-A SUPER SKYRIDER receiver, the two wires of the doublet lead-in should be connected to terminals A1 and A2. The jumper between A2 and G can remain connected or removed, depending upon its effect on favorable reception.

A ground can be used if desired and should be connected to the G terminal. Connecting the receiver to a good ground (cold water pipe or 6 foot rod driven in moist soil) might improve reception and reduce noise. Under normal conditions no noticeable difference will exist so a ground is suggested only if it aids reception.

Should you wish to have a separate antenna for some one short wave frequency or band, a half-wave antenna cut to the proper length for the desired frequency will prove very effective. The following formula will give the length of the $\frac{1}{2}$ wavelength antenna depending on the desired frequency.

$$\text{Length in feet} = \frac{463}{\text{frequency in megacycles}}$$

or, for example, a half wave 40 meter antenna would be $\frac{463}{7} = 66.14$ feet long.

The antenna should preferably be of solid soft drawn enameled copper wire for ease in handling. The center of the wire is cut and an insulator inserted at that point. The twisted pair, or open wire transmission line, is then soldered to each 33 foot length, after the enamel has been scraped off, directly on either side of this center insulator. The other end of the transmission line should be connected to A1 and A2 on the receiver. It should be remembered that such an antenna has directional properties broadside to its length and should be so oriented if maximum pickup from a certain direction is to be expected.

In designing transmission line systems for a more accurate match of the line to the antenna input circuit, it will be helpful to know that the approximate antenna input impedance of the receiver is 400 ohms.

(3) PHONO-JACK

The Phono-Jack enables you to use the high fidelity audio amplifier of the receiver for phonograph record or transcription play-back purposes. A high impedance crystal or magnetic pick-up arm should be used for this purpose and connected to a standard headphone plug. This plug is then inserted in the PHONO-JACK when record playing is desired. The receiver is inoperative to radio signals, when the plug is in the phono-jack.

The volume of the audio amplifier is varied by rotating the AF Gain control until the proper level is obtained. Removal of the plug from the Phono-Jack once more places the RF and IF portions of the receiver in operation.

(4) DC POWER SOCKET

The octal socket on the rear of the chassis is used when it is necessary to furnish power to the receiver from a direct current source. For conventional AC operation, the shorting plug must remain in the DC OPERATION SOCKET. The shorting plug is removed for battery or vibrapack operation. A similar plug to the shorting plug is then wired, as shown in Fig. 13, and inserted in the octal socket.

A "B" supply capable of delivering 270 volts at 150 milliamperes is necessary for successful operation. Refer to the section on receiver specifications for the total battery drain for DC operation.

In addition to its function as connector for a DC supply, this socket also serves as an outlet for a remote stand-by switch. If the remote stand-by switch or relay is connected between pins #1 and #5 on the shorting plug and the SEND-RECEIVE switch on the front panel of the receiver is set at SEND, the remote switch or relay will control the operation of the receiver in the same manner as the SEND-RECEIVE switch.

(5) "S" METER ZERO SET

"S" METER CONTROL is obtained by varying the knurled knob appearing on the left hand chassis apron edge. This control enables you to properly set the "S" Meter to zero. In order to make the adjustment correctly, the RF GAIN CONTROL must be advanced clockwise as far as it will go. In addition, the switch directly below the bandspread hand-wheel must be in the AVC—ON Position. When these conditions have been complied with, remove the antenna from the Receiver and then adjust the S meter control until the S meter reads zero. Reconnecting the antenna to the receiver will then make the meter indicate the relative carrier strength of each incoming signal as various signals are tuned in.

B OPERATION

Each control of the Model SX-28-A SUPER SKYRIDER receiver performs a definite function that contributes to the outstanding reception capabilities of the unit. Full appreciation of the receiver is to be expected only after you have become familiar with each of the controls and the effect their operation has on the receiver's performance.

The large calibrated main dial shows the frequencies covered throughout the 6 band, 550 kc to 43 mc frequency range of the receiver. They are as follows:

Band 1—550	to 1,600 kilocycles
Band 2—	1.6 to 3.0 megacycles
Band 3—	3.0 to 5.8 megacycles
Band 4—	5.8 to 11.0 megacycles
Band 5—	11.0 to 21.0 megacycles
Band 6—	21. to 43. megacycles

(1) The BANDSWITCH, directly below the main dial, will place the proper set of coils in the circuit to cover the desired frequency. The main dial is turned by the large handwheel which is equipped with a micrometer scale for maximum accuracy in resetting or logging purposes. Of particular interest is the locking clutch which will be found directly below the handwheel. This feature will allow you to lock the main dial after a desired signal has been tuned in. Subsequent movement of the handwheel will not detune the receiver because the control is provided with a clutch which disengages the handwheel once the dial lock has been set.

The International Shortwave broadcast bands are indicated on the main dial by heavier lines showing the frequencies on which these transmissions will be heard.

The Amateur band setting positions of the main dial are indicated by a small 0 appearing over the red numbers which identify each amateur band. The hairline on the main dial window should be set so that it intersects this small circle when the main dial is placed in position for the desired amateur band.

(2) The BANDSPREAD dial is calibrated for the 10-20-40 and 80 meter amateur bands. When tuning on the 160 meter band the main dial should be used.

Note: The calibration on the main dial will be accurate only if the bandspread condenser is set at minimum capacity which is indicated by a setting of 100 on the bandspread logging scale. It should be recognized that if the bandspread condenser is left at any other setting but 100, that small amount of bandspread condenser capacity, added to the main tuning condenser capacity, would throw off the main tuning dial calibration because the receiver is calibrated with the Bandspread condenser set at minimum capacity. The portions of the amateur bands on which type A3, or telephone, transmissions will be heard are underscored with another dark line.

The numbered outer edge of the bandspread dial will prove to be of great help for logging or pre-setting purposes when the bandspread tuning control is used for easier tuning on frequencies other than those covered by the amateur bands.

When "bandspreading" any frequency throughout the tuning range of the receiver remember the main dial must then be set to a slightly higher frequency than the desired signal. The difference depends on the amount of bandspread condenser capacity used and the frequency of the received signal.

When switching from one range to another, an indicator moves vertically behind both the main and bandspread dials. Tuning fatigue is thereby greatly minimized by focusing attention on only the frequencies covered by that particular setting of the bandswitch.

The translucent, indirectly lighted dials are easily read and so arranged that parallax is reduced to an absolute minimum.

To operate the receiver adjust the following controls in the order in which they are mentioned:

(3) The TONE CONTROL turns the receiver on and off and in addition emphasizes either the base or treble frequencies to the extent required by various receiving conditions. The effect the Tone Control has on the fidelity of reproduction is shown in Fig. 10.

(4) Place the SEND-RECEIVE switch in the RECEIVE position—have the ANL control off (turned to the left until the switch operates).

Place the bandswitch in position .55 to 1.65 mc, which will then enable you to tune in stations on the standard Broadcast Band.

(5) Rotate the RF GAIN control to the right until #9 on the skirt of the control appears under the panel marker. (The RF Gain must be full ON as above indicated before the S meter will indicate correctly.) So that the S meter will be properly connected in the circuit, the AVC-BFO switch appearing to the lower right of the bandspread handwheel, must be in the AVC ON position.

(6) Note: The Antenna Trimmer control is operated on all Bands. Proper adjustment of this control is indicated by the maximum signal.

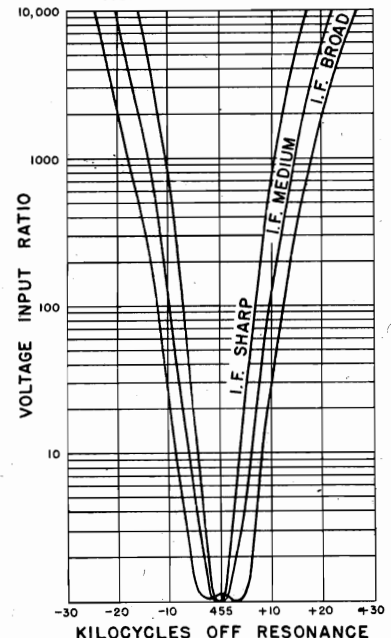
(7) After complying with the above conditions, the AF GAIN control should be advanced to the right until the desired volume is obtained. Tuning the receiver by operating the main dial handwheel will now allow you to pick up stations throughout the .55 to 1.65 mc tuning range of the Broadcast band. Maximum deflection of the S Meter will indicate when each station is accurately tuned in.

When covering the short-wave or higher frequency bands the above procedure should be followed—except that greater care should be used because it is so easy to completely pass over a station.

The other controls on the model SX-28-A SUPER SKYRIDER receiver will enable you to obtain the best results from the receiver once you have become used to their effects on the reception of various types of signals.

(8) The SELECTIVITY control acts as a shutter or gate and varies the width of the path on which signals reach the second detector of the receiver. Six different selectivity steps are provided so that you can successfully cope with different degrees of interference. Reference to Fig. 1 and Fig. 4 will show, graphically, how the control trims the width of the signal so that what interference might be present in the signal's skirts or sidebands is effectively clipped off. Should an interfering signal lap over into the desired signal, adjustment of the SELECTIVITY control, will reduce that interference.

FIG. 1—I. F. SELECTIVITY



Once more refer to Fig. 1 and Fig. 4 and recognize the fact that with the control set in the BROAD IF position, the signal proper and all its parts, which are combined in the side bands, or skirts, will be passed to the 2nd detector, audio amplifier, and then Speaker. As the selectivity of the receiver is increased from BROAD-IF to XTALSHARP, the gate, or admittance path, is so narrowed that only the main portion of the signal is allowed to pass through. This fact and its effect on the quality of reproduction is readily appreciated by listening to a signal and noting the reduction in higher frequency response in the more selective settings of the switch. (See Fig. 10 and Fig. 11)

At this point, it is suggested that the CRYSTAL SHARP setting be used only in cases of extreme interference—the receiver must then be tuned exactly to the signal. Only then will the signal be intelligible because you have clipped off its sidebands in which the sibilants and overtones are embodied.

The CRYSTAL SHARP position of the selectivity switch is to be used principally for the reception of code, or CW, signals. By proper associated operation of the CRYSTAL PHASING control true single signal operation and the maximum in selectivity can be obtained (crystal circuit discussed in detail in the summary of related circuits). See Fig. 3.

MODEL SX-28A, Super Skyrider

THE HALLICRAFTERS CO.

(3) **THE IF AMPLIFIER**

The IF Amplifier of the Model SX-28-A was designed with a view towards permanency of adjustment under conditions of extreme changes in temperature and humidity as well as unusual mechanical vibration.

The first two IF Transformers are permeability tuned. In comparing this type of transformer with one having compression mica tuning condensers, it must be remembered that it takes many more turns of the adjusting screw to cause the equivalent change in tuning of the permeability tuned type. Hence a slight change in the position of the screw will have negligible effect upon the tuning. The adjusting screw is under spring tension thereby making it impossible to turn under vibration.

The diode transformer is air-tuned with two variable condensers each with a lump capacity of 50 mmf and variable of 50 mmf. These air trimmers are also under spring tension so that they can withstand considerable vibration. Being of the air tuned type, their capacity change is negligible with wide changes in humidity. Reference to the Schematic will show that the IF transformers are expanded in two steps—thereby enabling medium or full reproduction of the higher frequencies to be obtained.

(4) **VARIABLE SELECTIVITY**

Six ranges of selectivity are provided in the model SX-28-A receiver. They are:

- 1—Broad IF—(for high fidelity reception)
- 2—Medium IF—(more selectivity—less highs)
- 3—Sharp IF—(reduces annoying interference—far less highs)
- 4—Crystal Broad—(Similar to Sharp IF but cleaner cutting of side bands)
- 5—Crystal Medium—(next selectivity step to #4—greatly increased sideband cutting—more pronounced crystal "Slot" for interference—very little highs present)
- 6—Crystal Sharp—(position of extreme selectivity—practically no sideband content—very pronounced crystal "slot")

The graphic effects of the different steps of selectivity on a signal are shown in Fig. 1 and Fig. 4.

(5b)

CRYSTAL

The CRYSTAL FILTER and holder are wired directly into the receiver and do not plug in as heretofore. In this manner exceptional crystal filter action is obtained because of the elimination of the capacity and losses of a socket. So mounting the crystal prevents possible change in polarity which would occur if the crystal were improperly inserted in the circuit.

The size of the crystal has been carefully determined to allow the BROAD CRYSTAL position to tune as broadly as possible. The capacity of the crystal holder has been reduced to a minimum through the use of a specially designed polystyrene holder.

(5) **CRYSTAL FILTER CIRCUIT**

In positions 1, 2, 3 the crystal is short circuited. In position 4 the short across the crystal is opened and the iron core in the secondary of the transformer is adjusted for Broad Crystal Action and at this point is accurately tuned to the crystal frequency. Due to the close coupling of the secondary to the crystal, the sharply rising resonance curve of the crystal causes, in contrast, a sharply falling resonance curve in the secondary. The combined action of these two characteristics results in a relatively broad resonance curve for the CRYSTAL BROAD selectivity setting. In the MEDIUM CRYSTAL No. 5 position, C₂₉ is adjusted for selectivity midway between the BROAD and CRYSTAL SHARP settings. (See Fig. 2 and Fig. 4)

In position 6, or CRYSTAL SHARP, the trimmer C₃₀ is adjusted for the Sharpest crystal action. Under this condition, the Secondary is slightly detuned from the resonant crystal frequency sufficiently so that its resonance curve is not greatly affected by the crystal but still coupled tightly enough so that it can transfer energy to the crystal circuit. When this point is reached it is indicated by a rise in the output. Two such points of increased output will normally occur—one for each adjustment of the secondary on either side of the resonant frequency of the crystal.

FIG. 2—CRYSTAL FILTER SCHEMATIC

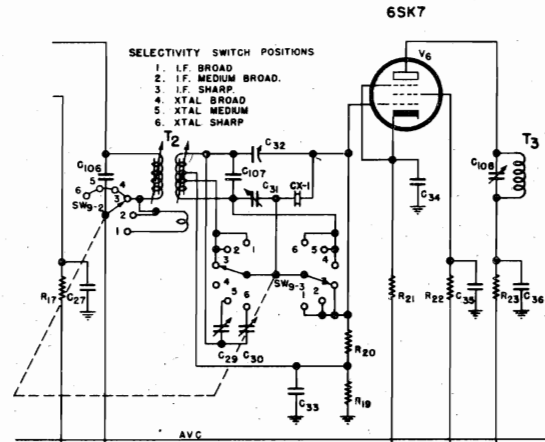


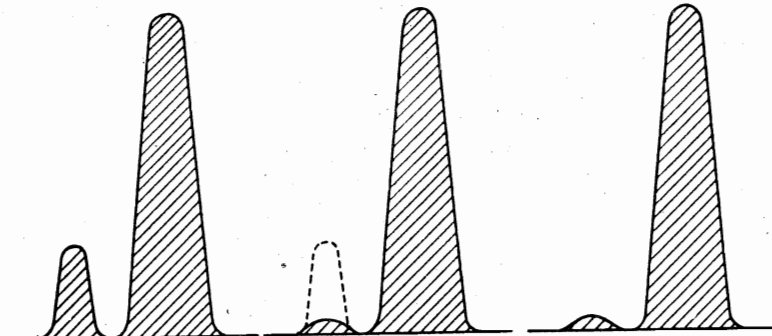
FIG. 3—SINGLE SIGNAL OPERATION

(5a)

SINGLE SIGNAL ADJUSTMENT

It is extremely simple to attain single signal reception with the SX-28-A. First, turn on the BFO to the desired Beat Note and turn the selectivity switch to the XTAL SHARP position. Pick a good solid CW signal, preferably a commercial station because a commercial is likely to stay on long enough for you to complete the phasing adjustment for single signal reception.

You will find on tuning across this signal that it has two amplitudes. Tune first to the weaker of these two amplitudes. Now, turn the PHASING control until this weaker of the two amplitudes is reduced to a minimum. (If the weaker amplitude appears on the right the above procedure still holds.) Then tune to stronger of the two amplitudes and adjust the BFO control to a tone most pleasing to you. This adjustment for single signal selectivity will hold with no further adjustment unless you change the phasing control. (See Fig. 3.)



With Selective Switch in XTAL Sharp position identify the weaker amplitude—Tune Receiver to the weaker.

Adjust phasing control carefully until this weaker amplitude is reduced to a minimum.

Retune Receiver to the stronger amplitude and then adjust pitch control until you get note most pleasing to copy.

THE HALLICRAFTERS CO. MODEL SX-28A, Super Skyrider

(9) CRYSTAL PHASING CONTROL

The Phasing Control is in the circuit on three positions of the selectivity control namely—XTAL Sharp, XTAL Medium and XTAL Broad.

The control is used to remove heterodyne interference as well as to minimize other forms of interference having a predominance of high frequency components—such as static and interference from electrically operated devices.

(10) The A.N.L., or *Automatic Noise Limiter*, materially contributes to the satisfactory operation of the receiver by limiting objectionable interference caused by ignition systems or other man made causes of electrical disturbances. With the A.N.L. control retarded to the left as far as it will go, or until the A.N.L. switch is heard to operate—the noise limiter circuit is not functioning. Turning the control to the right closes the switch which is mounted on the control. The noise limiter is now operating. Progressively turning the control clockwise varies the threshold at which the noise limiter starts to take hold. The setting at which the control will be left depends entirely on the type and amount of interference present as well as the signal strength. The noise limiter should be judiciously adjusted because through its operation the desired signal can even be eliminated or badly distorted which destroys its usefulness. Only after you have become familiar with the operation of this control by actual practice can you determine how far it should be advanced before the best compromise between noise and signal is obtained. (See Fig. 6.)

(11) The AVC-BFO OFF-ON switch performs a dual function. The AVC circuit should be operating for the reception of telephone, or modulated, signals in order to reduce fading to a minimum. As previously mentioned, the functioning of the S Meter is dependent upon AVC action so the switch must be in the AVC ON position when the S meter is used to measure relative carrier intensity.

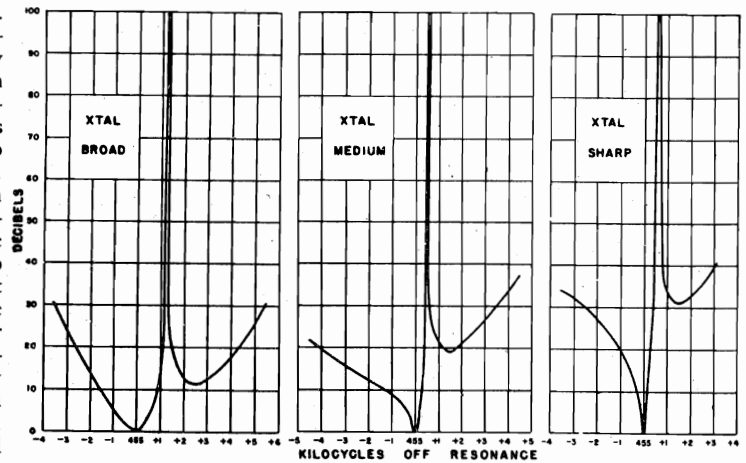
Inasmuch as the AVC circuit levels all signals to a predetermined value (See Fig. 7) no one signal can overload the receiver and cause distortion. At times, in searching for distant or weak signals, it might be desirable to use the full sensitivity of the Model SX-28-A. In that case place the AVC switch in the AVC OFF position. Remember that with the receiver operating with no AVC action, strong signals will overload the input circuit with resultant distortion. Under such a condition of operation the sensitivity of the set must be then controlled, manually, by properly retarding the RF Gain control until you have reached the point below which overloading takes place.

The other function of this switch is to turn on the Beat Frequency oscillator. When receiving code signals, a beat note is absolutely essential. With the BFO switch in the ON position, each signal tuned in will be accompanied with a beat note or whistle. For proper adjustment of the BFO control which appears directly under the TONE CONTROL the following procedure is suggested. Set the BFO control to zero, now tune in a signal either voice or code. If a code signal is received, only the carrier or thump of the signal will be audible because no beat note is present. Be sure that you have the signal accurately resonated. Now, without retuning the receiver, rotate the BFO control until a beat note of the desired pitch is obtained. You now have introduced a beat note which differs from the IF frequency of the receiver, namely 455 kc, by the frequency of the audible signal. Variation of the BFO control will allow you to change the pitch, or frequency, of the oscillator which will prove to be of help under various conditions of interference.

(12) Directly under the BFO control will be seen the BASS IN-OUT Switch. With this switch in the BASS IN position you will have normal audio fidelity. Placing the switch in the BASS OUT position, the audio filter CH₂ is inserted. The effect of this filter on the band of frequencies passed is shown Fig. 11. This filter will contribute greatly to the intelligibility of the received signal when the receiver is operated in the advanced positions of selectivity.

(13) The Head Phone Jack is connected to a tap on the output transformer. The signal in the headphones is of the proper volume for satisfactory communications reception. Since no direct current is present in the headphone circuit crystal type phones can be used.

FIG. 4—CRYSTAL SELECTIVITY



(1) THE 2-STAGE PRESELECTOR

The RF AMPLIFIER, or pre-selector, of the Model SX-28-A SUPER SKYRIDER has 1-6AB7, 1-6SK7 tubes in cascade on Bands 3, 4, 5, and 6. On Bands 1 and 2 more than one stage is unnecessary to obtain the required image ratio and reduction of spurious interference. With two RF stages using three pre-selection circuits, the band width would be narrowed to such an extent that even expanding the IF Amplifier to its utmost would still not provide high-fidelity reception. The modern communications receiver requires two stages of preselection on the higher frequencies to accomplish only one primary object—satisfactory image rejection.

The Model SX-28-A has an image ration of 20 to 1 at 28 mc—350 to 1 at 14 mc and a proportionately increasing ratio as the frequency is lowered. While the two RF stages are principally needed to obtain such image ratios they also perform two other useful functions—more favorable signal to noise ratio and slightly increased selectivity.

Examining the coil assembly will immediately show how rigidly it is constructed and what care has been taken to completely shield each section from the other. The manner in which the RF and antenna coils are tuned on bands 3, 4, 5, and 6 will be interesting. Rather than push turns to compensate for variations in inductance, each coil is permeability tuned. This results in exact adjustment of inductance with improved tracking and gain as the result. On Bands 1 and 2 the inductance of the antenna coils is sufficiently large so that lead length differences do not cause any noticeable inductance change.

2) THE OSCILLATOR AND CONVERTER

A separate 6SA7 tube is used as the High Frequency Oscillator in the Model SX-28-A SUPER SKYRIDER. This tube proves desirable in this function because of its very high value of transconductance which enables the oscillator to operate with very little coupling to the coil. This feature reduces the unfavorable effects of tube variations and voltage fluctuations on the tuned circuit. The HF Oscillator is coupled to the 6SA7 converter tube at the Cathode Tap—a point where variations of operating parameters of the converter tube will least affect the 6SA7 Oscillator. A 6SA7 tube is used in the Mixer Circuit because tests indicated that changes in operating voltages caused less reflection in the injector grid loading than would occur in most converter tubes. Another feature in favor of the 6SA7 tube is that a negative loading is applied to the tuned circuit feeding its control grid. This characteristic improves the gain and selectivity of the tuned circuit which in turn improves the image and signal to noise ratio.

MODEL SX-28A,
Super Skyriider

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FIG. 5—NOISE
LIMITER SCHEMATIC

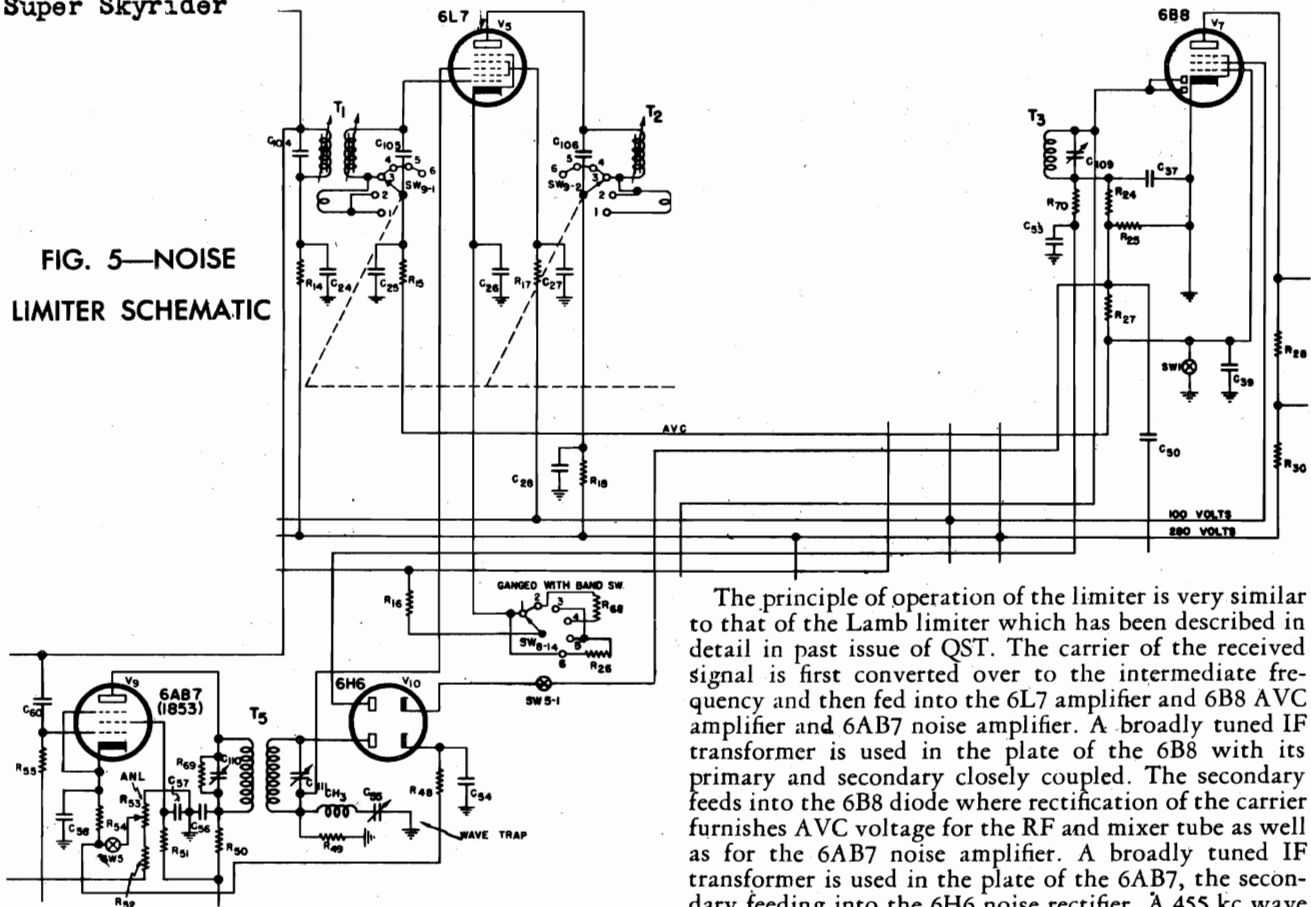
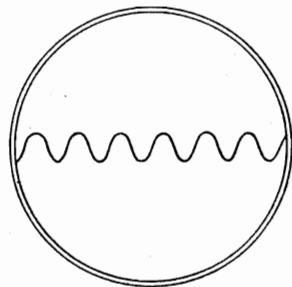
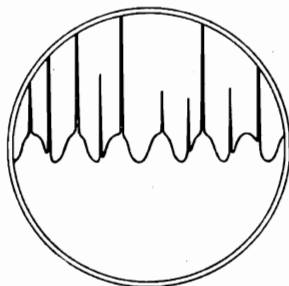


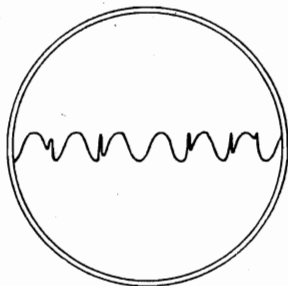
FIG. 6—NOISE LIMITER ACTION



Constant tone signal no interference ANL OFF.



Same Signal ANL OFF. (Note transient peaks extend well beyond range of screen. Signal not readable.)



Same signal. Same noise. ANL ON adjusted for most favorable signal to noise ratio.

The principle of operation of the limiter is very similar to that of the Lamb limiter which has been described in detail in past issue of QST. The carrier of the received signal is first converted over to the intermediate frequency and then fed into the 6L7 amplifier and 6B8 AVC amplifier and 6AB7 noise amplifier. A broadly tuned IF transformer is used in the plate of the 6B8 with its primary and secondary closely coupled. The secondary feeds into the 6B8 diode where rectification of the carrier furnishes AVC voltage for the RF and mixer tube as well as for the 6AB7 noise amplifier. A broadly tuned IF transformer is used in the plate of the 6AB7, the secondary feeding into the 6H6 noise rectifier. A 455 kc wave trap (CH4 and C55) is used which allows the passage of the higher audio frequencies without attenuation. In the form of further explanation of our approach toward noise elimination, it must be remembered that noise in general is composed of a random mixture of high and low frequencies. Of this mixture the predominating higher frequencies are the most objectionable. It is to our advantage to retain the high frequency components. Thus, these transients will be allowed to rise to a point far above the carrier level with the result that they will be applied to the injector grid of the 6L7 tube without being reduced in value. Transients, such as ignition interference having a steep wave front, consist largely of high frequency components. The voltage applied to the grid of the 6L7 tube has a negative polarity because of the 6H6 noise rectifier. By varying the ANL control, we raise or lower the negative voltage applied to the 6L7 tube until it is barely sufficient to overcome the noise impulses applied to the grid of this tube without allowing the modulation peaks of the carrier to become badly distorted.

If the noise limiter adjustment permits too great a value of transient voltage to be applied to the 6L7 injector grid, detection will take place and rectified components of this modulated carrier will appear in the 6L7 plate circuit. This effect will appear as distortion in the output of the receiver. If, on the other hand, not enough noise voltage is applied, then the momentary decrease in sensitivity will not be great enough to stop the noise from getting through and some of it will appear in the plate circuit of the 6L7 tube and consequently in the output of the receiver. As a result the noise limiter must be carefully adjusted to the particular carrier and noise level being received. (See Fig. 6)

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MODEL SX-28A,
Super Skyrider

FIG. 10—AUDIO FIDELITY CURVE

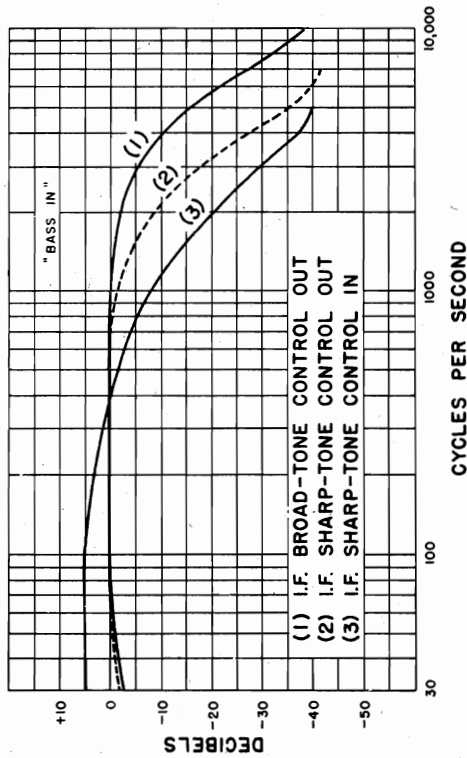
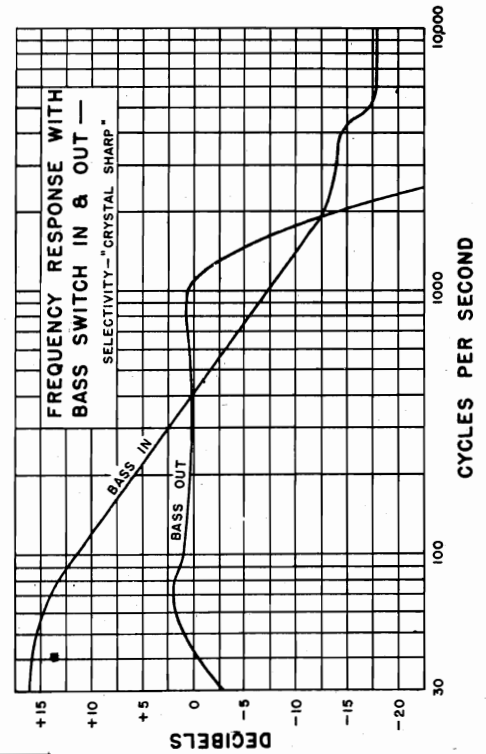


FIG. 11—AUDIO FILTER CURVE



The following measurements made with a 20,000 ohms per volt meter and taken from the socket terminal indicated to ground or receiver chassis. Antenna and ground were disconnected from the receiver when these measurements were taken and the RF and AF gain controls set at maximum. "DL" means Dead Lug but will indicate voltage when used as a tic. Normal tolerance allows a variation of $\pm 10\%$ from the indicated values.

TUBE	FUNCTION	SOCKET TERMINALS								
		1	2	3	4	5	6	7	8	
V ₁ -6AB7	RF Amp. (1)	...	...	...	0.1	4.15	170	6.3	227	Cap.
V ₂ -6SK7	RF Amp. (2)	...	...	4.35	0.1	4.35	105	6.3	279	
V ₃ -6SA7	Mixer	...	...	250	100	0.12	4.1	6.3	...	
V ₄ -6SA7	HF Osc.	...	...	116	116	0.3	...	6.3	116	
V ₅ -6L7	IF Amp. (1) Noise Limiter	...	...	245	102	...	...	6.3	4	-075
V ₆ -6SK7	IF Amp. 2	...	...	4	...	4	107.5	6.3	235	
V ₇ -6B8	2nd Det. S Meter Tube	...	...	17.2	-255	-255	108	6.3	...	-17
V ₈ -6B8	AVC Amp.	...	...	225.5	0.2	0.2	107	6.3	2	
V ₉ -6AB7	Noise Amp.	...	...	...	0.07	1.1	150	6.3	225	
V ₁₀ -6H6	Noise Rectifier	...	...	...	1	...	17.6 DL	6.3	-1	
V ₁₁ -6J5	Beat Osc.	...	...	140	...	...	-7.4	6.3	...	BFO ON ONLY FOR TEST
V ₁₂ -6SC7	1st Audio Amp.	...	140	...	...	137	1.4	6.3	...	
V ₁₃ -6V6GT	P.P. Audio Amp.	...	...	310	290	...	198 DL	6.3	17	
V ₁₄ -6V6GT	P.P. Audio Amp.	...	...	310	290	...	...	6.3	17	
V ₁₅ -5Z3	Rectifier *	320	340 AC	340 AC	320	

* 5 V. AC between Terminals 1 & 4

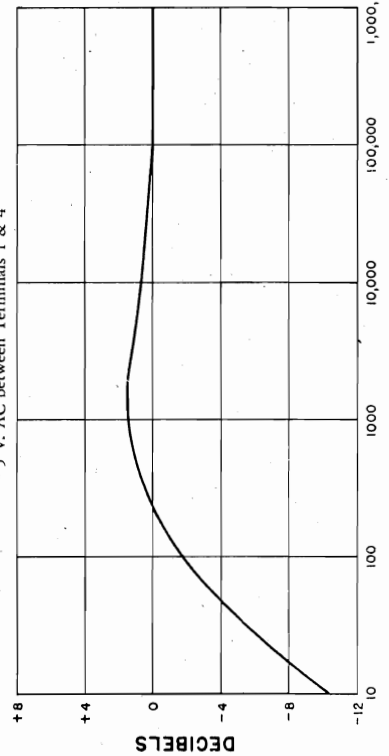
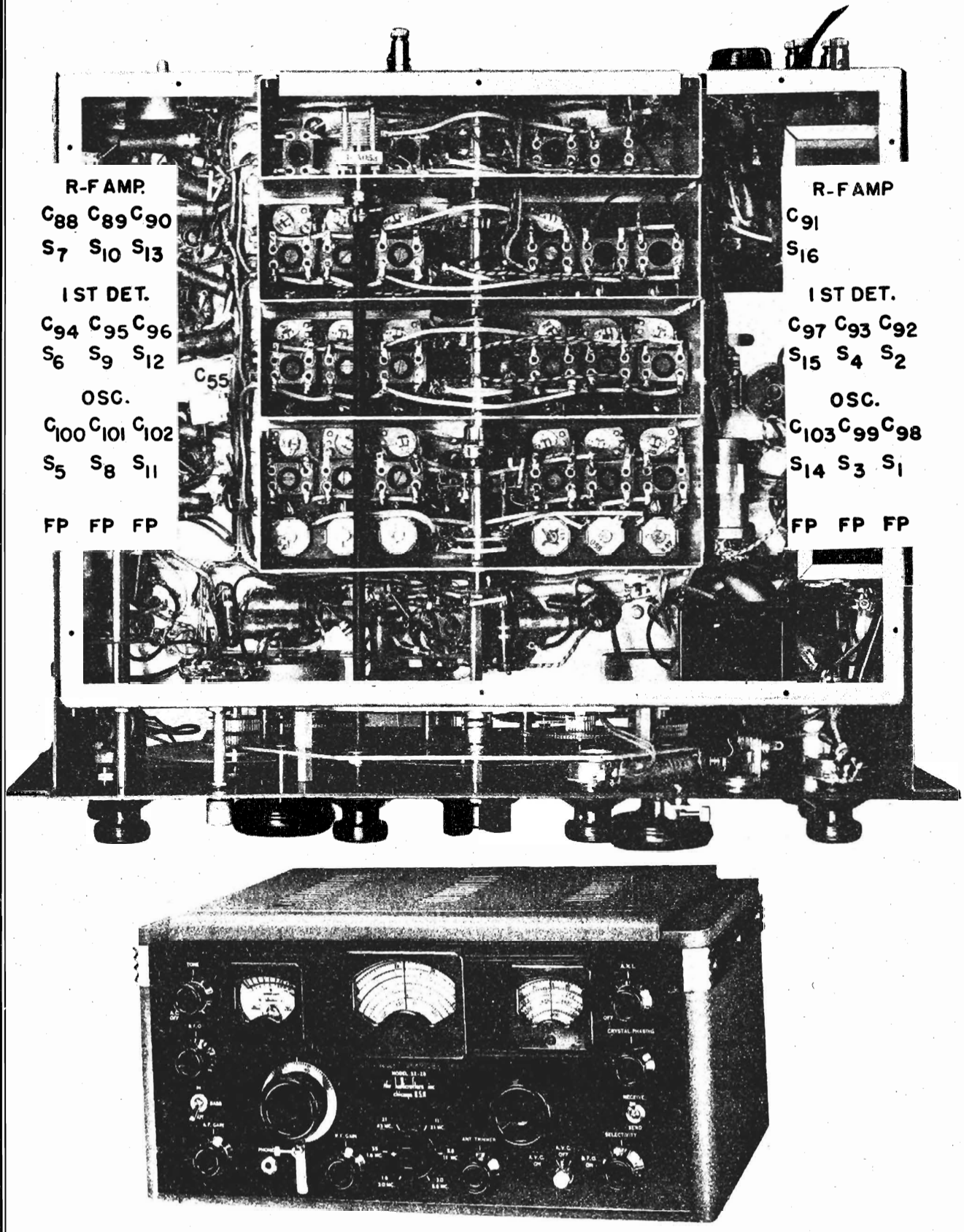


FIG. 7—A.V.C. CURVE—AT 3 MC.

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FIG. 12—RF AND OSC ADJUSTMENT LOCATION AND ALIGNMENT PROCEDURE



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MODEL SX-28A, Super Skyrider

triode is fed to the grid of the other 6SC7 triode section, thereby giving two output voltages in opposite phase suitable for exciting the push-pull 6V6GT output amplifier.

THE POWER SUPPLY

The power supply in the Model SX-28-A is quite normal except that it supplies voltage for the 6V6GT output tubes directly from the rectifier or before the filter system. Voltage fluctuations in the receiver are greatly reduced—increasing the audio output of the receiver and stabilizing the operation of all circuits.

The filter circuit consisting of a total of 60 mfd of capacity plus an additional filter in the 6SC7 plate supply and a 12 henry choke keep the hum level of the receiver in excess of 60 DB below maximum output. The power transformer is built to withstand continuous operation at 250 degrees F but has been designed to run at approximately 160 degrees F under normal conditions.

SPECIFICATIONS

- Tubes:
- 1-6AB7 1st RF Amplifier
 - 1-6SK7 2nd RF Amplifier
 - 1-6SA7 Mixer
 - 1-6SA7 HF Oscillator
 - 1-6L7 1st IF Amplifier Noise Limiter
 - 1-6SK7 2nd IF Amplifier
 - 1-6B8 2nd Detector and S meter tube
 - 1-6AB7 AVC Amplifier
 - 1-6H6 Noise Rectifier
 - 1-6I5 Beat Oscillator
 - 1-6SC7 1st Audio Amplifier
 - 2-6V6GT Push-Pull Output Amplifiers
 - 1-5Z3 Rectifier

Power Consumption—AC operation—18 amp. at 6 volts or 108 watts

Power Output—8 watts undistorted

Sensitivity—(for 500 milliwatts output) varies between the limits of 6 to 20 microvolts over the entire frequency range of the receiver.

Selectivity—IF band (high fidelity) 2 x 1000 x IF Sharp 4.1 kc 22 kc

Frequency Range RF—Note: These are the actual frequencies covered corresponding to nominal figures indicated on the front panel.

550 to 1,620 kilocycles
1.5 to 3.1 megacycles
2.9 to 5.9 megacycles
5.75 to 11.5 megacycles
10.3 to 21.5 megacycles
20.4 to 45 megacycles

Frequency response AF (audio filter out—broad IF—tone control high)—70 to 3000 cycles ± 2 1/2 DB

Speaker Output Impedances—500 and 500 ohms
Intermediate Frequency—455 kc

Table cabinet dimensions—20 1/2" long x 10" high x 14 1/4" deep
Relay Rack dust cover dimensions—14 1/2" deep x 17 1/2" long x 8 1/4" high

Panel dimensions—19" x 8 1/4"
Chassis dimensions—17 1/8" x 13 1/2"
Weight—(unpacked)—75 lbs. (packed) 97 lbs.

AVC ACTION
A double AVC system is used. The RF and mixer tubes are operated by the broadly tuned carrier coming through only three tuned IF circuits. The final signal however passes through six-tuned IF circuits. As a result, when the signal is slightly detuned, the receiver output is dropped considerably while the AVC action has dropped but very little. This results in a reduction of between-section noise and a more sharply defined aural tuning action.

"S" OR SIGNAL INTENSITY METER
The approximate DB per S unit equivalent is 6 DB's. As is "level" and is defined as being the least detectable change in the average ear. 3DB the least change in pitch, tone, or pitch. By comparison, a variation of one S unit on the meter will indicate a change of two detectable steps in signal level. Quantitatively, a DB gain or loss is equal to 20 log (E₂/E₁) where E₁ = input voltage and E₂ = output voltage.

THE SECOND DETECTOR
As will be noted, a diode type of second detector is used in the Model SX-28-A. Its choice was prompted by the fact that such a detector is capable of handling large percentages of modulation with very little distortion. This is due to the output of the diode being easily filtered (IF Removed). In addition, the rectified output contains a DC component which can be used for AVC purposes.

THE BEAT FREQUENCY OSCILLATOR
The BFO is turned on with the switch below the band-spread handwheel and adjusted by the skirted knob directly below the tone control. The BFO circuit, as will be seen by referring to Fig. 13, is the well known Hartley oscillator. It will be noticed that a plate dropping resistor is used to compensate for plate voltage variations. An increase in receiver voltage causes an increase in the plate current of the oscillator. This increase in turn causes the voltage drop across the resistor to increase, thus maintaining a more constant voltage at the plate of the beat oscillator tube. A favorable ratio of capacity to inductance is used. The fixed tank capacity has been artificially aged by alternately exposing it to very high and then low temperatures. In this manner any residual strains of the component parts are removed and the capacity of the condenser remains constant. The BFO coil is permeability tuned which further moves the possibility of drift which would occur should a compression variable be used to resonate the circuit. Proper location of the Beat Oscillator tube and its associated components plus excellent shielding and mechanical rigidity do much to keep stray fields from being established. Little BFO leakage is to be expected in the Model SX-28-A so "sweets" or BFO harmonics will not prove to be bothersome.

THE AUDIO AMPLIFIER
The second or output stage of the audio amplifier in the Model SX-28-A receiver uses two 6V6GT tubes connected in push-pull. These tubes are driven by the 6SC7 double triode. One of the triode sections of the 6SC7 tube is used as the inverter to the 6V6GT tubes. A portion of the signal from the plate circuit of the first 6SC7

parent when the correct adjustment has been reached. Switch to "Xtal Sharp" and adjust C₃₉ for maximum output while varying signal generator frequency. Two points of maximum output will be noted corresponding to two adjustments of C₃₉. Either one of these points may be used at which to correct C₃₉—a sharply peaked tone will result at the correct adjustment.

Switch to "Xtal Medium" and adjust C₃₉ till the output is midway between the outputs reached while aligning the "Xtal Sharp" and "Xtal Broad" positions. The apparent sharpness of tone should be midway between the "Sharp" and "Broad" positions.

Switch again to "Xtal Sharp" and set the signal generator to exact crystal frequency. Set BFO front panel control to a tone of approximately 1000 cycles. Switch again to "Sharp IF" and carefully realign the IF transformers as earlier described in the first paragraph of these instructions.

(2) BFO Adjustment: Set front panel control to zero—BFO switch ON—Signal Generator tuned to crystal frequency—selectivity switch in IF Sharp position—now, adjust screw on top of T₄, after loosening lock nut, to zero best. (See Fig. 8)

(3) Noise Limiter and AVC Amplifier Adjustment: Have the controls set as before except that the AVC switch is now in the ON position. Connect a high resistance type voltmeter across R₄₉ which is connected between terminal #5 of the 6L7 tube and chassis. Connect a 50,000 ohm resistor across primary of T₅ (Red and Blue leads). Set generator at 455 kc as for IF alignment. Connect generator to grid of 6AB7 tube (pin #4). Rotate ANL control all the way to the right, or position #9. Adjust screws on top of T₅ for maximum indication on DC meter connected across R₄₇. Reconnect generator, as for IF alignment, to mixer grid of 6SA7 tube. Remove 50,000 ohm resistor which was inserted across primary of T₅ during alignment. Remove grid clip off top of 6L7 tube. With generator set at 455 kc and ANL control at extreme right adjust wave trap trimmer C₅₅ for minimum signal as indicated on output meter. (See Fig. 8 and Fig. 12 for location of adjustments.)

With generator connected to 6SA7 mixer grid as above, replace 6L7 grid and turn ANL control to extreme left until switch clicks. Connect high resistance DC meter across 6B8 diode filter condenser C₆₄. Adjust screw on top of T₆ for maximum indication on DC meter across C₆₄.

(4) For RF and oscillator adjustment location and alignment procedure see Fig. 12.

Equipment Needed for Alignment:
1—An all wave signal generator which will provide an accurately calibrated signal at the test frequencies indicated.

2—Output indicating meter connected to 5000 ohm output terminals.

3—Non-metallic screw driver.

4—Dummy antenna of 200 mmf and also 400 ohm carbon resistor.

Setting of controls prior to alignment—IF and RF. Tone control at maximum high frequency position (#9)—BFO at 0—Bass switch at Bass IN—AF Gain at #9—RF Gain at #9—Band switch—IF alignment position. S₅ to 1.6 band—RF alignment depending on band aligned.

Selectivity control at sharp IF—Send-Receive switch in Receive—Crystal phasing at #3 on left side—ANL—OFF at 0—AVC OFF.

Important: Have bandspread control so logging scale reads 100.

Antenna trimmer adjusted for Maximum gain at each RF alignment point on all bands.

(1) 455 KC—IF Alignment: Tune main dial to 1400 kc on .55 to 1.6 mc band. Connect the hot lead from the signal generator to 6SA7 mixer terminal #8—Ground to chassis. Roughly adjust the aligning screws of T₁, the lower screw of which is accessible through hole in right mounting bracket, for maximum gain. Now adjust lower screw on T₂ (do not adjust upper screw). Also adjust C₃₁ and the air trimmer condensers at the top of T₅ for maximum gain. (See Fig. 8 for location of IF adjustments)

Switch to Crystal Broad Position—Turn on BFO and adjust to a tone of about 1000 cycles. Vary the frequency of the signal generator while adjusting the top screw on T₂ until the output goes through a maximum, dips down and starts going up again. Adjust the phasing control for maximum selectivity and then back off the top screw on T₂ until the output reaches a minimum value between the two maximum values first noted. The frequency of the signal generator should be varied over a small range while adjusting the top screw of T₂. A swishing note, in contrast to the usual sharp crystal tone will be apparent.

Connect hot lead of signal generator to A₁—through dummy antenna shown in table. Leave jumper connected between A₁ and G. Ground of generator to chassis. "RF" indicates fixed pad—do not adjust.

Band	Rec. Dial Setting	Sig. Gen. Freq.	Dummy Antenna	HIGH FREQUENCY END		LOW FREQUENCY END	
				Adjust. Osc. With	Adjust. Trimmers for Max. Gain	Adjust. Osc. With	Permeability Tuned By
1	1.5 mc	1.5 mc	200 mmf	C ₉₈	C ₉₂	S ₁	S ₂
2	3.0	3.0	400 ohms	C ₉₉	C ₉₃	S ₃	S ₃
2	1.8	1.8	400 ohms	C ₁₀₀	C ₉₄ C ₉₈	S ₄	S ₄
3	5.4	5.4	400 ohms	C ₁₀₁	C ₉₅ C ₉₈	S ₅	S ₅ S ₁₀
3	3.0	3.0	400 ohms	C ₁₀₂	C ₉₆ C ₉₉	S ₆	S ₆ S ₁₁
4	7.0	7.0	400 ohms	C ₁₀₃	C ₉₇ C ₉₁	S ₇	S ₇ S ₁₂ S ₁₃
5	20.0	20.0	400 ohms				
5	12.0	12.0	400 ohms				
6	36.0	36.0	400 ohms				
6	24.0	24.0	400 ohms				

Connect hot lead of signal generator to A₁—through dummy antenna shown in table. Leave jumper connected between A₁ and G. Ground of generator to chassis. "RF" indicates fixed pad—do not adjust.

MODEL SX-28A,
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REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR.'S. PART NO.	REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR.'S. PART NO.
R ₁	Resistor, 100,000 ohm ± 10%, ½ watt, carbon	ASA	RC21AE104K	C ₁	Capacitor, variable, 4 unit gang, each unit consists of 2 sections, except unit 4 at rear which contains only one section (section #2), air dielectric, special; Section #1-min. cap. 16.3 mmfd., max. cap. 187.5 mmfd. (C ₁ , C _{1.1} , C _{1.2}); Section #2-min. cap. 21.5 mmfd., max. cap. 250.0 mmfd. (C ₂ , C _{2.1} , C _{2.2} , C _{2.3}).	RC	48B050
R ₂	Resistor, variable, 10,000 ohm ± 20% carbon, type 35	CT	25C066	C _{1.1}			
R ₃	Resistor, 330 ohm ± 10%, ½ watt, carbon	ASA	RC21AE331K	C _{1.2}			
R ₄	Resistor, 27,000 ohm ± 10%, ½ watt, carbon	ASA	RC31AE273K	C _{2.1}			
R ₅	Resistor, 1000 ohm ± 10%, ½ watt, carbon	ASA	RC21AE102K	C _{2.2}			
R ₆	Resistor, 6,800 ohm ± 10%, 2 watt, carbon	ASA	RC41AE682K	C _{2.3}			
R ₇	Same as R ₁			C ₃			
R ₈	Same as R ₅			C _{3.1}			
R ₉	Same as R ₅			C _{3.2}			
R ₁₀	Resistor, 2700 ohm, ± 10%, ½ watt, carbon	ASA	RC21AE272K	C _{3.3}			
R ₁₁	Same as R ₁			C ₄			
R ₁₂	Resistor, 390 ohm ± 10%, ½ watt, carbon	ASA	RC21AE391K	C _{4.1}			
R ₁₃	Same as R ₅			C _{4.2}			
R ₁₄	Same as R ₁₀			C _{4.3}			
R ₁₅	Same as R ₁			C ₅			
R ₁₆	Resistor, 270 ohm ± 10%, ½ watt, carbon	ASA	RC21AE271K	C _{5.1}			
R ₁₇	Same as R ₅			C _{5.2}			
R ₁₈	Same as R ₁₀			C _{5.3}			
R ₁₉	Same as R ₁			C ₆			
R ₂₀	Resistor, 470,000 ohm ± 10%, ½ watt, carbon	ASA	RC21AE474K	C ₇			
R ₂₁	Resistor, 270 ohm ± 10%, ½ watt, carbon	ASA	RC21AE271K	C ₈			
R ₂₂	Same as R ₅			C ₉			
R ₂₃	Same as R ₁₀			C ₁₀			
R ₂₄	Same as R ₁			C ₁₁			
R ₂₅	Same as R ₂₀			C ₁₂			
R ₂₆	Resistor, 1,000 ohm ± 10%, ½ watt, carbon	ASA	RC21AE102K	C ₁₃			
R ₂₇	Same as R ₂₀			C ₁₄			
R ₂₈	Resistor, 100 ohm ± 10%, ½ watt, carbon	ASA	RC21AE101K	C ₁₅			
R ₂₉	Resistor, variable, 500 ohm ± 20% carbon, type 25	CT	25C022	C ₁₆			
R ₃₀	Resistor, 27,000 ohm ± 10%, 2 watt, carbon	ASA	RC41AE273K	C ₁₇			
R ₃₁	Resistor, two sections; section #1 (R ₃₁), 11,000 ohm ± 10%, 1½ watts; section #2 (R ₃₂) 4,000 ohm ± 10%, 7 watts; metal clad, wire wound			C ₁₈	Capacitor, variable, min. cap. 3.5 mmfd., max. cap. 50 mmfd., air dielectric, ceramic insulation, type 22	RC	48A053
R ₃₂		CS	24A046	C ₁₉			
R ₃₃	Resistor, variable, 500,000 ohm ± 20%, carbon	CT	25C065	C ₂₀	Capacitor, 2980 mmfd. adjustable ± 5%, mica dielectric, steel mtg. frame, special	UE	44B110
R ₃₄	Same as R ₅			C ₂₁	Capacitor, 2400 mmfd. adjustable ± 5%, mica dielectric, steel mtg. frame, special	UE	44B109
R ₃₅	Resistor, variable, 500,000 ohm ± 20%, carbon type AE-35-500M	CT	25C064	C ₂₂	Capacitor, 2240 mmfd. adjustable ± 5%, mica dielectric, steel mtg. frame, special	UE	44B108
R ₃₆	Same as R ₁			C ₂₃	Capacitor, 1700 mmfd. adjustable ± 5%, mica dielectric, steel mtg. frame, special	UE	44B107
R ₃₇	Same as R ₁			C ₂₄	Capacitor, 822 mmfd. adjustable ± 5%, mica dielectric, steel mtg. frame, special	UE	44B106
R ₃₈	Resistor, 47,000 ohm ± 10%, ½ watt, carbon	ASA	RC21AE473K	C ₂₅	Capacitor, 541 mmfd. adjustable ± 5%, mica dielectric, steel mtg. frame, special	UE	44B105
R ₃₉	Resistor, 180,000 ohm ± 10%, ½ watt, carbon	ASA	RC21AE184K	C ₂₆	Capacitor, adjustable, 5 mmfd. ± 0.2 mmfd. at 25° C., capacity change -0.02 mmfd. per ° C., type S-2739	UE	44A062
R ₄₀	Resistor, 270,000 ohm ± 10%, ½ watt, carbon	ASA	RC21AE274K	C ₂₇	Capacitor, 0.02 mfd. -10 + 40%, 400 V. D-C working, paper dielectric	SP	46AW203J
R ₄₁	Same as R ₄₀			C ₂₈	Same as C ₁₄		
R ₄₂	Resistor, 220 ohm ± 10%, 2 watt, wire wound, type BW2	IRC	24BV221E	C ₂₉	Capacitor, fixed, 0.02 mfd. - 10 + 40%, 600 V. D-C working, paper dielectric	SP	46AY203J
R ₄₃	Resistor, 20,000 ohm ± 5%, 2 watt, carbon	ASA	RC41AE203J	C ₃₀	Capacitor, fixed, 0.05 mfd. - 10 + 40%, 200 V. D-C working, paper dielectric	SP	46AU503J
R ₄₄	Resistor, 5,000 ohm ± 20%, 10 watt, wire wound, vitreous enamel, type CC	U	24BG502F	C ₃₁	Same as C ₁₄		
R ₄₅	Same as R ₄₃			C ₃₂	Capacitor, fixed, 2200 mmfd. ± 10%, 500 V. D-C working, mica dielectric	ASA	CM30A222K
R ₄₆	Same as R ₃₃			C ₃₃	Same as C ₁₇		
R ₄₇	Resistor, 10 ohm ± 10%, ½ watt, carbon	ASA	RC21AE100K	C ₃₄	Same as C ₁₄		
R ₄₈	Same as R ₁			C ₃₅	Same as C ₁₆		
R ₄₉	Resistor, 1 megohm ± 10%, ½ watt carbon,	ASA	RC21AE105K	C ₃₆	Same as C ₁₆		
R ₅₀	Resistor, 560 ohm ± 10%, ½ watt, carbon	ASA	RC21AE561K	C ₃₇	Capacitor, variable, min. cap. 2 mmfd., max. cap. 6 mmfd., ceramic dielectric, special mtg. bracket, type B-820-202	CRL	44A079
R ₅₁	Resistor, 20,000 ohm ± 5%, 1 watt, carbon	ASA	RC31AE203J	C ₃₈	Same as C ₁₆		
R ₅₂	Same as R ₃₃			C ₃₉	Capacitor, variable, min. cap. 4 mmfd., max. cap. 20 mmfd., ceramic dielectric, special mtg. bracket, type B-820-304	CRL	44A078
R ₅₃	Resistor, variable, 50,000 ohm ± 20%, carbon with DPST switch, type WR-35	CT	25C067	C ₄₀	Same as C ₃₀	RC	48A059
R ₅₄	Resistor, 33 ohm ± 10%, ½ watt, carbon	ASA	RC21AE330K	C ₄₁	Capacitor, variable, min. cap. 3.0 mmfd., max. cap. 25 mmfd., air dielectric, ceramic insulation, type 22-7		
R ₅₅	Same as R ₂₀			C ₄₂	Same as C ₁₄		
R ₅₆	Same as R ₅			C ₄₃	Same as C ₁₇		
R ₅₇	Same as R ₁			C ₄₄	Same as C ₁₄		
R ₅₈	Resistor, 180 ohm ± 10%, ½ watt, carbon	ASA	RC21AE181K	C ₄₅	Same as C ₁₄		
R ₅₉	Same as R ₁			C ₄₆	Same as C ₁₆		
R ₆₀	Same as R ₄₀			C ₄₇	Capacitor, fixed, 47 mmfd. ± 10%, 500 V. D-C working, mica dielectric	ASA	CM20A470K
R ₆₁	Same as R ₂₀			C ₄₈	Not used		
R ₆₂	Same as R ₂₀ . Part of transformer T ₁ . Shown for reference only.			C ₄₉	Same as C ₁₄		
R ₆₃	Same as R ₁₀						
R ₆₄	Same as R ₂₀						
R ₆₅	Same as R ₃₈						
R ₆₆	Same as R ₃₈						
R ₆₇	Same as R ₅₀						
R ₆₈	Resistor, 1,200 ohm ± 10%, ½ watt, carbon	ASA	RC21AE122K				
R ₆₉	Same as R ₁						
R ₇₀	Same as R ₄₉						
R ₇₁	Resistor, 4700 ohm ± 10%, 1 watt, carbon	ASA	RC31AE472K				
R ₇₂	Same as R ₅₀						
R ₇₃	Not used						
R ₇₄	Same as R ₄₇						

THE HALLICRAFTERS CO.

MODEL SX-28A,
Super Skyrider

REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR.'S. PART NO.	REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR.'S. PART NO.
C40	Capacitor, fixed, 470 mmfd. ± 10%, 500 V. D-C working, mica dielectric	ASA	CM35A512J	C104 } C105 } C106 }	Capacitor, fixed, 275 mmfd., silver mica. Part of transformer T ₁ . Shown for reference only.		
C41	Capacitor, fixed, one unit of dual unit, 40 mfd. - 10 + 40%, 25 V. D-C working, electrolytic (See C44)			C107	Capacitor, fixed, 125 mmfd., silver mica. Part of transformer T ₂ . Shown for reference only.		
C42	Same as C16				Capacitor, fixed, 65 mmfd., silver mica. Part of transformer T ₂ . Shown for reference only.		
C43	Capacitor, fixed, 5100 mmfd. ± 5%, 300 V. D-C working, mica dielectric	ASA	CM20A471K	C108 } C109 }	Capacitor assembly; fixed capacitor, 25 mmfd. ± 5%, silver mica; variable capacitor, min. cap. 70 mmfd., max. cap. 30 mmfd., ceramic dielectric; both capacitors connected in parallel to form assembly. Part of transformer T ₃ . Shown for reference only.		
C44	Capacitor, fixed, one unit of dual unit, 10 mfd. - 10 + 40%, 300 V. D-C working, electrolytic (See C41)	SP	42A032	C110 } C111 }	Capacitor, variable, compression type, 80 mmfd., (nominal), mica dielectric. Part of transformer T ₅ . Shown for reference only.		
C45	Capacitor, fixed, 0.05 mfd. - 10 + 40%, 400 V. D-C working, paper dielectric	46AW503J		C112	Capacitor, fixed, 100 mmfd. ± 10%, 500 V. D-C working mica. Part of transformer T ₆ . Shown for reference only.		
C46	Same as C45						
C47	Capacitor, fixed, one unit of dual unit, 40 mfd. - 10 + 40%, 5 V. D-C working, electrolytic (See C48)	SP	42A031	C113	Capacitor, fixed, 25 mmfd. ± 10%, 500 V. D-C working, mica. Part of transformer T ₆ . Shown for reference only.		
C48	Capacitor, fixed, one unit of dual unit, 30 mfd. - 10 + 40%, 400 V. D-C working, electrolytic in same container with C47						
C49	Capacitor, fixed, 30 mfd. - 10 + 40%, 450 V. D-C working, electrolytic, type D8290	SP	42A030	C114	Capacitor, fixed, 10 mmfd. ± 10%, 500 V. D-C working, ceramic dielectric, -0.00075 mmfd./mmfd./deg. Cent. temp. coeff., type class D modified	CRL	47A041
C50	Same as C14						
C51	Capacitor, fixed, 0.01 mfd. - 10 + 40%, 600 V. D-C working, paper dielectric	SP	46AY103J	T ₁	Transformer, I-F, 455KC, primary and secondary tuned by adjustable iron core, secondary has expander winding, special	SI	50B082
C52	Same as C51			T ₂	Transformer, I-F, 455KC, primary and secondary tuned by adjustable iron core, secondary tapped for crystal filter and variable band width, primary has expander winding, special	SI	50B081
C53	Same as C17						
C54	Same as C45			T ₃	Transformer, I-F, 455KC, primary and secondary tuned by variable capacitor, iron core coils, type 3365	SWI	50B083
C55	Capacitor, variable, compression type, 50 mmfd. (nominal), mica dielectric, type 5W-1530	SWI	53A012	T ₄	Transformer, 455KC, tuned by adjustable iron core, special	SWI	54B014
C56	Same as C16			T ₅	Transformer, I-F, 455KC, primary and secondary tuned by variable capacitor, iron core coils special	SWI	50B097
C57	Same as C14			T ₆	Transformer, I-F, 455KC, primary tuned by adjustable iron core, secondary untuned air core, special	SWI	50B080
C58	Same as C17						
C59	Same as C17						
C60	Same as C37						
C61	Capacitor, fixed, 250 mmfd. ± 20%, 500 V. D-C working, mica dielectric, type 1468. Part of transformer T ₁ . Shown for reference only.						
C62	Same as C14						
C63	Same as C17						
C64	Capacitor, fixed, 100 mmfd. ± 10%, 500 V. D-C working, mica dielectric	ASA	CM20A101K	T ₇	Transformer, power, standard; primary, 117 V. A-C, single phase, 50/60 cycles; secondary, 580 V. A-C @ 185 ma., center tapped; 6.3 V. A-C @ 5.5 amperes, 5 V. A-C @ 3 amperes, type 6K53	GT	52B033
C65	Same as C14						
C66	Same as C17						
C67	Same as C16						
C68	Same as C37						
C69	Same as C37						
C70	Same as C25						
C71	Same as C64						
C72	Capacitor, variable, min. cap. 5 mmfd., max. cap. 25 mmfd., air dielectric, special	RC	48A064	T ₈	Transformer, A-F, primary, 10,000 ohm winding center tapped; secondary, 5000 ohm winding tapped at 500 and 100 ohms, iron core, type 3A347	GT	55B009
C73	Capacitor, fixed, 500 mmfd. ± 5%, 500 V. D-C working, silver mica, type 1469, Part of transformer T ₄ . Shown for reference only.	A	47BT501D	T ₉	Transformer, R-F, range 3.0-5.8 megacycles, air core, special	SWI	51B568
C74	Capacitor, fixed, 0.01 mfd. - 10 + 40%, 600 V. D-C working, paper dielectric, braided leads, type AB	SP	46A021	T ₁₀	Transformer, R-F, range 5.8-11.5 megacycles, air core, special	SWI	51B569
C75	Capacitor, 2 mmfd., twisted leads			T ₁₁	Transformer, R-F, range 10.5-21 megacycles, air core, special	SWI	51B570
C76	Same as C25			T ₁₂	Transformer, R-F, range 21-43 megacycles, air core, special	SWI	51B571
C77	Same as C17			T ₁₃	Transformer, R-F, range .55-1.6 megacycles, air core, special	SWI	51B566
C78	Not used			T ₁₄	Transformer, R-F, range 1.6-3.0 megacycles, air core, special	SWI	51B567
C79	Not used			T ₁₅	Transformer, R-F, range 3.0-5.8 megacycles, adjustable iron core, special	SWI	51B572
C80	Not used						
C81	Not used						
C82	Not used						
C83	Capacitor, fixed, 2.5 mmfd. ± 20%, 500 V. D-C working, bakelite dielectric		49A001	T ₁₆	Transformer, R-F, range 5.8-11.5 megacycles, adjustable iron core, special	SWI	51B573
C84	Not used			T ₁₇	Transformer, R-F, range 10.5-21 megacycles, adjustable iron core, special	SWI	51B574
C85	Not used						
C86	Same as C40			T ₁₈	Transformer, R-F, range 21-42 megacycles, adjustable iron core, special	SWI	51B575
C87	Capacitor, fixed, 0.25 mfd. - 10 + 40%, 200 V. D-C working, paper dielectric	SP	46AT254J	T ₁₉	Transformer, R-F, range .55-1.6 megacycles, adjustable iron core, special	SWI	51B576
C88	Capacitor, variable, min. cap. 4 mmfd., max. cap. 20 mmfd., ceramic insulation, temp. coeff. - 0.005 mmfd/mmfd/°C., type 820-B	CRL	44A102	T ₂₀	Transformer, R-F, range 1.6-3.0 megacycles, adjustable iron core, special	SWI	51B577
C89	Same as C88			T ₂₁	Transformer, R-F, range 3.0-5.8 megacycles, adjustable iron core, special	SWI	51B578
C90	Same as C88			T ₂₂	Transformer, R-F, range 5.8-11.5 megacycles adjustable iron core, special	SWI	51B579
C91	Same as C88			T ₂₃	Transformer, R-F, range 10.5-21 megacycles, adjustable iron core, special	SWI	51B580
C92	Capacitor, variable, min. cap. 2.5 mmfd., max. cap. 6 mmfd., ceramic insulation, temp. coeff. 0.0005 mmfd/mmfd/°C., special	CRL	44A119	T ₂₄	Transformer, R-F, range 21-42 megacycles, adjustable iron core, special	SWI	51B581
C93	Same as C88			T ₂₅	Transformer, R-F, range .55-1.6 megacycles, adjustable iron core, special	SWI	51B582
C94	Same as C88			T ₂₆	Transformer, R-F, range 1.6-3.0 megacycles, adjustable iron core, special	SWI	51B583
C95	Same as C88						
C96	Same as C88						
C97	Same as C88						
C98	Same as C88						
C99	Same as C88						
C100	Same as C88						
C101	Same as C88						
C102	Same as C88						
C103	Same as C88						

**MODEL SX-28A,
Super Skyrider**

THE HALLICRAFTERS CO.

REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFG. CODE	CONTR.'S PART NO/SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR.'S PART NO.	
T ₂₉	Transformer, R-F, range 10.5-21 megacycles, adjustable iron core, special	SWI	51B586	V ₁ Tube, pentode type 6AB7	RCA	90X6AB7	
T ₃₀	Transformer, R-F, range 21-42 megacycles, adjustable iron core, special	SWI	51B587	V ₂ Tube, triple-grid super-control amplifier, type 6SK7	RCA	90X6SK7	
SO ₁	Socket, octal, female, low loss mica-filled bakelite insulation, type MIP8T	AP	6A042	V ₃ Tube, multi-electrode pentagrid converter, type 6SA7	RCA	90X6SA7	
TS ₁	Terminal strip, black bakelite, marked "A ₂ " "A ₁ ", special	H	8A039	V ₄ Same as V ₃	RCA	90X6L7	
TS ₂	Terminal strip, black bakelite, marked "5000", special	H	8A040	V ₅ Tube, multi-electrode pentagrid mixer amplifier, type 6L7	RCA	90X6B8	
TS ₃	Terminal strip, black bakelite, marked "500", special	H	8A041	V ₆ Same as V ₅	RCA	90X6B8	
				V ₇ Tube, duplex-diode pentode, type 6B8			
				V ₈ Same as V ₇			
				V ₉ Same as V ₁	RCA	90X6H6	
				V ₁₀ Tube, twin diode, type 6H6			
				V ₁₁ Tube, triode, type 6J5	RCA	90X6J5	
CH ₁	Inductor, 13 henries ± 10%, @ 100 milliamperes D-C, d-c resistance 300 ohms ± 10%, iron core, type 1D25	GT	56B008	V ₁₂ Tube, twin triode, type 6SC7	RCA	90X6SC7	
CH ₂	Inductor, 4 henries ± 10% d-c resistance 220 ohms ± 10%, iron core, type 10C5	ST	55A010	V ₁₃ Tube, beam power amplifier, type 6V6GT	RCA	90X6V6GT	
CH ₃	Inductor, universal winding, iron core, designed to resonate at 455KC with 47 mmfd. ± 7% across the coil, type 774	SWI	53B012	V ₁₄ Same as V ₁₃	RCA	90X5Z3	
				V ₁₅ Tube, full wave high vacuum rectifier; type 5Z3			
TROPICALIZED PARTS LIST							
			R ₃₁	Resistor, two sections; section #1 (R ₃₁) 10,000 ohm ± 10%, 2 watts; section #2 (R ₃₂) 4,000 ohm ± 10%, 8 watts; metal clad, wire wound, type MW 5	IRC	24A822	
			R ₃₂				
J ₁	Jack, single circuit, switching type, single pole double throw, 1 pair contacts normally closed, bushing 3/8-32 x 5/16" long, type 503C	U	36B003	T ₃ Transformer, I-F, 455 KC., primary and secondary tuned by adjustable capacitors, fixed iron cores, vacuum impregnated with zophar #1340 and flash dipped in Hallowax #2002, special	SWI	50B132	
J ₂	Jack, switching type, single pole double throw, 1 pair contacts normally closed, bushing 3/8-32 x 3/8" long, type ST-627A	U	36B011	T ₄ Transformer, 455 KC., tuned by adjustable iron core, winding vacuum wax impregnated and dipped in zophar #1598, special	SWI	54B020	
FS ₁	Fuse, 1.5 amperes @ 250 V., 4AG, glass enclosed, type 1041	LF	39A320	T ₅ Transformer, I-F, 455 KC., primary and secondary tuned by adjustable capacitors, air core, vacuum impregnated with zophar #1340 and flash dipped in Hallowax #2002, trimmers heat cycled at nominal capacity setting (80 mmfd.) and humidity stabilized, special	SWI	50B131	
PL ₁	Plug, octal, male, bakelite body, jumpers connect terminals 6 and 7, and terminals 3 and 4, type CP-8	AP	35A003	T ₆ Transformer, I-F, 455 KC., primary tuned by adjustable iron core, secondary untuned air core, vacuum impregnated with zophar #1340 and flash dipped in Hallowax #2002, special	SWI	50B130	
PL ₂	Plug and line cord assemble, 2 conductor rubber covered #18 copper stranded wire moulded rubber plug at one end, length 6 feet	E	87A078	T ₇ Transformer, power, standard; primary, 115 V. A-C, single phase, 50/60 cycles; secondary #1, to provide 290 V. A-C @185 milliamperes with a 5Z3 rectifier and a 30 mfd. input capacitor, center tapped; secondary #2, 6.3 V. A-C @5.5 amperes; secondary #3, 5 V. A-C @3 amperes; windings and core vacuum wax impregnated; transformer potted in a high melting point compound, type 6K64	SWI	50B130	
M ₁	Meter 0.5 milliamperes, 8.8 ohms internal resistance, pointer swing 90 degrees, special mtg bracket, special	BE	82A070	T ₈ Transformer, A-F; primary, 10,000 ohm winding, center tapped; secondary, 5000 ohm winding tapped at 500 and 100 ohms, iron core, entire unit dioned in Korite #4, type 3A517	GT	52B045	
CX ₁	Crystal, frequency 455KC ± 5KC, type CF6	BL	19A123	CH ₁ Inductor, 13 henries, ± 15% @100 milliamperes D-C, d-c resistance 300 ohms ± 10%, iron core, winding impregnated with vacuum wax, entire unit dipped in Korite #4, type 1D34	GT	56B035	
SW ₁	Switch, rotary selector, single section, 3 position, shorting type rotor contacts, bakelite wafer, shaft 2-1/16" long x 1/4" dia., bushing 1/4" deep, type H	OM	60B052	SW ₁	Switch, rotary selector, single section, 3 position, shorting type rotor contacts, wax impregnated bakelite wafer, shaft 2-5/16" long x 1/4" dia., bushing 1/4" deep, type H	OM	60B144
SW ₂				SW ₂			
SW ₃	Switch, SPST, toggle action, located on rear of resistor R ₃₅	HH	60A103	SW ₄	Switch, SPST, bat handle toggle, rated 3 amperes @250 V., type 21350GA	CH	60A138
SW ₄	Switch, SPST, bat handle toggle, rated 3 amperes @ 250 V., type 21350GA	HH	60A103	SW ₅	Same as SW ₁		
SW ₅	Switch, DPST, toggle action, located on the rear of resistor R ₃₃			SW ₆			
SW ₅₋₁					SW ₇		
SW ₆	Switch, rotary selector, 3 section, 6 position, bakelite wafers, sections are assembled to struts, type H	OM	62B025	SW ₈	Switch, rotary selector, single section, 3 position, shorting type rotor contacts, wax impregnated bakelite wafer, shaft 2-5/16" long x 1/4" dia., bushing 1/4" deep, type H	OM	60B144
SW ₇				SW ₉			
SW ₈	Switch, rotary selector, 2 section, 6 position, bakelite wafers, sections are assembled to struts, type 18908-H2	OM	62B013	SW ₁₀	Switch, SPST, bat handle toggle, rated 3 amperes @250 V., type 8280 15/32 bushing	CH	60A138
SW ₉				SW ₁₁	Switch, rotary selector, single section, 3 position, shorting type rotor contacts, wax impregnated bakelite wafer, shaft 2-5/16" long x 1/4" dia., bushing 1/4" deep, type H	OM	60B144
SW ₁₀	Same as SW ₈₋₅ , SW ₈₋₆ and SW ₈₋₇			SW ₁₂			
SW ₁₁	Switch, rotary selector, 2 section, 6 position, bakelite wafers, sections are assembled to struts type H	OM	62B015	SW ₁₃	Switch, rotary selector, 3 section, 6 position, wax impregnated bakelite wafers, sections are assembled to struts, type H	OM	62B033
SW ₁₂				SW ₁₄			
SW ₁₃				SW ₁₅			
SW ₁₄	Switch, rotary selector, single section, 6 position, shorting type rotor contacts, bakelite wafer, type 23586-H	OM	62B023	SW ₁₆	Switch, rotary selector, 2 section, 6 position, wax impregnated bakelite wafers, sections are assembled to struts, type H	OM	62B031
SW ₁₅				SW ₁₇			
SW ₁₆	Switch, rotary selector, 3 section, 6 position, shorting type rotor, contacts, bakelite wafers, shaft 2-3/8" long x 1/4" dia., bushing 1/4" deep, type 22659-H3	OM	60B048	SW ₁₈	Switch, rotary selector, 2 section, 6 position, wax impregnated bakelite wafers, sections are assembled to struts, type H	OM	62B031
SW ₁₇				SW ₁₉			
SW ₁₈	Switch, SPDT, bat handle toggle, rated 1 ampere @ 250 V. and 3 amperes @ 125 V., type 20994KF	HH	60A102	SW ₂₀	Switch, rotary selector, 2 section, 6 position, wax impregnated bakelite wafers, sections are assembled to struts, type H	OM	62B031
SW ₁₉				SW ₂₁			
LM ₁	Lamp 6.3 V. @ 250 milliamperes, bayonet base type 44	GE	39A003	SW ₂₂	Switch, rotary selector, 2 section, 6 position, wax impregnated bakelite wafers, sections are assembled to struts, type H	OM	62B031
LM ₂	Same as LM ₁			SW ₂₃			
LM ₃	Lamp, 6.3 V. @ 150 milliamperes, bayonet base type 47	GE	39A004	SW ₂₄	Switch, rotary selector, 2 section, 6 position, wax impregnated bakelite wafers, sections are assembled to struts, type H	OM	62B032
				SW ₂₅			

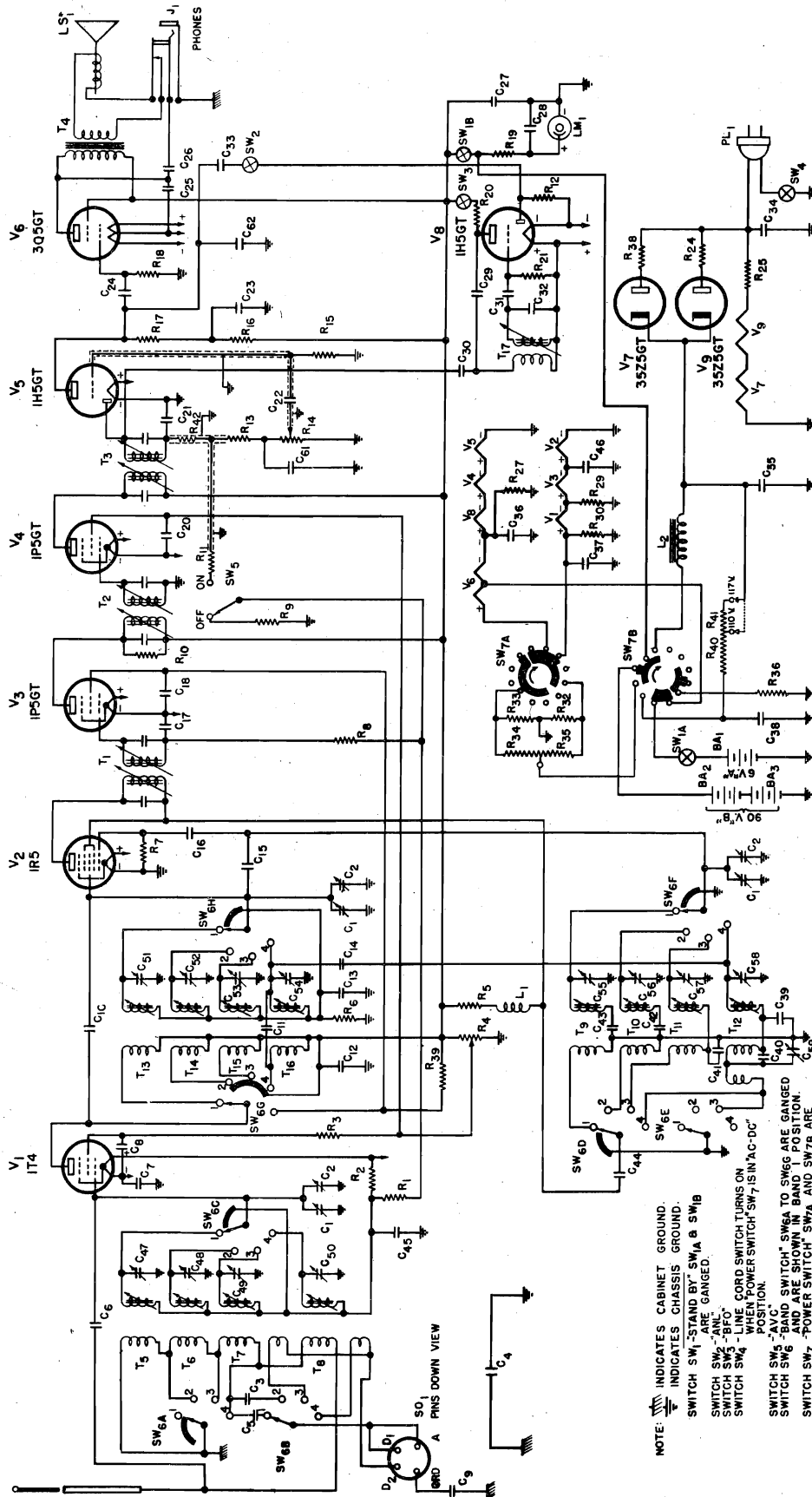
THE HALLICRAFTERS CO.

MODEL SX-28A,
Super Skyrider

SW ₈₋₁₄	} Switch, rotary selector, single section, 6 position, wax impregnated bakelite wafer, section is assembled to strut, type H	OM	60B135
SW ₈₋₁₅			
SW ₉₋₁	} Switch, rotary selector, 3 section, 6 position, wax impregnated bakelite wafers, shorting type rotar contacts shaft 2-5/8" long x 1/4" dia., bushing 1/4" deep, type	.OM	60B134
SW ₉₋₂			
SW ₉₋₃			
SW ₁₀	Switch, SPDT, bat handle toggle, 3 amperes @125 V., type 8282 15/32 bushing	CH	60A139

INDEX TO PARTS MANUFACTURERS

<u>SYMBOL</u>	<u>MANUFACTURER</u>	<u>SYMBOL</u>	<u>MANUFACTURER</u>
A	Aerovox Corp. New Bedford, Mass.	H	The Hallicrafters Co. Chicago, Illinois
AP	American Phenolic Corp. Cicero, Illinois	HH	Hart & Hegeman Elec. Co. Hartford, Conn.
ASA	Any manufacturer meeting the applicable American Standard Association specification	IRC	International Resistance Co. Philadelphia, Pa.
BE	Beede Electrical Inst. Co. Penacook, N. H.	LF	Littlefuse Inc. Chicago, Illinois
BL	Bliley Electric Co. Erie, Pa.	OM	Oak Mfg. Co. Chicago, Illinois
CH	Cutler-Hammer Inc. Milwaukee, Wis.	RC	Radio Condenser Camden, N. J.
CM	Chicago Molding Co. Chicago, Illinois	RCA	R. C. A. Mfg. Co. Harrison, N. J.
CRL	Centralab Milwaukee, Wis.	SI	F. W. Sickles Co. Springfield, Mass.
CS	Clarostat Mfg. Co. Brooklyn, N. Y.	SP	Sprague Specialties Co. North Adams, Mass.
CT	Chicago Telephone Supply Co. Elkhart, Ind.	ST	Standard Transformer Corp. Chicago, Illinois
E	Essex Wire Co. Chicago, Illinois	SWI	S. W. Inductor Chicago, Illinois
GE	General Electric Co. Schenectady, N. Y.	U	Utah Radio Products Co. Chicago, Illinois
GT	General Transformer Corp. Chicago, Illinois	UE	Underwood Elec. Co. Chicago, Illinois



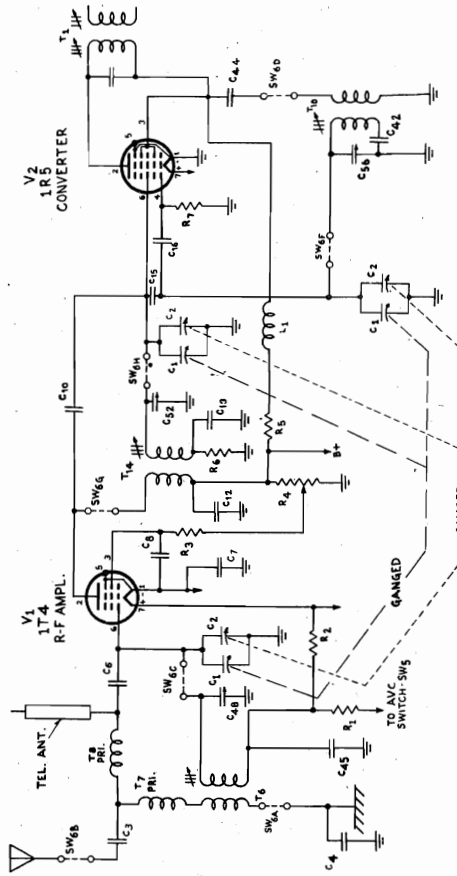
IF PEAK
455 KC

NOTE: INDICATES CABINET GROUND.
 INDICATES CHASSIS GROUND.
 SWITCH SW1 "STAND BY" SW1A & SW1B ARE GANGED.
 SWITCH SW2 "AFL" ARE GANGED.
 SWITCH SW3 "BFO" LINE CORD SWITCH SW7 IS IN "AC-DC" POSITION.
 SWITCH SW4 "AVC" POSITION.
 SWITCH SW5 "BAND SWITCH" SW6A TO SW6C ARE GANGED AND ARE SHOWN IN BAND 1 POSITION.
 SWITCH SW6 "GAIN" SW7A AND SW7B ARE GANGED AND ARE SHOWN IN "GAIN" POSITION.
 SWITCH SW7 "TUNING" SW7C AND SW7D ARE GANGED AND ARE SHOWN IN "TUNING" POSITION.
 SWITCH SW8 "R-F GAIN" CONTROL RESISTOR R4 "A-F GAIN" (VOLUME) CONTROL INTERMEDIATE FREQUENCY - 455 KC

June 9, 1944

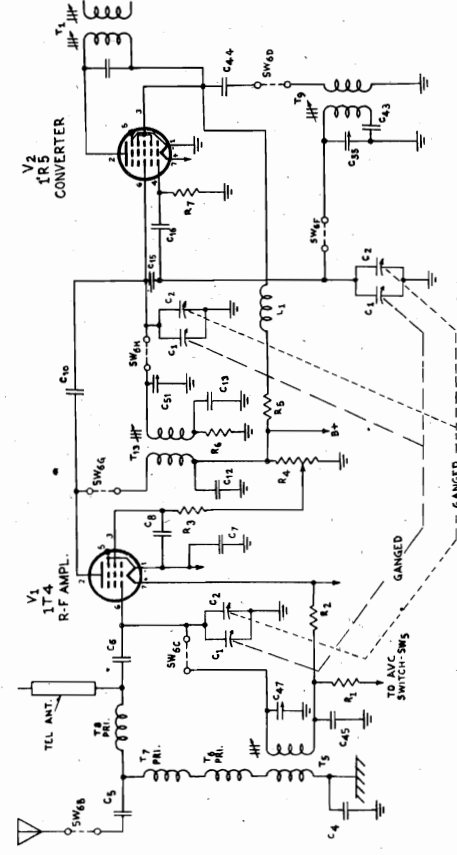
THE HALLICRAFTERS CO.

MODEL S-39, Skyranger



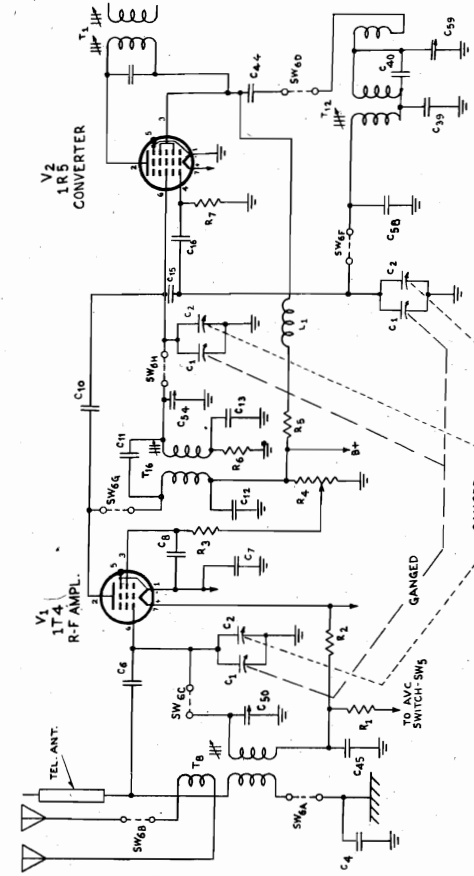
BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE
BAND 2
1.5 MC - 4 MC

////// DENOTES CABINET GROUND
⊥ DENOTES CHASSIS GROUND



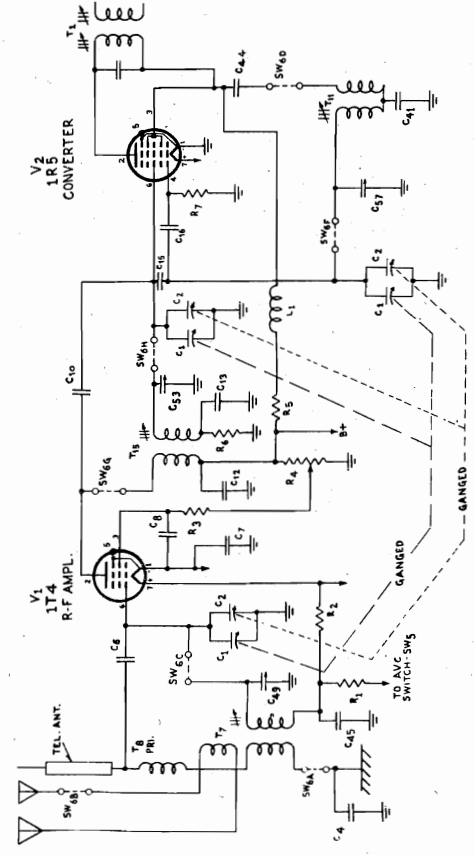
BAND-SWITCH SHOWN AT 1ST POSITION.
BROADCAST BAND
BAND 1
550 KC - 1450 KC

////// DENOTES CABINET GROUND
⊥ DENOTES CHASSIS GROUND



BAND-SWITCH SHOWN AT 4TH POSITION CLOCKWISE
BAND 4
11.5 MC - 30 MC

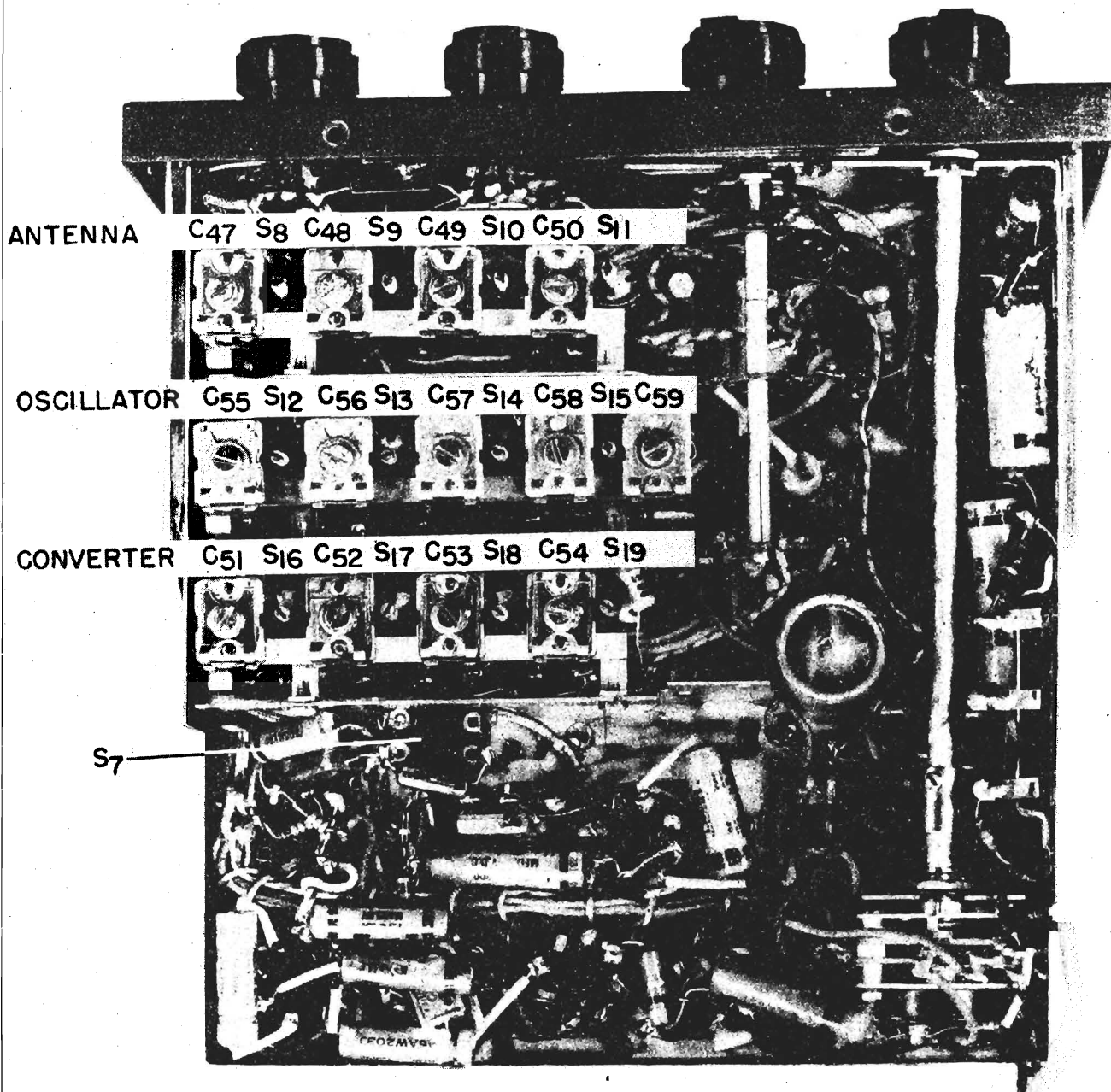
////// DENOTES CABINET GROUND
⊥ DENOTES CHASSIS GROUND



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE
BAND 3
4.5 MC - 11 MC

////// DENOTES CABINET GROUND
⊥ DENOTES CHASSIS GROUND

MODEL S-39, Skyranger THE HALLICRAFTERS CO.



BOTTOM VIEW OF CHASSIS

TUBE	TYPE	PURPOSE
V ₁	1T4	R-F amplifier
V ₂	1R5	Converter and oscillator
V ₃	1P5GT	First i-f amplifier
V ₄	1P5GT	Second i-f amplifier
V ₅	1H5GT	Detector, A-V-C and first audio amplifier
V ₆	3Q5GT	Audio amplifier
V ₇	35Z5GT	Rectifier
V ₈	1H5GT	Beat frequency oscillator and automatic noise limiter
V ₉	35Z5GT	Rectifier

THE HALLICRAFTERS CO.

MODEL S-39, Skyranger

E-1. RECEIVER ALIGNMENT -

F-4. TABLE OF TUBE SOCKET VOLTAGES
Measured from socket pin to ground with 1000 ohm-per-volt meter
All voltages are D-C unless otherwise specified.

Tube	Pin Number								
	1	2	3	4	5	6	7	8	Cap.
Battery Supply									
V ₁ 1T4	2.62	87	84	NC	2.62	0	4.1	X	X
V ₂ 1R5	0	65	0	0	0	0	1.5	X	X
V ₃ 1P5GT	0	2.7	87	60	NC	11.5	1.5	NC	0
V ₄ 1P5GT	0	2.8	88	88	NC	X	1.4	NC	0
V ₅ 1H5GT	0	1.45	62	NC	0	X	0	NC	0
V ₆ 3Q5GT	NC	7.4	84	88	0	X	4.4	5.9	X
V ₇ 3Z5GT	NC	0	NC	X	0	X	0	0	X
V ₈ 1H5GT	0	4.4	470	NC	0	X	2.8	NC	3.5
V ₉ 3Z5GT	NC	0	NC	X	0	X	0	0	X
117 Volts AC									
V ₁ 1T4	2.6	103	92	NC	2.7	0	4.2	X	X
V ₂ 1R5	0	75	75	0	0	0	1.5	X	X
V ₃ 1P5GT	0	2.5	105	75	NC	11.45	1.45	NC	0
V ₄ 1P5GT	0	2.95	102	105	NC	X	1.55	NC	0
V ₅ 1H5GT	0	1.5	70	NC	0	X	0	NC	0
V ₆ 3Q5GT	NC	7.6	100	110	0	X	4.6	6.1	X
V ₇ 3Z5GT	NC	0	7.8 A-C	X	114A-C	X	39.5 A-C	110	X
V ₈ 1H5GT	0	4.3	*82.5	NC	0	X	2.95	NC	3.5
V ₉ 3Z5GT	*115 A-C	33.5 A-C	43 A-C	X	114A-C	*115 A-C	65 A-C	110	X
120 Volts DC									
V ₁ 1T4	2.8	103	92	NC	2.8	0	4.2	X	X
V ₂ 1R5	0	72	72	0	0	0	1.5	X	X
V ₃ 1P5GT	0	2.8	103	72	NC	11.5	1.5	NC	0
V ₄ 1P5GT	0	3.2	102	102	NC	X	1.6	NC	0
V ₅ 1H5GT	0	1.6	87	NC	0	X	0	NC	0
V ₆ 3Q5GT	NC	7.7	100	103	0	X	4.8	6.3	X
V ₇ 3Z5GT	NC	0	7.3	X	118	X	35.	110	X
V ₈ 1H5GT	0	4.8	*85	NC	0	X	3.2	NC	4
V ₉ 3Z5GT	*120	35	43	X	118	120	70	110	X

NC - No Connection.
X - No pin
* - With BFO switch at ON.
† - Tie lug.

(a) Equipment needed to align the receiver -
Signal generator to cover 455 KC to 30 MC
Non-metallic screwdriver
Output meter with a phone plug connector
.1 mfd. condenser
6.5 mmfd. condenser. (Dummy antenna)

(b) Setting of controls for I-F alignment -
ANL, AVC and BFO switches at OFF
STAND BY switch at ON
A.F. and R.F. GAIN controls set at maximum gain
BAND SWITCH at #1 Band
POWER SWITCH at BAT. (power cord removed from wall socket)
BANDSPREAD TUNING at "0"
Telescoping antenna completely collapsed.

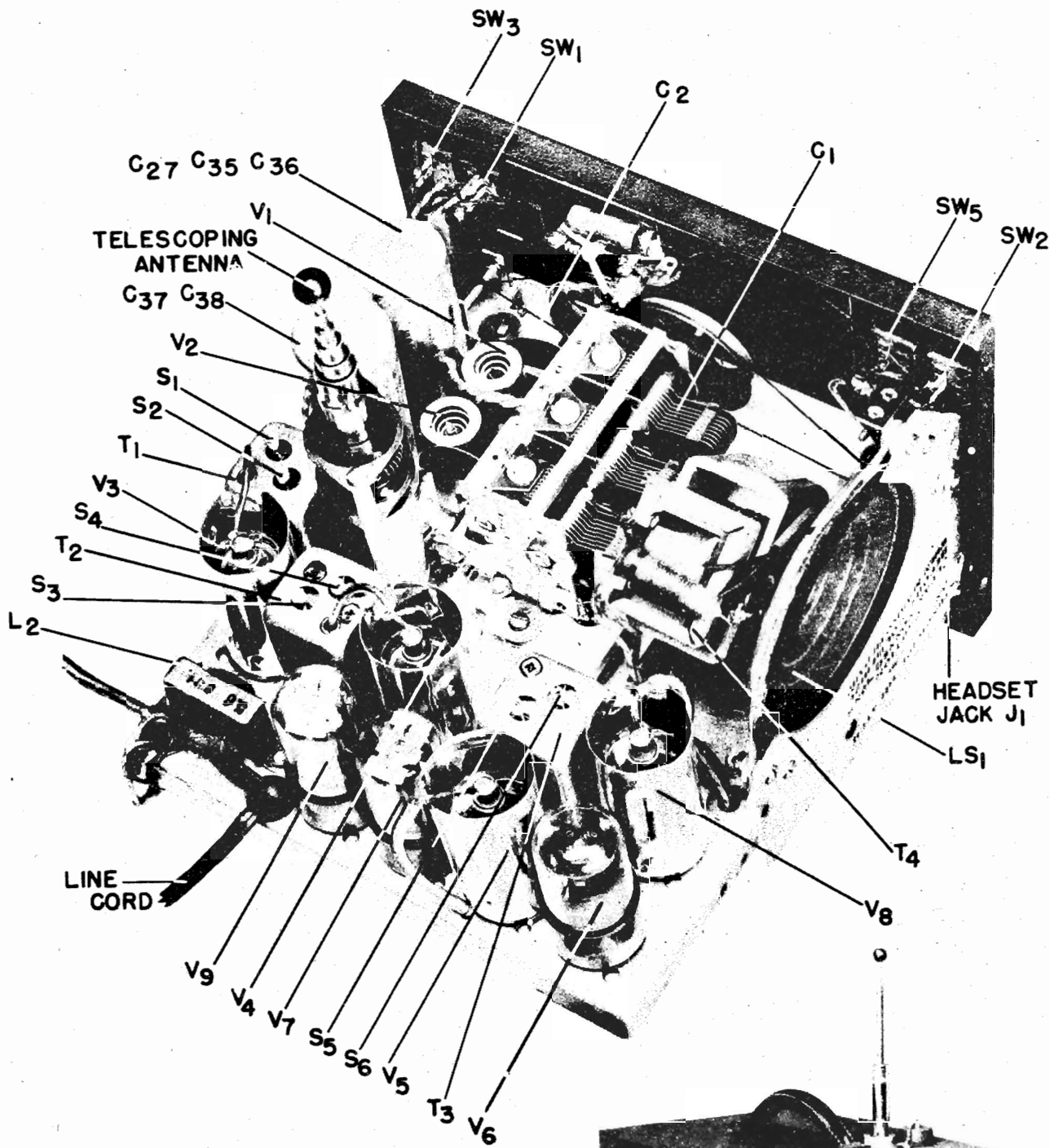
(c) I-F alignment (455 KC) -
Remove top and bottom cover for access to internal components
Have external antenna plug PL₂ out of socket S01
Connect "hot" lead of signal generator through the .1 mfd condenser to the lug on rear stator section of main tuning condenser (C₁).
Connect "ground" lead of signal generator to chassis
Plug output meter plug in the phone jack (J₁)
Set MAIN TUNING dial at 1500 KC
Band #1
Tune signal generator to 455 KC.
Adjust slugs S₁ to S₆ inclusive for maximum output. Refer to figure 4 for location of the adjusting screws on transformers T₁, T₂ and T₃.

(d) B-F-O adjustment -
Without disconnecting the signal to chassis generator, after completing the Have external antenna plug PL₂ I-f transformer alignment, adjust out of socket S01
Set MAIN TUNING dial of receiver and signal generator frequency as shown in the alignment chart.
Set BFO switch at ON
Remove modulation from the signal generator
Adjust tuning slug S₇ to desired pitch (Approx. 1000 cycles).
Slug S₇ is located under the chassis just in back of the coil shield plate.
Note: It is possible to adjust the B-F-O pitch without the use of the signal generator. Tune in a c-w signal to exact resonance with the BFO switch set at OFF. Set BFO switch at ON and adjust pitch to the tone desired by turning slug S₇. Replace top cover after aligning the I-F and B-F-O transformers.
Note: Only one section of the telescoping antenna shall extend above the top cover of the receiver. (This procedure is necessary to obtain an accurate calibration for the receiver when aligning with the dummy antenna of 6.5 mmfd.) The receiver's top cover must be fastened down for the following adjustments.
ANL, AVC and BFO switches at OFF
STAND BY switch at ON
A.F. and R.F. GAIN controls set at maximum gain
BAND SWITCH at Band to be aligned (See alignment chart)
POWER SWITCH at BAT. (power cord removed from wall socket)
BANDSPREAD TUNING at "0"
Telescoping antenna is collapsed except for bottom section
R-F alignment -
Leave output meter plug in phone jack (J₁)

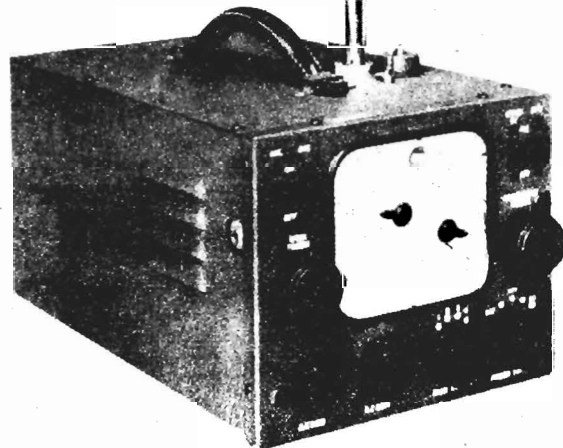
ALIGNMENT CHART

BAND	SIGNAL GENERATOR FREQUENCY AND "MAIN TUNING" DIAL SETTING	ADJUST FOR MAXIMUM OUTPUT		OSCILLATOR FREQUENCY RELATIVE TO SIGNAL FREQUENCY
		OSCILLATOR SECTION	ANTENNA AND CONVERTER SECTIONS	
1	1.4 MC	C ₅₅	C ₄₇ and C ₅₁	455 KC Above
	.6 MC	S ₁₂	S ₈ and S ₁₆	455 KC Above
2	4.0 MC	C ₅₆	C ₄₈ and C ₅₂	455 KC Above
	2.0 MC	S ₁₃	S ₉ and S ₁₇	455 KC Above
3	10.0 MC	C ₅₇	C ₄₉ and C ₅₃	455 KC Above
	5.0 MC	S ₁₄	S ₁₀ and S ₁₈	455 KC Above
4	28.0 MC	C ₅₈	C ₅₀ and C ₅₄	455 KC Below
	14.0 MC	S ₁₅ C ₅₉	S ₁₁ and S ₁₉	455 KC Below

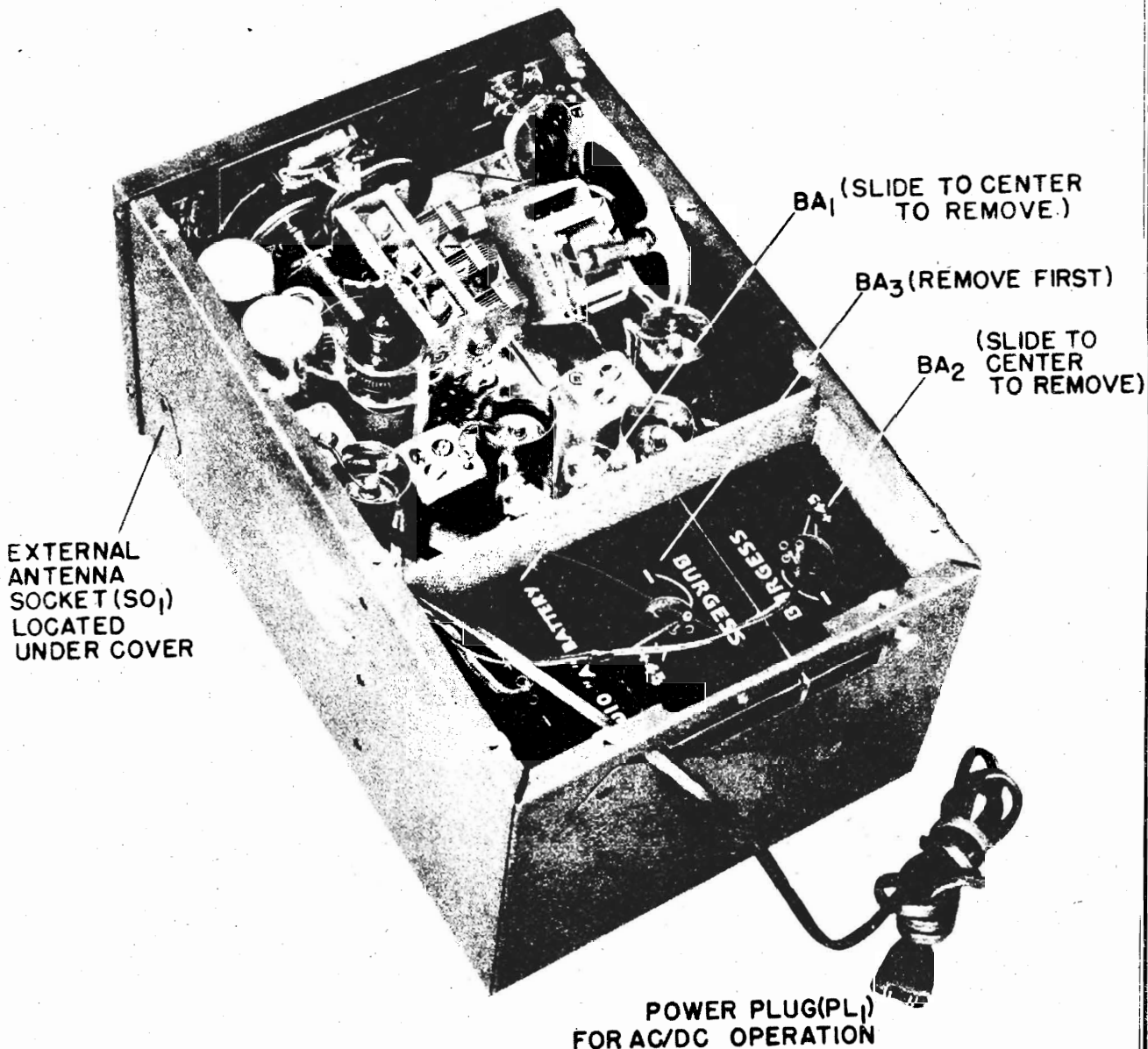
Connect "Hot" lead of signal generator to extended section of the telescoping antenna through the 6.5 mmfd dummy antenna condenser.
Connect ground side of generator to chassis
Have external antenna plug PL₂ out of socket S01
Set MAIN TUNING dial of receiver and signal generator frequency as shown in the alignment chart.
Adjust trimmers (C₄₇ to C₅₉) and slugs (S₈ to S₁₉) in the order shown on the alignment chart. (See figure 5 for location of adjustment screws).
Note: When aligning bands 3 and 4 "rock" the MAIN TUNING control slightly to peak the adjustment.
When aligning the low frequency end of band 4 by adjusting slug S₁₈, the oscillator may cease to function. A slight adjustment of condenser C₅₉ will bring it back into oscillation.



TOP VIEW.



THE HALLICRAFTERS CO. MODEL S-39, Skyranger



MODEL S-39 RECEIVER, REAR VIEW, COVER REMOVED, SHOWING POWER CORD COMPARTMENT AND BATTERY COMPARTMENT.

A-3. POWER SUPPLIES - Two separate and independent power supplies are incorporated in the receiver, namely an internal battery supply and a rectifier-filter type of supply for use with an external a-c/d-c source.

The battery supply consists of two 45-volt "B" batteries (BA₂ and BA₃) connected in series, and one 6-volt "A" battery (BA₁) all of which are located in the back section of the carrying-case cabinet. See figure 6.

The a-c/d-c supply consists of two type 35Z5GT rectifier tubes (V₇ and V₉) and the associated filter (L₂, C₃₅ and C₂₇) and filament voltage dropping resistors (R₃₂, R₃₃, R₃₄ and R₃₅). This supply may be used whenever commercial power lines, delivering 110-to 117-volts A-C or D-C are accessible. Refer to Section D for operating instructions.

The supply to be used is selected from the front panel by POWER SWITCH, SW₇. Refer to figure 2 for circuit details.

MODEL S-39, Skyranger

THE HALLICRAFTERS CO.

REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR. S. PART NO.	REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR. S. PART NO.
R ₁	Resistor, 2.2 megohm ± 10%, ½ watt, carbon	ASA	RC10AE225K	C ₈	Capacitor, 0.01 mfd. -10 + 40%, 400 V. D-C working, paper dielectric, type AF	SP	46AW103J
R ₂	Same as R ₁						
R ₃	Resistor, 8,200 ohm ± 10%, ½ watt, carbon	ASA	RC21AE822K				
R ₄	Resistor, variable, ½ megohm ± 20%, carbon	CT	25C071	C ₉	Same as C ₈		
R ₅	Resistor, 4,000 ohm ± 10%, ½ watt, carbon	ASA	RC10AE472K	C ₁₀	Capacitor, adjustable, min. cap. 5 mmfd., max. cap. 6.5 mmfd., 500 V. D-C working, temp. coeff. -.00075 mmfd./mmfd./degree Cent., ceramic dielectric, type 807-004	CRL	47A005
R ₆	Same as R ₁						
R ₇	Resistor, 100,000 ohm ± 10%, ½ watt, carbon	ASA	RC10AE104K	C ₁₁	Same as C ₁₀		
R ₈	Resistor, 1.0 megohm ± 10%, ½ watt, carbon	ASA	RC10AE105K	C ₁₂	Same as C ₇		
R ₉	Same as R ₁			C ₁₃	Same as C ₇		
R ₁₀	Resistor, 51,000 ohm ± 5%, ½ watt, carbon	ASA	RC21AE513J	C ₁₄	Capacitor, 3 mmfd., twisted wire leads		
R ₁₁	Same as R ₁			C ₁₅	Capacitor, 2 mmfd., twisted wire leads		
R ₁₂	Same as R ₈			C ₁₆	Same as C ₃		
R ₁₃	Same as R ₇			C ₁₇	Same as C ₇		
R ₁₄	Resistor, variable, ½ megohm ± 20%, carbon	CT	25C070	C ₁₈	Same as C ₈		
R ₁₅	Resistor, 10 megohm ± 20%, ½ watt, carbon	ASA	RC10AE106M	C ₁₉	Not used		
R ₁₆	Same as R ₇			C ₂₀	Same as C ₇		
R ₁₇	Resistor, 470,000 ohm ± 20%, ½ watt, carbon	ASA	RC10AE474M	C ₂₁	Capacitor, 100 mmfd. ± 20%, 500 V. D-C work- ing, mica dielectric	ASA	CM20A101M
R ₁₈	Same as R ₁₇						
R ₁₉	Same as R ₁₇						
R ₂₀	Resistor, 47,000 ohm ± 20%, ½ watt, carbon	ASA	RC10AE473M	C ₂₂	Capacitor, 0.004 mfd. -10 + 40%, 600 V. D-C working, paper dielectric, type 684	A	46AZ402J
R ₂₁	Same as R ₂₀			C ₂₃	Capacitor, 0.1 mfd. - 10 + 40%, 200 V. D-C working, paper dielectric, type 284	A	46AU104J
R ₂₂	Not used			C ₂₄	Same as C ₈		
R ₂₃	Not used			C ₂₅	Capacitor, 0.005 mfd. - 10 + 40%, 400 V. D-C working, paper dielectric, type 484	A	46AW502J
R ₂₄	Resistor, 24 ohm ± 5%, 1 watt, carbon	ASA	RC31AE240J	C ₂₆	Capacitor, 0.02 mfd. -10 + 40%, 400 V. D-C working, paper dielectric, type AB	SP	46AW203J
R ₂₅	Resistor, 330 ohm ± 5%, 9 watt, wire wound, candohm, type FH	MT	24A829	C ₂₇	Capacitor, 60 mfd. -10 + 50%, 150 V. D-C working, electrolytic, one section of 3 section unit, 6 prong plug-in assembly, type 10B336	IC	45A065
R ₂₆	Not used			C ₂₈	Capacitor, 0.02 mfd. -10 + 40%, 400 V. D-C working, paper dielectric, type AB	SP	46AW203J
R ₂₇	Resistor, 1000 ohm ± 10%, ½ watt, carbon	ASA	RC10AE102K	C ₂₉	Same as C ₂₈		
R ₂₈	Not used.			C ₃₀	Capacitor, 3 turn twisted wire leads		
R ₂₉	Resistor, 560 ohm ± 10%, ½ watt, carbon	ASA	RC10AE561K	C ₃₁	Same as C ₂₁		
R ₃₀	Same as R ₂₉			C ₃₂	Capacitor, 510 mmfd. ± 5%, 500 V. D-C work- ing, mica dielectric	ASA	CM20A511J
R ₃₁	Not used			C ₃₃	Same as C ₇		
R ₃₂	Same as R ₂₇			C ₃₄	Capacitor, 0.05 mfd. -10 + 40%, 400 V. D-C working, paper dielectric, type 484	A	46AW503J
R ₃₃	Resistor, 820 ohm ± 10%, 1 watt, carbon	ASA	RC31AE821K	C ₃₅	Capacitor, 30 mfd. -10 + 50%, 150 V. D-C working, electrolytic, one part of triple unit - refer to C ₂₇		
R ₃₄	Resistor, 1645 ohm ± 10%, tapped at 800 ohm, 7.4 watt, 2 unit, wire wound, unit #1 800 ohm (R ₃₄), unit #2 845 ohm (R ₃₅), candohm, type MW-2			C ₃₆	Capacitor, 100 mfd. -10 + 65%, 5 V. D-C working, electrolytic, one part of triple unit - refer to C ₂₇		
R ₃₅		IRC	24A044				
R ₃₆	Resistor, 820 ohm ± 10%, ½ watt, carbon	ASA	RC10AE821K	C ₃₇	Capacitor, dual, 120 mfd. -10 + 50%, 150 V. D-C working (C ₃₈), 60 mfd. -10 ± 65%, 5 V. D-C working (C ₃₇), unit hermetically sealed 4 prong plug-in assembly, type 10B335	IC	45A066
R ₃₇	Not used.			C ₃₈			
R ₃₈	Same as R ₂₄			C ₃₉	Capacitor, 4300 mmfd. ± 5%, 500 V. D-C work- ing, mica dielectric	ASA	CM35A432J
R ₃₉	Resistor, 1.5 megohm ± 20%, ½ watt, carbon	ASA	RC10AE155M	C ₄₀	Capacitor, 240 mmfd. ± 5%, 500 V. D-C work- ing, mica dielectric	ASA	CM20A241J
R ₄₀	Resistor, 450 ohm tapped at 87 ohm, 7 watt, 2 unit, wire wound, unit #1 363 ohm (R ₄₀), unit #2 87 ohm (R ₄₁) candohm, special	MT	24A819				
R ₄₁							
R ₄₂	Same as R ₇						
C ₁	Capacitor, variable, 3 section, 2 unit, unit #1-(C ₁), max. cap. per section 352 mmfd., air dielectric, unit #2-(C ₂) max. cap. per section 22 mmfd. air dielectric, each unit has separate drive shaft to which pulleys are fixed, type 945-3-20						
C ₂		48B055					
C ₃	Capacitor, 51 mmfd. ± 5%, 500 V. D-C work- ing, low loss mica dielectric	ASA	CM20C510J				
C ₄	Capacitor, 0.1 mfd. -10 + 40%, 400 V. D-C working, paper dielectric, type 484	A	46AV104J				
C ₅	Capacitor, 15 mmfd. ± 20%, 500 V. D-C work- ing, temp. coeff. -.00075 mmfd./mmfd./degree Cent., ceramic dielectric, type 809-047	CRL	47A027				
C ₆	Capacitor, 10 mmfd. ± 20%, 500 V. D-C work- ing, temp. coeff. -.00075 mmfd./mmfd./degree Cent., ceramic dielectric, type 811-013.	CRL	47A028				
C ₇	Capacitor, 0.05 mfd. -10 + 40%, 200 V. D-C working, paper dielectric, type AB	SP	46AU503J				

THE HALLICRAFTERS CO.

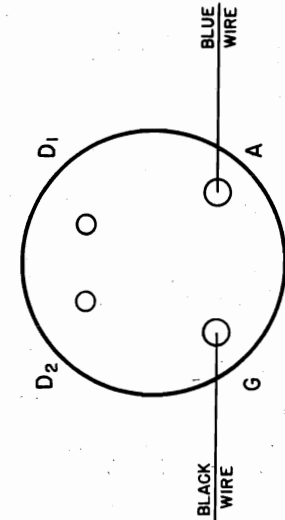
MODEL S-39, Skyranger

REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR.'S. PART NO.	REF. SYMBOL	NAME OF PART AND DESCRIPTION	MFR. CODE	CONTR.'S. PART NO.
C ₄₁	Capacitor, 2000 mmfd. ± 5%, 500 V. D-C working, mica dielectric	ASA	CM30AR02J	SW ₇	Switch, rotary selector, 3 position, single section, non-shorting type contacts, has a type 8030-K4 toggle action, SPST A-C switch ganged on rear of assembly "ON" position full clockwise, type H	OM	60A162
C ₄₂	Capacitor, 910 mmfd. ± 5%, 500 V. D-C working, mica dielectric	ASA	CM30A911J	SO ₁	Socket, female, 4 contacts, bakelite insulation, wafer type, brass contacts, 2 mtg. holes with 1/4" mtg. centers, type 2642	CN	10A080
C ₄₃	Capacitor, 390 mmfd. ± 5%, 500 V. D-C working, mica dielectric	ASA	CM20A391J	PL ₁	Plug with line cord, 2 conductor, rubber insulation, #18 ga. stranded copper wire, length 6 feet, 2 prong spring type molded on plug, special	E	87A078
C ₄₄	Same as C ₈			BA ₁	Battery, 6 V. D-C, 2 hole socket, 3-7/8" x 2-15/16" x 5/8", type P698A	ROV	27A010
C ₄₅	Same as C ₇			BA ₂	Battery, 45 V. D-C, combination "B" socket, 4-1/8" x 2-9/16" x 5-5/16", type P5303	ROV	27A009
C ₄₆	Capacitor, 0.5 mfd. -1C + 40%, 200 V. D-C working, paper dielectric		46AT504J	BA ₃	Same as BA ₂		
C ₄₇	Capacitor, 4 unit assembly, mica dielectric, compression type adjustment, trimmers mounted on a single metal strip, 3 units with min. cap. 2.7 mmfd., max. cap. 35 mmfd. (C ₄₇ , C ₄₉ , C ₅₀) 1 unit with min. cap. 1.5 mfd., max. cap. 10 mmfd. (C ₄₈ special	UE	44A064	J ₁	Jack, single circuit, normally closed, brass mechanism, bakelite insulation, type 1J102	U	36A002
C ₄₈				LS ₁	Loudspeaker; 4 inch O.D. permanent magnet dynamic, includes transformer T ₄ in the assembly, type 4-OM-11A	OT	85B009
C ₄₉				LM ₁	Lamp, indicator, 1-1/8" leads, clear glass bulb type 4 ₂ , type NE-7	GE	39A007
C ₅₀				V ₁	Tube, pentode, type 1T4	RCA	90X1T4
C ₅₁	Same as C ₄₇ , C ₄₈ , C ₄₉ , C ₅₀ , assembly. C ₅₁ , C ₅₂ , C ₅₃ , C ₅₄ same as C ₄₈			V ₂	Tube, pentagrid converter, type 1R5	RCA	90X1R5
C ₅₂				V ₃	Tube, type, 1P5GT	RCA	90X1P5GT
C ₅₃				V ₄	Same as V ₃		
C ₅₄				V ₅	Tube, diode triode, type 1H5GT	RCA	90X1H5GT
C ₅₅	Capacitor, 5 unit assembly, mica dielectric, compression type adjustment, trimmers mounted on a single metal strip, 2 units with min. cap. 1.5 mmfd., max. cap. 10 mfd. (C ₅₇ and C ₅₈), 2 units with min. cap. 2.7 mmfd., max. cap. 35 mmfd. (C ₅₅ and C ₅₆), 1 unit with min. cap. .25 mmfd., MAX. 140 mmfd. (C ₅₉), special	UE	44A092	V ₆	Tube, beam power amplifier, type 3Q5GT	RCA	90X3Q5GT
C ₅₆				V ₇	Tube, half-wave high-vacuum rectifier, type 35Z5GT	RCA	90X35Z5GT
C ₅₇				V ₈	Same as V ₅		
C ₅₈				V ₉	Same as V ₇		
C ₅₉							
C ₆₀	Not used						
C ₆₁	Same as C ₄₀						
C ₆₂	Same as C ₂₁						
T ₁	Transformer, I-F, 455 KC., fixed primary trimmer 155 mmfd., fixed secondary trimmer 80 mmfd., primary and secondary are tuned by adjustable iron cores, special	SI	50A086	FOR TROPICAL RECEIVERS USE THE ABOVE PARTS			
T ₂	Same as T ₁ except for length of leads	SI	50B157	T ₁	Transformer, I-F, 455 KC., fixed primary trimmer 155 mmfd., fixed secondary trimmer 85 mmfd., primary and secondary are tuned by adjustable iron cores, vacuum impregnated with zophar #1340 and flash dipped in Hollowax #2012, special (Note: T ₁ differs from T ₂ and T ₃ in the length of the wire leads)	SI	50A150
T ₃	Same as T ₁ , except for length of leads	SI	50B158				
T ₄	Transformer, A-F, primary to match the output of the type 3Q5GT tube, part of speaker assembly LS ₁ . Shown for reference only			T ₂	Transformer, I-F, 455 KC., fixed primary trimmer 155 mmfd., fixed secondary trimmer 85 mmfd., primary and secondary are tuned by adjustable iron cores, vacuum impregnated with zophar #1340 and flash dipped in Hollowax #2012, special (Note: T ₂ differs from T ₁ and T ₃ in the length of the wire leads)	SI	50A159
T ₅	Transformer, R-F, 4 unit assembly, tunes from .55 MC. to 30 MC. in 4 bands with condenser C ₁ and C ₂ , inductance adjusted by movable iron cores.	SWI	51B301				
T ₆							
T ₇							
T ₈							
T ₉	Transformer, R-F, 4 unit assembly, tunes from .55 MC. to 30 MC. in 4 bands with condensers C ₁ and C ₂ , inductance adjusted by movable iron cores	SWI	51B303				
T ₁₀							
T ₁₁							
T ₁₂							
SW ₂	Switch, DPST, slide action, bakelite insulation, steel mtg. plate with 2 holes having 1-1/8" mtg. centers, type 71	OM	60A061	L ₁	Reactor, R-F, inductance 170 microhenries, air core, vacuum impregnated with zophar #1340 and flash dipped in Hollowax #2012, type 3485	SWI	53A057
SW ₃	Same as SW ₂			L ₂	Reactor, filter, d-c resistance 250 ohms ± 20%, max. load current 30 milliamperes, inductance 3.6 henrys at 30 milliamperes, vacuum wax impregnated and flash dipped in Hollowax #2012, type 1A1251 modified	GT	56B051
SW ₄	Switch, SPST, toggle action, refer to SW ₇			SW ₆	Switch, rotary selector, 4 position, 3 section, shorting type contacts, bushing 1/4" long, terminal 6 of section 2 front and rear are electrically connected, type RM	MA	60B179
SW ₅	Switch, SPDT, slide, bakelite insulation, brass solder lugs, steel mtg. plate with 2 holes having 1-1/8" mtg. centers, type 77	OM	60A130				
SW ₆	Switch, rotary selector, 4 position, 3 section, shorting type contacts, bushing 1/4" long, type RM	MA	60B160				

THE HALLICRAFTERS CO.

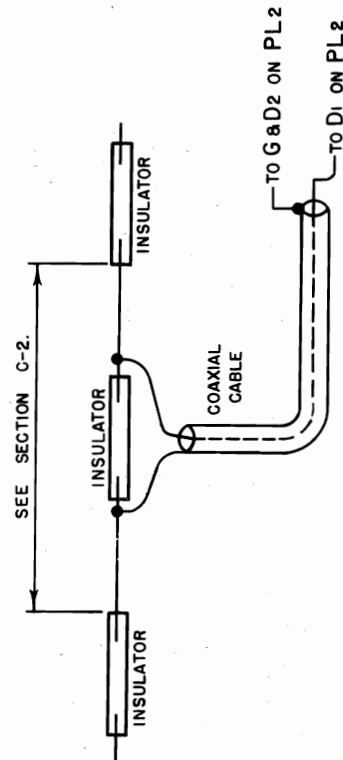
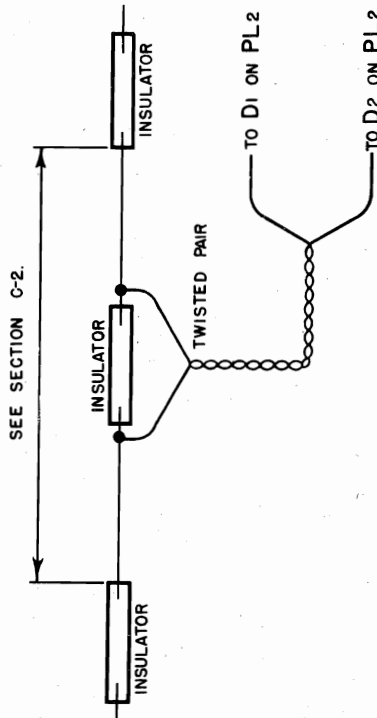
MODEL S-39, Skyranger

RECOMMENDED ANTENNA INSTALLATIONS



PL2
PIN VIEW

NOTE: PL2 IS SUPPLIED WIRED AS ABOVE



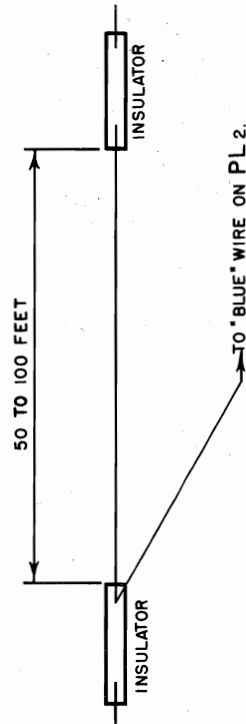
REF. SYMBOL NAME OF PART AND DESCRIPTION MFR. CODE CONTR.'S. PART NO.

T3 Transformer, I-F, 455 KC., fixed primary trimmer 155 mmfd., fixed secondary trimmer 85 mmfd., primary and secondary are tuned by adjustable iron cores, vacuum impregnated with zophar #1340 and flash dipped in Hollowax #2012, special, (Note T3 differs from T1 and T2 in the length of the wire leads)

T5 Transformer, R-F, 4 unit assembly, tunes from 0.55 MC. to 30 MC. in 4 bands with condenser C1 and C2, inductance adjusted by movable iron cores, wax impregnated with Hollowax #2012

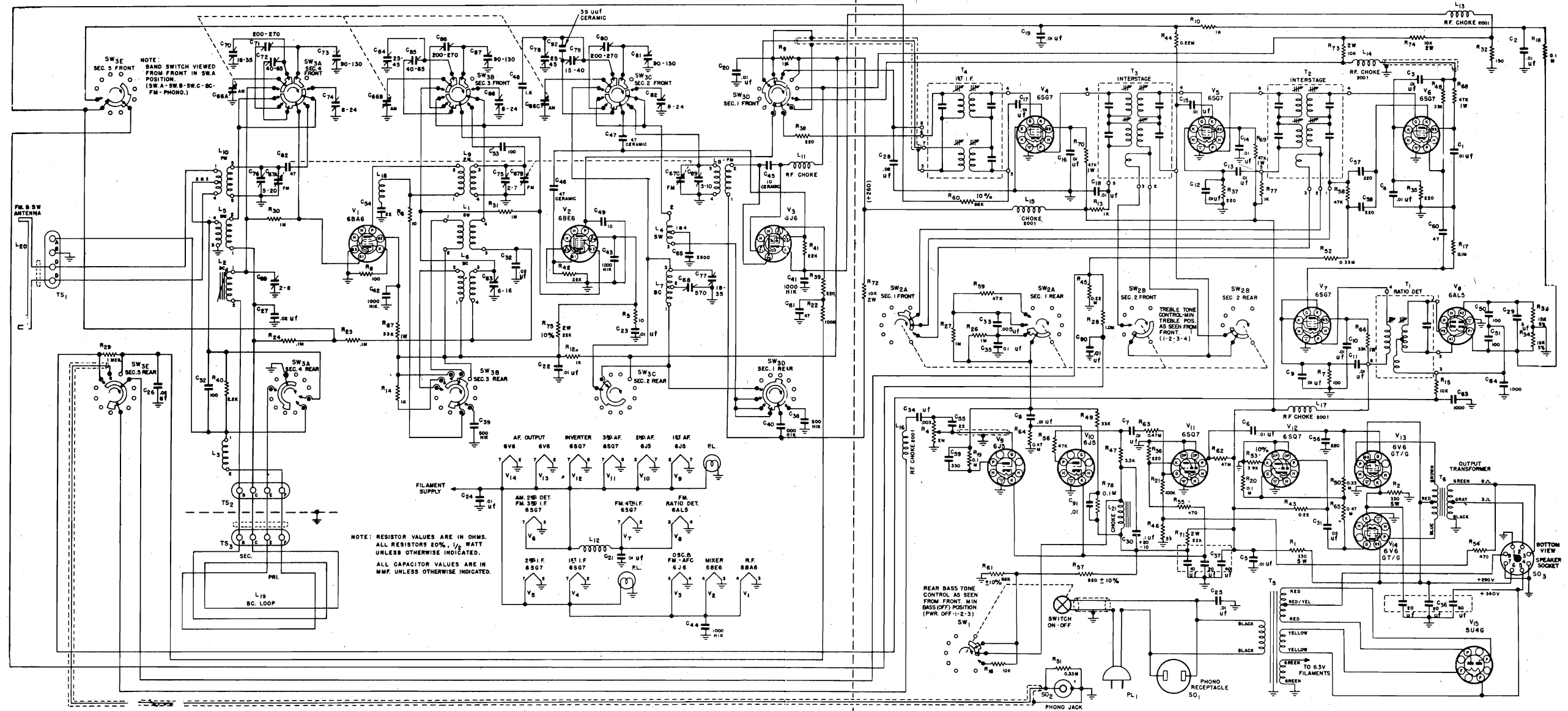
T9 Transformer, R-F, 4 unit assembly, tunes from 0.55 MC. to 30 MC. in 4 bands with condenser C1 and C2, inductance adjusted by movable iron cores, wax impregnated with Hollowax #2012

T13 Transformer, R-F, 4 unit assembly, tunes from 0.55 MC. to 30 MC. in 4 bands with condenser C1 and C2, inductance adjusted by movable iron cores, wax impregnated with Hollowax #2012



THE HALLICRAFTERS CO.

MODELS EC-403, EC-404,
Echophone



BUTTON SETTING:

1. Select any one pushbutton.
2. Pull translucent insert straight out.
3. Insert screw driver blade through large hole of pushbutton into slot of locking screw. (See Fig. 1).
4. Loosen locking screw about one-half turn. (Not more than one full turn.)
5. With pushbutton depressed, carefully tune in desired station with the manual control.
6. With the manual control held firm, tighten the locking screw.

Tuning Range.....(BC) 540 kc - 1700 kc
 (A) 15 mc - 18 mc
 (B) 9 mc - 12 mc
 (C) 5.8 mc - 18 mc
 (FM) 88 mc - 108 mc

Intermediate Frequency..... 455 kc
 Intermediate Frequency..... 10.7 mc
 Power Supply..... 105-125 V. 60 cycle AC
 Power Consumption..... 180 watts

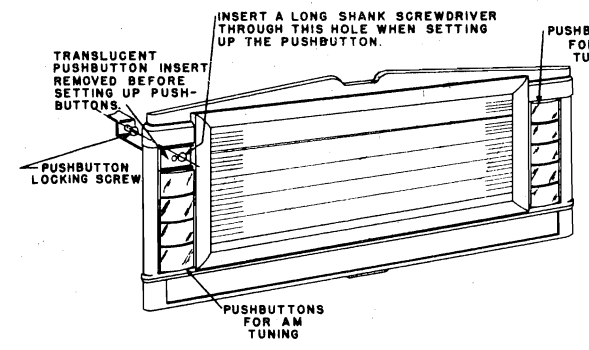
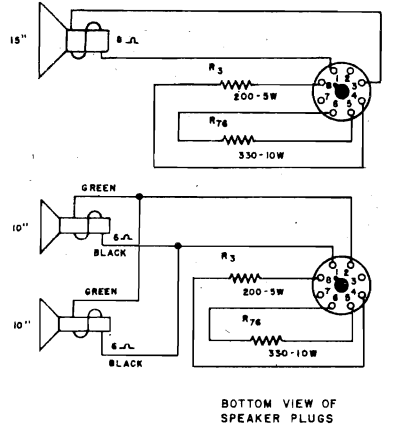
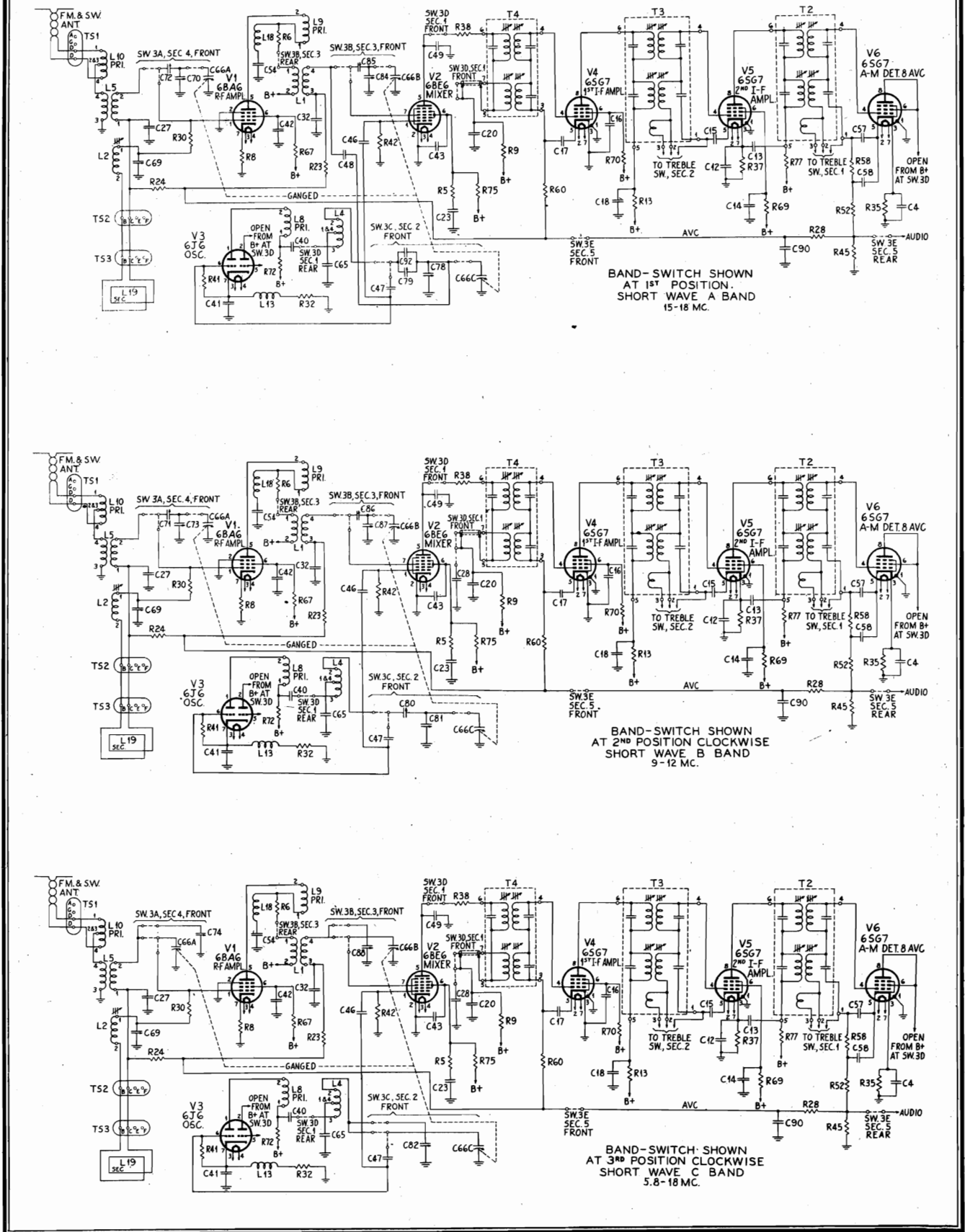


Fig. 1. View showing pushbutton setup.

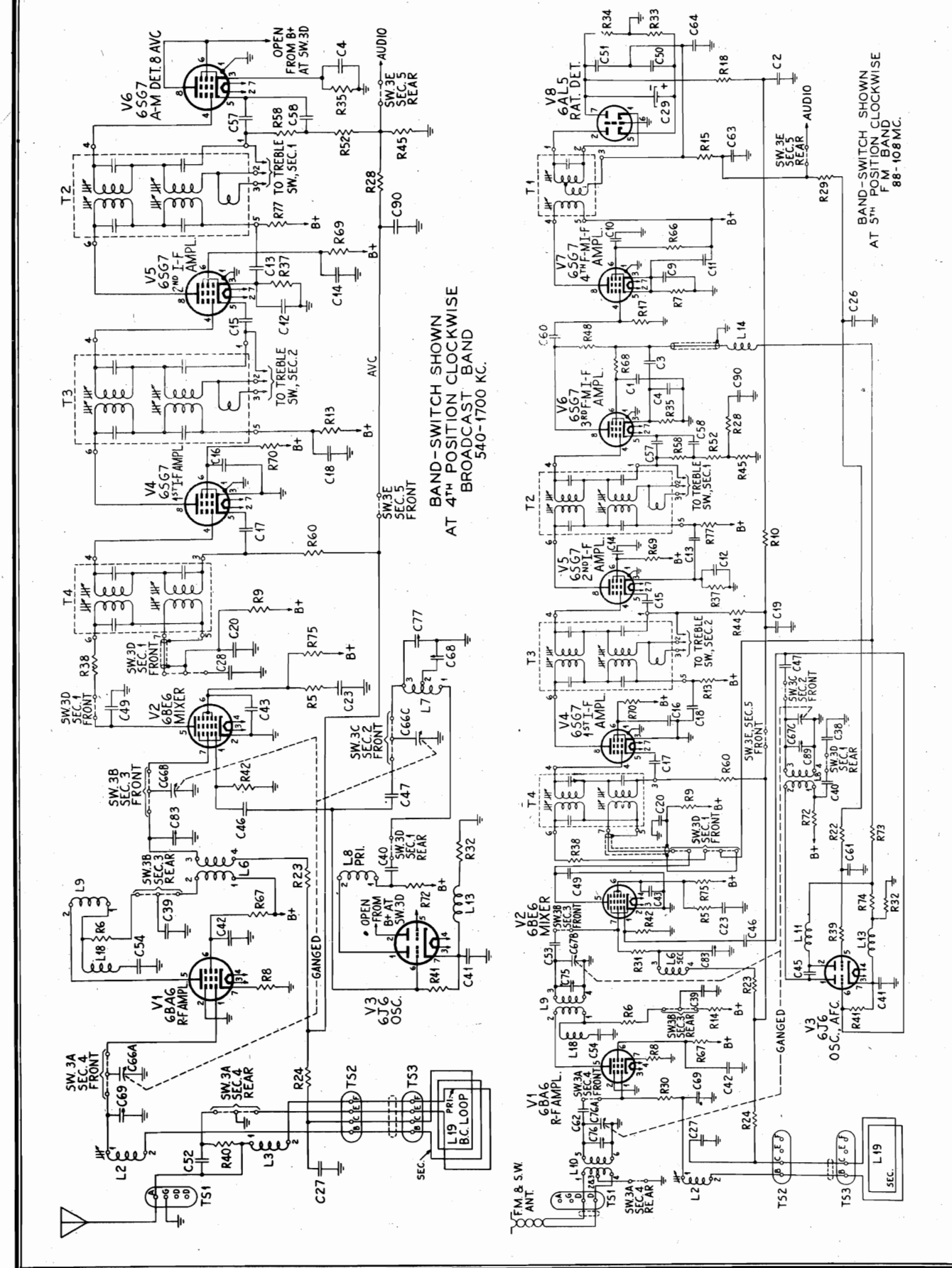


BOTTOM VIEW OF SPEAKER PLUGS

THE HALLICRAFTERS CO. MODELS EC-403, EC-404, Echophone

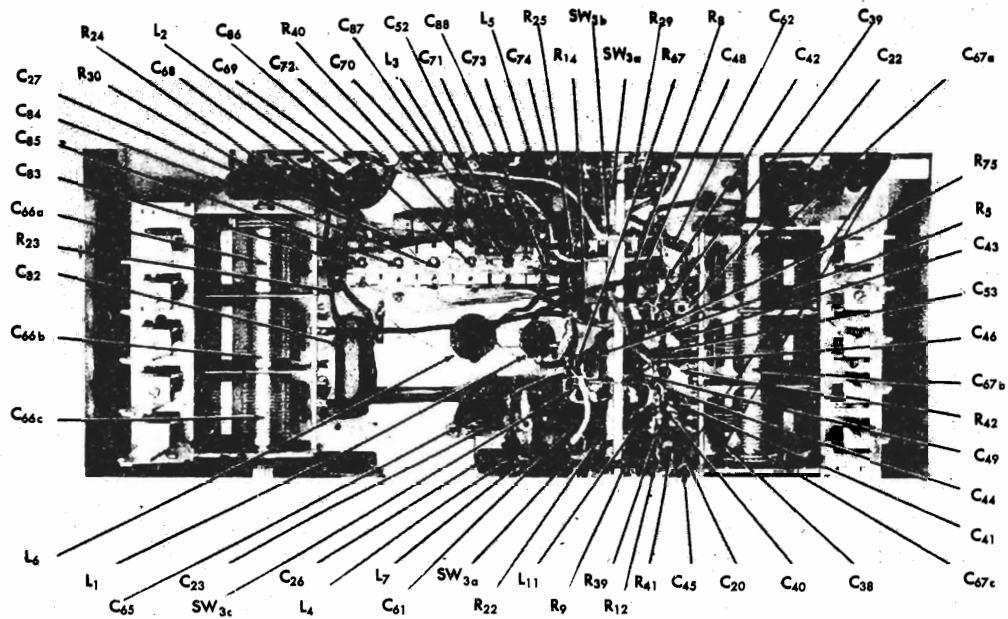


MODELS EC-403, EC-404, THE HALLICRAFTERS CO. Echophone

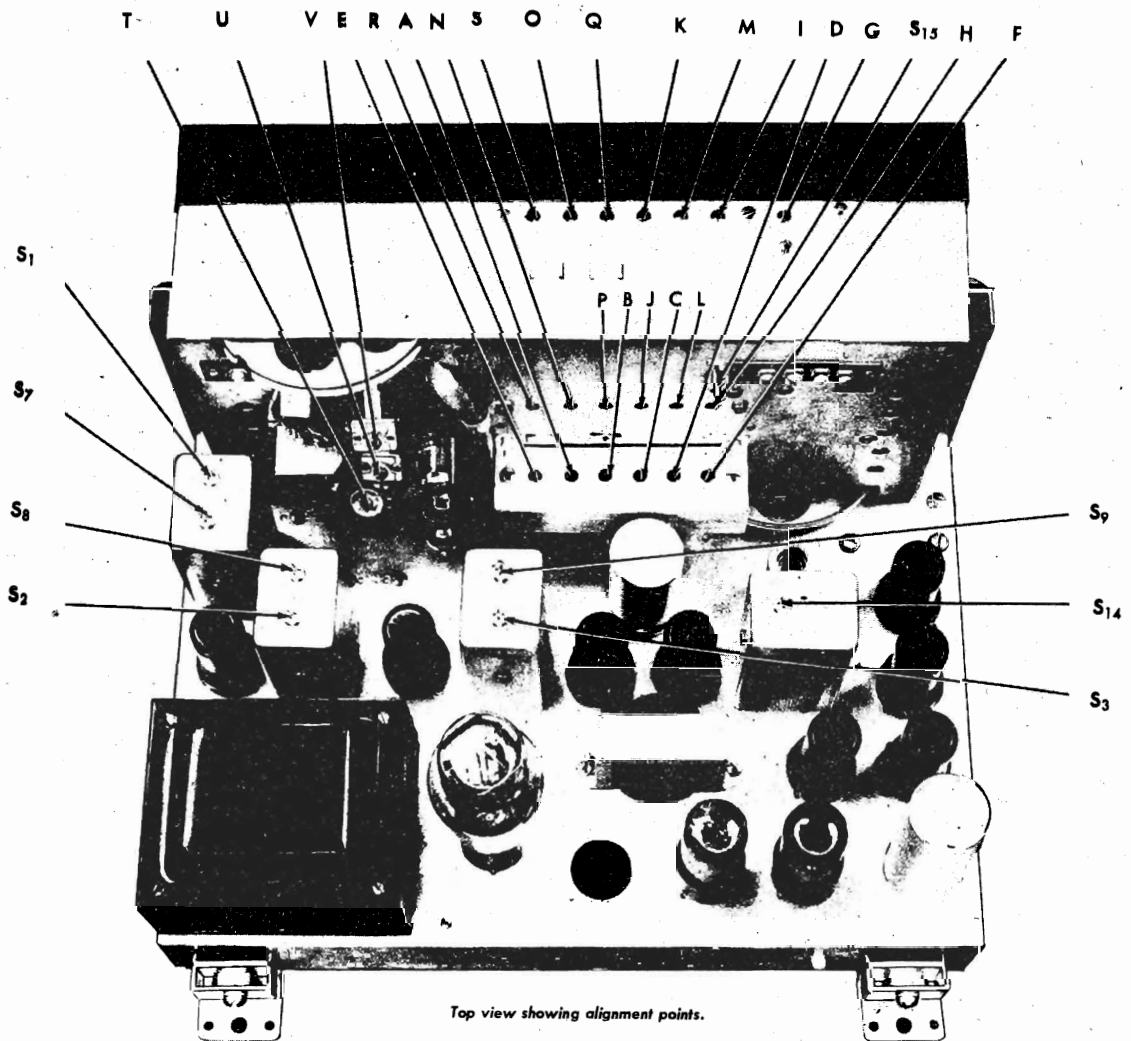


THE HALLICRAFTERS CO.

MODELS EC-403, EC-404,
Echophone



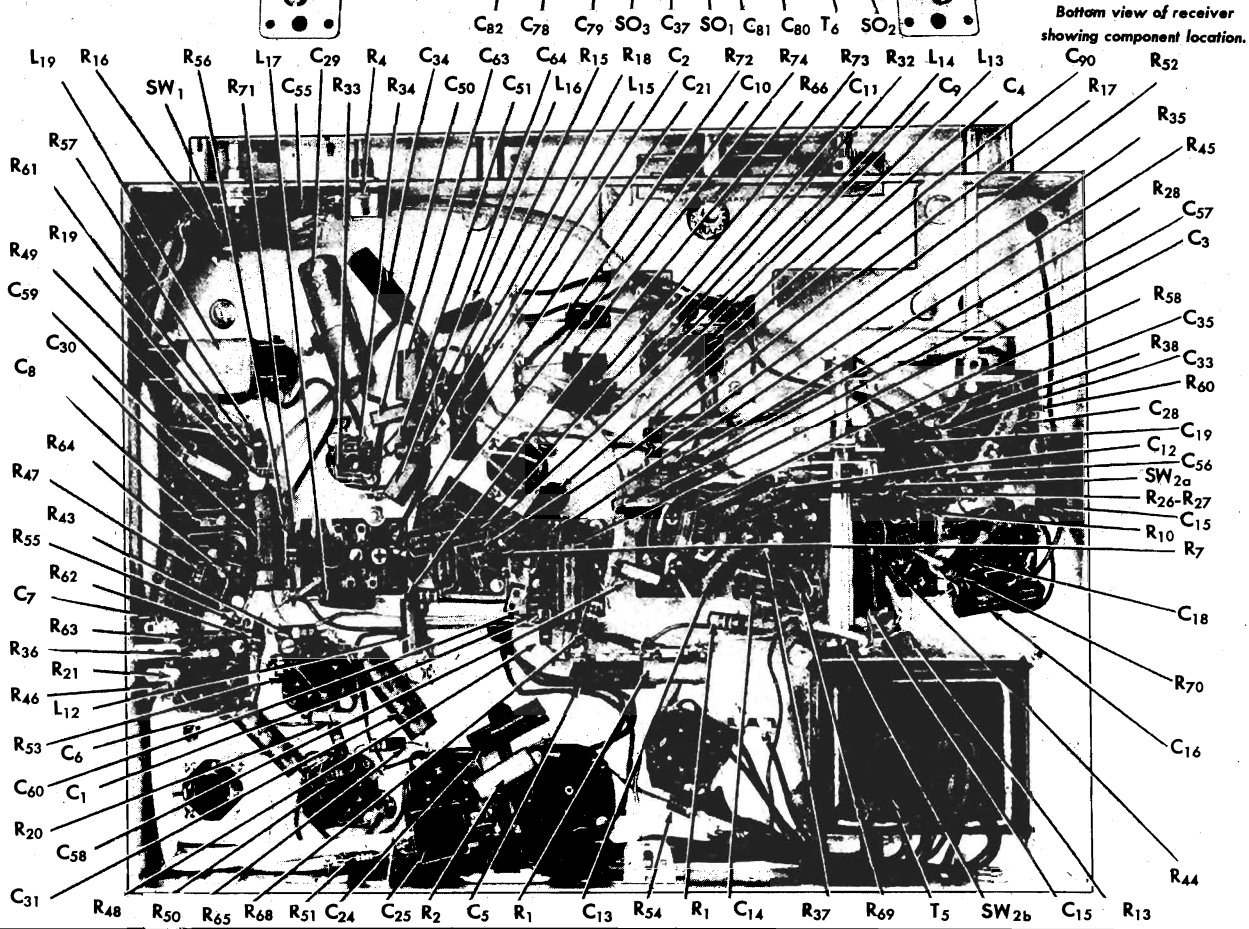
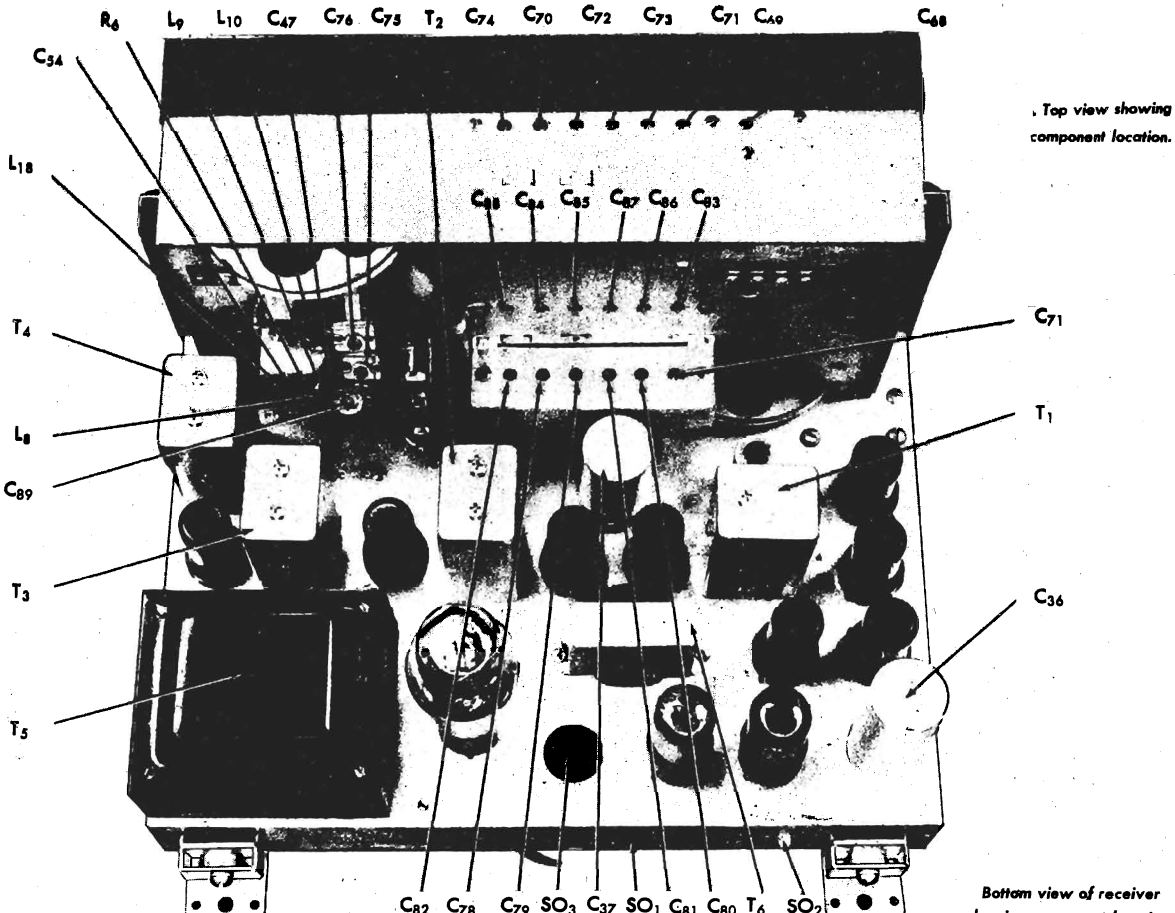
Back view of R.F. chassis showing component location.



Top view showing alignment points.

MODELS EC-403, EC-404,
Echophone

THE HALLICRAFTERS CO.



MODELS EC-403, EC-404,
Echophone

THE HALLICRAFTERS CO.

SERVICE PARTS LIST

SERVICE PARTS LIST (Continued)

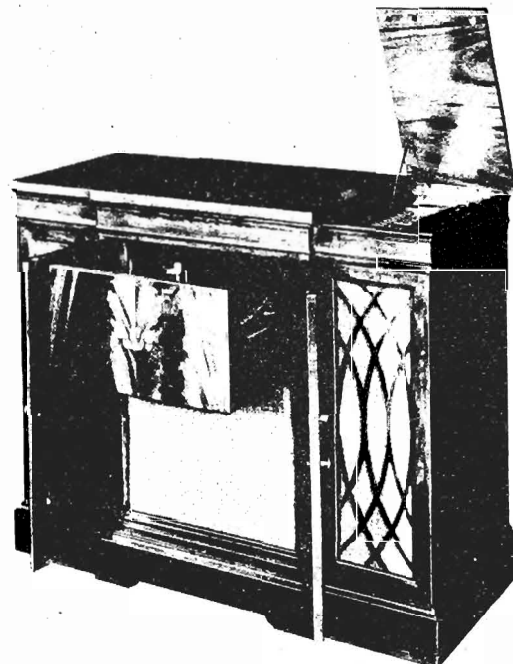
Illustration No.	Description	Hallcrafters Part No.
CABINET PARTS		
	Mahogany, cabinet.....	66F341
	Walnut, cabinet.....	66F342
TRANSFORMERS AND COILS		
T1	Freq. detector trans. FM.....	50C208
T2, 3	Interstage I.F. trans.....	50C209
T4	1st I.F. trans.....	50C210
L1	R.F. Coil, short wave.....	51B905
L2	Loading coil, ant., BC.....	51B906
L3	Loop loading coil.....	51B907
L4	Osc. coil, short wave.....	51B908
L5	Ant. coil, short wave.....	51B909
L6	R.F. Coil, B.C.....	51B910
L7	Osc. coil, B.C.....	51B911
L8	Osc. coil, FM.....	51B914
L9	R.F. coil, FM.....	51B915
L10	Ant. coil, FM.....	51B916
L11	Plate choke.....	53B008
L12	Filament choke.....	53B009
L13, 14, 15, 16, 17	R.F. choke.....	53A106
L18	R.F. choke.....	53A115
L19	BC-SW loop ant.....	57D106
L20	FM dipole ant.....	57C108
T5	Power transformer.....	52C132
T6	Output transformer.....	55B086
L21	Audio choke.....	56B082
CONDENSERS		
C1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 90, 91.	.01 mfd. 600 v. tubular.....	46AZ103F
C26, 27, 28	.02 mfd 600 v. tubular.....	46AV203F
C30	.1 mfd 200 v. tubular.....	46AU104H
C31, 32	.05 mfd 600 v. tubular.....	46AY503F
C33	.002 mfd 600 v. tubular.....	46AZ202J
C34, 35	.003 mfd 600 v. tubular.....	46AZ202J
C38, 39	500 uuf ceramic.....	47A147
C40, 41, 42, 43, 44, 16	1000 uuf ceramic.....	47A148
C45	10 uuf ceramic.....	47A149
C46, 47	47 uuf ceramic.....	47A150
C48	1.5 uuf "Gimmick," wire.....	Not Supplied
C49	10 uuf 500 v. mica, 10%.....	CM20A100K
C50, 51, 52, 53	100 uuf 500 v. mica.....	CM20A101M
C54	22 uuf 500 v. mica, 10%.....	CM20A220K
C55	22 uuf 500 v. mica.....	CM20A220M
C56, 57, 58	220 uuf 500 v. mica.....	CM20A221M
C59	330 uuf 500 v. mica.....	CM20A331M
C60, 61, 62	47 uuf 500 v. mica.....	CM20A470M
C63, 64	1000 uuf 500 v. mica.....	CM30A102M
C65	3900 uuf 500 v. mica.....	CM35A392J
C36	60-20 mfd 450 v. electrolytic.....	45B099
C37	20 mfd 30 v. electrolytic.....	45B100
	40-10 mfd 450 v. electrolytic.....	45B100
	20 mfd 30 v. electrolytic.....	45B100
C29	5 mfd, 50 v. electrolytic.....	45A108
C68	570 uuf trimmer.....	44A189
C75	Trimmer, FM, RF.....	44A192
C89	Trimmer, FM, Osc.....	44A193
C76	Trimmer, FM, Ant.....	44A194
C69, 70, 71, 72, 73, 74	Trimmer assembly, ant.....	44B190
C77, 78, 79, 80, 81, 82	Trimmer assembly, Osc.....	44B195
C83, 84, 85, 86, 87, 88	Trimmer assembly, RF.....	44B196
C67a-b-c	Variable condenser, "FM".....	48C175
C66a-b-c	Variable Condenser, "AM".....	48C176
C92	39 uuf, Ceramic.....	CC30SH390M

Illustration No.	Description	Hallcrafters Part No.
RESISTORS (Continued)		
R60, 61	68,000 ohm, 1/2 W.....	RC20AE683K
R62, 63, 64, 65	470,000 ohm, 1/2 W.....	RC20AE474M
R66, 67	33,000 ohm, 1 W.....	RC30AE333M
R68, 69, 70	47,000 ohm, 1 W.....	RC30AE473M
R71	68,000 ohm, 1 W.....	RC30AE683M
R72, 73, 74	10,000 ohm, 2 W.....	RC40AE103M
R75	22,000 ohm, 2 W.....	RC40AE223K

Illustration No.	Description	Hallcrafters Part No.
MISCELLANEOUS		
SW1	Bass, on and off, complete.....	60B265
SW2	Treble, complete.....	60B264
SW3	Band switch, 5 sec. 6 pos.....	60C266
	Phono motor receptacle.....	10A015
	Phono pick-up jack.....	36A034
	Speaker socket.....	6A190
	Octal socket, (tube).....	6A190
	Miniature socket.....	6A276
	Pilot light socket and bracket, L.H.....	86A046
	Pilot light socket and bracket, R.H.....	86A047
	Pointer carriage.....	67B645
	Tube shield spring retainer.....	69A104
	Shield base.....	69A169

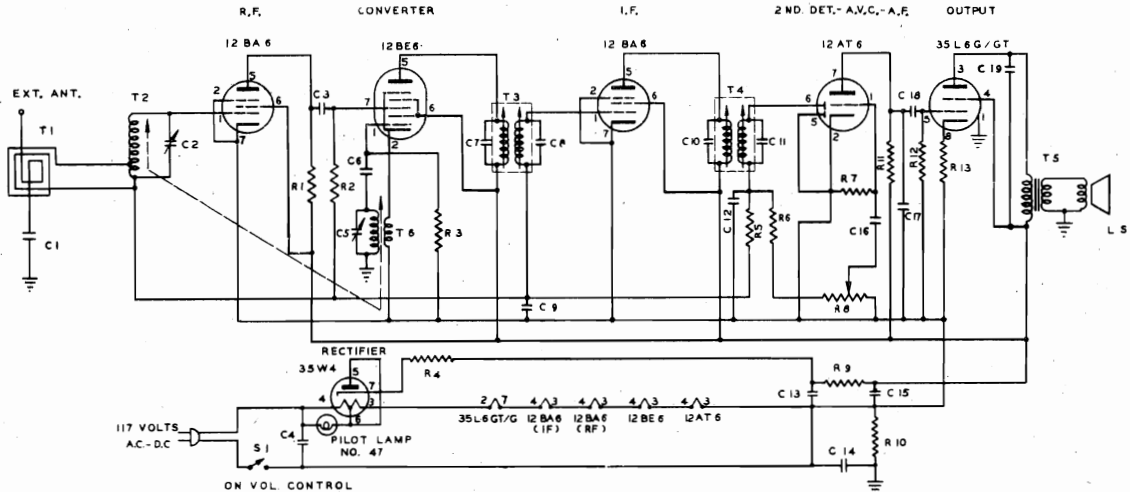
	Dial cord.....	38A014
	Line cord and plug.....	87A157C
	Pilot lamp.....	39A004
	Pointer, FM.....	82A120
	Pointer, AM.....	82A121
	Insert, pointer, FM.....	17A022
	Insert, pointer, AM.....	17A023
	Push-button.....	17B028
	Speaker, PM, 15".....	85C045
	Speaker, PM, 10".....	85C043 No. 1 85C047 No. 2
	Knob, with index.....	15B093
	Knob.....	15B096
	Push-button insert.....	17A027
	Call letters.....	17A025
	Record changer.....	115C002-2
	Dial glass, lower.....	22B179
	Dial glass, upper.....	22B178
	Escutcheon.....	7D039

Illustration No.	Description	Hallcrafters Part No.
TUBES		
V15	5U4G Rectifier.....	90X5U4G
V8	6AL5 FM Freq. detector.....	90X6AL5
V1	6BA6 RF amplifier.....	90X6BA6
V2	6BE6 1st detector.....	90X6BE6
V9, 10	6J5 1st and 2nd audio amp.....	90X6J5
V3	6J6 H.F. osc. and FM AFC.....	90X6J6
V4, 5, 6, 7	6SG7 1st and 2nd I.F., AM 2nd det., FM 3rd and 4th I.F.....	90X6SG7
V13, 14	6V6GT/G push pull audio amp.....	90X6V6GT
V12, 11	6S07 Inverter and 3rd audio amp.....	90X6SQ7



HOFFMAN RADIO CORP.

MODELS A202, A309,
Chassis 119



SYMBOL	DESCRIPTION	HOFFMAN No.
C1	.005 Mfd. 600 Volt Tubular Paper	4102
C2, C5	Dual Padder 280 Mmf. Per Section	4307
C3, C6	100 Mmf. ± 20% Mica	4000
C4	.05 Mfd. 400 Volt Tubular Paper	4101
C7, C8	100 Mmf. ± 10% Ceramic	4012
C9	.05 Mfd. 200 Volt Tubular Paper	4100
C10, C11	100 Mmf. ± 10% Ceramic	4012
C12	270 Mmf. ± 20% Mica	4001
C13, C15	Dry Electrolytic (30-50 Mfd./150 V.)	4201
C14	.2 Mfd. 200 Volt Paper Tubular	4108
C16	.005 Mfd. 600 Volt Paper Tubular	4102
C17	270 Mmf. ± 20% Mica	4001
C18	.005 Mfd. 600 Volt Tubular Paper	4102
C19	.02 Mfd. 400 Volt Tubular Paper	4106
LS	5" PM Loudspeaker	9003
R1	2200 Ohm ± 20% 1/2 Watt	4512
R2, R6	47,000 Ohm ± 20% 1/2 Watt	4504
R3	22,000 Ohm ± 20% 1/2 Watt	4501
R4	47 Ohm ± 20% 1/2 Watt	4508
R5	2.2 Megohm ± 20% 1/2 Watt	4502
R7	10 Megohm ± 20% 1/2 Watt	4505
R8	.5 Megohm Pot. with Switch (Volume)	4802
R9	500 Ohm ± 10% 5 Watt	4700
R10, R12	.47 Megohm ± 20% 1/2 Watt	4506
R11	.22 Megohm ± 20% 1/2 Watt	4500
R13	150 Ohm ± 20% 1/2 Watt	4510
S1	On-Off Switch (on Volume Control)	
T1	Antenna Loop	5238
T2	R.F. Coil	55203
T3	Input I.F. Transform (455 Kc.)	55201
T4	Output I.F. Transform (455 Kc.)	55202
T5	Audio Output Transformer	5101
T6	Oscillator Coil	55204

MODELS A202 & A309

DESCRIPTION

Hoffman Models A202 and A309 are electrically identical and differ in cabinet design only. The receiver consists of a 6-tube broadcast band AC-DC Superheterodyne incorporating a built-in loop antenna.

SPECIFICATIONS

Tuning Range 540 Kc to 1650 Kc
 Intermediate Frequency 455 Kc.
 Power Supply 115 V. D.C. or 115 V. A.C. 50-60 C.P.S.
 Power Consumption 28 Watts
 Undistorted Audio Output6 Watt
 Maximum Audio Output9 Watt
 Loudspeaker 5-inch round P.M.

NORMAL OPERATING CURRENTS

35W4 Cathode Current 60 Ma.
 35L6 Cathode Current 30 Ma.
 Meter inserted in circuit at cathode.

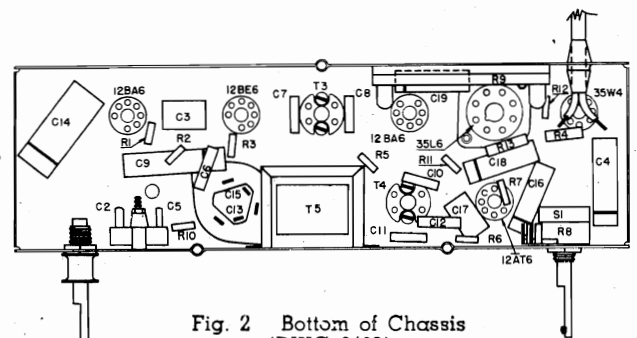


Fig. 2 Bottom of Chassis (DWG 6468)

NORMAL OPERATING VOLTAGES

The following table lists the normal operating voltages to be expected at the various tube socket terminals.

PIN NO.	1	2	3	4	5	6	7	8
12BA6(R.F.)	— 45	0.	25. A.C.	37.5 A.C.	+65.	+80.	0.	
12BE6	4.6*	0.	12.5 A.C.	25. A.C.	+80.	+80.	0.	
12BA6 (I.F.)	— 45	0.	37.5 A.C.	50. A.C.	+80.	+80.	0.	
12AT6	—1.5*	0.	0.	12.5 A.C.	0.	—15.	+37.5	
35L6	0.	85 A.C.	+75 D.C.	+80. D.C.	0.	0.	50. A.C.	+4.6
35W4	115 A.C.	0.	85. A.C.	115. A.C.	110. A.C.	110. A.C.	+110. D.C.	

D.C. voltages measured with 1000 ohm/volt meter
 A.C. voltages measured with 1000 ohm/volt meter
 All voltages measured with reference to B-Line voltage 115.

* These readings taken with V. T.V. M.

NOTE: The above readings are obtained with no signal input to receiver.

MODELS A202, A309
MODEL B400

HOFFMAN RADIO CORP.

A202, A309

ALIGNMENT PROCEDURE

CAUTION:

No alignment adjustments should be attempted without first thoroughly checking over all other possible causes of trouble such as defective tubes, resistors, and condensers. In order to align the receiver properly, remove the chassis from the cabinet and proceed as follows:

EQUIPMENT REQUIRED:

1. Signal Generator.
2. Output Meter with 2.5 Volt Scale.
3. .25 Mfd. Condenser.

I. F. ALIGNMENT:

1. Connect output meter across speaker voice coil; set meter on 2.5 volt scale.
2. Connect output of signal generator directly to 12BE6 control grid; connect ground side of generator to chassis of receiver through .25 Mfd. condenser. Set signal generator on 455 Kc (modulated).
3. Adjust I.F. slugs (first T4 and then T3) for maximum reading on output meter.

Note: Keep signal level low, just enough to keep maximum reading on lower half of meter scale. Tuning condenser plates should be all the way out; volume control should be on full. After adjustment, put a drop of wax on each I.F. tuning slug to hold it in place.

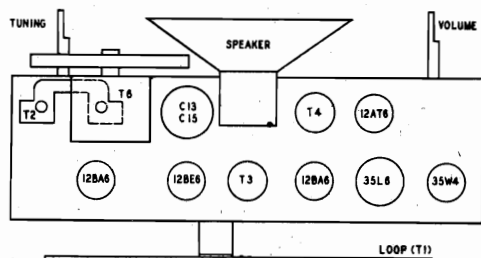


Fig. 1 Top of Chassis
(DWG 1023-4)

R.F. ALIGNMENT:

- control slugs
1. Set receiver tuning condenser with plates all the way in.
 2. Set signal generator on 540 Kc (modulated) and connect generator output to antenna post on receiver. The ground side of the generator should be connected to receiver B through a .25 Mfd. condenser.
 3. Tune in signal by adjusting oscillator trimmer C5.
 4. Adjust output of signal generator to obtain deflection on lower half of meter scale.
 5. Adjust oscillator trimmer for maximum output.
 6. Set signal generator on 1650 Kc and check signal with tuning condenser plates all the way out.
 7. Set signal generator on 1470 Kc.
 8. Tune in signal on receiver and adjust rf trimmer C2 for maximum reading on output meter. Feed only enough signal from the generator to keep maximum reading on lower half of meter scale.
 9. Recheck at 600 Kc, 1000 Kc and 1410 Kc for tracking and readjust as required.

DIAL ADJUSTMENT:

To set the dial on calibration, pick up a station of known frequency near the center of the dial and move the pointer by hand as required.

B400

ALIGNMENT PROCEDURE

CAUTION:

No alignment adjustments should be attempted without first thoroughly checking over all other possible causes of trouble such as defective tubes, resistors, and condensers. In order to align the receiver properly, remove the chassis from the cabinet and proceed as follows:

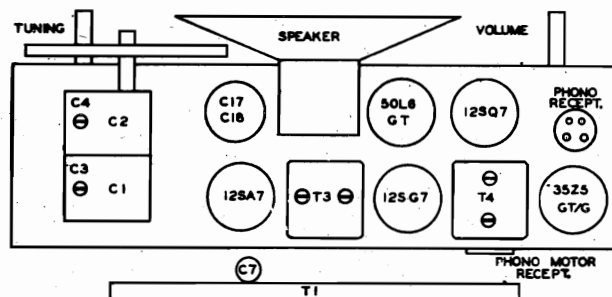
EQUIPMENT REQUIRED:

1. Signal Generator.
2. Output Meter with 2.5 Volt Scale.
3. .1 Mfd. Condenser.

I. F. ALIGNMENT:

1. Connect output meter across speaker voice coil; set meter on 2.5 volt scale.
2. Connect output of signal generator directly to antenna post on loop; connect ground side of generator to chassis of receiver through .1 Mfd. condenser. Set signal generator on 455 Kc (modulated).
3. Adjust I.F. trimmers (first T4 and then T3) for maximum reading on output meter.

NOTE: Keep signal level low, just enough to keep maximum reading on lower half of meter scale. Tuning condenser plates should be all the way out, volume control should be on full.



R.F. ALIGNMENT:

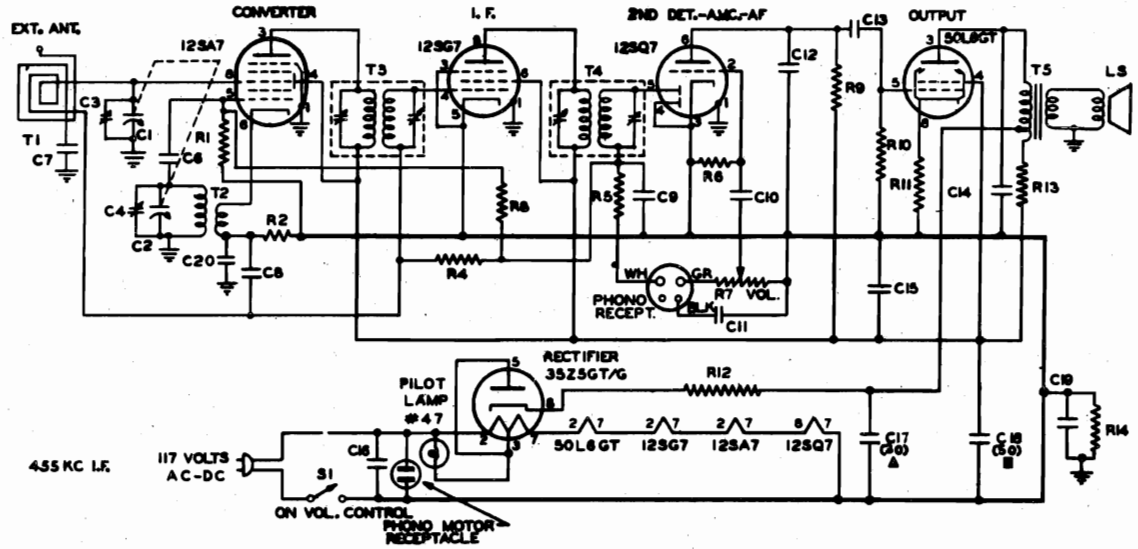
1. Set tuning condenser with plates completely out.
2. Set signal generator at 1650 Kc (modulated) and feed its output into a loop of wire about 6" in diameter. Place this loop about one foot away from and parallel to the receiver loop antenna.
3. Tune in signal by adjusting oscillator trimmer (C4).
4. Adjust output of signal generator to obtain deflection on lower half of meter scale.
5. Adjust oscillator trimmer (C4) for maximum output.
6. Set signal generator at 1400 Kc and tune in signal with tuning condenser.
7. Adjust antenna trimmer (C3) while rocking gang condenser for maximum reading on output meter. Feed only enough signal from generator to keep maximum reading on lower half of meter scale.

DIAL ADJUSTMENT:

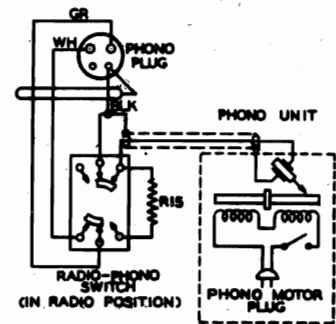
To set the dial on calibration, tune in a station of known frequency near the center of the dial and move the pointer by hand as required.

HOFFMAN RADIO CORP.

MODEL B400, Chassis 118



SYMBOL	DESCRIPTION	HOFFMAN No.
C1, C2	Two Section Variable (388-180 Mmf.)	4401
C3, C4	Trimmer: Part of Variable Cond.	
C6	100 Mmf. ±20% Mica	4000
C7, C10, C13	.005 Mfd. 600 Volt Tubular Paper	4102
C8, C11, C15	.05 Mfd. 200 Volt Tubular Paper	4100
C9, C12	270 Mmf. ±20% Mica	4001
C14	.02 Mfd. 400 Volt Tubular Paper	4106
C16	.05 Mfd. 400 Volt Tubular Paper	4101
C17, C18	Dry Electrolytic (50-30 Mfd., 150 V.)	4201
C19	.2 Mfd. 200 Volt Tubular Paper	4108
C20	.001 Mfd. 600 Volt Tubular Paper	4104
R1	22,000 Ohm ±20% ½ Watt	4501
R4	2.2 Megohm ±20% ½ Watt	4502
R5	47,000 Ohm ±20% ½ Watt	4504
R6, R8	10 Megohm ±20% ½ Watt	4505
R7	.5 Megohm Pot. with Switch (Vol.)	4802
R9	.22 Megohm ±20% ½ Watt	4500
R10, R14, R15	.47 Megohm ±20% ½ Watt	4506
R11	150 Ohm ±20% ½ Watt	4510
R12	47 Ohm ±20% ½ Watt	4508
R13	1500 Ohm ±20% 1 Watt	4552
S2	Phono-Radio-Tone Switch	6021
L5	PM Loudspeaker	9023
S1	On-Off Switch (on Vol. Control)	
T1	Antenna Loop	5255
T2	Oscillator	5208
T3	Input I.F. Transformer (455Kc.)	5205
T4	Output I.F. Transformer (455Kc.)	5206
T5	Audio Output Transformer	5117



DESCRIPTION

Hoffman model B400 is a table model radio-phonograph combination. The radio section consists of a 5-tube AC-DC superheterodyne receiver with a built-in loop antenna. The phonograph section consists of an automatic record changer which plays either fourteen 10-inch records or twelve 12-inch records at one loading. The record changer may also be operated manually.

SPECIFICATIONS

Tuning Range	540 Kc to 1650 Kc
Intermediate Frequency	455 Kc
Power Supply	115 V. D.C. or A.C. 50-60 C.P.S.
Power Consumption	48 Watts
Audio Output	1.25 Watts

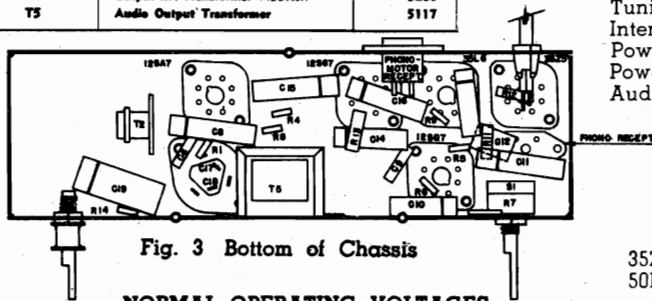


Fig. 3 Bottom of Chassis

NORMAL OPERATING VOLTAGES

The following table lists the normal operating voltages to be expected at the various tube socket terminals.

PIN NO.	1	2	3	4	5	6	7	8
12SA7	0	24 A.C.	+85	+92	-5.5	0	11.5 A.C.	-.4
12SG7	0	22 A.C.	0	-4	0	+92	36 A.C.	+86
12SQ7	0	-8	0	0	-1.0	+60	0	9 A.C.
50L6	0	36 A.C.	+101	+93	+2	0	87 A.C.	+7.5
35Z5	0	117 A.C.	114 A.C.	+112	114 A.C.	0	87 A.C.	+116

D.C. voltages measured with 20,000 ohm/volt meter.
 A.C. voltages measured with 1,000 ohm/volt meter.
 All voltages measured with reference to B-.
 Line voltage 117.

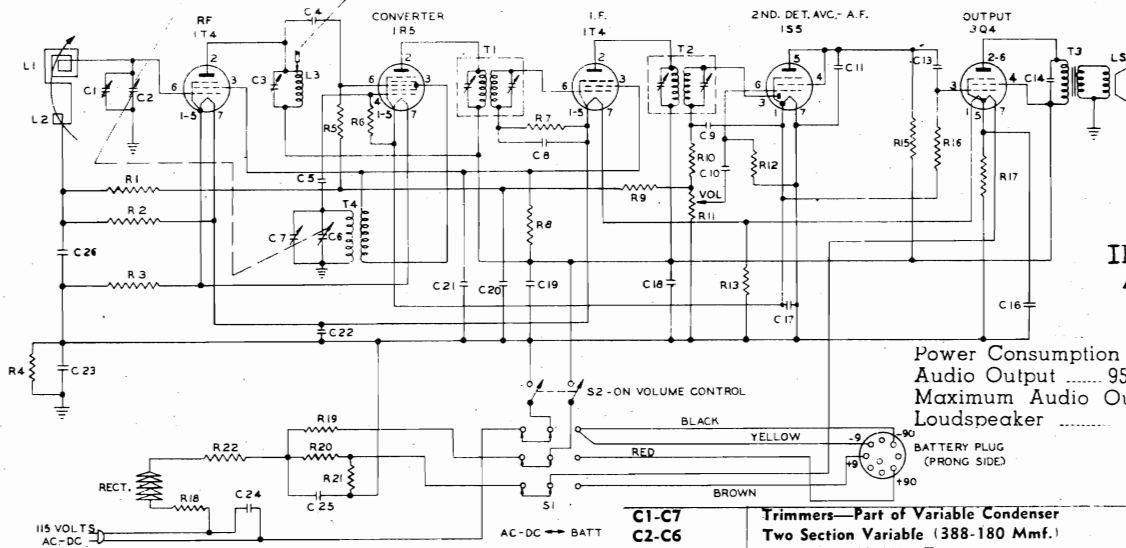
NOTE: The above readings are obtained with no signal input to the receiver, radio-phonograph switch in the RADIO position, and volume control full on.

NORMAL OPERATING CURRENTS

35Z5	Cathode Current	57 Ma
50L6	Cathode Current	33 Ma

MODEL A700, Chassis 110S

HOFFMAN RADIO CORP.



IF PEAK
455KC

Power Consumption 17 watts at 117 V.
Audio Output 95 mw. at 10% dist.
Maximum Audio Output ... 225 mw.
Loudspeaker 5-inch round P.M.

In order to align the receiver properly, remove the chassis from the cabinet and remove the bottom plate from the chassis.

I. F. Alignment

1. Connect output meter across speaker voice coil; set meter on 1-volt scale.
2. Connect output of signal generator to trimmer C3 (blue wire on trimmer located at rear of chassis). The ground side of the signal generator should be connected to B through a .1 Mfd. condenser. Set signal generator on 455 Kc (modulated).
3. Adjust I.F. trimmers (first T2 and then T1) for maximum reading on output meter.
NOTE: Keep signal level low, just enough to keep the maximum reading on the output meter at 0.4 volt or less; tuning gang should be set with plates all the way out; volume control full on.
4. Replace bottom cover plate.

R. F. Alignment

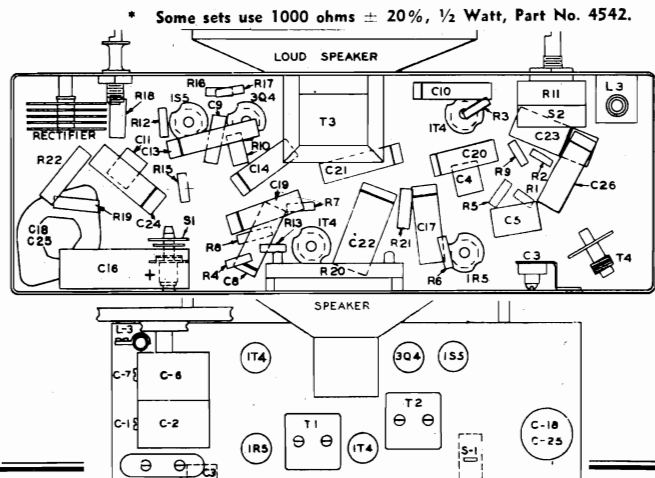
1. Leave tuning gang with plates all the way out.
2. Set signal generator on 1650 Kc (modulated) and feed generator output into a loop of wire approximately 6" in diameter. Place the loop about one foot away and parallel to the receiver loop antenna.
3. Tune in signal by adjusting oscillator trimmer C7.
4. Adjust output of signal generator to obtain deflection of .4 volt or less on output meter.
5. Adjust oscillator trimmer for maximum output.
6. Set signal generator to 1400 Kc and tune in signal with tuning condenser.
7. Adjust loop antenna trimmer C1 and R. F. Coil assembly for maximum output. The R. F. coil adjustment is made by loosening the coil mounting clamp and sliding the coil up or down as required.
8. Set signal generator and tuning gang to 600 Kc and adjust R. F. trimmer C3 for maximum output.
9. Go back to 1400 Kc to check tracking and readjust at 1400 Kc and 600 Kc as required.

C1-C7	Trimmers—Part of Variable Condenser	4401
C2-C6	Two Section Variable (388-180 Mmf.)	4306
C3	60-260 Mmf. Mica Trimmer	4000
C4-C9-C11	.0001 Mfd. Mica	4009
C5	47 Mfd. Mica	4112
C8-C26	.01 Mfd. 400 Volt Tubular Paper	4102
C10-C12-C13-C14	.005 Mfd. 600 Volt Tubular Paper	4204
C15-C16	100 Mfd. 25 Volt Dry Electrolytic	4100
C17-C19-C20-C21	.05 Mfd. 200 Volt Tubular Paper	4201
C18-C25	Dry Electrolytic Condenser (30-50 Mfd. 150-150 Volt)	4108
C22-C23	.2 Mfd. 200 Volt Tubular Paper	4101
C24	.05 Mfd. 400 Volt Tubular Paper	55208
L1	Antenna Loop	5250
L2	Antenna Loop Compensator	5245
L3	R.F. Coil Permeability Tuned	9019
L.S.	5 1/4" P.M. Speaker	4535
R1-R14	3.3 Megohm, 1/2 Watt	4502
R2-R7-R9-R16	2.2 Megohm, 1/2 Watt	4514
R3	680 Ohms, 1/2 Watt	4506
R4	.47 Megohm, 1/2 Watt	4513
R5-R15	1 Megohm, 1/2 Watt	4511
R6-R10	.1 Megohm, 1/2 Watt	4527
R8	3900 Ohms ± 10%, 1/2 Watt	4808
R11	1 Megohm Potentiometer with D.P.S.T. Switch (Volume)	4505
R12	10 Megohm, 1/2 Watt	4533
R13*	820 Ohm ± 10%, 1/2 Watt	4534
R17	1500 Ohm, 1/2 Watt	4532
R18-R22	47 Ohm, 2 Watt	4522
R19	1000 Ohm, 1 Watt	4701
R20	1500 Ohm, 6 1/2 Watt ± 5% Wirewound	4531
R21	470 Ohm, 1 Watt ± 10%	6010
S1	AC/DC Battery Switch Plug Operated	
S2	On-Off Switch (on Volume Control)	
T1	Input I.F. Transformer (455 K.C.)	5242
T2	Output I.F. Transformer (455 K.C.)	5104
T3	Output Audio Transformer	5244
T4	Oscillator Coil	9517
Rect.	Selenium Rectifier	

PIN NO.	1	2	3	4	5	6	7	8
IT4 (RF)	2.6	84	65		2.6		3.9	
IR5	1.3	84	64	-5.0*	1.3	3*	2.6	
IT4 (RF)	3.9	84	65	1.2*	3.9	1.5*	5.2	
IS5	1.3	0	.5*	20*	1	-.5*	0	
3Q4	5.2	84	-1.3*	84	6.5	84	7.8	

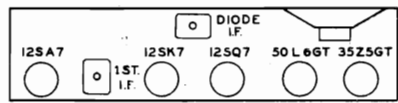
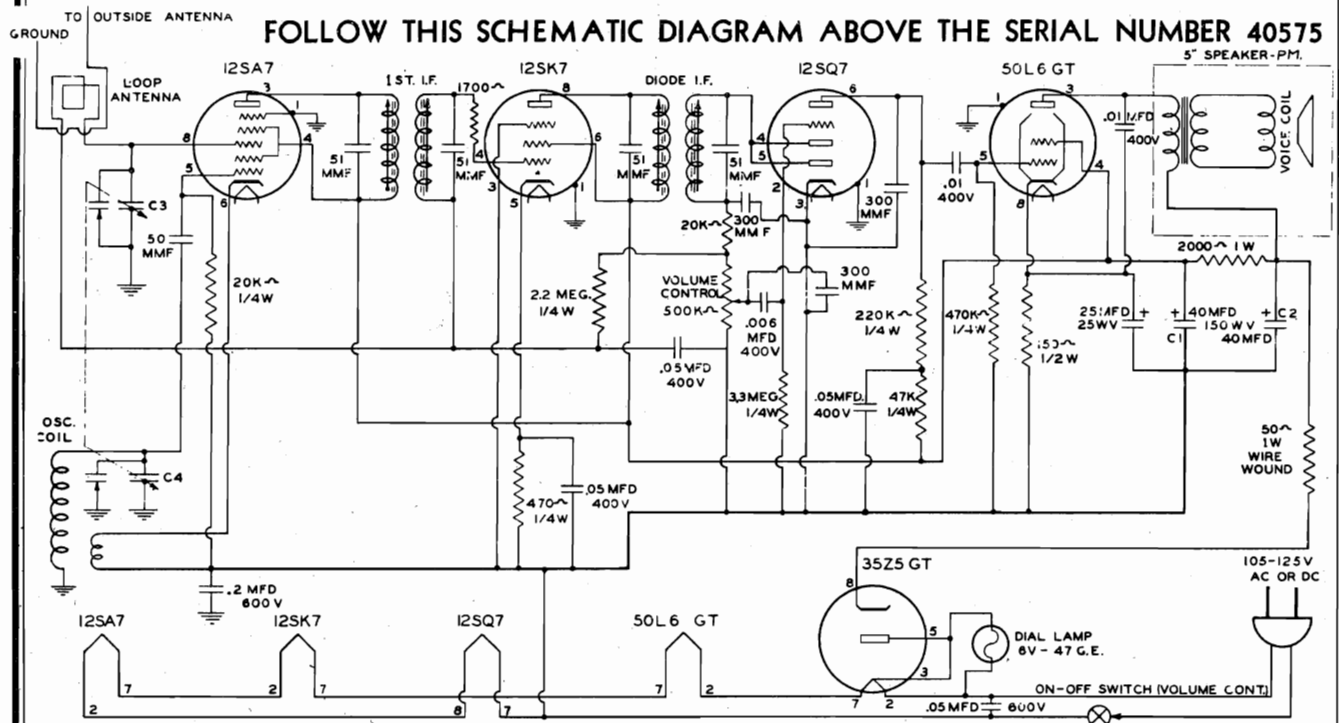
NOTE: All voltages are measured with reference to B- (black wires on volume control switch) and no signal input to receiver.

* These readings must be taken with a V. T. V. M.



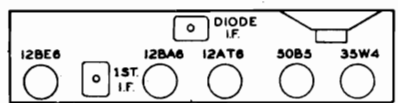
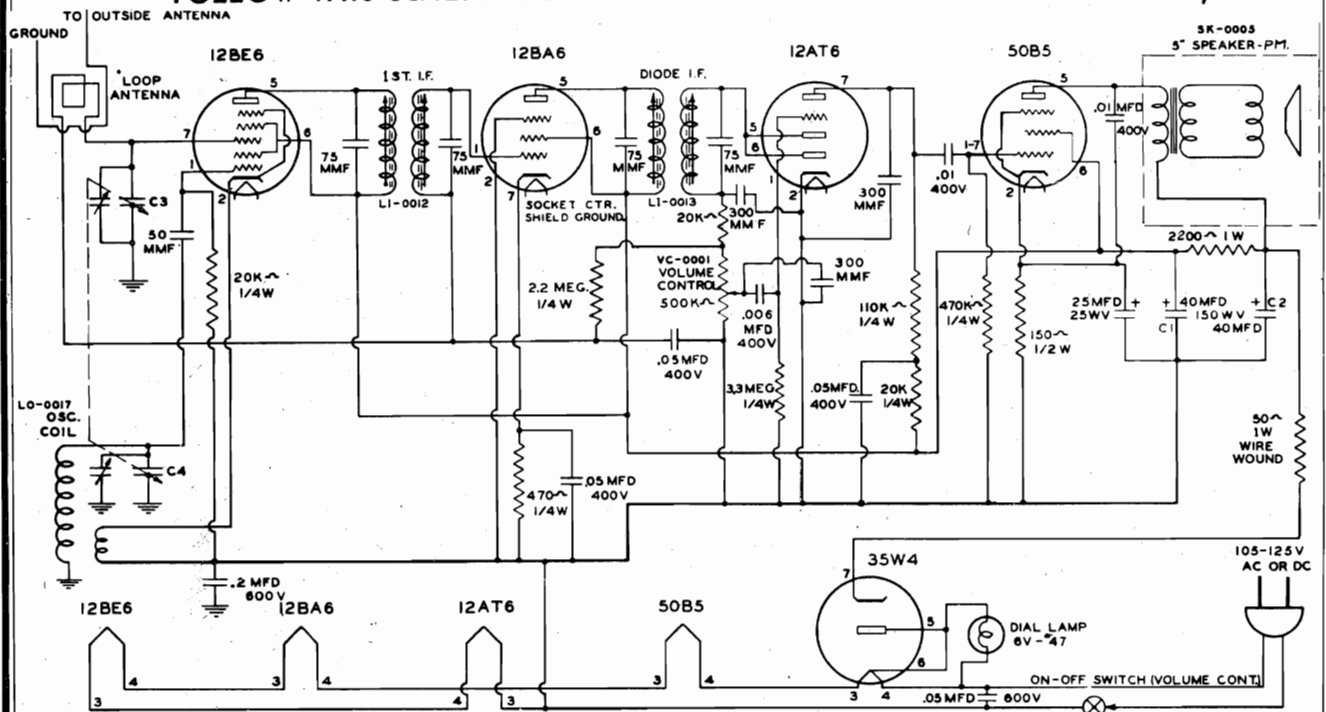
HOWARD RADIO CO.

MODEL 901-A
MODEL M901-A



HOWARD RADIO CO.		
MODEL 901-A		
SD-000-D-E-F-G		
DR'N. BY	CH'K'D. BY	APP'D. BY
<i>K. O.</i>	<i>Pat</i>	<i>HP</i>

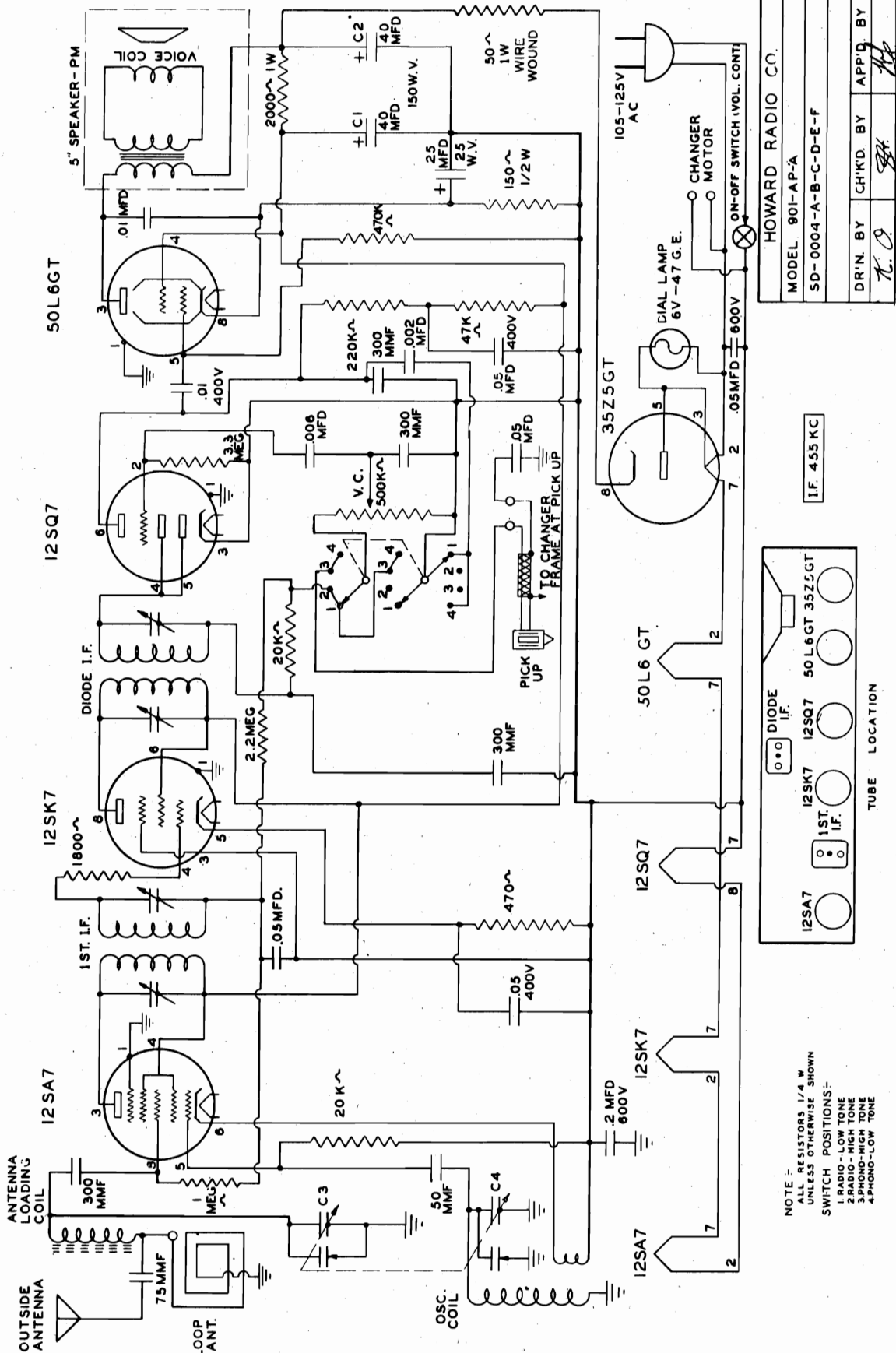
FOLLOW THIS SCHEMATIC DIAGRAM ABOVE THE SERIAL NUMBER 45,771



HOWARD RADIO CO.		
MODEL M901-A		
SD-0007		
DR'N. BY	CH'K'D. BY	APP'D. BY
<i>K. O.</i>	<i>Pat</i>	<i>HP</i>

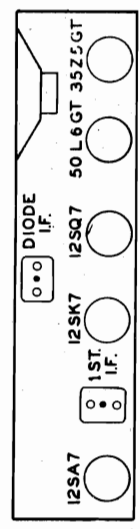
MODEL 901-AP-A

HOWARD RADIO CO.



HOWARD RADIO CO.			
MODEL	901-AP-A	DR'N. BY	CH'KD. BY
SD-	0004-A-B-C-D-E-F		
APPR'D. BY			

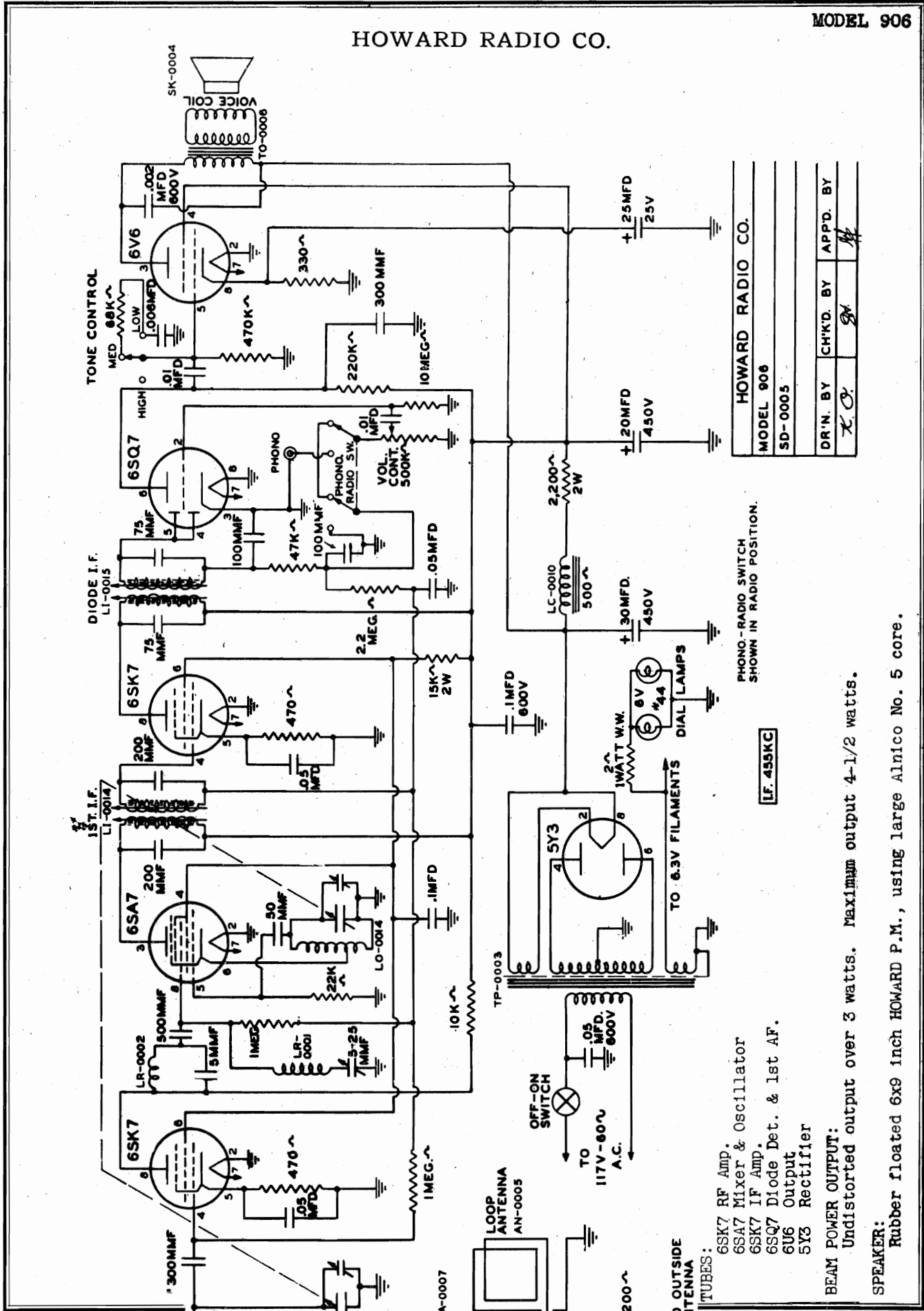
IF. 455 KC



NOTE -
 ALL RESISTORS 1/4 W
 UNLESS OTHERWISE SHOWN
 SWITCH POSITIONS -
 1. RADIO - LOW TONE
 2. RADIO - HIGH TONE
 3. PHONO - HIGH TONE
 4. PHONO - LOW TONE

FOLLOW THIS SCHEMATIC DIAGRAM ABOVE THE SERIAL NUMBER 13000

HOWARD RADIO CO.



© John F. Rider

HOWARD RADIO CO.			
MODEL 906			
SD-0005			
DR'N. BY	CHKD. BY	APPD. BY	
K. O.	SA		

PHONO-RADIO SWITCH SHOWN IN RADIO POSITION.

[LF. 455KC]

- TUBES:
- 6SK7 RF Amp.
 - 6SA7 Mixer & Oscillator
 - 6SK7 IF Amp.
 - 6SQ7 Diode Det. & 1st AF.
 - 6U6 Output
 - 5Y3 Rectifier

BEAM POWER OUTPUT:
Undistorted output over 3 watts. Maximum output 4-1/2 watts.

SPEAKER:
Rubber floated 6x9 inch HOWARD P.M., using large Alnico No. 5 core.

MODEL 906
MODEL 906C

HOWARD RADIO CO.

ALIGNMENT CHART-MODELS 906 AND 906C

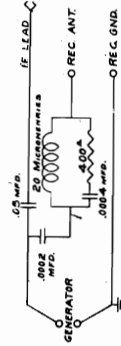
Set controls at indicated positions before following alignment chart.
Tone switch high
Volume control on full
Set dial between stations
Radio phono control at radio

DUMMY ANTENNA	SIG. GEN. CONNECTION TO	GEN. FREQ.	BAND POSITION SETTING	DIAL SETTING	ORDER OF TRIMMER ADJUSTMENTS	TRIMMER FUNCTION	SEE NOTE
.05 Mfd.	Grid of 6SA7	455 KC	BC	Off Station	①②③④	I. F. Peak to Max. Output	A
.05 Mfd.	Ant.	455 KC	BC	Off Station	⑤	Null	B
400 Ohm. Resistor	"A" Ant. Post.	1400 KC	BC	1400 KC	⑥⑦	BC Osc. and RF	C

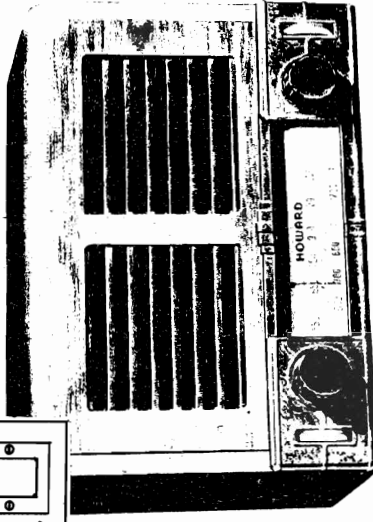
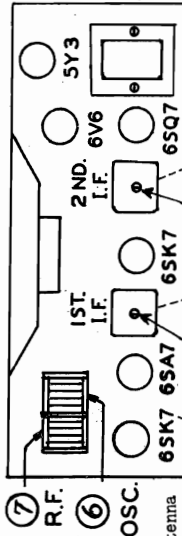
NOTE A. The I. F. adjustments are iron core slug tuning and it should not be necessary to move them very far in either direction from the factory setting, since they are of a very stable nature.

NOTE B. Important. Connect the signal generator to the antenna screw on the outside of the radio chassis and keep the metal of the chassis between the generator lead and the wave trap coil. Use your signal generator in a turned up powerful position and adjust the wave trap trimmer to null.

NOTE C. Set dial at 1400 KC. Adjust oscillator and R. F. trimmer for maximum sensitivity.



TUBE LAYOUT



MODEL 906

DIAL AND CONTROL ACCESSORIES

- AS-0213 Tuning Shaft Assembly
- AS-0217 Dial Pointer Assembly
- AR-0019 Dial Light Bracket Assembly - Right Side
- AR-0024 Dial Light Bracket Assembly - Left Side
- ES-0001 Dial covering - Plastic escutcheon for cabinet
- SP-0010 Dial Drive Spring
- DC-0001 Dial Drive Cord 52" long
- FR-0062 Dial Glass Snaps
- GR-0001 Rubber Grommets for Tuning Gang and Speaker Mounting
- DG-0004 Calibrated Lucite Dial
- LS-0002 #44 Blue Bead Pilot Lamp

KNOBBS

- AR-0025 Thumb wheel Assembly (Tone Control)
- AR-0026 Thumb wheel Assembly (Radio Phono)
- KB-0015-1 Knobs Brown Bakelite

SPEAKER

- SK-0004 Speaker 9" Elliptical RM Table Model

TRANSFORMERS

- TC-0006 Speaker Output Transformer
- TF-0003 Power Transformer - 60 cycle 110 volt
- LC-0010 Power Choke (500 ohm D.C.)

TUBE COMPLEMENT

- TU-5Y3 Tube
- TU-6SK7 Tubes (2 used)
- TU-6SA7 Tube
- TU-6SQ7 Tube
- TU-6V6 Tube

SOCKETS

- SO-0010 Phono Socket
- SO-0017 Tube Socket
- TB-0007 Terminal Strip, External Antenna

SWITCHES

- SW-0009 Radio Phono Switch D.P.D.T.
- SW-0010 Tone Switch - 3 position

CABINET

- CW-0008 Cabinet complete
- AS-0240 Metal Grill Assembly (1 used)
- BC-0003 Wood Baffle used with above item or
- MO-0026 Plastic Grill (2 used)

LINE CORD

- CA-0038 Line Cord - 6 ft and Moulded Plug

SOCKET VOLTAGE READINGS - 906 AND 906C

Voltage reading taken from ground with voltage at line set at 110 volts A.C. These readings were taken with a vacuum tube voltmeter of the Voltomyst type.

TUBE	FUNCTION	CATH.	SC.	PLATE	B+
6SK7	R. F.	1.8	* 79.	* 210.	* 8
6SK7	Converter	79.	4	230.	3
6SK7	1st. I. F.	2.3	5	240.	8
6SQ7	Det. & 1st. Audip.			115.	6
6V6	Output	11.	8	225.	3
5Y3	Rectifier				285

* Socket Terminal Number.

Voltage drop across filter choke 10 volts.

PARTS LIST - 906

CONTROLS

- VC-0005 Volume Control with Switch or
- VC-0006 Volume Control with Switch

CONDENSERS

- AC-0004 Tuning Gang with Gears and Drive Hub.
- CE-0009 Capacitor - Electrolytic 30-20-20 mfd. 450 volts or the following 3 capacitors.
- CE-0005 Capacitor - 25 mfd. 25 volts.
- CE-0011 Capacitor - 30 mfd. 450 volts.
- CE-0012 Capacitor - 20 mfd. 450 volts.

COILS

- AN-0005 Loop Antenna
- LA-0007 Loop Load Coil
- LI-0014 1st IF Transformer in can
- LI-0015 2nd IF Transformer in can
- LO-0014 Oscillator Coil
- LR-0001 Wave Trap 455 KC
- LR-0002 Untuned RF Coil

MODEL 906C

HOWARD RADIO CO.

TB-0007	Terminal Strip, external antenna
SO-0010	Phono and Speaker Socket (female)
SO-0012	Power Socket 110 V.
TL-0005	Phono Speaker Plug (male)
	SWITCHES
SW-0009	Radio Phono Switch DPDT
SM-0010	Tone Switch - 3 position
	CABINET
CW-0009-1	Cabinet - Mahogany
CW-0009-2	Cabinet - Blonde
AA-0008-1	Drawer Sub-assembly (Mahogany)
AA-0008-2	Drawer Sub-assembly (Blonde)
AW-0015	Carriage Assembly
	AUTOMATIC RECORD CHANGER
PH-0003	Record Changer VM400
	LINE CORD
CA-0039	Line Cord - 8 ft. and Moulded Plug
CA-0043	Line Cord & Plug 42" long for record changer motor
	DIAL AND CONTROL ACCESSORIES
AS-0213	Tuning Shaft Assembly
AS-0217	Dial Pointer Assembly
AR-0019	Dial Light Bracket Assembly - right side
AR-0024	Dial Light Bracket Assembly - left side
SP-0010	Dial Drive Spring
FR-0062	Dial Glass Snaps
DC-0001	Dial Drive Cord 52" long
GR-0001	Rubber Grommets for tuning gang & Mounting Bracket
DG-0008	Calibrated Lucite Dial 550 KC at right
LS-0002	#44 Blue Bead Pilot Lamp
ES-0004-1	Metal Escutcheon (Mahogany)
ES-0004-2	Metal Escutcheon (Blonde)
	KNOBBS
AR-0042	Thumb Wheel Assembly (Tone Control)
AR-0043	Thumb Wheel Assembly (Radio Phono)
KB-0015-1	Knob for Radio (Walnut)
KB-0015-3	Knob for Radio (Blonde)
KB-0014-1	Knob for Drawer (Mahogany)
KB-0014-2	Knob for Drawer (Blonde)
	SPEAKER
SK-0004	Speaker 9" Elliptical P.M.

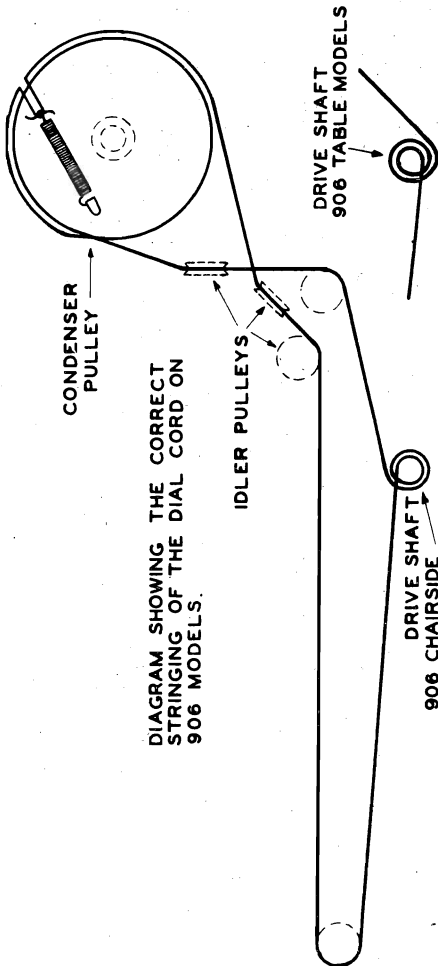


DIAGRAM SHOWING THE CORRECT STRINGING OF THE DIAL CORD ON 906 MODELS.

906 CHAIRSIDE MODELS TO REMOVE RADIO CHASSIS FROM CABINET

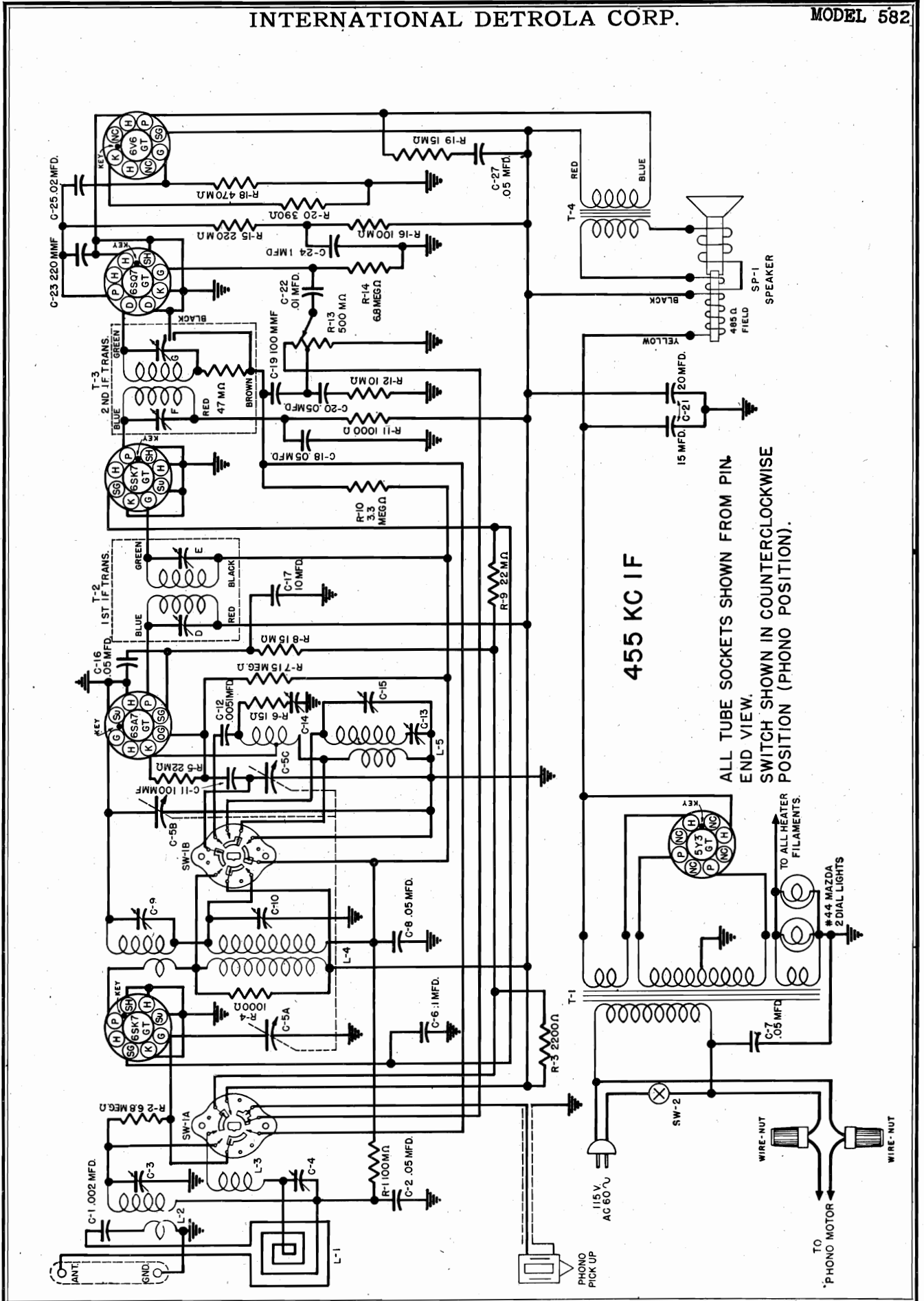
Take knobs off volume control and tuning control by loosening set screws. Remove the wood screws that are located inside the record storage space at the top rear of the cabinet. The entire top wood panel lifts out by pushing upward inside the storage space one inch, and then remove panel by lifting to the rear of the cabinet. After the panel is removed, it is easy to see the mounting bolts that hold the chassis.

TO REMOVE DRAWER

Pull the drawer out to its full extremity. Place your hands (one on each side) beneath the drawer about 3 inches from the back and feel along the track until you hit two little metal flaps that are the stops for the drawer. Lift these up with your index fingers and the drawer can then be pulled right out of the cabinet.

PARTS LIST

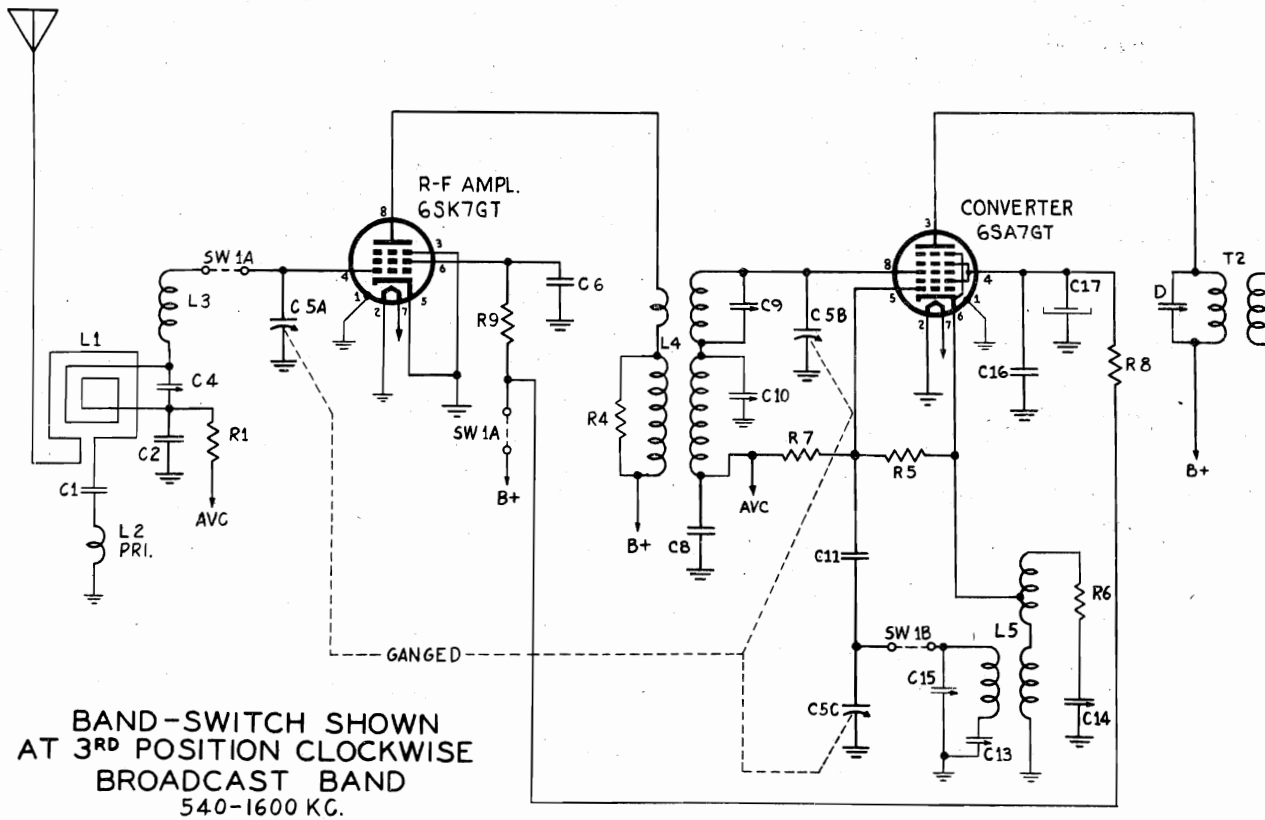
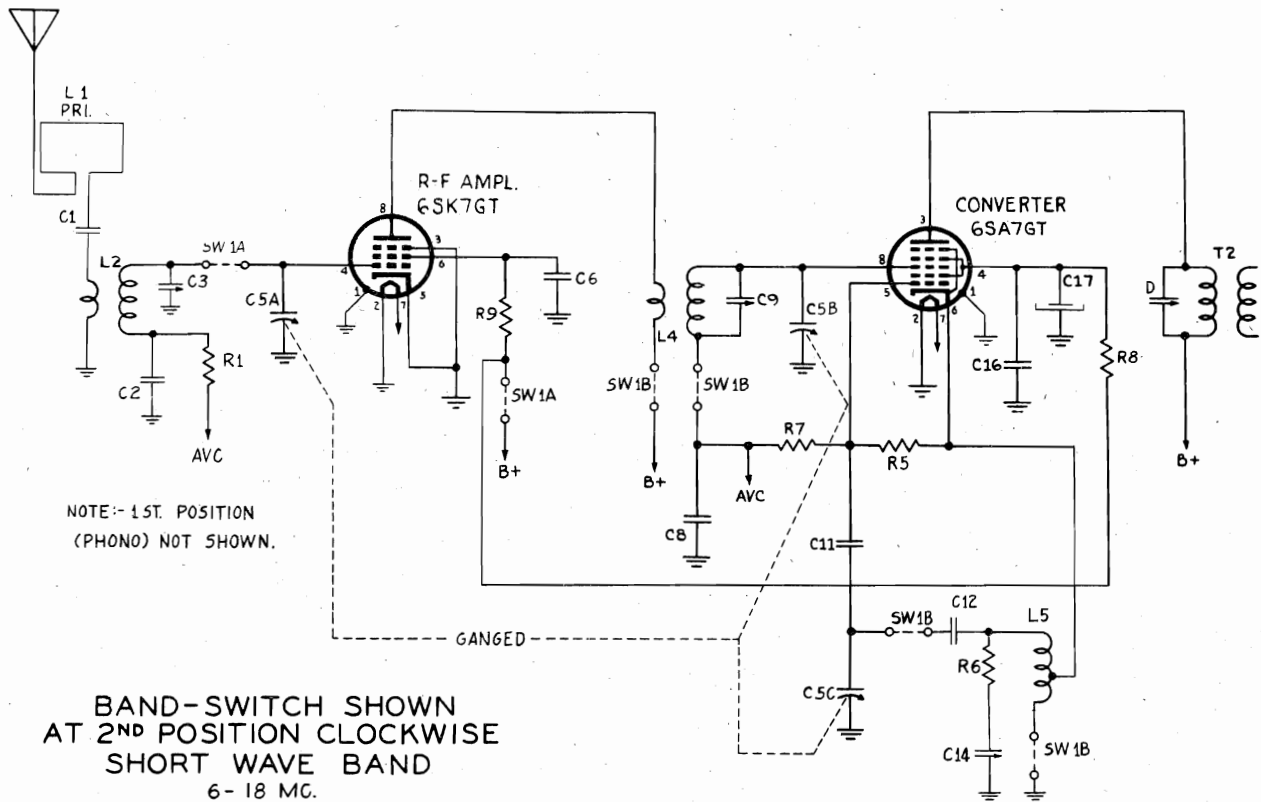
VC-0005	Volume Control with A.C. Switch	LA-0007	Loop Load Coil
VC-0006	Volume Control with A.C. Switch or CONDENSERS	LI-0014	1st I.F. Transformer in can - iron slug tuned
AC-0004	Tuning Gang with Gears and Drive Hub	LI-0015	2nd I.F. Transformer in can - iron slug tuned
CE-0009	Capacitor - Electrolytic 30-20 M.F.D. 450 V. - 25 M.F.D. 25 V.	LI-0021	1st I.F. Transformer - air trimmers
CE-0005	Capacitor - 25 M.F.D. 25 V.	LI-0022	2nd I.F. Transformer - air trimmers
CE-0011	Capacitor - 30 M.F.D. 450 V. CE-0009	LO-0014	Oscillator Coil
CE-0012	Capacitor - 20 M.F.D. 450 V.	LR-0001	Wave Trap 455 KC
	COILS	LR-0002	Untuned RF Coil TRANSFORMERS
AN-0006	Loop Antenna (low impedance)	TO-0006	Speaker Output Transformer
	SOCKETS AND PLUGS	TP-0003	Power Transformer - 60 cycle 110 V.
		LC-0010	Power Choke - 500 Ohm. D.C.
		SO-0017	Tube Socket



455 KC IF

ALL TUBE SOCKETS SHOWN FROM PIN END VIEW. SWITCH SHOWN IN COUNTERCLOCKWISE POSITION (PHONO POSITION).

"clarified schematics"



MODEL 582

INTERNATIONAL DETROLA CORP

MODEL 582
MODEL 7270

Electrical and Mechanical Specifications

Frequency Range.....540-1600 kc., 6-18 mc. Power Output (Undistorted).....1.8 watts
 Intermediate Frequency.....455 kc. Power Output (Maximum).....3.75 watts
 Power Supply.....105-125 volts, 60 cycle AC Rated Power Input.....65 watts at 115 volts
 Loudspeaker.....8-inch, Dynamic Tuning Drive Ratio.....6 to 1
 V.C. Impedance.....3.5 ohms at 400 cycles

ALIGNMENT PROCEDURE

The following equipment is necessary to properly align this chassis:

A signal generator which will provide an accurately calibrated signal at the frequencies listed.

A non-metallic screwdriver.

Dummy antenna: .1 mfd. — 400 ohm resistor — RMA loop.

An output meter.

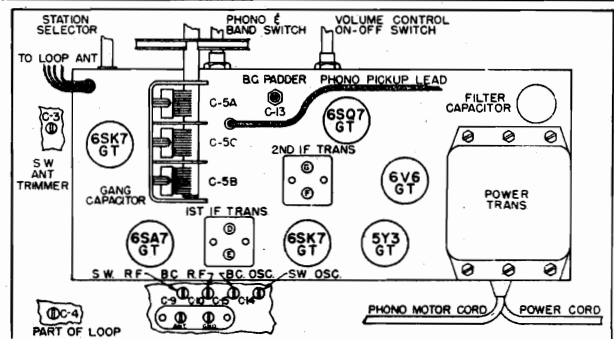
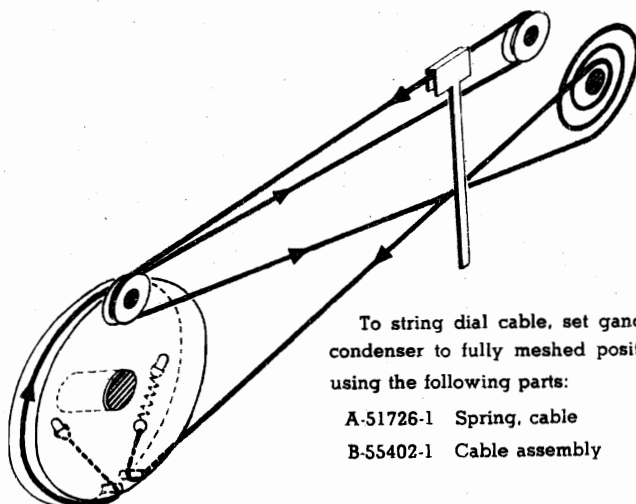
NOTE: Intermediate Frequency and Oscillator Adjustments may be made with the loop disconnected provided a resistor of 10,000 to 50,000 ohms is substituted to close the RF grid circuit. The loop alignment

must be done with the loop and chassis mounted in operating position in the cabinet. A single turn loosely coupled to the loop may be substituted for RMA loop.

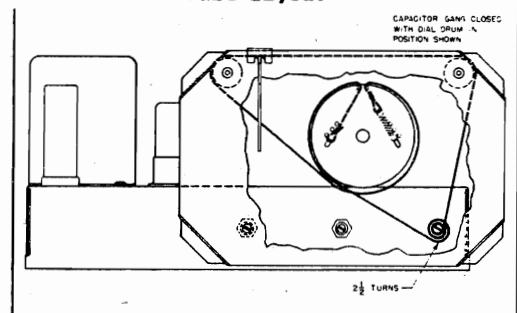
CONNECT TEST OSCILLATOR TO	DUMMY ANTENNA	INPUT SIGNAL FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
6SA7GT grid	.1 mfd.	455 kc.	Broadcast	HF end	D E F G	Align IF
6SK7GT RF grid	.1 mfd.	18.3 mc.	Short wave	HF end	C-14	Set limit of band
6SK7GT RF grid	.1 mfd.	16 mc.	Short wave	16 mc.	C-9	Align RF
Antenna post	400 ohms	16 mc.	Short wave	16 mc.	C-3	Align antenna
6SK7GT RF grid	.1 mfd.	1620 kc.	Broadcast	HF end	C-15	Set limit of band
6SK7GT RF grid	.1 mfd.	1400 kc.	Broadcast	1400 kc.	C-10	Align RF
6SK7GT RF grid	.1 mfd.	600 kc.	Broadcast	600 kc.	C-13	Rock gang and adjust to maximum
RMA loop	Through loop	1400 kc.	Broadcast	1400 kc.	C-4	Align antenna

MODEL 7270

DIAL AND POINTER DRIVE CABLE ARRANGEMENT



Tube Layout



Dial Mechanism

SOCKET VOLTAGES

TUBE	POSITION	1	2	3	4	5	6	7	8
6SK7GT	RF Amplifier	0	0	0	0	0	107	6AC	255
6SA7GT	Converter	0	6AC	250	103	0	0	0	0
6SK7GT	IF Amplifier	0	0	0	0	0	105	6AC	237
6SQ7GT	Det.—AVC—1st Audio	0	0	0	0	0	34	6AC	0
6V6GT	Power Output	0	0	235	250	0	0	6AC	13
5Y3GT	Rectifier	0	310	0	300 AC	0	300 AC	0	310

NOTE: The above glass tubes are interchangeable with their metal equivalent.

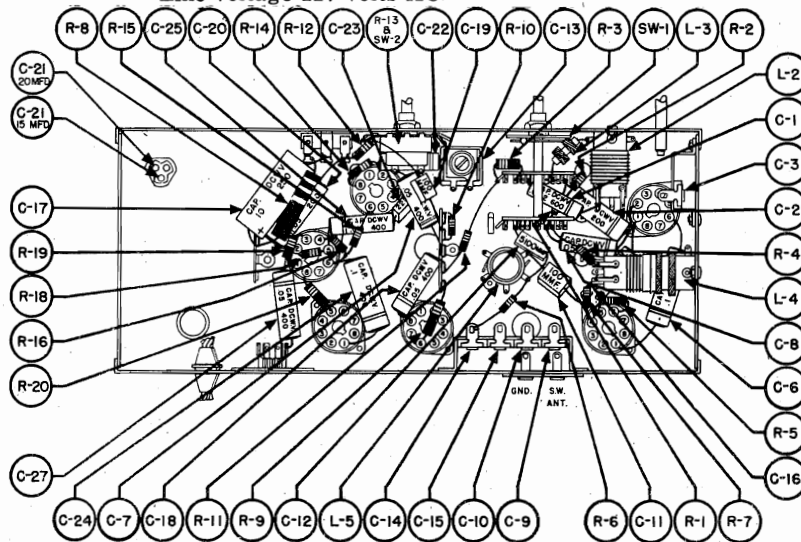
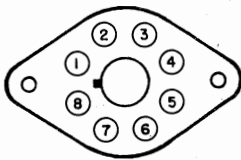
NOTE: Band switch in "Broadcast" position.

All voltages measured from chassis to socket contact indicated. DC voltages measured with a 1000 ohm-per-volt meter.

All voltages are positive DC unless otherwise marked.

Volume control full on. No signal.

Line voltage 117 volts AC.



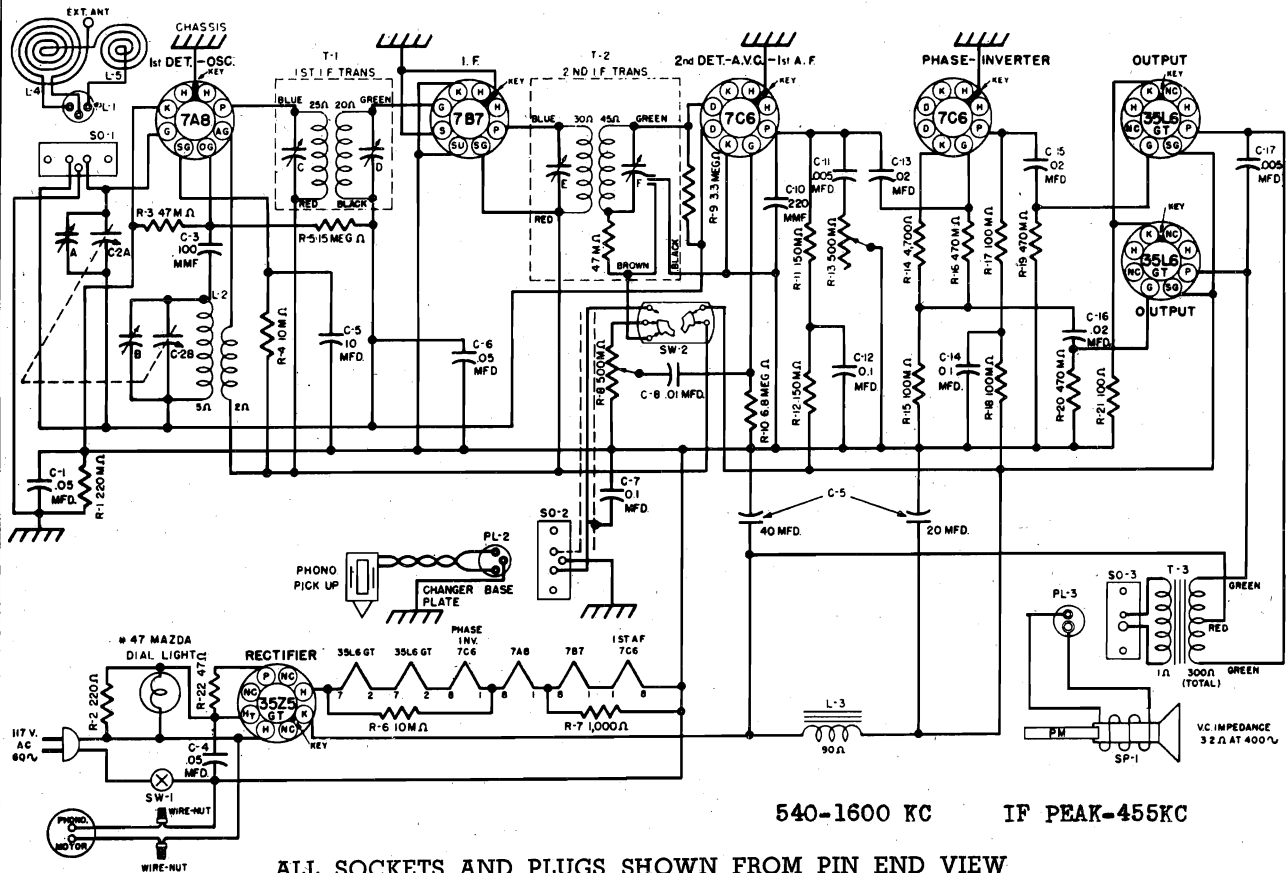
Parts Layout

Chassis Model 582

Symbol	Part No.	Description	Symbol	Part No.	Description
C-2, 8, 20	BD210503	Capacitor, Paper, .05 mfd., 200 v.	A-54847		Cord, Power, 6 ft.
C-22	BD410103	Capacitor, Paper, .01 mfd., 400 v.	B-51162-7		Shaft, Dial Drive
C-6, 24	BD410104	Capacitor, Paper, .1 mfd., 400 v.	A-51163		Clip, Spring
C-25	BD410203	Capacitor, Paper, .02 mfd., 400 v.	A-51260		Shield, Tube
C-16, 18, 29, 7	BD410503	Capacitor, Paper, .05 mfd., 400 v.	A-51331		Spring, Dial Bracket
C-1	BD610202	Capacitor, Paper, .002 mfd., 600 v.	A-51356		Cap., Electrolytic, 15-20-20 mfd.
C-12	BM58D512	Capacitor, Mica, 5100 mmf.	C-51401-2		Capacitor, Variable, 3-section
C-11, 19	BM78A101	Capacitor, Mica, 100 mmf.	T-2	B-51416-1	Transformer Assembly, 1st IF
C-23	BM78A221	Capacitor, Mica, 200 mmf.	T-3	B-51417-1	Transformer Assembly, 2nd IF
R-20	BR16E391	Resistor, 390 ohm, 1/3 w.	C-17	A-51419	Cap., Electrolytic, 10 mfd., 250 v.
R-4, 11	BR17B102	Resistor, 1000 ohm, 1/3 w.	L-5	B-51420	Coil Assembly, Oscillator
R-12	BR17B103	Resistor, 10M ohm, 1/3 w.	T-1	C-51421	Transformer, Power
R-1, 16	BR17B104	Resistor, 100M ohm, 1/3 w.	L-4	B-51425	Coil Assembly, RF
R-6	BR17B150	Resistor, 15 ohm, 1/3 w.	C-13	A-51428-5	Capacitor, Padder
R-19	BR17B153	Resistor, 15M ohm, 1/3 w.	L-2	B-51430	Coil Assembly, S.W. Antenna
R-7	BR17B156	Resistor, 15 megohm, 1/3 w.	R-13	B-51445-3	Control, Volume & Sw., 500M ohm
R-5	BR17B223	Resistor, 22M ohm, 1/3 w.	C-9, 10, 14, 15	A-51656	Capacitor Assembly, Trimmer (4)
R-15	BR17B224	Resistor, 220M ohm, 1/3 w.	C-3	A-51657	Capacitor Assem., Trimmer (Spec.)
R-10	BR17B335	Resistor, 3.3 megohm, 1/3 w.	A-51787		Spring, Cable
R-18	BR17B474	Resistor, 470M ohm, 1/3 w.	A-51801		Rivet, Pronged (for dial cable)
R-2, 14	BR17B685	Resistor, 6.8 megohm, 1/3 w.	B-51952-1		Switch, Band
R-3	BR17E222	Resistor, 2200 ohm, 1 w.	C-51961		Speaker, 8-inch Dyn., 485 ohm
R-9	BR17E223	Resistor, 22M ohm, 1 w.	B-51968		Coil Assembly, Antenna Loading
R-8	BR17G153	Resistor, 15M ohm, 2 w.	A-57464		Sheet, Service
A-2163		Cable, Drive	A-54848		Bushing, Strain Relief
A-9285		Lamp, Pilot, Mazda No. 44			

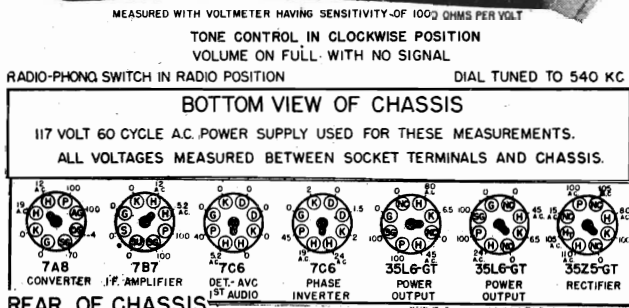
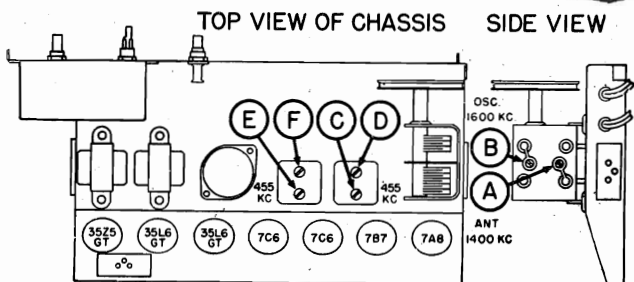
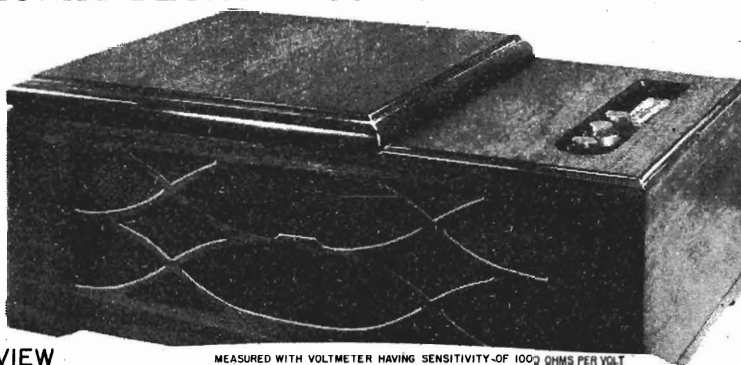
INTERNATIONAL DETROLA CORP.

MODEL 7270



ALL SOCKETS AND PLUGS SHOWN FROM PIN END VIEW
ALL SWITCHES SHOWN IN COUNTERCLOCKWISE POSITION, SHAFT END VIEW

SYMBOL	PART NO.	DESCRIPTION	LIST PRICE	SYMBOL	PART NO.	DESCRIPTION	LIST PRICE
CAPACITORS							
C-1	BD410503	Capacitor—.05 Mfd., 400 volt.	.35	L-4, 5	D-57259	Loop Antenna assembly	\$1.00
C-2A, B	C-57243-1	Capacitor—Variable gang	4.50	L-2	B-56143	Coil—Oscillator assembly	2.00
C-3	BM74A101	Capacitor—Mica 100 Mmfd. ± 20%	.35	L-3	B-51726-1	Filter Choke, 80 ma.	2.00
C-4	BD410503	Capacitor—.05 Mfd., 400 volt.	.35	T-1	B-51010-3	Transformer—1st I.F.	2.00
C-5	A-56154	Capacitor—Electrolytic 40-20-10 Mid., 150 volt.	1.60	T-2	B-51011-3	Transformer—2nd I.F.	2.50
C-6	BD210503	Capacitor—.05 Mfd., 200 volt.	.30	T-3	B-57253-1	Transformer—Output	1.50
C-7	BD410104	Capacitor—.01 Mfd., 400 volt.	.40	OTHER ELECTRICAL PARTS			
C-8	BD410103	Capacitor—.01 Mfd., 400 volt.	.30	SW-1	B-56156-1	Switch—power part of R-8 and R-13	1.00
C-10	BM74A221	Capacitor—Mica 220 Mmfd. ± 20%	.40	SW-2	C-57272	Switch—Radio-Phono	*
C-11	BD610502	Capacitor—.005 Mfd., 600 volt.	.30	SP-1	A-6158	Speaker—5" x 9" Permanent Magnet.	15
C-12	BD410104	Capacitor—.01 Mfd., 400 volt.	.40	MISCELLANEOUS PARTS			
C-13	BD410203	Capacitor—.02 Mfd., 400 volt.	.30	B-57275-1	Background for dial	*	
C-14	BD410104	Capacitor—.01 Mfd., 400 volt.	.40	A-54848	Bushing—Strain relief (power cord)	.20	
C-15	BD410203	Capacitor—.02 Mfd., 400 volt.	.30	A-56155	Bushing—Tuning control shaft	*	
C-16	BD410203	Capacitor—.02 Mfd., 400 volt.	.30	E-57270-1	Cabinet	*	
C-17	BD610502	Capacitor—.005 Mfd., 600 volt.	.30	B-51330-1	Channel rubber—mtg. for Dial scale	.04	
RESISTORS							
R-1	BR17B224	Resistor—Carbon, 220,000 Ohms, 1/2 watt.	.15	B-55402-1	Dial Cable assembly (includes clips at end of cable)	.25	
R-2	BR17C221	Resistor—Carbon, 220 Ohms, 1/2 watt.	.15	B-57269-1	Dial scale—plastic	*	
R-3	BR17B473	Resistor—Carbon, 47,000 Ohms, 1/2 watt.	.15	B-51427-2	Grommet—rubber; mtg. for variable gang	.05	
R-4	BR17B103	Resistor—Carbon, 10,000 Ohms, 1/2 watt.	.15	B-51124-1	Knob—Volume & switch, tuning or radio-phon	.15	
R-5	BR17B156	Resistor—Carbon, 15 Meg., 1/2 watt.	.15	B-56138-1	Knob—Tone Control	.15	
R-6	BR17E103	Resistor—Carbon, 10,000 Ohms, 1 watt.	.15	BN751V02	Pinnut—No. 3/32; for mtg. controls	.02	
R-7	BR17B102	Resistor—Carbon, 1,000 Ohms, 1/2 watt.	.15	BN770S02	Pinnut—No. 10-24; for mtg. record changer	.01	
R-8	B-56142-1	Control—Dual Potentiometer, with switch 500,000 Ohms, (V. C.)	2.25	A-57271	Plug—3 Prong—Phono pick-up connection	*	
R-9	BR17B335	Resistor—Carbon, 3.3 Meg., 1/2 watt.	.15	B-55130-9	Pointer	.15	
R-10	BR17B685	Resistor—Carbon, 6.8 Meg., 1/2 watt.	.15	B-58069-1	Power Cord	.75	
R-11	BR17B154	Resistor—Carbon, 150,000 Ohms, 1/2 watt.	.15	BP934G02	Screw—No. 4 x 1/2"; for mtg. loop & back	.03	
R-12	BR17B154	Resistor—Carbon, 150,000 Ohms, 1/2 watt.	.15	BP928N02	Screw—No. 8 x 1 1/4"; for mtg., chassis	.03	
R-13	B-56142-1	Control—500,000 Ohms, (T. C.) part of R-8	.15	BS016S09	Screw—No. 10-24 x 1"; for mtg. record changer	.04	
R-14	BR17B472	Resistor—Carbon, 47,000 Ohms, 1/2 watt.	.15	A-56136	Shaft—tuning control	*	
R-15	BR17B104	Resistor—Carbon, 100,000 Ohms, 1/2 watt.	.15	A-54726	Socket—octal base	.20	
R-16	BR17B474	Resistor—Carbon, 470,000 Ohms, 1/2 watt.	.15	A-54900	Socket—loctal base	.25	
R-17	BR17B104	Resistor—Carbon, 100,000 Ohms, 1/2 watt.	.15	A-57273	Socket—3 Prong; Phono pick-up & loop antenna	.20	
R-18	BR17B104	Resistor—Carbon, 100,000 Ohms, 1/2 watt.	.15	A-57258	Socket—2 Prong; speaker connection	.20	
R-19	BR17B474	Resistor—Carbon, 470,000 Ohms, 1/2 watt.	.15	A-6182-5	Socket—dial lamp (with leads)	.15	
R-20	BR17B474	Resistor—Carbon, 470,000 Ohms, 1/2 watt.	.15	A-51331	Spring—Mtg., for channel rubbers	.10	
R-21	BR16C101	Resistor—Carbon, 100 Ohms, ± 10% 1/2 watt.	.15	A-51787	Spring—dial cable tension	.07	
R-22	BR17G470	Resistor—Carbon, 47 Ohms ± 20% 2 watt.	.30	A-50147	Spring—conical; for mtg. record changer	.10	
PRICES SUBJECT TO CHANGE WITHOUT NOTICE							
*PRICE AVAILABLE UPON REQUEST							



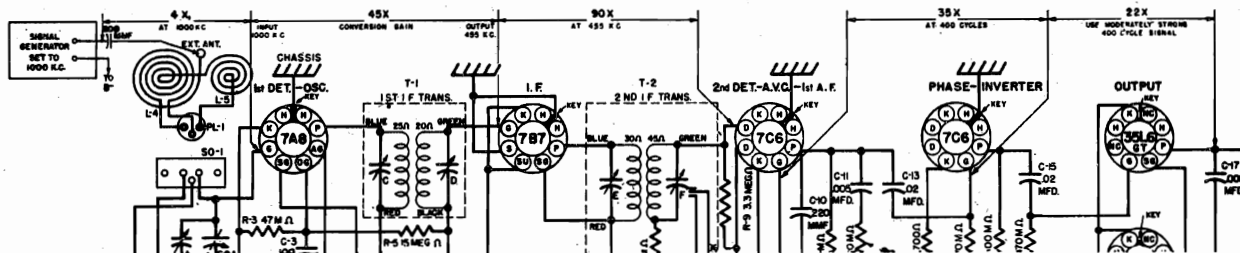
1. The chassis, record changer and loop should remain in their normal position in the cabinet when making loop adjustment.
2. With the gang condenser fully meshed, dial pointer should be in the position indicated by the last division below 55 on the dial.
If it is set incorrectly, slide pointer along dial cord to correct position.
3. Connect output meter across speaker voice coil.
4. Connect the ground of signal generator to B-.
5. Set volume control at maximum volume position and use a weak signal from the signal generator.
6. Radio-Phono switch in Radio position.

NOTE: For best results, it is advisable to use an isolation transformer between the 117 V. AC line and AC input to receiver.

DUMMY ANT.	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER LETTER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
0.1 Mfd. Condenser	7A8 Grid	455 KC	Any point where it does not affect the signal	F-E D-C	2nd IF 1st IF	Adjust for maximum output. Then repeat adjustment.
0.1 Mfd. Condenser	7A8 Grid	1620 KC	Gang condenser completely out of mesh.	B	Oscillator	Adjust for maximum output.
RMA Loop		1400 KC	Tuned to 1400 kc Generator signal	A	Loop Antenna	Adjust for maximum output.

Be sure R.F. and I.F. stages are accurately aligned before measuring gain. R.F. gains can be measured with a "channel" type instrument containing a tuned and calibrated R.F. amplifier. A vacuum tube voltmeter may be used for audio gain measurements. Observe following precautions:

1. For all gain measurements connect signal generator as shown. Use 1000 KC signal with 400 cycle modulation (use nearby frequency if local station interferes).
2. Be sure radio is carefully tuned to generator signal. (Use weak signal for sharp tuning.)
3. When using a "channel" type instrument, carefully tune it for maximum output at desired frequency before making measurements.

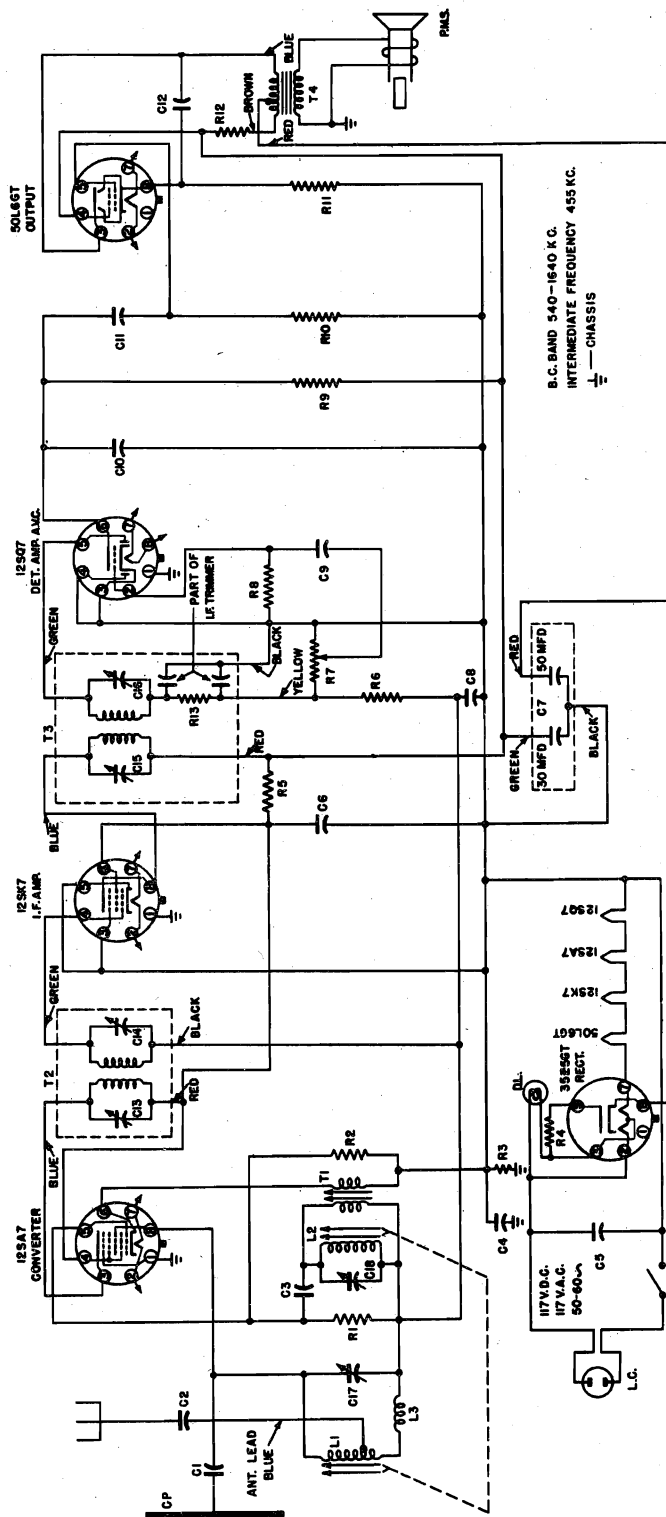


Differences in tube characteristics, tolerance of parts, adjustment of tuned circuits, and variations of line voltage will influence stage gain. Accuracy of measurements is dependent upon careful tuning of receiver to generator signal and experience in using your test equipment. These factors may create considerable variation in gain measurements.

LEAR, INC.

MODELS 565, 565BL, 566, 567, 568

JULY 1, 1946

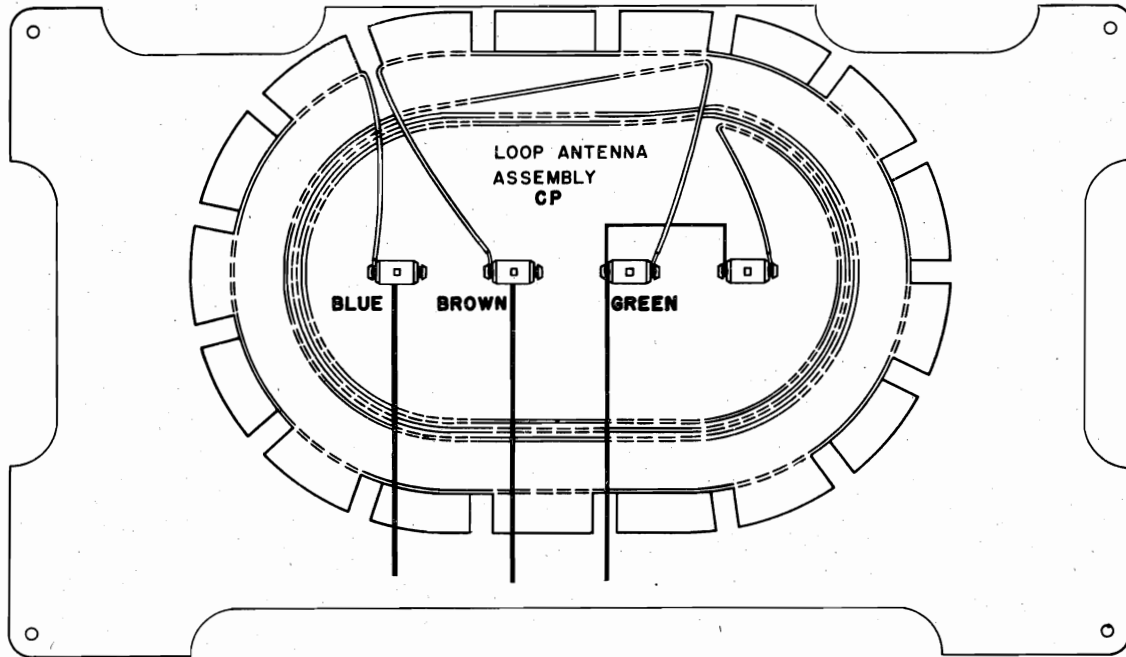


DWG. SYM.	PART NO.	DESCRIPTION	DWG. SYM.	PART NO.	DESCRIPTION
R1	55496	15 meg. $\frac{1}{2}$ w. carbon resistor	CP	52570	Antenna Assy. LOOP
R2	55479	22,000 ohm $\frac{1}{2}$ w. carbon resistor	T1	54282	Oscillator Transformer Assy.
R3	55485	220,000 ohm $\frac{1}{2}$ w. carbon resistor	T2	53350	#1 I.F. Transformer Assy.
R4	55460	15 ohm $\frac{1}{2}$ w. carbon resistor	T3	53361	#2 I.F. Transformer Assy.
R5	55475	4,700 ohm $\frac{1}{2}$ w. carbon resistor	T4	52531	Output Transformer
R6	55481	2.2 meg. $\frac{1}{2}$ w. carbon resistor	G1	56053	22 mmfd. Mica Capacitor
R7, S1	56300	500,000 ohm vol. control & line sw.	G2	56053	22 mmfd. Mica Capacitor
R8	55491	2.2 meg. $\frac{1}{2}$ w. carbon resistor	G3	56053	47 mmfd. Mica Capacitor
R9	55487	470,000 ohm $\frac{1}{2}$ w. carbon resistor	G4	56331	.05 mfd. 400 v. Paper Capacitor
R10	55487	470,000 ohm $\frac{1}{2}$ w. carbon resistor	G5	56331	.05 mfd. 400 v. Paper Capacitor
R11	55466	150 ohm $\frac{1}{2}$ w. carbon resistor	G6	56331	.05 mfd. 400 v. Paper Capacitor
R12	55674	1,200 ohm $\frac{1}{2}$ w. carbon resistor	G7	52326	50 mfd. 150 v. Electrolytic Capacitor
R13	55481	47,000 ohm $\frac{1}{2}$ w. carbon resistor	G8	56600	.02 mfd. 200 v. Paper Capacitor
L1, L2	54284	Slug tuner & pulley Assy.	G9	56336	.05 mfd. 400 v. Paper Capacitor
C17, C18	53385	Antenna loading coil	C10	56059	.220 mmfd. Mica Capacitor
L3	53091	Line cord	C11	56583	.05 mfd. 400 v. Paper Capacitor
L.C.	70535	Dial light, type 47	C12	56628	#1 I.F. Trimmers (Part of Assy.)
D.L.			C13, C14		#2 I.F. Trimmers (Part of Assy.)
P.M.S.	55450	5" Permanent magnet speaker	C15, C16		

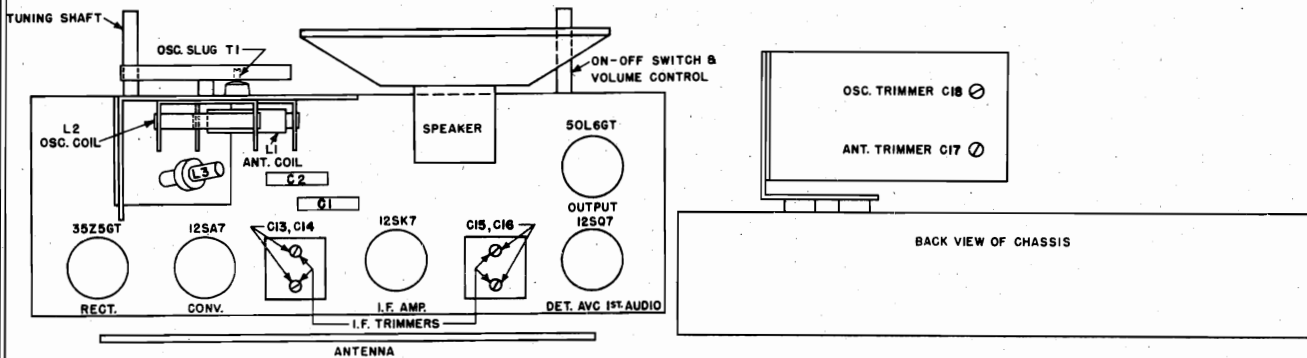
MODELS 565, 565BL, 566,
567, 568

LEAR, INC.

LOOP WIRING DIAGRAM



CHASSIS DIAGRAMS



ALIGNMENT CHART

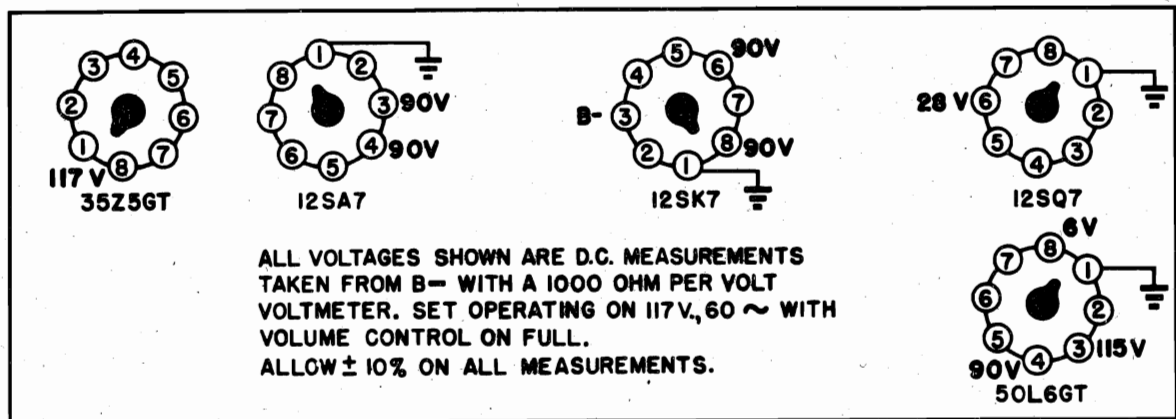
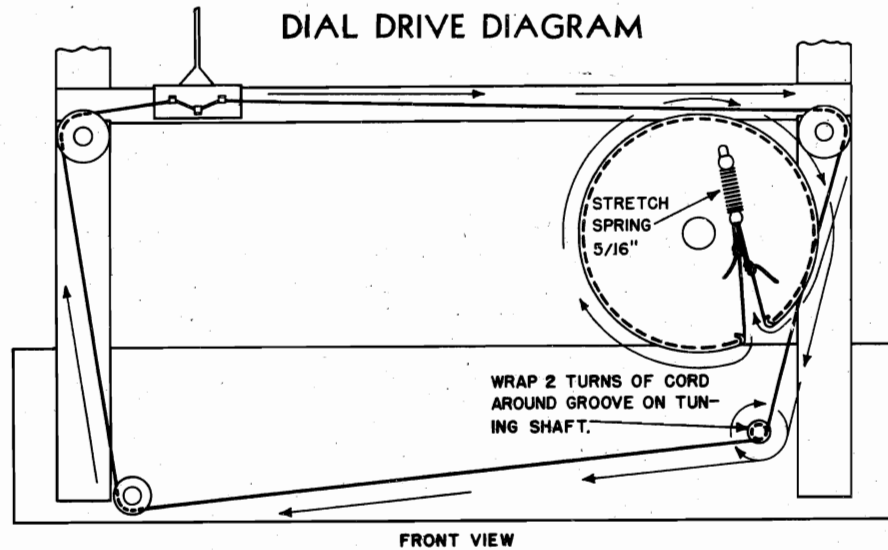
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	DIAL SETTING	TRIMMER	REMARKS
1	Set dial pointer at 1620 KC with tuning unit drive turned fully clockwise against stop.						
2	2nd IF	Pin No. 8 of 12SA7 and B-	.05 mf.	455 KC	1620 KC	C15, 16	Max. Output
3	1st IF					C13, 14	Max. Output
4	Osc. Trim	Antenna lead (blue wire) and B-	200 mmf.	1620 KC	1620 KC	C18	Max. Output
5	Ant. Trim			1500 KC	1500 KC	C17	Max. Output
6	Osc. Slug			600 KC	600 KC	T1	Max. Output*
7	Repeat adjustments in operations 5 and 6 until no further increase in output is obtained.						

* Rock dial tuner slightly while adjusting

Notes: Connect output meter to voice coil circuit.
Volume control on full for all adjustments.
Signal generator gain control at minimum for satisfactory output meter reading.

MODELS 565, 565BL, 566,
567, 568

LEAR, INC.



TUNING SHAFT

BOTTOM VIEW OF CHASSIS

ON-OFF SWITCH & VOLUME CONTROL

Line voltage: 117 volts, 60 cycles (AC)

Position of volume control: On full (with no signal)

TUBE	FUNCTION	Voltage of each socket prong to B- (Prong No. 3 of 12SK7)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
12SA7	Oscillator - Converter	0	-	90	90	0	0	-	0
12SK7	I-F Amplifier	0	-	0	0	0	90	-	90
12SQ7	Detector - AVC - 1st. Audio	0	0	0	0	0	28	-	-
50L6	Beam Power Amplifier	0	-	115	90	0	0	-	6
35Z5	Rectifier	-	-	-	-	110 AC	-	-	117

Notes: voltage readings are for schematic diagram in this bulletin. Allow 10% ± on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. voltages are DC unless otherwise specified. All voltages measured from prong No. 3 of 12SK7 tube socket, or B-.

MODELS 662,663,665,6618

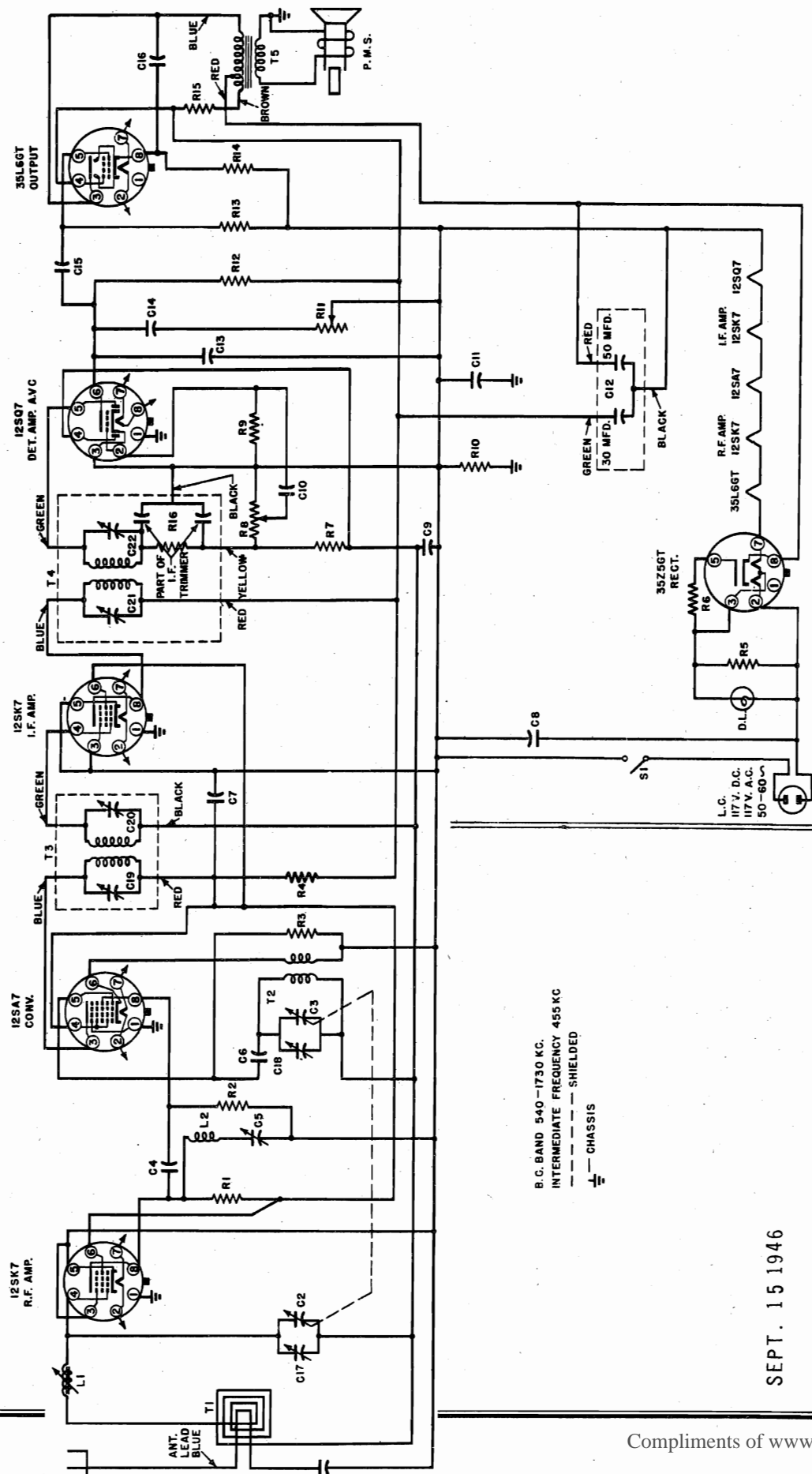
LEAR, INC.

PART NO.	DESCRIPTION
55494	6.8 MEG. 1/2 W. CARBON RESISTOR
55485	220,000 OHM " "
56339	500,000 OHM " TONE CONTROL
55487	470,000 OHM 1/2 W. CARBON RESISTOR
55487	150 " " " "
55486	150 " " " "
55840	1500 " " " "
55840	1500 " " " "
55481	47,000 " " " "
55481	47,000 " " " "
52697	ANT. LOAD COIL
65016	R.F. WAVE TRAP
53091	LINE COIL
70535	DIAL LIGHT TYPE 47
53450	5" PERMANENT MAGNET SPEAKER

PART NO.	DESCRIPTION
56805	.2 MFD. 200V. PAPER CAPACITOR
56856	.05 " " 500V " "
56800	" " " " 200V " "
56896	.02 " " " " 400V " "
56851	.1 " " " " " " " "
52326	30-50 MFD. 150V. ELECTROLYTIC
56059	220 MMFD. MICA CAPACITOR
56642	.005 MFD. 600V. PAPER CAPACITOR
56689	.004 " " 200V. " "
56628	.05 " " 400V. " "
C17	ANT. TRIMMER ON VARIABLE
C18	OSC. " " " "
C19,C20	NO. 1 I.F. TRIMMERS (PART OF ASSY.)

PART NO.	DESCRIPTION
C7	.2 MFD. 200V. PAPER CAPACITOR
C8	.05 " " 500V " "
C9	" " " " 200V " "
C10	4.700 OHM 1/2 W. CARBON RESISTOR
C11	" " " " " " " "
C12	220,000 " " " " " " " "
C13	22,000 OHM " " " " " " " "
C14	470 " " " " " " " "
C15	150 " " " " " " " "
C16	15 " " " " " " " "
C18	2.2 MEG. " " " " " " " "
C19,C20	500,000 OHM VOL. CONTROL & LINE SW.

PART NO.	DESCRIPTION
12SA7	R.F. AMP.
12SK7	I.F. AMP.
12SK7	I.F. AMP.
12SA7	CONV.
35L6GT	35L6GT
35L6GT	35L6GT
35Z5GT	RECT.



B.C. BAND 540-1730 KC.
 INTERMEDIATE FREQUENCY 455 KC
 --- SHIELDED
 --- CHASSIS

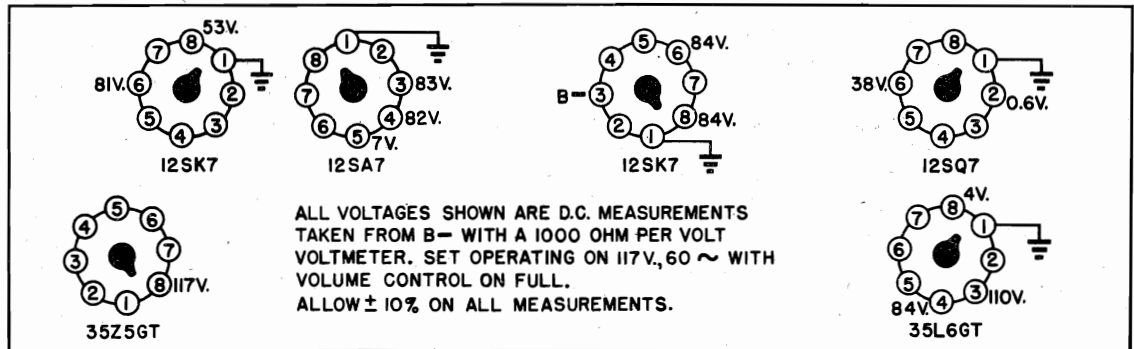
SEPT. 15 1946

LEAR, INC.

MODELS 662,663,665,6618
MODEL 6617PC

MODELS 662,663,665,6618

CHASSIS VOLTAGE CHART



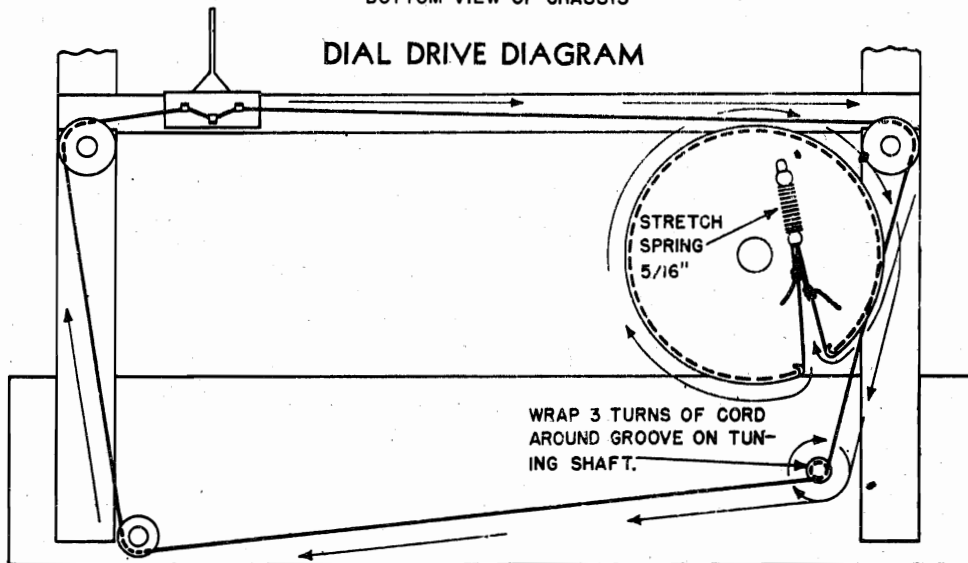
TUNING SHAFT

tone CONTROL

ON-OFF SWITCH & VOLUME CONTROL

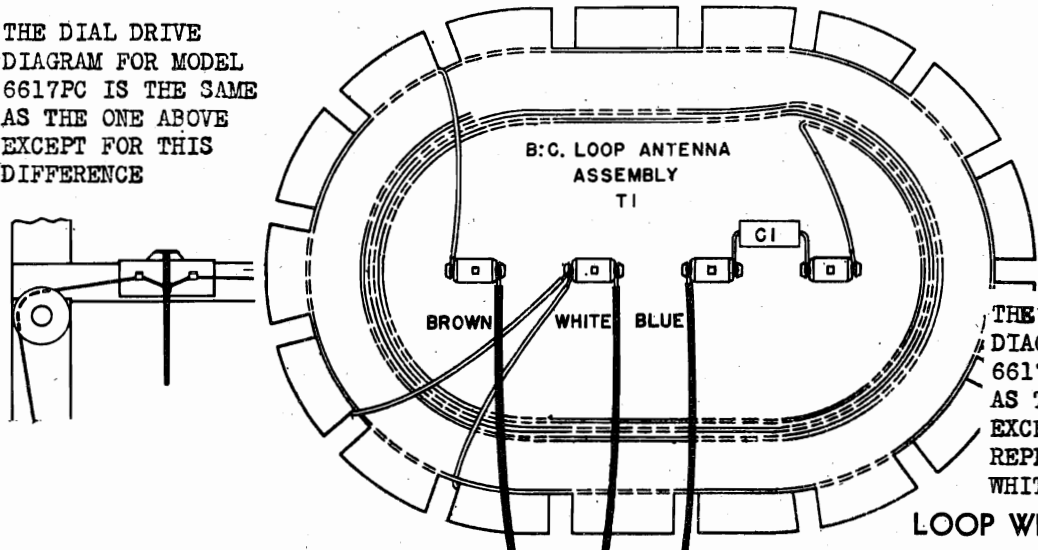
BOTTOM VIEW OF CHASSIS

DIAL DRIVE DIAGRAM



FRONT VIEW

THE DIAL DRIVE DIAGRAM FOR MODEL 6617PC IS THE SAME AS THE ONE ABOVE EXCEPT FOR THIS DIFFERENCE

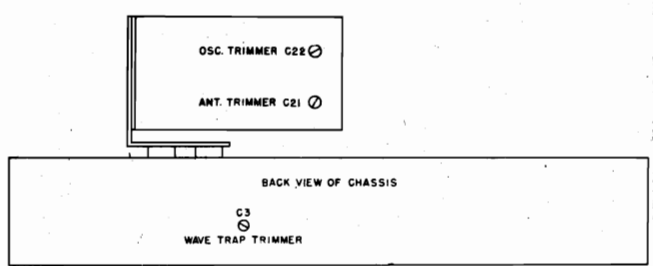
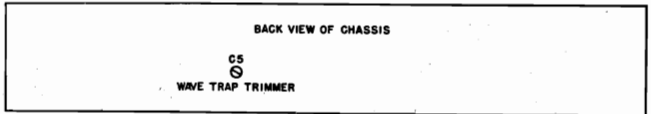
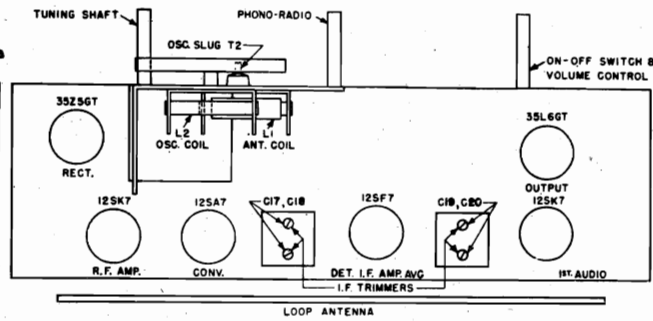
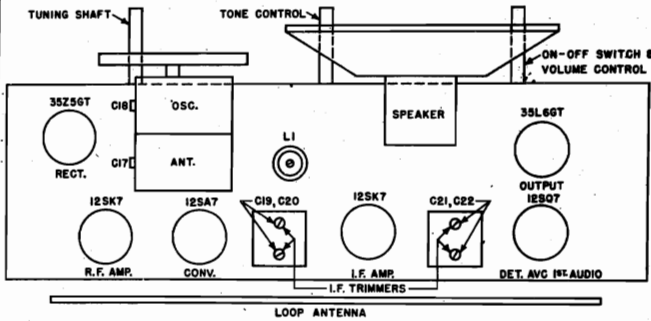


THE LOOP WIRING DIAGRAM FOR MODEL 6617PC IS THE SAME AS THE ONE ON THE LEFT EXCEPT THAT BROWN IS REPLACED BY WHITE AND WHITE BY BROWN

LOOP WIRING DIAGRAM

MODELS 662,663,665,6618
MODEL 6617PC

LEAR INC.



MODELS 662,663,665,6618

MODEL 6617PC

ALIGNMENT CHART MODELS 662,663,665,6618

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	DIAL AND CONDENSER SETTING	TRIMMER	REMARKS
1	Set dial pointer to last mark at low frequency and of dial with gang condenser closed						
2	2nd IF	Pin No. 8 of 12SA7 and B-	.05mf.	455 KC	open	C21, C22	Max. Output
3	1st IF					C19, C20	Max. Output
4	Wave trap	Antenna lead (Blue wire) and B-	200 mmf.	455 KC	open	C5	Max. Output
5	Osc. trim.			1500 KC	1500 KC	C18	Max. Output
6	Ant. trim.			1500 KC	1500 KC	C17	Max. Output
7	Load Coil			600 KC	600 KC	Slug in L1	Max. Output
8	Repeat adjustments in operations 5 and 6 until no further increase in output is obtained.						

Notes: Connect output meter to voice coil circuit.
Volume control on full for all adjustments.
Signal generator gain control at minimum for satisfactory output meter reading.

ALIGNMENT CHART MODEL 6617PC

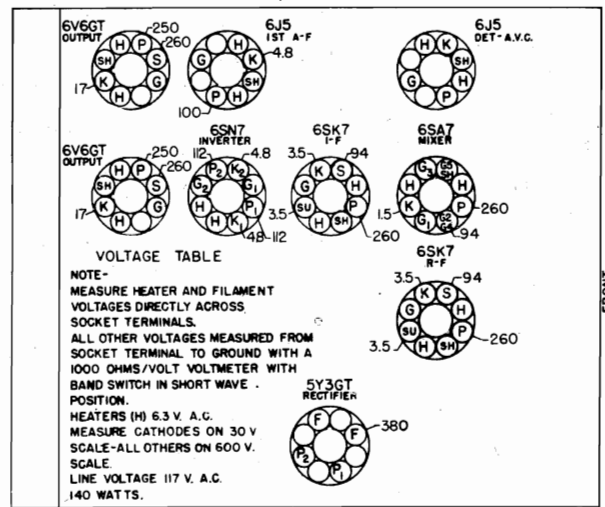
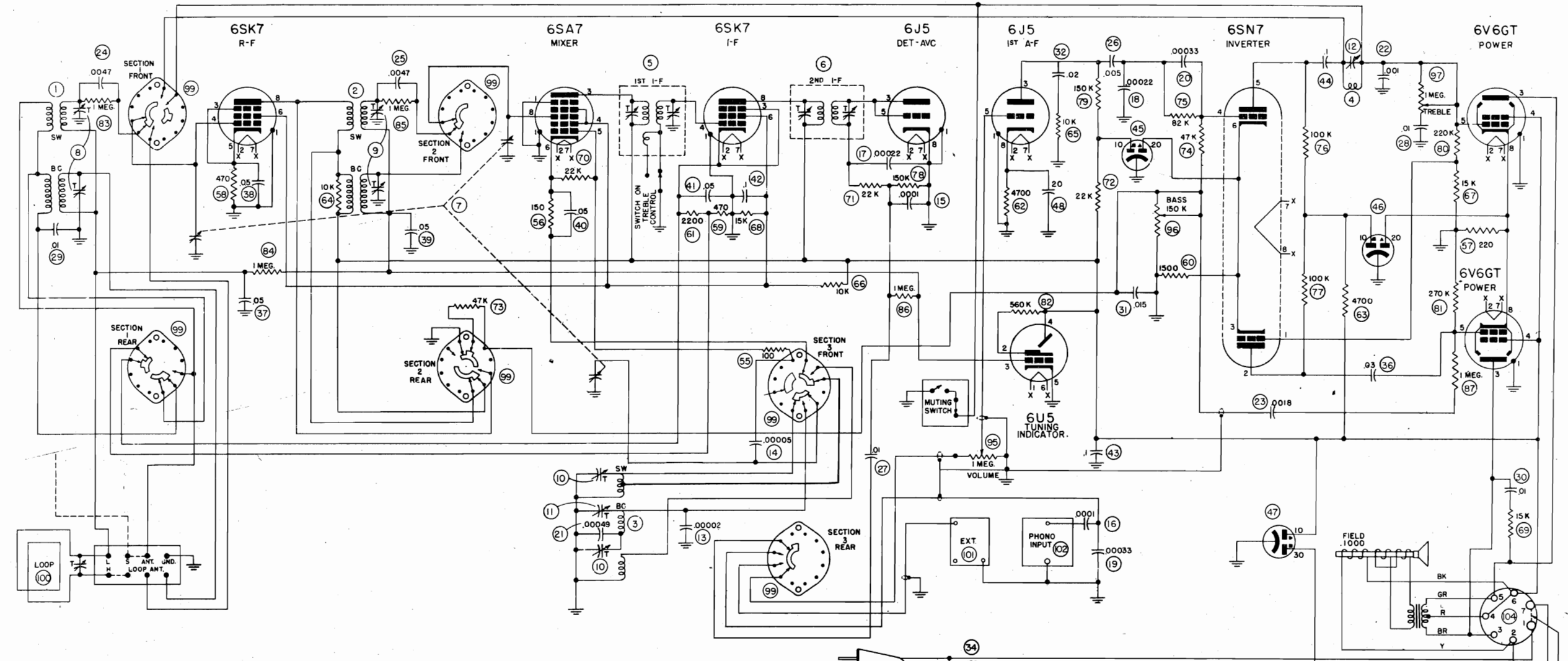
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	DIAL SETTING	TRIMMER	REMARKS
1	Set dial pointer at 1620 KC with tuning unit drive turned fully clockwise against stop.						
2	2nd IF	Pin No. 8 of 12SA7 and B-	.05 mf.	455 KC	1620 KC	C19, C20	Max. Output
3	1st IF					C17, C18	Max. Output
4	Wave Trap	Antenna lead (blue wire) and B-	200 mmf.	455 KC	1620 KC	C3	Min. Output
5	Osc. Trim			1620 KC	1620 KC	C22	Max. Output
6	Ant. Trim			1500 KC	1500 KC	C21	Max. Output
7	Osc. Slug			600 KC	600 KC	T2	Max. Output*
8	Repeat adjustments in operations 5 and 6 until no further increase in output is obtained.						

* Rock dial tuner slightly while adjusting T2.

Notes: Connect output meter to voice coil circuit.
Volume control on full for all adjustments.
Signal generator gain control at minimum for satisfactory output meter reading.

THE MAGNAVOX CO.

FIRST ISSUE—MARCH, 1947



I-F 455 K.C.

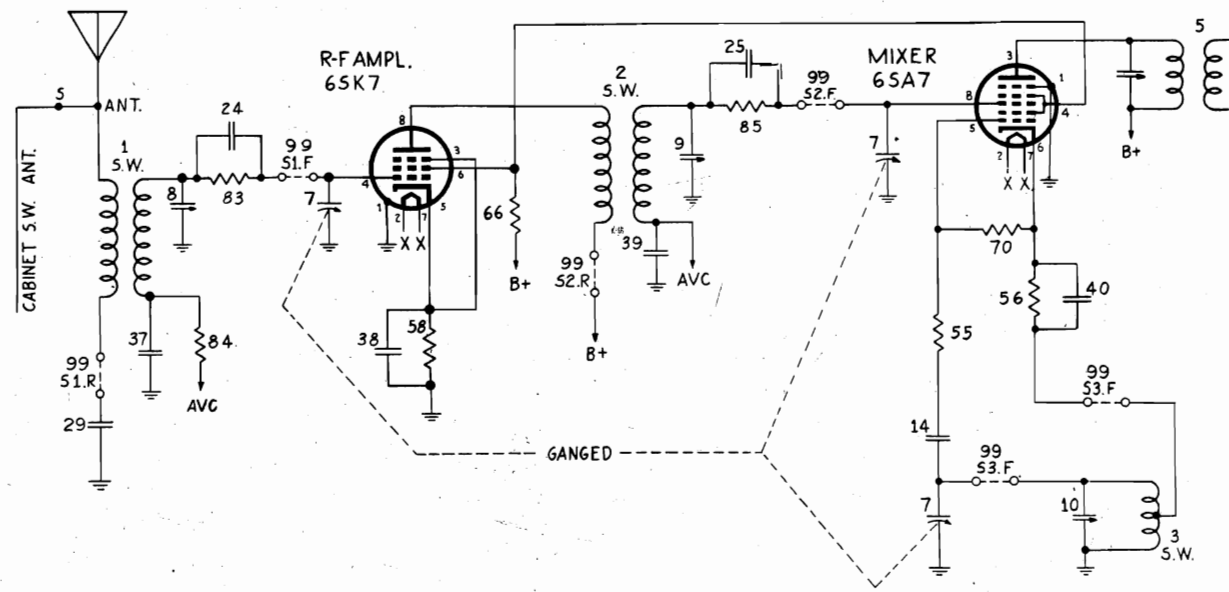
NOTES

1. BAND SWITCH SHOWN IN CLOCKWISE (SHORT WAVE) POSITION. THIS CONDITION OBTAINS WITH KNOB IN COUNTERCLOCKWISE POSITION.
2. BAND EXPANDER SWITCH SHOWN BENEATH FIRST I-F TRANSFORMER IS ACTUATED BY THE TREBLE CONTROL KNOB.
3. ALL ELECTRICAL VALUES SHOWN ARE IN MICRO-FARADS OR OHMS UNLESS OTHERWISE SPECIFIED.

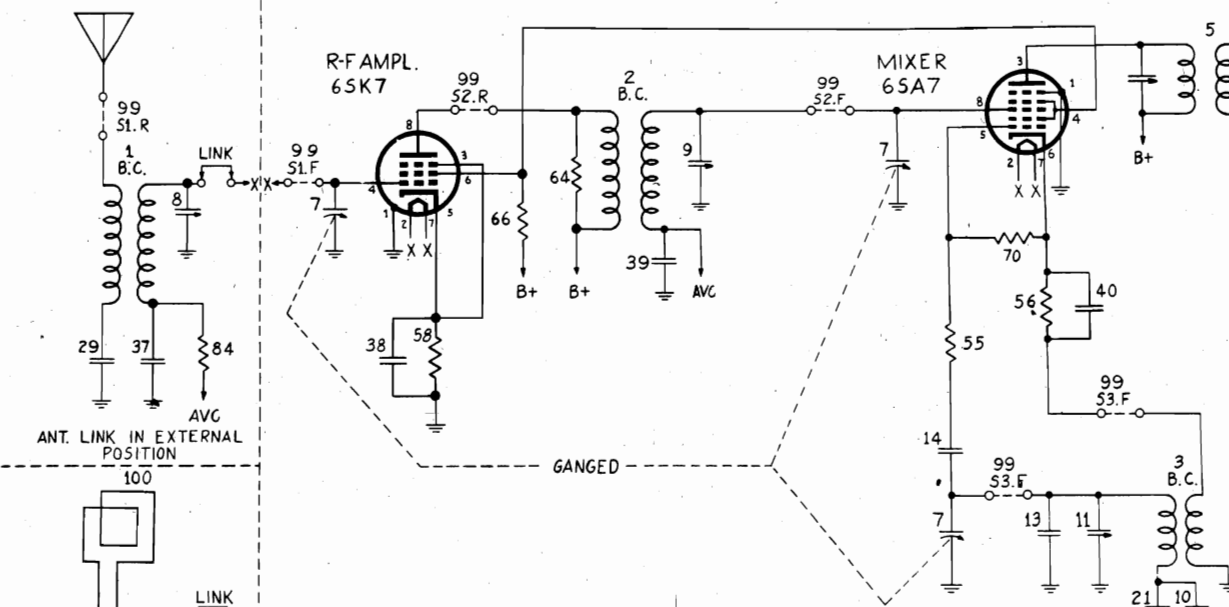
GENERAL

Models CR-197A and CR-197B are alike electrically. However, a change is incorporated in the dial drive mechanism. The differences are indicated on Figure 4.

FIGURE 6



BAND-SWITCH SHOWN AT 1ST POSITION SHORT WAVE BAND 4.95-18.4 MC.



BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE BROADCAST BAND 525-1630 KC.

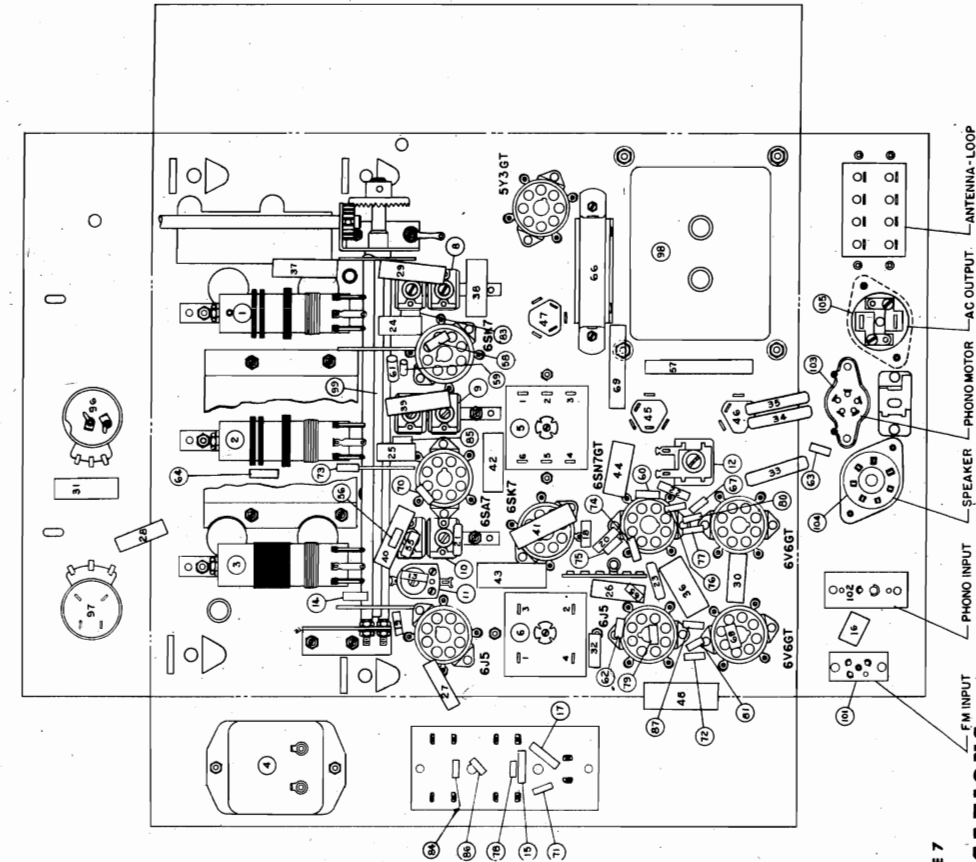
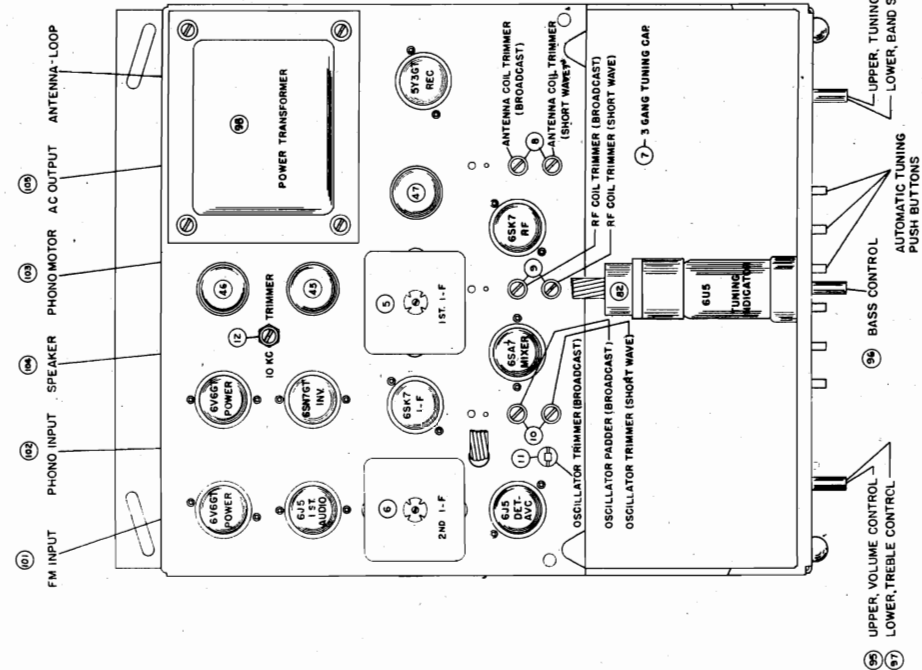


FIGURE 7

SPECIFICATIONS

Detector and AVC	6S1
First Audio	6S1
Inverter	6S1
Power output (push-pull stage)	(2) 6V6GT
Rectifier	6S1
Tuning Indicator	6U5
Dial lamps	6S1
Speakers:	Match No. 44
Field coil resistance	1000 ohms
Voice coil impedance (400 cycles)	3.0 ohms
Output transformer	8,000/3 ohms



Power supply	117 volts 50/60 cycles AC
Power consumption	95 watts
Power output	12 watts
Intermediate frequency	455 kc.
Tuning frequency range:	
Broadcast band	525-1630 kc.
Short Wave band	4.95-18.4 mc.
Tubes:	
R-F Amplifier	6SK7
Converter	6SA7
I-F Amplifier	6SK7

THE MAGNAVOX CO. MODELS CR-197, CR-197A, CR-197B
MODELS CR-198, CR-198A, CR-198B

- by one of the push buttons, using the Dial Tuning knob. Be sure to set the Selectivity Switch to Sharp Tune and observe that the shaded portion of the green circle in the tuning indicator is as narrow as possible.
- Press inward on the Dial Tuning knob (without turning it to the left or right) to hold the station in tune and press one of the push button knobs in as far as it will go—while holding it in this position, tighten the push button knob by turning it clockwise as far as possible.
- Insert the correct tab with the coil letters of the selected station in the space provided and proceed with setting up the remaining push buttons in the same manner. Stations should be set up on the push buttons in the order of their frequency so that the lowest frequency station is tuned by the button at the extreme left of the assembly; the highest frequency station should be selected by the button at the right end.

SPECIAL SERVICE INFORMATION

The following information is provided for the service man who has a vacuum tube voltmeter or a similar measuring instrument available.

STAGE GAINS*

Antenna Post to Converter Grid at:	4.1
600 kc.	1.85
6 mc.	1.43
R-F to Converter Grid at:	2.8
600 kc.	4.6
6 mc.	4.2
R-F on Converter to I-F Grid at:	60
600 kc.	30
6 mc.	70

OSCILLATOR OUTPUT VOLTAGE
The DC voltage developed across Oscillator Grid Resistor (48) at:

600 kc.	6.6
6 mc.	5.3

AUDIO GAIN

Voltage required across Volume Control to produce .05 watt speaker output** at 400 cycles is .0075 volt with Band Selector Switch in BDCST setting.

* Variations of ±20% are permissible. All readings made with sufficient input signal to provide .05 watt speaker output. ** Measurements taken by connecting a .25 ohm load in series with a high resistance AC voltmeter across the voice coil of a 4-watt speaker.

- Set the receiver to 1400 kc. and adjust the trimmer on the receiver loop for maximum output.

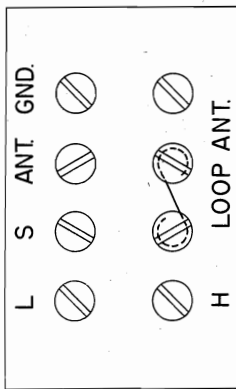


FIGURE 2

SHORT WAVE BAND ALIGNMENT

- Set the band selector switch to SW as for short wave reception and substitute a 400 ohm resistor for the capacitor in series with the signal generator lead connected to the antenna terminal on the receiver.
- Set the signal generator and the radio receiver to 15 mc.; then adjust the 15 mc. oscillator trimmer, the 15 mc. r-f trimmer and the 15 mc. antenna trimmer for maximum output. While adjusting the 15 mc. oscillator trimmer two peaks may be observed; only one is the correct peak for 15 mc. alignment. Screw in the trimmer to maximum capacity—then decrease the capacity until the first peak is observed. This is the correct one.

10 KC FILTER ADJUSTMENT

This chassis incorporates a 10 kc. filter circuit to eliminate the beat note heard as a whistle between stations on the broadcast band. If the trimmer is out of adjustment, the following procedure should be observed.

- Set the Selectivity Switch to FULL RANGE by turning the Treble Control knob clockwise as far as possible.
- Connect the output of an audio oscillator to the phonograph pickup socket on the radio chassis and adjust the oscillator to EXACTLY 10,000 cycles.
- Set the band selector to PHONO and adjust the 10 kc. trimmer for minimum output.
- If an audio oscillator is not available for making this adjustment, set the band selector to BDCST, connect an antenna to the receiver and set the gang condenser to a point between two stations on adjacent channels having approximately the same power. If the 10 kc. trimmer is out of adjustment, a whistle will be heard. Adjust the trimmer until the whistle is eliminated.

SETTING THE PUSH BUTTONS

- Loosen each of the push button knobs several turns.
- Select a station that is to be automatically tuned

Method for Removing Chassis from Cabinet
THE DATA ON THIS ENTIRE PAGE ALSO APPLIES TO THE CR-198 SERIES Model CR-197 radio chassis is designed for easy removal from the cabinet in which it is installed. As the radio panel is permanently fastened to the chassis, the control knobs need not be removed when the chassis is taken out of the cabinet for service.

To remove the chassis, first remove the antenna leads from their terminals and all plugs from the receptacles on the rear of the chassis. Then remove the two Phillips-head screws from the angular slots in the flange at the rear of the chassis. Lift the rear of the chassis about one inch and pull it straight back. Never remove the chassis tray from the cabinet—it has been properly positioned to bring the radio panel in place when the chassis is replaced. In replacing the chassis, slide it so that the small

ALIGNMENT PROCEDURE

On some models of the CR-197 chassis, the two i-f trimmers are located in the top of the respective i-f transformers, while in others one trimmer is accessible from the top and the other from the bottom of each transformer as shown in the layout diagram, Figure 7.

Broadcast Band Alignment

- Remove the signal generator lead from the 6SA7 grid and connect it to the radio antenna terminal through the .00025 mfd. capacitor. The link on the antenna terminal board must be set in the ANT position as shown in Figure 1.
- Check the tuning dial pointer adjustment. When the plates of the tuning condenser are completely meshed, the dial pointer must be in line with the last calibration mark at the low frequency end of the dial. If it is not, loosen the set screws in the hub of pulley "P" shown on Figure 3 and make the necessary adjustment.
- With the band selector still set for broadcast band reception, adjust the signal generator and the radio receiver to 600 kc. While rocking the gang condenser a few degrees to the right and to the left, adjust the 600 kc. oscillator paddler for maximum indication on the output meter.
- Set the signal generator and the radio receiver to 1400 kc., adjust the 1400 kc. oscillator trimmer, the 1400 kc. r-f trimmer and the 1400 kc. antenna trimmer for maximum output. If considerable adjustment was necessary, recheck the 600 kc. paddler setting.
- If the loop antenna trimmer is out of adjustment it should be set after the radio chassis is in the cabinet. Set the link on the antenna terminal board to the LOOP position as shown in Figure 2. Adjust the signal generator to 1400 kilocycles and connect its output to a loop containing approximately five turns of wire eight inches in diameter placed eighteen inches from the receiver loop and in the same plane.

The alignment of this receiver requires the use of an accurately calibrated r-f signal generator and an output meter. All trimmer locations are shown on the chassis layout diagram, Figure 7. The radio volume control should be turned to maximum and the signal generator output kept as low as possible during alignment to prevent the AVC from operating and giving false readings. Always set the Selectivity Switch to SHARP TUNE before aligning the i-f stages. This is done by turning the Treble Control counter-clockwise as far as possible.

I-F Alignment

- Connect the output of the signal generator to the oscillator grid (pin No. 5) of the 6SA7 tube through a .00025 mfd. capacitor. The ground on the signal generator should be connected to the radio chassis ground.
- Turn the condenser gang until it is completely meshed, (low-frequency end of dial calibration) and set the band selector switch to BDCST as for broadcast band reception.
- Adjust the signal generator to EXACTLY 455 kc. and peak the second i-f transformer and the first i-f transformer trimmers in that order.

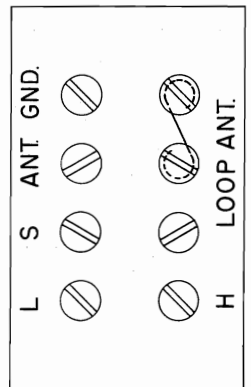


FIGURE 1

MODELS CR-197, CR-197A, CR-197B THE MAGNAVOX CO.
MODELS CR-198, CR-198A, CR-198B

DIAL CORD REPLACEMENT

Rotate the brass pulley designated "A" in Figure 3 until the dial pointer strikes the stop at the high frequency end of the dial calibration. In this condition the slot in pulley "A" should be approximately ten degrees to the left of being vertical—see Figure 3. If the slot in the pulley is in some other position under the above mentioned conditions, the pointer set screw is probably loose and has allowed the pointer to slip.

To correct this condition, first remove the glass dial and loosen the pointer screw. Then while holding pulley "A" so that its slot is approximately ten degrees to the left of vertical (when viewed from the rear) adjust the pointer until it is resting against the stop at the high frequency end of its travel. Then tighten the pointer set screw securely and replace the glass dial.

Completely unmesh the condenser gang and check the location of the hole or slot in pulley "D". If this hole is not approximately 45 degrees back from vertical as shown on Figure 3, loosen the two No. 6 Allen set screws in the hub of pulley "D" and slip the pulley on its shaft (while holding the condenser gang unmeshed) until the specified adjustment is obtained; then tighten one of the set screws securely. It will be shown later that this is a temporary setting. Next, tie a double knot in the exact center of a 25-inch length of dial cable and fold the cable back on itself so that the knot is at one end. The correct

method for tying this knot is shown as an inset on Figure 3. Grasp the cable near the knotted end and slide it into the pulley slot so that the knot is against the inside rim of the pulley as shown in the sketch. The piece of cable nearest the dial frame should be wound in the direction shown for one-half turn; then over the lower pulley "B" around the bottom of the large pulley "D" and into the hole. Pull the cable taut and wrap the end around the small hook on pulley "D" temporarily.

The remaining piece of cable should be wound around pulley "A" in the direction shown, for one complete turn, over the upper pulley "C", and over the top of pulley "D". Thread the end through the small hole in pulley "D" and pull both ends of the cable taut. With one end of tension spring "E" fastened to the hook on pulley "D", lace the two free ends of the cable through the opposite end of the spring and tie a knot at a point that will allow $\frac{1}{4}$ " to $\frac{5}{16}$ " of cable between the spring and the inside rim of pulley "D". Be sure to tie the knot around one coil of the spring in the manner shown.

Now with the condenser gang completely meshed, check the position of the dial pointer. If it is not in line with the last calibration mark at the low frequency end of the dial, loosen the set screw in pulley "D" and turn it until the pointer is in the specified position. Be sure that the condenser gang does not move during this adjustment. Then tighten the two screws in pulley "D", securely completing the operation.

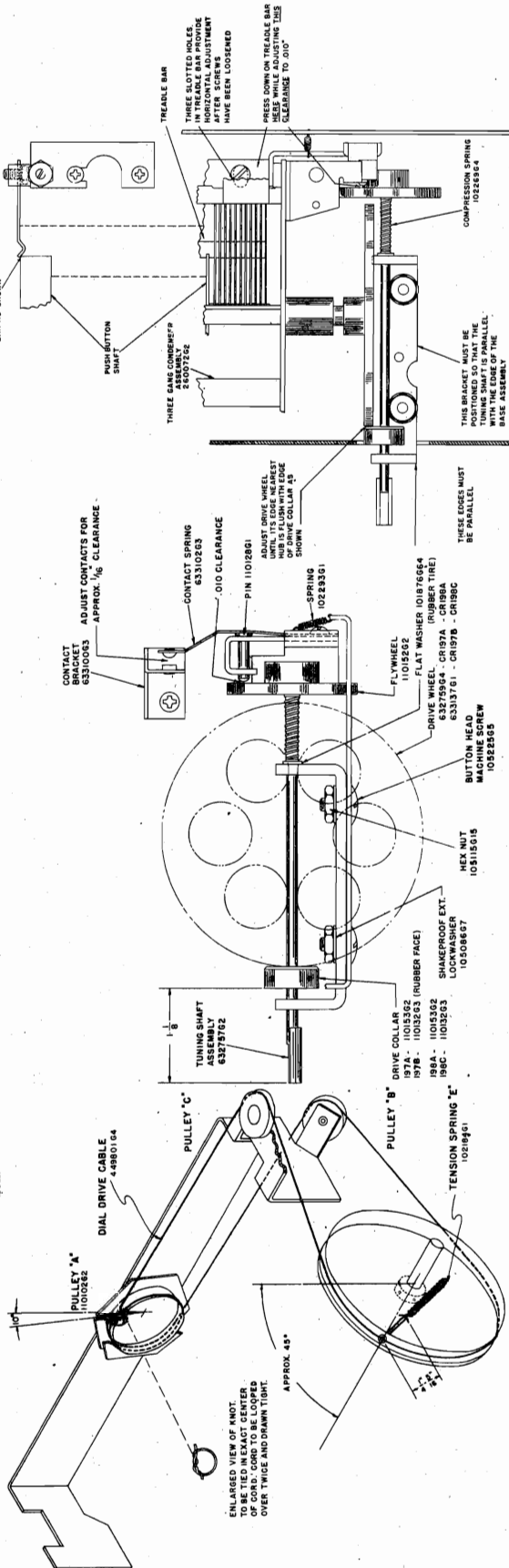
CONDENSER GANG DRIVE ADJUSTMENTS

Whenever any of the mechanical parts in the condenser gang drive assembly require replacement due to rough handling or for any other reason, it is extremely important that clearances and adjustments shown on Figures 4 and 5 are correct; otherwise, the tuning mechanism will be sluggish or it may slip during operation.

In reassembling the mechanism after any part was replaced, follow the procedure outlined below:

1. Assemble the Tuning Shaft, Drive Collar, Compression Spring and Flywheel in the order shown on Figure 5. The distance between the front of the Drive Collar and the front of the Tuning Shaft must be $\frac{1}{16}$ inches as specified on Figure 4. Install the Flywheel on the rear of the Tuning Shaft and slide it forward until it nearly touches the edge of the Drive Wheel; then tighten one of the set screws in the Flywheel hub. Insert a .010" gauge between the Flywheel and the Pin, and while holding the gauge in this position, loosen the set screw in the Flywheel hub that was previously tightened. The Compression Spring should force the Flywheel back against the gauge—when this occurs, tighten both set screws in the Flywheel hub.

2. Adjust the Muting Switch contact clearance by loosening the two screws in the Contact Bracket and sliding the bracket in the required direction until a $\frac{1}{16}$ " clearance is obtained. If this adjustment cannot be obtained in the manner prescribed, bend the Contact Bracket until proper clearance is realized.
3. The Drive Wheel is properly located on its shaft when its edge nearest the hub is in line with the outside edge of the Drive Collar as shown on Figure 5. Two Allen set screws in the Drive Wheel hub provide a means of adjusting the position of this wheel.
4. When the adjustment outlined in paragraph 2 is correct, the proper contact clearances will automatically be obtained when the Muting Switch is to be "unmuted" while the push buttons are being set. While pressure is applied to any one of the push buttons while they are being set up, a pressure applied simultaneously to the Tuning Control knob will cause the Muting Switch contacts to open. Detailed instructions on setting up these push buttons are shown elsewhere in this bulletin.
5. If the push button shafts at both ends do not engage the Treadle Bar as shown on Figure 5, the three screws in the Treadle Bar must be loosened and the Treadle Bar should be moved until the required condition is obtained.



THE MAGNAVOX CO. MODELS CR-197, CR-197A, CR-197B
MODELS CR-198, CR-198A, CR-198B

PARTS LIST

MODELS CR-197, CR-197A, CR-197B

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.	REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil Assembly, Antenna, two band	360273G1	48	Capacitor, electrolytic, 20 mfd, 25V	270027G2
2	Coil Assembly, r-f, two band	360274G1	55	Resistor, composition, 100 ohms, 1/4 W	230084G7
3	Coil Assembly, Oscillator, two band	360275G1	56	Resistor, composition, 150 ohms, 1/4 W	230084G8
4	Coil Assembly, 10KC filter	360278G1	57	Resistor, composition, 220 ohm, 2W ± 10%	230064G54
5	Transformer, First i-f	360024G1	58	Resistor, composition, 470 ohms, 1/2 W	230084G11
6	Transformer, Second i-f	360025G1	59	Resistor, composition, 470 ohms, 1/2 W	230084G11
7	Capacitor, Variable, three-gang, tuning	260071G1	60	Resistor, composition, 1500 ohms, 1/2 W	230084G14
	Push button assembly for 260071G1 capacitor	260063G1	61	Resistor, composition, 2200 ohms, 1/2 W	230084G15
8	Capacitor, Variable, two-gang trimmer	260021G1	62	Resistor, composition, 4700 ohms, 1/2 W	230084G17
9	Capacitor, Variable, two-gang trimmer	260021G1	63	Resistor, composition, 4700 ohms, 1/2 W	230084G17
10	Capacitor, Variable, two-gang trimmer	260021G1	64	Resistor, composition, 10,000 ohms, 1/2 W	230084G19
11	Capacitor, Variable, Oscillator padder	260067G3	65	Resistor, composition, 10,000 ohms, 1/2 W	230084G31
12	Capacitor, Variable, 10 KC trimmer	250008G1	66	Resistor, Wire wound, 10,000 ohms, 3 W ± 10%	240035G2
13	Capacitor, Ceramic, 20 mmf	250088G32	67	Resistor, composition, 15,000 ohms, ± 5%, 1/2 W	230084G187
14	Capacitor, Ceramic, 50 mmf	250088G24	68	Resistor, composition, 15,000 ohms, 2 W	230086G20
15	Capacitor, molded mica, 100 mmf ± 20%	250159G98	69	Resistor, composition, 15,000 ohms, 1 W	230085G20
16	Capacitor, molded mica, 100 mmf ± 10%	250159G82	70	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
17	Capacitor, molded mica, 220 mmf ± 20%	250159G100	71	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
18	Capacitor, molded mica, 220 mmf ± 10%	250159G100	72	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
19	Capacitor, molded mica, 330 mmf ± 10%	250159G88	73	Resistor, composition, 47,000 ohms, 1/2 W	230084G23
20	Capacitor, silvered mica, 330 mmf ± 10%	250159G88	74	Resistor, composition, 47,000 ohms, 1/2 W	230084G23
21	Capacitor, silvered mica, 490 mmf ± 1%	250085G32	75	Resistor, composition, 82,000 ohms, ± 10%, 1/2 W	230084G85
22	Capacitor, molded mica, 1000 mmf ± 20%	250160G82	76	Resistor, composition, 100,000 ohms, 1/2 W	230084G25
23	Capacitor, molded mica, 1800 mmf ± 10%	250160G67	77	Resistor, composition, 100,000 ohms, 1/2 W	230084G25
24	Capacitor, molded mica, 4700 mmf ± 2%	250160G5	78	Resistor, composition, 150,000 ohms, 1/2 W	230084G26
25	Capacitor, molded mica, 4700 mmf ± 2%	250160G5	79	Resistor, composition, 150,000 ohms, 1/2 W	230084G26
26	Capacitor, paper .005 mfd, 400V	250152G30	80	Resistor, composition, 220,000 ohms ± 5%, 1/2 W	230084G215
27	Capacitor, paper .01 mfd, 200V	250152G18	81	Resistor, composition, 270,000 ohms, ± 10%, 1/2 W	230084G91
28	Capacitor, paper .01 mfd, 200V	250152G18	82	Resistor, composition, 560,000 ohms, ± 10%, 1/2 W	230084G95
29	Capacitor, paper .01 mfd, 600V	250152G38	83	Resistor, composition, 1 megohm, 1/2 W	230084G31
30	Capacitor, paper .01 mfd, 600V	250152G38	84	Resistor, composition, 1 megohm, 1/2 W	230084G31
31	Capacitor, paper .015 mfd, 200V	250152G70	85	Resistor, composition, 1 megohm, 1/2 W	230084G31
32	Capacitor, paper .02 mfd, 400V	250152G26	86	Resistor, composition, 1 megohm, 1/2 W	230084G31
33	Capacitor, molded paper, .02 mfd, 600V	250129G3	87	Resistor, composition, 1 megohm ± 10%, 1/2 W	230084G98
34	Capacitor, molded paper, .02 mfd, 600V	250129G3	95	Control, Volume, 1 megohm	220044G23
35	Capacitor, molded paper, .02 mfd, 600V	250129G3	96	Control, Bass, 150,000 ohm with Power Switch	220045G61
36	Capacitor, paper, .03 mfd, 400V	250152G25	97	Control, Treble, 1 megohm with Band Expander Switch	220071G2
37	Capacitor, paper, .05 mfd, 200V	250152G15	98	Transformer, Power, 117 V., 50/60 cycle	30034G1
38	Capacitor, paper, .05 mfd, 200V	250152G15	99	Switch, Rotary, Band Selector	16012G1
39	Capacitor, paper, .05 mfd, 200V	250152G15	100	Antenna Loop Assembly	*
40	Capacitor, paper, .05 mfd, 200V	250152G15	101	Socket, FM Input	180060G1
41	Capacitor, paper, .05 mfd, 200V	250152G15	102	Socket, Phonograph Input	189741G1
42	Capacitor, paper, .1 mfd, 200V	250152G13	103	Socket, Phonograph Motor	180501G5
43	Capacitor, paper, .1 mfd, 400V	250152G22	104	Socket, Speaker	180504G16
44	Capacitor, paper, .1 mfd, 400V	250152G22	105	Socket, FM Power	180428G1
45	Capacitor, electrolytic, 10 mfd, 450V, 20 mfd, 25V	270023G6		Dial Glass Assembly	150291G1
46	Capacitor, electrolytic, 10 mfd, 450V, 20 mfd, 25V	270023G6			
47	Capacitor, electrolytic, 10-30 mfd, 450V	270023G2			

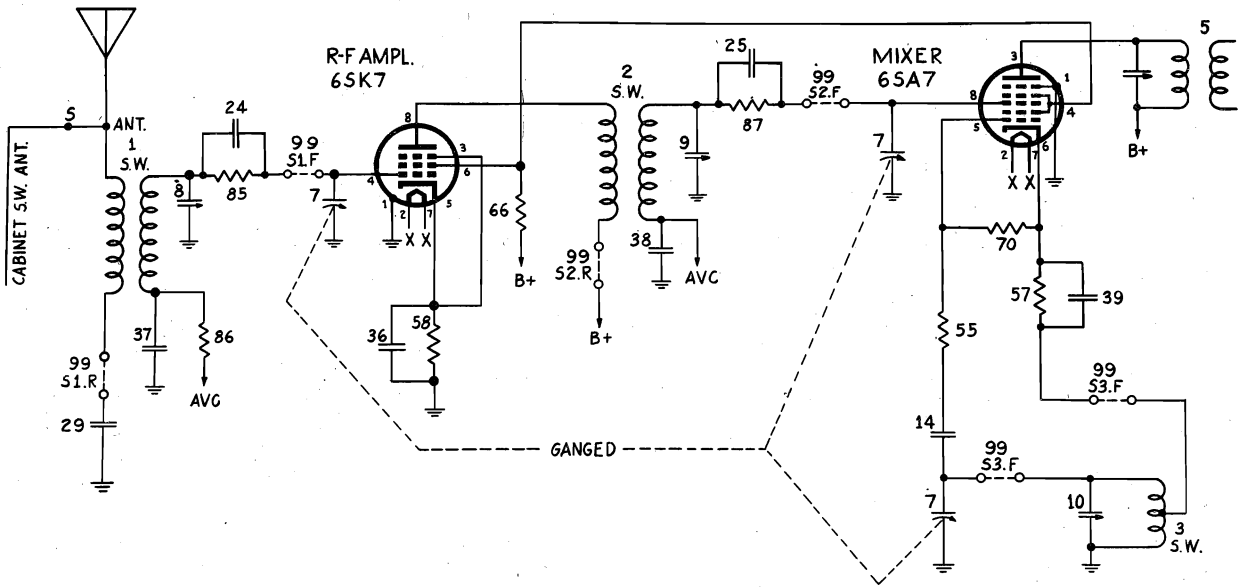
PARTS LIST

MODELS CR-198, CR-198A, CR-198B

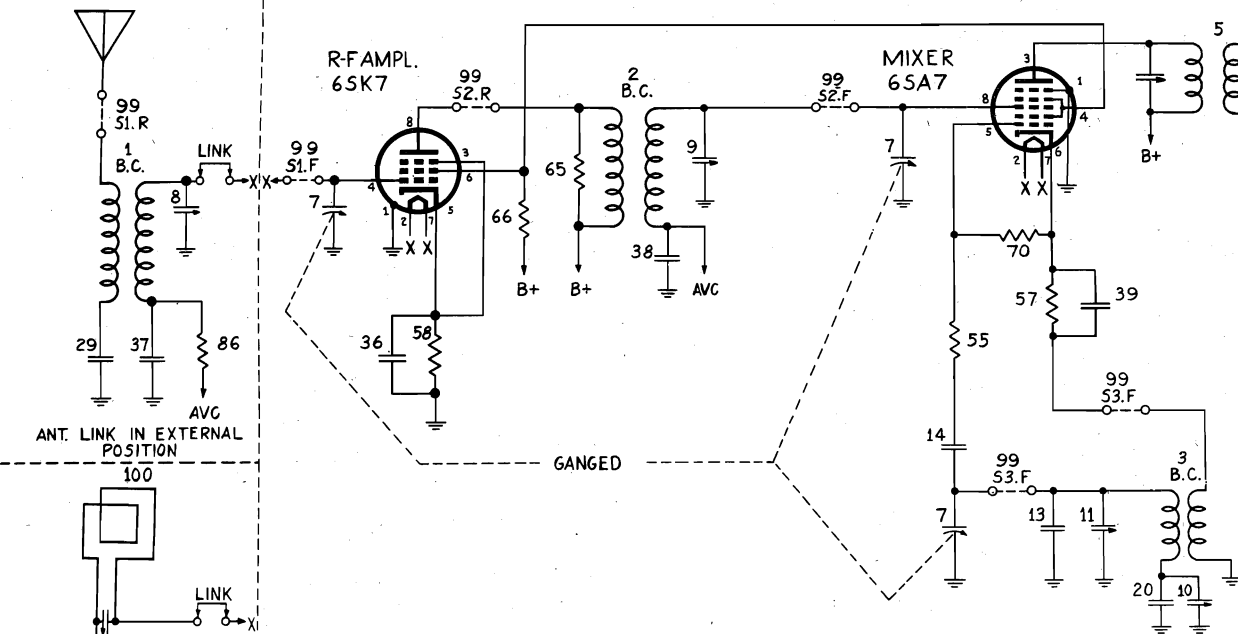
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4	Coil Assembly, 10KC filter	360278G1	58	Resistor, composition, 470 ohms, 1/2 W	230084G11
5	Transformer, First i-f	360024G1	59	Resistor, composition, 470 ohms, 1/2 W	230084G11
6	Transformer, Second i-f	360025G1	60	Resistor, composition, 1000 ohms, 2 W ± 10%	230064G62
7	Capacitor, Variable, three gang, tuning	260071G1	61	Resistor, composition, 1500 ohms, 1/2 W	230084G14
	Push Button assembly for 260071G1	260063G1	62	Resistor, composition, 2200 ohms, 1/2 W	230084G15
8	Capacitor, Variable, two gang trimmer	260021G1	63	Resistor, composition, 4700 ohms, 1/2 W	230084G17
9	Capacitor, Variable, two gang trimmer	260021G1	64	Resistor, composition, 4700 ohms, 1/2 W	230084G17
10	Capacitor, Variable, two gang trimmer	260021G1	65	Resistor, composition, 10,000 ohms, 1/2 W	230084G19
11	Capacitor, Variable, Oscillator padder	260067G3	66	Resistor, composition, 10,000 ohms, 1/2 W	230084G19
12	Capacitor, Variable, 10KC trimmer	250008G1	67	Resistor, Wire wound, 10,000 ohms, ± 10%, 3 W	240035G2
13	Capacitor, Ceramic, 20 mmf	250088G32	68	Resistor, composition, 15,000 ohms, ± 5%, 1/2 W	230084G187
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17	Capacitor, molded mica, 220 mmf ± 20%	250159G100	72	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
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19	Capacitor, molded mica, 330 mmf ± 10%	250159G88	74	Resistor, composition, 47,000 ohms, 1/2 W	230084G23
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22	Capacitor, molded mica, 1800 mmf ± 10%	250160G67	77	Resistor, composition, 100,000 ohms, 1/2 W	230084G25
23	Capacitor, molded mica, 4700 mmf ± 2%	250161G5	78	Resistor, composition, 150,000 ohms, 1/2 W	230084G26
24	Capacitor, molded mica, 4700 mmf ± 2%	250161G5	79	Resistor, composition, 150,000 ohms, 1/2 W	230084G26
25	Capacitor, paper .005 mfd, 400V	250152G30	80	Resistor, composition, 220,000 ohms, ± 5%, 1/2 W	230084G215
26	Capacitor, paper .01 mfd, 200V	250152G18	81	Resistor, composition, 270,000 ohms, ± 10%, 1/2 W	230084G91
27	Capacitor, paper .01 mfd, 200V	250152G18	82	Resistor, composition, 560,000 ohms, ± 10%, 1/2 W	230084G95
28	Capacitor, paper .01 mfd, 600V	250152G38	83	Resistor, composition, 690,000 ohms, 1/2 W	230084G30
29	Capacitor, paper .01 mfd, 600V	250152G38	84	Resistor, composition, 1 megohm, ± 10%, 1/2 W	230084G31
30	Capacitor, paper .015 mfd, 200V	250152G70	85	Resistor, composition, 1 megohm, 1/2 W	230084G31
31	Capacitor, paper .02 mfd, 400V	250152G26	86	Resistor, composition, 1 megohm, 1/2 W	230084G31
32	Capacitor, molded paper, .02 mfd, 600V	250129G3	87	Resistor, composition, 1 megohm, 1/2 W	230084G31
33	Capacitor, molded paper, .02 mfd, 600V	250129G3	88	Resistor, composition, 1 megohm, 1/2 W	230084G31
34	Capacitor, molded paper, .02 mfd, 600V	250129G3	95	Control, Volume, 1 megohm	220044G23
35	Capacitor, paper, .03 mfd, 400V	250152G25	96	Control, Bass, 150,000 ohm with Power Switch	220045G61
36	Capacitor, paper, .05 mfd, 200V	250152G15	97	Control, Treble, 1 megohm with Band Expander Switch	220071G2
37	Capacitor, paper, .05 mfd, 200V	250152G15	98	Transformer, Power, 117 V., 50/60 cycle	30035G1
38	Capacitor, paper, .05 mfd, 200V	250152G15	99	Switch, Rotary, Band Selector	16012G1
39	Capacitor, paper, .05 mfd, 200V	250152G15	100	Antenna Loop Assembly	*
40	Capacitor, paper, .05 mfd, 200V	250152G15	101	Socket, FM Input	180060G1
41	Capacitor, paper, .1 mfd, 200V	250152G13	102	Socket, Phonograph Input	189741G1
42	Capacitor, paper, .1 mfd, 400V	250152G22	103	Socket, Phonograph Motor	180501G5
43	Capacitor, paper, .1 mfd, 400V	250152G22	104	Socket, Speaker	180504G16
44	Capacitor, electrolytic, 10 mfd, 450V, 20 mfd, 25V	270023G6	105	Socket, FM Power	180428G1
45	Capacitor, electrolytic, 10 mfd, 450V, 20 mfd, 25V	270023G6		Dial Glass Assembly	150291G1
46	Capacitor, electrolytic, 10-30 mfd, 450V	270023G2			
47	Capacitor, electrolytic, 20 mfd, 25V	270023G2			

*The part number of the loop antenna assembly changes with different cabinets. It is therefore important that you specify the Style Number of the instrument when ordering a replacement loop antenna assembly.

"clarified schematics"



BAND-SWITCH SHOWN
AT 1ST POSITION
SHORT WAVE BAND
4.95-18.4 MC.



BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE
BROADCAST BAND
525-1630 KG.

FIRST ISSUE—JANUARY, 1947

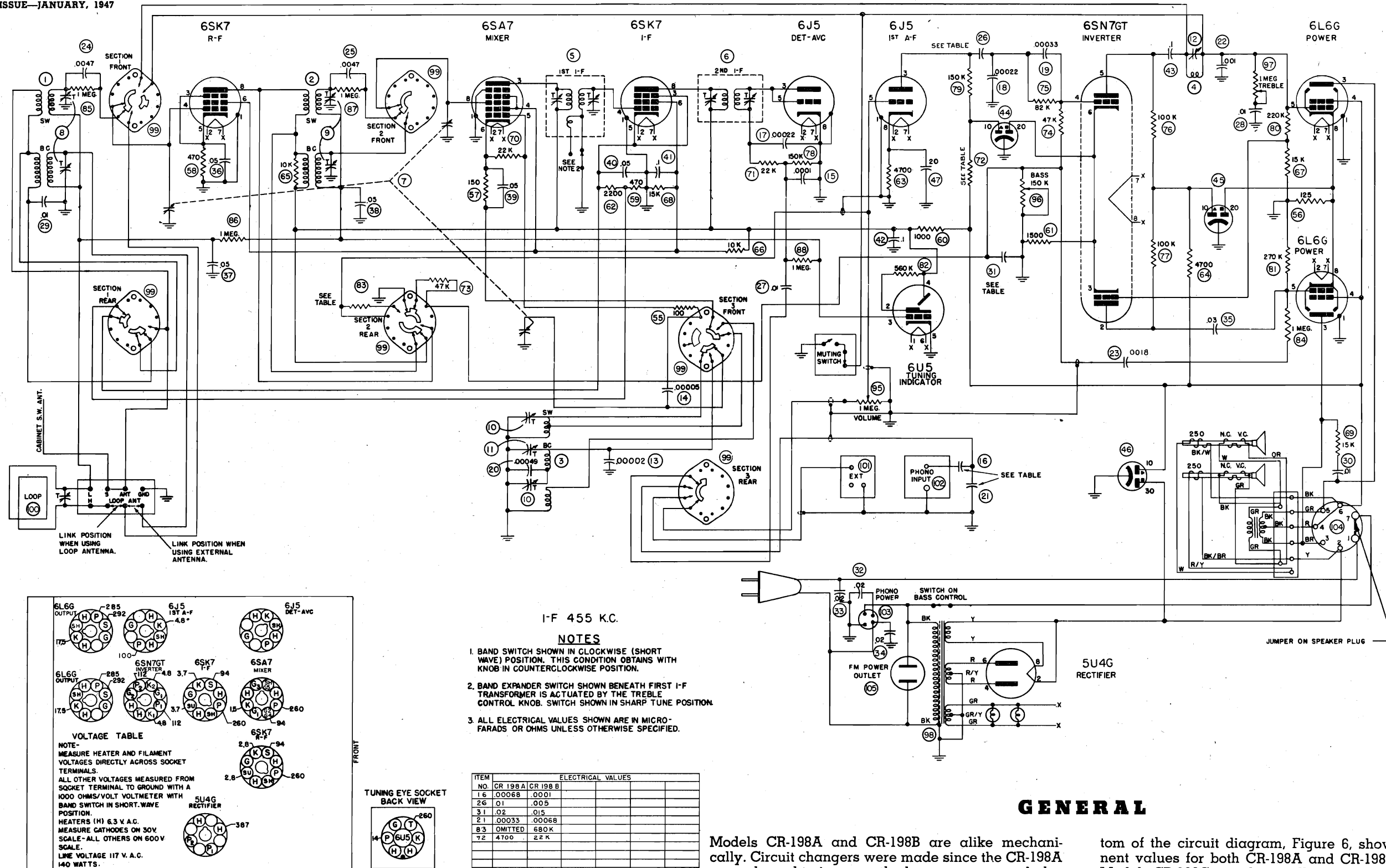


FIGURE 6

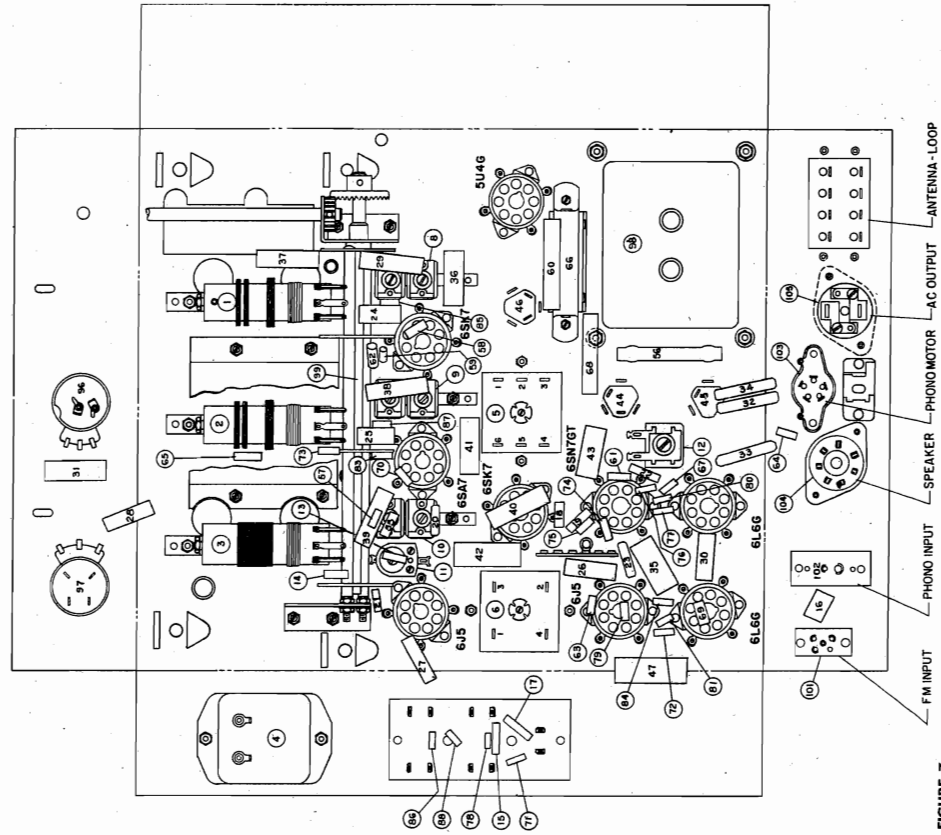


FIGURE 7

Detector and AVC..... 6I5
 First Audio..... 6I5
 Inverter..... 6SN7GT
 Power output (push-pull stage)..... (2) 6L6G
 Rectifier..... 5U4G
 Tuning Indicator..... 6U5
 Dial Lamps..... Mazda No. 44
 Speakers: No. 582815 No. 582847
 No. 250 ohms 250 ohms
 Field coil resistance..... 5.7 ohms 5.4 ohms
 Voice coil impedance (400 cycles)..... None 5,000/3 ohms
 Output transformer.....

SPECIFICATIONS

Power supply..... 117 volts 50/60 cycles AC
 Power consumption..... 140 watts
 Power output..... 20 watts
 Intermediate frequency..... 455 kc.
 Tuning frequency range:
 Broadcast band..... 525-1630 kc.
 Short Wave band..... 4.95-18.4 mc.
 Tubes: 6SK7
 RF Amplifier..... 6SK7
 Converter..... 6SA7
 IF Amplifier..... 6SK7

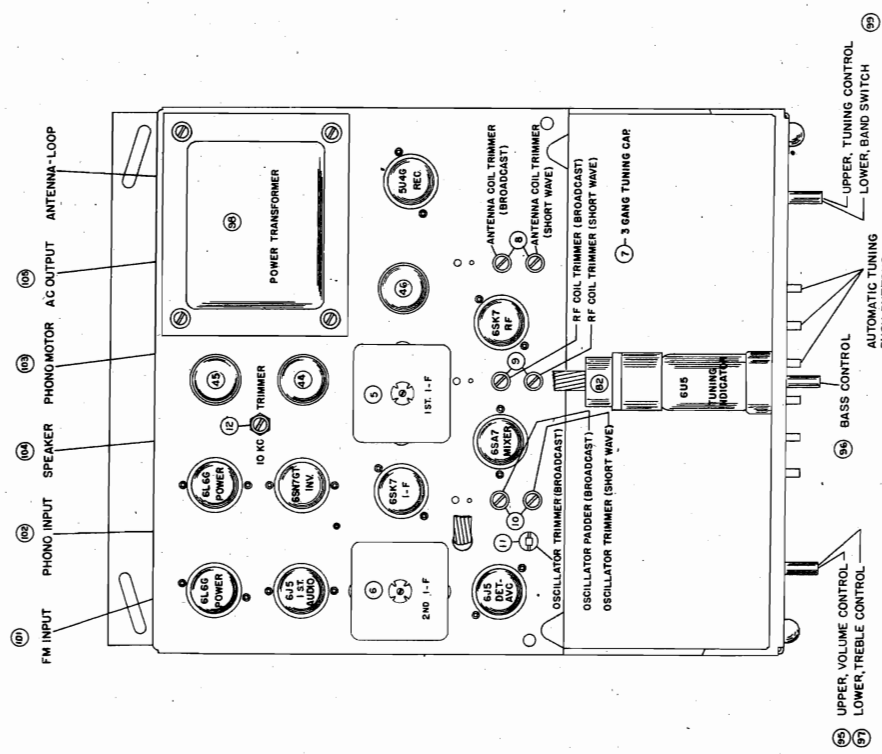


FIGURE 8

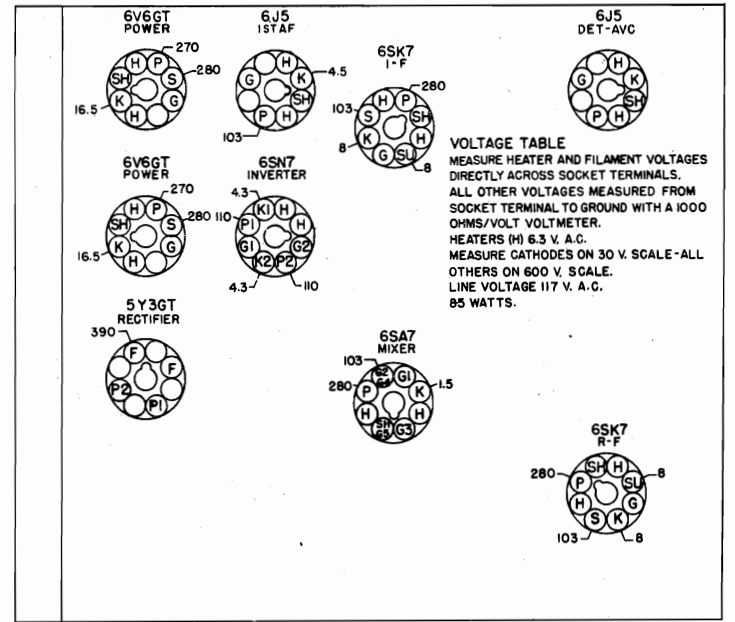
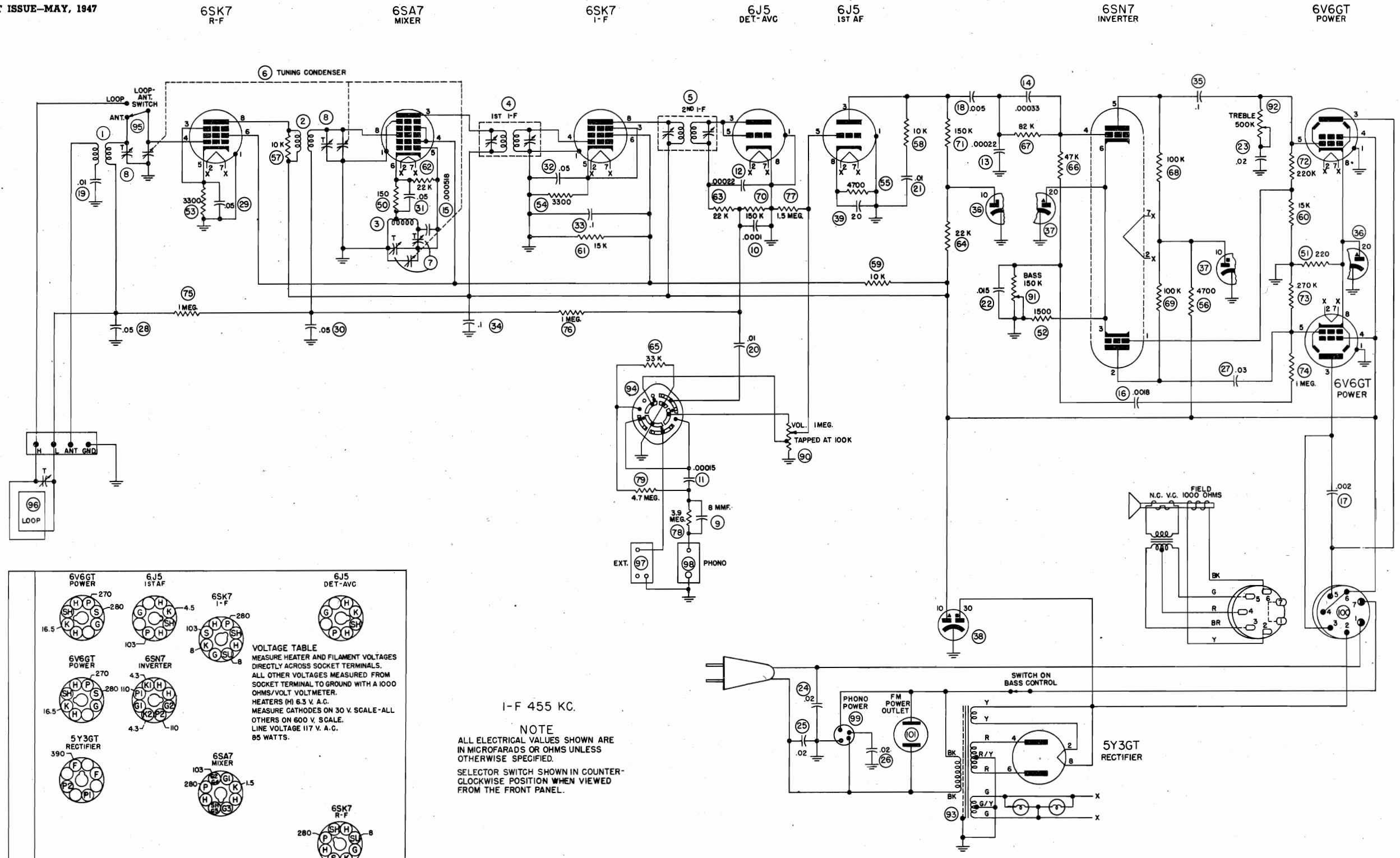
REFERENCE NO.	MAGNAVOX PART NO.	DESCRIPTION	MAGNAVOX PART NO.
54	230084G16	Resistor, composition, 3300 ohm, 1/2 W.	230084G16
55	230084G17	Resistor, composition, 4700 ohm, 1/2 W.	230084G17
56	230084G17	Resistor, composition, 4700 ohm, 1/2 W.	230084G17
57	230084G19	Resistor, composition, 10,000 ohm, 1/2 W.	230084G19
58	230084G19	Resistor, composition, 10,000 ohm, 1 W.	230084G19
59	240035G2	Resistor, wire wound, 10,000 ohm ± 10%, 3 W.	240035G2
60	230084G187	Resistor, composition, 15,000 ohm ± 5%, 1/2 W.	230084G187
61	230084G20	Resistor, composition, 15,000 ohm, 2 W.	230084G20
62	230084G21	Resistor, composition, 22,000 ohm, 1/2 W.	230084G21
63	230084G21	Resistor, composition, 22,000 ohm, 1/2 W.	230084G21
64	230084G21	Resistor, composition, 22,000 ohm, 1/2 W.	230084G21
65	230084G22	Resistor, composition, 33,000 ohm, 1/2 W.	230084G22
66	230084G23	Resistor, composition, 47,000 ohm, 1/2 W.	230084G23
67	230084G85	Resistor, composition, 82,000 ohm, ± 1/2 W.	230084G85
68	230084G25	Resistor, composition, 100,000 ohm, 1/2 W.	230084G25
69	230084G25	Resistor, composition, 100,000 ohm, 1/2 W.	230084G25
70	230084G26	Resistor, composition, 150,000 ohm, 1/2 W.	230084G26
71	230084G26	Resistor, composition, 150,000 ohm, 1/2 W.	230084G26
72	230084G215	Resistor, composition, 220,000 ohm, ± 5%, 1/2 W.	230084G215
73	230084G91	Resistor, composition, 270,000 ohm, ± 10%, 1/2 W.	230084G91
74	230084G98	Resistor, composition, 1 megohm, ± 10%, 1/2 W.	230084G98
75	230084G31	Resistor, composition, 1 megohm, 1/2 W.	230084G31
76	230084G31	Resistor, composition, 1 megohm, 1/2 W.	230084G31
77	230084G32	Resistor, composition, 1.5 megohm, 1/2 W.	230084G32
78	230084G105	Resistor, composition, 3.9 megohm, ± 10%, 1/2 W.	230084G105
79	230084G106	Resistor, composition, 4.7 megohm, ± 10%, 1/2 W.	230084G106
90	220074G1	Control, volume, 1 megohm with 100,000 ohm tap.	220074G1
91	220045G6	Control, bass, 150,000 ohm with power switch.	220045G6
92	220044G22	Control, treble, 500,000 ohm.	220044G22
93	300036G1	Transformer, power, 117 V. 50-60 cycle.	300036G1
94	160175G1	Switch, rotary, band selector.	160175G1
95	160176G1	Switch, slide, SPDT antenna loop.	160176G1
96	*	Antenna loop assembly.	*
97	180060G1	Socket, fm input.	180060G1
98	189741G1	Socket, phonograph input.	189741G1
99	180501G5	Socket, phonograph motor.	180501G5
100	180504G16	Socket, speaker.	180504G16
101	180428G1	Socket, fm power.	180428G1
97	150293G1	Dial glass assembly.	150293G1
101	180060G1	Socket, FM input.	180060G1
101	180428G1	Socket, FM power.	180428G1
	150293G1	Dial Glass Assembly.	150293G1

All resistor tolerances not given are ± 20%

REFERENCE NO.	MAGNAVOX PART NO.	DESCRIPTION	MAGNAVOX PART NO.
1	360279G1	Coil assembly, antenna.	360279G1
2	360280G1	Coil assembly, r-f.	360280G1
3	360281G1	Coil assembly, oscillator.	360281G1
4	363700G1	Transformer, first i-f.	363700G1
5	363700G1	Transformer, second i-f.	363700G1
6	260074G1	Capacitor, variable, three-gang tuning.	260074G1
7	260021G1	Capacitor, variable, two-gang trimmer.	260021G1
8	260078G1	Capacitor, variable, two-gang trimmer.	260078G1
9	250164G1	Capacitor, 8 mmf.	250164G1
10	250159G98	Capacitor, molded mica, 100 mmf. ± 20%.	250159G98
11	250159G84	Capacitor, molded mica, 150 mmf. ± 10%.	250159G84
12	250159G100	Capacitor, molded mica, 220 mmf. ± 20%.	250159G100
13	250159G100	Capacitor, molded mica, 220 mmf. ± 20%.	250159G100
14	250159G88	Capacitor, molded mica, 330 mmf. ± 10%.	250159G88
15	250085G35	Capacitor, silvered mica, 518 mmf. ± 1%.	250085G35
16	250160G67	Capacitor, molded mica, 1800 mmf. ± 10%.	250160G67
17	250152G44	Capacitor, paper, .002 mfd. 600 V.	250152G44
18	250152G41	Capacitor, paper, .005 mfd. 600 V.	250152G41
19	250152G18	Capacitor, paper, .01 mfd. 200 V.	250152G18
20	250152G18	Capacitor, paper, .01 mfd. 200 V.	250152G18
21	250152G27	Capacitor, paper, .01 mfd. 400 V.	250152G27
22	250152G15	Capacitor, paper, .015 mfd. ± 10%, 200 V.	250152G15
23	250152G17	Capacitor, paper, .02 mfd. 200 V.	250152G17
24	250129G3	Capacitor, molded paper, .02 mfd. 600 V.	250129G3
25	250129G3	Capacitor, molded paper, .02 mfd. 600 V.	250129G3
26	250129G3	Capacitor, molded paper, .02 mfd. 600 V.	250129G3
27	250129G25	Capacitor, paper, .03 mfd. 400 V.	250129G25
28	250152G15	Capacitor, paper, .05 mfd. 200 V.	250152G15
29	250152G15	Capacitor, paper, .05 mfd. 200 V.	250152G15
30	250152G15	Capacitor, paper, .05 mfd. 200 V.	250152G15
31	250152G15	Capacitor, paper, .05 mfd. 200 V.	250152G15
32	250152G15	Capacitor, paper, .05 mfd. 200 V.	250152G15
33	250152G13	Capacitor, paper, .1 mfd. 200 V.	250152G13
34	250152G22	Capacitor, paper, .1 mfd. 400 V.	250152G22
35	250152G22	Capacitor, paper, .1 mfd. 400 V.	250152G22
36	270023G6	Capacitor, electrolytic, 10 mfd. 450 V., 20 mfd. 25 V.	270023G6
37	270023G6	Capacitor, electrolytic, 10 mfd. 450 V., 20 mfd. 25 V.	270023G6
38	270023G2	Capacitor, electrolytic, 10-30 mfd. 475 V.	270023G2
39	270027G2	Capacitor, electrolytic, 20 mfd. 25 V.	270027G2
50	230084G8	Resistor, Composition, 150 ohm, 1/2 W.	230084G8
51	230064G54	Resistor, wire wound, 220 ohm, ± 10%, 2 W.	230064G54
52	230084G14	Resistor, composition, 1500 ohm, 1/2 W.	230084G14
53	230084G16	Resistor, composition, 3300 ohm, 1/2 W.	230084G16

THE MAGNAVOX CO.

FIRST ISSUE—MAY, 1947



I-F 455 KC.
 NOTE
 ALL ELECTRICAL VALUES SHOWN ARE IN MICROFARADS OR OHMS UNLESS OTHERWISE SPECIFIED.
 SELECTOR SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION WHEN VIEWED FROM THE FRONT PANEL.

FIGURE 2

MODELS 5A445, 5A445R

MAJESTIC RADIO & TELEV. CORP.

C20	220 MMFD. ± 20%, 500V	6-151
C18	.04 MFD + 20%-10%, 400V	5-58
T1	1ST I.F. TRANSFORMER	3-116
T2	2ND I.F. TRANSFORMER	3-117
L3	OSCILLATOR COIL ASSEMBLY	3-158
	OUTPUT TRANSFORMER	12-20
	SPEAKER	22-32
	DIAL SCALE	117-66
	DIAL CORD TENSION SPRING	129-29
	DIAL POINTER	135-14
	SWITCH, PHONO-RADIO	11-52
	LOOP ANTENNA AND BACK COVER	20-30
	KNOB-TUNING	128-54
	KNOB, RADIO-PHONO	128-55
	KNOB, VOLUME	128-56
	PILOT LIGHT JEWEL	127-205
	PILOT LIGHT SHIELD	23-45
	PILOT LIGHT, #47	26-2
	PHONO MOTOR RECEPTACLE	15-98
	CABINET, MODEL 5A445R	115-22
	ESCUTCHEON, MODEL 5A445R	122-38
	CABINET, MODEL 5A445	115-18
	DIAL CRYSTAL AND ESCUTCHEON, MODEL 5A445	122-33

C20
C18
T1
T2
L3

ITEM	DESCRIPTION	PART NO.
R1	22,000 OHM, 20%, 1/4 WATT	9-184
R2	220,000 OHM, 20%, 1/4 WATT	9-182
R3	3.3 MEGOHM, 20%, 1/4 WATT	9-206
R5	VOLUME CONTROL WITH SWITCH, 1/2 MEGOHM	13-28
R6	10 MEGOHM, 20%, 1/4 WATT	9-160
R7	330,000 OHM 20%, 1/2 WATT	9-89
R8	470,000 OHM 20%, 1/4 WATT	9-207
R9	150 OHM, 20%, 1 WATT	9-251
R10	1200 OHM, 10%, 1 WATT	9-216
R11	2200 OHM, 10%, 1/2 WATT	02-100
R12	18,000 OHM, 20%, 1/4 WATT	9-269
C1, C17		
C21	.01 MFD. + 40%-10%, 200V	5-57
C2, C3, C5	GANGED TUNING CONDENSER	7-24
C6, C7		
C10, C19		
C22	.05 MFD. + 40%-10%, 200V	5-40
C8, C9		
C12, C13	TRIMMER (PART OF GANG CONDENSER)	
C11	20-40 MFD 150V ELECTROLYTIC	19-24
C4	20 MFD ELECTROLYTIC CONDENSER 150V	19-32
C14	.002 MFD. + 40%-10%, 200V	5-52
C15, C16		

ALIGNMENT

BEFORE ALIGNING, SET THE DIAL POINTER SO THAT IT IS IN LINE WITH THE LAST MARK AT THE HIGH FREQUENCY END OF THE DIAL SCALE

WHILE ALIGNING THIS RECEIVER, TURN THE VOLUME CONTROL FULL ON, AND KEEP THE SIGNAL GENERATOR OUTPUT AS LOW AS POSSIBLE TO PREVENT AVC ACTION AND FALSE READINGS

STEP	DUMMY ANT.	TEST OSC. CONNECTION	TEST OSC. FREQUENCY	RECEIVER DIAL	ADJUST	REMARKS
1	.01 MFD	12SA7 GRID (PIN NO 5)	455 KC. MODULATED	ANY QUIET SPOT	C13, C12, C9, C8 FOR MAX. OUTPUT	REPEAT IN REVERSE ORDER
2	.....	LOOP*	1500 KC MODULATED	150	C5 FOR MAXIMUM OUTPUT	
3	.....	LOOP*	1500 KC MODULATED	150	C2 FOR MAXIMUM OUTPUT	ROCK GANG WHILE ADJUSTING
4	REPEAT COMPLETE ALIGNMENT PROCEDURE CAREFULLY					

* MAKE A TWO OR THREE TURN LOOP ABOUT 12 INCHES IN DIAMETER CONNECT TO OUTPUT TERMINALS OF THE SIGNAL GENERATOR PLACE THIS LOOP IN A PLANE PARALLEL TO THE RECEIVER LOOP ANTENNA AND ABOUT A FOOT AWAY FROM THE RECEIVER LOOP IMPORTANT: WHEN MAKING RF ADJUSTMENTS, THE RECEIVER LOOP ANTENNA SHOULD BE SPACED FROM THE CHASSIS EXACTLY AS WHEN THE RECEIVER IS IN THE CABINET

MODELS 7C432, 7C447
Chassis 4706, 4707

MAJESTIC RADIO & TELEV. CORP.

VOLTAGE TABLE

TUBE	PLATE	SCREEN	CATHODE
6SA7 (conv.)	244	74	--
6J5 (osc.)	244	--	--
6SK7 (I.F.)	244	74	1.6
6SQ7 (A.F.)	75		
6V6 (out)	268	243	11

NOTE: All voltages measured to ground with 1,000 Ohm per volt meter; line 117 v.a.c. values may vary 10 per cent.

CRITICAL LEAD DRESS:

- Green lead from r.f. coil on tuner to pin 8 of the 6SA7 socket should be dressed well over toward the 6J5 socket, around the ceramic condenser C2.
- Plate leads (BLUE) of both I.F. transformers should be laid down against the chassis.
- Grid leads (GREEN) of both I.F. transformers should be dressed up away from the chassis as far as possible.
- The .01 mfd. 400 v. condenser (C13) from the volume control to the 6SQ7 grid should be dressed as far over as possible toward the electrolytic condenser.
- The .005 mfd. 600 v. condenser (C17) from the 6V6 plate to ground should be dressed as far away from C13 as possible.

Before aligning, close the tuner (slugs fully into the coils). Set the pointer to extreme left-hand mark on the dial.

When making r.f. adjustments, connect to the output of the signal generator a loop, about 12 inches in diameter, consisting of two or three turns of wire. Place this loop in a plane parallel to that of the receiver loop antenna and about a foot away from it. The receiver loop antenna should be in about the same position relative to the chassis as it is when installed in the cabinet.

While aligning, keep the volume control full on and the signal generator output no higher than is necessary to obtain an output indication.

USE ONLY ALL PLASTIC OR FIBRE SCREWDRIVER ON THE 600 KC PADDING COIL. INSERTION OF THE SLIGHTEST BIT OF METAL INTO THIS COIL WILL DETUNE THE CIRCUIT.

STEP	DUMMY ANTENNA	TEST OSCILLATOR CONNECTION	TEST OSCILLATOR FREQUENCY	RECEIVER DIAL	ADJUST FOR MAXIMUM	NOTES
1	.01 MFD. 6SA7 GRID	455 KC	ANY QUIET SPOT	C10, C9 REPEAT IN REVERSE ORDER		
2	LOOP	1500 KC.	600 KC.	150	C3, C4	ROCK TUNER WHILE ADJUSTING
3	LOOP	1500 KC.	600 KC.	60	L3	DO NOT READJUST C3
4	LOOP	1500 KC.	1500 KC.	150	C4	
5	REPEAT STEPS 3 & 4					

PART NO.

5-40	.05 mfd., + 40% - 10% 200 volt, paper
6-159	47 mfd. 20% 500 volts, ceramic trimmers, part of tuning unit
5-77	.05 mfd., 30% 600 v. paper
5-39	1 mfd + 40% - 10% 200 volts, paper
6-151	Trimmers, part of T2
19-26	280 mfd. 20% 500 volts, mica
6-112	C10-10-20 mfd., 400-400-25 volts, electrolytic
6-132	.01 mfd., + 20% - 10% 200 volts, paper
5-61	.01 mfd., + 30% - 10% 400 volts, paper
6-159	.005 mfd 20% 600 volts, paper
5-57	47 mfd 20% 500 volts ceramic
9-184	.01 mfd., + 40% - 10% 200 v., paper
9-208	220 ohms, 20%, 1/3 watt
9-320	22,000 ohms, 10%, 1 watt
9-206	3.5 megohms, 20%, 1/3 watt
9-201	47,000 ohms, 20%, 1/3 watt
15-19	Volume control, .5 megohms
9-160	10 megohms, 20%, 1/3 watt
9-211	470,000 ohms, 20%, 1/2 watt
14-6	Tone control, 2 megohm, (with switch)
9-207	470,000 ohms, 20%, 1/3 watt
9-207	820 ohms, 10%, 1/2 watt
9-189	1,000 ohms, 20%, 1 watt
9-269	16,000 ohms, 20%, 1/4 watt
3-159	1st I.F. transformer, inc. C6 & C7
3-160	2nd I.F. transformer, inc. C9 & C10
12-27	Output transformer (chassis 4706)
12-26	Output transformer (chassis 4707)
2-16	Power transformer
32-1	Tuner assembly
22-20	Speaker, Model 7C432
22-26	Speaker, Model 7C447
20-23	Loop antenna assembly, Model 7C432
20-24	Loop antenna assembly, Model 7C447
11-52	Phono-radio switch
15-98	Phono motor receptacle
26-2	Pilot light, Mazda #47
128-50	Knobs
122-30	Escutcheon, Model 7C447
117-56	Dial scale, Model 7C432
117-59	Dial scale, Model 7C447
135-8	Dial pointer
129-29	Dial cord spring
S-1297	Dial cord assembly
115-7	Cabinet, Model 7C432
115-14	Cabinet, Model 7C447

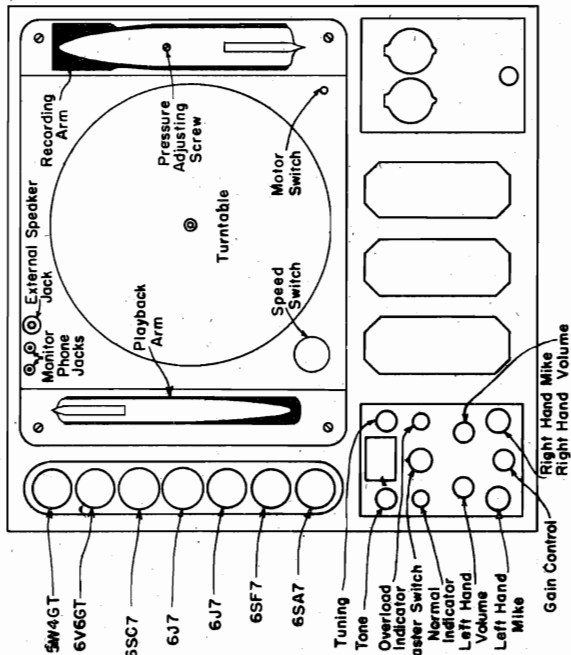
Model 7C447 - REMOVING CHASSIS FROM CABINET:

Always slide the chassis out through the BACK of the cabinet, NEVER through the bottom. On some cabinets there is a reinforcing block in the rear, lower left corner. Remove this block by removing the two wood screws before removing chassis.

MODEL 9-1065

MEISSNER MFG. DIV.
MAGUIRE INDUSTRIES INC.

- 92076Antenna coil (Loop)
- 01710Oscillator coil
- 02072Input I-F transformer
- 02074Output I-F transformer
- 19851Power transformer
- 19847Power transformer
- 19843D. P. S. T. wafers switch
- 198425 Position switch
- 19696Motor switch
- 19828Tone control with switch
- 19827Volume control
- 181622-gang Variable cond.
- 1612415-15 mfd. 450 wv. Electrolytic
- 2412610-10 mfd. 25 wv. Electrolytic
- 161138 mfd. 450 wv. Electrolytic
- 151431 mfd. 400 v. paper condenser
- 151421 mfd. 200 v. paper condenser
- 1418105 mfd. 400 v. paper condenser
- 1613601 mfd. 1000 v. paper condenser
- 1411001 mfd. 400 v. paper condenser
- 1810701 mfd. line condenser
- 1410200025 mfd. mica condenser
- 161984.5 ohm candohm resistor
- 15152100 ohm 1/4 w. resistor
- 141911,000 ohm 1/4 w. resistor
- 141941,500 ohm 1/4 w. resistor
- 1414310,000 ohm 1/4 w. resistor
- 1416920,000 ohm 1/4 w. resistor
- 1419020,000 ohm 1 w. resistor
- 14144100,000 ohm 1/4 w. resistor
- 14170200,000 ohm 1/2 w. resistor
- 14155500,000 ohm 1/4 w. resistor
- 181521 megohm 1/4 w. resistor
- 241272 megohm 1/4 w. resistor
- 171463 megohm 1/4 w. resistor
- 1816615 megohm 1/4 w. resistor
- 19846Dial Scale
- 19628Neon Indicators
- 19695Speaker
- 19821Motor turntable
- 19470Jack
- 19468Pin Jack
- 19855Microphone
- 19856Microphone Plug



POWER SUPPLY110-125 volts 50-60 cycles A.C.

OPERATING VOLTAGES

Below is given the voltage measured from the tube pins shown—to chassis, using a 1000 ohm per volt meter, line volts 117. It should be remembered that variations of as much as several percent from the voltages shown in the chart, do not necessarily indicate trouble, since variation in line voltage, variation of resistors within the allowable tolerance, etc. all effect the operating voltages.

POWER CONSUMPTION110 Watts including motor

INTERMEDIATE FREQUENCY456 KC

ALIGN1400 KC

PADNo adjustment necessary

NEON VOLUME INDICATORSGE T-2

DIAL LIGHTAny 6-8 Volt type—Bayonet Base

VOLTAGE CHART

Tubes	# 1 Pin	# 2 Pin	# 3 Pin	# 4 Pin	# 5 Pin	# 6 Pin	# 7 Pin	# 8 Pin
6SA7	—	—	260	80	—	—	6.3 AC	—
6SF7	—	—	—	80	—	260	6.3 AC	—
6J7	—	—	60 *	— †	.4	250	6.3 AC	.4
6J7	—	—	60 *	— †	.4	250	6.3 AC	.4
6SC7	—	125	—	—	125	1.7	6.3 AC	—
6V6 GT	—	—	230	260	—	—	6.3 AC	12.5
5W4GT	—	310	—	320AC	—	320AC	—	310

Note: Line voltage=117 volts * Measured on 1000 volt range. † Very low reading on 1000 volt range. Switch to be in RADIO position for all readings

MEISSNER MFG. DIV.-
MAGUIRE INDUSTRIES INC.

OPERATION

The following chart is designed to give the user of the Meissner Radio-Recorder a quick insight of the functions of the various controls. For best results the notes and instructions following the chart should be read and followed, since the chart alone cannot contain all the information essential to the proper use of the equipment.

In the top row of the chart are listed the five functions of the unit, corresponding to the five positions of the selector switch in the center of the control panel. In the left hand column are listed the different controls and other devices on the control panel. By glancing down any vertical column it can be immediately determined what con-

trols and indicators are in use for that position of the selector switch.

In operating the Meissner Radio-Recorder as a radio receiver, a record player, a recorder, or a public address system, there are certain precautions that must be observed and also several special hook-ups that may be used to get the best results and to take advantage of the full flexibility of which the unit is capable. These are listed under sub-headings following, and should be studied carefully before attempting to operate the equipment, and should also be referred to often until the user is fully acquainted with his equipment and all functions it will perform.

Position of Selector Switch	Radio Only	Phono Playback	Record Mike	Record Radio	Public Address
Tuning	Radio Tuning	_____	_____	Radio Tuning	_____
Tone	_____ Tone Control & Line Switch _____				
Normal and Overload	_____	_____	Volume Level Indicators	Volume Level Indicators	_____
Volume (Left Hand)	_____ Volume Control for Left Hand Mike _____				
Volume (Right Hand)	Radio Volume Control	Phono Volume Control	Volume Control for Right Hand Mike	Radio Volume Control	Volume Control for Right Hand Mike
Mike (Left Hand)	Input for Mike, External Radio, or External Phono				
Mike (Right Hand)	_____	_____	Input for Mike Ext. Phono Ext. Radio	_____	Input for Mike Ext. Phono Ext. Radio
Gain	_____ Gain Control for using different types of Microphones _____				

POWER SUPPLY

This Radio-Recorder is designed to operate from a 110-125 volt 50-60 cycle alternating current supply. Never attempt to operate it from other source of supply—serious damage to the equipment is almost sure to occur.

LINE SWITCH

The line switch for the unit is located on the tone control. The switch for the turntable is located in the front, right hand corner of the turntable base. The turntable will not operate unless both the master switch on the tone control and the motor switch are turned on.

ADJUSTMENT

CUTTER ARM HEIGHT

The cutter arm height is adjusted at the factory for a standard 5/8" stylus. If recoring blanks of the usual home recording type are used, the cutter arm height should not have to be changed. If recording blanks of unusual thickness are used, it will be necessary to re-adjust the cutter arm height. For instructions for performing this adjustment, refer to the section of this instruction sheet entitled SERVICE NOTES.

CUTTER ARM PRESSURE

Variation in the hardness of different record coatings may require different cutting pressures for different makes of records.

The normal depth of cut produces a width of groove approximately equal to the width of the uncut portion left between grooves. When changing kinds or make of records examine a portion of the new record after having made a trial cutting to see if it approaches this condition. If not, refer to the SERVICE NOTES of this sheet and make the proper adjustment according to the instructions given there.

REPRODUCING NEEDLES

In choosing the correct reproducing needles to use, it should be kept in mind that while most any good make of reproducing needle is satisfactory for reproducing commercial records, the same is not true with home recordings. The material used to make instantaneous recording blanks is necessarily softer than the material used in commercial records and is more easily damaged by a reproducing needle which is not properly made to fit the groove in the record. There are a number of good needles on the market made especially for reproducing instantaneous recordings and one of these should be chosen.

RECORDING SPEED

Two recording speeds are provided on the Meissner Radio-Recorder, 78 RPM and 33 1/3 RPM. In general it may be said that the 78 RPM speed is for quality, the 33 1/3 RPM speed for economy.

The 33 1/3 RPM speed is not recommended where the best fidelity is desired. It will be found that at the center of the record, made at this speed, music loses its brilliance and does not have the high frequency notes recorded faithfully. The same is true of speech recordings but to a much lesser degree, since the high frequencies contained in voice are negligible. Thus when recording long speeches the 33 1/3 RPM speed offers the advantage of being able to record for longer time intervals without interruptions to change records, as well as the advantage of record economy. For instance, a 10 inch record when operated at 78 RPM will record 4 1/2 minutes of program material, while at 33 1/3 RPM it will record 10 minutes of program material.

In other cases where the best fidelity is not essential, it may be found that the economy of the lower recording speed is more desirable than the better quality of the higher speed. The switch that controls the turntable speed is located on the front left-hand corner of the turntable base.

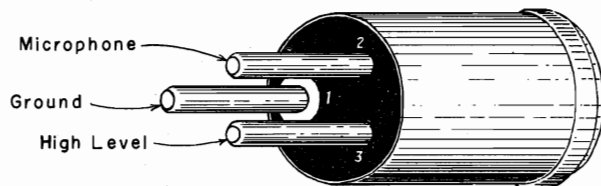
MODEL 9-1065

MEISSNER MFG. DIV.-
MAGUIRE INDUSTRIES INC.

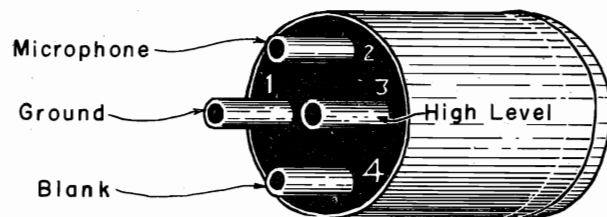
INPUT OTHER THAN MICROPHONES

In many cases it may be desirable to introduce external input to the amplifier other than that from the microphone. For either recording or Public Address work it may be desirable to feed in the output of (a) an external radio (b) FM Tuner (c) external phono pickup or other electronic devices. Such sources are considered high level inputs and the gain switch should be set accordingly.

Any high level input may be introduced into either of the mike jacks through a plug like the extra plug supplied with the unit and should be connected as shown below.



Some trouble may be experienced in the making of instrumental recordings. There may be heard what appears to be distortion but due to the fact that the ordinary room does not have the acoustical properties of a recording studio there will be room reverberation. The ear does not notice this at the time but the microphone will. Frequently this trouble is corrected by the use of contact microphones. Placed directly on the sounding boards of the instrument, (Piano, Violin etc.), it gives a true reproduction of the tones and overtones produced by the instrument.



CUTTING ARM ADJUSTMENTS

CUTTING ARM HEIGHT

1. Place on the turntable an uncut record of the type that is to be used for recording.

2. Place stylus in the cutting head. Insert it as far as it will go, rotate it until the long flat on the shank of the stylus faces the stylus screw, then firmly tighten the screw.

3. Raise the cutter arm well up from its rest, swing it over the record and carefully lower it so that the stylus rests on the record near the center (which should not be revolving). Observe the position of the stylus screw in the slot in the cutter arm. If the screw is approximately in the middle of the slot no adjustment of the cutter arm height is required, but if the stylus screw is close to either the top or the bottom of the slot the arm should be adjusted in the following manner:

(a) Lift the cutter arm into a vertical position. Underneath the arm will be found a machine screw on which the arm rests. The adjustment of this screw is preserved by a lock nut. Loosen the lock nut and rotate this screw until the stylus screw occupies the center position in the slot when the cutter arm is in the recording position, then tighten the lock nut and again check the position of the stylus screw to see that the adjustment has not been disturbed by tightening the lock nut.

(b) Cut a few blank grooves (volume control at zero) while watching the stylus screw to see that as the record revolves, the stylus screw does not approach either end of the slot. If this condition holds true, the height of the cutter arm is properly adjusted until a new stylus is used having a length a great deal different than the stylus used in the original adjustment, or unless records of a new thickness are used that are sufficiently different from the original rec-

ords to require readjustment of cutter arm height. NEVER ATTEMPT TO MAKE A RECORDING WITH MORE THAN ONE DISC ON THE TURNTABLE.

If the normal position of the screw is too high, the entire weight of the cutting arm is placed on the stylus when the stylus screw hits the top of the slot. This heavy weight will cause the stylus to dig into the record base and ruin at least the record and in all probability the stylus as well.

CUTTING PRESSURE

Variation in the hardness of different record coatings may require different cutting pressures for different makes of records.

The normal depth of cut produces a width of groove approximately equal to the width of the uncut portion left standing between grooves. Examine the blank grooves cut during the preliminary adjustment to see whether they approach this condition. If not, the adjusting screw exposed through the top of the cutting arm can be changed quite easily to accomplish the desired result. If the cut is too light, the playback needle may not "track" and may jump out of the groove and scratch across the record. If the cut is too heavy the stylus may cut over into the adjacent groove on loud notes, or in cutting one groove, the stylus may push some of the wall material into the previously cut groove producing what is called an "echo", although when played back the "echo" precedes rather than follows the normally recorded sound.

The most common error in adjusting cutting pressure is making the cutting pressure greater than necessary, which increases the wear on the stylus, increases echo, and increases the difference in speed between recording and playback.

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MAKING A RECORD

The first attempt at cutting a record may best be done by recording from the microphone. After having plugged the microphone into the left-hand mike jack, turn on the line switch and set the selector switch to "Record Mike", speak into the microphone in a normal tone of voice about four to six inches away from it and adjust the left hand volume control until the "normal" neon indicator is flashing most of the time but the "overload" neon indicator flashes only occasionally. Touch a finger lightly to the needle in the cutting head and you will feel the needle vibrate in accordance with the sound impressed on the microphone.

In placing the recording disc on the turntable make certain that the drive pin enters the hole provided for it in all recording discs. NEVER PUT ON OR REMOVE A DISC WHILE TURNTABLE IS ROTATING. To do otherwise will injure the drive mechanism. ALWAYS HAVE TURNTABLE IN MOTION BEFORE LOWERING CUTTING STYLUS DOWN ON DISC as the stylus may easily be damaged if this care is not taken.

Pick up the cutting head, swing it over the record and lower it gently onto the record at the desired starting point. Permit two or three grooves to be cut before beginning the recording so that when the record is played back it will not be essential that the pickup start at the beginning of the first groove in order to reproduce the beginning of the recording. During the entire recording very careful attention should be paid to the volume indicators as explained in the section "Volume Indicators." Note: The mechanism which traverses the cutting head is engaged when the cutting head is lowered onto the record. Never attempt to force the cutting head sideways. Lift it first, which will disengage the cross-feed mechanism and allow the arm to be swung freely into any desired position. Lowering the arm onto its rest does not engage the cross-feed because the mechanism does not operate at such a great radius. For the same reason, the recorder will not cut 12 inch discs.

When the recording is finished, the "thread" that the stylus has cut out of the disc must be removed before the record is played. The best device for this purpose is a camels hair brush with which the thread is "picked up" rather than merely brushed to the center for manual removal, but if no brush is available, a wad of cotton, a piece of soft cloth or even a finger drawn lightly over the disc may be used to gather the thread around the spindle where it can be easily removed. The "thread" should be deposited in some fireproof container since many of the "Instantaneous Recording" discs are coated with highly inflammable cellulose nitrate (celluloid) although there are others coated with cellulose acetate (safety film) which do not require such precautions. It is very wise operating procedure to assume that all "threads" are inflammable and to dispose of them accordingly.

EXTERNAL ANTENNA

A built in loop antenna is supplied with the unit. This antenna should give excellent results in localities reasonably near the stations to be received. However, in some localities the performance of loop antennas is not entirely satisfactory and for this reason provision has been made for connecting an external antenna.

A lead will be found in the microphone compartment to which an external antenna may be connected. No ground connection is necessary.

PUBLIC ADDRESS SYSTEM

The amplifier in the unit has ample power for many applications as a public address amplifier. When coverage of an area greater than that of a medium sized room in a home is desired, it is best to use an external speaker connected as explained under EXTERNAL SPEAKERS. Such a speaker should be mounted in a baffle or carrying case and a little experiment in its placement will soon show how best results may be obtained.

When using the unit as a public address system, it will be found that if the speaker is operated near the microphone the sound from the speaker will feed back into the microphone causing a "howl". This is true in any PA system and may be remedied by (a) removing the loud speaker farther from the microphone (b) reducing the volume (c) using a directional microphone turned so that its direction of greatest pickup is away from the loud speaker.

EXTERNAL SPEAKER

If it is desired to use an external speaker instead of the one in the unit, provision is made for doing so. The voice coil of an external speaker may be plugged into the phone plug jack located on the back side of the turntable base. The voice coil impedance of the external speaker should be 6 to 8 ohms. This cuts out the internal speaker voice coil and substitutes the voice coil of the external speaker. An external speaker so used must either be of the permanent magnet type or of the electrodynamic type with self-contained field supply.

The advantages of such an arrangement are that for use as a public address system, the speaker may be placed in a remote position away from the amplifier to get better sound coverage in a room or building, at the same time, reducing the tendency for microphonic feed back from the speaker to the microphone when high output is desired.

MIXING

The input from the left hand mike jack may be superimposed on any other input to the system at any time by merely turning up the left hand volume control. The input from this jack may be fed in any time regardless of the setting of the selector switch. Before attempting to make a recording by mixing in the input from this channel, it will be well to do a little experimenting with the setting of the two volume controls to assure that the signals from the two input channels have the correct relative levels when they reach the cutting head. This may be done by adjusting each volume control while the other is turned to zero, adjusting to the correct level by observing the neon indicators and noting the setting of the volume control knob. After the correct setting for each has been determined in this way, set each volume control knob to its correct position and make the recording.

MICROPHONES

Microphones in general, as far as sensitivity is concerned, may be divided into two classes: (a) High level and (b) Low level. Ordinarily quality microphones will be found to fall in the low level classification. The crystal microphone supplied with this unit is this high quality low level type. The single button carbon type with transformer and battery and the contact microphones are high level microphones. Other high level sources will be discussed under the head, input other than microphone.

A gain switch has been provided to allow the use of high or normal input to the amplifier. When recording with a low level input the gain switch should be set on the High Gain position and when using a high level input, it should be set on the normal gain position.

RE-RECORDING

Many novel effects may be obtained by Re-Recording, that is after a record is cut it may be placed on an external record player, the output of whose pickup head is fed into the right hand mike jack of the recorder. This should be fed in by a specially wired plug as shown above. As the record is being played on the record player and re-recorded on

the Recorder, input from the Recorder microphone may be superimposed on it by turning up the left hand volume control. As an example of the novel effects obtainable, a person might record a song, re-record it, mixing in his own voice while re-recording, thus sing a duet with himself.

MODEL 9-1065

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RECORDING STYLI

Recording styli are made of three general types of material, ordinary hard steel, special tool steel and alloy such as Stellite or equivalent, or they may be made of the still harder material, sapphire. When samples of all three types of styli are in good condition, it can usually be demonstrated that the steel styli, either regular steel or tool steel, produce about equal surface noise, while the sapphire stylus will usually produce less.

The advantage of the special alloy steel stylus over the regular steel stylus is longer playing life, but this is accomplished at a sacrifice in ability to withstand abuse. The same thing applies to sapphire styli only to a much greater extent because the sapphire is quite brittle and can easily be chipped.

The two accidents most likely to damage a stylus are:

- (1) Dropping the cutting arm so that the stylus strikes some surface thereby chipping or breaking the stylus.
- (2) Cutting through the record coating into the base material.

The latter may be caused by poor quality or damaged records, either by cutting through thin spots that may exist, or by digging in after the stylus has been thrown off of the record surface by bumps or hard spots.

From the foregoing, it seems that in general home recording service, especially if the equipment may be handled by many people, as at parties, amateur dramatics, amateur concerts etc., it is more economical to use good quality regular steel styli that can be discarded without regret if accidentally damaged, rather than to invest in a supposedly long-lived high priced stylus, whose life may be greatly shortened by the careless act of some well meaning but uninformed person.

RECORD BLANKS

The Meissner Radio-Recorder is designed to cut records up to 10 inches in diameter and to play records up to 12 inches in diameter.

"Instantaneous Recording" phonograph discs are comparatively new and consequently their manufacturer is far from being standardized. The only rule for selection is that of experience, either personal or that of your dealer. The record that performs best for you on your recorder is the best for you to use. Concentrate on that particular brand if you wish to produce consistently good recordings.

The most important characteristics of a record are listed below to be used as a guide in comparing and selecting records:

1. The blank should cut a clean shiny groove and produce a continuous thread. Records which produce a rough and dull looking groove, or which powder the material cut out of the groove, or which break the thread up into many pieces, or that produce a "sticky" thread, are not good records.

2. The "needle scratch" should be low. Generally the record producing the smoothest looking grooves will give the lowest needle scratch, but a more reliable method of testing is to cut a few blank grooves at the same radius with the same stylus on each of the records to be compared, and then to play them successively with the same setting of the volume control for all records, selecting the one producing the least volume of scratch, provided that its other characteristics are acceptable.

3. "Rumbel" is produced on some records having very flexible base materials. This is especially true of paper records. It is almost axiomatic that if a high quality recording is desired a paper (or other very flexible) base record should not be used, however, because of the economy that such discs offer they probably will enjoy the maximum volume of sale.

4. The "ageing" characteristics of records is a factor influencing the production of consistently good recordings but is somewhat difficult for the home recordist to check unless he is on the lookout for such differences and is a keen observer. Some records cut beautifully at a certain age and less well both before and after that time. Others cut well only when relatively fresh, while still others will not cut well until they have aged some time. This ageing characteristic may explain why a certain make of record may give excellent results at one time and not at another.

5. High Frequency Response is a characteristic in which wide variation can be expected. The variation between some makes of records is so great that only the most casual listening test is required to distinguish the record with good high-frequency response from that with poor high-frequency response. Such a test should, of course, be made with the same stylus, the same type of program, and the same type of play-back needle. Preferably the test should be made with live program material having a reasonable percentage of high-frequency notes. If the program is obtained from

the radio, the tuning should be adjusted to produce a reasonable percentage of high notes and should not be changed between the several test runs because the tuning of most sets has a considerable influence on the high-frequency response.

6. Groove depth should be uniform. If there is any great difference in cutting depth a definite "pattern" will be evident on the record and the variable load on the motor will tend to produce a "wow" or unsteadiness in tone.

VOLUME INDICATORS

ONE OF THE MOST IMPORTANT PHASES OF RECORDING IS CLOSE ATTENTION TO THE PROPER RECORDING VOLUME. THE BEST OPERATION IS OBTAINED WHEN THE "NORMAL" NEON INDICATOR IS LIT AS MUCH OF THE TIME AS POSSIBLE WHILE THE "OVERLOAD" NEON INDICATOR FLASHES ONLY AT RARE INTERVALS. A close control of program level is required to achieve such results but every bit of effort expended in the attempt will be well worth while.

If the volume is too high, it will cause distortion to be recorded on the disc. Once this distortion is recorded, no playback amplifier, however perfect it may be, can reproduce the program without distortion. Too much volume while recording will also cause overcutting, that is cutting into an adjoining groove, and may damage the cutting stylus itself.

If the recording level is too low, the surface noise is exaggerated and the playback has to be made with a high setting of the volume control. In the extreme case of very low recording volume, the volume control on playback may have to be set so high that a low frequency "microphonic howl" may be set up that can be eliminated only by turning down the volume control or by playing the record on an electric phonograph that has the speaker well isolated from the turntable and pickup.

When a musical program of a limited range of volume levels is being recorded, the volume control should be set so that the maximum volume operates the "overload" indicator only at very rare intervals. If the program has a very wide range of level, the volume will have to be turned up somewhat in the softest passages and reduced in the loudest passages. Such a practice is standard in professional recording and is the only way in which, for example, the tremendous volume range of a symphony orchestra from a single instrumental solo to full orchestra can be recorded without having the loud passages "cut over" into adjacent grooves, or having the softest passages covered up by needle scratch.

It will be helpful when recording to keep in mind that the volume indicators are giving a direct indication of the volume level being applied to the cutting head.

TONE CONTROL WHEN RECORDING

The setting of the tone control when recording is partly a matter of choice and preference of the operator but it might well be pointed out here that usually the most satisfactory recordings are made with the tone control turned to the counter-clockwise position. There are exceptions to this and the operator, after a little experience in handling the equipment will learn what setting of the tone control is required for any particular set of conditions.

MONITORING

There are several conditions under which it is desirable to be able to listen to the output of the amplifier when the speaker must of necessity be in-operative. The one such condition most commonly encountered is when recording from the self contained radio receiver, and is automatically taken care of in the switching. When the selector switch is turned to the "Record Radio" position, the speaker is put into the circuit but is operated at reduced volume. Thus the operator may hear the program material at the same time it is being recorded and can determine when the recordings should be stopped etc.

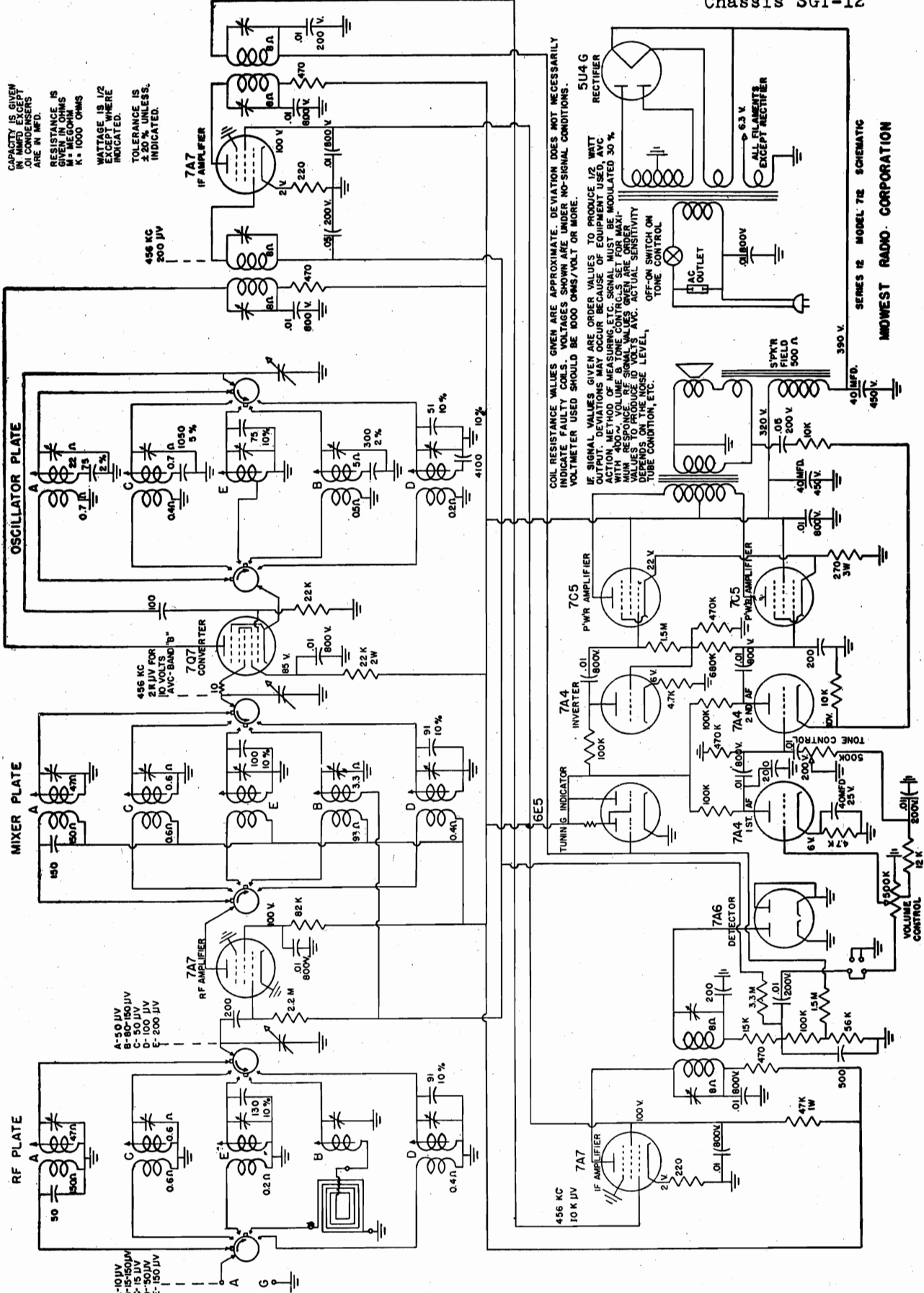
Other conditions under which it may be desirable to monitor the amplifier output are:

1. When recording from an external radio.
2. When recording from two mikes. The operator may desire to listen to the actual signal that is being applied to the cutting head to keep the levels from the two mikes equal.
3. When operating as a PA system using a remote speaker. If the remote speaker is located some distance away or in another room, the operator can use monitoring phones to adjust volume level etc.

Provision is made for plugging in high-impedance headphones for monitoring. They should plug into the Phone tip jacks located on the left hand rear side of the turntable base. Only high impedance phones should be used.

MIDWEST RADIO CORP.

MODEL 712; Series 12:
S-12, ST-12, SG-12;
Chassis SGT-12

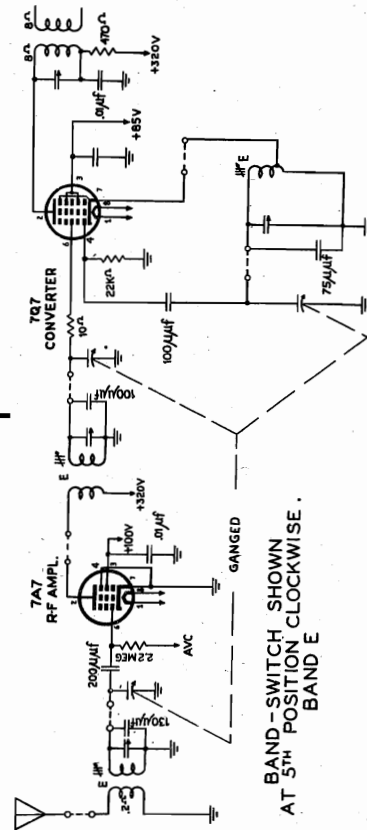
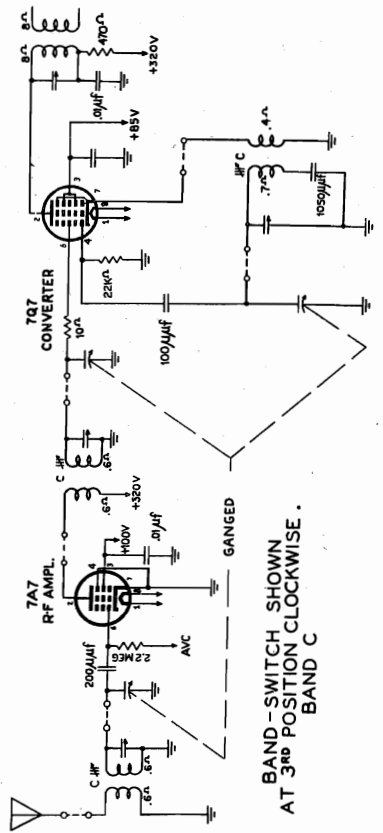
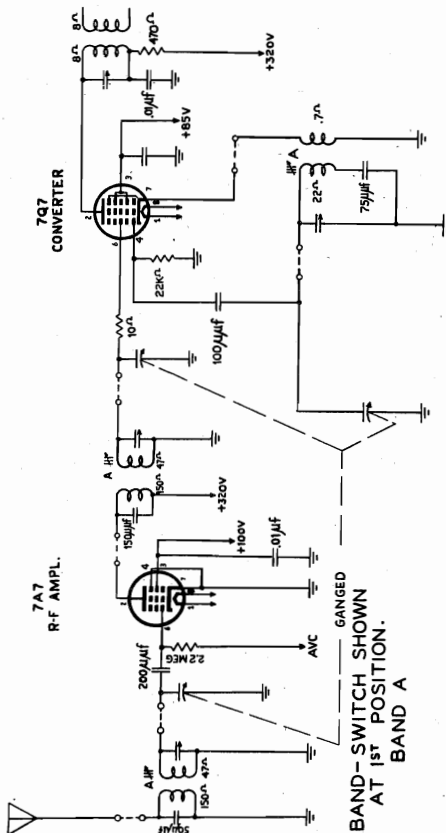
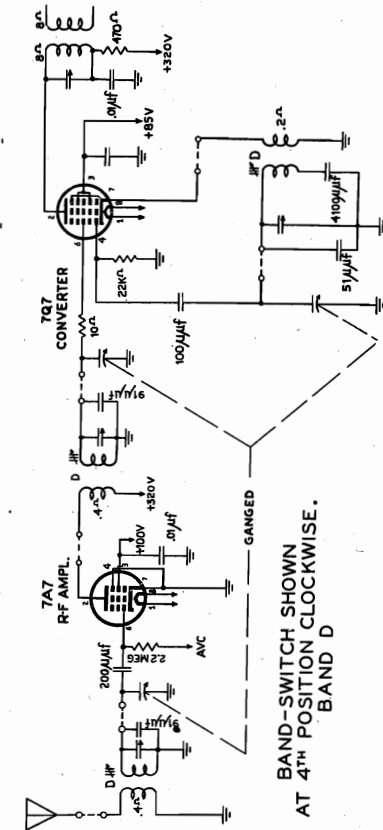
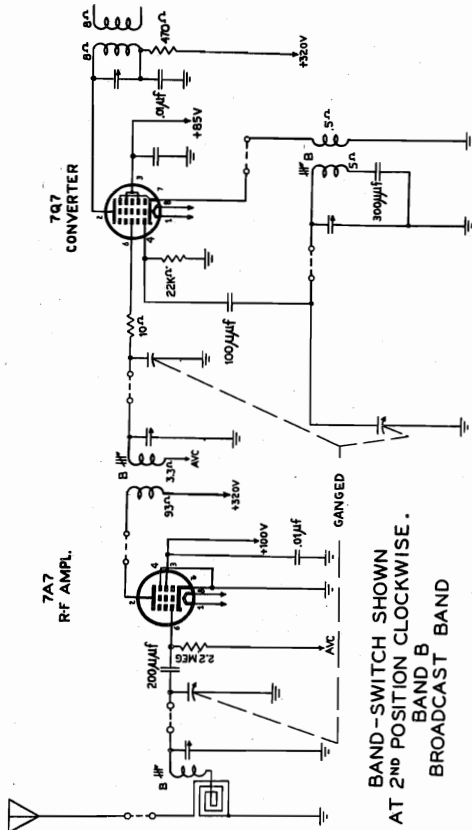


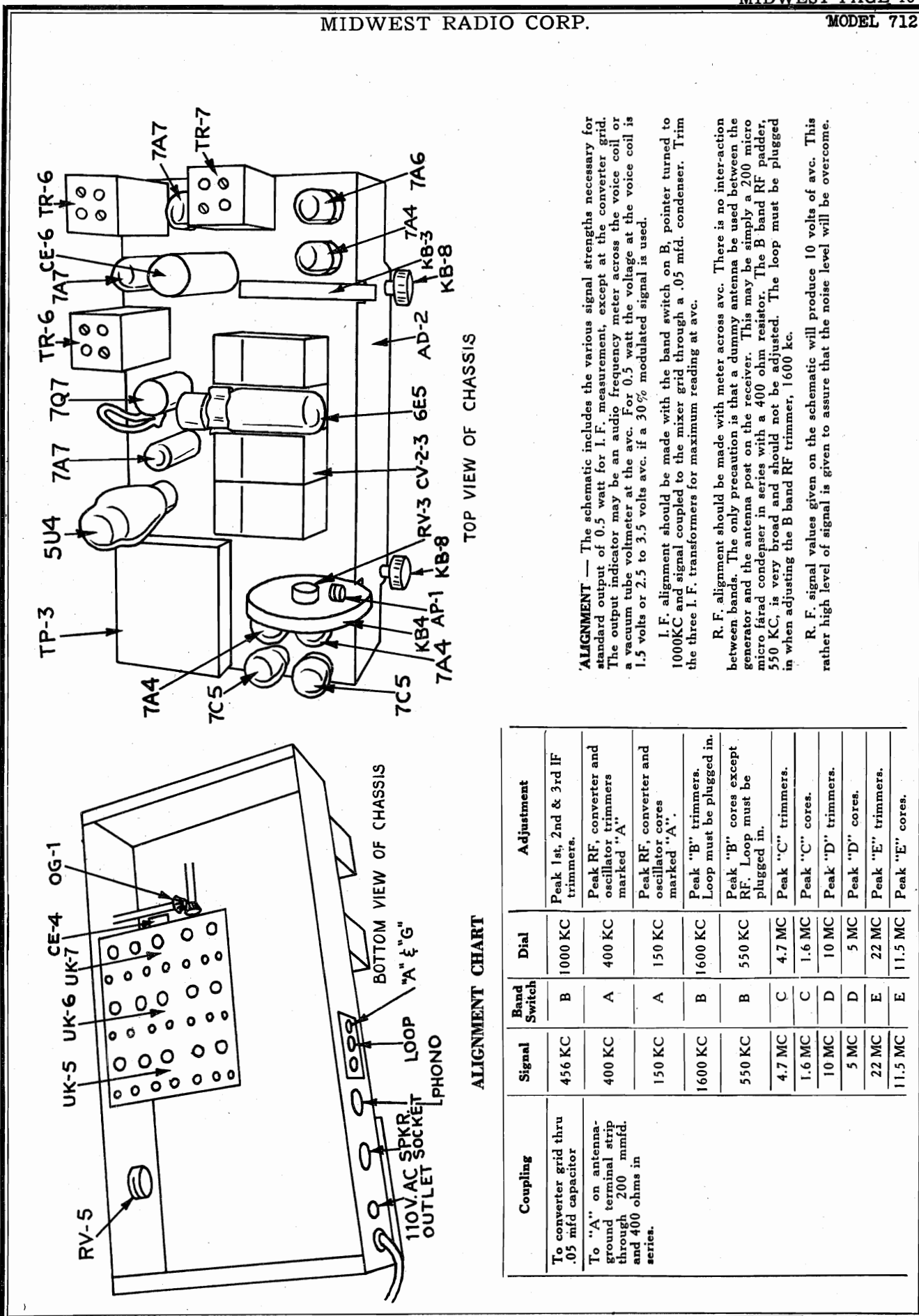
CAPACITY IS GIVEN IN MMFD EXCEPT WHERE INDICATED.
RESISTANCE IS IN OHMS UNLESS INDICATED.
WATTAGE IS 1/2 EXCEPT WHERE INDICATED.
TOLERANCE IS 2.20% UNLESS INDICATED.

COIL RESISTANCE VALUES GIVEN ARE APPROXIMATE. DEVIATION DOES NOT NECESSARILY INDICATE FAULTY COILS. VOLTAGES SHOWN ARE UNDER NO-SIGNAL CONDITIONS.
VOLUME CONTROL SHOULD BE 100 OHMS/VOLT OR MORE.
IF SIGNAL VALUES GIVEN ARE ORDER VALUES TO PRODUCE 1/2 WATT OUTPUT, DEVIATIONS MAY OCCUR BECAUSE OF EQUIPMENT USED, AVC ACTION, METHOD OF MEASURING ETC. SIGNAL MUST BE MODULATED 30% WITH 400% VOLUME & TONE CONTROLS SET FOR MAXIMUM OUTPUT.
VALUES TO PRODUCE 10 VOLTS AVC ACTUAL SENSITIVITY DEPENDS ON THE NOISE LEVEL, TUBE CONDITION, ETC.
OFF-ON SWITCH ON TONE CONTROL.
AC OUTLET
5U4G RECTIFIER
5U4G FULL-WAVE RECTIFIER

SERIES 12 MODEL 712 SCHEMATIC
MIDWEST RADIO CORPORATION

"clarified schematics"





TOP VIEW OF CHASSIS

BOTTOM VIEW OF CHASSIS

ALIGNMENT CHART

Coupling	Signal	Band Switch	Dial	Adjustment
To converter grid thru .05 mfd capacitor	456 KC	B	1000 KC	Peak 1st, 2nd & 3rd IF trimmers.
To "A" on antenna-ground terminal strip through 200 mmfd. and 400 ohms in series.	400 KC	A	400 KC	Peak RF, converter and oscillator trimmers marked "A".
	150 KC	A	150 KC	Peak RF, converter and oscillator cores marked "A".
	1600 KC	B	1600 KC	Peak "B" trimmers. Loop must be plugged in.
	550 KC	B	550 KC	Peak "B" cores except RF. Loop must be plugged in.
	4.7 MC	C	4.7 MC	Peak "C" trimmers.
	1.6 MC	C	1.6 MC	Peak "C" cores.
	10 MC	D	10 MC	Peak "D" trimmers.
	5 MC	D	5 MC	Peak "D" cores.
	22 MC	E	22 MC	Peak "E" trimmers.
	11.5 MC	E	11.5 MC	Peak "E" cores.

ALIGNMENT — The schematic includes the various signal strengths necessary for standard output of 0.5 watt for I. F. measurement, except at the converter grid. The output indicator may be an audio frequency meter across the voice coil or a vacuum tube voltmeter at the avc. For 0.5 watt the voltage at the voice coil is 1.5 volts or 2.5 to 3.5 volts avc. if a 30% modulated signal is used.

I. F. alignment should be made with the band switch on B, pointer turned to 1000KC and signal coupled to the mixer grid through a .05 mfd. condenser. Trim the three I. F. transformers for maximum reading at avc.

R. F. alignment should be made with meter across avc. There is no inter-action between bands. The only precaution is that a dummy antenna be used between the generator and the antenna post on the receiver. This may be simply a 200 micro micro farad condenser in series with a 400 ohm resistor. The B band RF padder, 550 KC, is very broad and should not be adjusted. The loop must be plugged in when adjusting the B band RF trimmer, 1600 kc.

R. F. signal values given on the schematic will produce 10 volts of avc. This rather high level of signal is given to assure that the noise level will be overcome.

MODEL 712
MODELS 716, 716A

MIDWEST RADIO CORP.

SERVICE — Series 12, Model 712, is a straight forward design, containing no trick circuits. Servicing of the coil plates or IF transformers should be avoided, except under special conditions, and rather than attempt to repair these assemblies a replacement should be ordered.

The Midwest Radio Corporation is anxious to help the service technician in every way; inquiries for special data will be promptly answered and your comments will be most welcome.

PARTS LIST

Part	Description
AD-2	Dial
AE-1	Eacutcheon
AK-2	Coil plate cover
AP-1	Wood pulley
AP-6	Pointer
AS-1	Wood pulley mtg. stud
CE-6	Filter condenser 40-40
CE-4	Cathode by pass 40 mfd. 25v.
*CV-2-3	Tuning gang
EG-2	Speaker grommet
ES-12	Tube shield
HE-1	Speaker mtg. eyelet
IL-1	Panel lamp 6-8 volts
KB-3	Tuning knob
KB-4	Volume control knob
KB-8	Tone or Band knob
KB-6	Push buttons, set of 7
OG-1	Miter gear, pair
OS-3	Dial string spring
PC-3	Loop plug
PC-4	Phonograph plug
RV-3	Volume control
RV-5	Tone control
*SP-2	Speaker, 14 inch
TP-3	Power transformer
TP-4	Universal power transformer
*TR-6	1st IF and 2nd IF Transformer
*TR-7	3rd IF transformer
*TR-6	1st IF and 2nd IF transformer
*TR-7	3rd IF transformer
*UK-5	R.F. Coil plate
*UK-6	Mixer coil plate
*UK-7	Oscillator coil plate

Note: Order resistors and condensers by value, tolerance and wattage or voltage.
Note: When ordering include serial number of chassis, since Midwest records of changes in parts specifications are kept by that number.

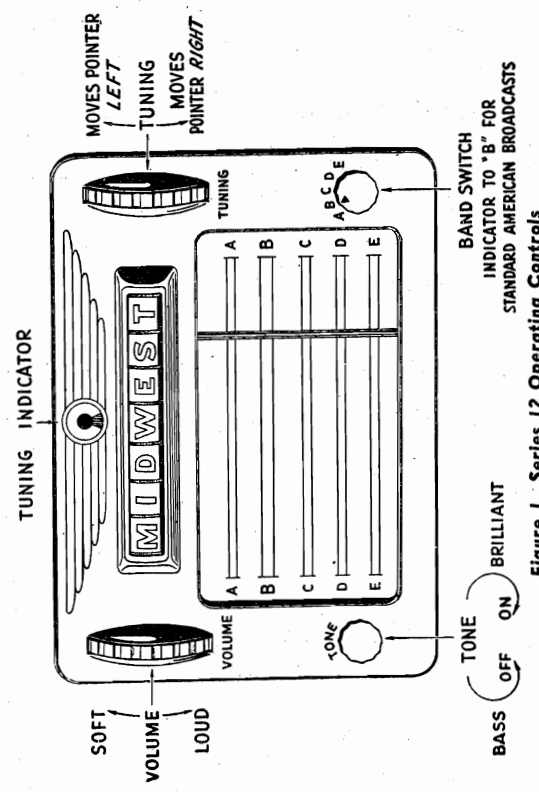


Figure 1. Series 12 Operating Controls

Note: Modulate the signal with 400 cycles 30%. The output indicator must be a VTUM on the avc. The IF sensitivity figures shown on the schematic are for 1/2 watt output except at converter grid; the voltage of the voice coil is 1.5 and the avc. voltage is between 7.5 and 3.5 for 1/2 watt output. The RF and IF alignment should be done with an avc. indicator only. The schematic shows RF signal values to produce 10 volts avc.

DIAL STRINGING — Use a light weight flexible dial cord when replacing worn or broken cord such as Beven-Wilcox FSN-25-12.

MODELS 712, 716, 716A

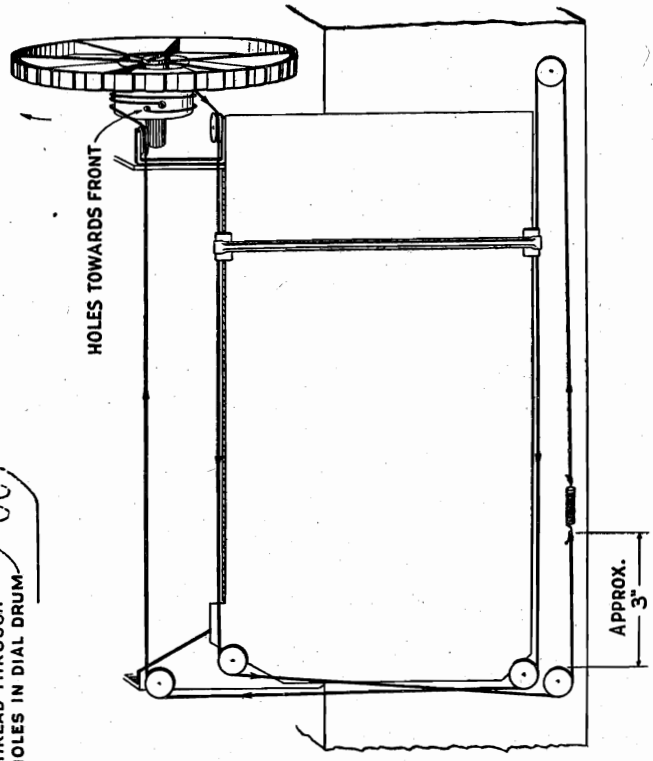
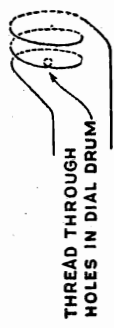
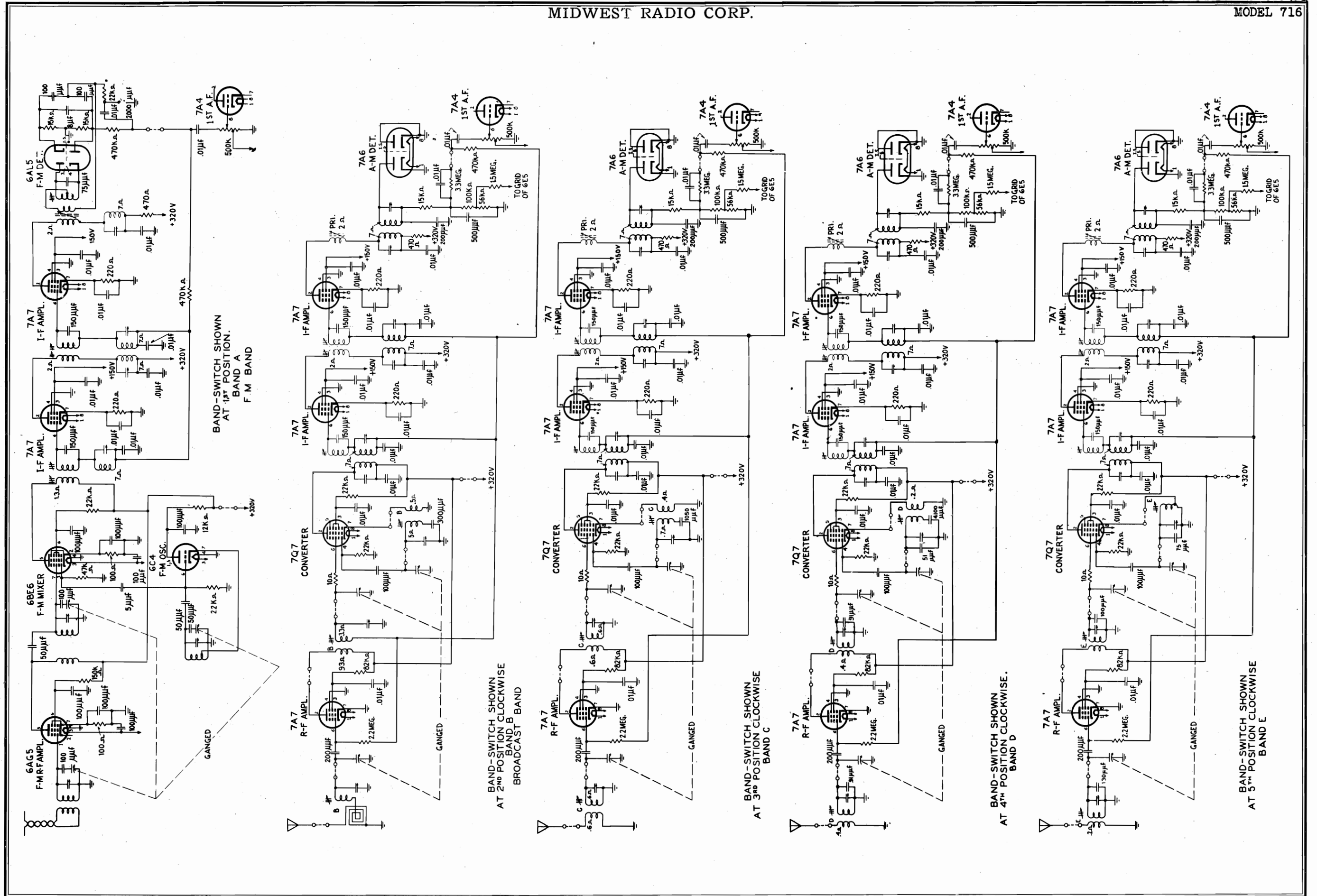


Figure 4. Series 12 Dial Stringing

Care must be taken to assure travel room for the SPRING. If the dial is strung with parts approximately as shown in Figure 4, there will not be too much adjustment necessary. The final step should be to set the pointer after replacing the dial, at the low frequency end of the dial in line with the end of the calibration base line. Use a small piece of gummed tape on the string so that clamping the pointer does not cut the dial cord.



PUSH BUTTONS — The push buttons are for your convenience in selecting stations without the bother of making the exact tuning adjustments necessary for best reception. There are seven buttons and each button may be set for a station. The station may be at any point on the dial.

It is not recommended that the buttons be used for short wave stations. To set the push buttons this exact procedure should be followed. A small screw driver will be needed.

1. Turn on the receiver and allow at least three minutes to warm up.
2. Remove the push button by pulling straight out. A hooked instrument will assist in removing the end buttons.
3. Loosen the LOCK SCREW at least one half turn.
4. Using the screw driver with the blade in the screw slot, push the mechanism in firmly. Hold in during step 5. The mechanism may bind at first. Use sufficient force to break loose so that the push button and tuning control are independent.
5. Tune the pointer past the desired station then back to the desired station and make the tuning adjustment as carefully as you know how.
6. Tighten the LOCK SCREW.
7. Check the setting of this push button by tuning away from the station manually, then pushing in firmly. Pushing the button must return the pointer to the position it had when the LOCK SCREW was tightened. If the station is not now tuned in perfectly repeat the steps 2 to 6 carefully.
8. Adjust each of the seven buttons, or as many as you wish to set, exactly as outlined above.

Any button can be set for any pointer position, however, you may find it more desirable to select the button nearest the pointer position so that each successive adjustment moves the pointer in the same direction. That is, the "M" button will be set for a station at the left of the dial, the "W" button will set for a station near the center, etc.

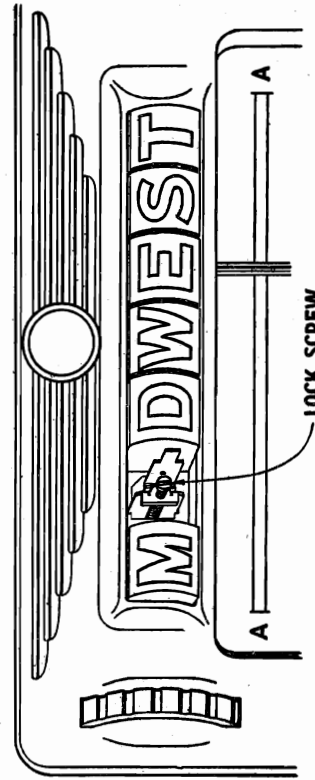


Figure 4. Push Button Mechanism

SERVICE — Series 16, Model 716, is a straight forward design, containing no trick circuits. Servicing of the coil plates or IF transformers should be avoided, except under special conditions, and rather than attempt to repair these assemblies a replacement should be ordered.

ALIGNMENT — Refer to the alignment chart for step by step procedure. It is preferable to align the FM IF stages with an AM or CW Signal. It should be noted that all adjustment are made for peak avc reading except the secondary of the third transformer. At this point, if you use an AM signal, it may be tuned for minimum audio signal; or the discriminator voltage may be used, reading it with a VTVM, and the secondary may be adjusted to the zero voltage. There may be some discrepancy between these methods, and if it is not excessive, is of no importance; it is simply an indication of the exactness of equivalent capacitive and inductive coupling balance in the transformer.

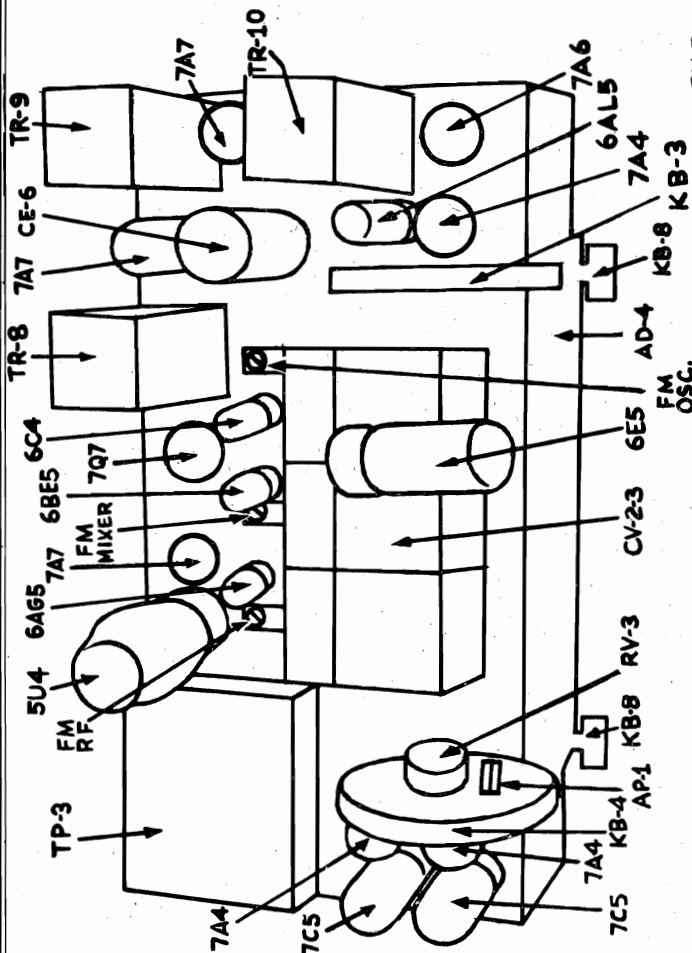
The FM RF alignment should be made using an FM signal and either avc or audio for peaking. In doing this alignment, or when feeding the IF signal into the FM mixer grid, care must be taken not to move the wiring. If the wiring is displaced so as to affect the inductance of the RF circuits it is difficult to re-establish the RF-Oscillator tracking.

The AM, RF and IF alignment should be done with a VTVM across the avc. The recommended signal value is one which will generate 10 volts of avc. When aligning the "B" band the loop must be plugged in and you need not adjust the RF padder core. The RF padder is very broad and can be aligned only if the converter grid lead is connected to an RF type VTVM as indicator; this will usually involve a signal level greater than is normally available.

Coupling	Signal	Band Switch	Dial	Adjustment
To 7Q7 converter grid through .05 mfd. capacitor.	456 KC AM	B	1000 KC	Peak 1st, 2nd and 3rd IF trimmers on top of IF cans.
To "A" on antenna ground terminal strip through 200 mfd. and 400 ohms in service.	1600 KC AM	B	1600 KC	Peak RF, converter and oscillator trimmers marked "B".
	550 KC AM	B	550 KC	Peak converter and oscillator padder cores marked "B". Loop must be plugged in. Do not adjust RF.
	4.7 MC AM	C	4.7 MC	Peak "C" trimmers.
	1.6 MC AM	C	1.6 MC	Peak "C" cores.
	10 MC AM	D	10 MC	Peak "D" trimmer
	5 MC AM	D	5 MC	Peak "D" cores.
	22 MC AM	E	22 MC	Peak "E" trimmer.
	11.5 MC AM	E	11.5 MC	Peak "E" cores.
To 6BE6 mixer grid direct.	10.7 MC AM or CW	A	100 MC	Peak core adjustments for avc (around 3 volts) at 1st, 2nd and primary of 3rd IF. Adjust secondary of 3rd IF for audio null from 30% amplitude modulated 10.7 MC IF signal.
To "D" and "D" on doublet terminal strip above "A-C" strip through a pair 150 ohm resistors.	105 MC FM	A	105 MC	Peak RF mixer and oscillator trimmers for avc or audio.

*Read text for use of CW for FM-IF alignment.

- KB-4—Volume control knob
- KB-8—Tone or Band knob
- KB-6—Push buttons, set of 7
- OG-1—Miter gear, pair
- OS-3—Dial string spring
- PC-3—Loop plug
- PC-4—Phonograph plug
- RV-3—Volume control
- RV-5—Tone control
- *SP-2—Speaker, 14 inch
- TP-3—Power transformer
- TP-4—Universal power transformer
- *TR-8—1st IF transformer
- *TR-9—2nd IF transformer
- *TR-10—3rd IF transformer
- *UK-8—R.F. Coil plate
- *UK-9—Mixer coil plate
- *UK-10—Oscillator coil plate

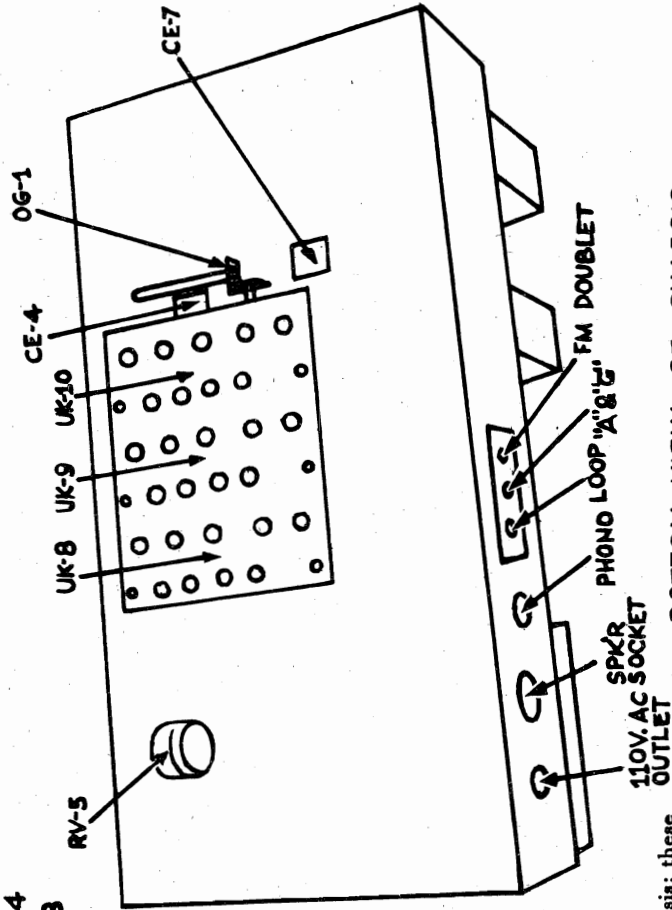


TOP VIEW OF CHASSIS

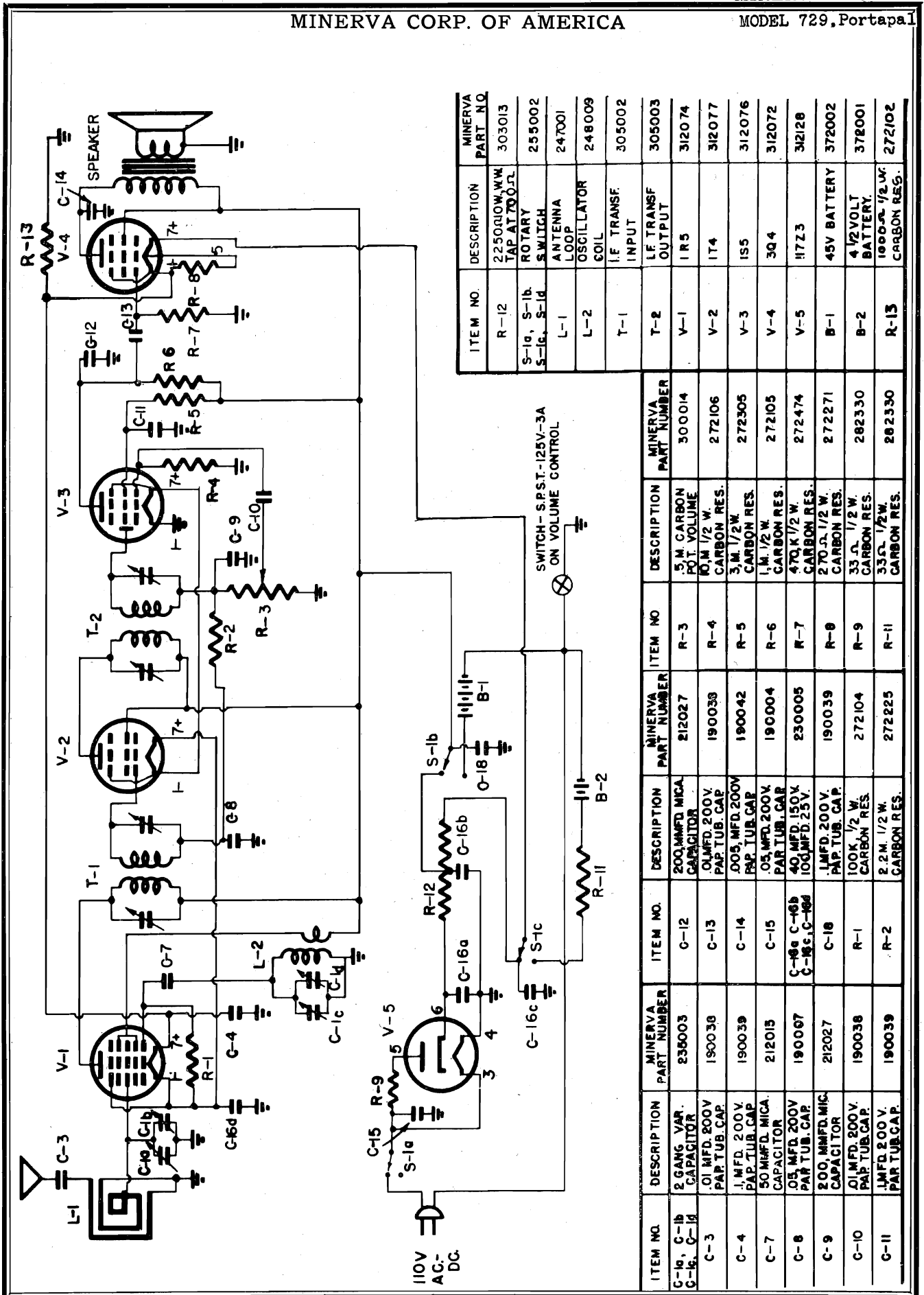
PARTS LIST

Part	Description
AD-4	Dial
AE-1	Escutcheon
AK-2	Coil plate cover
AP-1	Wood pulley
AP-6	Pointer
AS-1	Wood pulley mtg. stud
CE-6	Filter condenser 40-40
CE-4	Cathode by pass 40 mfd. 25v.
CE-7	Electrolytic 8 mfd. 150v.
*CV-2-3	Tuning gang
EG-2	Speaker grommet
ES-12	Tube shield
HE-1	Speaker mtg. eyelet
IL-1	Panel lamp 6-8 volts
KB-3	Tuning knob

REPLACEMENT PARTS — Certain parts are available on an exchange basis; these are shown on the parts list with an "*".



BOTTOM VIEW OF CHASSIS



ITEM NO.	DESCRIPTION	MINERVA PART NO.
R-12	2250Ω 10W W.W. TAP AT 700 Ω	303013
S-1a, S-1b	ROTARY SWITCH	255002
S-1c, S-1d	ANTENNA LOOP	247001
L-1	OSCILLATOR COIL	248009
L-2	I.F. TRANSF. COIL	305002
T-1	I.F. TRANSF. INPUT	
T-2	I.F. TRANSF. OUTPUT	305003
V-1	1R5	312074
V-2	1T4	312077
V-3	1S5	312076
V-4	3Q4	312072
V-5	117Z3	312128
B-1	45V BATTERY	372002
B-2	4 1/2 VOLT BATTERY	372001
R-13	1000Ω 1/2 W. CARBON RES.	272102

ITEM NO.	DESCRIPTION	MINERVA PART NUMBER	ITEM NO.	DESCRIPTION	MINERVA PART NUMBER
C-12	200 MFD. MICA CAPACITOR	212027	R-3	5 M CARBON POT. VOLUME	300014
C-13	.01 MFD. 200V. PAP. TUB. CAP.	190038	R-4	10 M 1/2 W. CARBON RES.	272106
C-14	.005 MFD. 200V. PAP. TUB. CAP.	190042	R-5	3 M 1/2 W. CARBON RES.	272305
C-15	.05 MFD. 200V. CAPACITOR	190004	R-6	1 M 1/2 W. CARBON RES.	272105
C-16a	40 MFD. 150V. C-16c, C-16d	230005	R-7	470 K 1/2 W. CARBON RES.	272474
C-16b	1 MFD. 200V. PAP. TUB. CAP.	190039	R-8	270 Ω 1/2 W. CARBON RES.	272271
C-16c	100K 1/2 W. PAP. TUB. CAP.	272104	R-9	33 Ω 1/2 W. CARBON RES.	282330
C-16d	2.2 M. 1/2 W. CARBON RES.	272225	R-11	33 Ω 1/2 W. CARBON RES.	282330

VOLTAGE MEASUREMENT

All reading in AC-DC position of power selector switch with 20,000 ohms per meter. Readings taken are referred to ground.

11723			
PIN	AC	DC	RESISTANCE IN OHMS
1	117V	—	540
2	—	120V	2000
3	117V	—	500
4	—	—	—
5	117V	—	500
6	120V	—	2000
7	—	—	—

3Q4					
PIN	DC	RESISTANCE IN OHMS	PIN	DC	RESISTANCE IN OHMS
1	4.8V	50	1	—	—
2	86V	2000	2	—	—
3	—	500,000	3	—	400,000
4	88V	1500	4	19V	3,000,000
5	6V	50	5	7.8V	1,500,000
6	86V	2000	6	—	10,000,000
7	7.6V	70	7	1.5V	260

1T4					
PIN	DC	RESISTANCE IN OHMS	PIN	DC	RESISTANCE IN OHMS
1	1.5V	260	1	3.3V	45
2	88V	1500	2	88V	1500
3	88V	1500	3	88V	1500
4	—	2,000,000	4	—	85
5	1.6V	—	5	1.6V	45
6	—	2,200,000	6	—	—
7	3.3V	45	7	2.3V	50

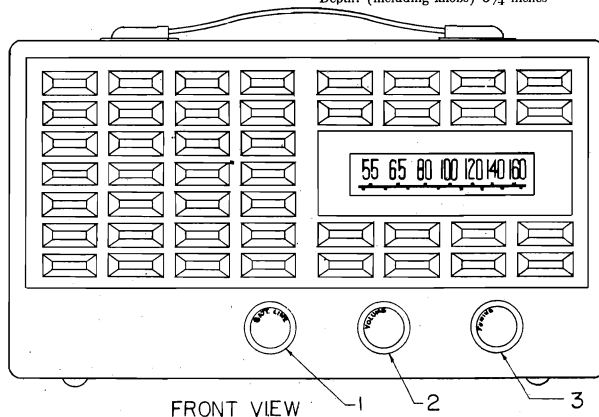
SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

Tuning Range: Standard Broadcast 540-1640 KCS
 Power Supply: Direct Current 105-125 volts or alternating current 105-125 volts, 50-60 Cycle or Batteries.
 Power Consumption: AC or DC—12 watts
 Battery Complement: 2—4½ Volt "A" Batteries
 Eveready No. 746 or equivalent.
 2—45 Volt "B" Batteries
 Eveready No. 482 or equivalent.

Tube Complement: IR5—Converter
 IT4—I. F. Amplifier
 IS5—2nd Det.—AVC—1st Audio
 3Q4—Power Amplifier
 11723—Rectifier

Mechanical Characteristics: Dimensions — Height: (including feet) 7¼ inches
 Width: 13 inches
 Depth: (including knobs) 6¼ inches



SERVICING NOTES

All specifications and measurements based on 117 Volts, 60 Cycles, and all readings based on a 20,000 ohms per volt meter. All readings are taken with volume control (switch No. 2) in maximum clockwise position. Apply the lowest signal level from the signal generator.

Output: 50 mw into a 3.2 ohm voice coil impedance.

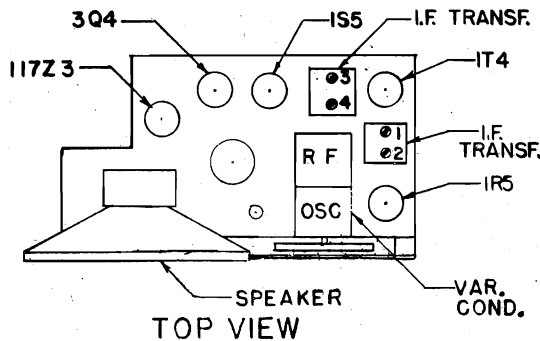
Approximate reading 0.4 Volt.

I. F. ALIGNMENT: With signal generator, set a 455 KC, apply signal through a .1 MFD condenser dummy to R.F. grid of converter (IR5) or the stator of RF section of the variable condenser (condenser must be fully meshed). Peak I.F. trimmers 1, 2, 3, 4 (top view diagram) to give maximum reading on output meter connected across voice coil. (Note: If for any possible reason the signal does not come through indicating the receiver is way out of alignment, apply the signal to the grid of the I.F. Amplifier (IT4) and tune signal in by trimmers 3, 4 of second I.F. Transformer. Peak for maximum and once this stage is tuned, repeat above procedure.)

R.F. Alignment: With signal generator, set at 1400 KC, apply signal through a dummy antenna (200 mmf condenser) to the antenna loop wire. Set dial of receiver to 1400 KC and peak trimmers 5 & 6 to give maximum reading of output meter. Then set signal generator at 600 KC and tune receiver to 600 KC mark on dial. This setting should fall on calibrated point.

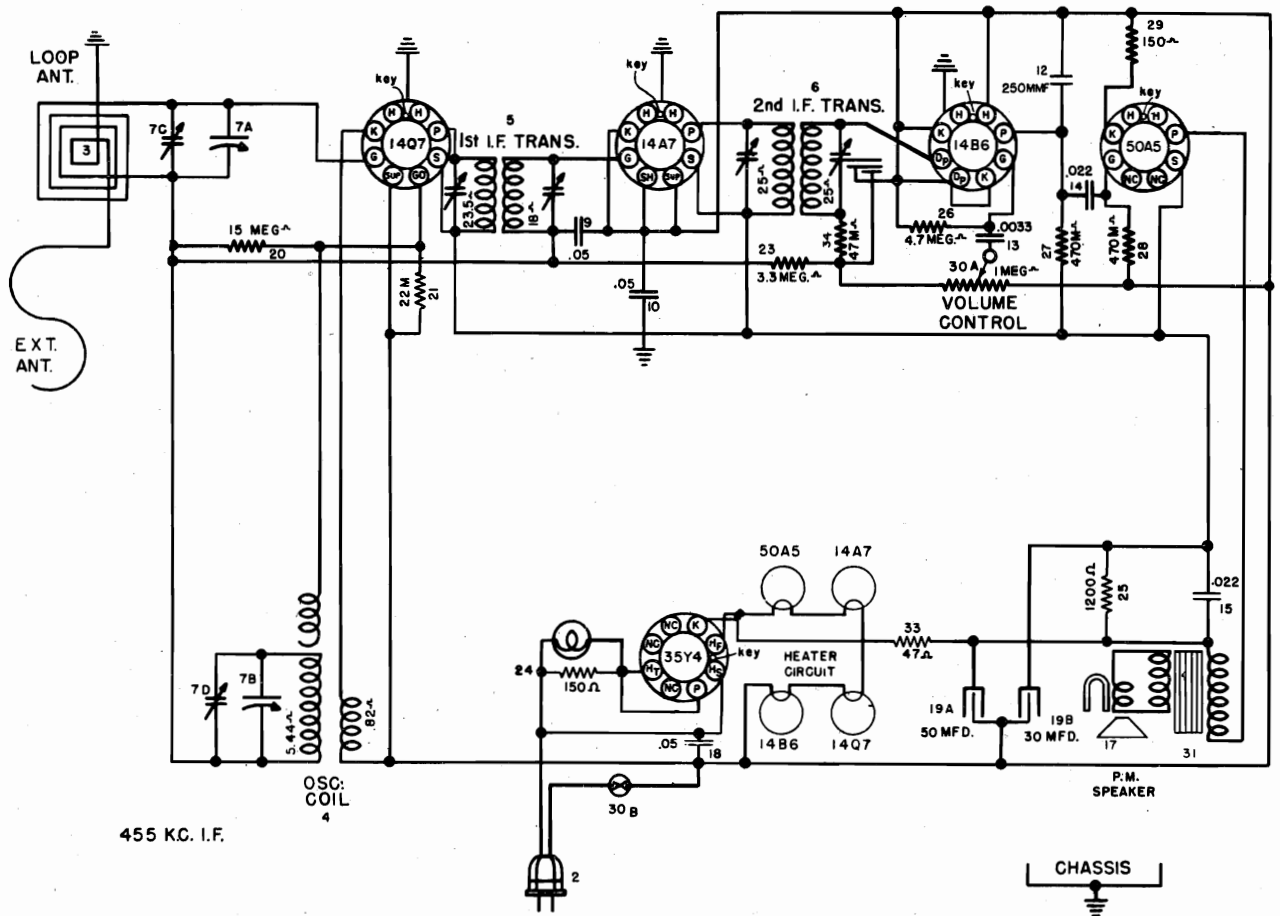
CORRECTIONS

- 1. Servicing Notes Section: Stator large section gang open to read; Stator large section gang closed.
- 2. Voltage Measurements Section: 20,000 ohms per meter to read; 20,000 ohms per volt D. C.; 1,000 ohms per volt A. C. meter; 11723 to read: 11723
- 3. Schematic Diagram Section: No S-Id; C 18: .1 mfd, 200 volts to read; .1 mfd, 400 volts; 1000 mfd - 6v D.C. Pin # 1 of V2 to ground.



Generator Connection	Dummy Ant.	Freq.	Adj. Trimmers	Output	Sensitivity uv.
Stator large section gang open	.1 MFD cond.	455 KC	1, 2, 3, 4	Max.	120
Antenna loop wire	200 mmf cond.	1400 KC	5 & 6	Max.	50
Antenna loop wire	200 mmf	600 KC	Variable Plates	Max.	150

August, 1946



SCHMATIC DIAGRAM

When using direct current it may be necessary to reverse the position of the power plug in the electric outlet for correct polarity. Reversing the position of the power plug when alternating current is used may reduce power hum. UNDER NO CIRCUMSTANCES SHOULD A GROUND BE CONNECTED TO THIS RECEIVER.

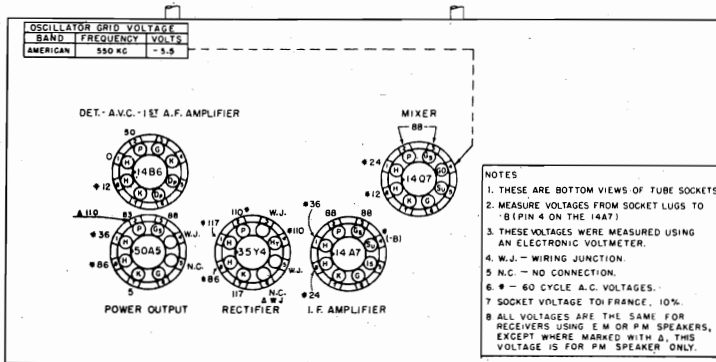
PARTS LIST

Figures in first column correspond to figures in Schematic Diagram

ITEM No.	PART No.	DESCRIPTION	ITEM No.	PART No.	DESCRIPTION
1	W-48858	Bulb (dial), Type 47, 6.3 v., .15 amp.	28	39294-29	Resistor, 470,000 ohm, 1/2 w.
2	C-132300-1	Cable and Plug (power)	29	39294-8	Resistor, 150 ohm, 1/2 w.
3	AC-135209	Ant. Loop and Back Assy. (TA56M, TW56M)	30A	C-135127	Control, Volume (1 megohm) } Assy.
	AC-135253	Ant. Loop and Back Assy. (TC56M)	30B		Switch (power) }
4	AW-135195	Oscillator Coil Assembly	31	B-135077	Transformer (output)
5	AW-137665	Transformer (1st I.F.)	33	W-137367	Resistor, 47 ohm, 1 w.
6	AW-137667	Transformer (2nd I.F.)	34	Part of Item #6	Resistor, 47,000 ohm, 1/2 w.
7A	B-135202	Condenser (variable) } Two		W-135371	Socket (tube)
7B		Condenser (variable) } Section		39017-5	Socket (dial light)
7C	Part of Item #7A	Condenser (trimmer)		AB-135135	Plate Assembly (dial)
7D	Part of Item #7B	Condenser (trimmer)		W-135074	Pulley (idler)
9	39001-65	Condenser, .05 mfd., 200 v., paper		B-135094	Pointer (dial)
10	39001-65	Condenser, .05 mfd., 200 v., paper		B-135075	Shaft (drive)
12	39001-73	Condenser, 250 mmf., 600 v., paper		W-134916	Washer (spring)
13	39001-10	Condenser, 3300 mmf., 600 v., paper		W-51071	Ring (retaining)
14	39001-63	Condenser, .022 mfd., 200 v., paper		W-131154-1	Cotter (external)
15	39001-63	Condenser, .022 mfd., 200 v., paper		W-51752	Spring (drive cord)
17	B-136768	Speaker		W-134055	Grommet
18	39001-65	Condenser, .05 mfd., 200 v., paper		W-135164	Bumper
19A	B-136770	Condenser, 50 mfd., 150 v. } Two Section		W-136630	Trimount Stud
19B		Condenser, 30 mfd., 150 v. } Elect. Filter		R-135163	Cabinet (TA56M)
20	39294-38	Resistor, 15 megohm, 1/2 w.		AW-135245	Cabinet (TW56M)
21	39294-21	Resistor, 22,000 ohm, 1/2 w.		D-135235	Cabinet (TC56M)
23	39294-34	Resistor, 3.3 megohm, 1/2 w.		B-135461	Dial Glass
24	39294-8	Resistor, 150 ohm, 1/2 w.		W-135391	Knob (TA56M, TC56M)
25	39015-26	Resistor, 1200 ohm, 1 w.		W-135390	Knob (TW56M)
26	39294-35	Resistor, 4.7 megohm, 1/2 w.		W-132124	Trimount Stud (TA56M, TW56M)
27	39294-29	Resistor, 470,000 ohm, 1/2 w.			

MODELS TA56M, TC56M, MONITOR EQUIPMENT CORPORATION
TW56M

SOCKET VOLTAGE CHART



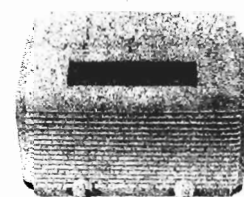
TC56M



TA56M



TW56M



DESCRIPTION

TYPE: Five-tube, single-band, superheterodyne.

FREQUENCY RANGE: 540 to 1600 kc.

INTERMEDIATE FREQUENCY: 455 kc.

POWER SUPPLY: a.c.—d.c.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 35 watts nominal.

POWER OUTPUT: 1 watt minimum.

TUBE COMPLEMENT:

Type	Function
14Q7	Mixer
14A7	I.F. Amplifier
14B6	Detector; AVC, 1st A.F. Amplifier
50A5	A.F. Power Output
35Y4	Rectifier

DIAL BULB: Type 47, 6.3 volts, .15 amp.

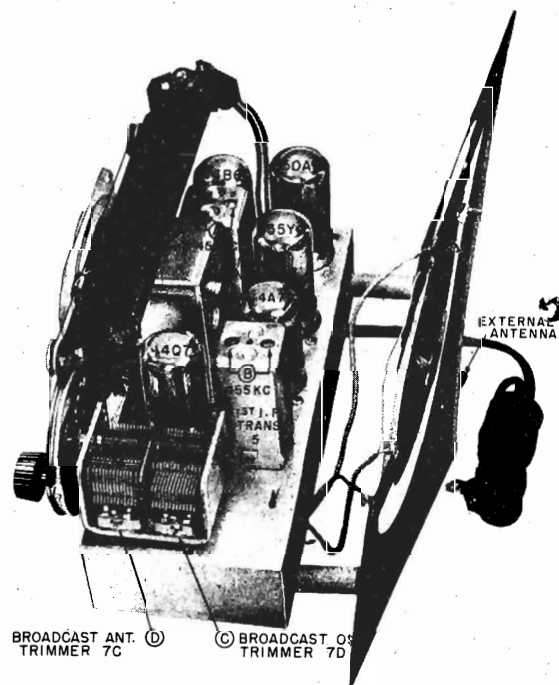
ALIGNMENT PROCEDURE

1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil,
3. The r.f. signal input from the signal generator should be connected to the external antenna lead. Connect the signal generator ground through a 0.1 mfd. condenser to —B (pin 4 on 14A7 tube socket).
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

ALIGNMENT CHART

Alignment adjustment locations are shown in Chassis, Side View at the right.

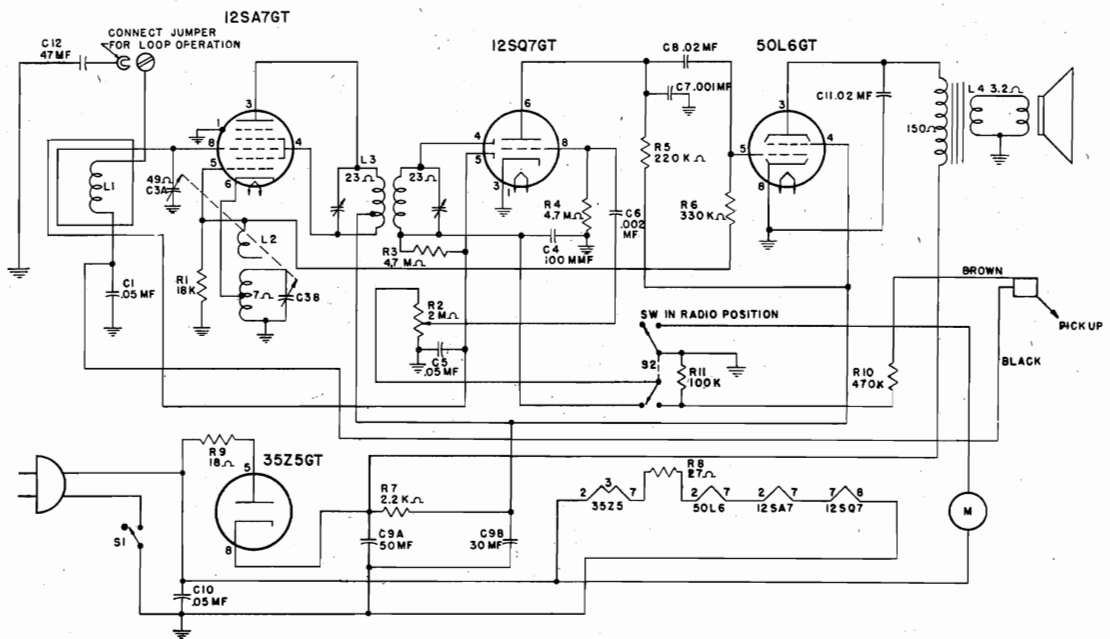
Alignment sequence	Signal Gen. Output			Position of Tuning Dial	Adjust for max. output
	Frequency in KC	In Series with	To		
1	455	200 mmf.	Ant.	1620	A & B
2	1620	200 mmf.	Ant.	1620	C
3	1400	200 mmf.	Ant.	1400	D



CHASSIS, SIDE VIEW

MONITOR EQUIPMENT CORPORATION

MODEL M-403



Tuning range	530 to 1600 kc	Sensitivity (for 0.5 watt output) :	
Intermediate frequency	455 kc	Loop	8000 microvolts per meter average
Power consumption	30 watts	Antenna	800 microvolts average
Selectivity	1. A.C.A.—3 to 1. 2. A.C.A.—12.5 to 1	Power output (in voice coil) :	
		Undistorted	0.8 watts
		Maximum	2.5 watts

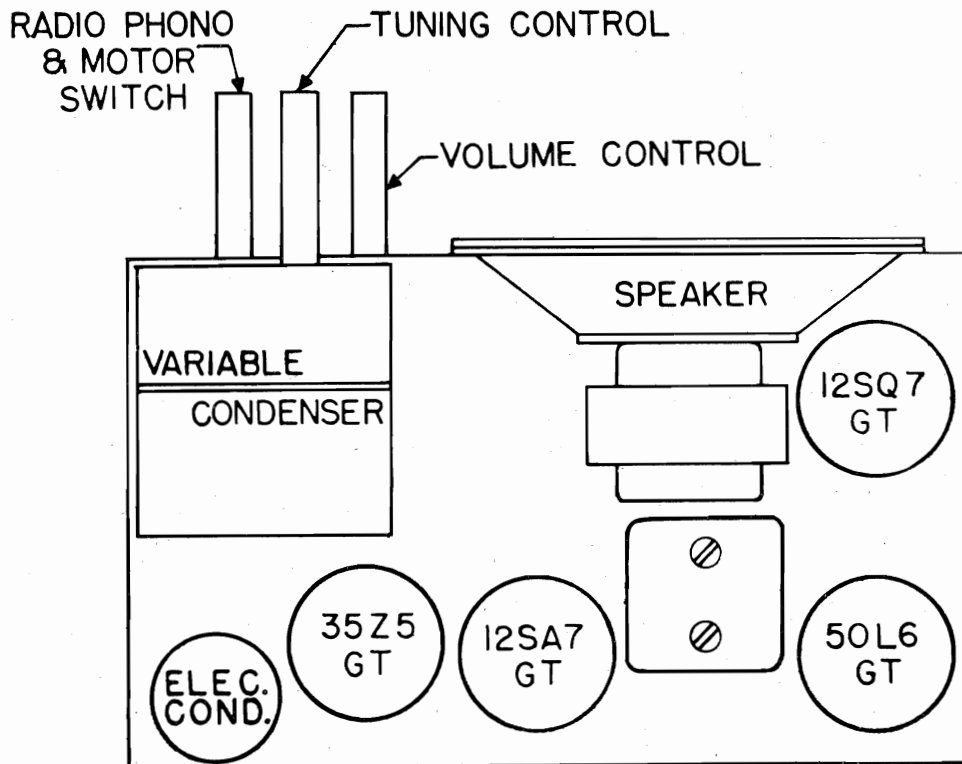
Ref. No.	Part No.	Description
Capacitors		
C1-C10		Paper, .05 mfd 400 volts
C6		Paper, .002 mfd 400 volts
C8-C11		Paper, .02 mfd 400 volts
C5		Paper, .05 mfd 200 volts
C7		Paper, .001 mfd 500 volts
C4		Ceramic 100 mmfd 500 volts
C12		Ceramic 47 mmfd 500 volts
C3	1675	Variable Air—2 gang
C9	2073	Electrolytic, 50-30 mfd 150 volts
Resistors		
R2	2480	Control, volume with switch, 2 meg-ohms
R1		18000 ohms, 1/4 watt
R3, R4		4.7 meg ohms, 1/4 watt
R5, R10		220,000 ohms, 1/4 watt
R6		330,000 ohms, 1/4 watt
R7		2200 ohms, 2 watts
R8		27 ohms, 1/2 watt
R9		18 ohms, 1/2 watt
R11		100,000 ohms, 1/4 watt

Ref. No.	Part No.	Description
Coils and Transformers		
L1	28186	Back cover with loop
L2	28184	Oscillator coil
L3	3376	I.F. transformer
L4	1300	Output transformer
Miscellaneous		
		Cord, line 6 ft.
	39160	Knob, tuning
	39161	Knob, volume
	5877	Speaker
	T470	Cabinet, wood
	54314	Tuning knob washer
		Phono-needle
	346-5	Walsco back clips
	18110	Sockets, wafer octal
	3828	Switch, phono-radio
		Phono motor and 8-inch turntable
		Phono crystal, L-26

* The values of the resistors and mica capacitors listed above are based on RMA standards. Due to conditions beyond our control some receivers have been shipped with components of pre-standardized values. This receiver will operate equally well with components of either group. An illustration of the differences in both resistors and capacitors follows:

Pre-standardized value—	50,000 ohms, 1/3 watt, 10%
RMA value—	47,000 ohms, 1/2 watt, 10%
Pre-standardized value—	200 mmf, 500 volts, 20%
RMA value—	220 mmf, 500 volts, 20%

TUBE LOCATION



ALIGNMENT PROCEDURE
(Refer to Chassis View)

- Output meter across 3.2-ohm output load.
- Volume control at maximum.
- Connect ground post of signal generator to chassis.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

Frequency	SIGNAL GENERATOR		TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT (in order shown)
	Dummy Antenna	Connection to Radio		
455 kc	0.1 mf	Stator of antenna section of gang	Any	Trimmers on I.F. can
1590 kc	* *	* *	Rotor full open (plates out of mesh)	Oscillator trimmer
1590 kc	* *	* *	Rotor full open (plates out of mesh)	Antenna trimmer

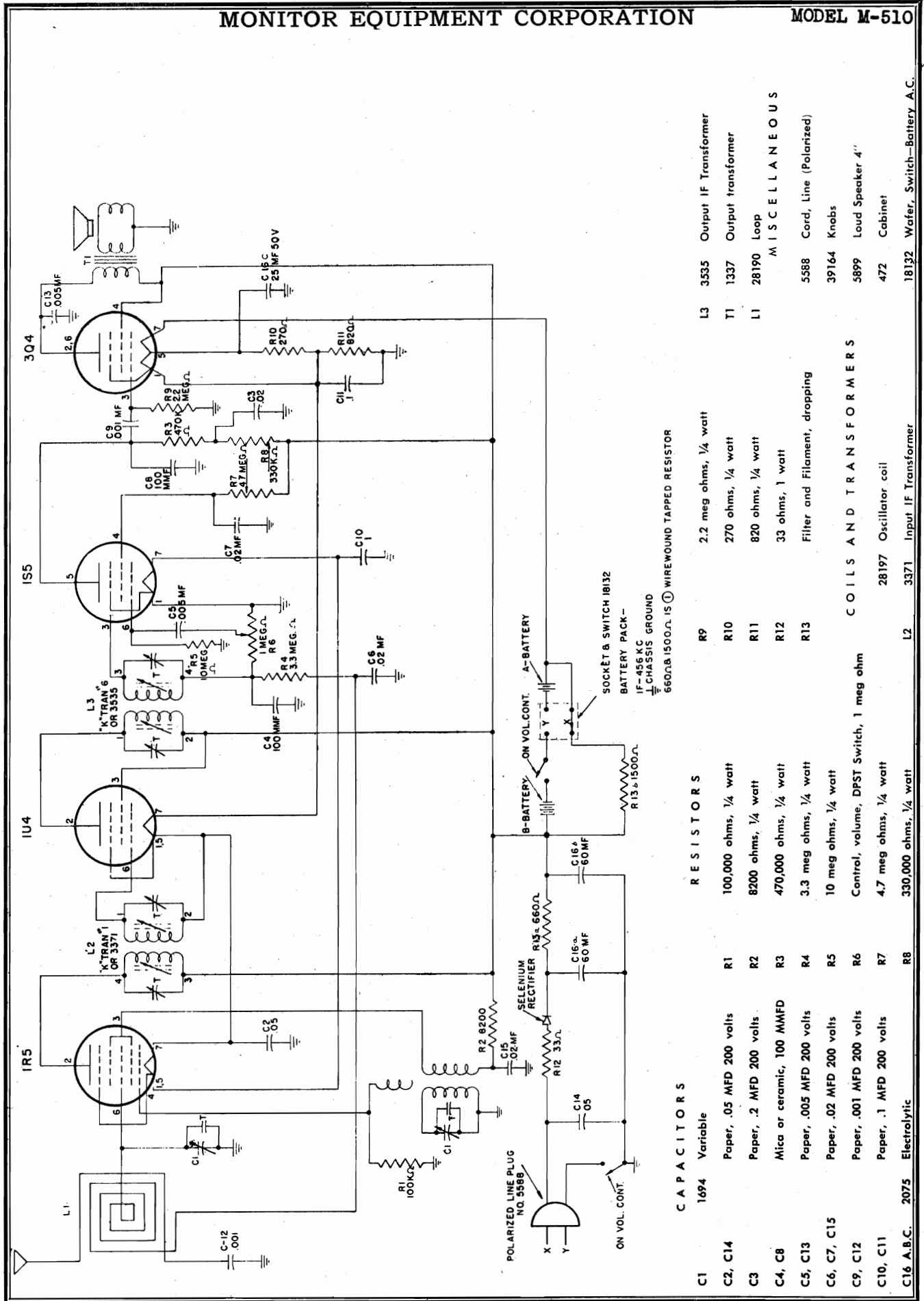
* * Run a wire from output terminal of the generator near the receiver. However, no connection is made between the signal generator and the receiver.

To remove the chassis from the cabinet, proceed as follows: Make sure the line cord is disconnected from the power receptacle. Remove the phonograph turntable and motor by unscrewing the three mounting screws on the phono motor. If the back has not been removed, pull out the four fasteners with which the back is mounted. Pull the volume and tuning knobs off their shafts. Remove the three mounting screws on the bottom of the cabinet. The chassis can then be slipped out of the cabinet.

This receiver is designed to operate without a ground. NO ATTEMPT SHOULD BE MADE TO USE ONE.

MONITOR EQUIPMENT CORPORATION

MODEL M-510



660Ω & 1500Ω IS ① WIREWOUND TAPPED RESISTOR

CAPACITORS		RESISTORS	
C1	1694 Variable	R9	2.2 meg ohms, 1/4 watt
C2, C14	Paper, .05 MFD 200 volts	R10	270 ohms, 1/4 watt
C3	Paper, .2 MFD 200 volts	R11	820 ohms, 1/4 watt
C4, C8	Mica or ceramic, 100 MMFD	R12	33 ohms, 1 watt
C5, C13	Paper, .005 MFD 200 volts	R13	Filter and Filament, dropping
C6, C7, C15	Paper, .02 MFD 200 volts		
C9, C12	Paper, .001 MFD 200 volts		
C10, C11	Paper, .1 MFD 200 volts		
C16 A.B.C.	2075 Electrolytic		

MISCELLANEOUS

5588	Cord, Line (Polarized)
39164	Knobs
5899	Loud Speaker 4"
472	Cabinet
18132	Wafer, Switch-Battery A.C.

COILS AND TRANSFORMERS

L3	3535 Output IF Transformer
T1	1337 Output transformer
L1	28190 Loop

SOCKET & SWITCH 18132

BATTERY PACK -
IF-455 KC
CHASSIS GROUND

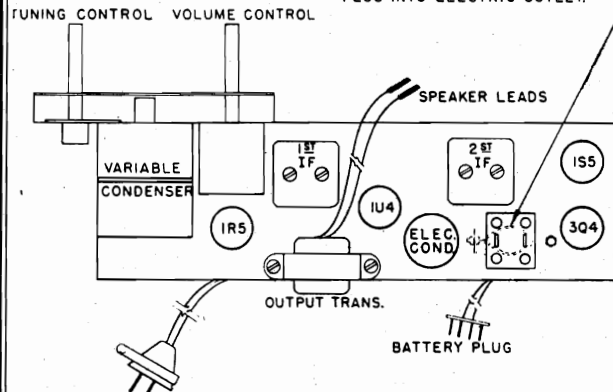
MODEL M-510

MONITOR EQUIPMENT CORPORATION

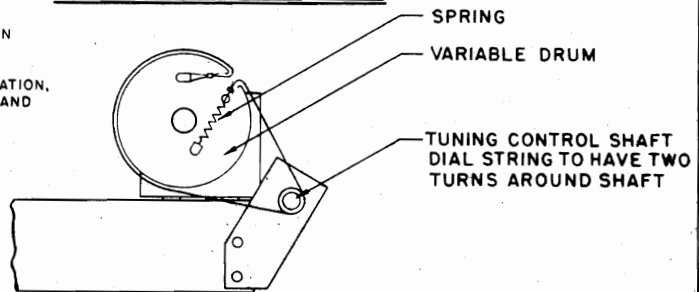
TUBE LOCATION

FOR BATTERY OPERATION PLUG LINE CORD IN THIS RECEPTACLE AS SHOWN BY DOTTED OUTLINE OF PLUG.

FOR 105-125 VOLT A.C. OR D.C. OPERATION, REMOVE THIS PLUG FROM SOCKET AND PLUG INTO ELECTRIC OUTLET.



DIAL STRINGING DIAGRAM



ALIGNMENT PROCEDURE

- Output Meter across 3.2 ohm output load
- Volume control at maximum
- Connect ground post of signal generator to chassis
- Align for maximum output. Reduce input as needed to keep output near 0.05 watts

SIGNAL GENERATOR

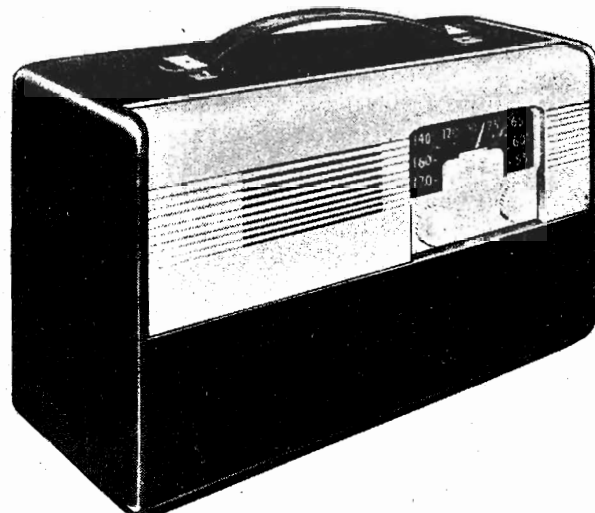
Frequency	Connection to Radio	Dummy Antenna	Tuner Setting	Adjust for Maximum Output (in order shown)
455 KC	Center of antenna section of Gang	0.2 mf	Any	Trimmers on I.F. Can
•1500 KC	**	**	Set pointer at second dot from end. On dial pan	Oscillator Trimmer on Gang.
1500 KC	**	**	Set pointer at second dot from end. On dial pan	R.F. Trimmer on Gang

** Run a wire from Output Terminal of the Generator near the Receiver. However, no connection is made between the signal generator and the Receiver.

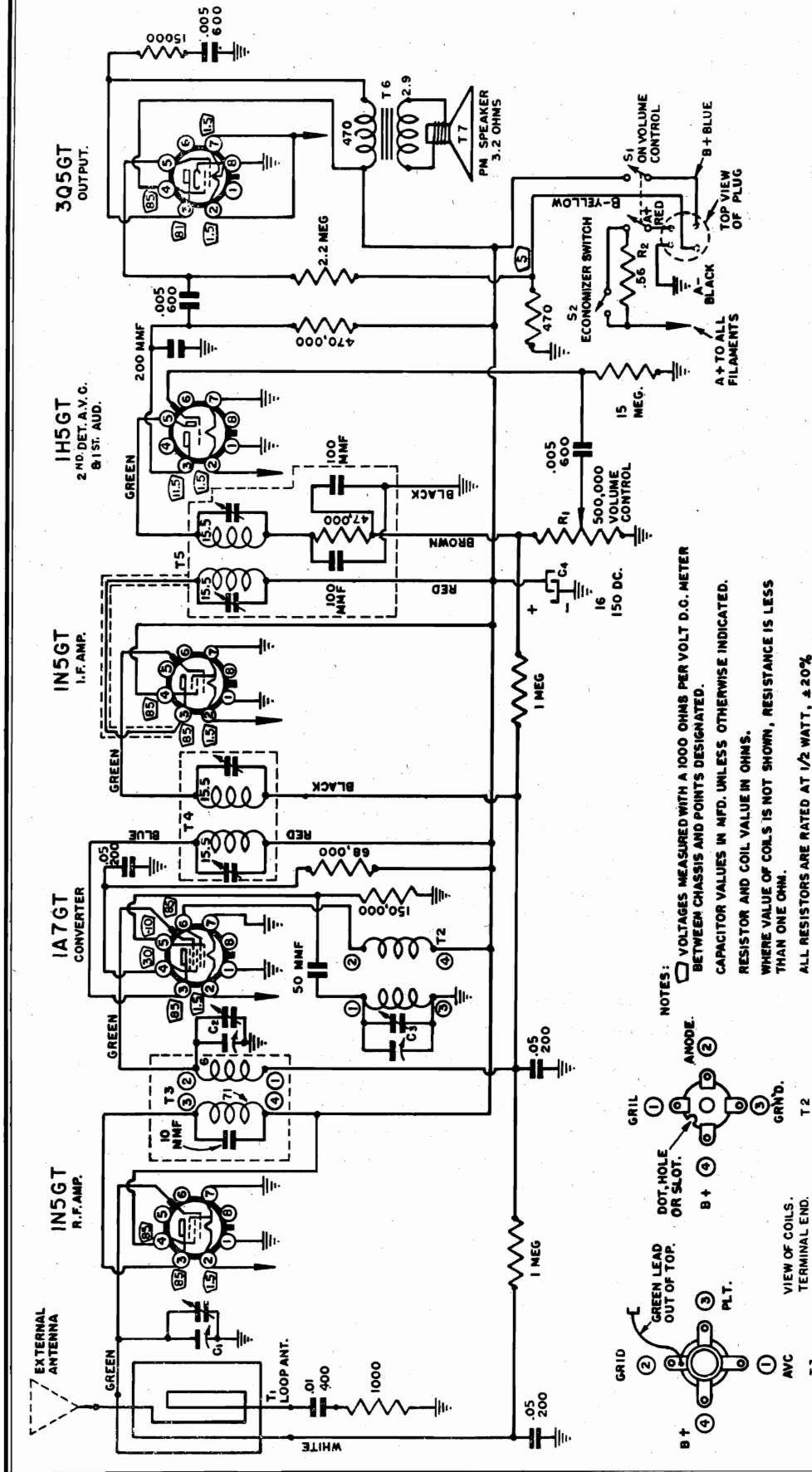
Tuning Range	540-1600	Sensitivity (For 0.05 Watt Output).....	300 Microvolts per Meter Average
Intermediate Frequency	455 KC	Power Output (in voice coil) :	
Power Consumption	15 Watts	Undistorted	130 Watts
Selectivity	A.C.A. 12-1	Maximum	300 Watts

This receiver is designed to operate without a ground. **NO ATTEMPT SHOULD BE MADE TO USE ONE.**

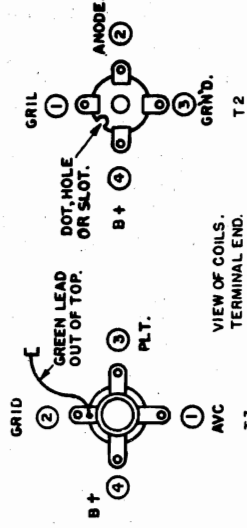
To remove the chassis from the cabinet, proceed as follows:— Make sure the line cord is disconnected from the power receptacle. Remove the back and disconnect the wires to the loop antenna. Pull the volume and tuning knobs off their shafts. Remove the two mounting screws which hold the chassis mounting shelf in place. The chassis with the mounting shelf can now be slipped out of the cabinet. To remove the chassis from the chassis mounting shelf, it is only necessary to remove the three mounting screws on the bottom of the shelf.



MONTGOMERY WARD



NOTES: VOLTAGES MEASURED WITH A 1000 OHMS PER VOLT D.O. METER BETWEEN CHASSIS AND POINTS DESIGNATED. CAPACITOR VALUES IN MFD. UNLESS OTHERWISE INDICATED. RESISTOR AND COIL VALUE IN OHMS. WHERE VALUE OF COILS IS NOT SHOWN, RESISTANCE IS LESS THAN ONE OHM. ALL RESISTORS ARE RATED AT 1/2 WATT, ±20%.

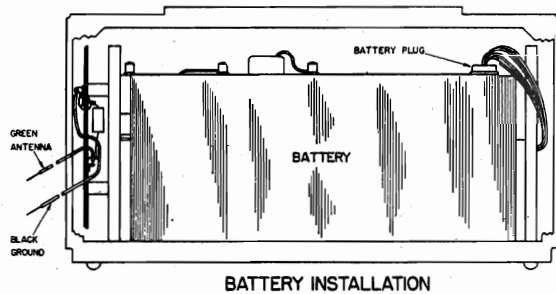


NOTE—Resistor - 68,000 Ohm in Screen Circuit of IA7GT Tube, Replaced With 33,000 Ohm. Voltage at Terminal #4 on IA7GT Tube Increased to 48 (Average).
 SELECTIVITY ... Over-all band width 35 KC at 1000 X signal at 1000 KC.
 SENSITIVITY ... 12 Microvolts for 50 Milliwatts output.
 POWER OUTPUT ... 150 M. W. undistorted 330 M. W. maximum.
 LOUD SPEAKER ... 5 inch diameter P. M. Magnet 2.15 oz. Alnico V. Voice coil 3.2 ohms impedance.
 TUBE COMPLEMENT ... IN5GT (Det.), IA7GT (Det.-Osc.), IN5GT (IF), IH5GT (Det.-Audio), 3Q5GT (Pwr.)

ELECTRICAL SPECIFICATIONS

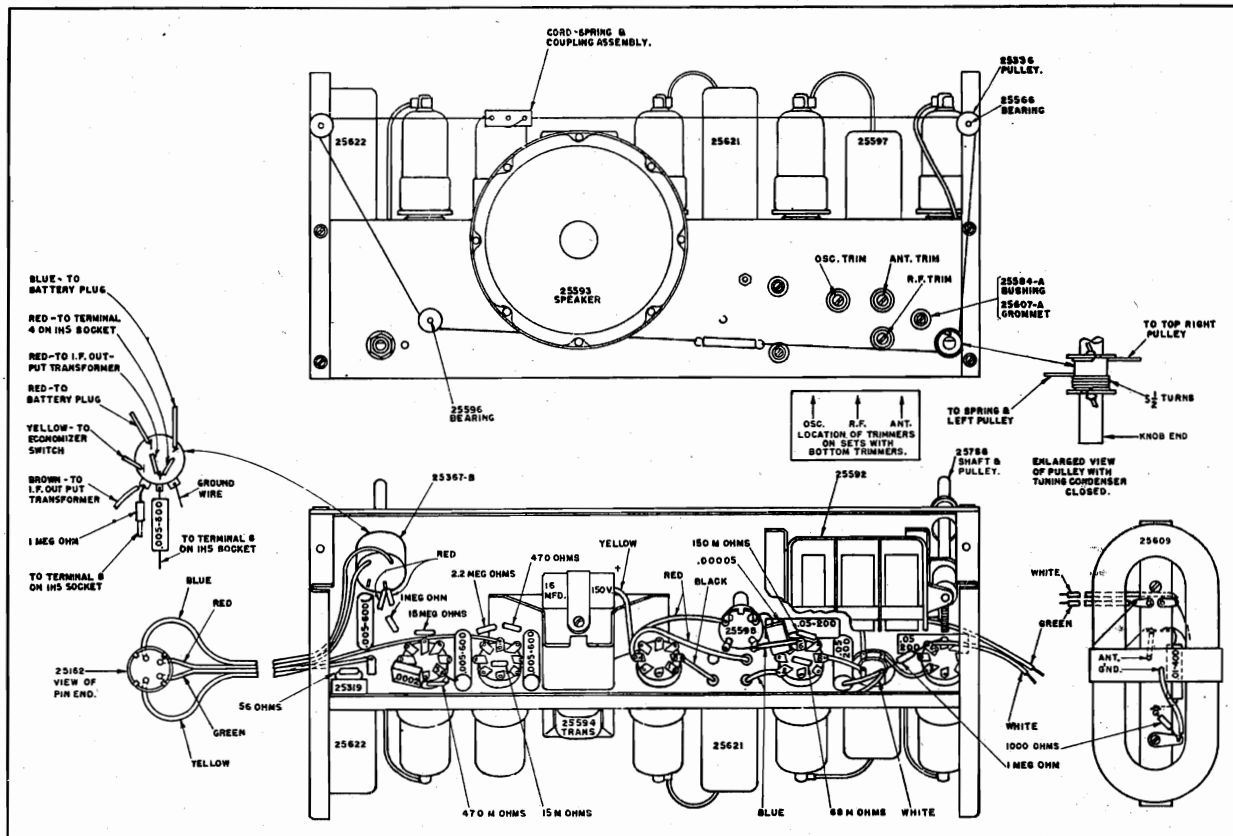
BATTERY USED ... (Wards 62-57): Battery dimensions, 16 x 6 5/8 x 4 1/2". "A" 1 1/2 volts, "B" 90 volts. "A" current 300 M. A., B current 11.5 M. A.
 TUNING RANGE ... 535-1620 KC.
 INTERMEDIATE-FREQUENCY ... 455 KC.

MONTGOMERY WARD



BATTERY INSTALLATION

REMOVAL OF CHASSIS—If it is found necessary for any reason to remove the radio chassis from the cabinet, proceed as follows: Remove knobs by pulling straight off, disconnect battery by removing plug, and remove two screws inserted through bottom of cabinet. Chassis can be removed now. (Note—After installing chassis in cabinet see that the bakelite strip attached to dial cord is engaged with the pin on the dial pointer.)



ALIGNMENT PROCEDURE
(Position of trimmers shown above)

- Output meter across 3.2-ohm output load. to keep output near 0.4 volts.
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed
- Loop antenna should be connected to receiver and in its proper position when making adjustments.

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT IN ORDER SHOWN
FREQUENCY	COUPLING CAPACITOR	CONNECTION TO RADIO	GROUND CONNECTION		
455 KC	.1	Grid Cap of 1N5GT (I.F.)	To Chassis	Capacitor full open (plates out of mesh)	2 trimmers on output IF can T5 (25622)
455 KC	.1	Grid Cap of 1A7GT	To Chassis	Capacitor full open (plates out of mesh)	2 trimmers on input IF can T4 (25621)
1620 KC	200 Mmf	Antenna Lead	To Chassis	Capacitor full open (plates out of mesh)	Oscillator trimmer C3 on gang
1400 KC	200 Mmf	Antenna Lead	To Chassis	Set dial pointer at 1400 KC	Antenna and R. F. trimmers C1, C2 on gang

MODEL 54KP-1209B
 MODEL 64WG-1207A
 MODEL 64WG-1804C

MONTGOMERY WARD
RECEIVER STAGE SENSITIVITIES

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 kc for all readings. All measurements are based on an output of 50 milliwatts. This may be measured by disconnecting the speaker voice coil and substituting a 3.2-ohm, 5-watt resistor across the secondary winding of the output transformer. A reading of 0.4 volts AC across this resistor will be equivalent to a 50-milliwatt output with the MODEL 54 KP-1209B

speaker connected.

The signal source must be an accurately calibrated signal generator capable of supplying both 1000 kc and 455 kc signals modulated 30% with a 400-cycle audio signal. Variations of plus or minus 25% are usually permissible.

The volume control must be set to maximum.

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
FREQUENCY	COUPLING CAPACITOR	CONNECTION TO RADIO	GROUND CONNECTION	
1000 KC	200 Mmf or RMA Dummy Antenna	External Antenna Clip	To Ground Lead	12 uv
1000 KC	.1 Mfd.	Grid (Top Connection) of R. F. Amp. (1N5)	To Chassis	20 uv
1000 KC	.1 Mfd.	Grid (Top Connection) of Converter (1A7)	To Chassis	220 uv
455 KC	.1 Mfd.	Grid (Top Connection) of Converter (1A7)	To Chassis	125 uv
455 KC	.1 Mfd.	Grid (Top Connection) I. F. Amp. (1N5)	To Chassis	6000 uv
400 Cycles	.1 Mfd.	Grid (Top Connection) Audio Amp. (1H5)	To Chassis	.1 v.
400 Cycles	.1 Mfd.	Grid (Pin) of Output Amp. (3Q5)	To Chassis	1.5 v.

MODEL 74WG-1207B 64WG-1207A & B

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	Antenna Lead	Chassis	10 microvolts
1000 kc	.05 mf	1R5 Mixer, Pin 6	Chassis	30 microvolts
455 kc	.05 mf	1R5 Mixer, Pin 6	Chassis	25 microvolts
455 kc	.05 mf	1U4 1st I-F, Pin 6	Chassis	400 microvolts
455 kc	.05 mf	1U4 2nd I-F, Pin 6	Chassis	3500 microvolts
400 cycles	.05 mf	1S5 1st A-F, Pin 6	Chassis	.031 volt
400 cycles	.05 mf	3Q4 Output, Pin 3	Chassis	2.7 volts

MODEL 64 WG-1804C

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	Loop Antenna— External antenna clip	Chassis	19.5 microvolts
1000 kc	.05 mf.	12SA7 Mixer—Pin 8	Point "X" (12SK7 Pin 3)	150 microvolts
455 kc	.05 mf	12SA7 Mixer—Pin 8	Same as above	100 microvolts
455 kc	.05 mf	12SF7 I-F—Pin 2	Same as above	3500 microvolts
400 cycles	.05 mf	12SJ7 1st A-F—Pin 4	Same as above	.042 volt
400 cycles	.05 mf	35L6GT Output—Pin 5	Same as above	1 volt

MONTGOMERY WARD REPLACEMENT PARTS INFORMATION

HOW TO ORDER PARTS — When ordering, specify applicable, and CHASSIS MODEL number. The model PART number, schematic diagram reference number when number appears on a label on the chassis.

REPLACEMENT PARTS LIST

Use Only Genuine Factory Replacement Parts

Ref. No.	Part No.	Description	Qty. Used In Set
CAPACITORS			
C1, C2, C3	25592	3 Gang Tuning Capacitor Including Trimmers	1
C4	25600	Electrolytic 16 Mfd. 150 V.	1
	8661	.05 Mfd. 200 V. Tubular	3
	8583	.01 Mfd. 400 V. Tubular	1
	14061	.005 Mfd. 600 V. Tubular	3
	14370	200 Mmf. Mica	1
	17091	50 Mmf. Mica	1
RESISTORS			
R1	25367	Control-Volume Including On-Off Switch	1
	14365	15 Megohm 1/2 Watt 20%	1
	25134	2.2 Megohm 1/2 Watt 20%	1
	8766	1 Megohm 1/2 Watt 20%	2
	25042	470,000 Ohm 1/2 Watt 20%	1
	14616	150,000 Ohm 1/2 Watt 20%	1
NOTE—	25040	68,000 Ohm 1/2 Watt 20%	1
	17164	15,000 Ohm 1/2 Watt 20%	1
	25414	1,000 Ohm 1/2 Watt 20%	1
	25085	470 Ohm 1/2 Watt 20%	1
	25613	.56 Ohm 1/2 Watt 10% (Wire Wound)	1
TRANSFORMERS AND COILS			
T1	25609	Loop Antenna (Includes Mounting Strips and Terminals)	1
T2	25598	Coil - Oscillator	1
T3	25597	Coil - RF (Includes Shield Can and 10 Mmf Condenser)	1
T4	25621	Transformer - IF Input (Complete in Can)	1
T5	25622	Transformer - IF Output (Complete in Can - Includes 2 100 Mmf Capacitors Built-In With Trimmers)	1
T6	25594	Transformer - Speaker (Includes Mounting Clamp)	1

Ref. No.	Part No.	Description	Qty. Used In Set
SPEAKER			
T7	25593	5" P. M. Speaker	1
SWITCHES			
S1		Part of Volume Control	
S2	25319	S. P. S. T. Slide Switch	1
DIAL AND TUNING PARTS			
	25566	Bearing - Short (For Upper Wood Pulleys)	2
	25596	Bearing - Long (For Lower Wood Pulley)	1
	25767	Cord - Dial (Includes Spring and Pointer Coupling)	1
	25336	Pulley - Wood	3
	25809	Plate - Assembly (Includes Dial Backing Plate with Brackets, Track, and Pointer)	1
	25586	Pointer	1
	25581	Track (For Pointer)	1
	25590	Scale - Dial	1
	25766	Shaft - Tuning (Includes "Spool" Pulley)	1
	25774	Screw - Set 8-32 x 1/8 (Used in Worm Gear of Tuning Condenser)	1
	25654	Screw - Wood #4 x 1/4 (Mounting Dial Back Plate)	4
MISCELLANEOUS			
	25553	Back - Chassis (Removable Back Plate)	1
	25591	Cabinet - Wood	1
	25603	Cap - Grid	4
	25605	End - Chassis	2
	25696	Knob - Bakelite	2
	25612	Plug - 4 Prong (For Battery Cable)	1
	25620	Socket - Octal, For Tubes	5
	25618	Screw - 10-32 x 7/8 (For Mounting Chassis)	2

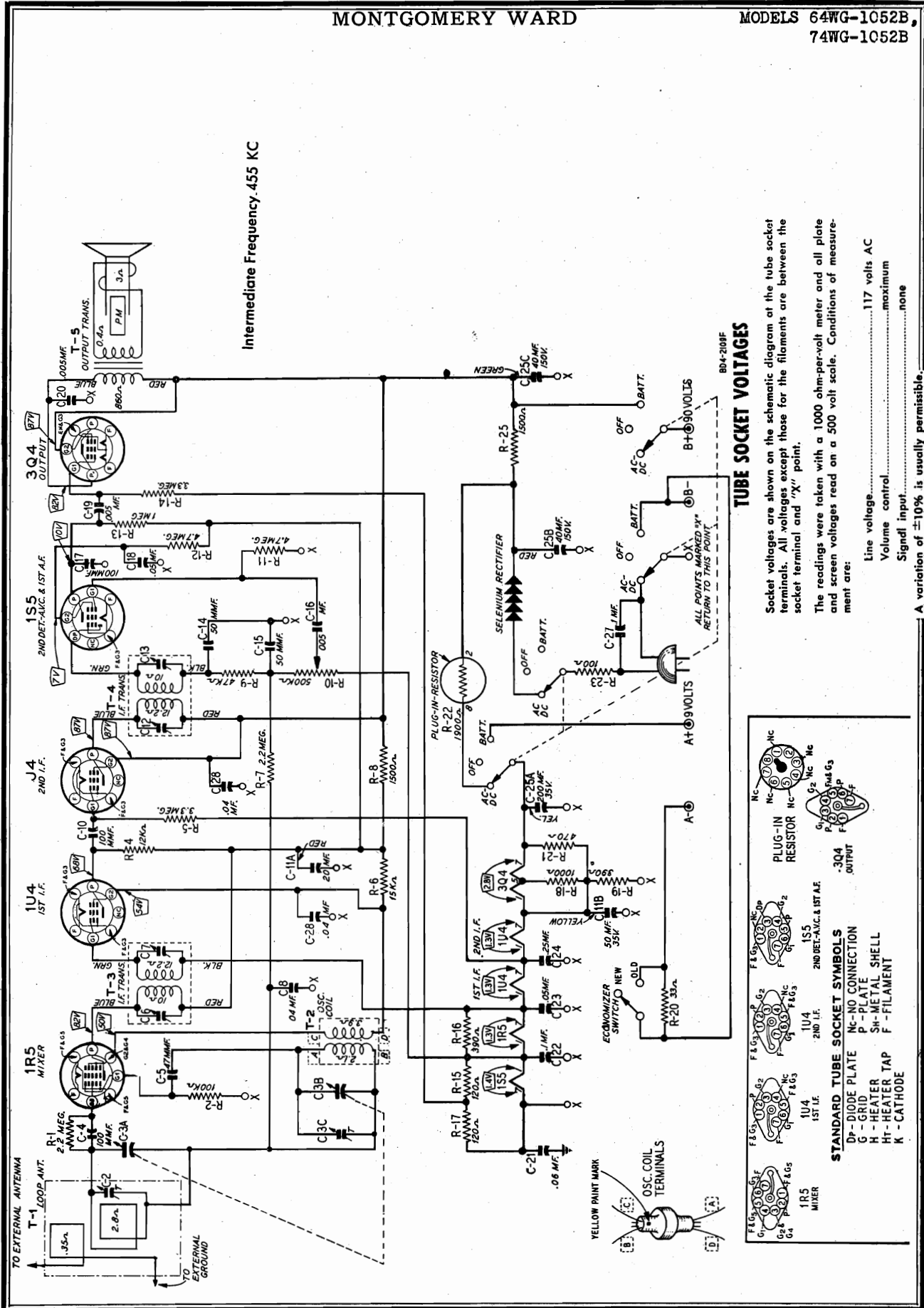
*The values of the resistors listed above are based on RMA standards. Due to conditions beyond our control some receivers have been shipped with resistors of pre-standardized values. This receiver will operate equally

well with resistors of either group. An illustration of the difference follows:

Pre-standardized value - 50,000 ohms,

RMA value - 47,000 ohms,

NOTE—#25040 resistor replaced with #25144 resistor
33,000 ohm. 1/2 watt 20%.

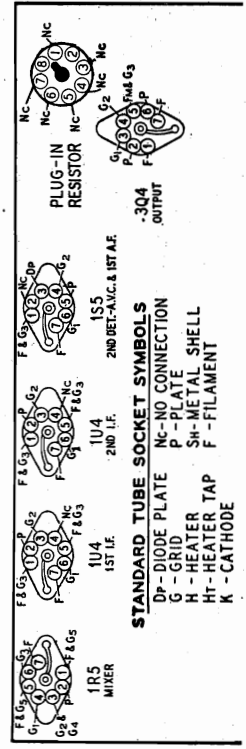


TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages except those for the filaments are between the socket terminal and "X" point.

The readings were taken with a 1000 ohm-per-volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

Line voltage.....	117 volts AC
Volume control.....	maximum
Signal input.....	none
A variation of ±10% is usually permissible.	



MODELS 64WG-1052B,
74WG-1052B

MONTGOMERY WARD

RECEIVER STAGE SENSITIVITIES

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 KC for all readings. All measurements are based on an output of 50 milliwatts. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm 5 watt resistor across the secondary winding of the output transformer. A reading of .4 volt AC

across this resistor will be equivalent to a 50 milliwatt output with the speaker connected. The volume control must be set to maximum. The signal source must be an accurately calibrated signal generator capable of supplying both 1000 KC and 455 KC signals modulated 30% with a 400 cycle audio signal. Output variations of Plus or Minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	Loop Antenna— External antenna clip	Chassis	20 microvolts
1000 kc	.05 mf.	1R5 Mixer—Pin 6	Point "X" (1S5 Pin 1)	30 microvolts
*455 kc	.05 mf.	1R5 Mixer—Pin 6	Same as above	15 microvolts
455 kc	.05 mf.	1U4 1st I-F—Pin 6	Same as above	440 microvolts
455 kc	.05 mf.	1U4 2nd I-F—Pin 6	Same as above	2200 microvolts
400 cycles	.05 mf.	1S5 1st A-F—Pin 6	Same as above	.022 volt
400 cycles	.05 mf.	3Q4 Output—Pin 3	Same as above	1.8 volts

*Short out the oscillator section of the gang condenser while making this measurement.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

The equipment in column at right is required for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter; Non-Metallic Screwdriver.

Dummy Antenna—.1 mf., 50 mmf.

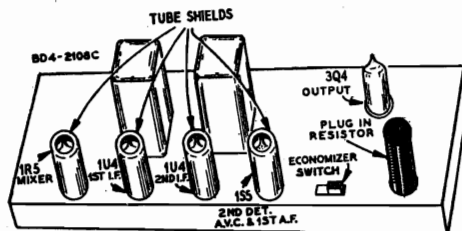
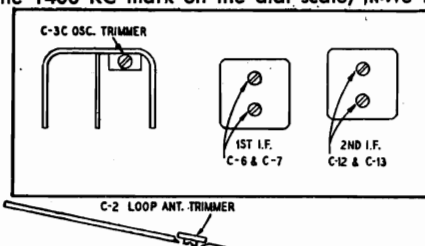
SIGNAL GENERATOR				CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM See Trimmer Illustration
Frequency Setting	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc	.1 mf	Control Grid 1U4—1st I-F Pin 6	Point "X" At Electrolytic Capacitor Black Lead	Turn Rotor to full open	2nd I-F (C13) & (C12)
455 kc	.1 mf	Control Grid 1R5—Mixer Pin 6 See Note C	Same as above	Turn Rotor to full open	1st I-F (C7) & (C6)
1620 kc	.1 mf	Control Grid 1R5—Mixer Pin 6	Same as above	Turn Rotor to full open	Oscillator (C3C)
1400 kc	50 mmf	External Antenna Clip on Loop See Note A	External Ground connection on loop	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note B	Antenna (C2)

NOTE A—Re-assemble chassis in cabinet and close the cabinet back before making adjustment.

NOTE B—Tune in a 1400 KC signal. If pointer is not at the 1400 KC mark on the dial scale, move the pointer on

the string to the 1400 KC mark.

NOTE C—Short out the oscillator section of the gang condenser for this adjustment only.



MONTGOMERY WARD

MODELS 64WG-1052B,
74WG-1052B

MODEL 64WG-1052B, 74WG-1052B

OPERATING VOLTAGES—Chassis for Models 64WG-1052B and 74WG-1052B are available for operation on the following power supplies:
 105-125 Volts AC 50-60 Cycles or
 105-125 Volts DC
 Ward's Battery (A Section 9 Volts
 Pack No. 62-35/B Section 90 Volts
 Pack No. 62-35/C Section 90 Volts
 Pack No. 62-35/D Section 90 Volts
 Pack No. 62-35/E Section 90 Volts
 Pack No. 62-35/F Section 90 Volts
 Pack No. 62-35/G Section 90 Volts
 Pack No. 62-35/H Section 90 Volts
 Pack No. 62-35/I Section 90 Volts
 Pack No. 62-35/J Section 90 Volts
 Pack No. 62-35/K Section 90 Volts
 Pack No. 62-35/L Section 90 Volts
 Pack No. 62-35/M Section 90 Volts
 Pack No. 62-35/N Section 90 Volts
 Pack No. 62-35/O Section 90 Volts
 Pack No. 62-35/P Section 90 Volts
 Pack No. 62-35/Q Section 90 Volts
 Pack No. 62-35/R Section 90 Volts
 Pack No. 62-35/S Section 90 Volts
 Pack No. 62-35/T Section 90 Volts
 Pack No. 62-35/U Section 90 Volts
 Pack No. 62-35/V Section 90 Volts
 Pack No. 62-35/W Section 90 Volts
 Pack No. 62-35/X Section 90 Volts
 Pack No. 62-35/Y Section 90 Volts
 Pack No. 62-35/Z Section 90 Volts

REPLACEMENT PARTS LIST

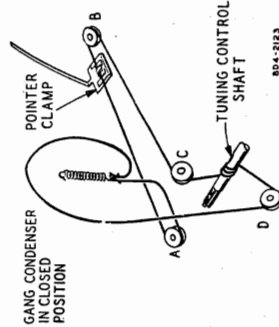
Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

Ref. No.	Part No.	Description	Qty. Used in Set
C-2	17A123	1.5 mfd/12 mf Trimmer	1
C-3	14A186	Gang Capacitor with Drive Pulley	1
C-4	47X476	Moulded	3
C-10	47X476	Moulded	1
C-5	47X463	Part of T-3 (1st I-F Transformer)	1
C-6			
C-7			
C-8			
C-28	B66403	.04 mf 200 V Tubular	3
C-29			
C-11A	45X348	150 V Dry	1
C-11B		30 mf 55 V electrolytic	1
C-12		Part of T-4 (2nd I-F Transformer)	1
C-13			
C-14			
C-15	47X112	50 mf Dual Mica	1
C-16			
C-19	B66502	.005 mf 200 V Tubular	2
C-18	B66503	.05 mf 200 V Tubular	2
C-20	D66502	.005 mf 400 V Tubular	1
C-21	D66603	.06 mf 400 V Tubular	1
C-22	B66104	.1 mf 200 V Tubular	1
C-24	B66254	.25 mf 200 V Tubular	1
C-25A		200 mf 35 V Dry	1
C-25B	45X347	150 V electrolytic	1
C-25C		40 mf electrolytic	1
C-27	D67104	.1mf 400 V Tubular	1
R-1	B83225	2.2 meg. Ohms	2
R-2	B83104	100 K	1
R-4	B84123	12 K	1
R-5	B85335	3.3 meg.	2
R-14	B84153	15 K	1
R-6	B84152	1500	1
R-9	B85473	47 K	1
R-10	36X307	500 K	1
R-11	B85475	4.7 meg.	2
R-12	B85105	1.0 meg.	1
R-13	B84121	120	1
R-15			
R-16	B84091	390	2
R-17			
R-18	B84102	1000	1
R-19	B83330	33	1
R-20	B84471	470	1
R-21	43X215	1900	1
R-22		Shaded W. W. Resistor (Ballast tube)	1
R-23	D84101	100	1

HOW TO ORDER PARTS—Should it be necessary to write us or to order any repair parts, it is important that the complete model number which appears on the label attached to the rear of the chassis be specified. Parts should be ordered from the nearest Ward's Retail Store, Catalog Order office or Mail Order House.

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully closed position. Use a new cord 30" long and tie one end to the tension spring. Fasten the other end of the tension spring to the hook on the drive pulley. Pass the cord through the slot in the drive pulley rim and continue around pulley rim 1/4 turn clockwise. Pass cord around pulleys A, B, and C as shown in the illustration. Wind three turns clockwise (viewed from rear of chassis) around tuning control shaft. The turns must progress toward rear of chassis. Pass cord around pulley D and continue 3/4 turn clockwise around large drive pulley. Pass cord through the slot in the pulley rim then stretch the tension spring and tie free end of cord to it. Cut off any excess string.

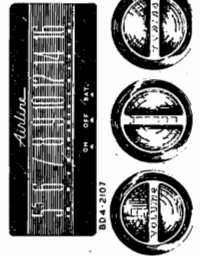


ELECTRICAL SPECIFICATIONS

Power Supply....."A" Battery Supply—9 Volts, 50 Ma.
 "B" Battery Supply—90 Volts, 11 Ma. or 105-125 volts AC, 50-60 cycles, 10 watts or 105-125 volts DC
 Battery Pack.....Ward's Battery Pack No. 62-35
 Frequency Range.....540-1600 KC
 Selectivity.....At 1000 KC, 53 KC wide at 1000 times signal
 Sensitivity.....(for .05 watt output with external antenna) 20 microvolts average
 Power Output.....0.125 watt maximum
 Loud Speaker.....5 1/2" PM dynamic
 Voice Coil Impedance.....3.2 ohms at 400 cycles

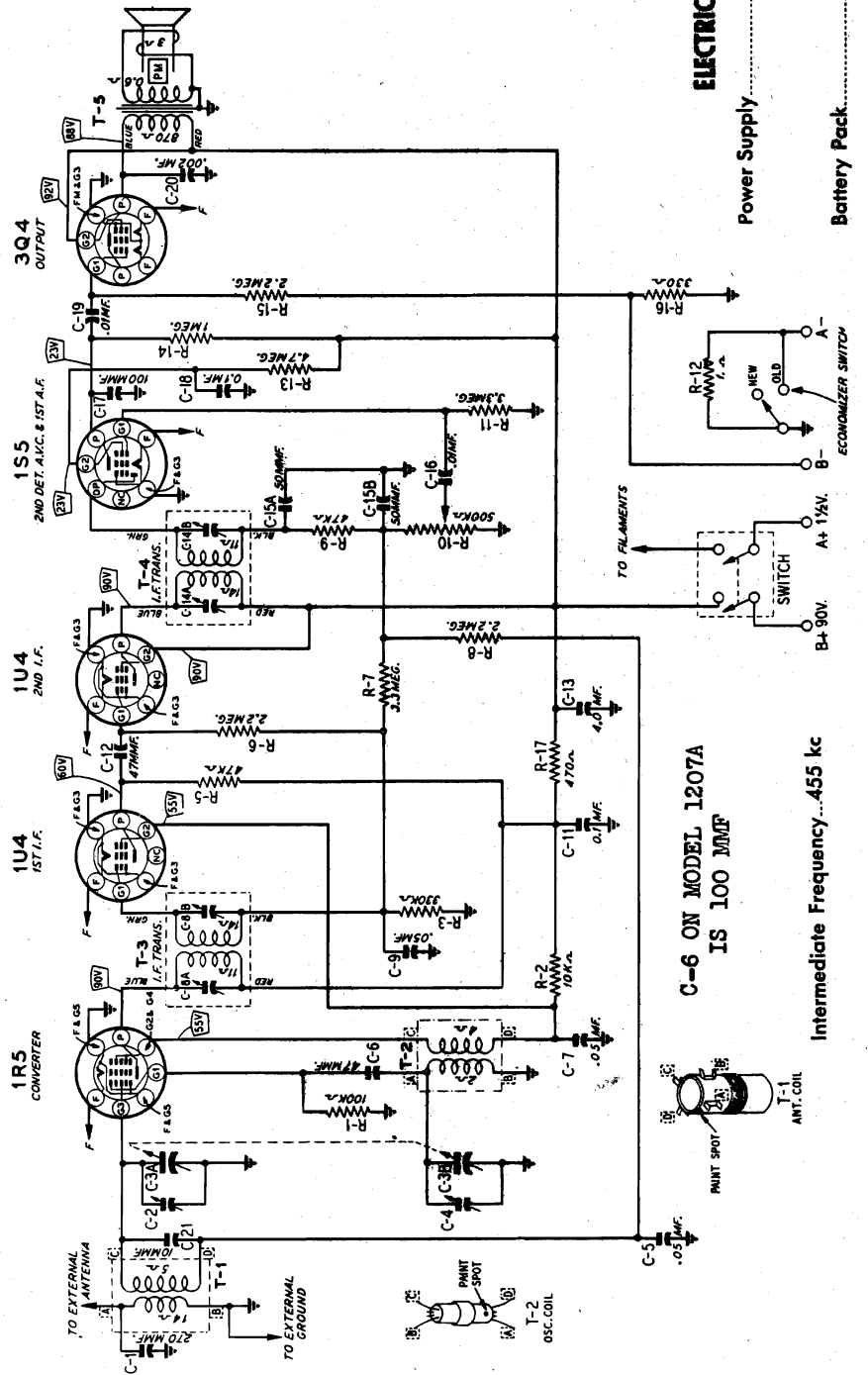
REMOVAL OF CHASSIS FROM CABINET

Pull off the three control knobs and disconnect the battery plug. Unwrap the power cord from the radio at the top of the cabinet if necessary. Remove the four screws that fasten the chassis to the cabinet (2 on the outside at each end of the cabinet). Tip the chassis slightly forward and at the same time withdraw it from the cabinet.



MODELS 64WG-1207A,
64WG-1207B,
74WG-1207B

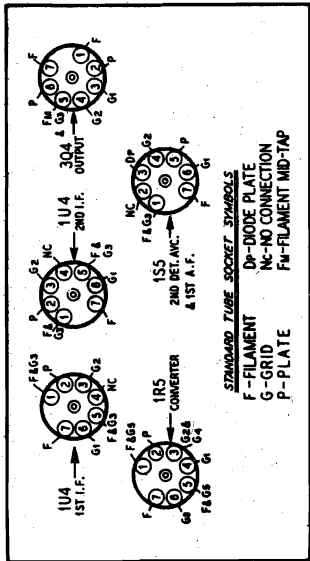
MONTGOMERY WARD



ELECTRICAL SPECIFICATIONS

Power Supply....."A" Battery Supply 1½ volts, 220 Ma.
"B" Battery Supply 90 volts, 12 Ma.
Battery Pack.....Wards Battery Pack 62-51 or 62-57

Frequency Range.....540-1600 kc
Selectivity.....At 1,000 kc, 40 kc broad at 1,000 times signal
Sensitivity.....(For .05 watt output and with external antenna) 10 microvolts average
Power Output......1 watt maximum
Loud Speaker......5" PM dynamic
Voice Coil Impedance.....3.2 ohms at 400 cycles



C-6 ON MODEL 1207A
IS 100 MMF

Intermediate Frequency...455 kc

TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and the chassis.

All readings, except those for the 1S5 tube, were taken with a 1000 ohm-per-volt meter and read on a 500 volt scale. The plate and screen voltages for the 1S5 tube were read with a vacuum tube voltmeter.

Conditions of measurement are:

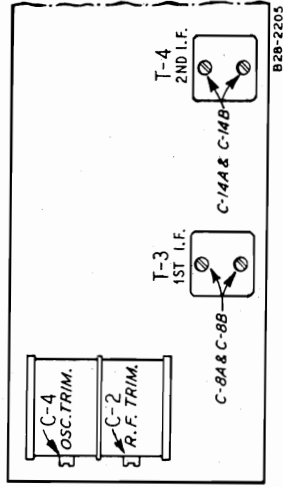
Battery voltages under load.....B, 90 volts
A, 1½ Volts
Volume control.....maximum
Signal input.....none
A variation of ±10% is usually permissible.

MONTGOMERY WARD

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
 Allow Chassis and Signal Generator to "Heat Up" for several minutes. Output Indicating Meter; Non-Metallic Screwdriver.
 The equipment in column at right is required for aligning: Dummy Antenna—.1 mf., 50 mmf.

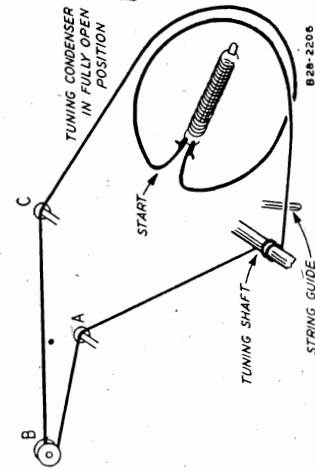
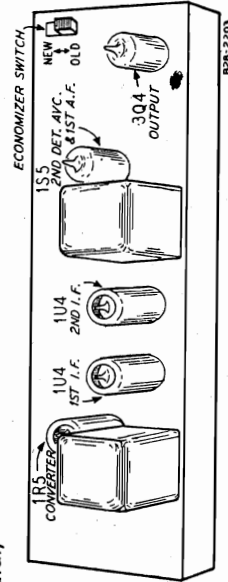
SIGNAL GENERATOR		RECEIVER	
Frequency Setting	Coupling Capacitor	Connection to Radio	Ground Connection
455 kc	.1 mf	Control Grid 1R5 Mixer Pin 6	Chassis
1620 kc	.1 mf	Control Grid 1R5 Mixer Pin 6	Chassis
1400 kc	50 mmf	External Antenna lead.	Chassis
			Adjust Trimmers for Maximum Output (See Trimmer Illustration)
		Turn Rotor to full open	2nd I-F C-14A and C-14B 1st I-F C-8A and C-8B
		Turn Rotor to full open	Oscillator C-4
		Turn Rotor to Max. Output Set pointer to 1400 kc See note A	Antenna C-2



NOTE A—Tune in a 1400 kc signal. If the pointer is not at the 1400 kc mark on the dial, move it along the string to 1400 kc.

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position and use a new drive cord 35" long. Tie one end of the new cord to the tension spring and hook the other end of the tension spring over the tab on the large drive pulley. Pass the cord through the opening in the drive pulley rim and continue 3/4 turn clockwise around the pulley rim. Pass the cord in front of the string guide, under the tuning shaft and wind 2 3/4 turns around the shaft with the turns progressing toward the chassis. Run the cord up and over the idler stud A, around pulley B, over idler stud C and then wind 1/2 turn clockwise around the large drive pulley. Pass the cord through the opening in the pulley rim, stretch the tension spring and tie the free end of the cord to it. Rotate the tuning shaft several times in order to take up any slack in the drive cord. If the installation is satisfactory cut off any excess string and attach the dial pointer.



MODELS 64WG-1207A,
64WG-1207B,
74WG-1207B
MODEL 64WG-1804C

MONTGOMERY WARD

Ref. No.	Part No.	Description	Qty. Used in Set
TRANSFORMERS AND COILS			
T-1	26A445	"B" Range loop antenna assembly...	1
T-2	9A1805	Oscillator coil assembly.....	1
T-3	9A1775	1st I-F Transformer and can assembly	1
T-4	9A1776	2nd I-F Transformer and can assembly	1
T-5	51X116	Output Transformer.....	1
RESISTORS			
Ohms Watts			
R-1	8B4332	3300 0.5 Carbon.....	1
R-2	8B5104	100,000 0.5 Carbon.....	1
R-3	8B4393	39,000 0.5 Carbon.....	1
R-4	8B5225	2.2 meg 0.5 Carbon.....	1
R-5	8B5473	47,000 0.5 Carbon.....	1
R-6	36X347	500,000 Volume control and switch	1
R-7	8B4153	15,000 C.5 Carbon.....	1
R-8	8B5475	4.7 meg. 0.5 Carbon.....	1
R-9	8B4474	470,000 0.5 Carbon.....	1
R-10	8B4333	33,000 0.5 Carbon.....	1
R-11	8B4823	82,000 0.5 Carbon.....	1
R-12	8B5474	470,000 0.5 Carbon.....	1
R-13	8B3181	180 0.5 Carbon.....	1
R-14	8B4274	270,000 0.5 Carbon.....	1
R-15	8B4390	39 2.0 Carbon.....	1
R-16	8B4270	27 0.5 Carbon.....	1
R-17	8B4152	1500 1.0 Carbon.....	1
R-20	8B5471	470 0.5 Carbon.....	1
DIAL AND DRIVE ASSEMBLY			
6X21		Rubber grommet Gang cond.....	3
20X329		Cond. cushion stud mfg.....	3
58X667		Dial.....	1
25X1461		Dial bracket.....	1
26A446		Pointer bracket assembly.....	1
15X217		Pointer.....	1
25X1398		Pilot light bracket.....	1
7A192		Pilot light socket assembly.....	1
		Pilot light No. 47.....	1
		42" drive cord.....	1
28X95		Drive cord tension spring.....	1
26X464		Drive shaft.....	1
19X192		"C" washer for drive shaft.....	2
41X81		Dial light diffuser.....	1
25X1385		Holder, light diffuser.....	1
4X884		Eucitecon.....	1
25X1460		Eucitecon mounting bracket.....	2
MISCELLANEOUS			
12A431		4" x 6" speaker with mounting bracket	1
		Cone and voice coil assembly (specify part number and letters stamped on speaker).....	1
3A-303		Tube socket—octal (8 prong) molded	5
3A421		Tube socket with shield.....	1
10A297		Knob (walnut) on-off switch, volume control and tuning.....	2

Ref. No.	Part No.	Description	Qty. Used in Set
MISCELLANEOUS			
12A443		5" P.M. Speaker with Mfg. Bracket.....	1
		Cone and Voice Coil Assembly (Specify part no. and letters stamped on speaker).....	1
26A432		Dial Bracket Assembly Complete with Dial, Bracket, Clamps, Pulleys and Crystal.....	1
28X95		Drive Card Tension Spring.....	1
15X224		35" Drive Cord.....	1
26X483		Pointer.....	1
6X19		Drive Shaft.....	1
20X329		Rubber Grommet } Mfg. Gang Cond.	3
2A175		Cond. Cushion Stud.....	3
3A312		On-Off Switch (Economizer).....	1
32X221		Miniature Tube Socket.....	5
13X555		Tube Shield.....	3
10A530		Battery Cable Assembly.....	1
10A531		Knob (Volume).....	1
		Knob (Tuning).....	1

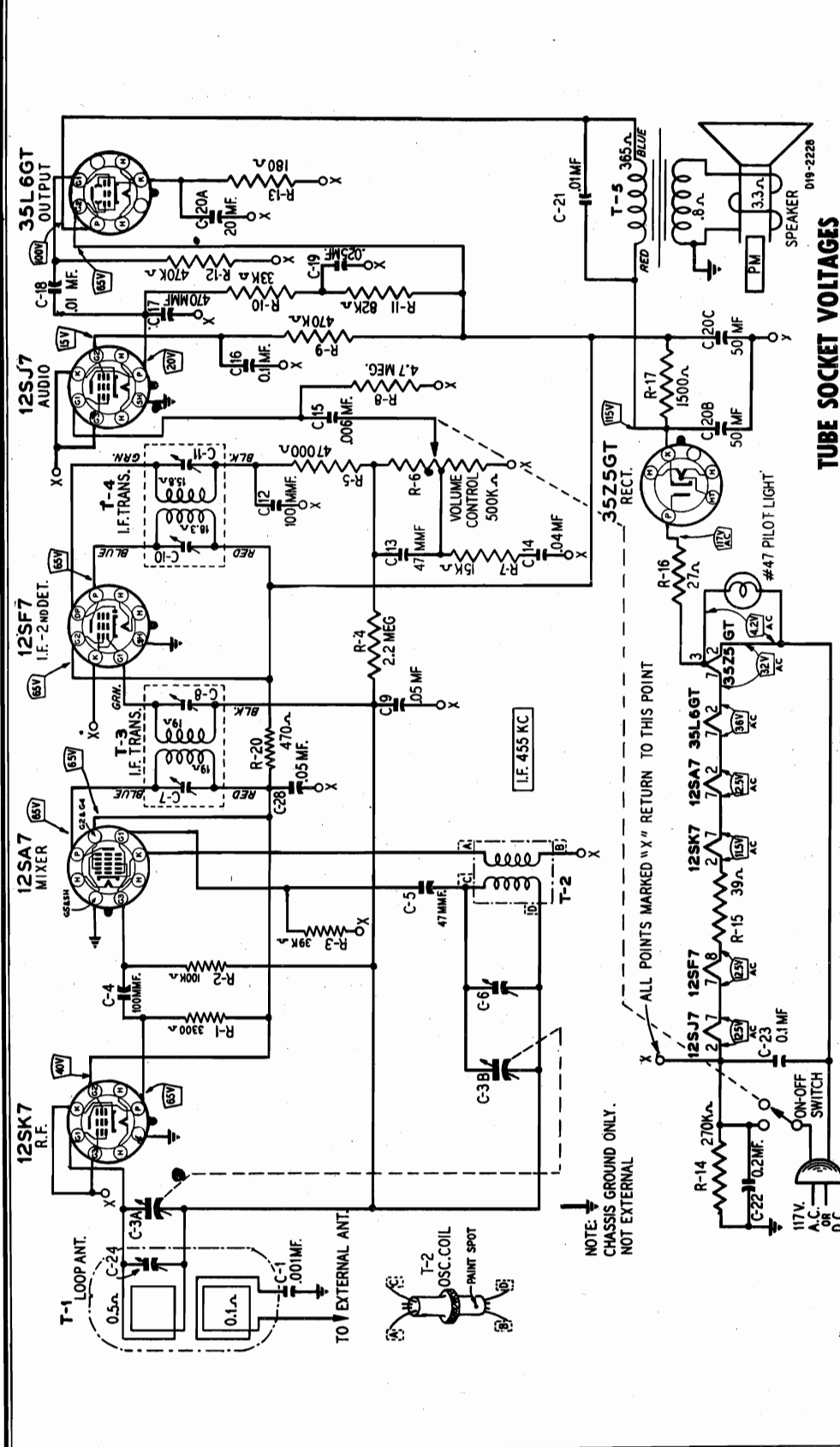
OPERATING VOLTAGES—Chassis for Model 64WG-1804C are available for operation on the following power supplies: 105-125 volts AC, 50-60 cycles or 105-125 volts DC.

Ref. No.	Part No.	Description	Qty. Used in Set
CAPACITORS			
C-1	D67102	.001 mf 400 V Tubular.....	1
C-3A	26A402	Gang condenser and pulley assembly	1
C-3B			
C-4	47X476	100 mmf Molded.....	2
C-5	47X446	47 mmf Molded.....	1
C-6		Part of C-3	
C-7		Part of T-3, 1st I-F Transformer	
C-8	B66503	.05 mf 200 V Tubular.....	1
C-9		Part of T-4, 2nd I-F Transformer	
C-10	47X463	47 mmf Molded.....	1
C-11	8B7403	.04 mf 200 V Tubular.....	1
C-14	867602	.006 mf 200 V Tubular.....	1
C-15	B66104	.1 mf 200 V Tubular.....	1
C-16	47X467	470 mmf Molded.....	1
C-17		Part of T-3, 1st I-F Transformer	
C-18	B66103	.01 mf 200 V Tubular.....	2
C-21	B67353	.025 mf 200 V Tubular.....	1
C-20A		20 mf 25 V Dry electrolytic	1
C-20B	45X344	50 mf 150 V condenser.....	1
C-20C		50 mf 150 V	
C-22	867204	0.2 mf 200 V Tubular.....	1
C-23	D67104	.1 mf 400 V Tubular.....	1
C-24	17A123	1.5-12 mmf Trimmer.....	1
C-28	B67503	.05 mf 200 V Tubular.....	1

OPERATING VOLTAGES—Chassis for Model 64WG-1207A are available for operation on the following power supply: Battery..... Wards Battery Pack } A Section 1½ Volts } B Section 90 Volts

Ref. No.	Part No.	Description	Qty. Used in Set
CAPACITORS			
C-1	47X445	270 mmf Molded.....	1
C-2		Part of C-3 (Gang Capacitor)	
C-4	26A431	Gang Capacitor and Pulley Assembly	1
C-5	B66503	.05 mf 200 V Tubular.....	3
C-6	47X476	100 mmf Molded.....	2
C-7		Part of T-3 1st I-F Transformer	
C-8A			
C-8B			
C-11	B66104	0.1 mf 200 V Tubular.....	2
C-18	47X463	47 mmf Molded.....	1
C-12	45X250	4.0 mf 100 V Dry Electrolytic.....	1
C-13		Part of T-4 2nd I-F Transformer	
C-14A			
C-14B			
C-15A	47X112	50 mmf Dual Mica.....	1
C-15B			
C-16	B66103	.01 mf 200 V Tubular.....	2
C-19	B66202	.002 mf 200 V Tubular.....	1
C-20	47X111	10 mmf Molded.....	1
C-21			
TRANSFORMERS AND COILS			
T-1	9A1800	Antenna Coil Assembly.....	1
T-2	9A1853	Oscillator Coil Assembly.....	1
T-3	9A1801	1st I-F Transformer and Can Assembly	1
T-4	9A1802	2nd I-F Transformer and Can Assembly	1
T-5	51X128	Output Transformer.....	1
RESISTORS			
Ohms Material			
R-1	8B5104	100k 0.5 Carbon.....	1
R-2	8B4103	10k 0.5 Carbon.....	1
R-3	8B5334	330k 0.5 Carbon.....	1
R-5	8B4473	47k 0.5 Carbon.....	1
R-6	8B4225	2.2 meg. 0.5 Carbon.....	2
R-7	8B4335	3.3 meg. 0.5 Carbon.....	1
R-9	8B5473	47k 0.5 Carbon.....	1
R-10	36X355	500k Volume Control & Switch	1
R-11	8B5335	3.3 meg. 0.5 Carbon.....	1
R-12	43X95	1.0 0.5 (5½" Resist. Wire)	1
R-13	8B5475	4.7 meg. 0.5 Carbon.....	1
R-14	8B5105	1.0 meg. 0.5 Carbon.....	1
R-15	8B5225	2.2 meg. 0.5 Carbon.....	1
R-16	8B4331	330 0.5 Carbon.....	1
R-17	8B5471	470 0.5 Carbon.....	1

MONTGOMERY WARD



TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages except those for the heater and dial lamp are between the socket terminal and "X" point.

The readings were taken with a 1000 ohm-per-volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

- Line voltage.....117 volts AC
- Volume control.....maximum
- Signal input.....none

A variation of ±10% is usually permissible.

NOTE: CHASSIS GROUND ONLY. NOT EXTERNAL.

ALL POINTS MARKED "X" RETURN TO THIS POINT

STANDARD TUBE SOCKET SYMBOLS
 D--DIODE PLATE
 G--CONTROL GRID
 G₂--ANODE GRID
 G₃--OSCILLATOR GRID
 S--SCREEN GRID
 H--HEATER
 K--HEATER TAP
 K--CATHODE
 NC--NO CONNECTION
 P--PLATE
 S--METAL SHELL
 S--SUPPRESSOR GRID

MODEL 64WG-1804C

MONTGOMERY WARD ALIGNMENT PROCEDURE

Check dial pointer position, see Dial Calibration paragraph.

Volume Control—Maximum All Adjustments.

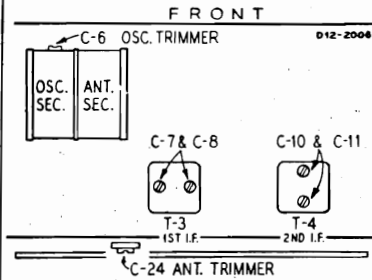
Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

The equipment in column at right is required for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter; Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 50 mmf.

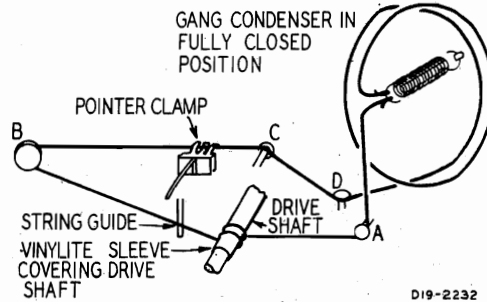


SIGNAL GENERATOR			Coupling Capacitor	DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT IN ORDER SHOWN (See Trimmer Illustration)
Frequency Setting	Connection to Receiver	Ground Connection			
455 kc	Control Grid 12SF7—I-F (Prong No. 2)	Point "X" 12SK7—R-F (Prong No. 3)	.1 mf	Turn Rotor to full open	2nd I-F (C10) & (C11)
455 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	Turn Rotor to full open	1st I-F (C7) & (C8)
1620 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	Turn Rotor to fully open position	Oscillator (C6)
1400 kc	External Antenna Clip on Loop	Chassis	50 mmf	Turn Rotor to 1400 kc Index Line. See Note A	Antenna (C24)

NOTE A:—Index line is on dial light diffuser strip. See DIAL CALIBRATION paragraph.

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully closed position. Use a new drive cord 42" long and tie one end to the tension spring. Hook the other end of the tension spring over the tab on the drive pulley. Pass the cord through the slot on the drive pulley rim, around stud A and wind two turns clockwise (from front of chassis) around the tuning shaft. Turns must progress away from chassis. Pass cord around pulley B and studs C and D. Pass cord under drive pulley and wind 1 3/4 turns counterclockwise around drive pulley. Stretch tension spring and tie free end of cord to spring. Cut off any excess cord.



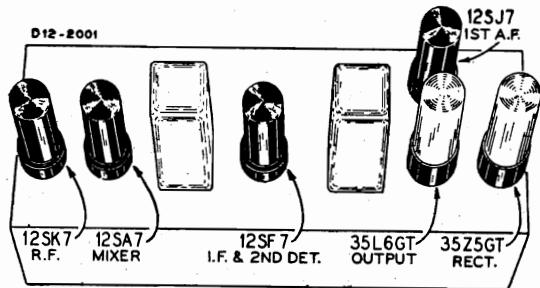
D19-2232

Attach the dial pointer to the cord and position as instructed in paragraph DIAL CALIBRATION.

DIAL CALIBRATION

In order to align the receiver, the dial pointer must be positioned on the dial string correctly with reference to the dial. Index lines are provided on the dial light diffuser for this purpose.

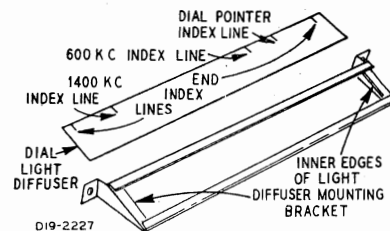
Before aligning the receiver (or when replacing the dial light diffuser) check the position of the diffuser strip, making certain that the two end index lines are aligned with the inner edges of the diffuser mounting bracket opening. The bracket should be crimped at one point to prevent movement of the diffuser strip. To position the dial pointer, turn the gang condenser to the fully closed position. The dial pointer should be directly over the dial pointer index line. (See illustration)



ELECTRICAL SPECIFICATIONS

- Power Supply.....105-125 volts AC, 50-60 cycles, 35 watts or 105-125 volts DC
- Selectivity.....At 1000 KC, 50 KC wide at 1000 times signal
- Sensitivity.....(for .05 watt output with external antenna) 15 microvolts average
- Power Output.....1.3 watts maximum
.75 watt 10% distortion
- Loud Speaker.....4"x 6" PM dynamic
- Voice Coil Impedance...3.2 ohms at 400 cycles

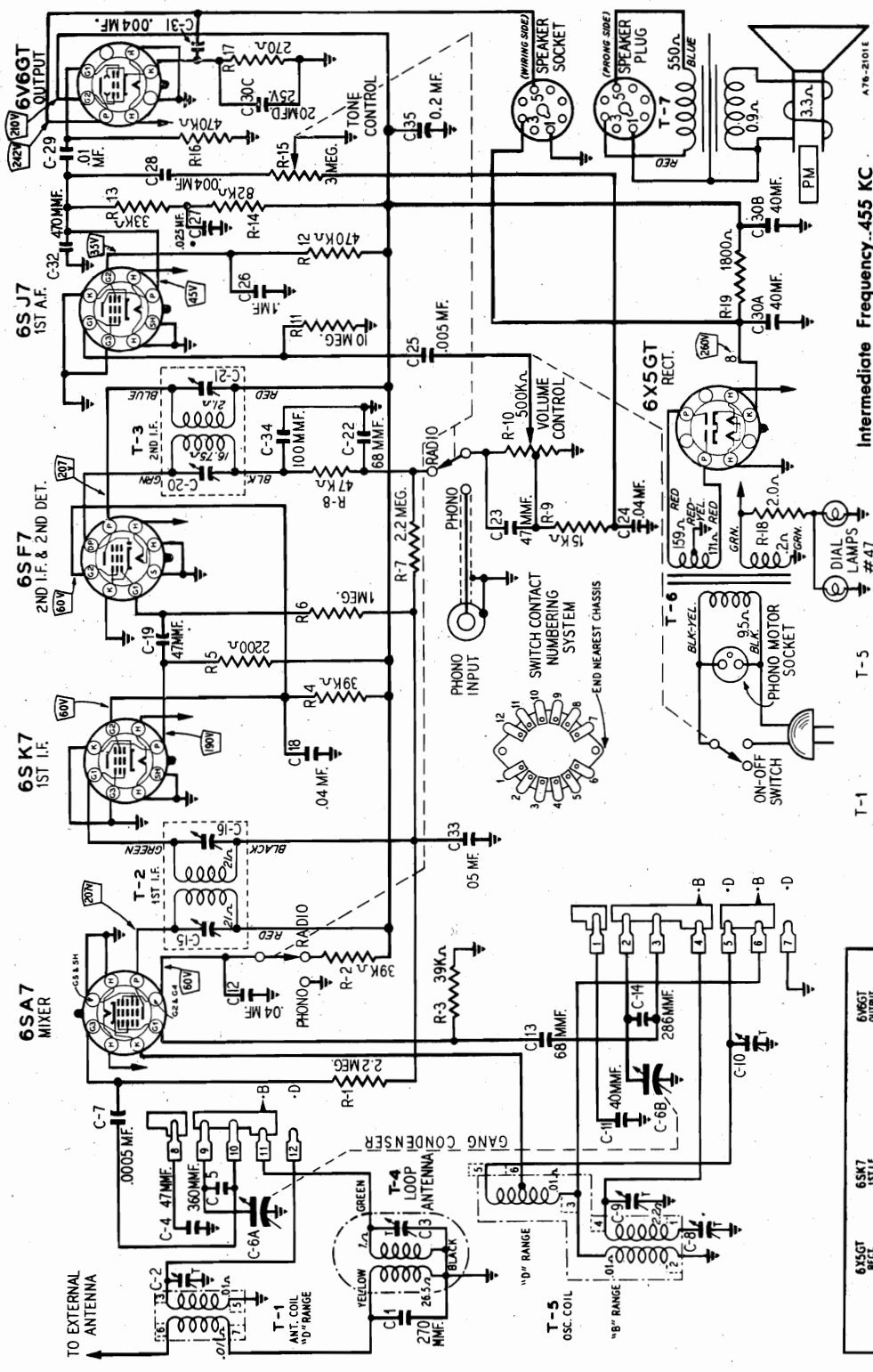
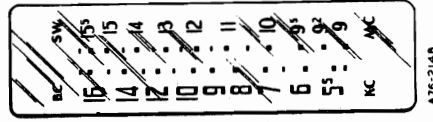
The 1400 KC index line is for use when aligning the receiver.



D19-2227

MONTGOMERY WARD

MODELS 64WG-2010A,
64WG-2010B,
74WG-2010B



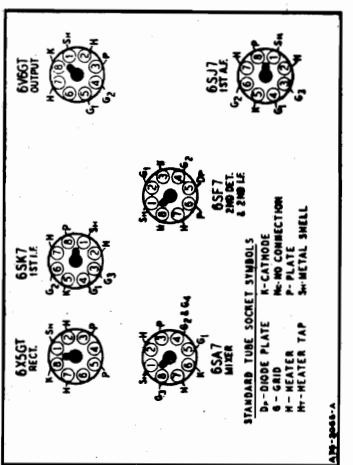
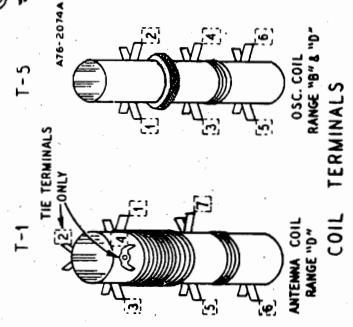
Intermediate Frequency .455 KC

TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground.

The readings were taken with a 1000 ohm per volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

- Line voltage..... 117 volts AC
- Volume control..... maximum
- Signal input..... none
- A variation of ± 10% is usually permissible.



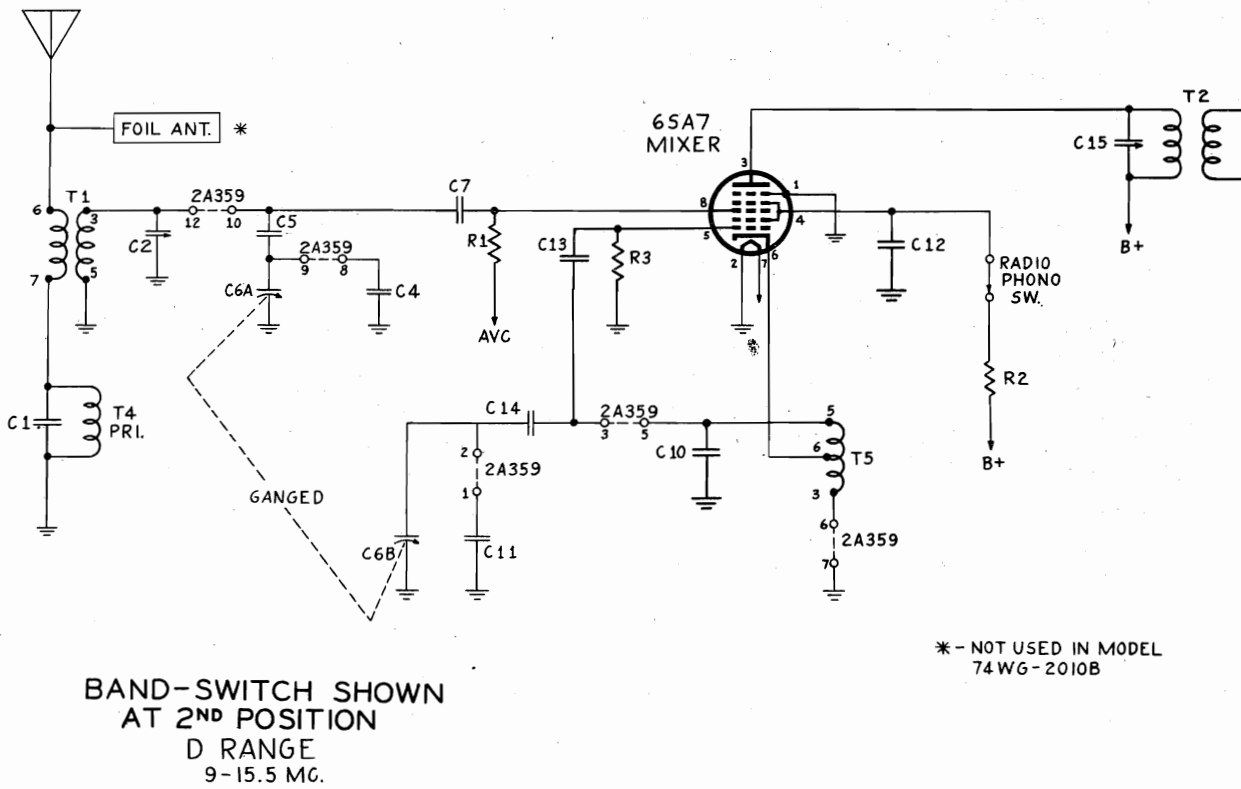
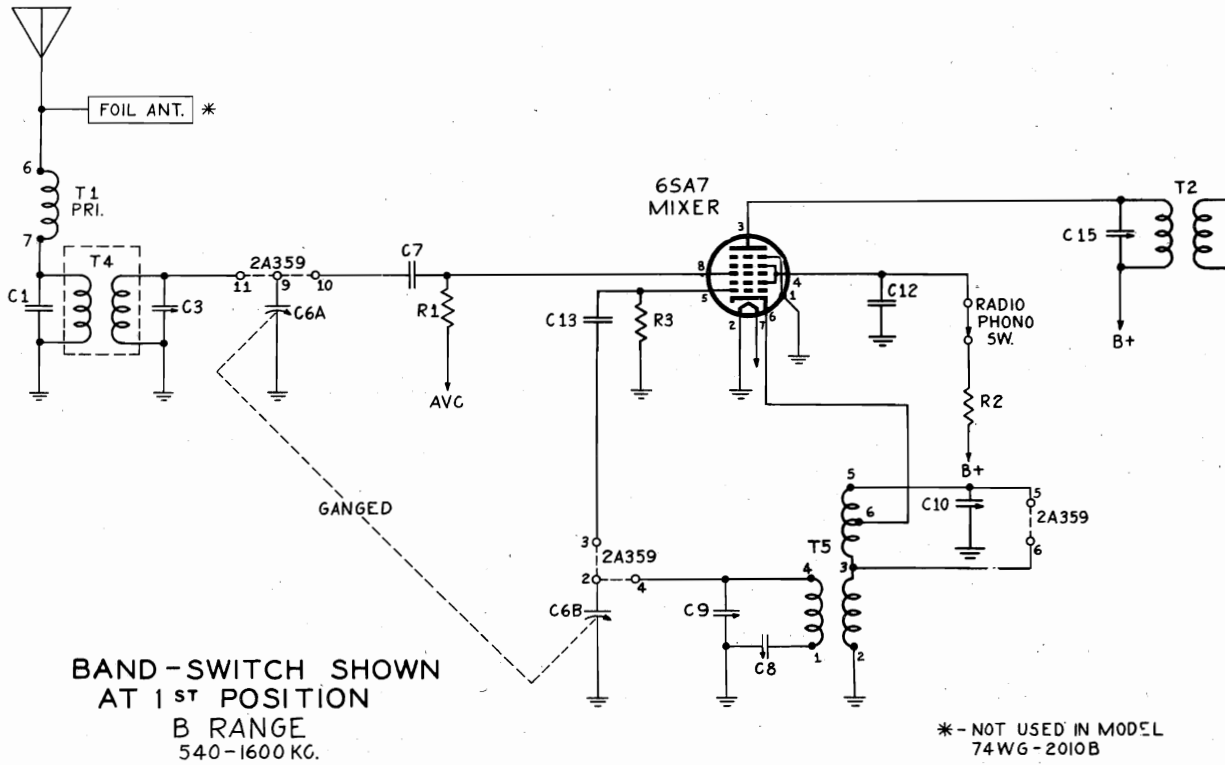
STANDARD TUBE SOCKET SYMBOLS
D- DIODE PLATE
R- CATHODE
S- GRID SCREEN
M- HEATER TAP
S- METAL SHELL

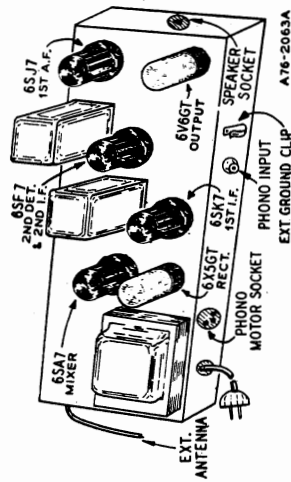
"clarified schematics"

PAGE 16-14 MONT-WARD

MODELS 64WG-2010A,
64WG-2010B,
74WG-2010B

MONTGOMERY WARD



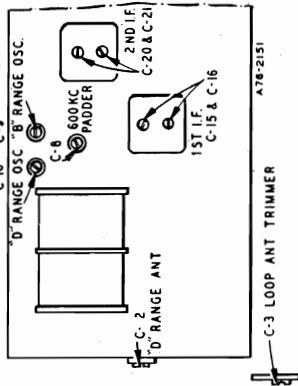
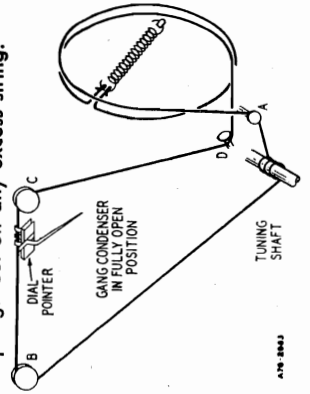


50 CYCLE OPERATION

Should it be desired to use the radio and record player on a 50 cycle power supply, it will be necessary to slip a 50 cycle conversion spring over the motor drive shaft on the record player. This conversion spring is listed in the parts list; however, alternate motor sources have been used for the changer and it will be necessary to check the motor assembly number stamped on the motor mounting plate and then order the conversion spring listed in the parts list under that motor.

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use a new drive cord 46" long and tie one end to the tension spring. Hook the other end of the tension spring to the tab on the drive pulley. Pass the cord through the slot in the drive pulley rim and continue one and one-half turns counter-clockwise around the drive pulley. Then pass the cord around idler stud A and wind three and one-half turns clockwise around the tuning shaft (turns must progress away from chassis). Pass cord around pulleys B and C and around idler stud D. Wrap cord counterclockwise around drive pulley, stretch the tension spring and tie free end of the cord to spring. Cut off any excess string.



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.
The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR		Band Switch Setting	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
	Frequency Setting	Dummy Antenna Connection at Radio			
I-F	455 kc	6SA7, Pin 8	B Range	Turn Rotor to Full Open	2nd I-F (C-20) & (C-21) 1st I-F (C-15) & (C-16)
RANGE B	1620 kc	Antenna Lead	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 kc	Antenna Lead	B Range	Tune Rotor to Max. Output. Set Indicator to 1400 KC. See Note A	Antenna Range B (C3)
	600 kc	Antenna Lead	B Range	Tune Rotor to Max. Output	600 kc (C8) Rock Rotor—See Note B
Repeat above oscillator adjustments at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C9) causes no further improvement in output.					
RANGE D	15.6 mc	Antenna Lead	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
	14 mc	Antenna Lead	D Range	Tune Rotor to Max. Output	Antenna Range D (C2) Rock Rotor—See Note B
LOOP RANGE B	1400 kc	Reassemble chassis in cabinet. Antenna Lead	B Range	Tune Rotor to Max. Output	Antenna Range B (C3)

- Selectivity.....40 KC broad at 1000 times signal, 1000 KC
- Sensitivity.....(for .5 watt output) with external antenna
B range—9 microvolts average
D range—20 microvolts average
- Power Output.....4 watts maximum
2.3 watts, 10% distortion
- Loud Speaker.....6" PM dynamic
- Voice Coil Impedance.....3.2 ohms at 400 cycles

ELECTRICAL SPECIFICATIONS

Power Supply.....105-125 volts AC, 60 cycles, 40 watts. (60 watts phono operating)
Frequency Range.....B range—540-1600 KC
D range—9 to 15.5 MC

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, re-set pointer at the 1400 KC mark on the dial scale.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

MONTGOMERY WARD

MODELS 64WG-2010A,
64WG-2010B, 74WG-2010B
MODELS 74WG-2505A,
74WG-2705A

RECEIVER STAGE SENSITIVITIES

MODEL 74WG-2010B 64WG-2010A & B

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 KC for all readings. All measurements are based on an output of .5 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. A reading of

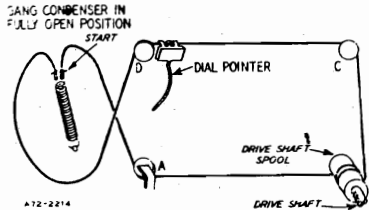
1.26 volts across this resistor will be equivalent to a .5 watt output with the speaker connected. The volume control must be set to maximum. The signal source must be an accurately calibrated signal generator capable of supplying both 1000 KC and 455 KC signals modulated 30% with a 400 cycle audio signal. Variations of Plus or Minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR .5 WATT OUTPUT
Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	External antenna lead	Chassis	9 microvolts
1000 kc	.05 mf	6SA7 Mixer, Pin 8	Same as above	42 microvolts
455 kc	.05 mf	6SA7 Mixer, Pin 8	Same as above	40 microvolts
455 kc	.05 mf	6SK7 1st I-F, Pin 4	Same as above	1075 microvolts
455 kc	.05 mf	6SF7 2nd I-F, Pin 2	Same as above	3900 microvolts
400 cycles	.05 mf	6SJ7 1st A-F, Pin 4	Same as above	.08 volt
400 cycles	.05 mf	6V6GT Output, Pin 5	Same as above	3.75 volts

DRIVE CORD REPLACEMENT

DIAL POINTER CORD

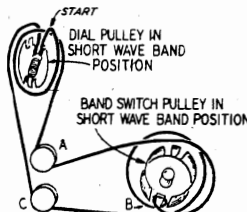
Use a new 10X60 drive cord assembly or a new length of cord 50 inches long for the installation. Install the cord as shown in the illustration winding two turns counterclockwise around the drive shaft spool with the turns progressing towards the front end of the drive shaft. After completing the installation rotate the drive shaft a few turns to take up the slack in the cord.



A72-2214

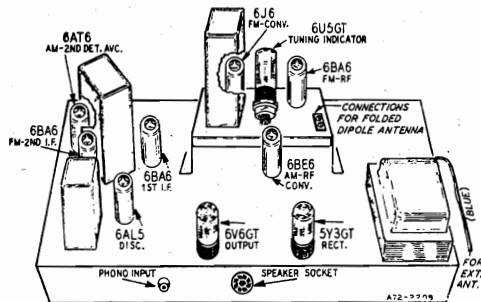
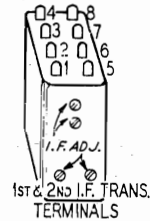
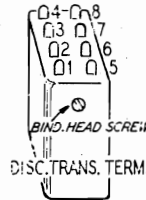
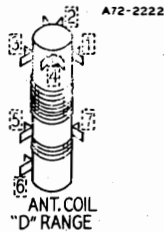
DIAL ROTATION CORD

Use a new 10X61 drive cord assembly or a new length of cord 21 inches long for the installation. Both the dial pulley and the band switch pulley must be turned to the short wave band positions as shown in the illustration. Install the new cord exactly as shown then change the position of the band switch several times and note the movement of the dial.



A72-2215

MODEL 74WG-2505A, 2705A



ELECTRICAL SPECIFICATIONS

- Power Supply.....105-125 volts AC 50-60 cycles, 80 watts
- Frequency Ranges.....Broadcast 540-1600 KC
Frequency Modulation 88-108 MC
Short Wave 9-15.5 MC
- Selectivity.....AM-40 KC broad at 1000 times signal, measured at 1000 KC
I.F. FM-225 KC broad at 2 times down
I.F. FM-700 KC broad at 200 times down

- AM Sensitivity.....(For .5 watt output with external antenna)
Broadcast, 12 microvolts average
Short Wave, 20 microvolts average
- FM Sensitivity.....(For .5 watt output)
25 microvolts average
- Power Output.....5.2 watts maximum
3.5 watts 10% distortion
- Loud Speaker.....10" Electro Dynamic
- Voice Coil Impedance.....3.2 ohms 400 cycles

MONTGOMERY WARD

MODELS 64WG-2010A,
64WG-2010B, 74WG-2010B
MODEL 74BR-1812A

MODEL 74BR-1812A

HOW TO ORDER PARTS—When ordering, specify PART applicable, and CHASSIS MODEL number. The model number, schematic diagram reference number when

REPLACEMENT PARTS LIST

Use Only Genuine Factory Replacement Parts

Ref. No.	Part No.	Description	Qty. Used in Set
C21, 18	C-8F3-12	470 mfd x 500 v., 20% mica	2
C30, 33, 34	C-8F4-10	220 mfd x 500 v., 20% mica	3
C44	C-8J-11388	.05 mfd x 600 v., 20%, molded	1
C26-27-39	C-8G-12449	3000 mfd., 20%, ceramic-in-sulated	6
C14, 16, 28	C-8G-12159	30 mfd., 500 volts, 5%, ceramic	6
C41, 42, 43	C-8G-11789	10 mfd., 10%, ceramic	6
C51	C-8G-11891	51 mfd., 5%, ceramic	2
C18-17	C-8G-12160	91 mfd., 5%, ceramic	2
C29-32	C-8F5-224	91 mfd., 5%, silver mica	2
RESISTORS			
R4	C-981-87	120K ohms, 1/2 watt, 10%	1
R15	C-981-73	820K ohms, 1/2 watt, 10%	1
R16	C-981-77	820K ohms, 1/2 watt, 10%	1
R18	C-981-77	820K ohms, 1/2 watt, 10%	1
R24	C-982-82	43K ohms, 1 watt, 10%	1
R28	C-982-81	39K ohms, 1 watt, 10%	1
R7	B-9C-11489	10K ohms, 5 watts, 10%, wire-wound	1
R30	C-981-78	22K ohms, 1/2 watt, 10%	1
R21	C-981-26	22K ohms, 1/2 watt, 10%	1
R22	C-981-55	270 ohms, 1/2 watt, 10%	1
R1A, 25, 29	C-981-15	2200 ohms, 1/2 watt, 20%	3
R8	C-981-107	5.6 megohms, 1/2 watt, 10%	1
R9, 10	C-981-31	100 ohms, 1/2 watt, 10%	2
R11, R17	C-981-50	100 ohms, 1/2 watt, 10%	2
R19	C-981-27	2200 ohms, 1/2 watt, 20%	1
R14	C-981-54	220 ohms, 1/2 watt, 20%	1
R27	C-981-54	220 ohms, 1/2 watt, 10%	1
R32	C-981-99	470K ohms, 1/2 watt, 10%	1
R31	C-981-79	27K ohms, 1/2 watt, 10%	1
R23	C-981-58	470 ohms, 1/2 watt, 10%	1
COILS			
T3	A-13D-11285	B.C. oscillator coil	1
T4	C-203-11743	Input I.F. coil combination	1
T5	C-203-11746	2nd I.F. coil combination	1
T6	C-203-11744	assembly, 455 kc and 10.7 mc	1
T10	C-203-11745	3rd I.F. coil assembly 10.7 mc	1
T11, C55	C-13E-12287	5ly 107 mc assembly with I.D. mfd cond. C-8G-12408	1
TRANSFORMERS			
T7	B-12C-11253	Output transformer for speaker	1
T9	B-12A-11259	Power transformer—105-125 volts AC, 60 cycles primary	1
SPEAKER			
T8	C-18B-12404	Electrodynamic speaker, 6 x 9 in., less output transformer	1
MISCELLANEOUS			
B-4D-11993	Knob, "Volume"	1	
B-8B-11273-37	Knob, "Bandwidth"	1	
B-8B-10378-37	Knob, "Tone"	1	
B-47A-11889	Pilot lite assembly	1	
A-46A-11739	Pilot lite bulb, 6-8 volt, T-44	1	
A-2D-11883	Reflector	1	
A-15B-1538	Speaker socket	1	
A-19B-1272	Antenna socket	1	
A-158-10440	8-prong, antenna tube socket	2	
A-15C-10717	7-prong, miniature tube socket	5	
A-2H-10718	Shield can	5	
A-2H-10719	Shield can	5	
A-23A-10344	Line cord feet	1	

HOW TO ORDER PARTS—Should it be necessary to write us or to order any repair parts, it is important that the complete model number which appears on the label attached to the rear of the chassis be specified. Repair parts should be ordered from your nearest Wards Retail Store, Catalog Order office or Mail Order House.

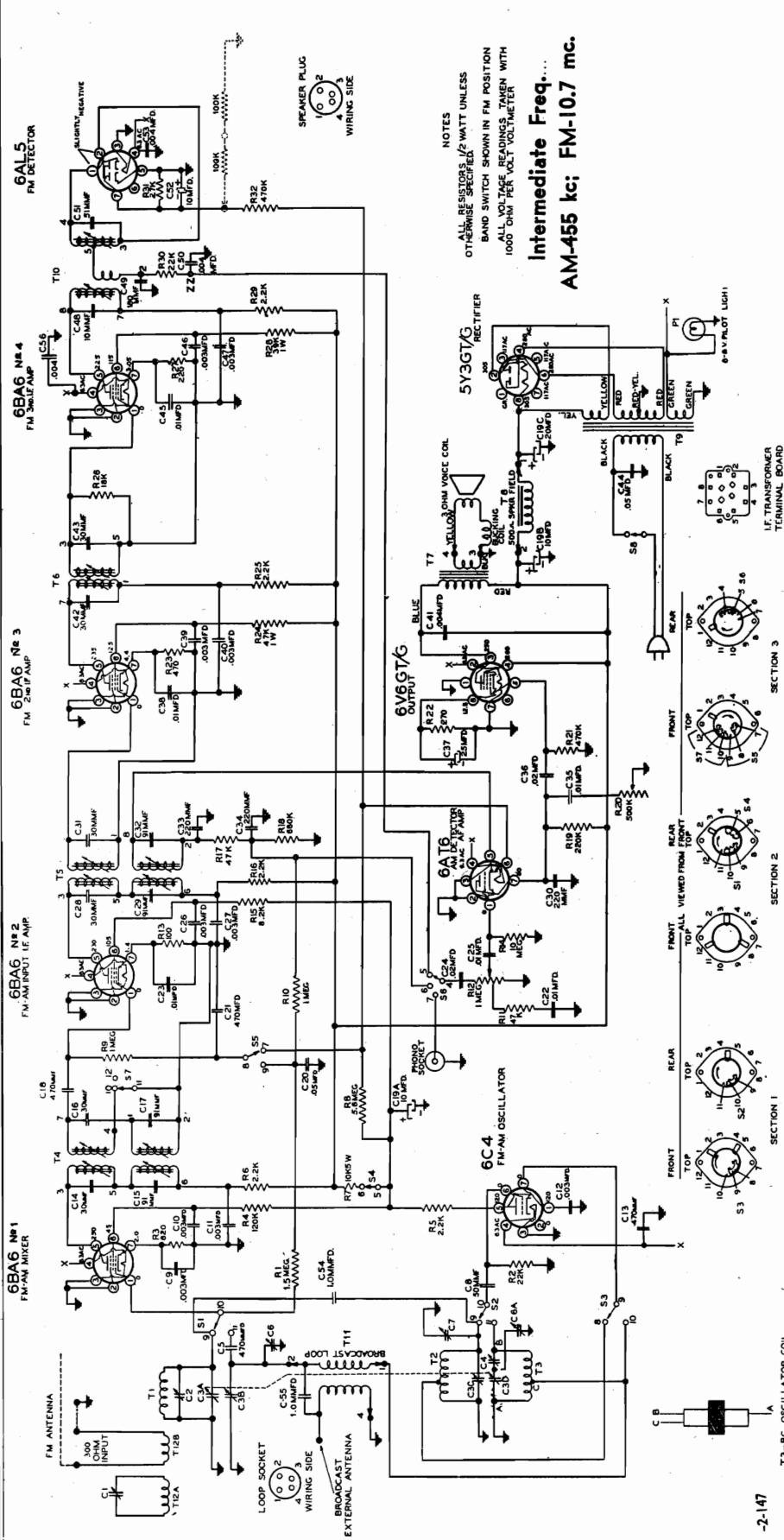
REPLACEMENT PARTS INFORMATION

OPERATING VOLTAGES—Chassis for Model 74WG-2010B are available for operation on the following power supply: 105-125 volts AC, 60 cycles

Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

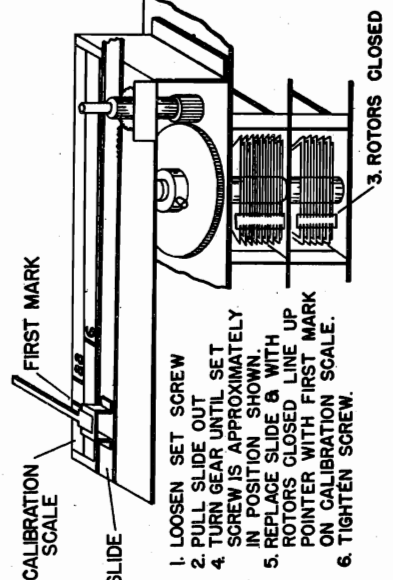
Ref. No.	Part No.	Description	Qty. Used in Set
TRANSFORMERS AND COILS			
T-1	9A1812	"D" Range Antenna Coil Assembly	1
T-2	9A1814	1st I.F. Coil Assembly	1
T-3	9A1816	"B" Range Loop Antenna	1
T-4	9A1816	"B" Range Loop Antenna	1
T-5	9A1813	"B" Range and "D" Range Oscillator Coil Assembly	1
T-6	53X282	117 Volt, 60 Cycle, Standard Power Transformer	1
T-7		Output Transformer (See Miscellaneous)	1
DIAL AND DRIVE ASSEMBLY			
26A423		Dial Mfg. Plate Assembly Complete with Dial, Background, Diffusers and Spacers	1
6321		Band and Spacers	1
20X329		Cond. Cushion Stud	3
26X485		Drive Shaft	1
19X192		"C" Washer (For Drive Shaft)	2
28X113		Pointer	1
7A202		Drive Cord Tension Spring	1
		Pilot Light Socket Assembly	1
		No. 47 Pilot Light Bulb	2
MISCELLANEOUS			
12A442		6" P.M. Speaker Complete with Output Transformer	1
		Cone and Voice Coil Assembly (Stamped on speaker)	1
3A303		On-pair transformer (Specify part number and letter)	1
3A304		Tube Socket—Octal (8 prong) Molded	7
3A305		Phono Motor Socket	1
2A359		Band Change Switch	1
10A378		Knob (Tuning, Volume)	1
10A579		Knob (Off-On, Volume)	1
10A580		Knob (SW-B)	1
10A581		Knob (Tone-R.F.)	1
TYPE S-28A119 RECORD CHANGER PARTS			
S-K228231		Motor, 60 cycle, 117 V.	1
S-K228232		30 Cycle Conversion Spring	1
S-K228233		Motor, 60 cycle, 117 V.	1
S-K228249		50 Cycle Conversion Spring	1
SUBSTITUTE PARTS			
The following parts are used in some receivers only. Check part number before ordering and order part originally used in receiver.			
*40X281		Tone Control (Substitute for 40X276)	1
*25X1539		Radio-Phono Switch Lever (When 40X281 is used)	1
*2A161		D.P.D.T. Switch (When 40X281 is used)	1
12A459		6" P.M. Speaker Complete with Output Transformer	1
RESISTORS			
R-1	885225	2.2 meg.	0.5
R-2	C-84973	39 K	0.5
R-3	84935	39 K	0.5
R-4	884222	2200	0.5
R-5	885105	1 meg.	0.5
R-6	88473	47 K	0.5
R-7	365358	500 K	0.5
R-8	365358	500 K	0.5
R-9	885106	10 meg.	0.5
R-10	885474	470 K	0.5
R-11	884333	33 K	0.5
R-12	884223	82 K	0.5
R-13	40X276	30 meg.	0.5
R-14	C-84271	270	1.0
R-15	43X213	2.0	2.0
R-16	884182	1800	0.5
R-17	884182	1800	0.5

USES SEEBURG MODEL "K" RECORD CHANGER



NOTES
 ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED
 BAND SWITCH SHOWN IN FM POSITION
 ALL VOLTAGE READINGS TAKEN WITH 1000 OHM PER VOLT VOLTMETER

Intermediate Freq. . . .
 AM-455 kc; FM-10.7 mc.



ELECTRICAL SPECIFICATIONS

Power Supply 105 to 125 volts, AC, 50-60-cycles;
 85 watts.

Frequency Ranges Broadcast Band—540 to 1600 kc.
 FM band—88 to 108 mc.

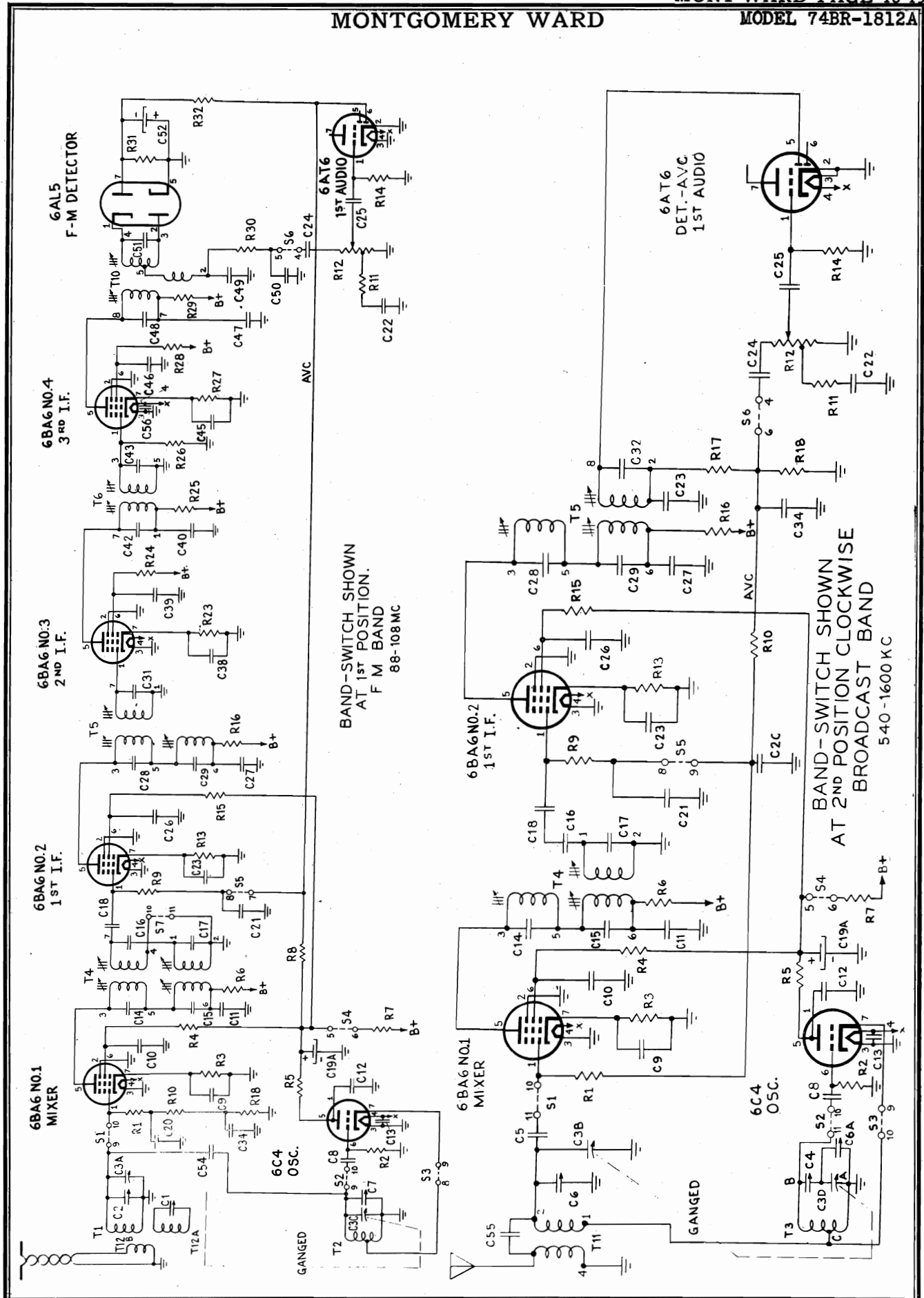
Selectivity AM-50 kc. broad at 1000 times
 signal, measured at 1000 kc.

I.F. FM-180 kc. broad at 2 times
 down.
 I.F. FM-290 kc. broad at 10 times
 down.

AM Sensitivity (For .5 watt output with external
 antenna)—20 microvolts average
 FM Sensitivity (For .5 watt output)—15 micro-
 volts average.

Power Output 3.5 watts 10% distortion. 7 watts
 maximum.

Loud Speaker 6" x 9" oval electrodynamic. Voice
 coil impedance 3.2 ohms, 400
 cycles.



ALIGNMENT PROCEDURE

Broadcast Band Section I.F. and R. F.

The alignment procedure below includes the sensitivities at the inputs of various stages. All signal input values are based on an output of 1/2 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2-ohm resistor across the secondary winding of the output transformer. A reading of 1.3 volts AC across this resistor will be approximately equivalent to a 1/2-watt output with the speaker connected. The volume control

must be set at maximum. The tone control must be set for maximum treble.

The signal source must be an accurately calibrated signal generator capable of supplying the frequencies designated, modulated 30% with a 400-cycles audio signal. A 400 cycle audio signal is required for the audio measurement. Variations in sensitivities of plus or minus 25% are usually permissible.

AM - I. F. ALIGNMENT

Band Switch in AM Position. Tune Set to 1400 Kc. Dummy Antenna .1 Mfd.

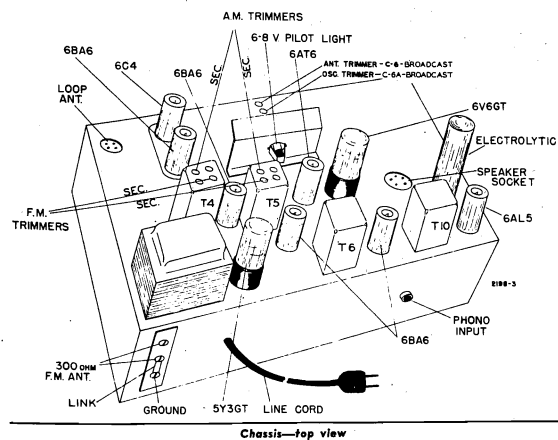
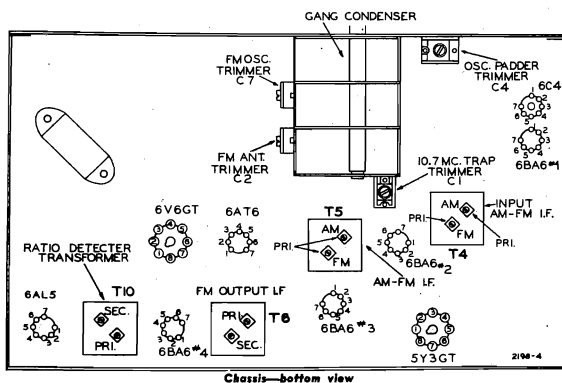
SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	ADJUSTMENT TO BE MADE	ADJUST FOR
455 Kc. Use 2100 microvolts	Pin No. 1 of 6BA6 No. 2 and ground	Primary and Secondary of T5 AM windings. See top and bottom views	Maximum output Should be 1/2 watt
455 Kc. Use 64 microvolts	Pin No. 1 of 6BA6 No. 1 and ground	Primary and Secondary of T4 AM windings. See top and bottom views	Maximum output Should be 1/2 watt
400 cycles. Use 63 millivolts	Pin No. 1 of 6AT6 and ground	None	Maximum output Should be 1/2 watt

BROADCAST BAND - R. F. ALIGNMENT

Check Pointer so that it is Exactly Over Calibration Marker to the Extreme Left When Gang is Fully Closed. For Adjustment Loosen Set Screw on Large Gear. (see dial mechanism illustration.)

SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	DUMMY ANTENNA	ADJUST
1400 Kc. Use 15 microvolts	Antenna and Ground	200 mmf.	C6A for maximum 1/2 watt
600 Kc. Use 25 microvolts	Antenna and Ground	200 mmf.	C4 for maximum 1/2 watt
1400 Kc.	Antenna and Ground	200 mmf	C6 See Note

NOTE: Recheck first two adjustments after this adjustment because of inter-locking effects.



ALIGNMENT PROCEDURE

FM Band Section. I.F. and R.F.

IMPORTANT

No alignment of the FM section of this radio should be attempted unless you are positive that the circuits are in need of adjustment and you have the necessary equipment.

All components used in this radio are extremely stable and the tuned circuits should require no adjustment over long periods of time.

NOTE

The following alignment is based on the use of the new Simpson vacuum tube voltmeter which has a "floating ground". In other words, the meter, when used as a vacuum tube voltmeter, can have both the positive and negative sides connected to points above ground and still give true readings.

A standard AM signal generator is required.

FM - I. F. ALIGNMENT

Band Switch in FM Position. Dummy Antenna .1 Mfd.

SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	VACUUM TUBE VOLT METER CONNECTION TO RADIO	ADJUSTMENT TO BE MADE	ADJUST FOR
10.7 Mc. Use about .1 volt	Pin No.1 of 6BA6 no. 4 and ground	Pin no. 7 of 6AL5 and ground	Primary of T10	Resonance should be about 3 volts
10.7 Mc. Use about .1 volt	Pin No.1 of 6BA6 no. 4 and ground	See note "A"	Secondary of T10	Zero. Use zero center scale. See note "B"
10.7 Mc. Use about 4000 microvolts	Pin No.1 of 6BA6 no. 3 and ground	Pin no. 7 of 6AL5 and ground	Primary and Secondary of T6	Resonance should be about 3 volts
10.7 Mc. Use about 150 microvolts	Pin No.1 of 6BA6 no. 2 and ground	Pin no. 7 of 6AL5 and ground	Primary and Secondary of 10.7 mc. windings of T5. See top and bottom views	Resonance should be about 3 volts
10.7 Mc. Use 3000 microvolts	FM Antenna input and ground	Pin no. 7 of 6AL5 and ground	Primary and Secondary of 10.7 mc. windings of T4. See top and bottom views	Resonance should be about 3 volts. See Note "C"
10.7 Mc.	FM Antenna input and ground	Pin no. 7 of 6AL5 and ground	C1	Minimum reponse. This is a trap circuit

NOTES ON FM—I.F. ALIGNMENT:

NOTE "A" Connect two resistors, 100K OHMS each, from Pin No. 7 of 6AL5 to ground. These resistors must be matched within 5%. Connect as shown in dotted lines on schematic diagram. Connect vacuum tube voltmeter between the mid point of the resistors and point zz.

NOTE "B" If T10 has been tampered with, it is possible that no

crossover point will be found at first. Careful adjustment of both primary and secondary is necessary.

GENERAL: Input signals should be adjusted to give approximately 3 volts. The ratio detector is operating at a reasonable level at this point and will give the truest indication of correct alignment with the procedure specified.

NOTE "C" The input microvolts specified is based on the trap circuits being adjusted.

FM - R. F. ALIGNMENT

Check Pointer so that it is Exactly Over Calibration Marker to the Extreme Left When Gang is Fully Closed. For Adjustment Loosen Set Screw on Large Gear. (see dial mechanism illustration.)

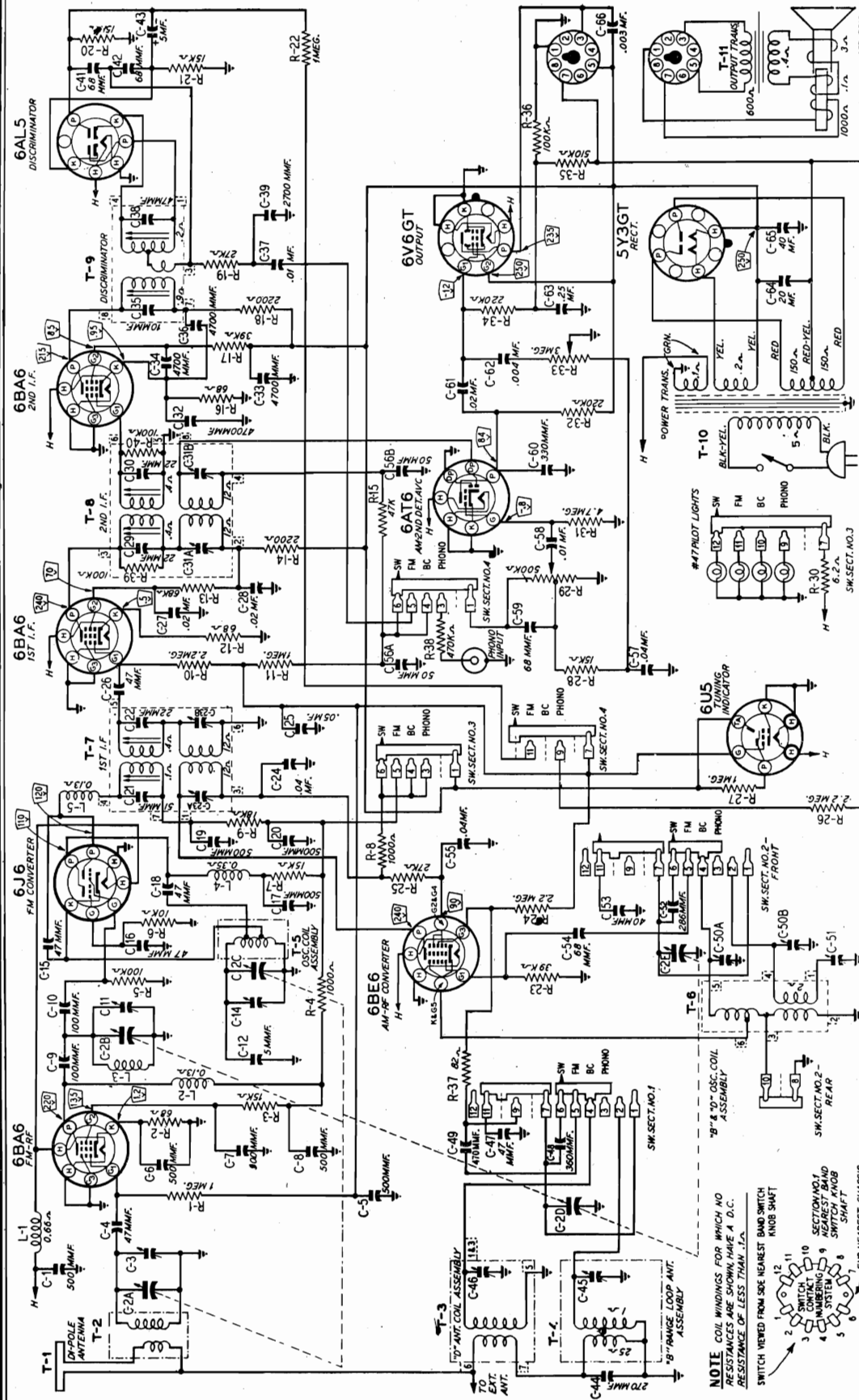
SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	DUMMY ANTENNA	ADJUST	VACUUM TUBE VOLT METER CONNECTION TO RADIO	ADJUST TO
100 Mc. Use about 15 microvolts	FM Antenna lead	300 ohms	C7 Osc. C2 Ant.	Pin No. 7 of 6AL5 and Ground	Resonance about 3 volts

NOTE: If a signal generator with the above fundamental frequency is not available, it is sometimes possible to use harmonics. Use extreme care in picking harmonics. An alternate procedure is

to use a local station carrier of known frequency to align the FM Band and to use the vacuum tube volt meter as above for resonance indication. A weak carrier, however will not produce 3 volts.

MODELS 74WG-2505A,
74WG-2705A

MONTGOMERY WARD



Intermediate Frequency—455 KC
FM—10.7 MC

NOTE: COIL WINDINGS FOR WHICH NO RESISTANCES ARE GIVEN HAVE A D.C. RESISTANCE OF LESS THAN 1 Ω.

SWITCH VIEWED FROM SIDE NEAREST BAND SWITCH KNOB SWMT

SECTION NO. 1 NEAREST BAND SWITCH SYSTEM SWMT

SECTION NO. 2 REAR

SECTION NO. 3 FRONT

SECTION NO. 4

SECTION NO. 5

SECTION NO. 6

SECTION NO. 7

SECTION NO. 8

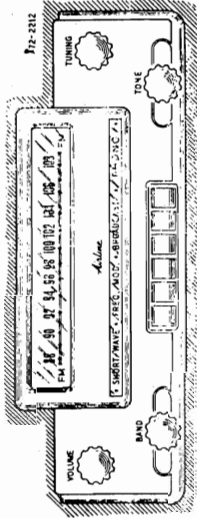
SECTION NO. 9

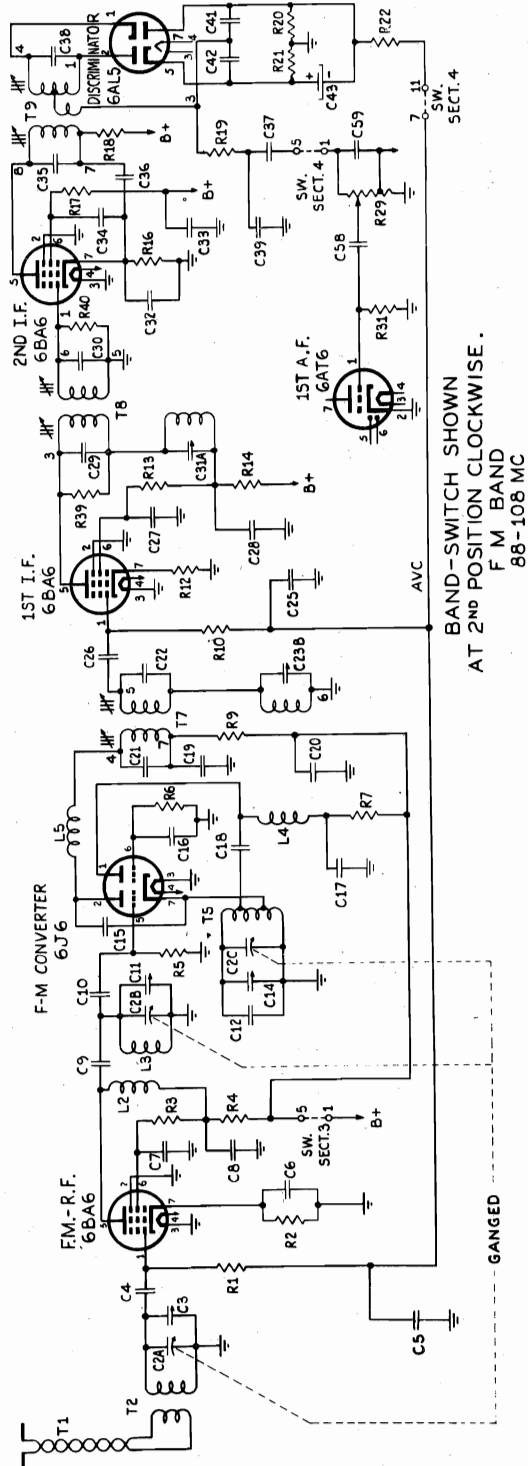
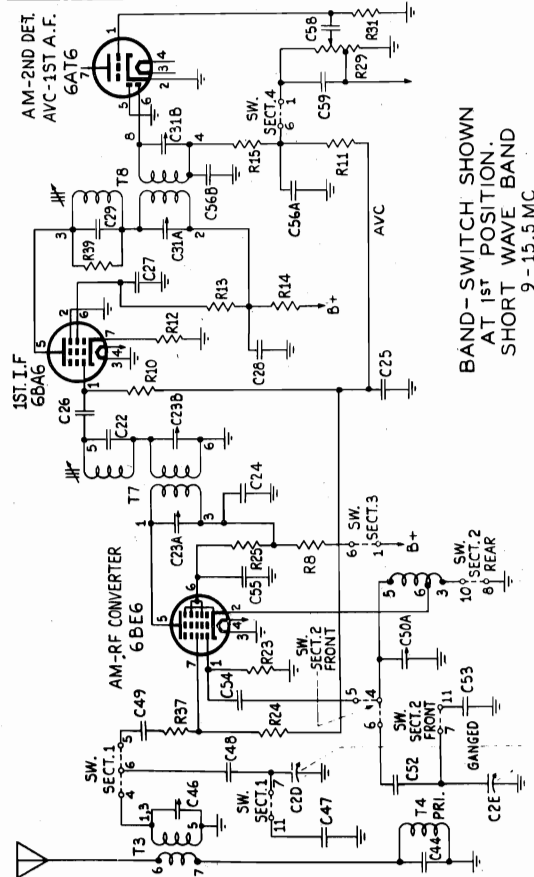
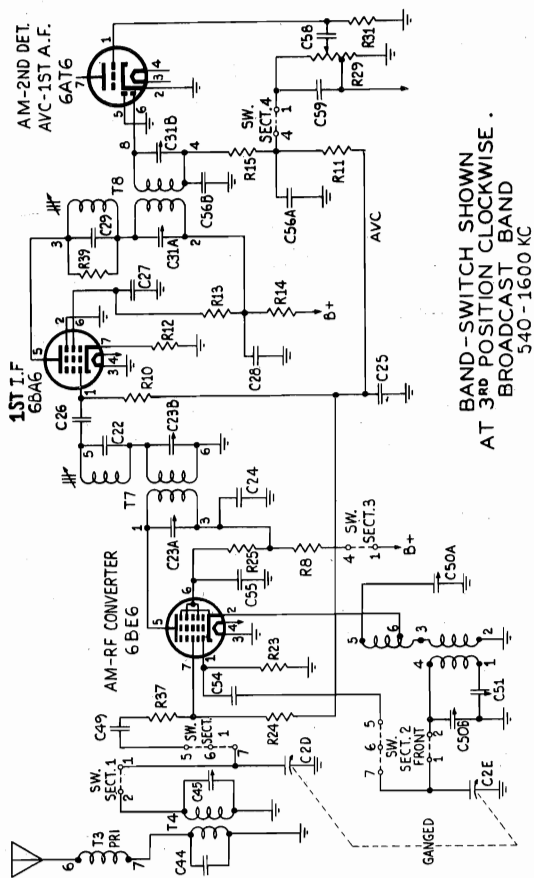
SECTION NO. 10

SECTION NO. 11

SECTION NO. 12

END NEAREST CHASSIS





MODELS 74WG-2505A,
74WG-2705A

MONTGOMERY WARD

ALIGNMENT PROCEDURE
FM STAGES

Allow chassis and signal generator to warm up for several minutes. The following equipment is required for aligning:

An accurately calibrated signal generator providing unmodulated signals at the test frequencies listed below.

Non-metallic screwdriver.

Dummy Antennas and I-F Loading Resistor—.01 mf, 300 ohms and 5000 ohms.

Zero center scale DC vacuum tube voltmeter having a range of approximately 3 volts.

(If a zero center scale meter is not available, a standard scale vacuum tube voltmeter may be used by reversing the meter connections for negative readings.)

	SIGNAL GENERATOR		DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUSTMENT FOR MAX. METER DEFLECTION
	FREQUENCY SETTING	CONNECTION AT RADJO				
Discriminator	10.7 MC Note B	6BA6 2nd I-F Pin 1 and Chassis	.01 mf	FM	Rotor to Full Open	Disc. Pri. ① Note A
	10.7 MC Note B	Same as above	.01 mf	FM	Same as above	Disc. Sec. Note C ②
	10.7 MC Note B	Same as above	.01 mf	FM	Same as above	Disc. Pri. ① Note A
	10.7 MC Note B	Same as above	.01 mf	FM	Same as above	Disc. Sec. Note C ②
I-F	10.7 MC	6BA6 1st I-F, Pin 1 and Chassis	.01 mf	FM	Same as above	2nd I-F Pri. Note A and D ③ 2nd I-F Sec. Note A and E ④
	10 MC	Connect to the FM-RF Gang Condenser terminal on underside of chassis	.01 mf	FM	Same as above	1st I-F Pri. ⑤ 1st I-F Sec. ⑥ Note A
Recheck I-F Adjustments in order given						
R-F & Osc.	108.4	Disconnect dipole and connect generator to dipole terminals with resistor in series	300 ohms	FM	Rotor to full open	Oscillator C-14
	104.5	Same as above	300 ohms	FM	Tune Rotor for Max. AVC voltage	R.F. C-11
	104.5	Same as above	300 ohms	FM	Same as above	.Ant. C-3
Recheck R-F and Osc. Adjustments in order given						

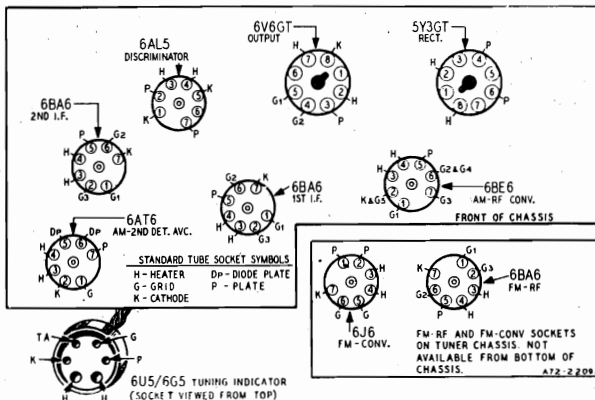
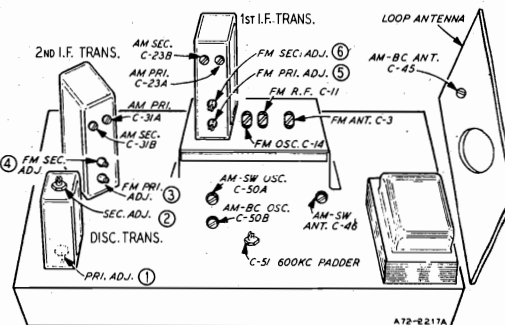
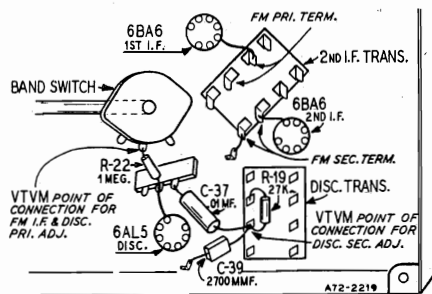
Note A—Test Equipment connections are as given in the table. The zero center scale DC vacuum tube voltmeter is to be connected between chassis ground and the AVC line at the 1 megohm resistor R-22 and the band switch terminal (as shown in the illustration) for all adjustments except the discriminator secondary adjustment, for which see Note C.

Note B—A signal of .1 volt must be fed into the receiver for this adjustment.

Note C—Disconnect zero center DC vacuum tube voltmeter from AVC and reconnect to junction of R-19, C-37 and C-39 (See illustration). Adjust for zero voltage indication.

Note D—Before adjusting Pri. core connect 5000 ohm load resistor across the 2nd I.F. secondary terminals, (See illustration).

Note E—Disconnect 5000 ohm load resistor from secondary terminals and reconnect across the 2nd I.F. primary terminals, (See illustration).



TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground. Plate, screen and cathode voltages were taken with a 1000 ohm-per-volt meter with a 300 volt scale used for plate and screen voltages. Audio grid voltages were read with a vacuum tube voltmeter. Conditions of measurement are:

Line voltage.....117 Volts AC
Signal Input.....None

A variation of ±10% is usually permissible.

**RECEIVER STAGE SENSITIVITIES
AM AND AUDIO STAGES**

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 KC for all readings. All measurements are based on an output of .5 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. A reading of 1.26 volts across this resistor will be equivalent to a .5 watt output.

The volume control must be set to maximum.

The signal source must be an accurately calibrated signal generator capable of supplying both 1000 KC and 455 KC signals modulated 30% with a 400 cycle audio signal. Variations in sensitivity of Plus or Minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR .5 WATT OUTPUT
FREQUENCY	COUPLING CAPACITOR	CONNECTION TO RECEIVER	GROUND CONNECTION	
1000 KC	200 mmf or RMA Dummy Antenna	External Antenna Lead	Chassis	25 Microvolts
1000 KC	.05 mf	6BE6 Converter Pin 7	Chassis	60 Microvolts
455 KC	.05 mf	6BE6 Converter Pin 7	Chassis	58 Microvolts
455 KC	.05 mf	6BA6 1st I-F Pin 1	Chassis	2400 Microvolts
400 cycles	.05 mf	6AT6 1st A-F Pin 1	Chassis	.05 Volt
400 cycles	.05 mf	6V6GT Output Pin 5	Chassis	2.8 Volts

FM STAGES

The table below lists the sensitivity for the FM stages of the receiver. The receiver must be tuned to 98 MC for all readings. Measurements are based on a .5 watt output the same as for the AM and Audio stage measurements.

The signal source must be an accurately calibrated signal generator capable of supplying a 98 MC signal modulated by a 400 cycle audio signal. For these measurements the generator must be adjusted for a 22.5 KC deviation. This will correspond to 30% AM modulation.

SIGNAL GENERATOR				INPUT FOR .5 WATT OUTPUT
FREQUENCY	COUPLING TO RECEIVER	CONNECTION TO RECEIVER	GROUND CONNECTION	
98 MC	300 ohms	External Antenna Terminal	External Ant. Terminal	30 microvolts
10.7 MC	.01 mf	6BA6 1st I-F Pin 1	Chassis	1200 microvolts
10.7 MC	.01 mf	6BA6 2nd I-F Pin 1	Chassis	37,000 microvolts

**ALIGNMENT PROCEDURE
AM BROADCAST AND SHORT WAVE BAND**

Volume Control—Maximum all Adjustments. Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead. Allow Chassis and Signal Generator to "Heat Up" for several minutes. The following equipment is required for aligning: An All Wave Signal

Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas—.1 mf, 200 mmf, and 400 ohms.

	SIGNAL GENERATOR		DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
	FREQUENCY SETTING	CONNECTION AT RADIO				
I-F	455 kc	6BE6 Pin 7	.1 mf	Broadcast	Rotor Fully Open	2nd I-F C-31B & C-31A 1st I-F C-23B & C-23A
Broadcast	1620 kc	External ant. lead	200 mmf	Broadcast	Rotor Fully Open	Oscillator C-50B
	1400 kc	External antenna lead	200 mmf	Broadcast	Turn Rotor to Max. Output Set pointer to 1400 kc See Note A	Antenna C-45
	600 kc	External antenna lead	200 mmf	Broadcast	Turn Rotor to Max. Output and Rock See Note B	600 Kc padder C-51
Repeat above oscillator adjustments at 1620 and 600 KC until readjusting the oscillator Range B Trimmer C-50B causes no further improvement in output.						
Short Wave	15.5 MC	External antenna lead	400 ohm	Short Wave	Rotor Fully Open	Oscillator C-50A
	15 MC	External antenna lead	400 ohm	Short Wave	Turn Rotor to Max. Output	Antenna C-46
Reassemble chassis in cabinet						
Broadcast	1400 kc	External antenna lead	200 mmf	Broadcast	Turn Rotor to Max. Output	Antenna C-45

After each range is completed, repeat the procedure as a final check. Note A—If the pointer is not at 1400 KC on the dial, reset pointer at the 1400 KC mark on the dial scale.

Note B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

MODELS 74WG-2505A,
74WG-2705A

MONTGOMERY WARD

Rel. No.	Part No.	Description	Qty. Used in Set
MISCELLANEOUS			
12A470		10" E.D. Speaker complete with output transformer	1
		Cone and voice coil assembly (specify part number) and letters stamped on speaker	5
		Output transformer (specify part number and letters stamped on speaker)	3
3A303		Tube socket—octal (8 prong) molded	5
3A425		Tube socket—miniature	3
32X386		Tube shield—miniature	7
3A427		Tube socket—Miniature (for FM R.F. and Converter Tubes)	2
13X549		Cable and socket assembly—tuning indicator	1
3A305		Phono Socket—single pin	1
3A304		Phono motor socket	1
2A367		Band switch	1
13X28		Line cord and plug assembly	1
10A510		Knob—tuning-band-tone	3
10A513		Knob—volume control and switch	1
10A509		Push Button	6
22X220		Push Button Spring	6
26A439		Escutcheon Assembly	1
4A670		Escutcheon Eye	1
DIAL AND DRIVE ASSEMBLY			
26A435		Dial Bracket Assembly	1
58X590		Dial	1
58X591		Dial Background	1
15X221		Pointer	1
26A438		Dial Drum Assembly	2
26X500		Dial Drum Shaft	1
26A440		Pulley and Pulley Assembly (for Dial Drum Shaft)	1
26A437		Pulley Assembly (for Band Switch)	1
26X469		Band Switch Shaft	1
24X553		Pinion Gear (for Band Switch Shaft)	1
26A441		Crown Gear Assembly (for Mig. to Band Switch)	1
26A434		Idle Bracket Assembly	1
28X1389		Drive Shaft Bracket	1
26A467		Drive Shaft	1
24X551		Drive Shaft Spool	1
10X60		Drive Card and Clip Assembly (Band Change)	1
28X524		Tension Spring (Band Change)	1
10X61		Drive Card and Clip Assembly (Dial Drive)	1
28X500		Tension Spring (Dial Drive)	1
7A209		Indicator Light Socket Assembly	4
41X22		Light Shield	4
7A187		Pilot Light Socket Assembly (Dual)	1
41X35		Light Shield	2
		No. 47 Pilot Light	6
25X498		Tuning Eye Clamp	1
25X1396		Tuning Eye Bracket	1

Rel. No.	Part No.	Description	Qty. Used in Set
RESISTORS (Cont.)			
R-9	C85183	18K Ohms	1
R-10	885225	1.0 Carbon	1
R-24		0.5 Carbon	3
R-26		2.2 meg	1
R-13	C84683	68K	1
R-14	885222	2200	2
R-18	885473	47K	1
R-15	C84393	39K	1
R-17	884273	27K	1
R-19	884273	27K	1
R-20	883153	15K	2
R-21		0.5 Carbon	1
R-22	884393	39K	1
R-23	C84273	27K	1
R-25		1.0 Carbon	1
R-27		Part of 13X549 Cable and Socket assembly	1
R-29	3A3263	500K	1
R-30	43X217	6.2	1
R-31	885475	4.7 meg	1
R-32	885224	220K	2
R-34		0.5 Carbon	1
R-33	40X259	3.0 meg	1
R-35	883314	510K	1
R-36	883104	100K	1
R-37	884820	82	1
R-38	885474	470K	1
R-39		0.5 Carbon	1
R-40	884104	100K	2
TRANSFORMERS AND COILS			
L-1	9A1881	Filament Choke Assembly	1
L-2	9A1880	FM Mixer Plate Choke	2
L-3	9A1874	R.F. Coil	1
L-4	9A1882	FM Oscillator Plate Choke	1
T-1	9A1900	Di-Pole Antenna	1
T-2	9A1875	"g" Antenna Coil Assembly	1
T-3	9A1872	"g" Antenna Coil Assembly	1
T-4	26A436	Range Loop Antenna Assembly	1
T-5	9A1873	Oscillator Coil Assembly	1
T-6	9A1813	"g" and "p" Oscillator Coil Assembly	1
T-7	9A1876	1st I.F. Call Assembly	1
T-8	9A1877	2nd I.F. Call Assembly	1
T-9	9A1895	Discriminator Coil Assembly	1
T-10	53X286	Power Transformer (60 cycle)	1
T-10	53X287	Power Transformer (25 cycle)	1
T-10	53X288	Power Transformer (40 cycle)	1
T-11		Output Transformer (see miscellaneous)	1

HOW TO ORDER PARTS—Should it be necessary to write us or to order any repair parts, it is important that the complete model number which appears on the label attached to the rear of the chassis be specified. Repair parts should be ordered from your nearest Ward's Retail Store, Catalog Order office or Mail Order House.

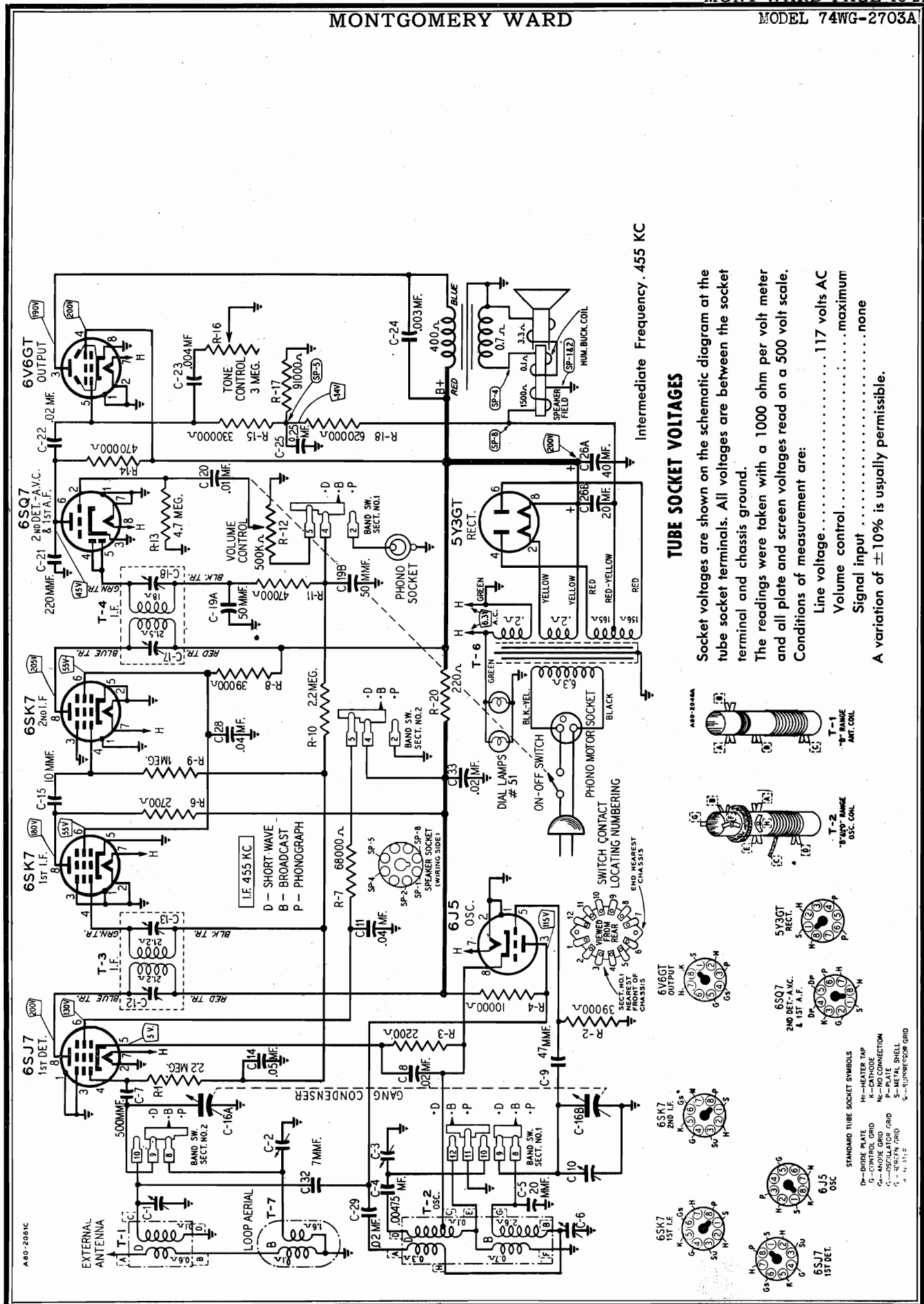
OPERATING VOLTAGES—Chassis for Models 74WG-2505A are available for operation on the following power supply:
105-125 volts AC, 50-60 cycles

REPLACEMENT PARTS LIST

Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

Rel. No.	Part No.	Description	Qty. Used in Set
C-39	47X492	2700 mmf	1
C-41	47X501	68 mmf	4
C-42		Molded	1
C-43	45X352	5 mf	1
C-44	47X445	270 mmf	1
C-45	17A123	1.5-12 mmf	1
C-46	17A244	5-50 mmf	1
C-47	47X503	47 mmf	1
C-48	47X474	360 mmf	1
C-49	47X467	470 mmf	1
C-50A	17A246	3.2-35 mmf	1
C-50B		Dual Trimmer	1
C-51	17A241	300-475 mmf	1
C-52	47X481	286 mmf	1
C-53	47X504	40 mmf	1
C-54		Silvered Mica	1
C-56A	47X112	50 mmf	1
C-56B		Dual Mica	1
C-57	864403	.04 mf	1
C-60	47X470	330 mmf	1
C-62	864402	.004 mf	1
C-63	864924	25 mf	1
C-64	45X351	20 mf	1
C-65	45X302	40 mf	1
C-66	D66502	.003 mf	1
RESISTORS			
R-1		Ohms	3
R-11	885105	1 meg	1
R-12		0.5 Carbon	1
R-16	883680	68	3
R-17		0.5 Carbon	1
R-3	883153	15K	2
R-28	883102	1K	2
R-4		0.5 Carbon	1
R-8	885104	100K	1
R-5	884103	10K	1
R-6		0.5 Carbon	1
R-7	D85153	15K	1

Rel. No.	Part No.	Description	Qty. Used in Set
CAPACITORS			
C-1		Ceramic	8
C-5			
C-6	47X496	500 mmf	1
C-17			
C-19			
C-20			
C-2	26A433	Tuner & Gang Condenser Assembly	1
C-3	17A249	5-35 mmf	1
C-4		Trimmer	1
C-16	47X495	47 mmf	3
C-26		Ceramic	1
C-9	47X497	100 mmf	2
C-10		Ceramic	1
C-11	17A247	3.12 mmf	2
C-14	47X500	5 mmf	2
C-12	47X479	47 mmf	2
C-13		Ceramic	1
C-18	47X498	47 mmf	1
C-21	47X468	51 mmf	1
C-25		Ceramic	1
C-29	47X467	22 mmf	3
C-30		Ceramic	1
C-28A			
C-31A	17A248	70-150 mmf	2
C-31B		Dual Trimmer	1
C-24	D66403	.04 mf	2
C-25	865503	.05 mf	1
C-27	D66203	.02 mf	3
C-61		400 V Tubular	1
C-32			
C-34	47X491	4700 mmf	4
C-36		Molded	1
C-35	47X489	10 mmf	1
C-37	566103	.01 mf	2
C-38		200 V Tubular	1



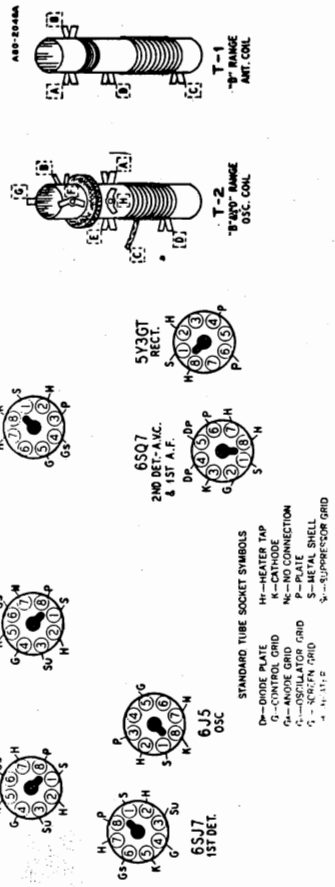
Intermediate Frequency .455 KC

TUBE SOCKET VOLTAGES

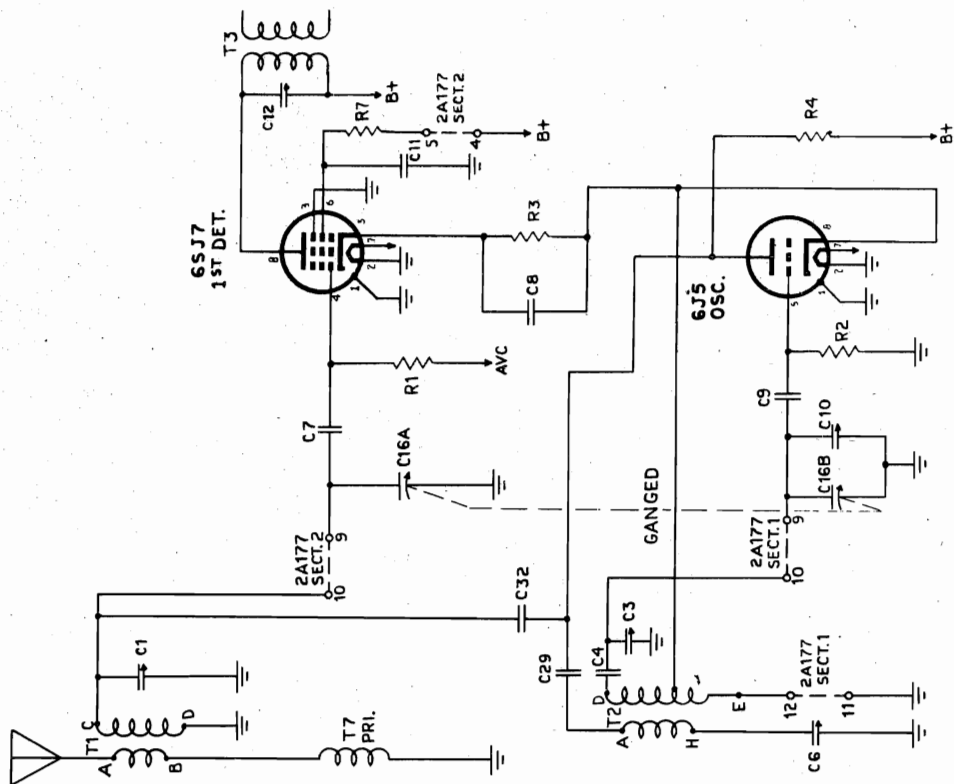
Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground.

The readings were taken with a 1000 ohm per volt meter and all plate and screen voltages read on a 500 volt scale.

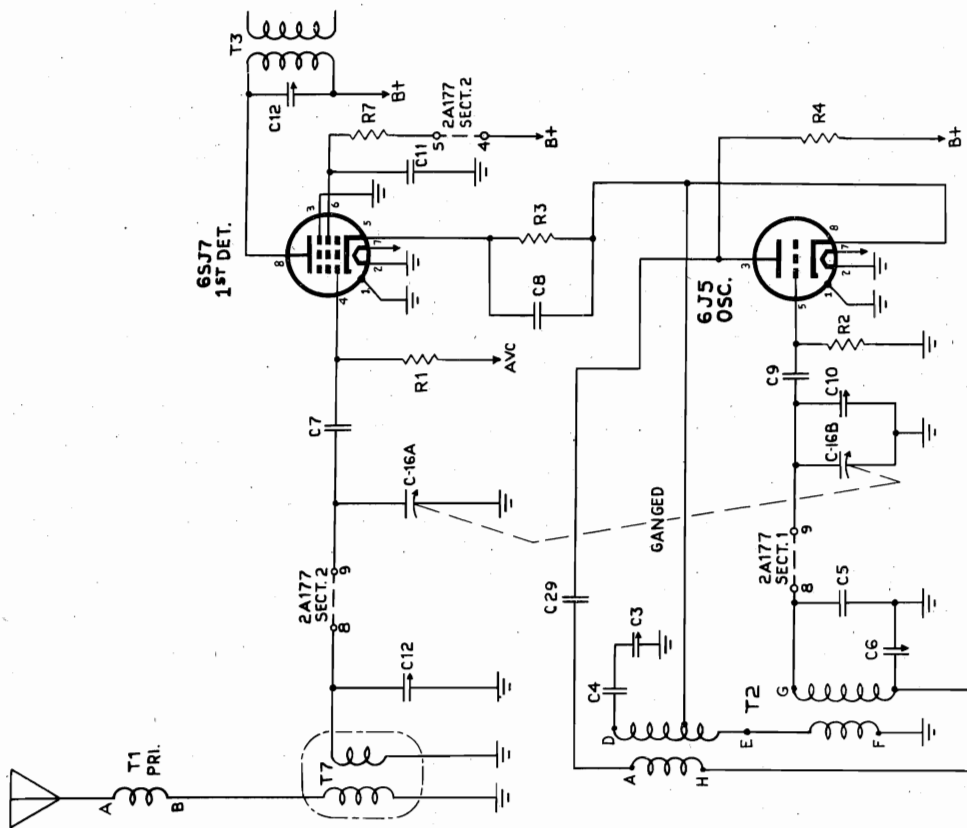
- Conditions of measurement are:
- Line voltage.....117 volts AC
 - Volume control.....maximum
 - Signal input.....none
 - A variation of ±10% is usually permissible.



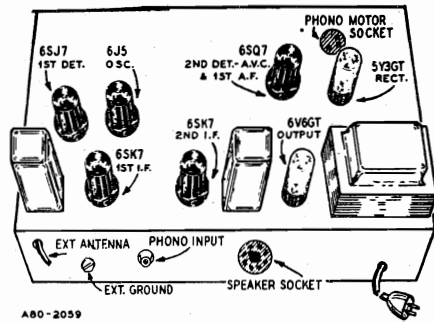
"clarified schematics"



BAND-SWITCH SHOWN
AT 2ND POSITION.
D RANGE
5.71 - 18.3 MC



BAND-SWITCH SHOWN
AT 1ST POSITION.
B RANGE
540 - 1600 KC



ABO-2059

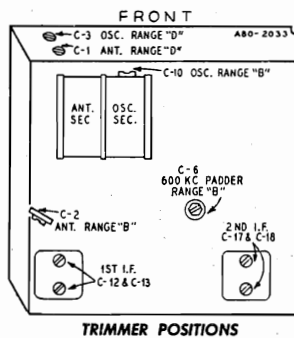
50 CYCLE OPERATION

If it is desired to use the radio and record player on a 50 cycle power supply, it will be necessary to replace the metal drive pulley on the record player motor shaft with a 50 cycle pulley. This pulley is listed in the parts list.

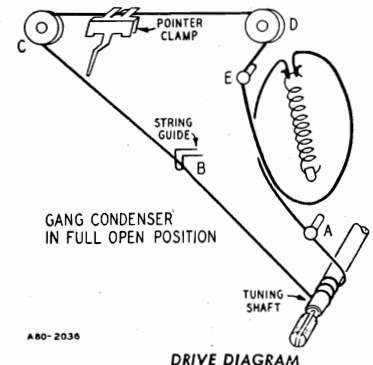
To change the pulley, turn the record selector post to the 12" position and lift the turntable off the record changer. Loosen the set screw holding the drive pulley on the motor shaft and remove the old pulley. Install the new 50 cycle pulley and replace the turntable.

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use a new 10X59 drive cord or a piece of cord 46" long and tie one end to the tension spring. Hook the other end of the tension spring to the tab on the drive pulley. Pass the cord through the slot in the drive pulley rim and continue one half turn counterclockwise around the drive pulley. Then pass the cord around idler stud A and wind three turns clockwise around the tuning shaft (turns must progress away from chassis). Pass cord through string guide B, over pulleys C and D and around idler stud E. Wrap 3/4 turn counterclockwise around drive pulley, stretch the tension spring and tie free end of the cord to spring. Cut off any excess cord.



TRIMMER POSITIONS



DRIVE DIAGRAM

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter; Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR		Dummy Antenna	Band Switch Setting	Condenser Setting	ADJUST TRIMMERS TO MAXIMUM
	Frequency Setting	Connection at Radio				
I-F	455 kc	6SJ7, Pin 4	.1 mf	B Range	Turn Rotor to Full Open	2nd I-F (C17) & (C18) 1st I-F (C12) & (C13)
RANGE B	1600 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Full Open	Oscillator Range B (C10)
	1400 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note A	Antenna Range B (C2)
	600 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Max. Output	600 kc (C6) Rock Rotor—See Note B
Repeat above oscillator adjustments at 1600 and 600 kc until readjusting the oscillator Range B Trimmer (C10) causes no further improvement in output.						
RANGE D	18,300 kc	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	17,000 kc	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Antenna Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet. 1400 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Max. Output	Antenna Range B (C2)

After each range is completed, repeat the procedure as a final check.

NOTE A—If the pointer is not at 1400 KC on the dial, re-set

pointer at the 1400 KC mark on the dial scale.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

REPLACEMENT PARTS INFORMATION

OPERATING VOLTAGES Chassis for Model 74WG-2703A, are available for operation on the following power supply:
105-125 volts A.C. 60 cycles

HOW TO ORDER PARTS Should it be necessary to write us or to order any repair parts, it is important that the complete model number which appears on the label attached to the rear of the chassis be specified. Repair parts should be ordered from your nearest Wards Retail Store, Catalog Order office or mail Order House.

REPLACEMENT PARTS LIST

Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

Ref. No.	Part No.	Description	Qty. Used in Set
C-1	17A163	2.25 mfd Ant. "D" Range Trimmer	1
C-2	17A149	2.25 mfd "D" Range Trimmer	1
C-3	18A12	1.8-12 mfd Loop aerial Trimmer	1
C-4	46X289	00475 180 V Tubular	1
C-5	47X482	20 mfd Molded	1
C-6	17A234	300-450 mfd 600 kc. Padder	1
C-7	D67501	.0005 mfd 400 V Tubular	1
C-8	866503	.02 200 V Tubular	2
C-9	47X463	.47 mfd Molded	1
C-10		Part of gang condenser C-16	
C-11	D66403	.04 mfd 400 V Tubular	2
C-12		Part of 1st I-F Assembly	
C-13	866503	.05 mfd 200 V Tubular	1
C-14	47X277	10 mfd Molded	1
C-15	14A150	Gang condenser assembly	1
C-16	14A150	Gang condenser assembly	1
C-17		Part of 2nd I-F Assembly	
C-18			
C-19A	47X112	50 mfd Dual Mica	1
C-19B	866103	.01 mfd Tubular	1
C-20	47X468	220 mfd Molded	1
C-21			
C-22	D66503	.02 mfd 400 V Tubular	2
C-23	866402	.004 mfd 200 V Tubular	1
C-24	D66502	.003mfd 400 V Tubular	1
C-25	866524	.25 mfd 200 V Tubular	1
C-26A	45X277	40 mfd 400 V Dry electrolytic	1
C-26B		20 mfd 450 V	1
C-32	47X182	7 mfd Ceramic	1
R-1	885225	2.2 meg. 0.5 Carbon	2
R-2	884393	39,000 0.5 Carbon	1
R-3	884222	2200 1.0 Carbon	1
R-4	C84103	10,000 1.0 Carbon	1
R-6	884272	2700 0.5 Carbon	1
R-7	884683	68,000 0.5 Carbon	1
R-8	C84393	39,000 1.0 Carbon	1
R-9	885105	1.0 meg. 0.5 Carbon	1
R-11	885473	47,000 0.5 Carbon	1
R-12	36X311	500,000 Volume control, ON/OFF switch	1
R-13	885475	4.7 meg. 0.5 Carbon	1
R-14	885474	470,000 0.5 Carbon	1
R-15	885534	330,000 0.5 Carbon	1
R-16	40X259	3 meg. Tone control	1
R-17	885913	91,000 0.5 Carbon	1
R-18	885624	620,000 0.5 Carbon	1
R-20	885221	220 0.5 Carbon	1

Ref. No.	Part No.	Description	Qty. Used in Set
T-1	9A1451	Antenna transformer assembly "B"	1
T-2	9A1452	Oxidizer coil assembly	1
T-3	9A1810	1st I-F Transformer and can assembly	1
T-4	9A1811	2nd I-F Transformer and can assembly	1
T-5	51X97	Output transformer	1
T-6	53X235	117 volt, 60 cycle standard power transformer	1
T-7	9A1395	"B" Band loop antenna	1
MISCELLANEOUS			
12A455		10" Electro dynamic speaker	1
		Cone and voice coil assembly (specify part number and letter stamped on speaker)	1
3A303		Tubular socket-catal (8 Prong)	7
3A293		Speaker socket-catal (8 Prong) molded	1
3A304		Phono motor socket	1
3A305		Single pin-clip socket (phono)	1
10A579		Knob (Volume control)	1
10A578		Knob (Tuning)	1
10A619		Knob (Band control)	1
13X328		Line cord and plug assembly	1
2A177		Bond and phono switch	1
8X99		Rubber chassis cushions (chassis to cabinet)	4
25X839		Gang mounting bracket	1
6X26		Rubber cushion studs	4
30X347		Can. cushion studs } mounting ring	4
19X432		Flat washer } bracket to chassis	4
26A459		Pulley Mtg. Plate Assem. Complete with idler pulleys, idler studs, brace bracket, string guide and dial back	1
58X681		Dial scale glass	1
30X184		Glass stop	2
4X942		Dial screw	1
		No. 2 x 3/8 Phillips Fr. oval hd. flat bronze (screws for escutcheon mounting)	5
15X190		Pointer	1
10X59		Drive card	1
28X113		Drive card tension spring	1
26X336		Drive shaft	1
23X980		PC washers for drive shaft	2
7X192		Dial light socket assembly	2
7A142		Light shield (No. 31)	2
41X25		Light shield	2
TYPE W-28ATI RECORD CHANGER PARTS			
		W-15X084-6 Motor assembly, 60 cycle, 115 volt	1
		Astetic L-75 Crystal cartridge	1
		W41P5444.4 50 cycle drive pulley	1

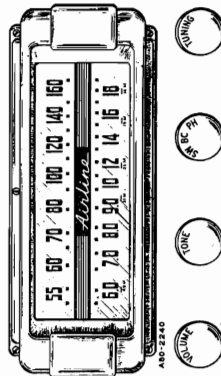
RECEIVER STAGE SENSITIVITIES

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 KC for all readings. All measurements are based on an output of .5 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. A reading of 1.26 volts usually permissible.

Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	INPUT FOR .5 WATT OUTPUT
1000 kc	200 mmf or RMA Dummy Antenna	External antenna lead	Chassis	2.3 microvolts
1000 kc	.05 mf	6S/7 1st Detector, Pin 4	Same as above	17 microvolts
455 kc	.05 mf	6S/7 1st Detector, Pin 4	Same as above	13.0 microvolts
455 kc	.05 mf	6SK7 1st I-F, Pin 4	Same as above	1300 microvolts
455 kc	.05 mf	6SK7 2nd I-F, Pin 4	Same as above	3400 microvolts
400 cycles	.05 mf	6SQ7 1st A-F, Pin 2	Same as above	.07 volt
400 cycles	.05 mf	6V6GT Output, Pin 5	Same as above	3.8 volts

ELECTRICAL SPECIFICATIONS

Power Supply.....105-125 volts A.C. 60 cycles, 55 watts normal, 72 watts phone operating
 Frequency Range.....B range—540-1600 KC
 D range—5.71 to 18.3 MC
 Selectivity.....43 KC broad at 1000 times signal, 1000 KC (for .5 watt output) with external antenna
 B range—2.5 microvolts average
 D range—12 microvolts average
 Power Output.....3.5 watts maximum
 Loud Speaker.....2 watts, 10% distortion
 Voice Coil Impedance...3.2 ohms at 400 cycles



MOTOROLA, INC.

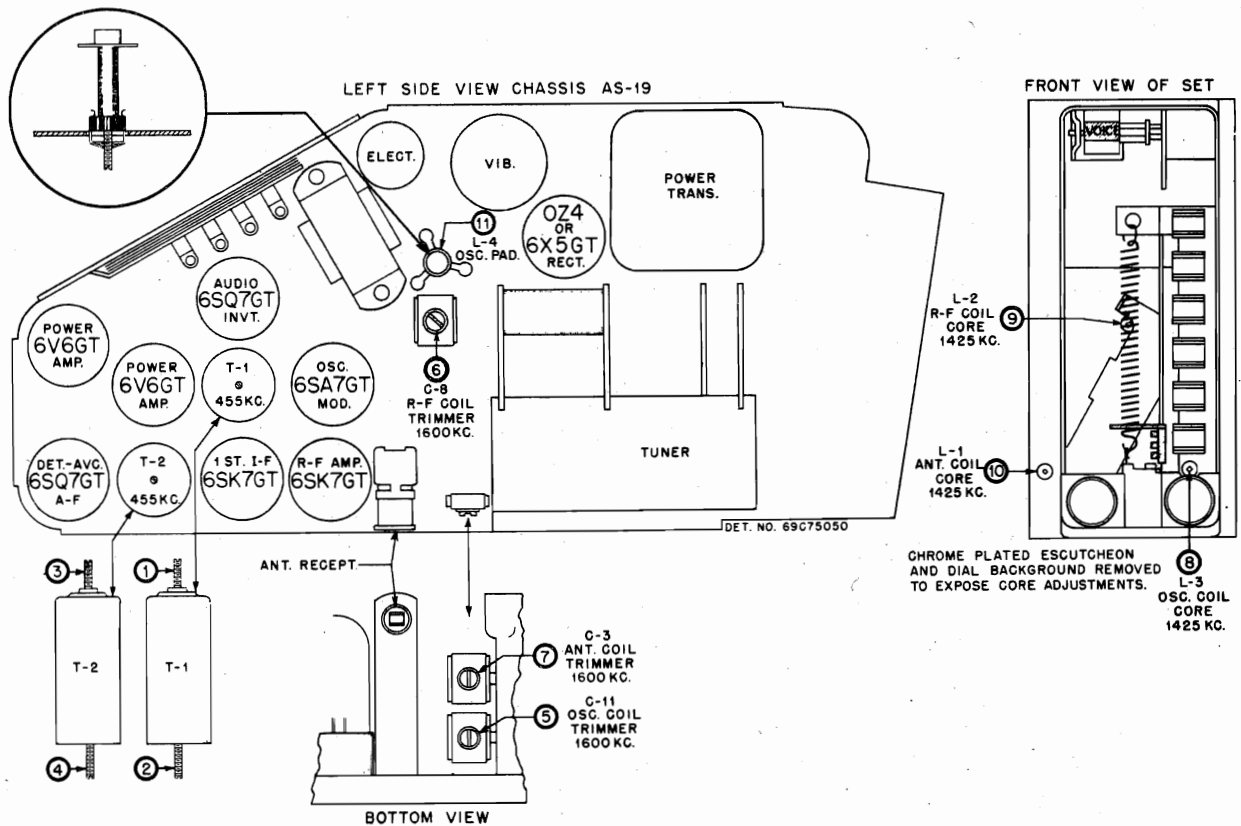


FIGURE 5. TUBE AND TRIMMER LOCATION DETAIL.

ALIGNMENT TABLE

Refer to Figure 5 for location of trimmers and adjustable iron cores.

STEP	TUNER POSITION SET TO	DUMMY ANTENNA	SIGNAL GENERATOR LEAD CONNECTED TO	SIG. GEN. SET AT	ADJUST FOR PEAK ON OUTPUT METER
1.	High frequency end (cores out)	.1 mfd. at Sig. Gen.	Osc.-Mod. grid (#5 pin)	455 Kc	#1 and 2 P & S in T-1 #3 and 4 P & S in T-2
2.	High frequency end, 60 mmf. at tuning shaft against stop. Cores should be set to project 1-1/8" from cans.	60 mmf. at Sig. Gen. in series in 21" long coax lead.	Antenna Receptacle	1600 Kc	#5 Osc. trimmer C-11 #6 R.F. trimmer C-8 #7 Ant. trimmer C-3
3.	EXACTLY one full turn in from high frequency end. Use knob set screw as an indicator. Start measuring turn the moment tuner carriage starts moving inward.	"	"	1425 Kc	#8 Osc. Core of L-3 #9 R.F. Core of L-2 #10 Ant. Core of L-1
4.	EXACTLY four more full turns in (as indicated by knob setscrew)	"	"	Power turned OFF	#11 Osc. Pad core of L-4 for maximum noise.
5.	Assemble and install receiver in car and connect car antenna. Turn the dial to approximately 1400 Kc (not to a local station) and adjust antenna trimmer for maximum noise. This adjustment is referred to as Antenna Padder in Figure 7.				

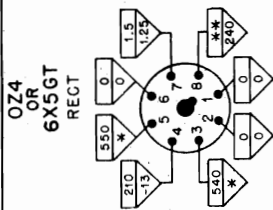
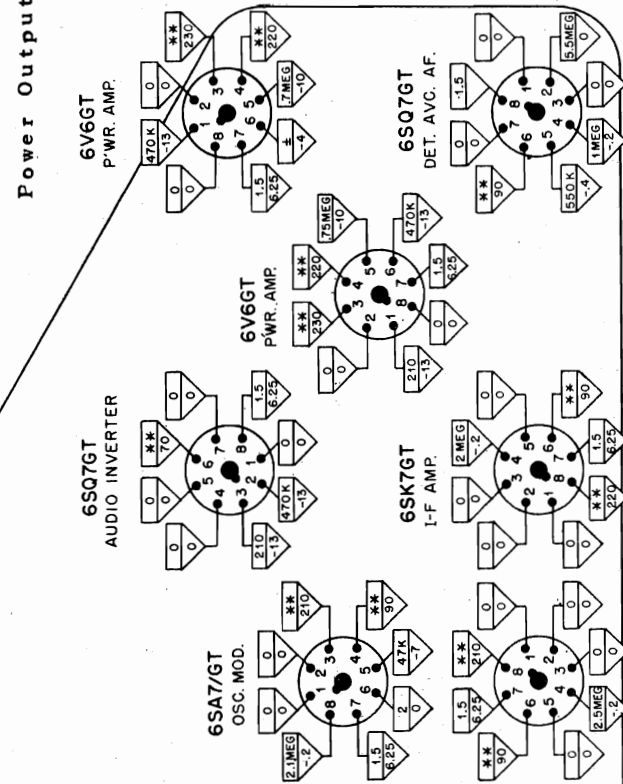
NOTE: If oscillator padder core adjustment is too far off, repeat alignment procedure, steps 2, 3, and 4. It may be necessary to repeat alignment more than once if padder adjustment has been indiscriminately tampered with.

MODEL CR6

MOTOROLA, INC.

Power Input: 10 A. at 6.3V
(including speaker field)

Power Output: 9 watts

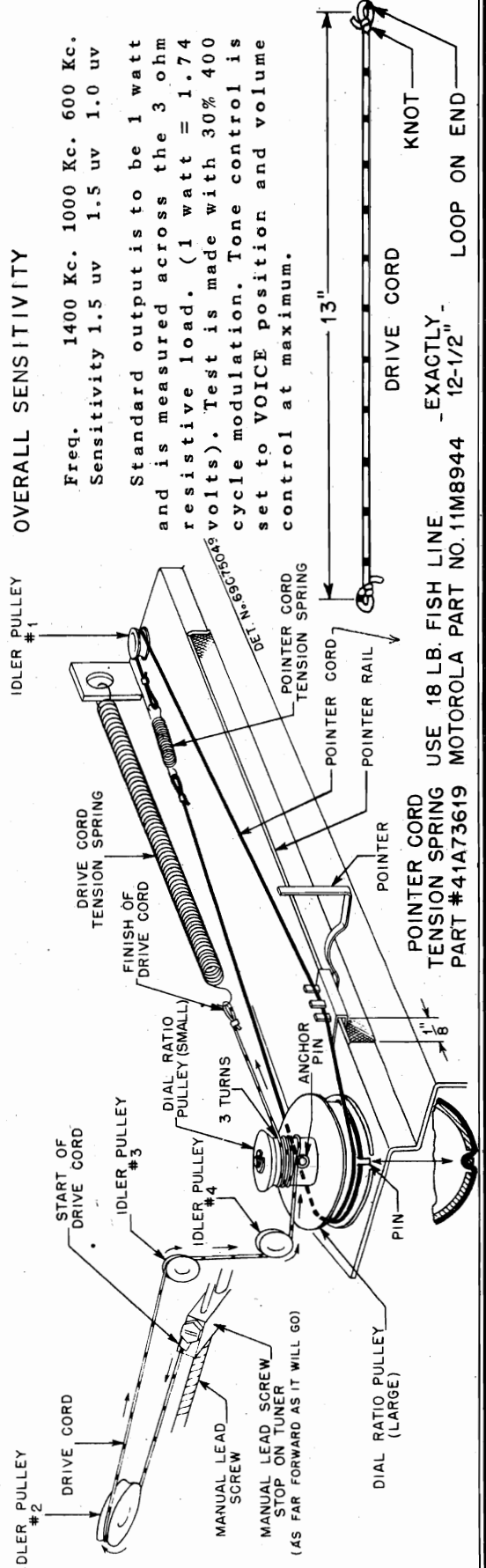


NOTE - VOLTAGES AND RESISTANCES WERE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER.
BATTERY INPUT VOLTAGE MEASURED AT SPARK PLATE WAS 6.3 V
A TOLERANCE OF $\pm 10\%$ VARIATION FROM INDICATED VOLTAGE MEASUREMENTS, IS NORMAL.
A TOLERANCE OF $\pm 20\%$ IS PERMISSIBLE ON RESISTANCE MEASUREMENTS EXCEPT WHERE RESISTORS CODED WITH A SILVER BAND ARE USED IN SUCH CIRCUITS THE TOLERANCE IS $\pm 10\%$.
± - $62 \Omega \pm 10\%$ (EARLY MODELS)
56 $\Omega \pm 10\%$ (LATE MODELS)
* - AC VOLTAGES.
** - MEASUREMENTS VARY DUE TO ELECTROLYTIC CAPACITOR C-27 BEING IN CIRCUIT
△ = VOLTAGE MEASUREMENTS.
□ = RESISTANCE MEASUREMENTS.

RIGHT SIDE VIEW OF CHASSIS

DET NO. 63C75052

VOLTAGE AND RESISTANCE DIAGRAM



Overall Sensitivity
Freq. 1400 Kc. 1000 Kc. 600 Kc.
Sensitivity 1.5 uv 1.5 uv 1.0 uv
Standard output is to be 1 watt and is measured across the 3 ohm resistive load. (1 watt = 1.74 volts). Test is made with 30% 400 cycle modulation. Tone control is set to VOICE position and volume control at maximum.

USE 18 LB FISH LINE - EXACTLY -
MOTOROLA PART NO. 11M8944 - 12-1/2"
PART #41A73619

MOTOROLA, INC.

ELIMINATION OF IGNITION INTERFERENCE

- a. Install distributor suppressor.
- b. Install generator condenser.

Mount the generator condenser on the generator frame, under the ground lead screw. Connect the space tip end of the condenser wire under the battery terminal of the generator. **WARNING: Do not connect the condenser wire to the field terminal.**

- c. Install hood bonds.

Remove one of drive screws that holds the cloth tape along the rear edge of the hood. Insert Hood Bond under tape so hole lines up with hole drive screw was in, put in self-tapping screw and fold in back over tape so rough points of hood bond are against under side of hood when hood is closed.

ADDITIONAL MOTOR NOISE HINTS

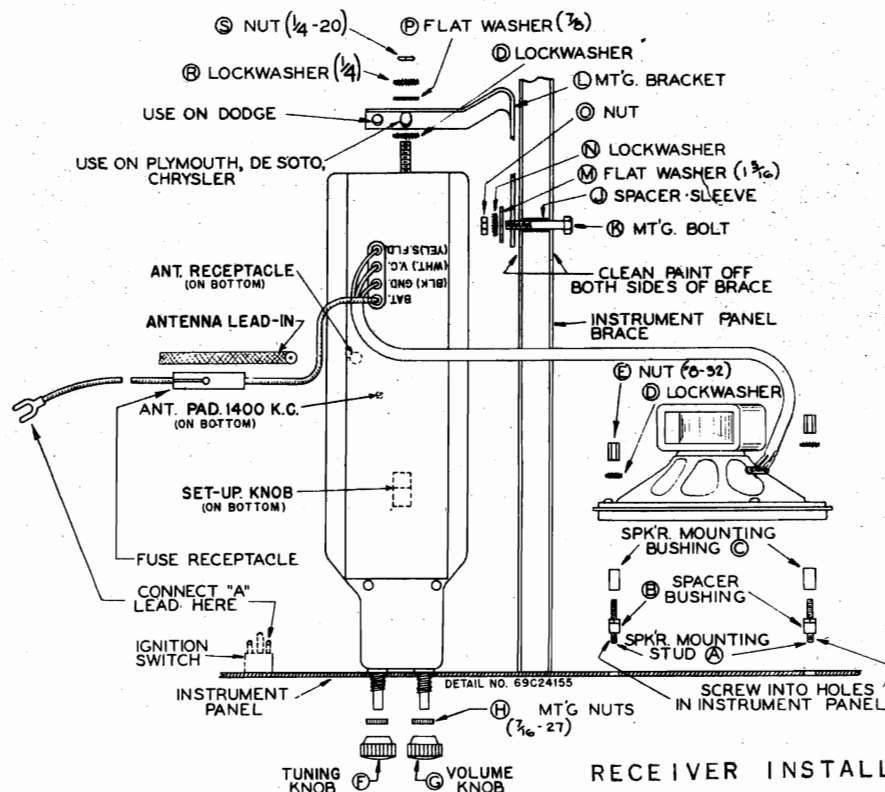
In most cars, the steps outlined above will completely take care of ignition interference. However, there are occasions when additional corrections are needed. Below are listed some suggestions which may be helpful in curing these unusual cases.

- a. When checking the car for motor noise, clamp the hood down tight.

- b. Motorola Hood Bonds (Part No. 39A4205) should be installed at the shoulders so that the hood makes a good-ground to the cowl of the car on the side the antenna is mounted.

- c. Wheel static can be cured by installing static collectors in the front hub caps. (Part No. 39A20513).

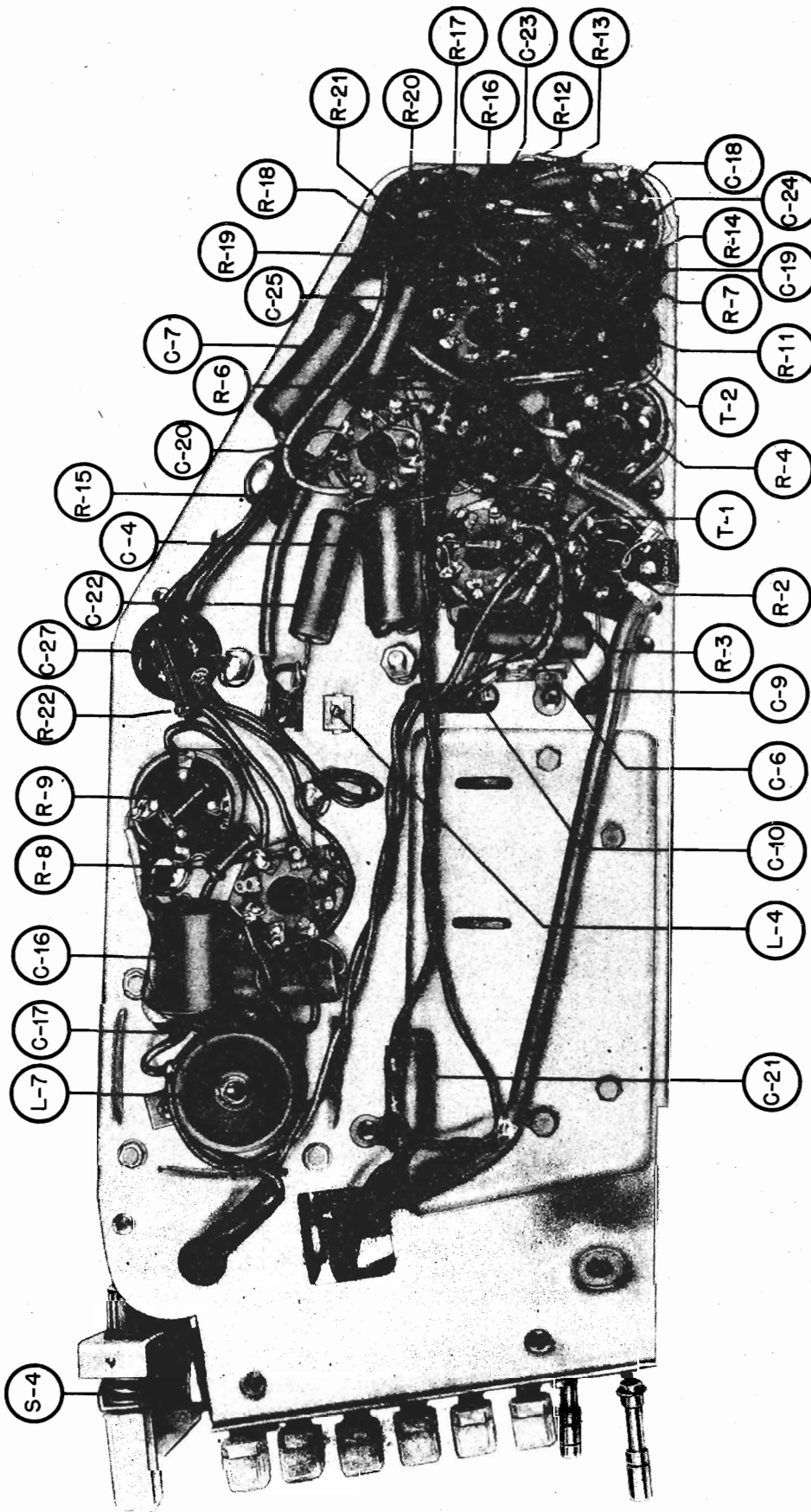
- d. If required, install an ammeter condenser, (Part No. 8K4661).



RECEIVER INSTALLATION DETAIL

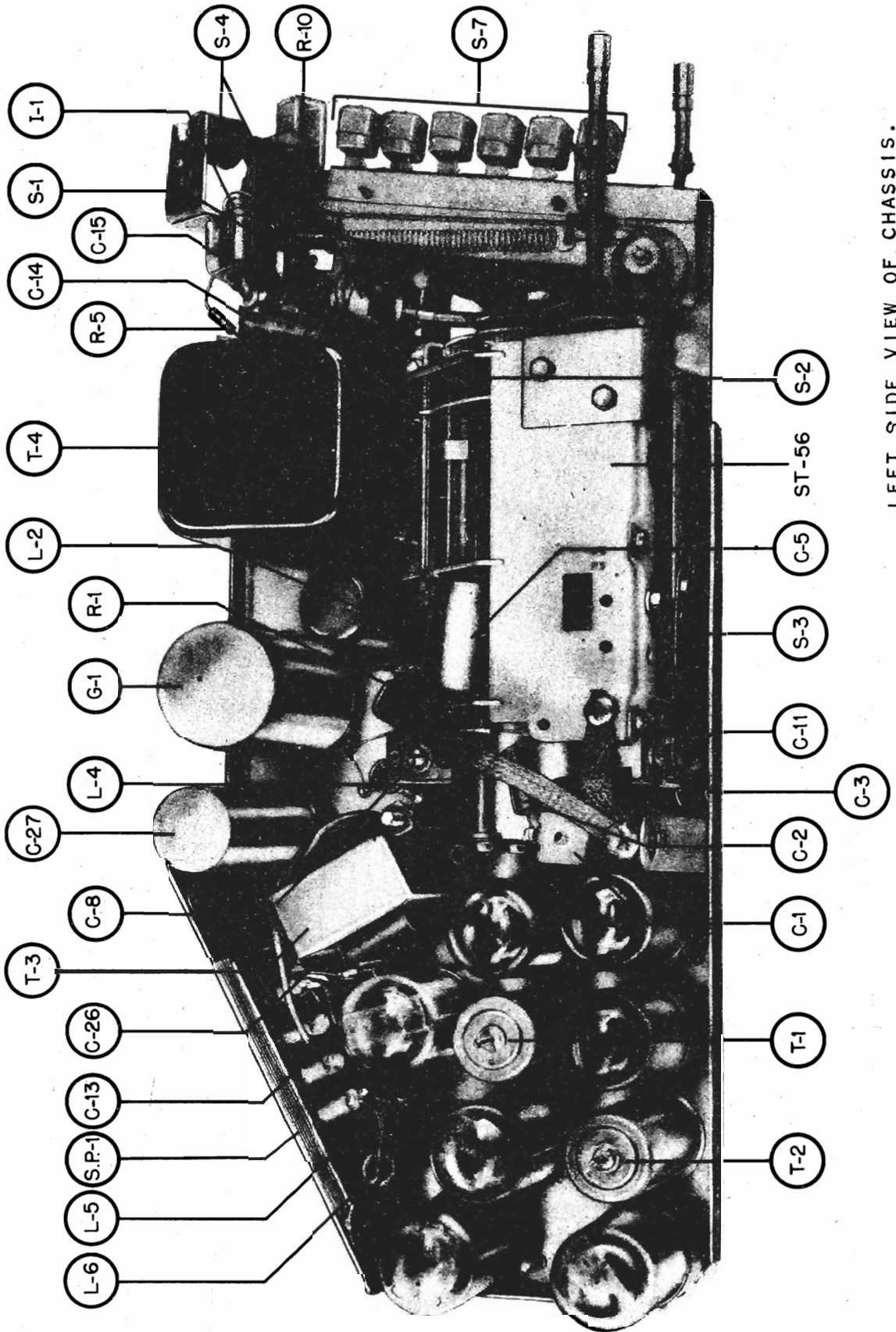
MODEL CR6

MOTOROLA, INC.



RIGHT SIDE VIEW OF CHASSIS

MOTOROLA, INC.



LEFT SIDE VIEW OF CHASSIS.

MODEL CR6
 MODEL FD6
 MODELS FD6, NH6

MOTOROLA, INC.

SETTING THE PUSH BUTTONS

PROCEDURE

- a. Turn ON the receiver
- b. Press the manual button marked "M"
- c. Turn the tuning knob until the desired station is tuned in.
- d. Press the number one button.
- e. Turn the set-up lever CLOCK-WISE (right) as far as it will go and release allowing it to return.
- f. Turn the tuning knob until the previously noted program is heard. (The dial will not indicate the station to which the button is set.)

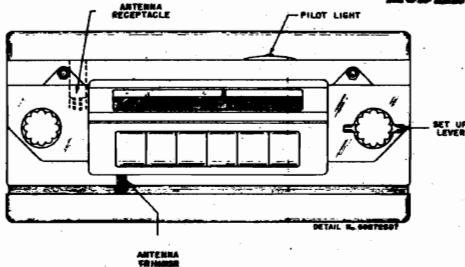
NOTE: The dial pointer may reach the end of the dial scale before the desired station is received. However, continue turning the tuning knob until the station is received. The dial pointer mechanism will not be affected.

- g. Press the "M" button and the "1" button is set.

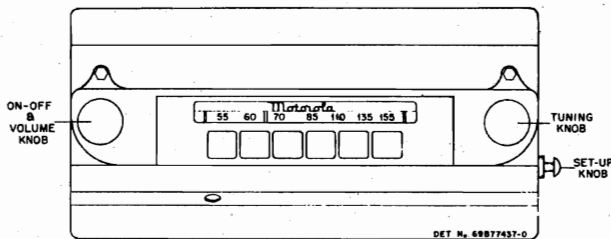
NOTE: Check the setting of the automatic button by tuning in the desired station, having the "M" button pushed in and then push the automatic button, either button should give the same volume and clarity.

- h. Repeat the above procedure, steps b and through g for each of the push buttons.

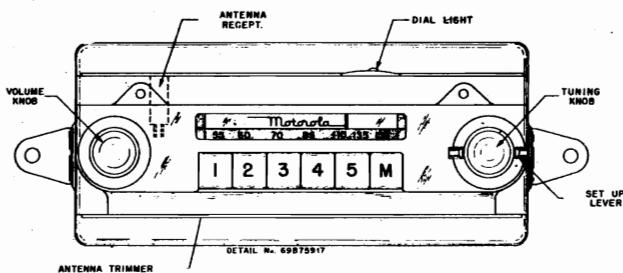
MODEL NH6



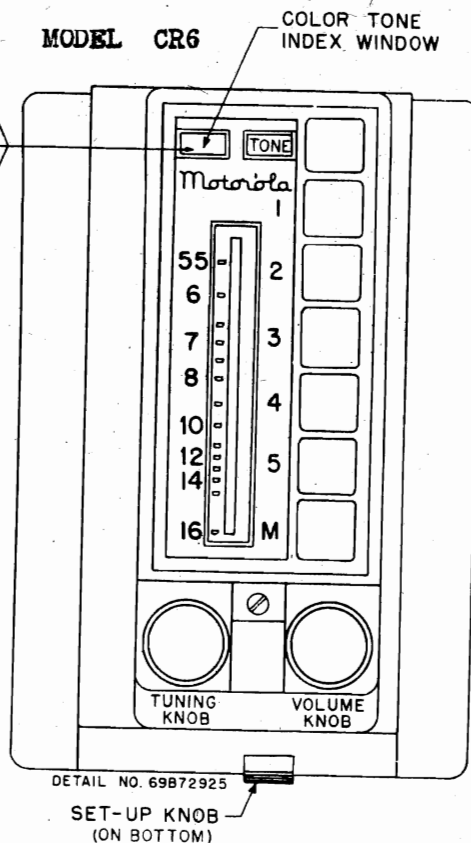
MODEL FD6



MODEL FD6



MODEL CR6



RED — MUSIC
 YELLOW — VOICE
 GREEN — MELLO

MOTOROLA, INC.

MODEL CR6	MODEL 405
MODELS CT6,OE6,PC6	MODEL 505
MODELS FD6,NH6	MODEL 605
MODEL PD6	MODEL 705

Two types of I.F.-Diode transformers have been used. The assemblies, if necessary, with same transformer shields for the late type as in the receiver. units have a powdered iron sleeve whereas none was used with the early I.F.-Diode transformers. See Figure 5.

Replace transformer coil as- The capacitor across each winding of both types of I.F.-Diode transformers is a dual 100 mmf. wafer type silver mica,

The late transformer or shield assemblies are not inter-changeable with the early ones. Although a late transformer and shield can be used to replace an early transformer and shield combination, it is not recommended because of difficulty in replacing shields which are staked to the chassis. Do not attempt to intermix the transformers and shields. If the wrong combination of transformer and shield is used, the transformer will not peak at the I.F. frequency of 455 Kc.

EARLY SETS:
Transformer, I.F. or diode: Part No. 24B70827
Shield: Part No. 26B70107

LATE SETS:
Transformer, I.F. or diode: Part No. 24B76553
Shield & Iron Core Sleeve Assembly: Part No. 1A71049.

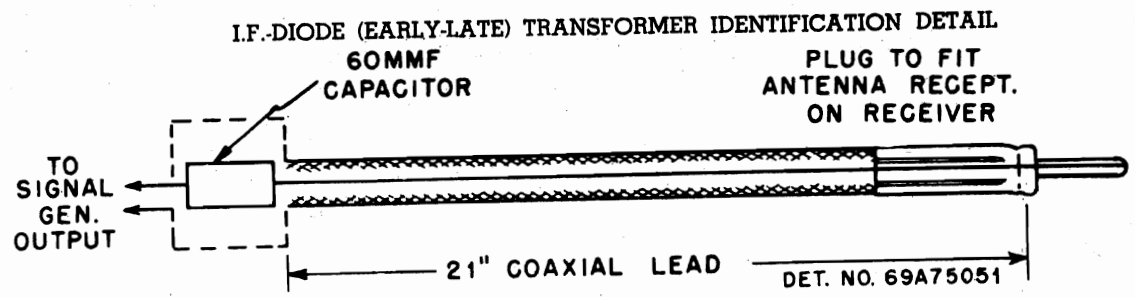
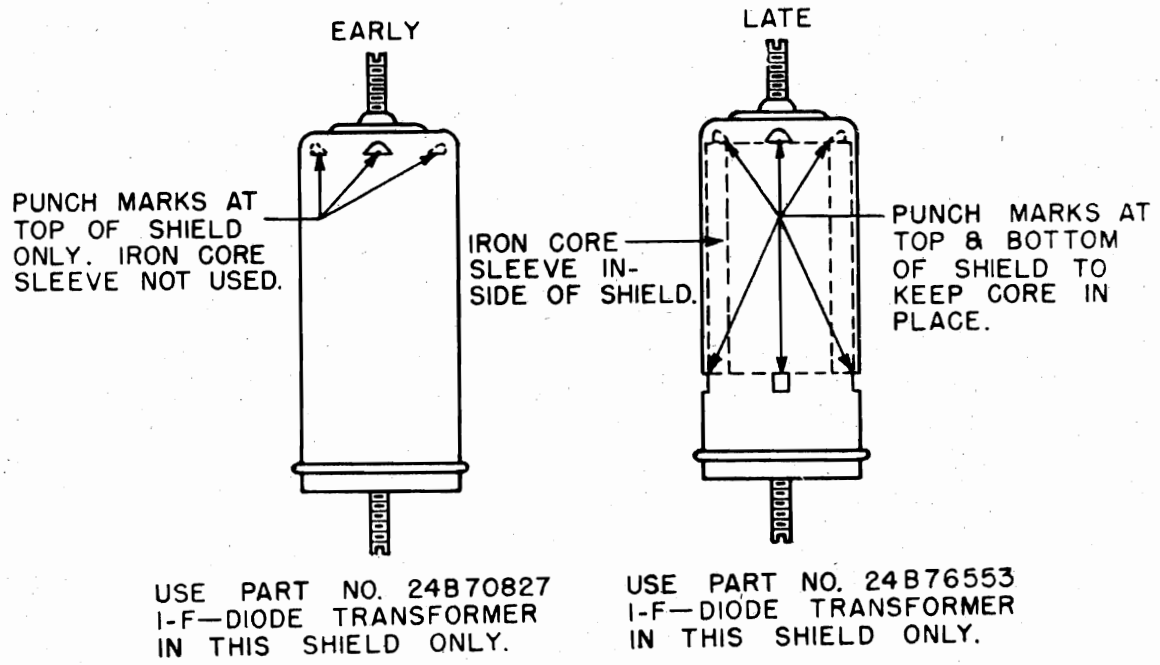


FIGURE 2. DUMMY ANTENNA CONSTRUCTION DETAIL

MODEL CR6

MOTOROLA, INC.

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	
C-1	21A20877	Capacitor, fixed: metal mica; 90 mmf	C-26	8K13165	Capacitor, fixed: paper; .003 F-1 1000 V	L-1	65K4437	Fuse: 20 amp; type 3A0	1X71047	Core & Palnut Assembly (I.F. & diode coil top tuning iron core with nut)	
C-2	8A4529	Capacitor, fixed: paper; .006 mf 100 V	C-27	23A75429	Capacitor, electrolytic: 20-201-1 mf 400 V, 20 mf 25V	L-1	48B5353	Vibrator, non-sync.	1X71048	Core & Clip Assembly (I.F. & diode bottom tuning iron core & clip)	
C-3	20A70801	Capacitor, variable: mica; 50-180 mmf	NOTE: Unless otherwise specified, all Resistors are 20%.					L-2	1A71881	Manual before replacing.	Lead, battery: 10" long; insulated bushing and contact eyelet on one end, red insulated pin on other end.
C-4	8A14791	Capacitor, fixed: paper; .05 mf 400 V	R-1	6R6032	Resistor, fixed: carbon; 470,000 1/2W Ins.	L-2	1A71879	Coil, antenna or R.F. (See Manual before replacing.)	1X27819	Lead, fuse: 20" long; fuse receptacle on one end, spade lug on other end	
C-5	8A19133	Capacitor, fixed: paper; .5 mf 100 V	R-2	6R0075	Resistor, fixed: carbon; 100,000 1/2W Ins.	L-3	24A70827	Coil, oscillator padder; includes mounting clip and adjustable iron core.	1K72125	Insulated pin terminals on one end	
C-6	8A14791	Capacitor, fixed: paper; .05 mf 400 V	R-3	6R0056	Resistor, fixed: carbon; 47,000 1/2W Ins.	L-3	24K70840	Coil, "A" choke	1K74106	Pointer & Slider Assembly	
C-7	8K13166	Capacitor, fixed: paper; .1 mf 400 V	R-4	6R6106	Resistor, fixed: carbon; 10,000 1W N.I.	L-4	24K75353	Coil, dial light & speaker field choke: 9 turns #16 yellow wire		Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together	
C-8	20A70801	Capacitor, variable: mica; 50-180 mmf	R-5	6R6028	Resistor, fixed: carbon; 22,000 1/2W Ins.	L-5	24A70199	Coil, "A" choke: with mounting bracket	1K70646	Receptacle, antenna: metal ferrule with ins. contact	
C-9	21K70720	Capacitor, fixed: mica; 5 mmf	R-6	6R6147	Resistor, fixed: carbon; 330 1W Ins.	L-6	Part of R-10 Switch; SPST (Part of volume control R-10)		9A70208	Socket, tube: 4 prong (vibrator socket)	
C-10	21R6513	Capacitor, fixed: mica; 50 mf 300 V	R-7	6R6004	Resistor, fixed: carbon; 1 meg. 1/2W Ins.	L-7	40B70862	Switch, selector	9A6788	Socket, tube: octal; plain	
C-11	20A70214	Capacitor, variable: mica; 30-80 mmf	R-8	6R6005	Resistor, fixed: carbon; 50 1/2W N.I.	L-7	1K732625	Switch, mute	9A70185	Socket, tube: octal; shielded type (for R.F. & I.F. amp)	
C-12	21A71872	Capacitor, fixed: ceramic; 400 mmf	R-9	6R6005	Resistor, fixed: carbon; 50 1/2W N.I.	L-7	40A70831	Switch, push button assembly	1K74142	Speaker Assembly: includes mounting plate and connecting cable	
C-13	8A17028	Capacitor, fixed: paper; .5 mf 100 V	R-10	18A71825 or 18A70172	Resistor, variable: carbon; .5 meg; with SPST switch	S-1	1K75194	Spark plate assembly	50B71900	Speaker: 8" electro; 3 ohm V.C. less mtg. plate and lead	
C-14	8K23690	Capacitor, fixed: paper; .01 mf 400 V	R-11	6R6056	Resistor, fixed: carbon; 47,000 1/2W Ins.	S-2	24B70827	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)		or	
C-15	8K23690	Capacitor, fixed: paper; .01 mf 400 V	R-12	6R3927	Resistor, fixed: carbon; 2.2 meg 1/2W Ins.	S-2	50B74946 or 50B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in late sets only)	50B74946 or 50B74041	Suppressor, distributor	
C-16	8A12840	Capacitor, fixed: paper; .006 mf 100 V	R-13	6R5118	Resistor, fixed: carbon; 3.3 meg 1/2W Ins.	S-3	1K70944	Switch Assembly, solenoid	6X17117	Switch, tone: consists of switch leafs, contacts and insulator assembly only.	
C-17	8A12840	Capacitor, fixed: paper; .006 mf 100 V	R-14	6R6015	Resistor, fixed: carbon; 220,000 1/2W Ins.	S-3	1K74087	Switch, tone control: with brackets; complete	40A72112	Switch, tone: consists of switch leafs, contacts and insulator assembly only.	
C-18	21A70176	Capacitor, fixed: mica; dual 120 mmf	R-15	6R6015	Resistor, fixed: carbon; 220,000 1/2W Ins.	S-4	40A70831	Switch, push button assembly	1X74109	Tone Indicator Assembly: consists of clear plastic indicator drum; bakelite cam and ratchet, and colored tone strip	
C-19	21R6513	Capacitor, fixed: mica; 50 mf 300 V	R-16	6R6004	Resistor, fixed: carbon; 1 meg. 1/2W Ins.	S-5	25K72044	Transformer, power		or	
C-20	21R6638	Capacitor, fixed: mica; 1000 mf 500 V	R-17	6R6253	Resistor, fixed: carbon; 150 106 1W N.I.	S-5	25B70850	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in late sets only)	1X74109	50B74946 or 50B74041	
C-21	8A4736	Capacitor, fixed: paper; .002 mf 400 V	R-18	6R5614	Resistor, fixed: carbon; 56 106 1/2W Ins.	S-5	1K74121	Accessories, ST00P CR6: includes all parts necessary to install receiver in car, except speaker assembly and receiver mounting bracket.		or	
C-22	8K13166	Capacitor, fixed: paper; .1 mf 400 V	R-19	6R6032	Resistor, fixed: carbon; 470,000 1/2W Ins.	T-3	8A4491	Capacitor, generator	1X74080	50B74946 or 50B74041	
C-23	8K23690	Capacitor, fixed: paper; .01 mf 400 V	R-20	6R6407	Resistor, fixed: carbon; 220,000 106 1/2W Ins.	T-4	1X74111	Cord, Assembly: dial pointer cord		or	
C-24	21R6648	Capacitor, fixed: mica; 250 mf 500 V	R-21	6R6414	Resistor, fixed: carbon; 270,000 106 1/2W Ins.	T-4	1X74283	Cord, Assembly: drive cord; with lug on one end		or	
C-25	8K23690	Capacitor, fixed: paper; .01 mf 400 V	R-22	6R6184	Resistor, fixed: carbon; 1000 1W N.I.					or	

MOTOROLA, INC.

MODELS CT6, OE6, PC6

SETTING THE PUSH BUTTONS

1. Turn ON the receiver.
2. Press the push button marked "M"
3. Turn the tuning knob until the desired station is tuned in. (Make mental note of the program)
4. Press the number one button.
5. Turn the set-up lever CLOCKWISE (right) as far as it will go and release, allowing it to return.
6. Turn the tuning knob until the previously heard program is heard. (The dial will not indicate the station to which the button is set).

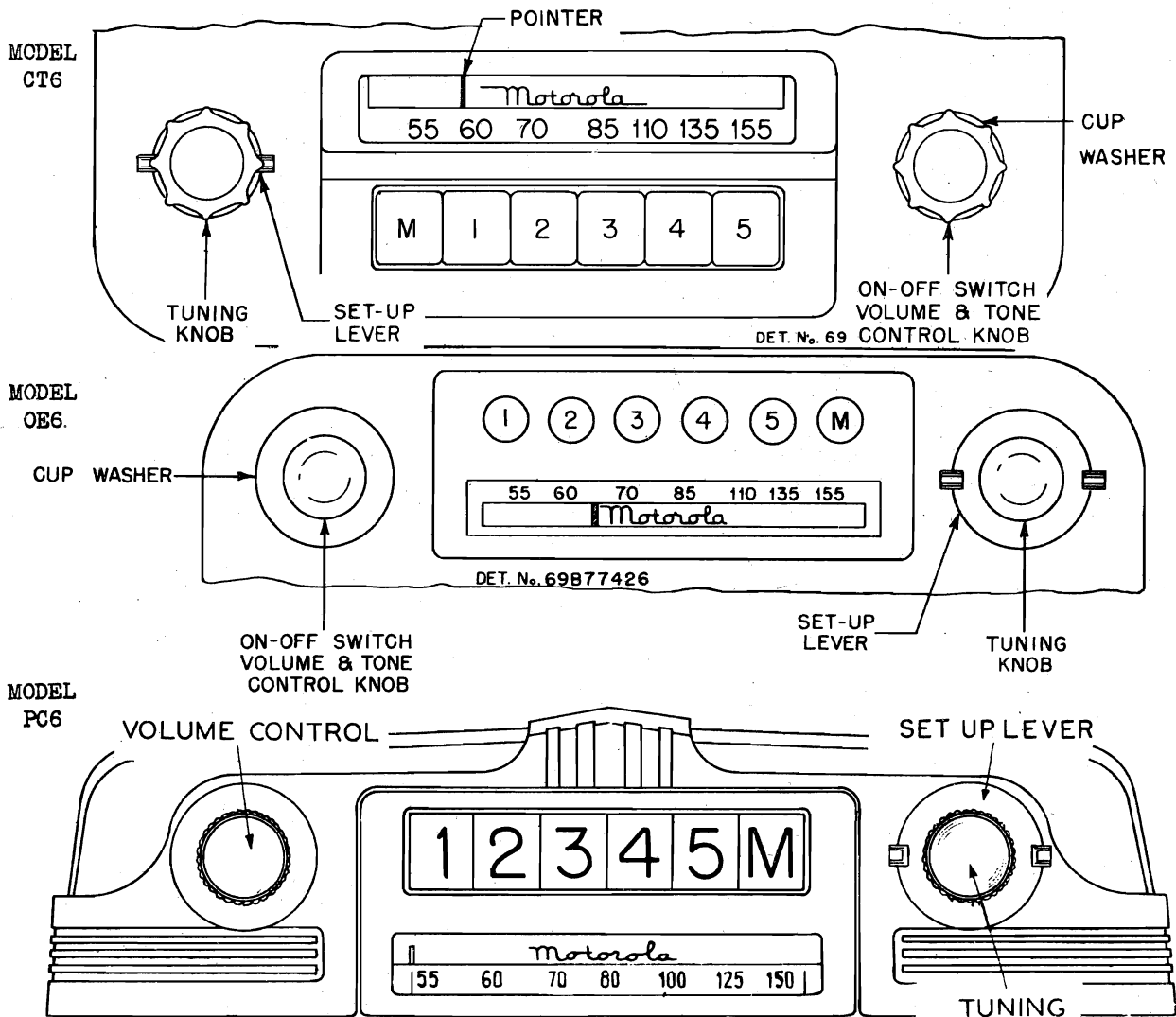
the desired station is received. However, continue turning the tuning knob until the station is received. The dial pointer mechanism will not be affected.

7. Press the "M" button and the number one push button is set.

NOTE: Check the setting of the automatic button by tuning in the desired station having the "M" button pushed in, and then push the automatic button that is set to the same station that was tuned in manually, either button should give the same volume and clarity. Any difference indicates that the push button was not set correctly.

8. Repeat the above procedure, steps 2 through 7 for each of the push buttons.

NOTE: The dial pointer may reach the end of the dial scale before



WARNING: CHECK VOLTAGE REGULATOR

Many late cars develop exceedingly high voltage due to improper adjustment of voltage regulator, which shortens the life of radio tubes, vibrator, electrical accessories and headlights. When

voltage exceeds 7.3 volts with motor running at about 35 miles per hour and no load on battery, have the voltage regulator adjusted for maximum voltage of 7.3 volts under a no load condition.

TO REPLACE DIAL LIGHT

It will be necessary to remove set from car when replacing dial light. Pry out large snap

button directly under push-button "M" and replace with a #44 bayonet base pilot lamp.

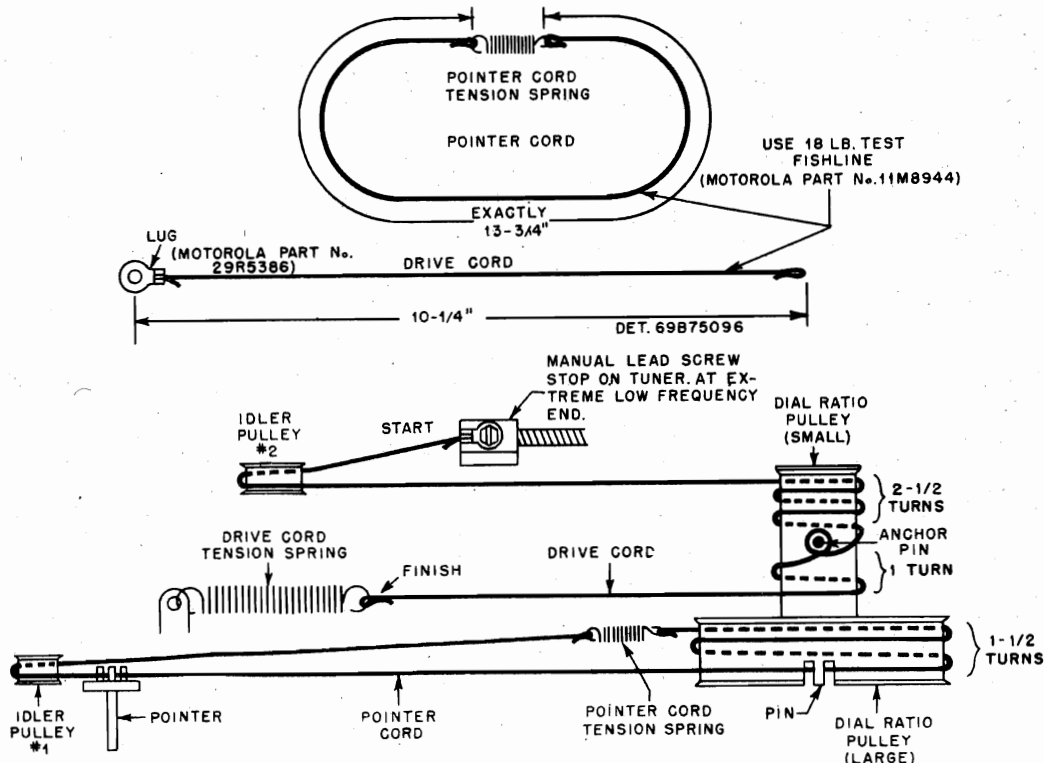
POINTER AND DRIVE CORD REPLACEMENT

PREPARE RECEIVER AS FOLLOWS

1. Remove the front cover.
2. Remove the dial background. Two snap-in eyelets hold it in position.
3. Remove the push button assembly. Four screws hold it in position. Do not unsolder any

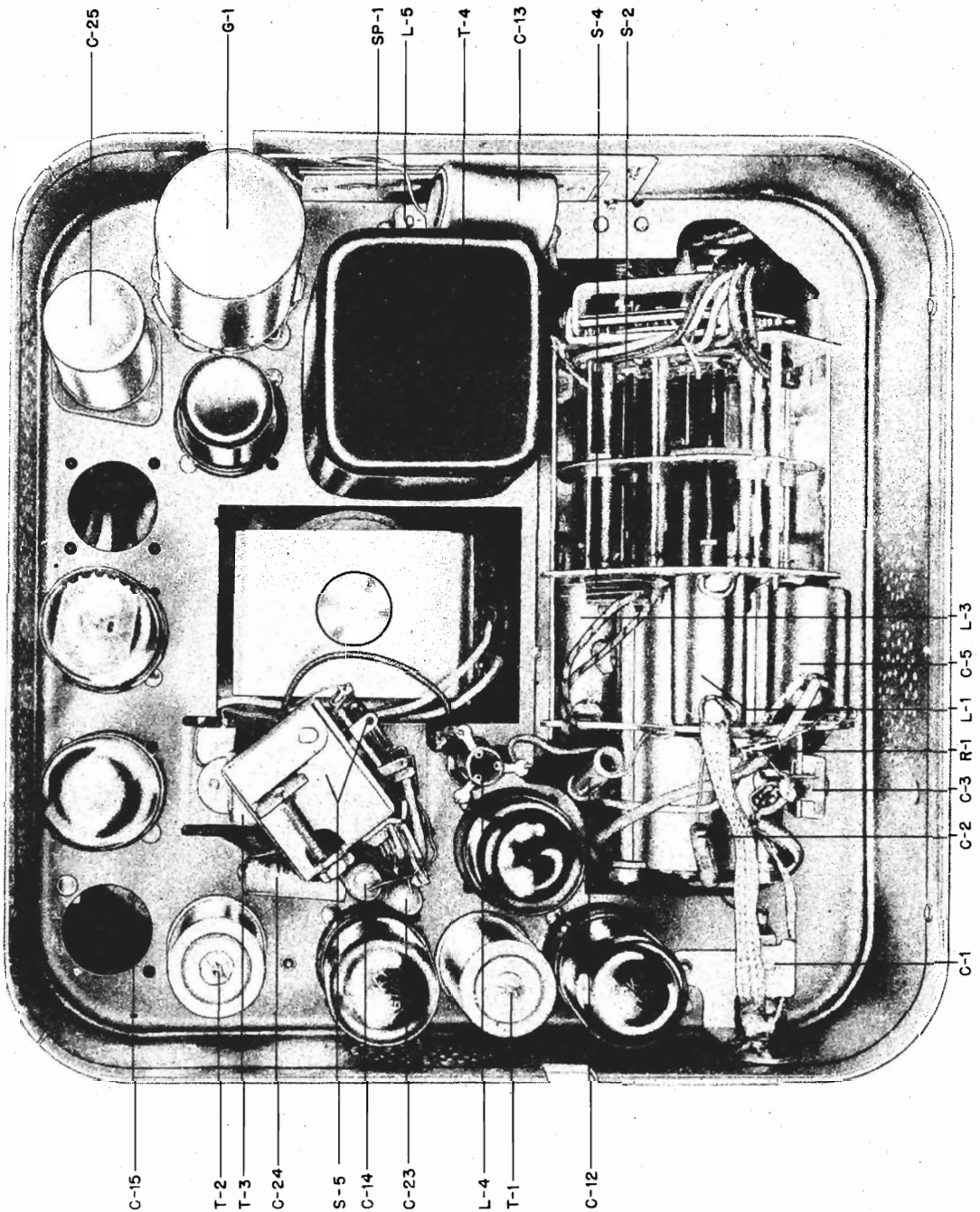
wire leads; just lay the push button assembly on top of the set.

4. The pointer & drive cords are now fully exposed. If only the pointer cord is to be replaced, temporarily remove the drive cord from dial ratio pulley to make the pointer cord more readily accessible.



POINTER AND DRIVE CORD RESTRINGING DETAIL

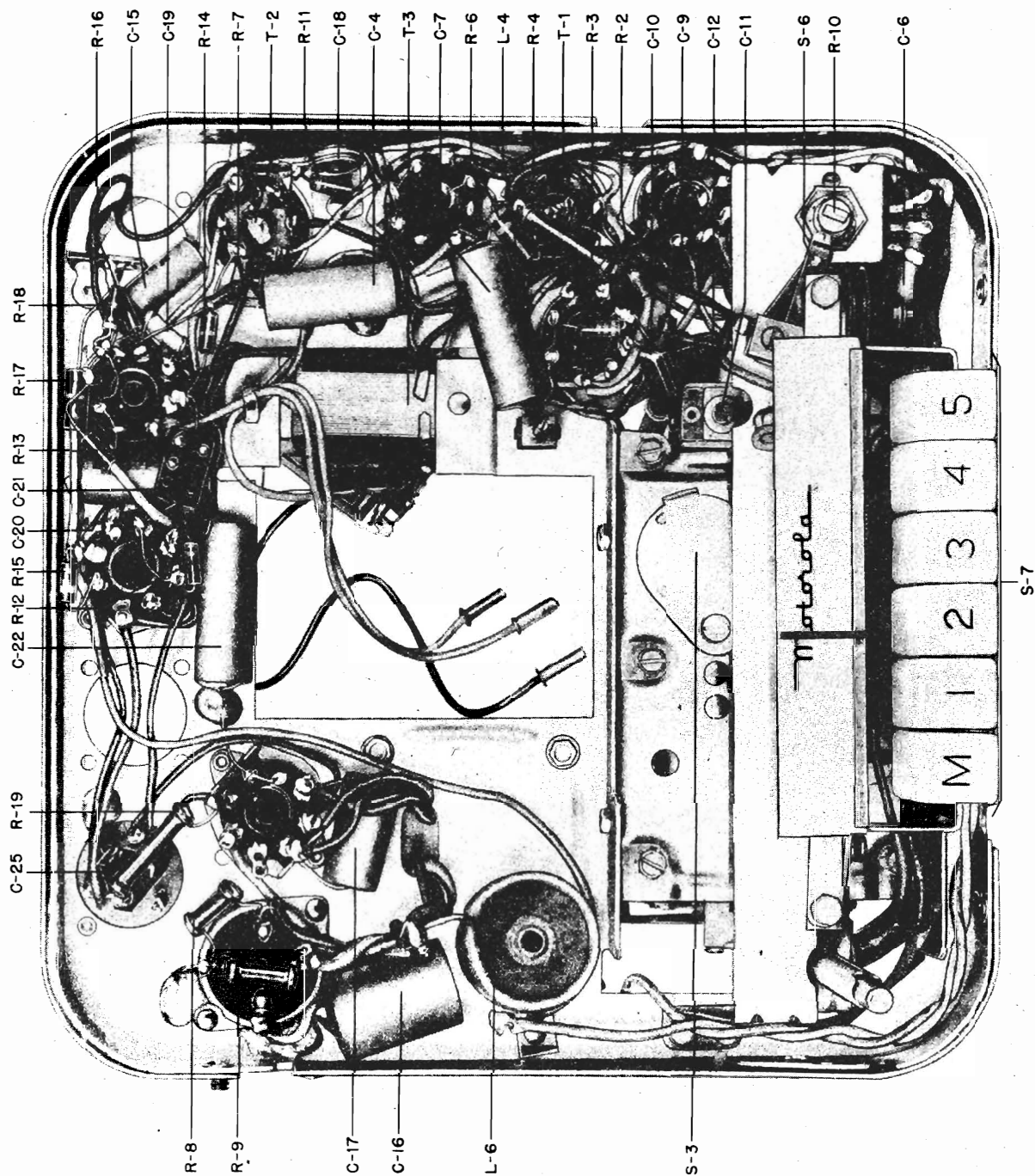
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CHASSIS TOP VIEW

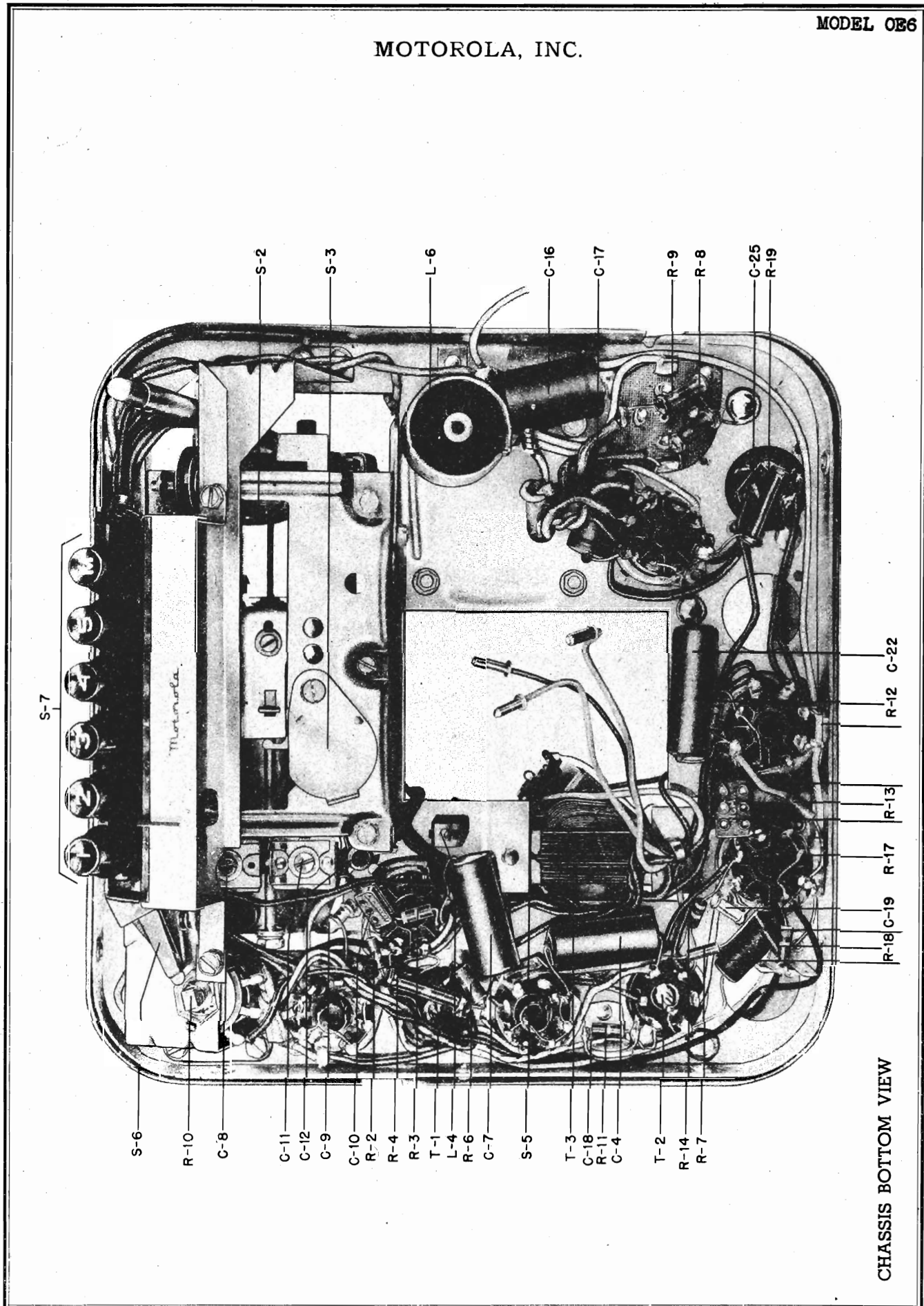
MODEL CT6

MOTOROLA, INC.



CHASSIS BOTTOM VIEW

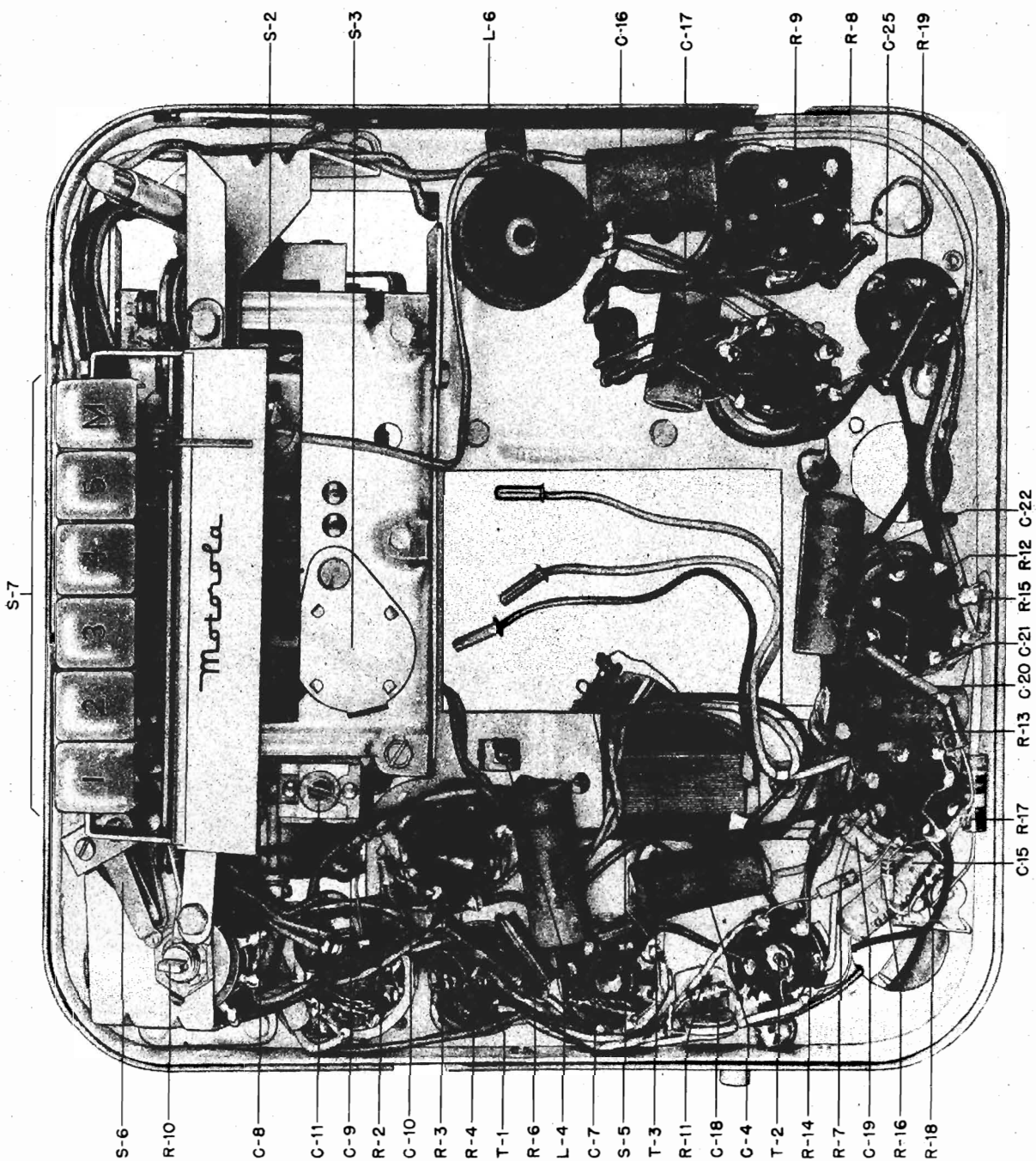
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CHASSIS BOTTOM VIEW

MODEL PC6

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CHASSIS BOTTOM VIEW

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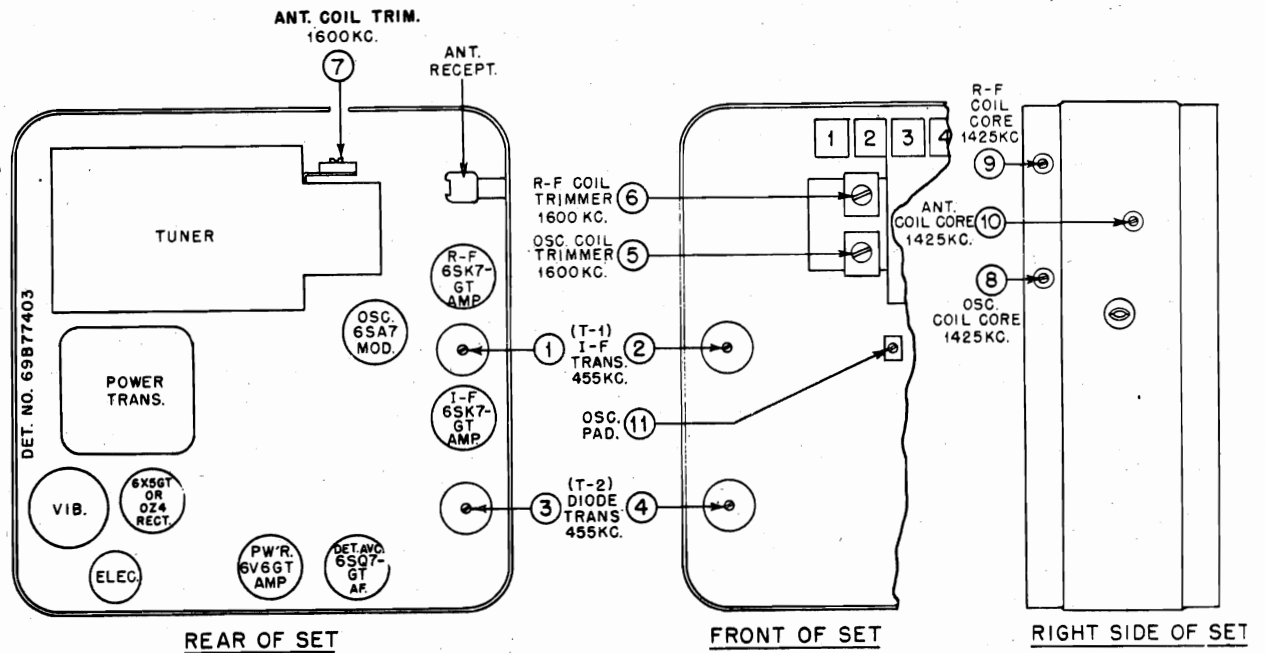
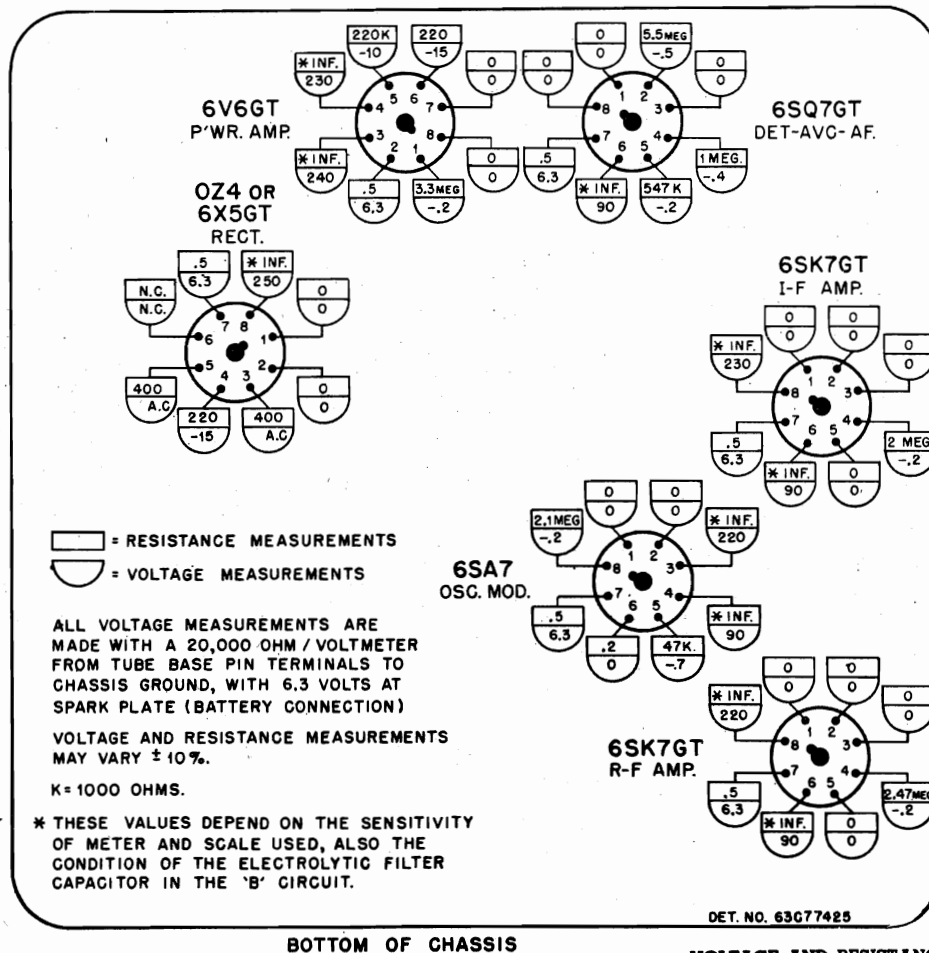


FIGURE 3. TUBE AND TRIMMER LOCATION DETAIL



MODELS CT6, OE6, PC6
 MODELS FD6, NH6
 MODEL 405, MODEL 505
 MODEL 605, MODEL 705

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STEP	TUNER POSITION SET TO	DUMMY ANTENNA	SIGNAL GENERATOR LEAD CONNECTED TO	SIG. GEN. SET AT	ADJUST FOR PEAK ON OUTPUT METER
1.	High frequency end (cores out)	.1 mfd. at. Sig. Gen.	Osc Mod grid (#5 pin)	455 Kc	#1 and 2 P & S in T-1 #3 and 4 P & S in T-2
2.	High frequency end, tuning shaft against stop. Cores should be set to project 1-1/8" from cans. * lead.	60 mfd. at. Sig. Gen. in series with 21" long coax lead.	Antenna receptacle	1600 Kc	#5 Osc. coil trimmer #6 R.F. coil trimmer #7 Ant. coil trimmer
3.	EXACTLY one full turn in from high frequency end. Use knob set screw as an indicator. Start measuring turn the moment tuner carriage starts moving inward *	"	"	1425 Kc	#8 Osc. coil core #9 R.F. coil core #10 Ant. coil core
4.	EXACTLY four more full turns in (as indicated by knob setscrew)	"	"	Power turned Off.	#11 Osc. Pad. core for maximum noise

NOTE: If oscillator padder core adjustment is too far off, repeat alignment procedure, steps 2, 3, and 4. It may be necessary to repeat alignment more than once if padder adjustment has been indiscriminately tampered with.

5. Assemble receiver and peak antenna trimmer (#7) to car antenna. The antenna trimmer is located at the top of the receiver and is inaccessible when the receiver is installed behind instrument panel, therefore, it is necessary to adjust antenna trimmer before final installation. Proceed by laying set on floor of car, connect antenna and "A" leads, tune set to a spot around 1400 kc that is free of stations and adjust antenna trimmer for maximum noise. The antenna should be fully extended.

IMPORTANT: Do not push in on the alignment tool when adjusting the tuner cores. The slightest inward pressure on the alignment tool may move the tuner carriage and result in inaccurate alignment.

TUNING RANGE

535 to 1600 K.C.

I. F. Frequency - 455 kc.

ELECTRICAL CHARACTERISTICS

Power Input: 6 Amp. at 6.3V (with P.M. dynamic type speaker)
 7.5 Amp. at 6.3V (with electrodynamic type speaker)
 Power Output: 5.6 watts (max.)

OVERALL SENSITIVITY

Frequency	1400 Kc	1000 Kc	600 Kc
Sensitivity	1.4uv	1.6uv	1.4 uv

Standard output is to be 1 watt and is measured across the 3 ohm resistive load. (1 watt = 1.74 volts). Test is made with 30% 400 cycle modulation. Tone control is set to voice position (high) and volume control at maximum. Signal is fed through 60 mfd. dummy to antenna connector of set through 21" coaxial lead. See Figure 2 for dummy antenna detail.

ALIGNMENT

EQUIPMENT REQUIRED

1. A special tool for adjusting the tuner cores. Use alignment tool, Motorola Part No. 66A76278.
2. A small screwdriver for I.F. and R.F. Alignment.
3. A modulated signal generator that can be accurately tuned to the frequencies indicated in the alignment chart.
4. A special dummy antenna for R.F. alignment. Construct dummy antenna per instructions given in Figure 2. The 21" coaxial lead needed in its construction is the same type as used for lead-in on Motorola car antenna.

5. A low range output meter.

6. A special tuner gauge, Motorola Part No. 66X76825, for accurately setting tuner to exact alignment frequencies is available. Instructions on its use come with the gauge. Receiver can be aligned without using gauge, but use of gauge will help you to do a speedier and more accurate job.

PROCEDURE

1. Remove the front and rear covers. All adjustments are now exposed. Refer to Figure 3 for their location.
2. Turn the receiver on and allow it to warm up for a few minutes. Press the "M" button to place automatic tuner in manual tuning position.
3. Connect the output meter across the speaker voice coil.
4. Set receiver volume control at maximum and tone control to voice position (high position).
5. Refer to the following alignment chart for procedure.

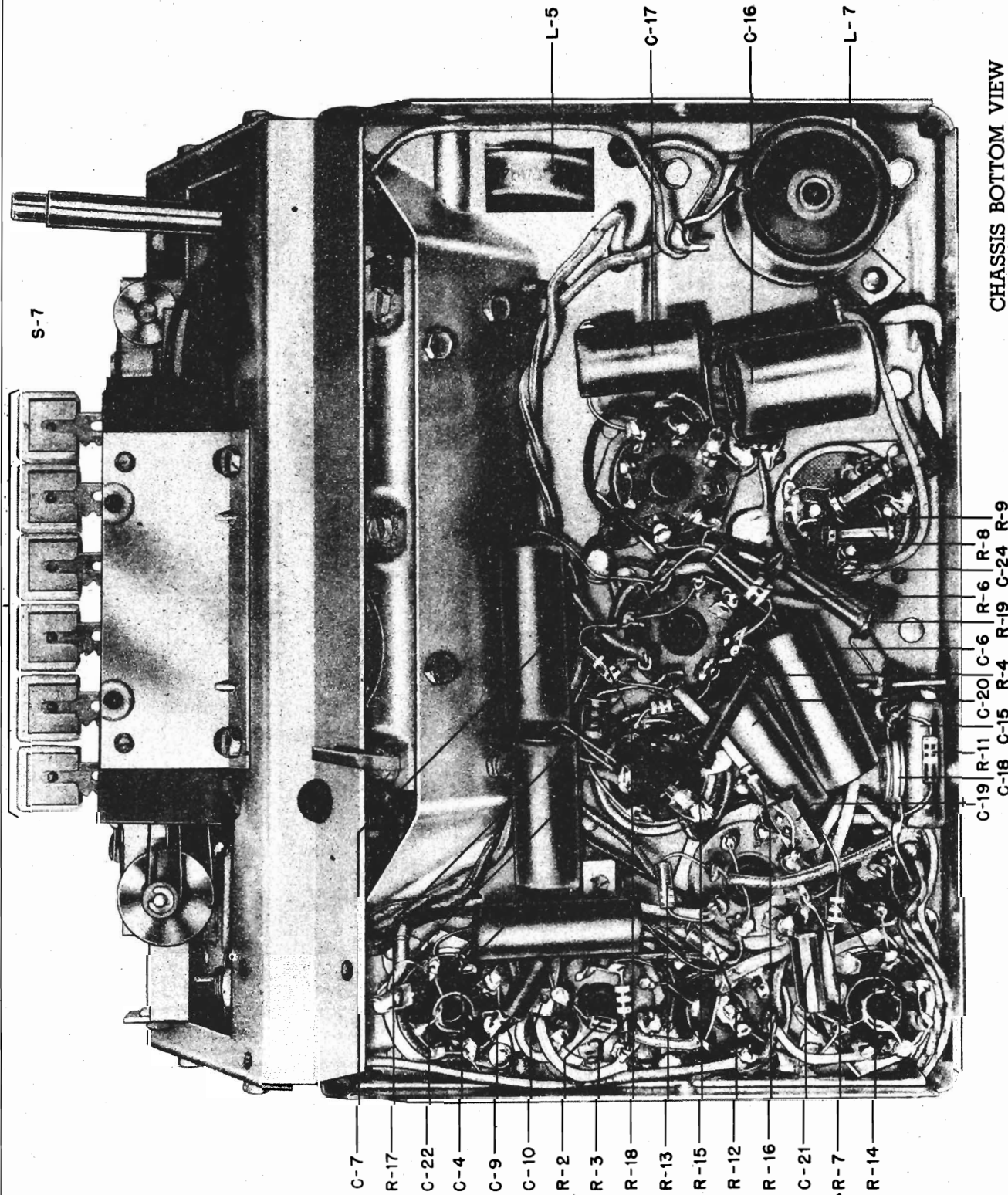
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PARTS LIST - MODELS CT6, PC6, OE6			REF NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	
REF NO.	PART NO.	DESCRIPTION	R-4	6RQ108	Resistor, fixed: carbon; 10,000 1W N.I.	9A12705	Plate, electrolytic capacitor mtg.: bakelite wafer	
C-1	21A20877	Capacitor, fixed: metal mica; 90 mmf	R-5	6R8028	Resistor, fixed: carbon; 22,000 1/2W Ins.	1X74288	Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together	
C-2	8A4629	Capacitor, fixed: paper; .006 mf. 100V	R-6	6R6147	Resistor, fixed: carbon; 330 1W Ins.	1X74338	Shaft Assembly, tuning control: consists of manual tuning shaft with gear, cam and shaft, cam spring, manual tuning shaft bearing block, miter gear bracket and large "C" washer	
C-3	20A70601	Capacitor, variable: mica; 50-180 mmf.; with mounting bracket	R-7	6R6004	Resistor, fixed: carbon; 1 meg 1/2W Ins.	9A70208	Socket, tube: 4 prong (vibrator socket)	
C-4	8A14791	Capacitor, fixed: paper; .05 mf. 400V	R-8	6R6005	Resistor, fixed: carbon; 50 1/2W N.I.	9A6788	Socket, tube: octal; plain	
C-5	8A19133	Capacitor, fixed: paper; .5 mf. 100V	R-9	6R6006	Resistor, fixed: carbon; 50 1/2W N.I.	9A70185	Socket, tube: octal; shielded type	
C-6	8A14791	Capacitor, fixed: paper; .05 mf. 400V	R-10	18A71925 or 18A70172	Resistor, variable: carbon; 500,000 with S.P.S.T. switch; tapped at 50,000 ohms; less shaft	50B73808	Speaker, dynamic: 6"; 3 ohm V.C.	
C-7	8K13166	Capacitor, fixed: paper; .1 mf. 400V	R-11	6R6056	Resistor, fixed: carbon; 47,000 1/2W Ins.	8X4141	Suppressor distributor	
C-8	20A70601	Capacitor, variable: mica; 50-180 mmf.; with mounting bracket	R-12	6R2118	Resistor, fixed: carbon; 5.3 meg 1/2W Ins.	1X74336	Tuner, Model ST-56-CT6 (complete)	
C-9	21K70720	Capacitor, fixed: mica; 5 mmf. 500V	R-13	6R3927	Resistor, fixed: carbon; 2.2 meg 1/2W Ins.	ADDITIONAL PARTS LIST - MODEL PC6		
C-10	21R6515	Capacitor, fixed: mica; 50 mmf. 300V	R-14	6R6032	Resistor, fixed: carbon; 470,000 1/2W Ins.	8K4661	Capacitor, ammeter	
C-11	20A70214	Capacitor, variable: mica; 50-60 mmf.; with mounting bracket	R-15	6R6015	Resistor, fixed: carbon; 220,000 1/2W Ins.	8A4491	Capacitor, generator	
C-12	21A71872	Capacitor, fixed: ceramic; 400 mmf. 5% 500V	R-16	6R6004	Resistor, fixed: carbon; 1 meg 1/2W Ins.	11M8944	Cord, dial: 18 lb; black	
C-13	8A17028	Capacitor, fixed: paper; .5 mf. 100V	R-17	6R6390	Resistor, fixed: carbon; 180 10% 1W Ins.	1X74305	Dial Background & Strip Assembly: plastic; with reinforcing strip	
C-14	8K23690	Capacitor, fixed: paper; .01 mf. 400V	R-18	6R5550	Resistor, fixed: carbon; 47 10% 1/2W Ins.	1X74304	Dial Light & Bracket Assembly: with 5-1/2" lead	
C-15	8K23690	Capacitor, fixed: paper; .01 mf. 400V	R-19	6R6184	Resistor, fixed: carbon; 1000 1W N.I.	1X4895	Lead Assembly, battery: 10" long; insulated bushing and contact eyelet on one end, red insulated pin on the other	
C-16	8A19133	Capacitor, fixed: paper; .5 mf. 100V	S-1		ON-OFF switch (part of volume control R-10)	1X74932	Lead Assembly, fuse: 20" long; fuse retainer on one end, ammeter clip on other end	
C-17	8A12840	Capacitor, fixed: paper; .006 mf. 1600V	S-2	1B70944	Switch, solenoid: with mounting plate	1K73886	Pointer & Slider Assembly	
C-18	21A70176	Capacitor, fixed: mica; dual 120 mmf.	S-3	40B70952	Switch, selector	1X74268	Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together	
C-19	21R6513	Capacitor, fixed: mica; 50 mmf. 300V	S-4	40A70931	Switch, mute	1X74299	Shaft Assembly, tuning: consists of manual tuning shaft with gear, cam and shaft, cam spring, manual tuning shaft bearing block, miter gear bracket and large "C" washer	
C-20	8A71911	Capacitor, fixed: paper; .03 mf. 400V	S-5	1X71470	Relay, MR-5 Tone control: complete	9A70208	Socket, 4 prong	
C-21	21R6648	Capacitor, fixed: mica; 250 mmf. 500V	S-6	1K70877	Magnet, tone relay	9A6788	Socket, tube: octal; plain	
C-22	8A13166	Capacitor, fixed: paper; .1 mf. 400V	S-7	40B71353	Switch, tone control actuating	9A70185	Socket, tube: octal; shielded type	
C-23	8A71909	Capacitor, fixed: paper; .004 mf. 400V	S-7	1K73625	Switch Assembly, push button	50B73808	Speaker, dynamic: 6" 3 ohm V.C.	
C-24	8A71910	Capacitor, fixed: paper; .006 mf. 400V	SP-1	1X74252	Spark Plate Assembly	1X74336	Tuner, Model ST-56-PC6 (complete)	
C-25	23A75429	Capacitor, electrolytic: 20-20 mf. 400V, 20 mf. 25V	T1 & T2	24B70827	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in early sets only)	ADDITIONAL PARTS LIST - MODEL OE6		
F-1	65K4637	Fuse: 20 Amp.; type 3AG				8A4491	Capacitor, generator	
G-1	48B3333	Vibrator: full wave; non-sync.				1X74273	Dial Background and Strip Assembly: translucent white plastic; with metal reinforcing strip	
I-1	65X10867	Bulb: 6-8V, .25 Amp., tubular bayonet; type #44				1X4895	Lead Assembly, battery: 10" long; insulated bushing and contact eyelet on one end, red insulated pin on other end.	
L-1	1A71861	Coil, antenna or R.F. (specify color of paint dots on old coil when ordering)		24B76553	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in late sets only)	1X4894	Lead Assembly, fuse: 20" long; fuse receptacle on one end, spade lug on other end	
L-2	1A71861	Coil, antenna or R.F. (specify color of paint dots on old coil when ordering)	T-3	25A72258	Transformer, output: with bracket	1K73732	Pointer and Slider Assembly	
L-3	1A71879	Coil, oscillator (specify color of paint dots on old coil when ordering)	T-4	25B70950	Transformer, power	1X74268	Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together	
L-4	24A70227	Coil, oscillator padder: includes mounting clip and adjustable iron core	ADDITIONAL PARTS LIST - MODEL CT6				49A73806	Pulley, cord: brass, 5/16 diameter (pointer cord idler pulley)
L-5	24A74954	Coil, "A" choke	8K4661		Capacitor, ammeter	9A70208	Socket, 4 prong	
L-6	24A70199	Coil, "A" choke: with mounting bracket	8A4491		Capacitor, generator	9A6788	Socket, tube: octal; plain	
R-1	6R6032	Resistor, fixed: carbon; 470,000 1/2W Ins.	11M8944		Cord, dial: 18 lb; black	1X74263	Shaft Assembly, tuning: includes manual tuning shaft with gear, cam & shaft, cam spring, manual tuning shaft bearing block, miter gear bracket and large "C" washer.	
R-2	6R6075	Resistor, fixed: carbon; 100,000 1/2W Ins.	1X74729		Dial Background & Strip Assembly: plastic; with re-inforcing strip.	1X74336	Tuner, Model ST-56-OE6 (complete)	
R-3	6R6056	Resistor, fixed: carbon; 47,000 1/2W Ins.	1X74352		Dial Light & Bracket Assembly			
			1X74932		Lead Assembly, fuse: 20" long; fuse retainer on one end, ammeter clip on other end			
			1X4895		Lead Assembly, battery: 10" long; male ferrule on one end			
			1X76898		Lead-in, antenna extension: 20" long			

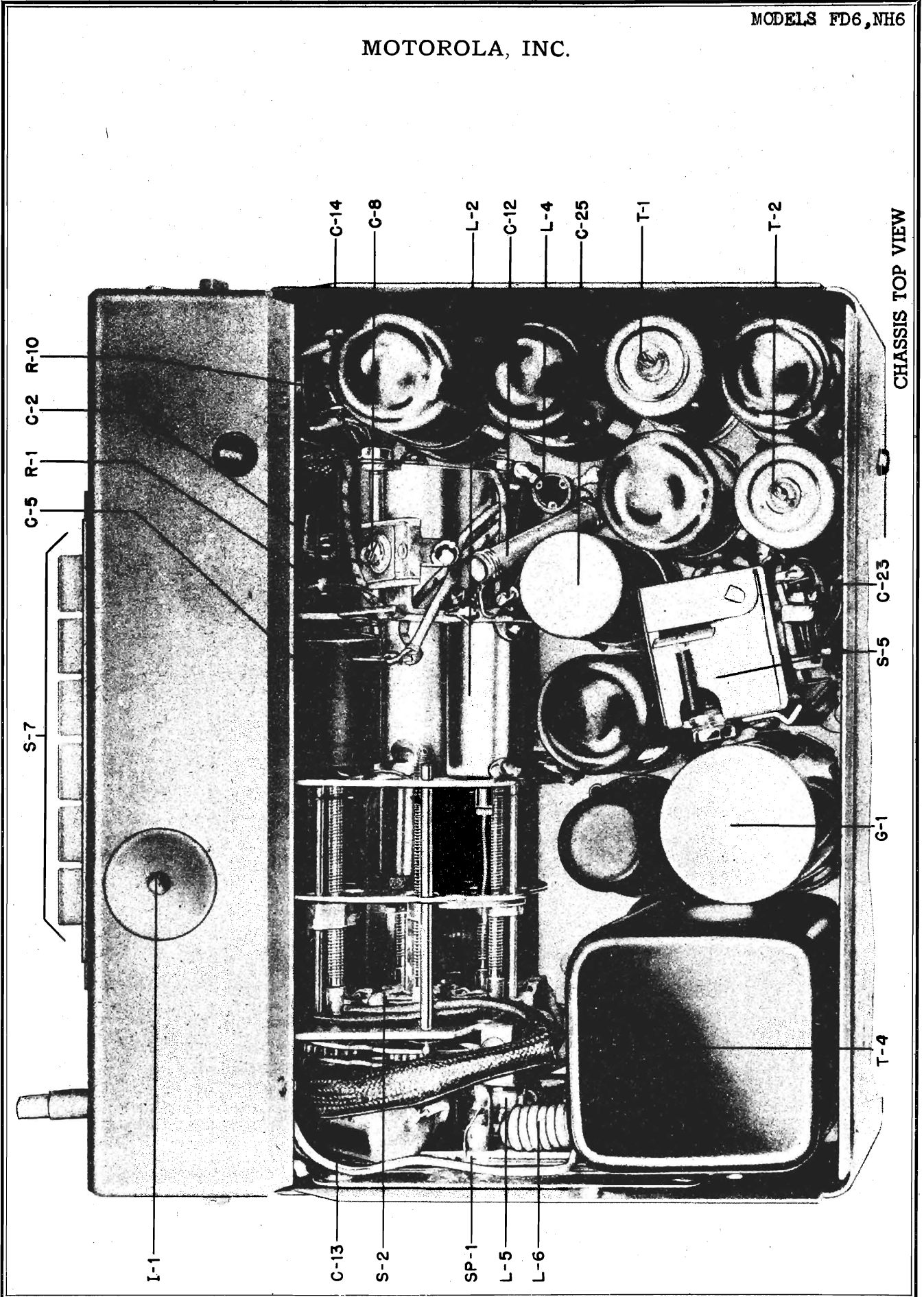
MODELS FD6, NH6

MOTOROLA, INC.



CHASSIS BOTTOM VIEW

MOTOROLA, INC.



MODELS FD6,NH6

MOTOROLA, INC.

WARNING: CHECK VOLTAGE REGULATOR

Many late cars develop exceedingly high voltage due to improper adjustment of voltage regulator, which shortens the life of radio tubes, vibrator, electrical accessories and headlights. When voltage exceeds 7.3

volts with motor running at about 35 miles per hour and no load or battery, have the voltage regulator adjusted for maximum voltage of 7.3 volts under a no load condition.

TO REPLACE DIAL LIGHT

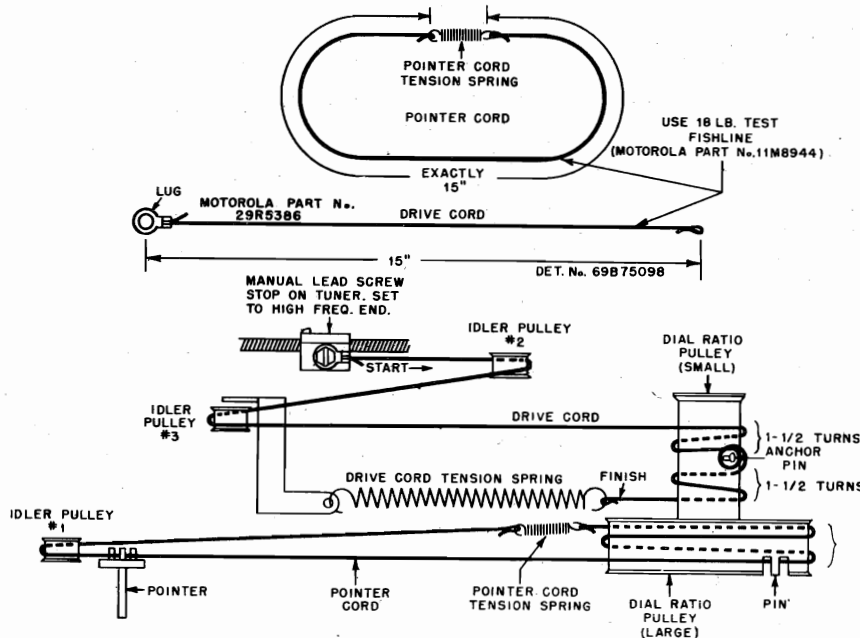
It will be necessary to remove set from car when replacing dial light. Pry off the large plug button directly over the "M" push

button and replace with a #44 miniature bayonet base pilot lamp.

POINTER AND DRIVE CORD REPLACEMENT

PREPARE RECEIVER AS FOLLOWS

1. Remove the escutcheon.
2. Remove the push button assembly. Two screws hold it in position. Do not unsolder any wire leads; just lay the push button assembly on top of the set.
3. The pointer & drive cords are now fully exposed. If only the pointer cord is to be replaced, temporarily remove the drive cord to make the pointer cord more readily accessible.



POINTER AND DRIVE CORD RESTRINGING DETAIL.

MOTOROLA, INC.

MODELS FD6, NH6

MODEL FD6

Hash, Ripple and Mechanical Vibration in Model FD-6.

Some Model FD-6's have been troubled by hash, ripple and mechanical vibration. These conditions can be remedied by dressing leads, changing the position of the screen by-pass capacitor (CO6) and adding a copper washer to the hash choke.

Hash: Remove Capacitor C-6 from its present location and mount it between electrolytic capacitor and the 6SA7 tube along side of the oscillator padder adjustment screw.

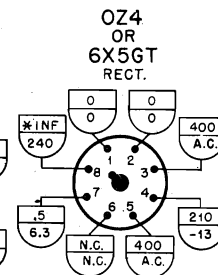
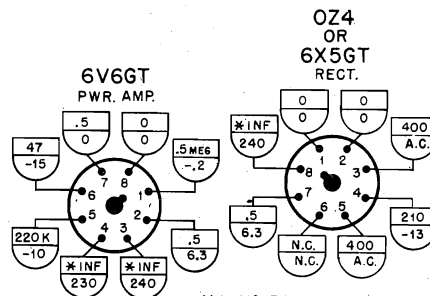
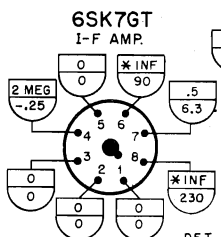
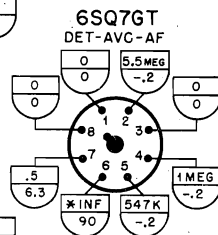
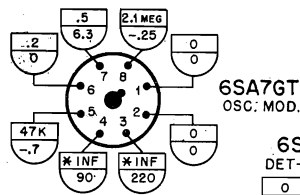
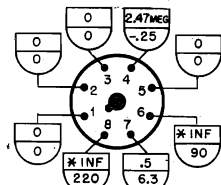
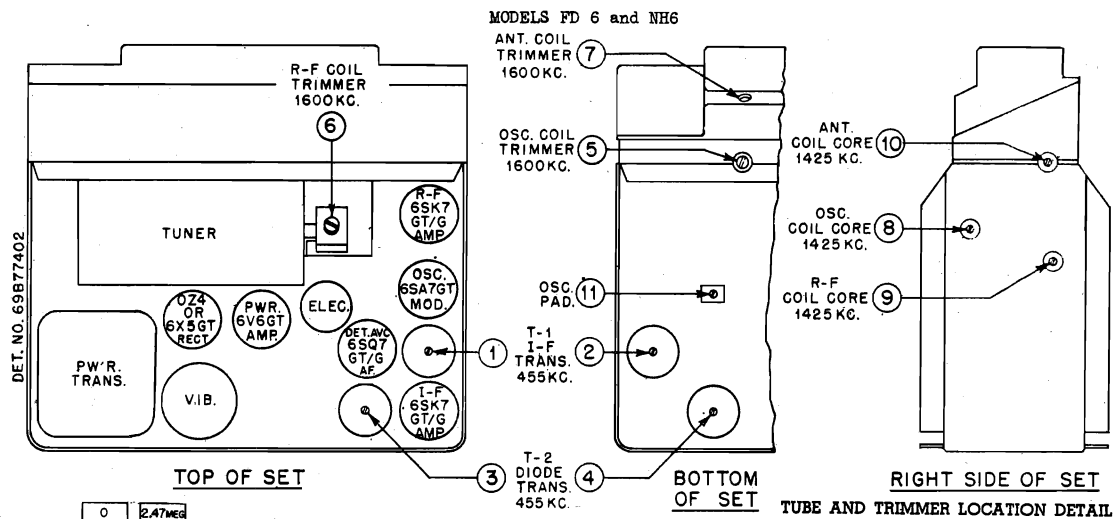
It is a tight fit but there is room for it.

Dress the vibrator leads (black and green) into the opening in the chassis base. Next, dress the hot "A" (yellow) lead away from the black and green vibrator leads.

Ripple: Ripple may be reduced by removing the chassis from the housing and removing the nose of the set exposing the volume control. Unsolder the grounded lug of the volume control from the bracket. Attach a lead to this lug and run it back

to the cathode terminal of the 6SQ7 tube socket.

Mechanical Vibration: A magnetic field is set up by the hash choke which in some instances causes a mechanical vibration (buzz). This condition can be eliminated by soldering a copper washer, Motorola Part Number 4S8203, (15/16 - 7/32 x .025) on top (end) of the hash choke. Solder the washer to the hash choke eyelet.



ALL VOLTAGE MEASUREMENTS ARE MADE WITH A 20,000 OHM / VOLTMETER FROM TUBE BASE PIN TERMINALS TO CHASSIS GROUND, WITH 6.3 VOLTS AT SPARK PLATE (BATTERY CONNECTION)

VOLTAGE AND RESISTANCE MEASUREMENTS MAY VARY ± 10%.

K=1000 OHMS.

* THESE VALUES DEPEND ON THE SENSITIVITY OF METER AND SCALE USED, ALSO THE CONDITION OF THE ELECTROLYTIC FILTER CAPACITOR IN THE 'B' CIRCUIT.

DET. NO. 63C75992-0

VOLTAGE AND RESISTANCE DIAGRAM

MODELS FD6, NH6

MOTOROLA, INC.

REF. NO.	MODEL PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	
C-1	21A20877	Capacitor, fixed: metal mica; 90 mmf	R-7	6R6004	Resistor, fixed: carbon; 1 meg-1/2W; Ins.	46A72155	Stud, dial ratio pulley: brass; 1/8" diameter X 51/64" long	
C-2	8A4529	Capacitor, fixed: paper; .006 mf. 100V	R-8	6R6005	Resistor, fixed: carbon; 50-1/2W; N. I.	6A76813	Suppressor, distributor	
C-3	20A70601	Capacitor, variable: mica; 50-180 mmf.; with mounting bracket	R-9	6R6005	Resistor, fixed: carbon; 50-1/2W; N. I.	29K5405	Terminal, insulated pin: black; (speaker ground terminal)	
C-4	8A14791	Capacitor, fixed: paper; .05 mf. 400V	R-10	18A71925 or 18A70172	Resistor, variable: carbon; .5 meg; with S.P.S.T. switch; tapped at 50,000 ohms; less shaft	14A74226	Insulator, switch: armite; 4" x 2-7/16"	
C-5	8A19133	Capacitor, fixed: paper; .5 mf. 100V	R-11	6R6056	Resistor, fixed: carbon; 47,000-1/2W; Ins.	36B72165	Knob, station set-up: die cast; polished chrome finish	
C-6	8A14791	Capacitor, fixed: paper; .05 mf. 400V	R-12	6R2118	Resistor, fixed: carbon; 3.3 meg 1/2W; Ins.	36K73406	Knob, control: with setscrew; (volume & tuning)	
C-7	6K13166	Capacitor, fixed: paper; .1 mf. 400V	R-13	6R3927	Resistor, fixed: carbon; 2.2 meg 1/2W Ins.	29R5368	Lug, soldering: #4 hot-tin dipped (used on one end of drive cord)	
C-8	20A70601	Capacitor, variable; mica; 50-180 mmf.; with mounting bracket	R-14	6R6032	Resistor, fixed: carbon; 470,000-1/2W; Ins.	1X4894	Lead Assembly, fuse: 20" long; fuse retainer on one end, spade lug on other end	
C-9	21K70720	Capacitor, fixed: mica; 5 mmf. 500V	R-15	6R6015	Resistor, fixed: carbon; 220,000-1/2W; Ins.	1X4895	Lead Assembly, battery: 10" long, male connector on one end, insulated pin terminal on other end.	
C-10	21R6513	Capacitor, fixed: mica; 50 mmf. 300V	R-16	6R6004	Resistor, fixed: carbon; 1 meg 1/2W; Ins.	1X78859	Lead Assembly, speaker: 2 conductor with black & white insulated pin terminals	
C-11	20A70214	Capacitor, variable; mica; 30-60 mmf.; with mounting bracket	R-17	6R6390	Resistor, fixed: carbon; 180 10% 1W Ins.	1X27619	Lead Assembly, speaker: 3 conductor, with black, white & yellow insulated pin terminals	
C-12	21A71872	Capacitor, fixed: ceramic; 400 mmf. 5% 500V	R-18	6R5550	Resistor, fixed: carbon; 47 10% 1/2W Ins.	1X72203	Plate, speaker mounting: includes speaker gasket	
C-13	8A17028	Capacitor, fixed: paper; .5 mf. 100V	R-19	6R6184	Resistor, fixed: carbon; 1000 1W N. I.	1K72248	Pointer & Slider Assembly	
C-14	6K23690	Capacitor, fixed: paper; .01 mf. 400V	S-1		ON-OFF switch (part of volume control R-10)	1X74268	Pulley Assembly, dial ratio: one large and one small pulley assembled together	
C-15	6K23690	Capacitor, fixed: paper; .01 mf. 400V	S-2	1870944	Switch, solenoid: with mounting plate	46A73807	Pulley, cord: 1/2" groove	
C-16	8A19133	Capacitor, fixed: paper; .5 mf. 100V	S-3	40B70952	Switch, selector	1X70646	Receptacle Assembly, antenna: metal ferrule with insulated contact	
C-17	8A12840	Capacitor, fixed: paper; .006 mf. 1800V	S-4	40A70931	Switch, mute	34B72259	Scale, dial; plastic	
C-18	21A70176	Capacitor, fixed: mica; dual 120 mmf.	S-5	1X71470	Reley, MR-5 Tone Control: complete	8K19266	Capacitor, distributor	
C-19	21R6513	Capacitor, fixed: mica; 50 mmf. 300V	S-6	40B71383	Switch, tone control	8A4491	Capacitor, generator	
C-20	8A71911	Capacitor, fixed: paper; .03 mf. 400V	S-7	1K73625	Switch Assembly, push button	42A51461	Clamp, electrolytic capacitor mounting	
C-21	21R6648	Capacitor, fixed: mica; 250 mmf. 500V	SP-1	1X75194	Spark Plate Assembly	42A4215	Clip, vibrator grounding	
C-22	8A13166	Capacitor, fixed: paper; .1 mf. 400V	T-1 & T-2	24B70827	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in early sets only)	11M8944	Cord, dial: 18 lb; black	
C-23	8A71909	Capacitor, fixed: paper; .004 mf. 400V		or		1X75221	Dial Background & Strip Assembly: plastic with reinforcing strip	
C-24	8A71910	Capacitor, fixed: paper; .006 mf. 400V		24B76553	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in late sets only)	1X75319	Dial Light Assembly: miniature bayonet base socket riveted to large plug button; with 12" lead	
C-25	23A76429	Capacitor, electrolytic: 20-20mf. 400V, 20 mf. 25V	T-3	25A72258	Transformer, output: with bracket	13C72265	Escutcheon, front plate: polished chrome finish (less dial scale and retaining frame)	
E-1	1X75200	Tuner, Model St-56 - FD6 - NH6 Pds: complete	T-4	25B70950	Transformer, power	587805	Eyelet, snap-in: steel (dial background strip mounting)	
F-1	65K4637	Fuse: 20 Amp.; type 3AG	MODEL FD6 - ADDITIONAL PARTS				7C74211	Frame, dial scale retaining
G-1	46B3333	Vibrator: full wave; non-sync.		1X75223	Shaft Assembly, volume control: brass shaft with bakelite washer at one end	14K74155	Insulator, electrolytic: fishpaper; 3-7/8 x 2-5/8"	
I-1	65X10687	Bulb: 6-8V, .25 Amp., tubular bayonet; type #44		47A73635	Shaft, volume control: hairpin shaped; 29/32" long (fits into volume control)	14X51112	Insulator, fuse: fibre tube	
L-1	1A71881	Coil, antenna or R. F. (specify color of paint dots on old coil when ordering)		26B70107	Shield, coil (for T-1 & T-2; use with 24B70827 I.F.-diode)	MODEL NH6 - ADDITIONAL PARTS		
L-2	1A71881	Coil, antenna or R. F. (specify color of paint dots on old coil when ordering)		1A71049	Shield and Iron Core Sleeve Assembly (for T-1 & T-2; use with 24B76553 I.F.-diode transformers only)	11M8944	Cord, dial: 18 lb. black	
L-3	1A71879	Coil, oscillator (specify color of paint dots on old coil when ordering)		9A70208	Socket, tube: 4 Pin	46A73807	Pulley, cord: 1/2" groove	
L-4	24A70227	Coil, oscillator padder: includes mounting clip and adjustable iron core		9A6788	Socket, tube: octal; plain	1X74268	Pulley Assembly, dial ratio: one large & one small pulley assembled together	
L-5	24K70840	Coil, "A" choke		9A70165	Socket, tube: octal, shielded type	1X70646	Receptacle Assembly, antenna: metal	
L-6	24K73535	Coil, choke: dial light and speaker field; 9 turns #16 yellow wire		50B71900 or 50B76589	Speaker: dynamic 6"; 3 ohm v.c.	26B70107	Shield, coil: (for T-1 & T-2; use with 24B70827 I.F.-Diode transformers only)	
L-7	24A70199	Coil, "A" choke: with mounting bracket		31K72404	Strip, terminal: 1 insulated lug, #1 mounting.	1A71049	Shield and Iron Core Sleeve Assembly (for T-1 & T-2; use with 24B76553 I.F.-Diode transformers only)	
R-1	6R6032	Resistor, fixed: carbon; 470,000-1/2W Ins.		31K74292	Strip, terminal: 1 insulated lug, #2 mounting	9A70208	Socket, tube: 4 pin	
R-2	6R6076	Resistor, fixed: carbon; 100,000-1/2W Ins.		31K74291	Strip, terminal: 2 insulated lugs, #2 mounting	9A6788	Socket, tube: octal; plain	
R-3	6R6056	Resistor, fixed: carbon; 47,000-1/2W; Ins.		41A51096	Spring, coil (used under volume knob for tone control operation)	9A70165	Socket, tube: octal; shielded type	
R-4	6R6106	Resistor, fixed: carbon; 10,000-1W; N. I.		41A73998	Spring, drive cord tension (large)	50B71900 or 50B76589	Speaker, dynamic: 6"; 3 ohm v.c.	
R-5	6R6028	Resistor, fixed: carbon; 22,000-1/2W; Ins.		41A73619	Spring, string tension (small)	6X4141	Suppressor, distributor	
R-6	6R6147	Resistor, fixed: carbon; 330-1W; Ins.						

MODEL PD6

MOTOROLA, INC.

ALIGNMENT

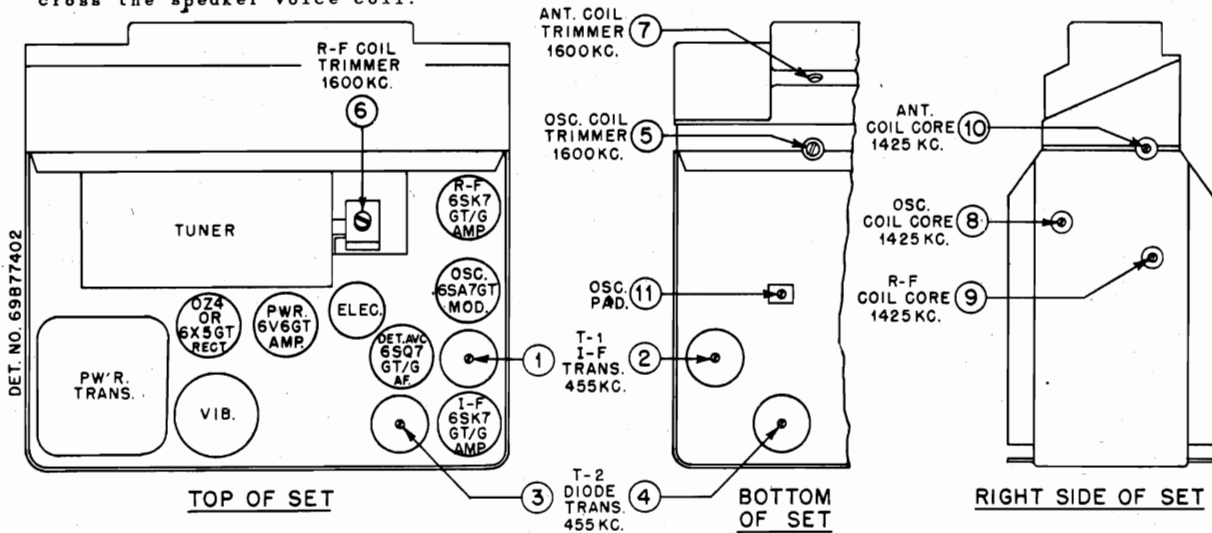
PROCEDURE

1. Remove the top and bottom covers. All adjustments are now exposed. Refer to Figure 3 for their location.
2. Turn the receiver on and allow it to warm up for a few minutes. Press the "M" button to place automatic tuner in manual tuning position.
3. Connect the output meter across the speaker voice coil.

4. Set receiver volume control at maximum and tone control to voice position (high position).

5. Refer to the following alignment chart for procedure.

IMPORTANT: Do not push in on the alignment tool when adjusting the tuner cores. The slightest inward pressure on the alignment tool may move the tuner carriage and result in inaccurate alignment.



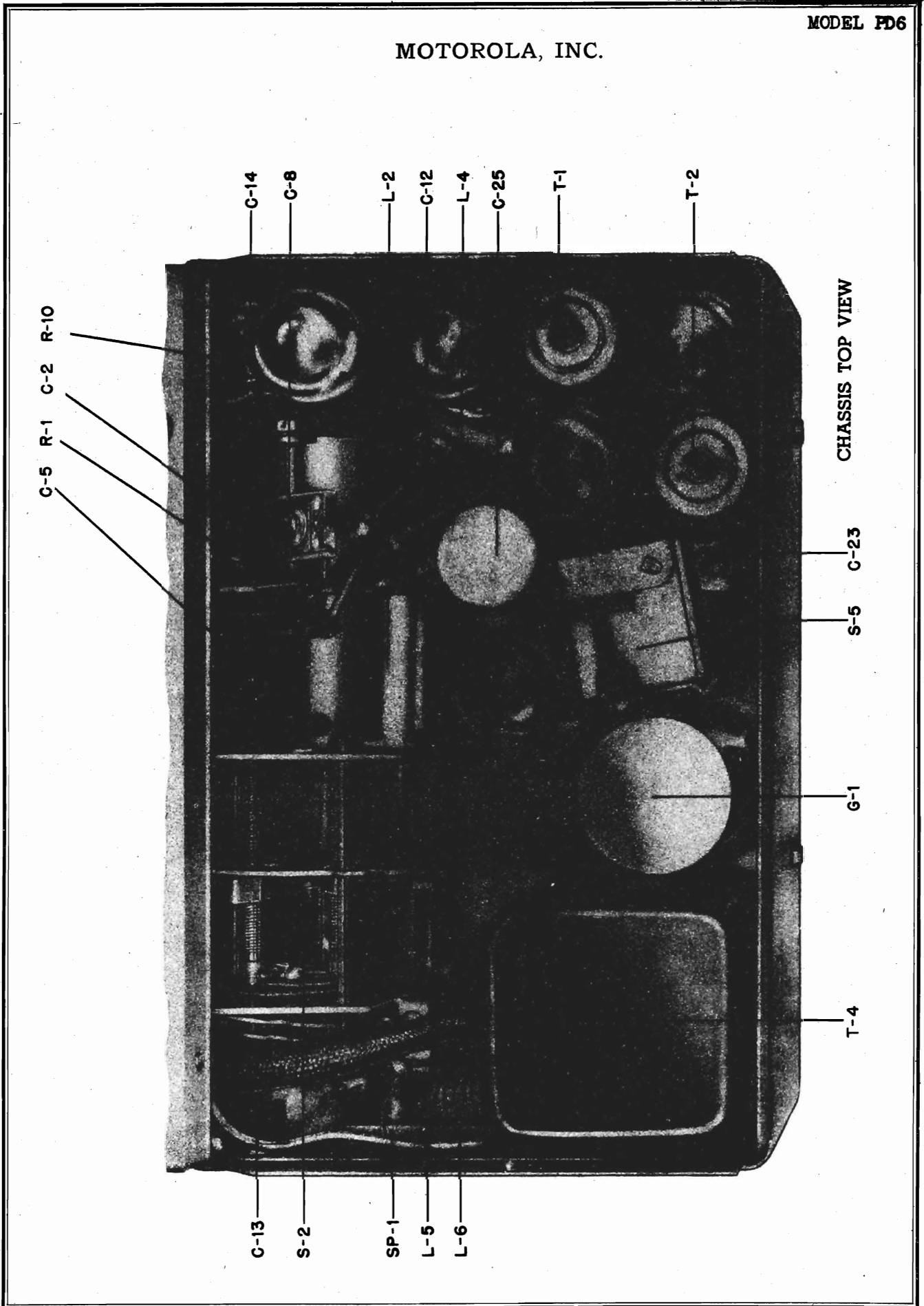
TUBE AND TRIMMER LOCATION DETAIL

Step	Tuner Position Set to	Dummy Antenna	Signal Generator Lead Connected to	Sig. Gen. Set at	Adjust for Peak on Output Meter
1.	High frequency end	.1 mfd. at Sig. Gen.	Osc. Mod grid (#5 pin)	455 Kc	#1 and 2, P & S in T-1 #3 and 4, P & S in T-2
2. *	High frequency end, tuning shaft against stop. Cores should be set to project 1-1/8" from cans.	60 mmf. at Sig. Gen. in series with 21" long coax lead.	Antenna Receptacle	1600 Kc	#5 Osc. coil trimmer #6 R.F. coil trimmer #7 Ant. Coil trimmer
3. *	EXACTLY one full turn in from high frequency end. Use knob set screw as an indicator. Start measuring turn the moment tuner carriage starts moving inward.	"	"	1425 Kc	#8 Osc. coil core #9 R.F. coil core #10 Ant. coil core
4.	EXACTLY four more full turns in (as indicated by knob setscrew)	"	"	Power turned Off	#11 Osc. Pad. core for maximum noise

NOTE: If oscillator padder core adjustment is too far off, repeat alignment procedure, steps 2, 3 and 4. It may be necessary to repeat alignment more than once if padder adjustment has been indiscriminately tampered with.

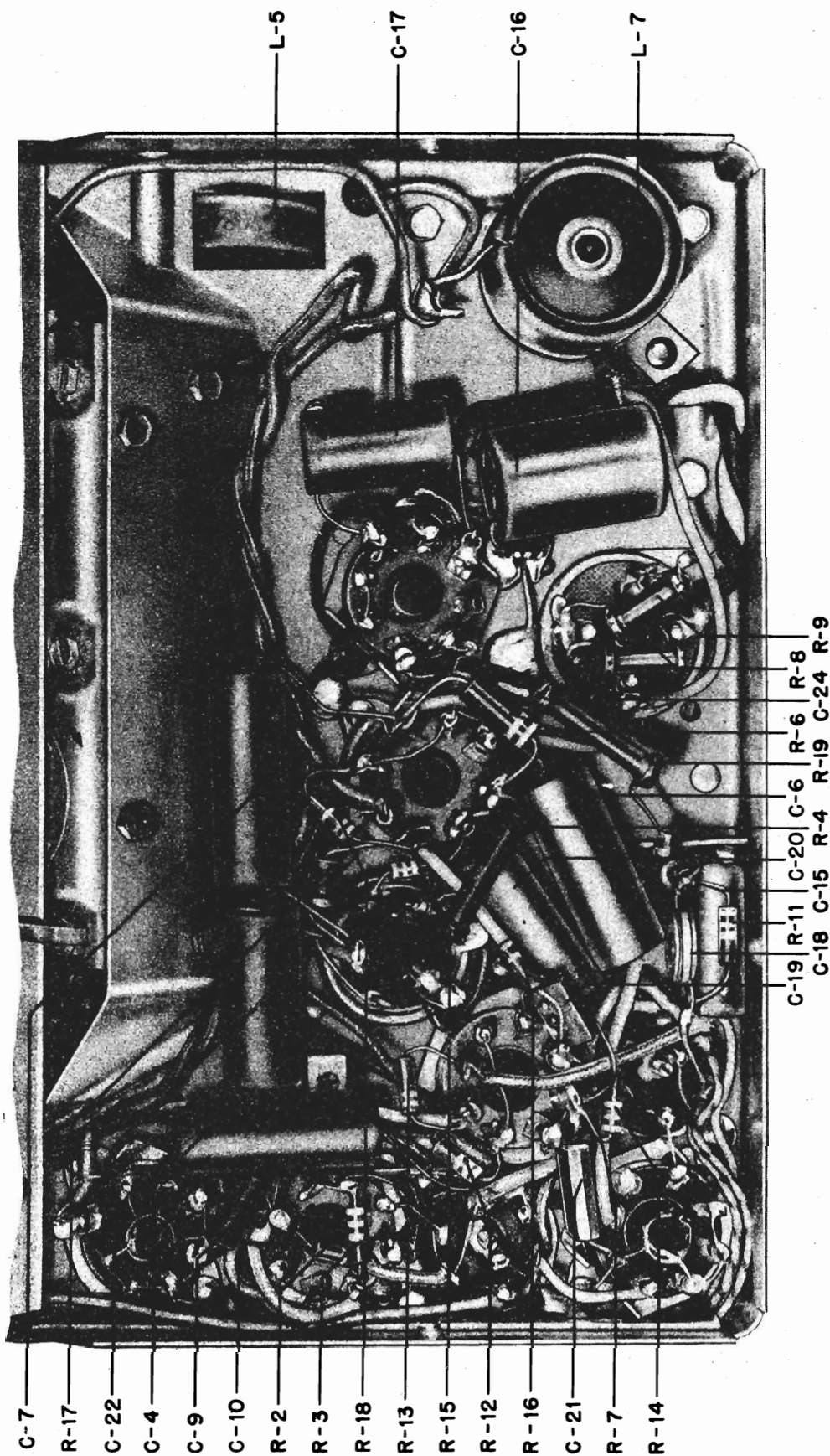
5. Assemble receiver and peak antenna trimmer (#7) to car antenna. The antenna trimmer is inaccessible when the receiver is installed behind instrument panel, therefore, it is necessary to adjust antenna trimmer before final installation. Proceed by laying set on floor of car, connect antenna and "A" leads, tune set to a spot around 1400 kc that is free of stations and adjust antenna trimmer for maximum noise. The antenna should be fully extended.

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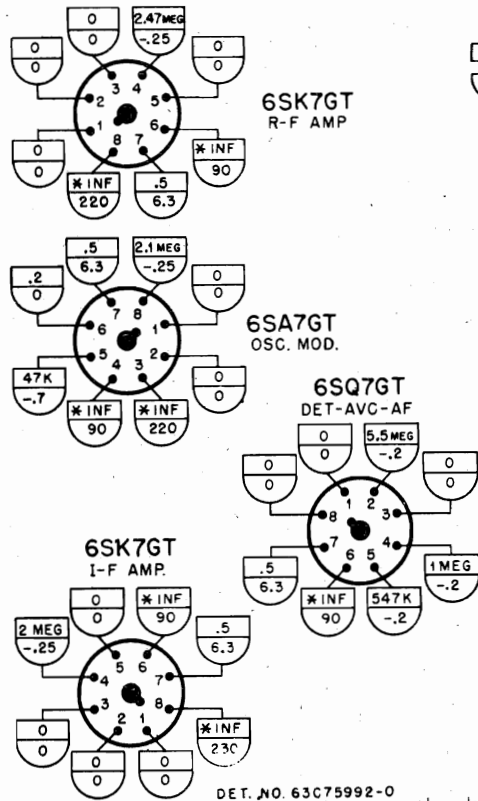


MODEL PD6

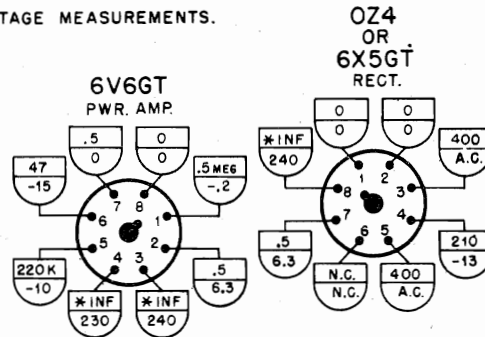
MOTOROLA, INC.



CHASSIS BOTTOM VIEW



= RESISTANCE MEASUREMENTS.
 = VOLTAGE MEASUREMENTS.



ALL VOLTAGE MEASUREMENTS ARE MADE WITH A 20,000 OHM/VOLTMETER FROM TUBE BASE PIN TERMINALS TO CHASSIS GROUND, WITH 6.3 VOLTS AT SPARK PLATE (BATTERY CONNECTION)

VOLTAGE AND RESISTANCE MEASUREMENTS MAY VARY ± 10%.

K=1000 OHMS.

* THESE VALUES DEPEND ON THE SENSITIVITY OF METER AND SCALE USED, ALSO THE CONDITION OF THE ELECTROLYTIC FILTER CAPACITOR IN THE 'B' CIRCUIT.

TO REPLACE DIAL LIGHT

It will be necessary to remove set from car when replacing dial light. Pry out the large plug button directly over the "M" push button and replace bulb with a #44 miniature bayonet base pilot lamp.

POINTER CORD REPLACEMENT

1. Make up the pointer cord as shown in Figure 1. The ends are tied to the pointer cord spring. IT MUST MEASURE 17-3/4" FROM ONE END OF THE SPRING TO THE OTHER AFTER BEING TIED. Secure the knots with a drop of shellac or household cement.

2. Restring as shown in Figure 1.

DIAL DRIVE CORD REPLACEMENT

1. Make up the drive cord as shown in Figure 1. Secure the knots with a drop of shellac or household cement.

3. Restring as shown in Figure 1.

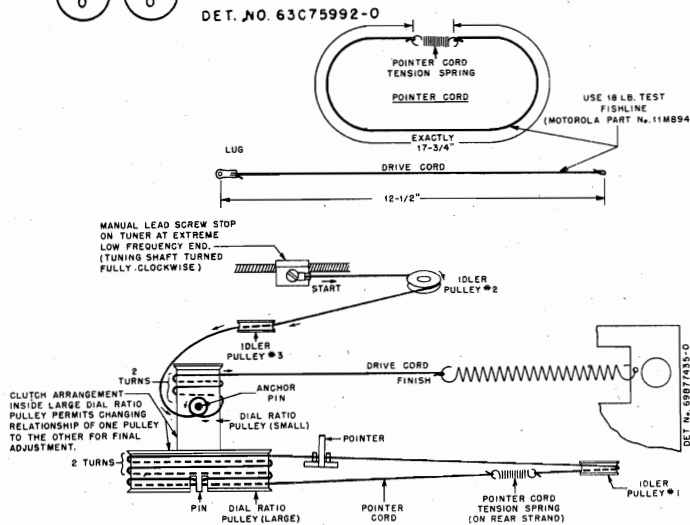


FIGURE 1. POINTER AND DRIVE CORD RESTRINGING DETAIL

POINTER AND DRIVE CORD REPLACEMENT

PREPARE RECEIVER AS FOLLOWS

1. Remove the escutcheon and push button assembly. Four screws hold it in position. Do not unsolder any wire leads; just lay the escutcheon and push button assembly to one side.

2. The pointer cord is now fully exposed. If only the pointer

cord is to be replaced, temporarily remove the drive cord to make the pointer cord more readily accessible.

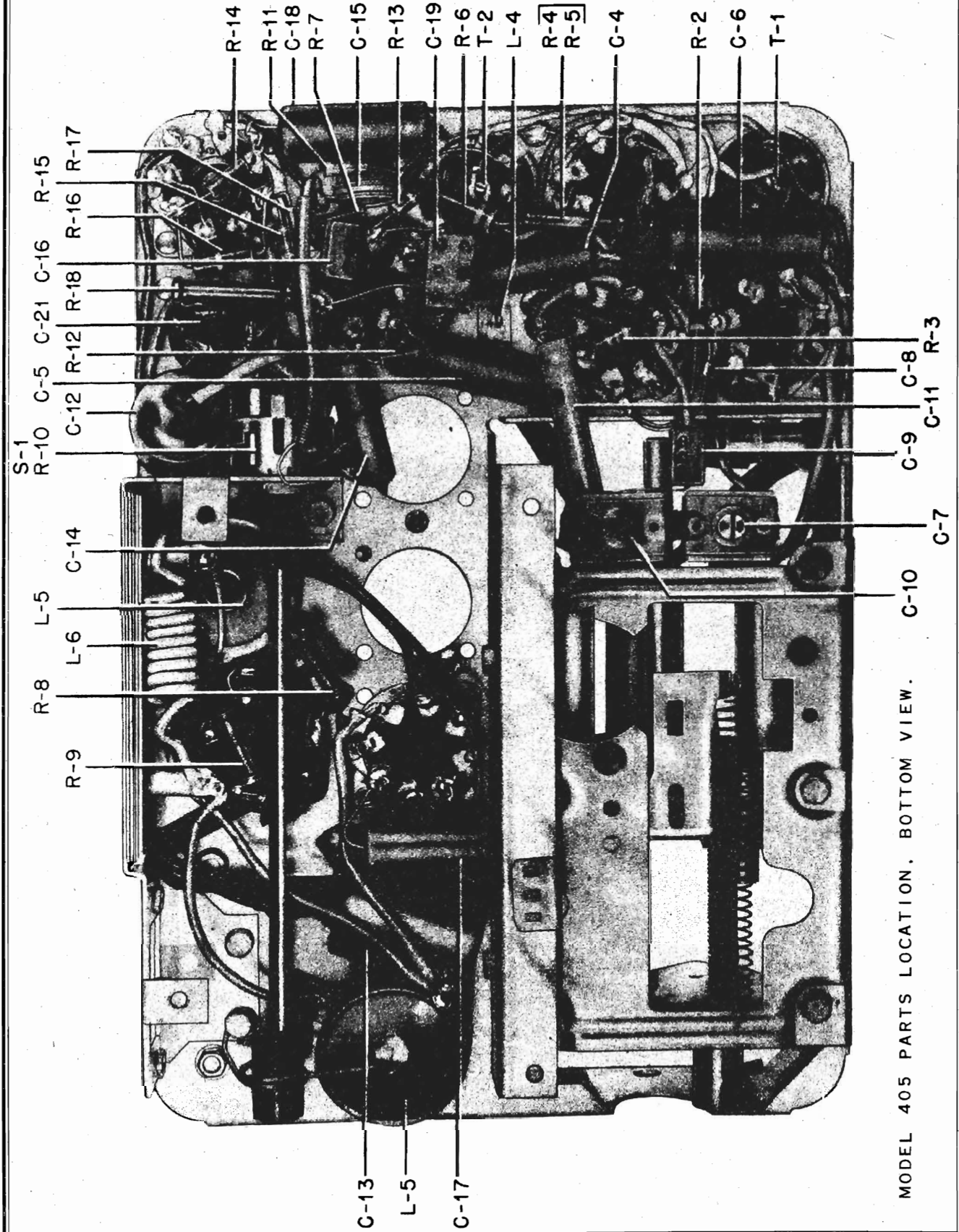
3. To reach drive cord, it will be necessary to remove stamped front of receiver in addition to escutcheon.

MODEL PD6

MOTOROLA, INC.

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
C-1	21A20877	Capacitor, fixed: metal mica; 90 mmf.	L-2	1A71881	Coil, antenna or R. F. (specify color of paint dots on old coil when ordering)	S-1	ON-OFF switch (part of volume control R-10)
C-2	8A4529	Capacitor, fixed: paper; .008 mf. 100V	L-3	1A71879	Coil, oscillator (specify color of paint dots on old coil when ordering)	S-2	1B70944 Switch, solenoid; with mounting plate
C-3	20A70601	Capacitor, variable: mica; 50-180 mmf.; with mounting bracket	L-4	24A70227	Coil, oscillator padder; includes mounting clip and adjustable iron core	S-3	40B70952 Switch, selector
C-4	8A14791	Capacitor, fixed: paper; .05 mf. 400V	L-5	24K70840	Coil, "A" choke	S-4	40A70931 Switch, mute
C-5	8A19133	Capacitor, fixed: paper; .5 mf. 100V	L-6	24K73535	Coil, choke: dial light and speaker field; 9 turns #16 yellow wire	S-5	1X71470 Relay, MR-5 Tone Control: complete
C-6	8A14791	Capacitor, fixed: paper; .05 mf. 400V	L-7	24A70199	Coil, "A" choke: with mounting bracket	S-6	40B71383 Switch, tone control
C-7	8K13188	Capacitor, fixed: paper; .1 mf. 400V	R-1	6R6032	Resistor, fixed: carbon; 470,000-1/2W Ins.	S-7	1K73625 Switch Assembly, push button
C-8	20A70601	Capacitor, variable; mica; 50-180 mmf.; with mounting bracket	R-2	6R6075	Resistor, fixed: carbon; 100,000-1/2W Ins.	SP-1	1X75194 Spark Plate Assembly
C-9	21K70720	Capacitor, fixed: mica; 5mmf. 600V	R-3	6R6058	Resistor, fixed: carbon; 47,000-1/2W; Ins.	T-1 & T-2	24B70827 Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in early sets only)
C-10	21R6513	Capacitor, fixed: mica; 50 mmf. 300V	R-4	6R6108	Resistor, fixed: carbon; 10,000-1W; N. I.	24B76553	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in late sets only)
C-11	20A70214	Capacitor, variable; mica; 30-60 mmf.; with mounting bracket	R-5	6R6028	Resistor, fixed: carbon; 22,000-1/2W; Ins.	T-3	25A72258 Transformer, output: with bracket
C-12	21A71872	Capacitor, fixed: ceramic; 400 mmf. 5% 500V	R-6	6R6147	Resistor, fixed: carbon; 330-1W; Ins.	T-4	25B70950 Transformer, power
C-13	8A17028	Capacitor, fixed: paper; .5 mf. 100V	R-7	6R6004	Resistor, fixed: carbon; 1 meg-1/2W; Ins.	64A4491	Capacitor, generator
C-14	8K23890	Capacitor, fixed: paper; .01 mf. 400V	R-8	6R6005	Resistor, fixed: carbon; 50-1/2W; N. I.	1X4895	Lead Assembly, battery 10" long; insulated bushing and contact eyelet on one end, insulated pin on the other end.
C-15	8K23890	Capacitor, fixed: paper; .01 mf. 400V	R-9	6R6005	Resistor, fixed: carbon; 50-1/2W; N. I.	1X74932	Lead Assembly; 20" long; fuse retainer on one end, ammeter clip on other end
C-16	8A19133	Capacitor, fixed: paper; .5 mf. 100V	R-10	18A71925 or 18A70172	Resistor, variable: carbon; .5 meg; with S.P.S.T. switch; tapped at 50,000 ohms; less shaft	1X76859	Lead Assembly, speaker; 2 conductor; with black and white insulated pin terminals
C-17	8A12840	Capacitor, fixed: paper; .006 mf. 1600V	R-11	6R6056	Resistor, fixed: carbon; 47,000-1/2W; Ins.	1X27619	Lead Assembly, speaker; 3 conductor; with black, white and yellow insulated pin terminals
C-18	21A70176	Capacitor, fixed: mica; dual 120 mmf.	R-12	6R2118	Resistor, fixed: carbon; 3.3 meg 1/2W; Ins.	64A24794	Plate, dial scale retainer
C-19	21R6513	Capacitor, fixed: mica; 50 mmf. 300V	R-13	6R3927	Resistor, fixed: carbon; 2.2 meg 1/2W Ins.	1X72011	Plate, speaker mounting; includes speaker gasket
C-20	8A71911	Capacitor, fixed: paper; .03 mf. 400V	R-14	6R6032	Resistor, fixed: carbon; 470,000-1/2W; Ins.	1K75353	Pointer & Slider Assembly
C-21	21R6648	Capacitor, fixed: mica; 250 mmf. 500V	R-15	6R6015	Resistor, fixed: carbon; 220,000-1/2W; Ins.	1X74288	Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together
C-22	8A13166	Capacitor, fixed: paper; .1 mf. 400V	R-16	6R6004	Resistor, fixed: carbon; 1 meg 1/2W; Ins.	49A73807	Pulley, cord: 1/8" groove
C-23	8A71909	Capacitor, fixed: paper; .004 mf. 400V	R-17	6R6390	Resistor, fixed: carbon; 180 10% 1W Ins.	1X75405	Shaft Assembly, tuning: consists of tuning shaft with gear, "C" washer, miter gear bracket and manual drive bearing
C-24	8A71910	Capacitor, fixed: paper; .008 mf. 400V	R-18	6R5550	Resistor, fixed: carbon; 47 10% 1/2W Ins.	1X75328	Shaft Assembly, volume control; brass; with bakelite washer at one end.
C-25	23A75429	Capacitor, electrolytic; 20-20mf. 400V, 20 mf. 25V	R-19	6R6184	Resistor, fixed: carbon; 1000 1W N. I.	47A73835	Shaft, volume control: hairpin shaped; 29/32" long (fits into volume control)
E-1	1X75200	Tuner, Model St-56 - PD6 - NH6 PD6: complete				9A6788	Socket, tube: octal; plain
F-1	65K4637	Fuse: 20 Amp.; type 3AG				9A70185	Socket, tube: octal; shielded type
G-1	48B3333	Vibrator: full wave; non-sync.				9A70208	Socket, tube: 4 prong
I-1	65X10887	Bulb: 6-8V, .25 amp., tubular bayonet; type #44				50B71900 or 50B76589	Speaker, dynamic: 6"; 3 ohm v.c.
L-1	1A71881	Coil, antenna or R.F. (specify color of paint dots on old coil when ordering)					

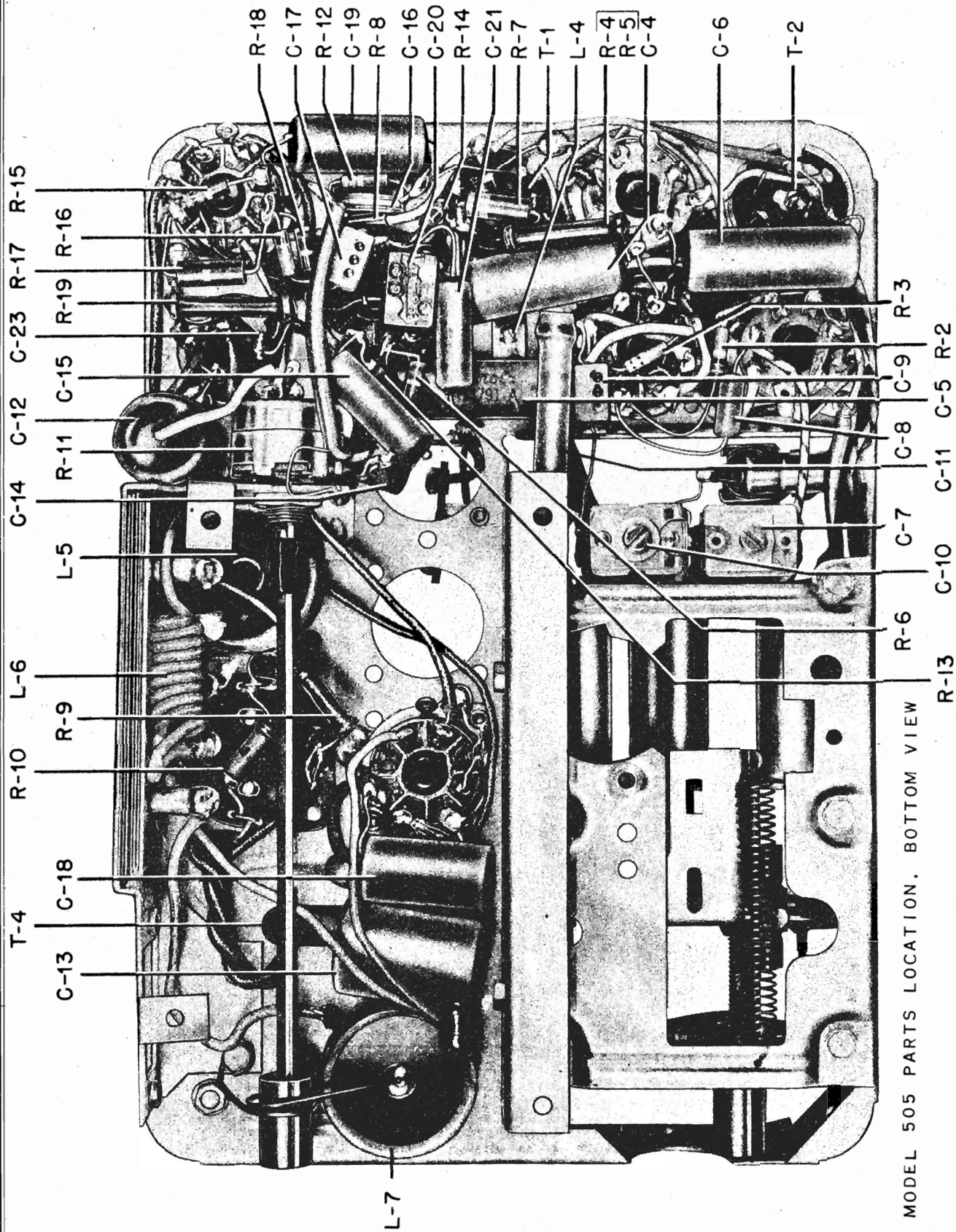
MOTOROLA, INC.



MODEL 405 PARTS LOCATION. BOTTOM VIEW.

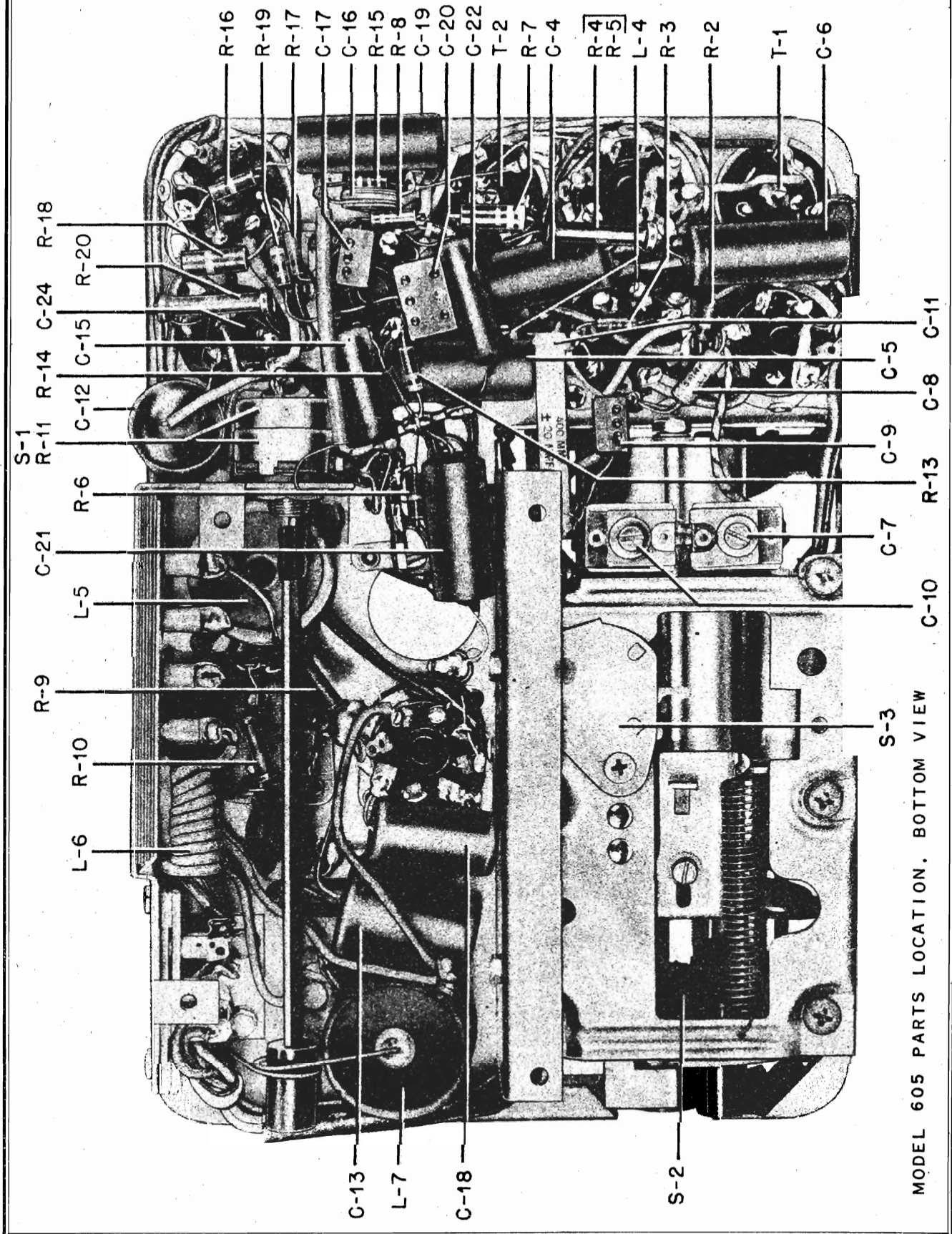
MODEL 505

MOTOROLA, INC.



MODEL 505 PARTS LOCATION. BOTTOM VIEW

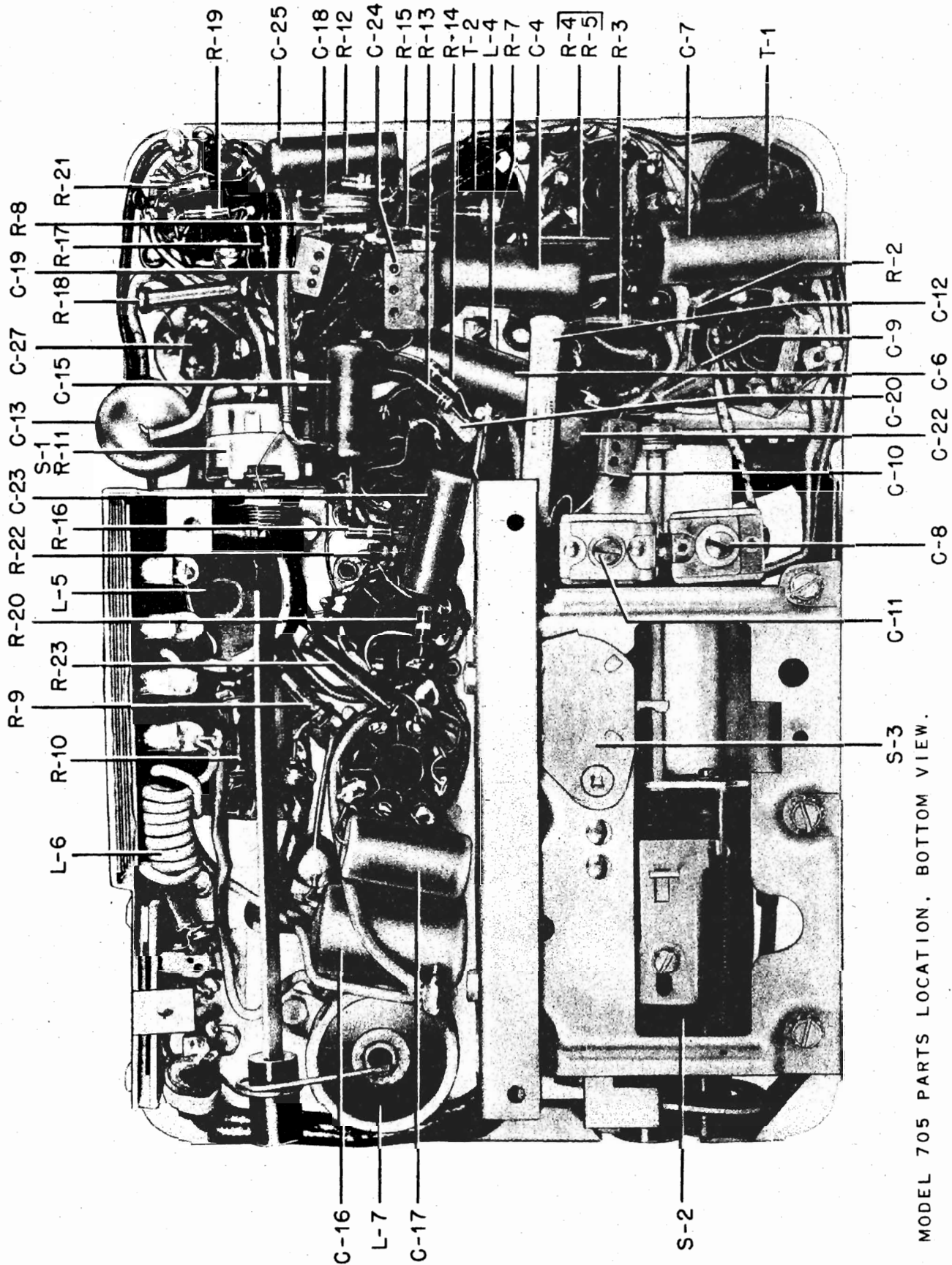
MOTOROLA, INC.



MODEL 605 PARTS LOCATION, BOTTOM VIEW

MODEL 705

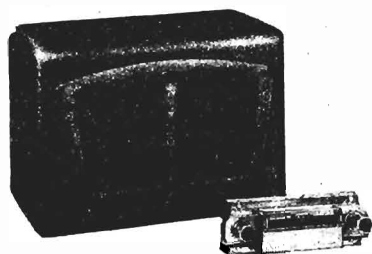
MOTOROLA, INC.



MODEL 705 PARTS LOCATION. BOTTOM VIEW.

MOTOROLA, INC.

MODEL 405, MODEL 505
MODEL 605, MODEL 705



MODEL 405

MODEL 405

Current drain - 7.5 amps at 6.3 volts

Power output - 5.6 watts

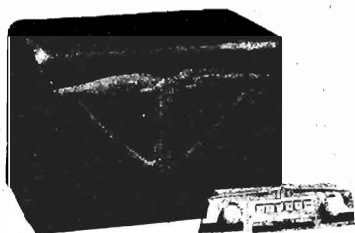
Frequency	1400 kc	1020 kc	600 kc
Max. Sensitivity	1.4 uv	1.3 uv	1.1 uv

MODEL 605

Current drain - 7.5 amps at 6.3 volts

Power output - 5.6 watts

Frequency	1400 kc	1020 kc	600 kc
Max. Sensitivity	1.4 uv	1.6 uv	1.45 uv



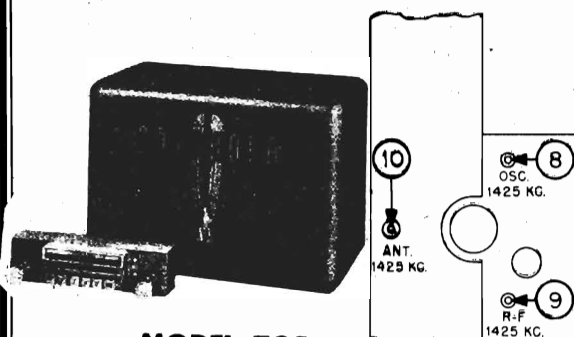
MODEL 605

MODEL 705

Current drain - 10 amps at 6.3 volts

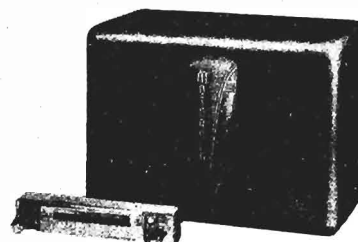
Power output - 9 watts

Frequency	1400 kc	1000 kc	600 kc
Max. Sensitivity	1.5 uv	1.6 uv	.9 uv



MODEL 705

END VIEW



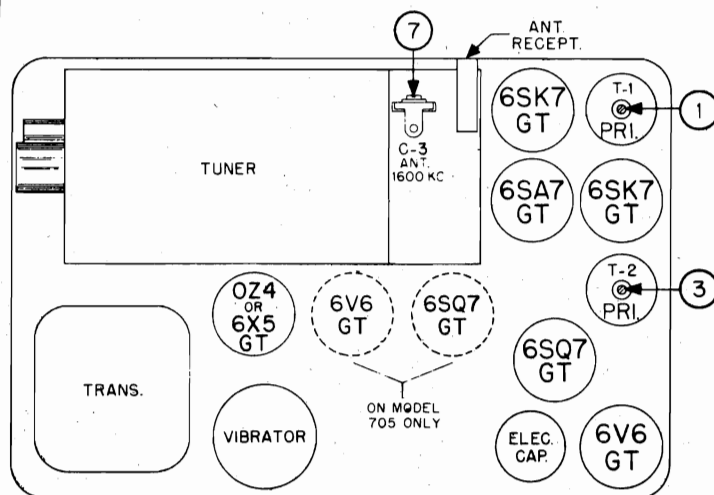
MODEL 505

MODEL 505

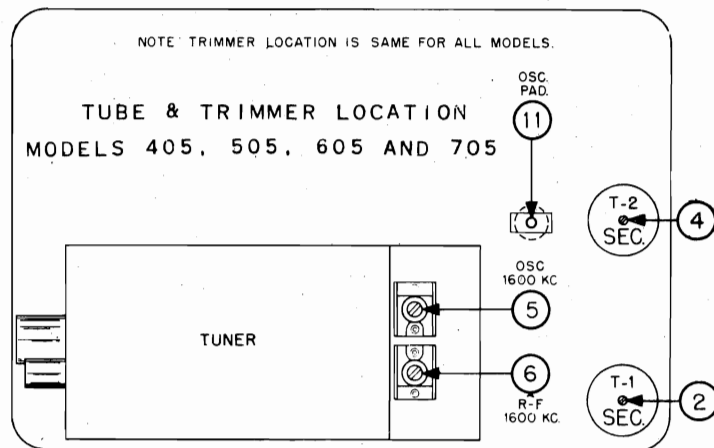
Current drain - 7.5 amps at 6.3 volts

Power output - 5.6 watts

Frequency	1400 kc	1000 kc	600 kc
Max. Sensitivity	1.5 uv	1.4 uv	1.5 uv



TOP VIEW



BOTTOM VIEW

NOTE: TRIMMER LOCATION IS SAME FOR ALL MODELS.
TUBE & TRIMMER LOCATION
MODELS 405, 505, 605 AND 705

DET. NO. 69C75046

MODEL 605
MODEL 705

MOTOROLA, INC.

PROCEDURE FOR SETTING UP PUSHBUTTONS (MODELS 605 & 705)

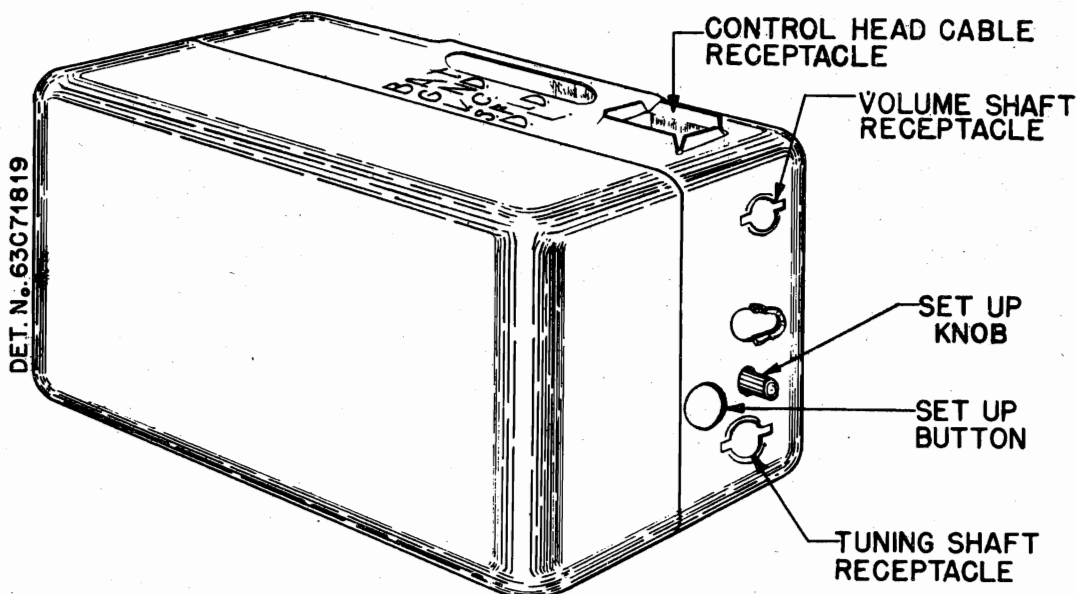
1. Receiver must be turned on for heads, the push-buttons latch a few minutes before setting when pressed in. up push-buttons.
2. Extend antenna fully.
3. Press manual button "M" on the control head till tuner in the receiver stops cycling.
4. Turn tuning knob on the control head till the desired station is heard. (Make mental note of the program).
5. Keep volume low, so that you can tell when a station is tuned in correctly.
6. Press desired button in and hold till tuning mechanism completes its operation.
7. Press "set-up button" in till click is heard (see Figure 4)
8. Turn "set-up knob" till previously noted program is heard. See Figure 4.
9. Press the "M" button and that station is set.
10. Repeat the above procedure for each additional station desired.

IMPORTANT:

To check whether push-buttons were set accurately, press the "M" button in, tune in a station manually that is set to a push-button, then press the push-button in that was set to that station. There should be no difference in quality or volume when a push-button is set correctly. Make this check for each push-button.

NOTE:

It will be necessary to hold the push-button in only when an early type of control head is used. On later model control

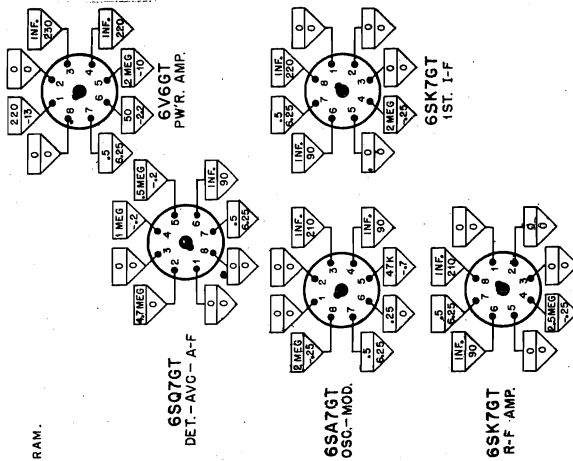


LOCATION OF "SET-UP BUTTON" AND "SET-UP KNOB:"
FIGURE 4 PUSH-BUTTON MODELS 605, AND 705.

MOTOROLA, INC.

MODEL 405, MODEL 505
MODEL 605, MODEL 705

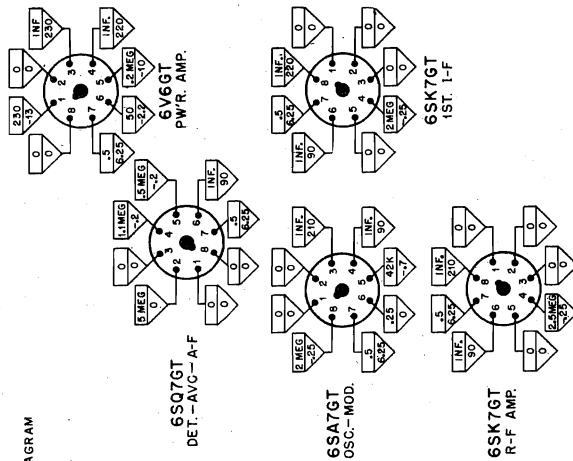
MODEL 505 VOLTAGE AND RESISTANCE DIAGRAM.



NOTE:- VOLTAGES AND RESISTANCES ARE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER. KICK SLIGHTLY WHEN TAKING RESISTANCE READINGS AT TERMINALS SHOWING "INF" VALUES DUE TO FILTER CAPACITOR BEING CHARGED BY BATTERY OF TESTER. TRUE READINGS ARE OBTAINED BY KEEPING TEST PRODS ON TERMINAL FOR A FEW SECONDS (REVERSE TEST PRODS IF METER POINTER BACKS UP) ALL LEADS AND CONTROL HEAD CABLE ARE DISCONNECTED.

□ = RESISTANCE MEASUREMENTS
△ = VOLTAGE MEASUREMENTS
ALL READINGS MAY VARY ± 10%

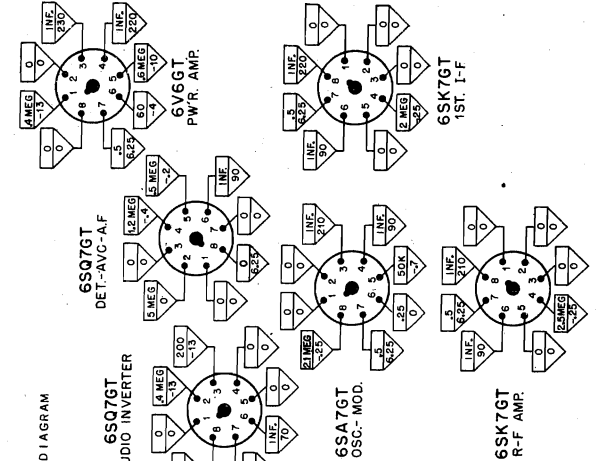
MODEL 405 VOLTAGE AND RESISTANCE DIAGRAM



NOTE:- VOLTAGES AND RESISTANCES ARE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER. KICK SLIGHTLY WHEN TAKING RESISTANCE READINGS AT TERMINALS SHOWING "INF" VALUES DUE TO FILTER CAPACITOR BEING CHARGED BY BATTERY OF TESTER. TRUE READINGS ARE OBTAINED BY KEEPING TEST PRODS ON TERMINAL FOR A FEW SECONDS (REVERSE TEST PRODS IF METER POINTER BACKS UP) ALL LEADS AND CONTROL HEAD CABLE ARE DISCONNECTED.

□ = RESISTANCE MEASUREMENTS
△ = VOLTAGE MEASUREMENTS
ALL READINGS MAY VARY ± 10%

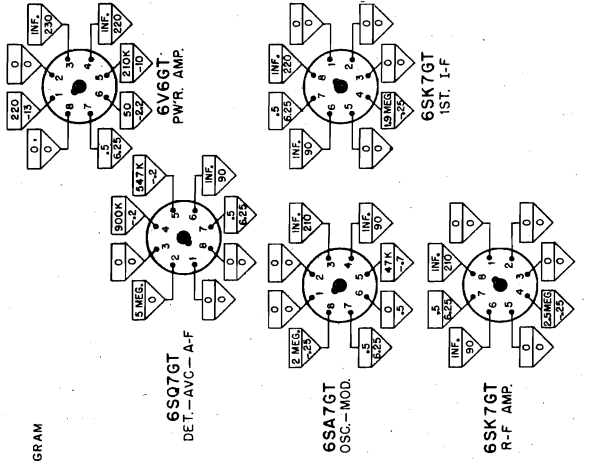
MODEL 705 VOLTAGE AND RESISTANCE DIAGRAM



NOTE:- VOLTAGES AND RESISTANCES ARE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER. KICK SLIGHTLY WHEN TAKING RESISTANCE READINGS AT TERMINALS SHOWING "INF" VALUES DUE TO FILTER CAPACITOR BEING CHARGED BY BATTERY OF TESTER. TRUE READINGS ARE OBTAINED BY KEEPING TEST PRODS ON TERMINAL FOR A FEW SECONDS (REVERSE TEST PRODS IF METER POINTER BACKS UP) ALL LEADS AND CONTROL HEAD CABLE ARE DISCONNECTED.

□ = RESISTANCE MEASUREMENTS
△ = VOLTAGE MEASUREMENTS
ALL READINGS MAY VARY ± 10%

MODEL 605 VOLTAGE AND RESISTANCE DIAGRAM



NOTE:- VOLTAGES AND RESISTANCES ARE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER. KICK SLIGHTLY WHEN TAKING RESISTANCE READINGS AT TERMINALS SHOWING "INF" VALUES DUE TO FILTER CAPACITOR BEING CHARGED BY BATTERY OF TESTER. TRUE READINGS ARE OBTAINED BY KEEPING TEST PRODS ON TERMINAL FOR A FEW SECONDS (REVERSE TEST PRODS IF METER POINTER BACKS UP) ALL LEADS AND CONTROL HEAD CABLE ARE DISCONNECTED.

□ = RESISTANCE MEASUREMENTS
△ = VOLTAGE MEASUREMENTS
ALL READINGS MAY VARY ± 10%

MODEL G-613

NATIONAL UNION RADIO CORP.

SPECIFICATIONS:

CIRCUIT—Superheterodyne—A.C.-D.C.—Battery
Automatic Volume Control

ANTENNA—Self-Contained plug-in Loop

TUNING—Broadcast Band 540-1650 K.C.

POWER SUPPLY—105-120 Volts A.C. or D.C. or Batteries
Consumption approx. 25 Watts (Electric operation)

BATTERY COMPLEMENT—2 NU-A835 "A" Batteries—2 NU-B862 "B" Batteries

TUBE COMPLEMENT—1 NU-1A7GT Converter
2 NU-1N5GT I.F.
1 NU-1H5GT Detector
1 NU-3Q5GT Power Amplifier
1 NU-117Z6GT Rectifier

CABINET—(Approx.) 13" Wide, 6" Deep, 10 $\frac{5}{8}$ " High (Not incl. Carrying Handle)

PARTS LIST

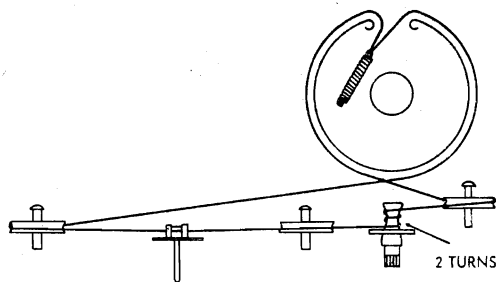
SYMBOL	DESCRIPTION	FACTORY PART NO.	NOTES
E-1	Speaker	EH-6-3	Less Ouput Transf.
L-1	Loop Antenna	LL-3	
T-1	1st I.F. Transf.	TM2-12	
T-2	2nd I.F. Transf.	TM2-13	
O.P.T.	Output Transf.	TA7-1	For 3Q5GT
C-RF C-OSC	2 gang Variable Capacitor	CV-6	
C1&A, B, C, D	Quadruple—Single Unit Electrolytic Capacitor	CEI-4A81	
R-9	Volume Control	RP5-2	
R-17	Resistor Fuse		
S2A, B	Switch	SS-1	
	Dial Pointer	NP-3	
	Dial Scale	ND-12	
	"A" Battery Plug	PM2-1	
	"B" Battery Plug	PM2-2	
E-1a	Speaker Plug	PM1-2	Male Section
E-1b	Speaker Plug	PM1-1	Female Section
	Cabinet	CCCD-613	
	Back Panel	AP-8	
	Window	NW-1	
	Handle	HK-27	

ALIGNMENT PROCEDURE

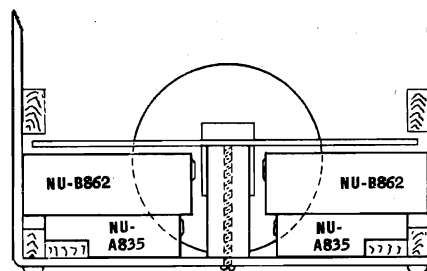
PRELIMINARY.

(a) Set VOLUME CONTROL to the FULL ON position; (b) OUTPUT METER across voice coil; (c) Maintain SIGNAL GENERATOR output at MINIMUM consistent with a readable Output meter indication; (d) Follow sequence indicated below.

SEQUENCE	DUMMY ANTENNA	DIAL SETTING	SIGNAL GENERATOR CONNECTIONS	SIGNAL GENERATOR SETTING	ADJUST TRIMMERS	NOTES
1 I.F.	.01 mfd.	At HIGH frequency end of scale. (Min. Capacity)	High side to stator lug of C-RF. Low side to B—	455 K.C.	T2a T2b T1a T1b	Adjust Trimmers for MAX. output reading
2 OSC.	3 turn coil of #18 or #20 insulated wire on 7" or 8" diameter LOOSELY Coupled to loop Antenna in Receiver.	Pointer at extreme RIGHT HAND END of dial scale (Min. Capacity)	Across Dummy Antenna	1700 K.C.	TY	Adjust Trimmer for MAX. output reading
3 R.F.	Same as in 2 above	1550 K.C.	Across Dummy Antenna	1550 K.C.	TX	Adjust Trimmer for MAX. output reading

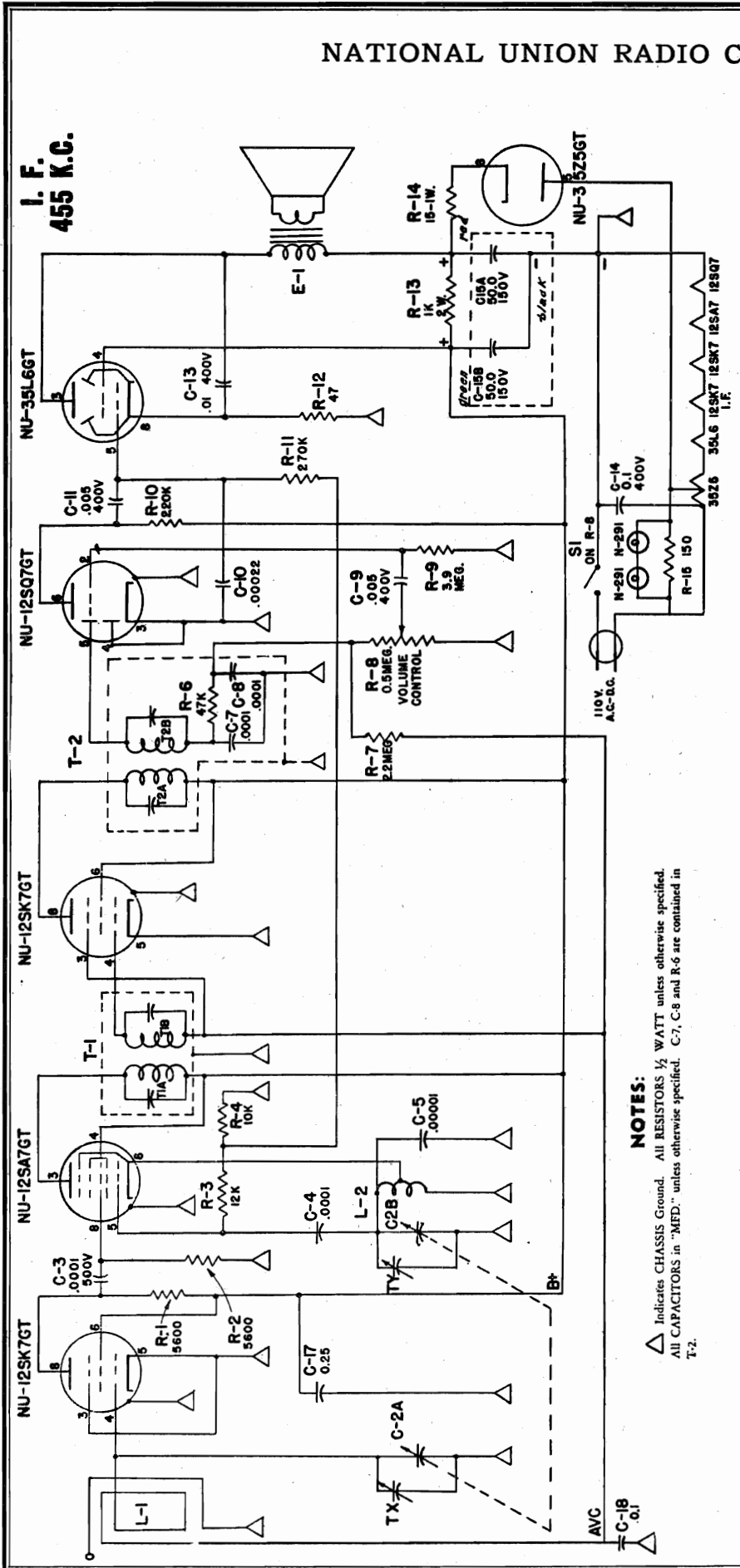


DIAL CORD DRIVE ASSEMBLY



BATTERY INSTALLATION

NATIONAL UNION RADIO CORP.



I. F.
455 K.C.

NOTES:

△ Indicates CHASSIS Ground. All RESISTORS 1/2 WATT unless otherwise specified.
All CAPACITORS in "MED." unless otherwise specified. C-7, C-8 and R-6 are contained in T-2.

SPECIFICATIONS:

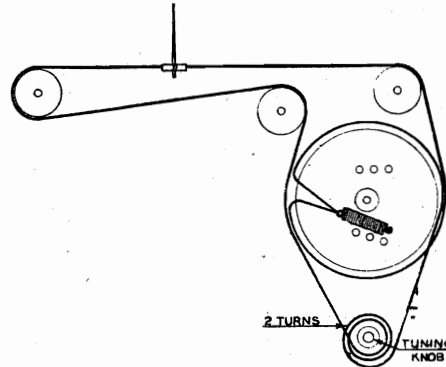
- CIRCUIT**—A.C.-D.C. Superheterodyne—Tuned R.F. Stage—Auto-Tube Complement—1 NU-12SK7GT R.F. Amp.
1 NU-12SA7GT Converter
1 NU-12SK7GT I.F. Amp.
1 NU-12SQ7GT Det.-AVC-AF
1 NU-35L6GT Power Output
1 NU-35Z5GT Rectifier
- ANTENNA**—Self-contained Loop—Coupling for External Antenna
- TUNING**—Broadcast Band—555 K.C. to 1620 K.C.—2 Gang Variable Capacitor
- POWER SUPPLY**—105-125 Volts, 60 cycles A.C.—105-125 Volts, Direct Current—Approx. 30 Watts Consumption
- PANEL LAMP**—2 N-291 (2.9V/.17A) Bayonet
- CABINET**—Approximate Dimensions 13 3/4" Wide, 8 3/8" High, 6 1/2" Deep

MODEL G-615

NATIONAL UNION RADIO CORP.

PARTS LIST

SYMBOL	DESCRIPTION	FACTORY PART NO.	NOTES
E-1	Complete Assembly (O.P. Transf. and P.M. Speaker)	EH6-2	Replacement of complete assembly is advisable if either part fails
Loop	Loop Antenna	LL-15	
L-2	Oscillator Coil	LO-2	
T-1	1st I.F. Trans.	TM2-1	
T-2	2nd I.F. Trans.	TM2-3	
R-8	Vol. Control With Switch (S-1)	RP5-2	NU-500M-C8 may be used as a replacement
C2-A C2-B	2 Gang Variable Capacitor	CV-16	
C1E C1B	Electrolytic Capacitor 50-50/150	CE-85	
	Dial Lamps 2.9 Volt .170 Amp.		N 291
	Dial Scale (Glass)	ND-17-2	
	Dial Pointer	ND-1-2	
	Dial Lamp Socket	JS13-163	



DIAL DRIVE ASSEMBLY

ALIGNMENT PROCEDURE

PRELIMINARY.

- (a) Adjust the DIAL POINTER along the dial cord to the position opposite the first right-hand punch mark on the dial backing-plate, with the tuning condenser gang completely out of mesh (Minimum Capacity); (b) Set VOLUME CONTROL to the FULL ON position; (c) Maintain SIGNAL GENERATOR output at MINIMUM consistent with a readable Output Meter indication; (d) OUTPUT METER across voice coil; (e) Follow sequence indicated below.

SEQUENCE	DUMMY ANTENNA	DIAL SETTING	SIGNAL GENERATOR CONNECTIONS	SIGNAL GENERATOR SETTING	ADJUST TRIMMERS	NOTES
1 I.F.	.01 mfd.	At HIGH frequency end of scale. (Min. Capacity)	High side to stator lug of C2-A Low side to B—	465 K.C.	T2a T2b T1a T1b	Adjust Trimmers for MAX. output reading
2 OSC.	3 turn coil of #18 or #20 insulated wire on 7" or 8" diameter LOOSELY Coupled to loop Antenna in Receiver	Pointer at extreme RIGHT HAND END of dial scale (Min. Capacity) Pointer will be in line with FIRST punch mark at right	Across Dummy Antenna	1700 K.C.	TY	Adjust Trimmer for MAX. output reading
3 R.F.	Same as in 2 above	Pointer in line with punch mark SECOND from right	Same as in 2 above	1520 K.C.	TX	Adjust Trimmer for MAX. output reading
4	Same as in 2 above	At LOW frequency end of scale (Max. Capacity)	Same as in 2 above	530 K.C.	None	530 K.C. signal should be picked up at or near this dial setting. Check operation in Seq. 2 if signal is not picked up

REINSTALLING CHASSIS (AFTER ALIGNMENT):—

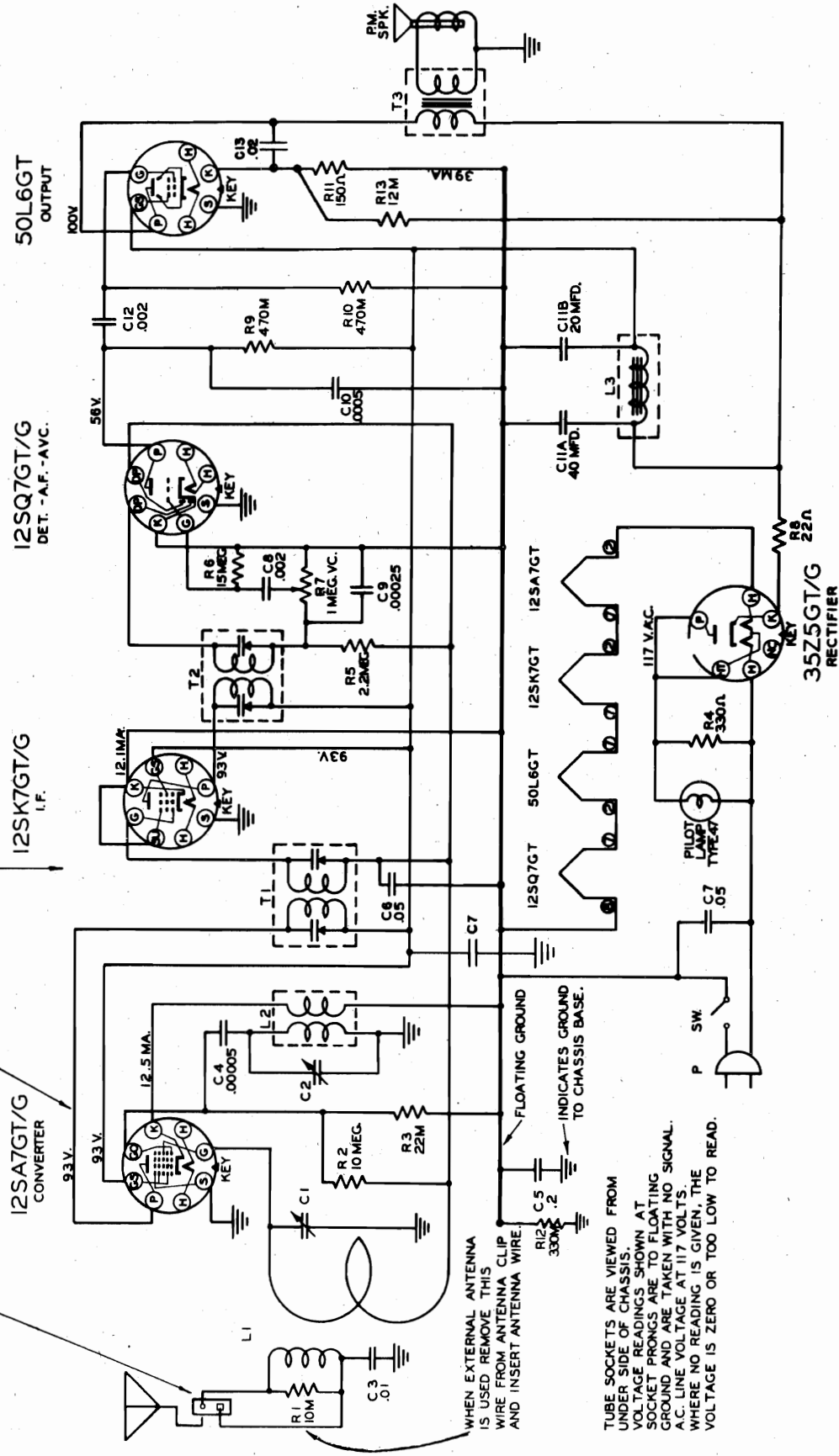
- 5
 - (a) With chassis still on the bench, set dial pointer at the minimum capacity end of travel.
 - (b) Slide chassis into cabinet and adjust its position so that the dial pointer is opposite and in line with the FIRST calibration mark at the right-hand end of the GLASS DIAL SCALE.
 - (c) Tighten the chassis hold down screws.
 - (d) Tuning should now track so that peak signal is attained at the proper frequency calibration on the glass dial scale.

NOBLITT-SPARKS INDUSTRIES INC.

MODELS 552N, 552AN
555, 555A

IF PEAK 455 KC

APPROX. INPUT REQUIRED FOR 50 MILLIWATTS STANDARD OUTPUT.
 300UV/M - 1400 KC
 19UV - 1400 KC
 300UV/M - 1000 KC
 5UV - 1000 KC
 400UV/M - 600 KC
 5UV - 600 KC
 WITH STANDARD LOOP AT ANTENNA CLIP



9000 UV AT IF GRID

50L6GT OUTPUT

12SQ7GT/G DET. - A.F. - AVC.

12L6IM I.F.

12SA7GT/G CONVERTER

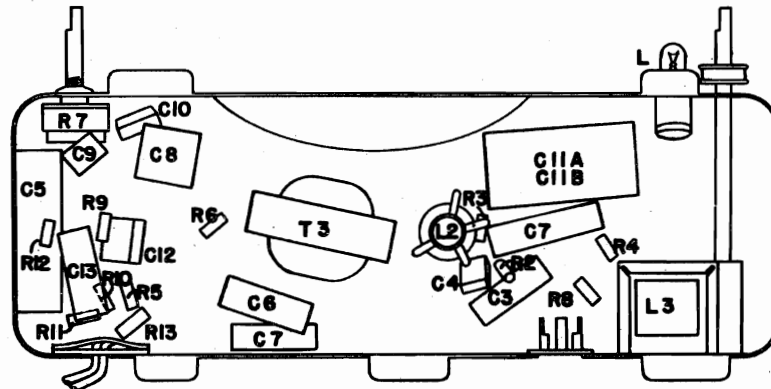
WHEN EXTERNAL ANTENNA IS USED REMOVE THIS WIRE FROM ANTENNA CLIP AND INSERT ANTENNA WIRE.

FLOATING GROUND INDICATES GROUND TO CHASSIS BASE.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

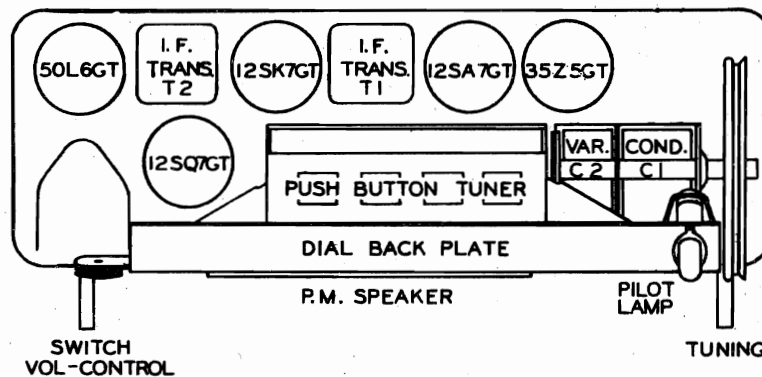
MODELS 552N, 552AN,
555, 555A

NOBLITT-SPARKS INDUSTRIES INC.



LOCATION OF PARTS UNDER CHASSIS

LOOP ANTENNA



TUBE LAYOUT OUTLINE

ALIGNMENT PROCEDURE

PRELIMINARY:

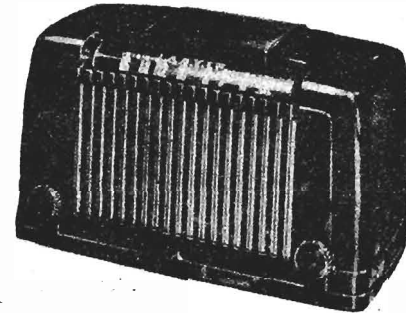
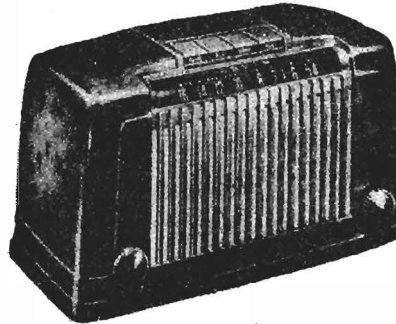
Output meter connection Across Speaker Voice Coil
 Output meter reading to indicate 200 milliwatts (Standard output)8 Volt
 Generator Modulation 30% 400 cycles
 Position of Volume Control Fully clockwise
 Position of dial pointer with variable condenser fully closed See Note below

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION HIGH SIDE	GENERATOR CONNECTION GROUND LEAD	ADJUST TRIMMERS IN ORDER SHOWN	TRIMMER FUNCTION
Open	455 KC	.05 mfd.	Mixer grid	Floating Ground	T2-T1	IF
1400 KC	1400 KC	50 mmf.	Ant. Clip	Floating Ground	C2	Oscillator
1400 KC	1400 KC	50 mmf.	Ant. Clip	Floating Ground	C1	Ant.

NOTES:

- To Set Pointer: There are 4 notches cut in the dial scale backing plate for calibration marks at 540; 600; 1400 & 1620 KC. Set the dial pointer at the 540 KC mark at the right-hand end of the dial plate with the variable completely closed.
- Place set loop in the same position and at the same distance with respect to the back of the chassis as it would be when the set is mounted in the cabinet, during alignment of the RF stage. (1 7/16" from back of chassis to front of long loop strip).
- If a standard test loop is used with the Signal Generator for alignment of the receiver the black wire will be left in the antenna clip. When the generator lead is connected to ant. clip the black wire is removed from the clip.
- The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the A.V.C. action of the receiver ineffective.

NOBLITT-SPARKS INDUSTRIES INC.

MODELS 552N, 552AN
555, 555A

FREQUENCY RANGE

Broadcast 540-1600 kc
 IF 455 kc

TUBES & FUNCTIONS

12SA7 Mixer-oscillator
 12SK7 IF Amp.
 12SQ7GT DET-AVC-AP
 50L6GT Output
 35Z5GT Rectifier

POWER SUPPLY

105-125 Volts AC-DC, 35 Watts

POWER OUTPUT

Undistorted 1.1 Watts
 Maximum 2.4 Watts
 Plate load 2000 ohms

LOUD SPEAKER

Type: Permanent magnet
 Size: 4 inch
 Voice coil impedance 3.2 ohms

CHASSIS FEATURES

Automatic Volume Control
 Built-in Loop
 Underwriters' Listed

OPERATING CONTROLS

1. Left knob ON-OFF Sw. & Volume
 2. Right knob Tuning

PHYSICAL DIMENSIONS

Length 11 $\frac{1}{2}$ inches
 Height 6 $\frac{1}{2}$ inches
 Depth 6 $\frac{1}{2}$ inches

Models 552N and 555 are in walnut cabinets. Models 552AN and 555A are in ivory cabinets. Models 555 and 555A have push buttons. Models 552N and 552AN do not have push buttons.

THE HEATER CIRCUIT.

The heaters of all of the tubes are connected in series, accordingly if one tube burns out the others will not light. It is necessary to replace only the burned out tube, the others will then light. The burned out tube can be located through the fact that the full line voltage will appear across its heater prongs.

To obtain best results always rebalance receiver after replacing tubes.

POSITION OF POWER CORD PLUG.

On AC, the power cord plug should be tried in both its possible positions in the receptacle, and left in the position that gives least hum. On DC, the receiver will work in only one position of the plug in its receptacle.

THE ANTENNA.

This receiver has a built-in loop which gives satisfactory reception in most locations. If the receiver is located some distance from a broadcasting station, or where the electrical interference is high, an outside antenna will improve reception. The Black wire should be removed from the antenna clip before the antenna is connected.

This receiver is designed to operate without a ground connection and no attempt should be made to use one.

CIRCUIT CHANGES.

On some sets C4 condenser is connected from Plate to Screen Grid instead of from Plate to Cathode of the output tube.

C-10, .05 uf condenser from screen grid of 12SA7 tube to chassis was added after the start of production to prevent oscillation.

MODELS 552N, 552AN
555, 555A

NOBLITT-SPARKS INDUSTRIES INC.

Replacement parts should be ordered by Arvin part number, description and model number of receiver from your Arvin Distributor. The Distributor will order direct from the factory, except in the case of tubes, which should be obtained through regular tube distribution channels.

Parts shipments are F.O.B. Columbus, Indiana. Terms of sale are the same as those applying to finished Arvin products.

REF. NO.	PART NO.	DESCRIPTION	LIST PRICE	REF. NO.	PART NO.	DESCRIPTION	LIST PRICE
R1	C20060-103	Resistor, 10,000 ohm, 1/2 watt	.10	Spk.	C19393	4" P. M. Speaker	4.25
R2	C20060-106	Resistor, 10 megohm, 1/2 watt	.10	P	B20064-3	Line Cord & Plug Assy	1.00
R3	C20060-223	Resistor, 22,000 ohm, 1/2 watt	.10		E19301	Cabinet, Walnut (Model 555)	5.00
R4	C20060-331	Resistor, 330 ohm, 1/2 watt	.10		E19302	Cabinet, Ivory (Model 555A)	5.50
R5	C20060-225	Resistor, 2.2 megohm, 1/2 watt	.10		E19303	Cabinet, Walnut (Model 552N)	5.00
R6	C20060-156	Resistor, 15 megohm, 1/2 watt	.10		E19304	Cabinet, Ivory (Model 552AN)	5.50
R7	C19389	Volume Control & Switch	1.00		A19401	Dial Crystal Mtg. Clip	.05
R8	C20060-220	Resistor, 22 ohm, 1/2 watt	.10		A19410	Ant. Loop Retainer Brkt.	.05
R9, R10	C20060-474	Resistor, .47 megohm, 1/2 watt	.10		C19408	Dial	1.00
R11	C20060-151	Resistor, 150 ohm, 1/2 watt	.10		A19391-1	Knob, Walnut	.20
R12	C20060-334	Resistor, 330,000 ohm, 1/2 watt	.10		C19422	Speaker Baffle	.15
R13	C20070-123	Resistor, 12,000 ohm, 1 watt	.15		*C19348-1	Call Letter Sheets (3)	.50
C1, C2	*E19359	Var. Condenser, 2 gang	8.00		A19414	Carton	.80
	**C19940	Var. Condenser, 2 gang	3.65		A19391-2	Knob, Ivory	.20
C3	C20068-103	Condenser, .01 uf, 400 V.	.25		*A19276	P. B. Knobs, Walnut	.25
C4	C20065-500	Condenser, .00005 uf, 500 V.	.25		*A19275	P. B. Knobs, Ivory	.30
C5	A19765	Condenser, .2 uf, 400 V.	.35		*A19346	P. B. Knob Shaft	.05
C6	C20067-503	Condenser, .05 uf, 200 V.	.25		A19344-3	Idler Pulley	.05
C7	C20068-503	Condenser, .05 uf, 400 V.	.25		A19344-2	Idler Pulley	.05
C8, C12	C20068-202	Condenser, .002 uf, 400 V.	.20		A19364	Dial Pointer	.15
C9	C20065-251	Condenser, .00025 uf, 500 V.	.25		A19205	Capacitor Mtg. Clip	.10
C10	C20065-501	Condenser, .0005 uf, 500 V.	.40		A20149-2	Dial Cord Spring	.10
C11A, C11B	A19360	Elect. Cond., 40-20 uf, 150 V.	1.25		A19361	Hair Pin Clip	.05
C13	C20068-203	Condenser, .02 uf, 400 V.	.25		A19132	Dial Drive Cord	.10
L1	AC19207-1	Ant. Loop Assy.	1.50		A19351	Dial Light Bulb	.20
L2	AC19354-1	Sec. Coil	.60		A18254-1	Tube Sockets	.15
L3	AC19357-1	Iron Core "B" Choke	1.00		A19233-1	Tube Sockets	.15
T1	AC19355-1	1st I. F. Coil	1.95		A19234	Ant. Loop Socket	.10
T2	AC19356-1	2nd I. F. Coil	1.95		A19396	Dial Light Socket Assy.	.35
T3	AC19358-1	Output Transformer	1.25		AA19423-1	Tuning Shaft Assy.	.25
					A19252	Ant. Conn. Plug	.10

* used only on 555 and 555A.

** used only on 552N and 552AN.

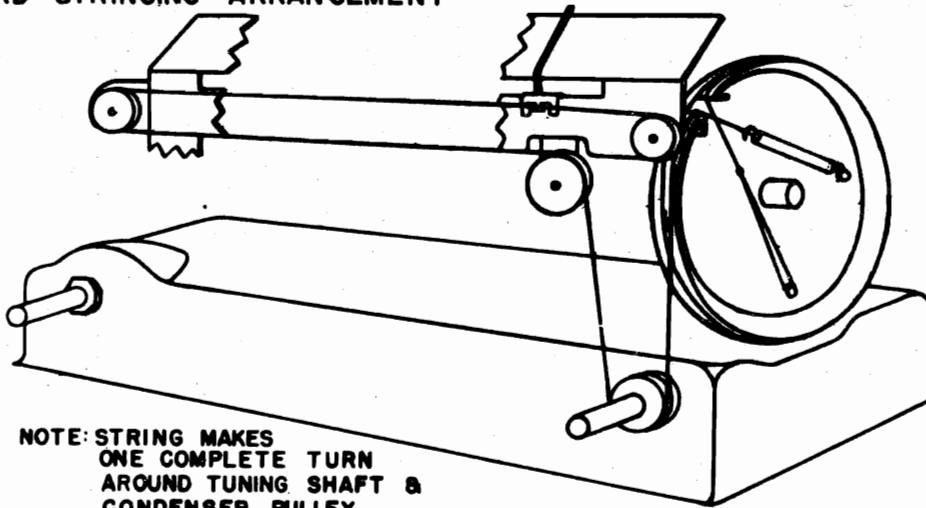
INSTRUCTIONS FOR SETTING UP PUSH BUTTONS:

Allow the receiver to remain on for ten to fifteen minutes before making the push button adjustments.

Each of the push buttons should be set to a desired station in the following manner:

1. Make a list of the four local stations for which push button tuning is desired and punch out the corresponding call letters from the call letter sheets.
2. Lift each button and insert a call letter tab into the slot at the side of the button, centering it in the front opening.
3. Lift a push button and insert a screw driver in the slotted screw head just below the button. Press down and loosen the locking screw by turning it to the left about two turns.
4. While holding the screw all the way down with the screw driver, tune in the desired station by hand with the tuning knob. Turning the tuning knob back and forth slightly either side of the station while holding the screw down will help to obtain a precise setting.
5. Tighten the screw, keeping it pushed all the way down while tightening it.
6. Check for accuracy by moving the pointer off the station about an inch and retuning it by depressing the push button set up for that station. If the setting is not accurate, repeat the foregoing procedure.
7. Follow the same procedure for each of the remaining buttons.
8. Should you desire to change your selection of stations, the old call letters can be removed from the buttons by pushing them out with a penknife, nail file or eraser on a pencil and repeating steps 3 to 8.

DIAL CORD STRINGING ARRANGEMENT



NOTE: STRING MAKES ONE COMPLETE TURN AROUND TUNING SHAFT & CONDENSER PULLEY

MODEL 665

NOBLITT-SPARKS INDUSTRIES INC.



FREQUENCY RANGE

Broadcast 540-1600 kc
 IF 455 kc

TUBES & FUNCTIONS

6SS7 RF Amp.
 12SA7 Mixer-oscillator
 6SS7 IF Amp.
 12SQ7GT DET-AVC-AF
 50L6GT Output
 35Z5GT Rectifier

POWER SUPPLY

105-125 Volts AC , 55 Watts

POWER OUTPUT

Undistorted 1 Watt
 Maximum 2.2 Watts
 Plate load 2000 ohms

SERVICE HINTS AND CIRCUIT CHANGES

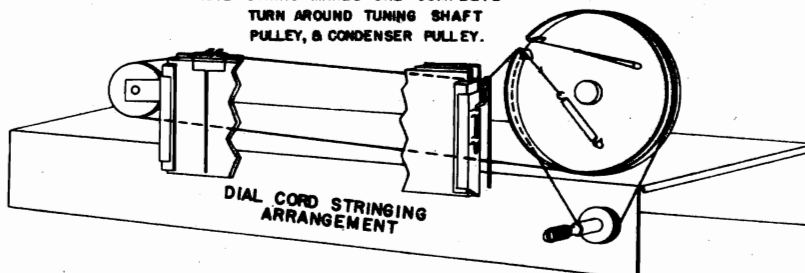
On AC, the power cord plug should be tried in both its possible positions in the receptacle, and left in the position that gives least hum. Do not attempt to operate on DC.

For service information on the record changer see "Automatic Record Changer Service Instructions, Model 205", which should be filed with this bulletin.

CIRCUIT CHANGES MADE SINCE THE START OF PRODUCTION.

1. C3B and C3C have been interchanged, and Filter Choke L3 changed from Part No. AC19589-1 to AC21073-1 to reduce hum.
2. The filament string arrangement has been changed. The original order was 35Z5; 6SS7 IF; 12SA7; 6SS7 RF; 50L6; and 12SQ7. If frequent burnout of the 6SS7 IF tube is encountered on these sets, the filaments should be rewired to correspond with the present Schematic Diagram.
3. 1 Megohm Resistor, R13 in grid circuit of converter tube replaced by 100M Resistor, R15 to eliminate hum modulation. R15 is connected from grid to floating ground, R13 was connected from grid to AVC.
4. Condensers C5, .0005 mfd., 500 V., across Volume Control, and C7, .002 mfd., 400 V., on Tone Control, replaced by C14, .00025 mfd., 600 V., and C13, .005 mfd., 400 V. respectively, to improve tone quality.

NOTE: STRING MAKES ONE COMPLETE
 TURN AROUND TUNING SHAFT
 PULLEY, & CONDENSER PULLEY.



LOUD SPEAKER

Type: Permanent magnet
 Size: 8 inch
 Voice coil impedance 3.2 ohms

CHASSIS FEATURES

Automatic Record Changer
 Automatic Volume Control
 Built-in Loop
 Underwriters Listed

OPERATING CONTROLS, LEFT TO RIGHT

1. Volume
2. Radio-Phono Sw.
3. ON-OFF - TONE
4. Tuning

PHYSICAL DIMENSIONS

Length 30 1/2 inches
 Height 33 1/4 inches
 Depth 16 1/2 inches

NOBLITT-SPARKS INDUSTRIES INC.

ALIGNMENT PROCEDURE

PRELIMINARY.

Output meter connection Across loudspeaker voice coil
 Output meter reading to indicate 200 milliwatts (standard output)8 volts
 Dummy antenna value to be used in series with generator output See chart below
 Connection of generator output lead See chart below
 Connection of generator ground lead Floating ground
 Generator modulation 30% 400 cycles
 Position of Volume Control Fully clockwise
 Position of dial pointer with variable fully closed ... Last rectangular mark at left edge of dial

Place the set loop in the same position with respect to the chassis, and the same distance from the chassis, as it would be with the set mounted in the cabinet.

Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmers adjusted in Order Shown for *Max. Output	Function of Trimmer
Open	455	.05 mfd.	12SA7 Grid (Stator of rear section of variable condenser)	Top of 2nd & 1st IF Trans.	IF
Open	455	.05 mfd.	RF Grid	*Adj. L4 for min. output	Wave Trap
1400	1400	.00005 mfd.	Antenna connection on back of loop	C2; C1, trimmers on Front & Rear sections of Variable Condenser	Osc. Ant.
600	600	.00005 mfd.	Antenna connection on back of loop	**Adj. antenna section plates of variable cond. for Max. output	Antenna

If a standard test loop is used with the signal generator for alignment of the receiver, the approximate sensitivities should be 350 uv/m and 250 uv/m or less at 600 Kc and 1400 Kc respectively.

Approximate stage by stage sensitivities for 200 Milliwatt output.

IF. - 455 Kc. ----- 2600 uv Mixer 1000 Kc. ----- 75 uv
 Mixer 455 Kc. ----- 60 uv Antenna 1400 Kc. ----- 70 uv

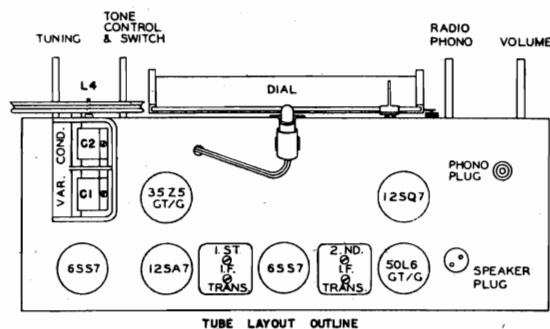
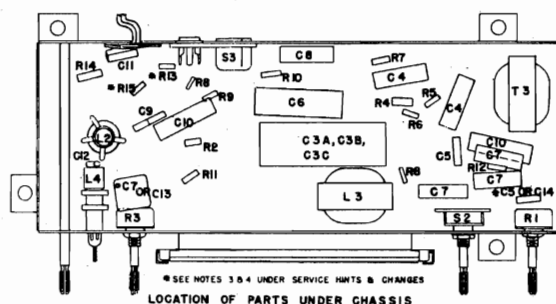
The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the AVC action of the receiver ineffective.

**AS THE CONDENSERS ARE ALL TRACKED BEFORE LEAVING THE FACTORY IT IS NOT PROBABLE THAT THE PLATES WILL NEED TO BE ADJUSTED UNLESS WIDE VARIATIONS IN TUBES ARE ENCOUNTERED.

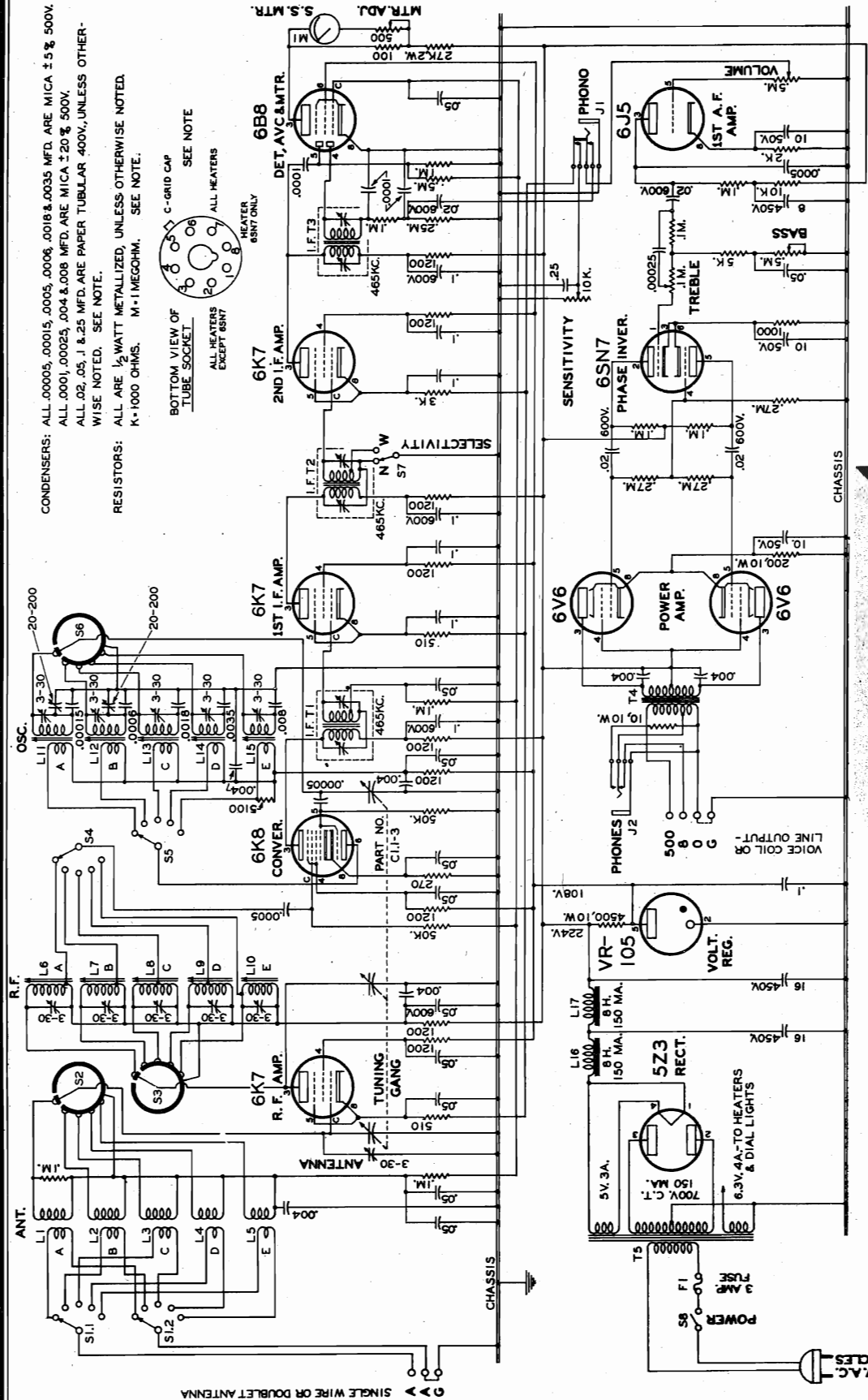
The outside plates on the antenna section of the variable condenser are cut, so they can be bent in or out to give more or less capacity at any given position of the rotor, after the trimmers on the variable have been adjusted at 1400 Kc. A disc type tuning wand affords a quick method of determining whether more or less capacity is needed in the antenna circuit. If the output increases when the Iron end of the wand is placed near the loop, the plates should be bent in to give more capacity. If the output increases when the brass or aluminum end of the wand is placed near the loop the plates should be spread out. If the wand indicates that the plates should go closer, but cannot go closer without shorting, the oscillator section can be spread, but the calibration should be checked after adjusting the oscillator section. Also the band coverage should be checked to see that 540 Kc can be received.

If the receiver is weak at 1000 Kc the same procedure can be followed at 1000 Kc as outlined above for 600 Kc but this will change the tracking at 600 Kc and may affect 1400 Kc so that all points should be rechecked in the original order.

The condenser should be checked for any possible shorting of the plates after the alignment is completed.

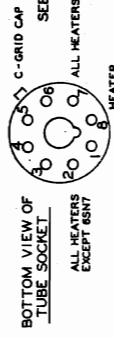


NORTHERN RADIO COMPANY

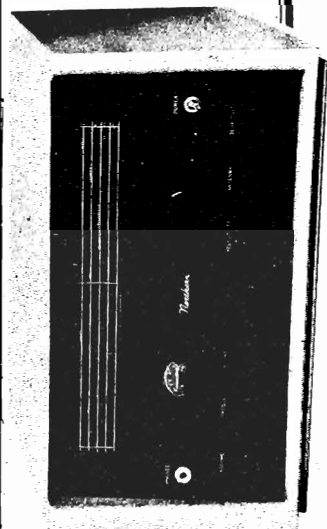


CONDENSERS: ALL .0005, .0015, .0025, .004 & .008 MFD. ARE MICA ± 5% 500V.
 ALL .001, .0025, .004 & .008 MFD. ARE MICA ± 20% 500V.
 ALL .02, .05, .1 & .25 MFD. ARE PAPER TUBULAR 400V, UNLESS OTHERWISE NOTED. SEE NOTE.

RESISTORS: ALL ARE 1/2 WATT METALLIZED, UNLESS OTHERWISE NOTED.
 K = 1000 OHMS. M = 1 MEGOHM. SEE NOTE.



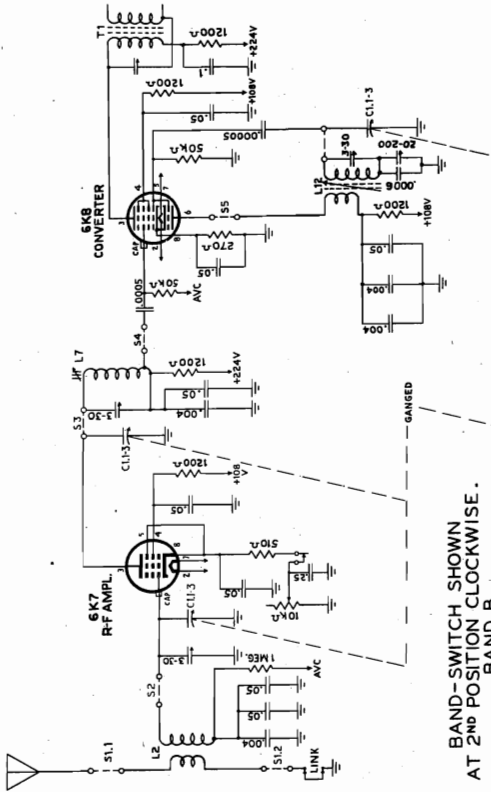
NOTE: PLAIN WHOLE NUMBERS - OHMS OR MICROFARADS.
 DECIMAL NUMBERS - MICROFARAD.
 DASHED NUMBERS - MICROMICROFARADS.
 NUMBERS AROUND TUBES INDICATE BASING DESIGNATION.



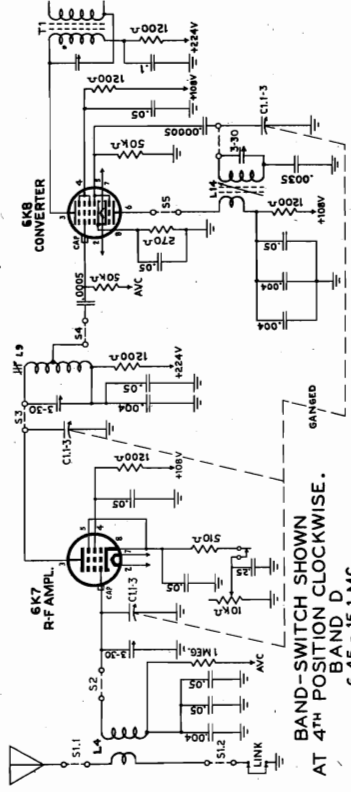
FREQUENCY RANGES: BAND A 550 - 1310 KC.
 BAND B 1280 - 3060 KC.
 BAND C 2.92 - 6.8 MC.
 BAND D 6.45 - 15.1 MC.
 BAND E 14.7 - 33.5 MC.

MODEL N605-E

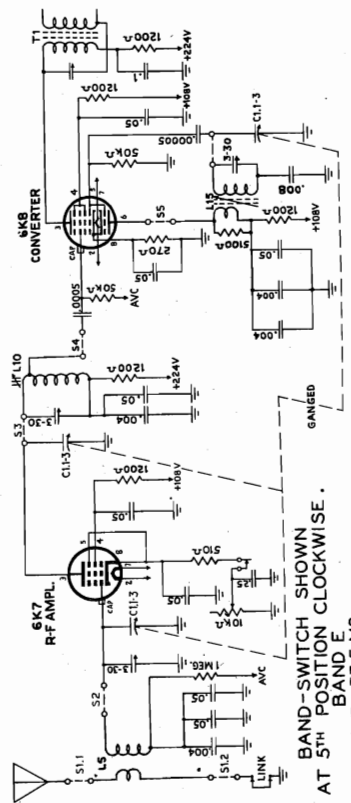
NORTHERN RADIO COMPANY



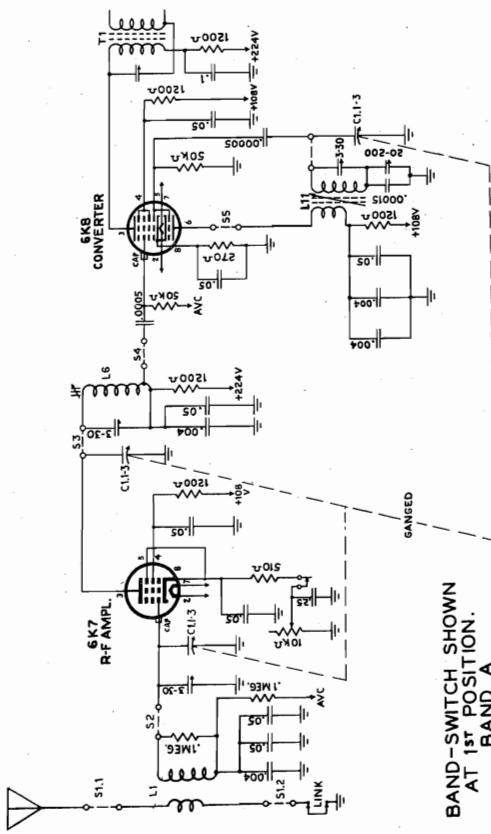
BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE. BAND B 1280 - 3060 KC



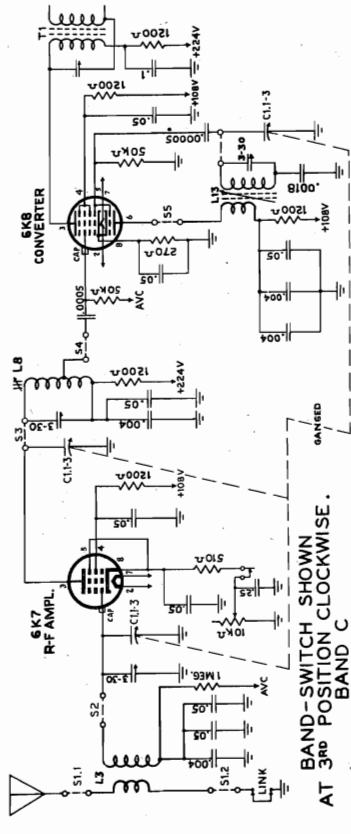
BAND-SWITCH SHOWN AT 4TH POSITION CLOCKWISE. BAND D 6.45 - 15.1 MC.



BAND-SWITCH SHOWN AT 5TH POSITION CLOCKWISE. BAND E 14.7 - 33.5 MC.



BAND-SWITCH SHOWN AT 1ST POSITION. BAND A 550 - 1310 KC.



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE. BAND C 2.92 - 6.8 MC.

NORTHERN RADIO COMPANY

ALIGNMENT: Alignment of this receiver will not be necessary unless a component part of the tuned circuits is replaced or the adjustments have been tampered with. When alignment is necessary, the following conditions must be observed before proceeding:

- A. SENSITIVITY control full on—clockwise.
- B. SELECTIVITY control in W (wide) position.
- C. BASS and TREBLE controls off—counterclockwise.
- D. Receiver chassis effectively grounded.
- E. Antenna terminals strapped for single-wire antenna.
- F. Dial pointer must center on vertical line at low frequency end of scale when tuning condenser is at maximum capacity.
- G. A dummy antenna consisting of a 400 ohm non-inductive resistor and .01 uf. mica condenser should be connected in series with the "hot" lead from the signal generator.

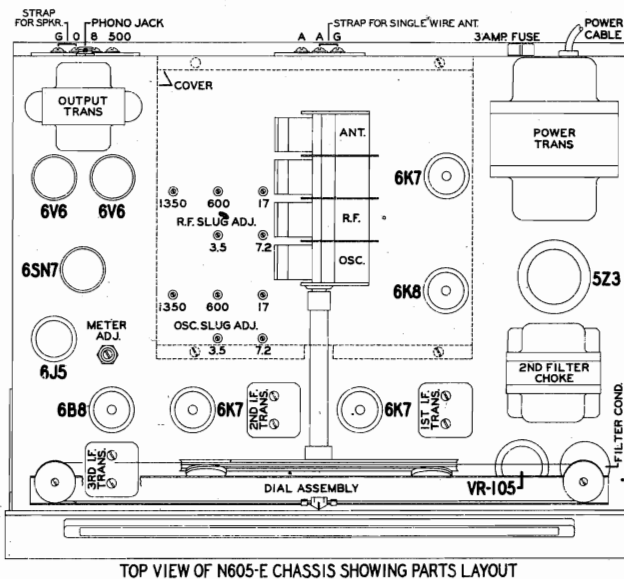
Notes:

1. Trimming and padding steps for each band should be repeated several times as each adjustment affects the other a small percentage. The SIGNAL STRENGTH (S.S.) meter is used as a tuning indicator, with a signal input sufficient to give one-half scale deflection.
2. A very large input, 100,000 microvolts or more, may be required to force a signal through the I.F. stages if seriously detuned. The dummy antenna can be connected to the I.F. grids as an alternative if sufficient signal is not available.
3. Do not adjust A and B band oscillator coil slugs. Use padding condensers only for dial calibration.
4. Above 3.5 mc. care must be taken to avoid image frequencies.

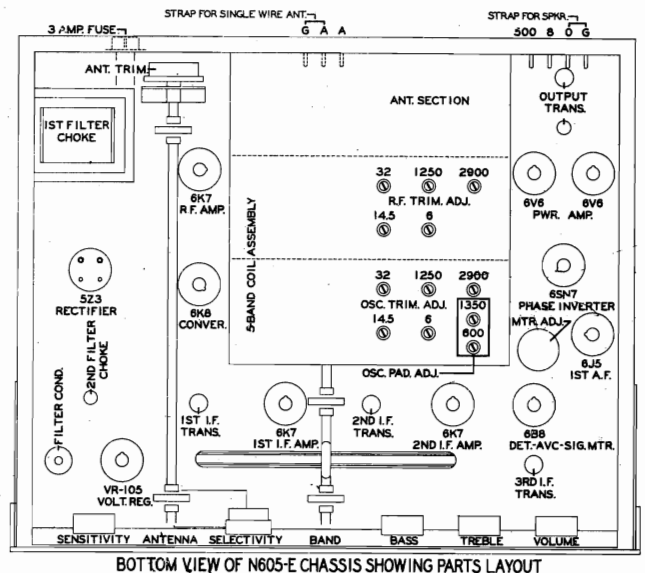
FILE NO 605E-12-1		ALIGNMENT CHART				12-46
STEP	CONNECT DUMMY ANT. TO-	SET SIG. GEN. TO-	SET BAND SW. TO-	SET DIAL TO-	ADJUST FOR MAXIMUM S.S. METER READING	SEE NOTE
1	CONV. 6K8 GRID CAP	465 KC	A	QUIET POINT	ALL I. F. TRIMMERS	1,2 & 6
2	"A" TERM.	600 KC	A	600 KC	OSC. 600 PAD, ANT. TRIM & RF 600 SLUG	1 & 3
3	"A" TERM.	1250 KC	A	1250 KC	OSC. 1250 TRIM, ANT. TRIM & RF 1250 TRIM	
4	"A" TERM.	1350 KC	B	1350 KC	OSC. 1350 PAD, ANT. TRIM & RF 1350 SLUG	1 & 3
5	"A" TERM.	2900 KC	B	2900 KC	OSC. 2900 TRIM, ANT. TRIM & RF 2900 TRIM	
6	"A" TERM.	3.5 MC	C	3.5 MC	OSC. 3.5 SLUG, ANT. TRIM & RF 3.5 SLUG	1 & 4
7	"A" TERM.	6.0 MC	C	6.0 MC	OSC. 6.0 TRIM, ANT. TRIM & RF 6.0 TRIM	1 & 4
8	"A" TERM.	7.2 MC	D	7.2 MC	OSC. 7.2 SLUG, ANT. TRIM & RF 7.2 SLUG	1 & 4
9	"A" TERM.	14.5 MC	D	14.5 MC	OSC. 14.5 TRIM, ANT. TRIM & RF 14.5 TRIM	1 & 4
10	"A" TERM.	17 MC	E	17 MC	OSC. 17 SLUG, ANT. TRIM & RF 17 SLUG	1 & 4
11	"A" TERM.	32 MC	E	32 MC	OSC. 32 TRIM, ANT. TRIM & RF 32 TRIM	1,4 & 5

When two signals are heard in the range of an oscillator trimming or padding adjustment the one tuned with minimum C or L is correct.

5. A small amount of interlock between Osc. and RF stages is present above 30 mc. Use a strong signal for aligning, rock the tuning condenser slightly while making the "RF-32 trim" adjustment and set this adjustment approx. 1/4 turn towards maximum C past the apparent optimum setting.
6. One trimmer of the 3rd I.F. transformer will be found to give maximum output at minimum meter reading and should be adjusted correspondingly.



TOP VIEW OF N605-E CHASSIS SHOWING PARTS LAYOUT



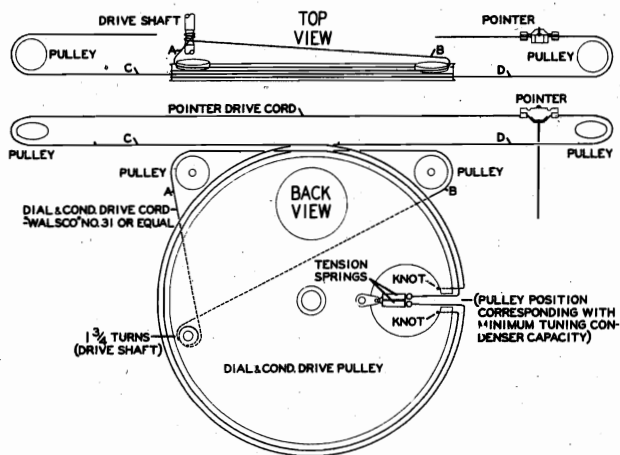
BOTTOM VIEW OF N605-E CHASSIS SHOWING PARTS LAYOUT

MODEL N605-E

NORTHERN RADIO COMPANY

Before attempting any maintenance disconnect the power cable (cord), remove the four screws holding the back plate, remove three screws in the back lip of the chassis and slide the chassis out of the cabinet.

All tubes should be checked in a mutual-conductance type tester and replacements made accordingly. Regardless of test results, tubes having been in service more than two years should be replaced to avoid unnecessary maintenance expense. Tube sockets are stamped for quick identification. Dial lights are Mazda type 47 and should be replaced whenever other maintenance work is done. Ready access to the center pilot light may be had by rotating the dial until the hole in the pulley is behind the light. Whenever the type 6B8 is replaced it will be necessary to reset the tuning meter as follows: set BAND switch on "C", SENSITIVITY control at minimum, disconnect antenna, set mechanical zero on meter, turn on POWER switch and after warm-up set METER ADJ. control for zero.



DIAL AND TUNING CONDENSER DRIVE MECHANISM

SPECIFICATIONS

FREQUENCY RANGES:

- Overall.....550 Kc to 33.5 Mc (546 to 8.96M)
- Band A.....550 Kc to 1310 Kc (546 to 228.8M)
- Band B.....1280 Kc to 3060 Kc (234 to 98.1M)
- Band C.....2.92 Mc to 6.8 Mc (102.7 to 44.1M)
- Band D.....6.45 Mc to 15.1 Mc (46.5 to 19.8M)
- Band E.....14.7 Mc to 33.5 Mc (20.4 to 8.96M)

INTERMEDIATE FREQUENCY.....465 Kc.

POWER OUTPUT.....7 Watts, undistorted

OUTPUT IMPEDANCE.....8 and 500 ohms

TUBE COMPLEMENT:

- (1) 6K7.....R.F. Amplifier
- (2) 6K8.....Converter (1st Detector-Oscillator)
- (3) 6K7.....1st I.F. Amplifier
- (4) 6K7.....2nd I.F. Amplifier
- (5) 6B8.....2nd Detector, A.V.C. & Signal Meter
- (6) 6J5.....1st A.F. Amplifier
- (7) 6SN7.....Phase Inverter
- (8-9) 6V6G.....Push-Pull Power Amplifier
- (10) VR105.....Voltage Regulator
- (11) 5Z3.....Plate Power Rectifier

TEST READINGS: Test readings are taken under the following conditions:

- A. SENSITIVITY (R.F. Gain) control full on—clockwise.
- B. SELECTIVITY switch in W (Wide) position.
- C. BASS and TREBLE controls off—counterclockwise.
- D. Antenna disconnected—no signal tuned in.
- E. Band switch in Band B position for voltage readings.
- F. A.C. line voltage—117 volts.

FILE NO. 605E-13-1		TEST READINGS				12-46
TUBE	STAGE	PLATE VOLTAGE	SCREEN VOLTAGE	CATHODE VOLTAGE	GRID VOLTAGE	SEE NOTE
6K7	R.F. AMP.	216	106	3.5	.6	1,2&3
6K8	CONVERTER OSC. SECTION	220 104	100 ---	2.8 ---	.6 1.8-8.0	1,2&3 1,2,3&4
6K7	1ST. I.F. AMP.	220	106	7	.6	1,2&3
6K7	2ND I.F. AMP.	215	106	3.7	0	1&2
6B8	2ND DET. & AVC SECTION. SIG. STRENGTH METER SECTION	-- 43	-- 108	-- 0	0 6	 1,2,3&5
6J5	1ST A.F. AMP.	75	--	2.9	0	1&2
6SN7	PHASE INVERTER	82	--	3.1	0	1&2
6V6	POWER OUTPUT	219	224	12.5	0	1,2&6
VR-105	VOLTAGE REG.	108	--	0	--	1&2
5Z3	RECTIFIER	350	--	--	--	1,2&7

Notes:

1. All voltages shown are in respect to chassis.
2. Plate, screen and cathode voltages read with 20,000 ohm/volt meter.
3. Control grid voltage read with VTVM having a d.c. input resistance of 11 megohms.
4. Oscillator grid voltage varies between limits over various bands.
5. Grid of 6B8 (AVC bus) varies from .5 to .9 V. over all bands.
6. Readings shown are applicable to either tube or section of dual tube.
7. Reading taken with .05—600 V. cond. in series with "hor" meter lead.

AUDIO RESPONSE.....Normal response (bass and treble controls off) within plus or minus 2.5 db. from 100 to 10,000 cycles.

BASS & TREBLE BOOST.....10 db. above normal

POWER SUPPLY RATING:*

105-125 Volts, A.C., 50-60 cycles.....85 Watts

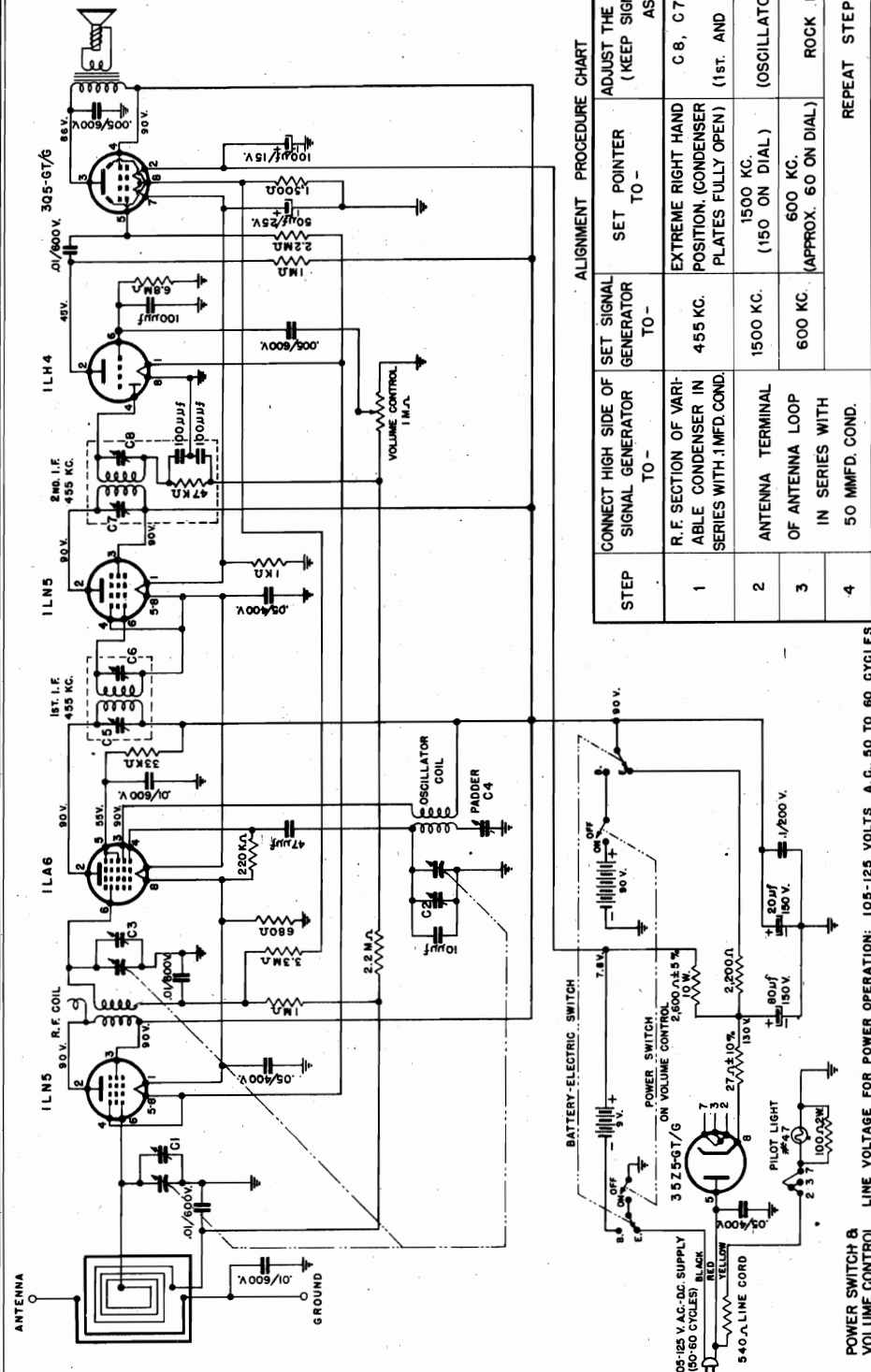
CABINET DIMENSIONS.....17-3/4" Wide; 9-1/2" High;
14-7/8" Deep

NET WEIGHT.....45 lbs.

*On special order, the N605-E Receiver can be supplied for 115-230 volt, A.C. operation.

OLYMPIC RADIO & TELEV. INC.

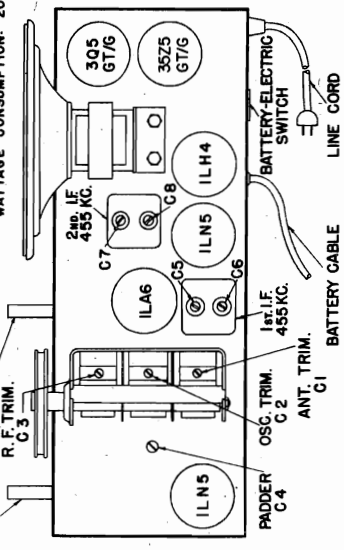
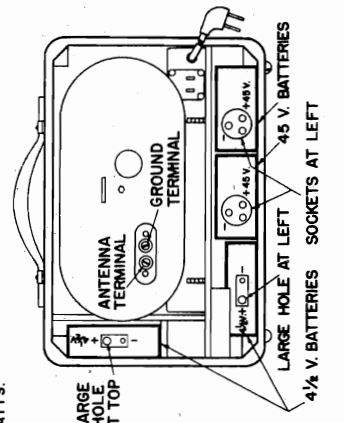
MODEL 6A-606



ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	SET POINTER TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE)
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH 1MFD COND.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN)	C 8, C 7, C 6, C 5 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANSFORMERS)
2	ANTENNA TERMINAL IN SERIES WITH 50 MMFD. COND.	1500 KC.	(150 ON DIAL)	C 2, C 3, C 1 (OSCILLATOR, R.F. AND ANTENNA TRIMMERS)
3	OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	600 KC.	(APPROX. 60 ON DIAL)	C 4 (PADDER) ROCK DIAL FOR MAXIMUM SIGNAL
4				REPEAT STEPS 2 AND 3

- NOTES:
1. ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
 2. ALL MICA CONDENSERS ± 20% TOLERANCE.
 3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN ± 5%. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 V., 60 CYCLES, A.C.



Frequency Range 530 - 1700 kc.

MODEL 6A-606

OLYMPIC RADIO & TELEV. INC.

WHEN SERVICING THIS RECEIVER DO NOT PLACE CHASSIS ON A GROUNDED METALLIC BENCH.

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

ALIGNMENT

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

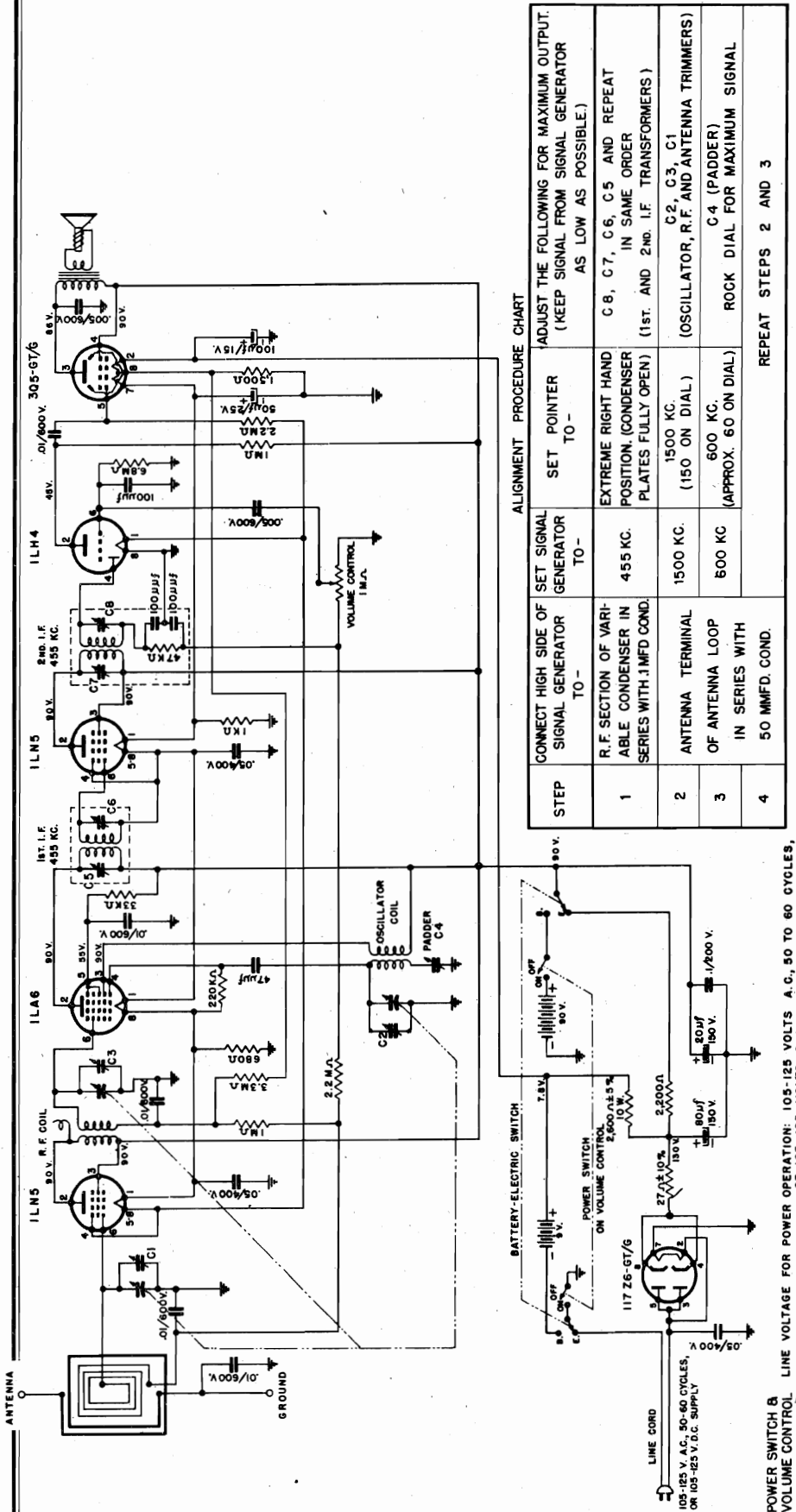
Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

BATTERIES

The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

REPLACEMENT PARTS

Part No.	Description	Part No.	Description
BK-405	Bracket-Resistor mounting bracket	RCPI0W6502A	Condenser-.005/600WV paper tubular condenser
BU-187	Bulb-pilot light bulb 6.3v (#47 Mazda)	RE-407	Resistor-2600 ohms ±5% 10 watt resistor
CA-229	Cabinet-portable cabinet	REB102M	Resistor-1000 ohms ±20% ½ watt resistor
CB-335	Cable-battery cable	REB105M	Resistor-1 megohm ±20% ½ watt resistor
CL-177	Coil-oscillator coil	REB152M	Resistor-1500 ohms ±20% ½ watt resistor
CL-630	Coil-R.F. coil	REB222M	Resistor-2200 ohms ±20% ½ watt resistor
CO-182	Condenser-80/20/150WV & 100/15WV electrolytic condenser	REB224M	Resistor-220,000 ohms ±20% ½ watt resistor
CO 808	Condenser-50 mfd /25 W.V. electrolytic condenser	REB225M	Resistor-2.2 megohms ±20% ½ watt resistor
CR-299	Crystal-dial crystal	REB270K	Resistor-27 ohms ±10% ½ watt resistor
CT-388	Condenser-220-680 mmfd padder condenser	REB333M	Resistor-33,000 ohms ±20% ½ watt resistor
CV-146	Condenser-3 gang variable condenser (with pulley)	REB335M	Resistor-3.3 megohms ±20% ½ watt resistor
DL-391	Dial-metal dial scale	REB681M	Resistor-680 Ohms ±20% ½ watt resistor
ES-274-1	Escutcheon-moulded escutcheon	REB685M	Resistor-6.8 megohms ±20% ½ watt resistor
KN-260	Knob-walnut knob	RED101M	Resistor-100 ohms ±20% 2 watt resistor
KN-261	Knob-walnut knob with dot	SK-476	Speaker-5" P.M. Speaker with output transformer
LC-315	Line Cord-540 ohms resistance line cord	SO-572	Socket-pilot light socket assembly
LP-178	Loop-Antenna	SP-191	Spring-Drive shaft retaining spring
PO-395	Pointer-dial pointer	SW-185	Switch-battery-electric D.P.D.T. slide switch
PT-576	Control-volume control 1 megohm with D.P.S.T. switch	TR-707	Transformer-I.F. 455 K.C. input-Transformer
RCM20A100M	Condenser-10 mmfd ±20% mica condenser	TR-708	Transformer-Output I.F. 455 K.C. Transformer with built-in I.F. filter
RCM20A101M	Condenser-100 mmf ±20% mica condenser		
RCM20A470M	Condenser-47 mmfd ±20% mica condenser		
RCPI0W2104A	Condenser-.1/200WV paper tubular condenser		
RCPI0W4503A	Condenser-.05/400WV paper tubular condenser		
RCPI0W6103A	Condenser-.01/600WV paper tubular condenser		

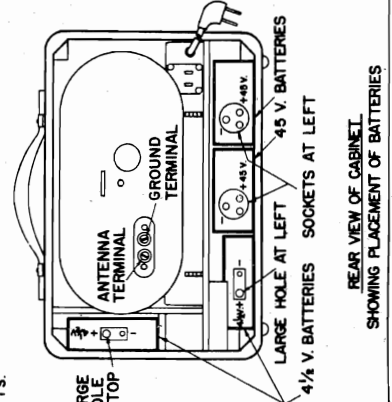


ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	SET POINTER TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH J MFD COND.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN)	C 8, C 7, C 6, C 5 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANSFORMERS)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1500 KC.	1500 KC. (150 ON DIAL)	C 2, C 3, C 1 (OSCILLATOR, R.F. AND ANTENNA TRIMMERS)
3		500 KC.	600 KC. (APPROX. 60 ON DIAL)	C 4 (PADDER)
4				ROCK DIAL FOR MAXIMUM SIGNAL

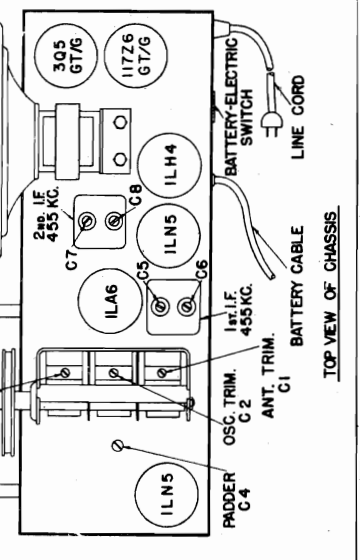
REPEAT STEPS 2 AND 3

- NOTES:
1. ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
 2. ALL MICA CONDENSERS ± 20% TOLERANCE.
 3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN ± 5%. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 V., 60 CYCLES, A.C.



Frequency Range 530 - 1700 kc.

POWER SWITCH & VOLUME CONTROL LINE VOLTAGE FOR POWER OPERATION: 105-125 VOLTS A.C., 50 TO 60 CYCLES, OR 105-125 VOLTS D.C.
WATTAGE CONSUMPTION: 20 WATTS.



WHEN SERVICING THIS RECEIVER DO NOT PLACE CHASSIS ON A GROUNDED METALLIC BENCH.

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

ALIGNMENT

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

BATTERIES

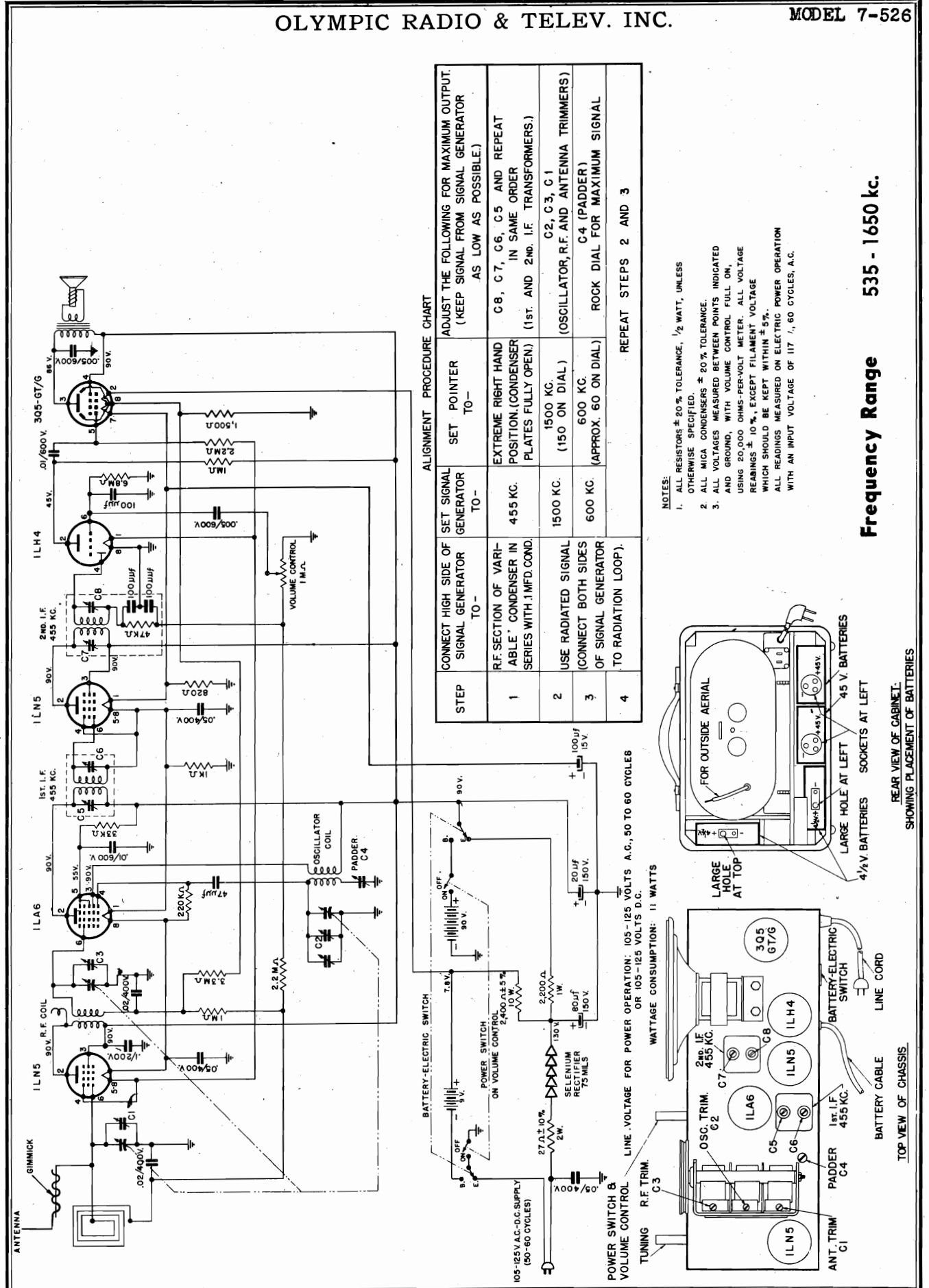
The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

REPLACEMENT PARTS

Part No.	Description	Part No.	Description
BK-405	Bracket-Resistor mounting bracket	RCPI0W6502A	Condenser-.005/600WV paper tubular condenser
		RE-407	Resistor-2600 ohms ±5% 10 watt resistor
CA-229	Cabinet-portable cabinet	REB102M	Resistor-1000 ohms ±20% ½ watt resistor
CB-335	Cable-battery cable	REB105M	Resistor-1 megohm ±20% ½ watt resistor
CL-177	Coil-oscillator coil	REB152M	Resistor-1500 ohms ±20% ½ watt resistor
CL-630	Coil-R.F. coil	REB222M	Resistor-2200 ohms ±20% ½ watt resistor
CO-182	Condenser-80/20/150WV & 100/15WV electrolytic condenser	REB224M	Resistor-220,000 ohms ±20% ½ watt resistor
CO 808	Condenser-50 mfd /25 W.V. electrolytic condenser	REB225M	Resistor-2.2 megohms ±20% ½ watt resistor
CR-299	Crystal-dial crystal	REB270K	Resistor-27 ohms ±10% ½ watt resistor
CT-388	Condenser-220-680 mmfd padder condenser	REB333M	Resistor-33,000 ohms ±20% ½ watt resistor
CV-146	Condenser-3 gang variable condenser (with pulley)	REB335M	Resistor-3.3 megohms ±20% ½ watt resistor
DL-391	Dial-metal dial scale	REB681M	Resistor-680 Ohms ±20% ½ watt resistor
ES-274-1	Escutcheon-moulded escutcheon	REB685M	Resistor-6.8 megohms ±20% ½ watt resistor
KN-260	Knob-walnut knob	RED101M	Resistor-100 ohms ±20% 2 watt resistor
KN-261	Knob-walnut knob with dot	SK-476	Speaker-5" P.M. Speaker with output transformer
LP-178	Loop-Antenna	SP-191	Spring-Drive shaft retaining spring
PO-395	Pointer-dial pointer	SW-185	Switch-battery-electric D.P.D.T. slide switch
PT-576	Control-volume control 1 megohm with D.P.S.T. switch	TR-707	Transformer-I.F. 455 K.C. input-Transformer
RCM20A101M	Condenser-100 mmf ±20% mica condenser	TR-708	Transformer-Output I.F. 455 K.C. Transformer with built-in I.F. filter
RCM20A470M	Condenser-47 mmfd ±20% mica condenser		
RCPI0W2104A	Condenser-.1/200WV paper tubular condenser		
RCPI0W4503A	Condenser-.05/400WV paper tubular condenser		
RCPI0W6103A	Condenser-.01/600WV paper tubular condenser		

OLYMPIC RADIO & TELEV. INC.

MODEL 7-526

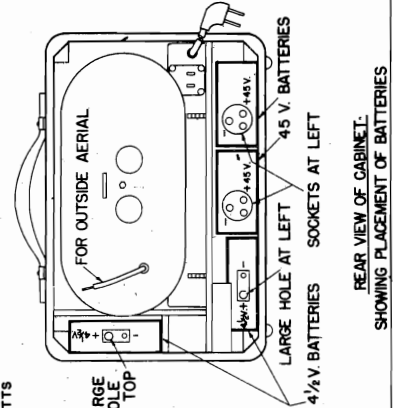


ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	SET POINTER TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH 1 MFD. COND.	455 KC.	EXTREME RIGHT HAND POSITION (CONDENSER PLATES FULLY OPEN)	C8, C7, C6, C5 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANSFORMERS.)
2	USE RADIATED SIGNAL (CONNECT BOTH SIDES OF SIGNAL GENERATOR TO RADIATION LOOP).	1500 KC.	1500 KC (150 ON DIAL)	C2, C3, C1 (OSCILLATOR, R.F. AND ANTENNA TRIMMERS)
3		600 KC.	600 KC (APPROX. 60 ON DIAL)	C4 (PADDER)
4				ROCK DIAL FOR MAXIMUM SIGNAL

REPEAT STEPS 2 AND 3

- NOTES:
1. ALL RESISTORS $\pm 20\%$ TOLERANCE, $\frac{1}{2}$ WATT, UNLESS OTHERWISE SPECIFIED.
 2. ALL MICA CONDENSERS $\pm 20\%$ TOLERANCE
 3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS $\pm 10\%$, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN $\pm 5\%$. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 ± 1 , 60 CYCLES, A.C.



Frequency Range 535 - 1650 kc.

OLYMPIC RADIO & TELEV. INC.

WHEN SERVICING THIS RECEIVER DO NOT PLACE CHASSIS ON A GROUNDED METALLIC BENCH.

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

To insure proper alignment, it is suggested to use a radiated signal. To radiate a signal connect a loop of about 6" to 8" diameter 1 turn of #14 or #12 wire across the output of the signal generator and place this loop parallel to the loop of the receiver to be aligned at a distance of about 8" or 10".

ALIGNMENT

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

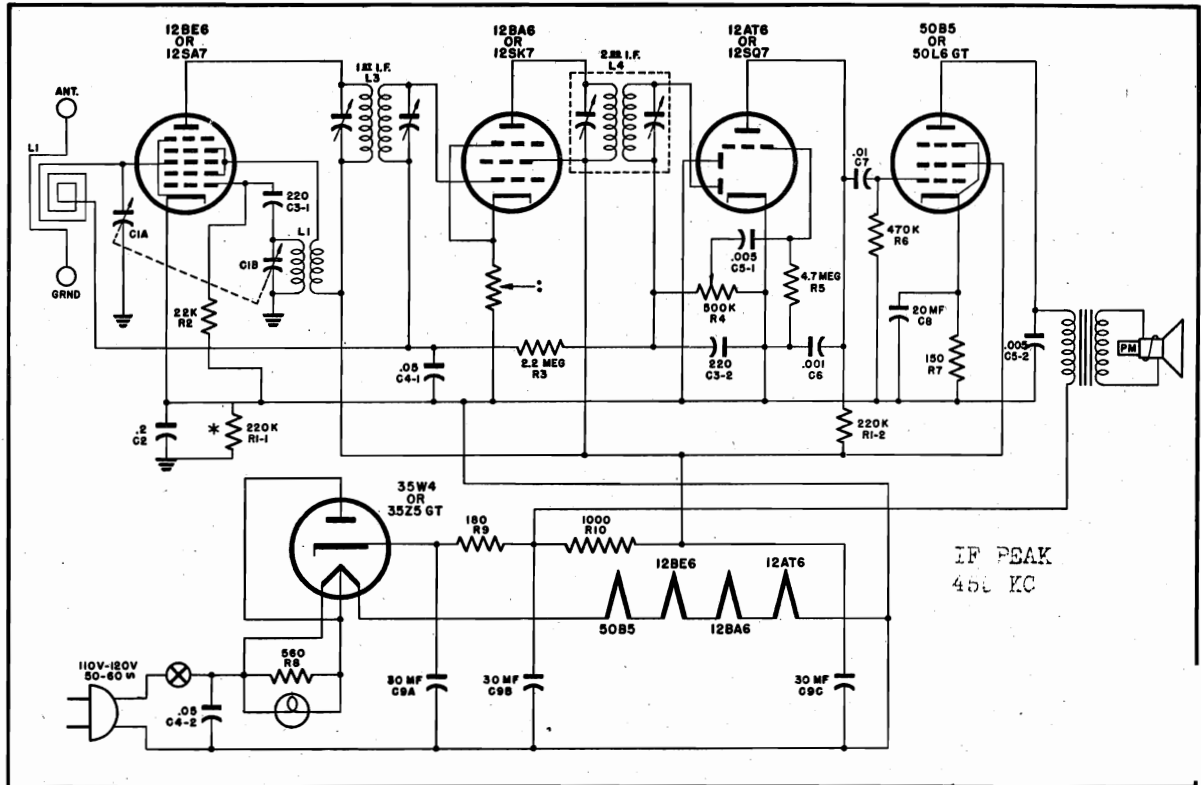
Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

BATTERIES

The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

REPLACEMENT PARTS

Part No.	Description	Part No.	Description
BK-405	Bracket-resistor mounting bracket	RE-879	Resistor-2400 ohms $\pm 5\%$ 10 watt resistor
CA-229	Cabinet-portable cabinet	REB102M	Resistor-1000 ohms $\pm 20\%$ ½ watt resistor
CB-335	Cable-battery cable	REB105M	Resistor-1 megohm $\pm 20\%$ ½ watt resistor
CL-954	Coil-r-f coil	REB152M	Resistor-1500 ohms $\pm 20\%$ ½ watt resistor
CL-957	Coil-oscillator coil	REB224M	Resistor-220,000 ohms $\pm 20\%$ ½ watt resistor
CO-182	Condenser-80/20/150 W.V. & 100/15 W.V. elect. condenser	REB225M	Resistor-2.2 megohms $\pm 20\%$ ½ watt resistor
CT-388	Condenser-220/680 mmfd. padder condenser	REB333M	Resistor-33,000 ohms $\pm 20\%$ ½ watt resistor
CV-816	Condenser-3 gang variable condenser	REB335M	Resistor-3.3 megohms $\pm 20\%$ ½ watt resistor
DL-872	Dial-metal dial scale	REB685M	Resistor-6.8 megohms $\pm 20\%$ ½ watt resistor
ES-274-1	Escutcheon-molded escutcheon	REB821M	Resistor-820 ohms $\pm 20\%$ ½ watt resistor
KN-352	Knob-walnut knob	REC222M	Resistor-2200 ohms $\pm 20\%$ 1 watt resistor
KN-947	Knob-walnut knob with dot	RED270K	Resistor-27 ohms $\pm 10\%$ 2 watt resistor
LP-993	Loop-antenna	RF-770	Rectifier-75 mils selenium rectifier
PO-395	Pointer-dial pointer	SK-476	Speaker-5" P.M. speaker
PT-576	Control-volume control	SP-191	Spring-drive shaft retaining spring
RCM20A101M	Condenser-100 mmfd. $\pm 20\%$ mica condenser	SP-295	Spring-pointer drive spring
RCM20A470M	Condenser-47 mmfd. $\pm 20\%$ mica condenser	SW-185	Switch-battery electric slide switch
RCP10W2104A	Condenser-.1/200 W.V. tubular paper condenser	TR-707	Transformer-455 kc first I.F. transformer
RCP10W4203A	Condenser-.02/400 W.V. tubular paper condenser	TR-708	Transformer-455 kc second I.F. transformer with diode filter
RCP10W4503A	Condenser-.05/400 W.V. tubular paper condenser		
RCP10W6103A	Condenser-.01/600 W.V. tubular paper condenser		
RCP10W6502A	Condenser-.005/600 W.V. tubular paper condenser		



*R1-1, 220,000 ohm resistor, is used only in sets utilizing metal, octal base tubes.

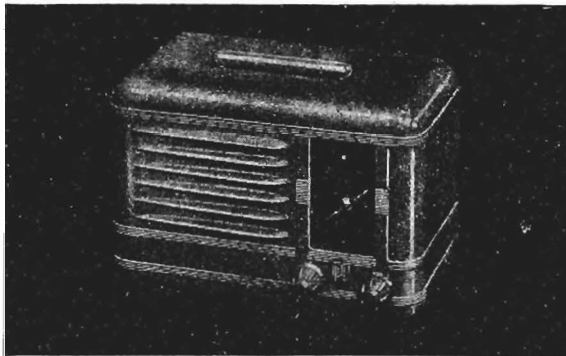
:180 ohm 1/2 watt resistor used for sets employing miniature glass tubes.

TABLE OF REPLACEABLE PARTS

PART NO.	REF. SYMBOL	DESCRIPTION
21004-AL		Cabinet, plastic: ivory
21004-BG		Cabinet, plastic: walnut
23503	C1A,B	Capacitor, variable
23018	C2	Capacitor, paper: .2 Mfd., 200 volt
23228	C3-1 C3-2	Capacitor, mica: 220 Mmf., 20%
23009	C4-1 C4-2	Capacitor, paper: .05 Mfd., 400 volt
23004	C5-1 C5-2	Capacitor, paper: .005 Mfd., 600 volt
23001	C6	Capacitor, paper: .001 Mfd., 600 volt
23006	C7	Capacitor, paper: .01 Mfd., 600 volt
24032	C8 C9A,B&C	Capacitor, electrolytic: 3 X 30 Mfd. 150 volt & 20 Mfd., 25 volt
28013		Clip, electrolytic
29308	L1	Loop, antenna
29203	L2	Coil, oscillator
29002	L3	Coil, 1st I.F.: 455 KC
29004D	L4	Coil, 2nd I.F.: 455 KC
32012-AB		Cord, AC:6' brown rubber
32011-AL		Cord, AC:6' white plastic
38032		Dial scale, stationized
38047		Dial scale, export
49009-AL		Handle, ivory
49009-AG		Handle, walnut
52027A-AL		Knob, plastic: ivory
52021A-BG		Knob, plastic: walnut
54002		Dial, lamp, bayonet base: T-47
55003		Crystal, dial
62000B		Panel, loop
68126		Instruction label

PART NO.	REF. SYMBOL	DESCRIPTION
73049	R1-1 R1-2	Resistor, carbon: 220,000 ohms, 20%, 1/2 watt
73041	R2	Resistor, carbon: 22,000 ohms, 10%, 1/2 watt
73055	R3	Resistor, carbon: 2.2 megohms, 20%, 1/2 watt
25001A	R4	Control, volume: 500,000 ohms, with AC switch
73057	R5	Resistor, carbon: 4.7 megohms, 20%, 1/2 watt
73051	R6	Resistor, carbon: 470,000 ohms, 20%, 1/2 watt
73081	R7	Resistor, carbon: 150 ohms, 10%, 1 watt
73022	R8	Resistor, carbon: 560 ohms, 10%, 1/2 watt
73077	R9	Resistor, carbon: 180 ohms, 10%, 1 watt
73071	R10	Resistor, carbon: 1000 ohms, 10%, 1 watt
77015		Shaft, dial drive
79002		Socket, tube: octal base, 8 prong wafer type
79012		Socket, tube: 8 prong miniature
79033		Socket, dial lamp: bayonet base
78029B		Shield, cabinet: paper
83004		Speaker, permanent magnet: 4"
84001		Spring, dial drive
84016		Spring, handle
89411		Transformer, output

AN EARLY RUN OF THESE RECEIVERS UTILIZED MINIATURE GLASS TUBES, CONSEQUENTLY THE INFORMATION SHOWN HAS BEEN COMPILED TO ACCOMODATE MINIATURE GLASS OR OCTAL BASE TUBES.



SPECIFICATIONS

- Overall Dimensions:**
 Height 6"
 Width 9 1/4"
 Depth 5"
 Weight 5 1/4 lbs.
- Electrical Rating:**
 Line Voltage . . . 110-120 volts AC-DC
 Power Consumption . . . 28 watts
- Tuning Frequency Range:**
 540 to 1740 KC
- Intermediate Frequency:**
 455 KC
- Electrical Power Output:**
 Maximum 1.7 watts
- Loudspeaker:**
 Type . . . Permanent Magnet
 Outside Cone Diameter . . . 4"
 Voice Coil Impedance . . . 3.2 ohms at 400 cycles
 Magnet Rating . . . 1.0 Oz. Alnico 5
- Tubes:**
- | Tube | Function |
|-----------------------|---------------------|
| No. 1 12BE6 or 12SA7 | Frequency Converter |
| No. 2 12BA6 or 12SK7 | I. F. Amplifier |
| No. 3 12AT6 or 12SQ7 | Detector Amplifier |
| No. 4 50B5 or 50L6-GT | Power Amplifier |
| No. 5 35W4 or 35Z5-GT | Rectifier |

All D.C. voltages measured with a vacuum tube voltmeter from socket contacts to ground buss.—A.C. voltages measured with a 1000 ohms per volt A.C. meter from socket contacts to ground buss.*—Volume Control maximum.—No signal.—117 volts A.C. line voltage.—All voltages shown are positive D.C. unless otherwise noted.
 *NOTE: Filament voltages should be measured across the filament of the tube.

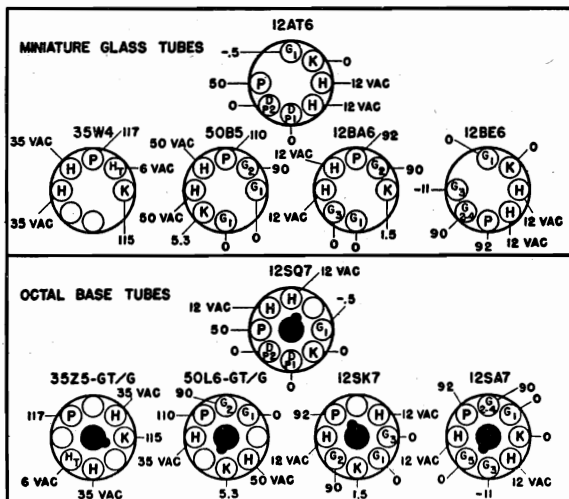


FIGURE 1—SOCKET VOLTAGES

GENERAL INFORMATION

Model 5DA is a superheterodyne receiver employing five tubes and a permanent magnet speaker. This model is for operation on AC or DC current and is enclosed in a plastic cabinet.

SPECIAL SERVICE INFORMATION

- Stage Gain Measurements:**
 Measurements taken with volume control maximum. — AVC shorted out.
 Standard Output . . . 50 milliwatts
 Dummy antenna . . . 200 Mmf.
 Converter Grid to 1st I.F. Grid . . . 71X at 1000 KC
 Converter Grid to 1st I.F. Grid . . . 78X at 455 KC
 1st I.F. Grid to 2nd Detector . . . 77X at 455 KC
 Overall Audio Gain . . . 375X at .5 watts 400 cycles

- Oscillator Grid Voltages:**
 At 117 volts AC line voltages. — Measurements made with an A.C. vacuum tube voltmeter input loading above 10 megohms.
 600 KC . . . 15 volts AC 1500 KC . . . 20 volts AC

- D.C. Resistance Measurements:**
- | | | |
|-----------------|-------------------------|---------------------------|
| 1st I.F. Coil | Primary . . . 17.5 ohms | Secondary . . . 17.5 ohms |
| 2nd I.F. Coil | Primary . . . 14.5 ohms | Secondary . . . 14.5 ohms |
| Oscillator Coil | Primary . . . 1.2 ohms | Secondary . . . 4.5 ohms |

ALIGNMENT PROCEDURE

Alignment Procedure consists of the four steps outlined in the Alignment Procedure Chart.
 For Step No. 1, I.F. Alignment, connect the leads of a test oscillator to the mixer grid and the ground buss through an .01 Mfd. capacitor (dummy load). Upon completion of this step "Rock" the variable condenser to assure that the I.F.s have been aligned to the correct frequency. Output should remain constant at any setting of the variable condenser.
 Steps 2 to 4 employ a Hazeltine Standard Test Loop No. 1150, or a reasonable substitute. Connect the test oscillator leads across this loop and place it in a vertical position about two feet from the receiver loop.
IMPORTANT NOTICE: Make certain that each step is done with a minimum input signal.

ALIGNMENT CHART

CONNECT STEP	TEST OSC. TO	TEST OSC. SETTING	ADJUST POINTER FOR MAX. SETTING	ADJUST FOR MAX. OUTPUT
1	Mixer Grid & Grd. .01 Mfd. Cap.	455 KC	540 KC	Trimmers A, B, C, & D
2	Standard* Test Loop	1740 KC	1740 KC	Trimmer E to 1740 KC
3	Standard* Test Loop	1500 KC	1500 KC	Trimmer F
4	Standard* Test Loop	600 KC	600 KC	Loop

*NOTE: Hazeltine Standard Test Loop No. 1150 or a reasonable substitute.

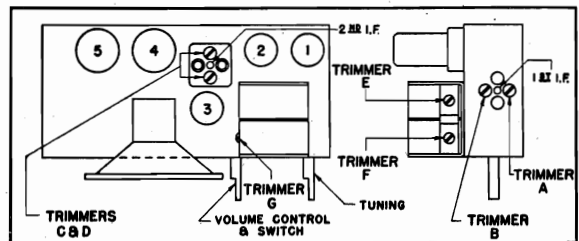
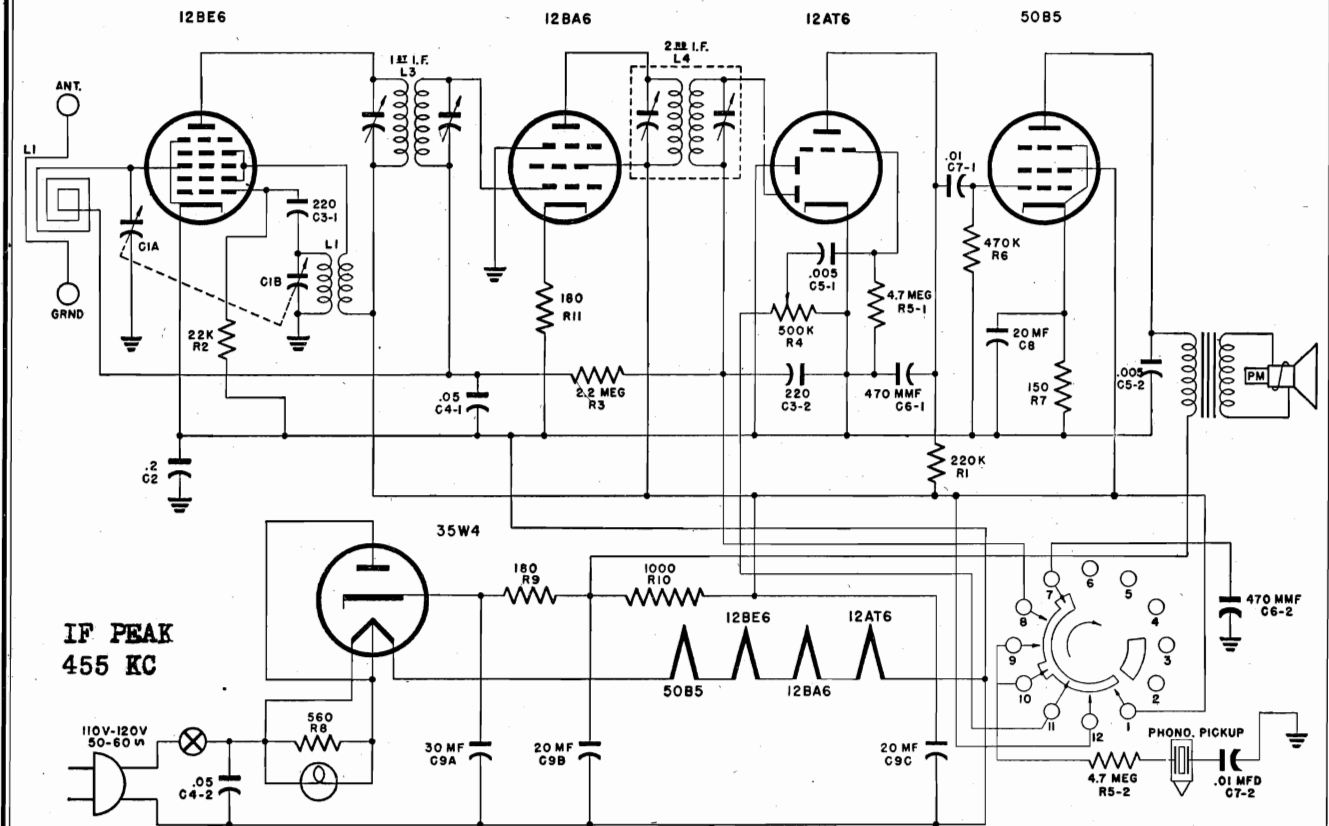


FIGURE 2—TRIMMER LOCATION



PART NO.	REF. SYMBOL	DESCRIPTION	PART NO.	REF. SYMBOL	DESCRIPTION
18004A		Bracket, pilot light	65042A		Plate, paper: dial
18012		Pick-up rest	66013		Plug, phono
20001B		Button plug	66008		Plug, phono motor
21027B		Cabinet, power cord holder	67005		Pointer, dial
21046C		Cabinet, wood: fabricoid covered	73049	R1	Resistor, carbon: 220,000 ohms, 20%, 1/2 watt
23503	C1A & B	Capacitor, variable: two gang with pulley	73041	R2	Resistor, carbon: 22,000 ohms, 10%, 1/2 watt
23018	C2	Capacitor, paper: .2 Mfd., 200 volt	73055	R3	Resistor, carbon: 2.2 megohms, 20%, 1/2 watt
23228	C3-1	Capacitor, mica: 220 Mmf., 20%	25001A	R4	Control, volume: 500,000 ohms, with AC switch
23009	C3-2		73057	R5-1	Resistor, carbon: 4.7 megohms, 20%, 1/2 watt
23009	C4-1	Capacitor, paper: .05 Mfd., 400 volt	R5-2		
23004	C4-2		73051	R6	Resistor, carbon: 470,000 ohms, 20%, 1/2 watt
23916	C5-1	Capacitor, paper: .005 Mfd., 600 volt	73081	R7	Resistor, carbon: 150 ohms, 10%, 1 watt
23916	C5-2		73022	R8	Resistor, carbon: 560 ohms, 10%, 1/2 watt
23916	C6-1	Capacitor, mica: 470 Mmf., 20%	73077	R9	Resistor, carbon: 180 ohms, 10%, 1 watt
23916	C6-2		73071	R10	Resistor, carbon: 1000 ohms, 10%, 1 watt
23006	C7-1	Capacitor, paper: .01 Mfd., 600 volt	73016	R11	Resistor, carbon: 180 ohms, 10%, 1/2 watt
23006	C7-2		77017		Shaft, dial drive
24032	C8	Capacitor, electrolytic: 30 Mfd., 2 x 20 Mfd., 150 WV & 25 Mfd., 25 WV	78019		Shield, AC switch
28013	C9A,B & C	Clip, electrolytic	78026		Shield, phono plug
29320	L1	Loop antenna	79004		Socket, phono
29203	L2	Coil, oscillator	79007		Socket, phono motor
29002	L3	Coil, 1st I.F.: 455 KC	79012		Socket, tube: 7 prong miniature
29004D	L4	Coil, 2nd I.F.: 455 KC	79033		Socket, dial lamp: bayonet base
32012-AB		Cord, AC: 6' brown rubber	83004		Speaker, permanent magnet: 4"
38044B		Dial scale, stationized	84001		Spring, dial drive
38053		Dial scale, export	86005B		Switch, rotary: radio-phono
38053		Escutcheon, AC switch	86701A		Switch, slide: AC phono motor
41002		Knob, bar	89411		Transformer, output
52014		Lamp, dial: bayonet base			
54002		Crystal, dial			
55008		Motor, phono			
58012		Needle, phono: permanent, osmium tip			
59003		Panel, cabinet			
62030A		Panel, motor			
62031A		Pick-up arm			
63023		Pick-up cartridge			
63024					



SPECIFICATIONS

Overall Dimensions:

Width 15" Depth 13 1/8"
 Height 7 3/4" Weight 15 lbs.

Electrical Rating:

Line Voltage 110-120 volts AC
 Power Consumption 43 watts

Tuning Frequency Range: Intermediate Frequency:

540 to 1740 KC 455 KC

Electrical Power Output:

Maximum 1.7 watts

Loudspeaker:

Type Permanent Magnet
 Outside Cone Diameter 4"
 Voice Coil Impedance 3.2 ohms at 400 cycles
 Magnet Rating 1.0 Oz. Alnico 5

Tubes:

- 12BE6 Frequency Converter
- 12BA6 I. F. Amplifier
- 12AT6 Detector Amplifier
- 50B5 Power Amplifier
- 35W4 Rectifier

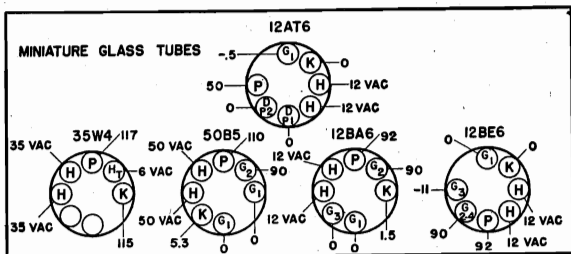


FIGURE 1—SOCKET VOLTAGES

All D.C. voltages measured from socket contacts to ground buss with a vacuum tube voltmeter. — A.C. voltages measured with a 1000 ohms per volt A.C. meter from socket contacts to ground buss.* — volume control maximum. — No Signal. — 117 A.C. line voltage. — All voltages shown are positive D.C. unless otherwise noted.

*NOTE: Filament voltages should be measured across the filament of the tube.

GENERAL INFORMATION

Model 568 is a combination superheterodyne receiver and phonograph. This model employs a permanent magnet speaker and a specially designed "Hi-Q" loop antenna. The model is capable of playing ten or twelve-inch records and is enclosed in a fabricoid covered carrying case.

IMPORTANT: While it is true this model uses a conventional "AC-DC" circuit, it must be confined to AC operation due to the AC phonograph motor.

NOTE: The 3 position Radio-Phono switch shown in the Schematic Diagram was used in the major portion of this model. A very small quantity utilized a 4 position switch. The overall wiring differs very little; the extra position on the 4 position switch provides a "Radio-Tone" position.

SPECIAL SERVICE INFORMATION

Stage Gain Measurements:

Measurements taken with volume control maximum. — AVC shorted out.

- Standard Output 50 milliwatts
- Dummy Antenna 200 Mmf.
- Converter Grid to 1st I.F. Grid 71X at 1000 KC
- Converter Grid to 1st I.F. Grid 78 X at 455 KC
- 1st I.F. to 2nd Detector 77X at 455 KC
- Overall Audio Gain 375X at 5 watts 400 cycles

Oscillator Grid Voltages:

600 KC 15 volts AC 1500 KC 20 volts AC

DC Resistance Measurements:

- 1st I.F. Coil
- Primary 17.5 ohms Secondary 17.5 ohms
- 2nd I.F. Coil
- Primary 14.5 ohms Secondary 14.5 ohms
- Oscillator Coil
- Primary 1.2 ohms Secondary 4.5 ohms

ALIGNMENT PROCEDURE

Alignment Procedure consists of the four steps outlined in the Alignment Chart.

For Step No. 1, I.F. Alignment, connect the leads of a test oscillator to the mixer grid and the ground buss through an .01 Mfd. capacitor (dummy load). Upon completion of this step "Rock" the variable condenser to assure that the I.F.s have been aligned to the correct frequency. Output should remain constant at any setting of the variable condenser.

Steps 2 to 4 employ a Hazeltine Standard Test Loop No. 1150 or a reasonable substitute. Connect the test oscillator leads across this loop and place it in a vertical position about two feet from the receiver loop.

IMPORTANT NOTICE: Make certain that each step is done with a minimum input signal.

ALIGNMENT CHART

STEP	CONNECT TEST OSC. TO	TEST OSC. SETTING	POINTER ADJUST SETTING FOR MAX. OUTPUT
1	Mixer Grid & Grd. .01 Mfd. Cap.	455 KC	540 KC Trimms A, B, C & D
2	Standard* Test Loop	1740 KC	1740 KC Trimmer E to 1740 KC
3	Standard* Test Loop	1500 KC	1500 KC Trimmer F
4	Standard* Test Loop	600 KC	600 KC Loop

*NOTE: Hazeltine Standard Test Loop or a reasonable substitute.

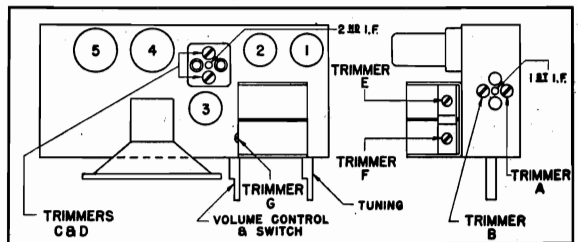
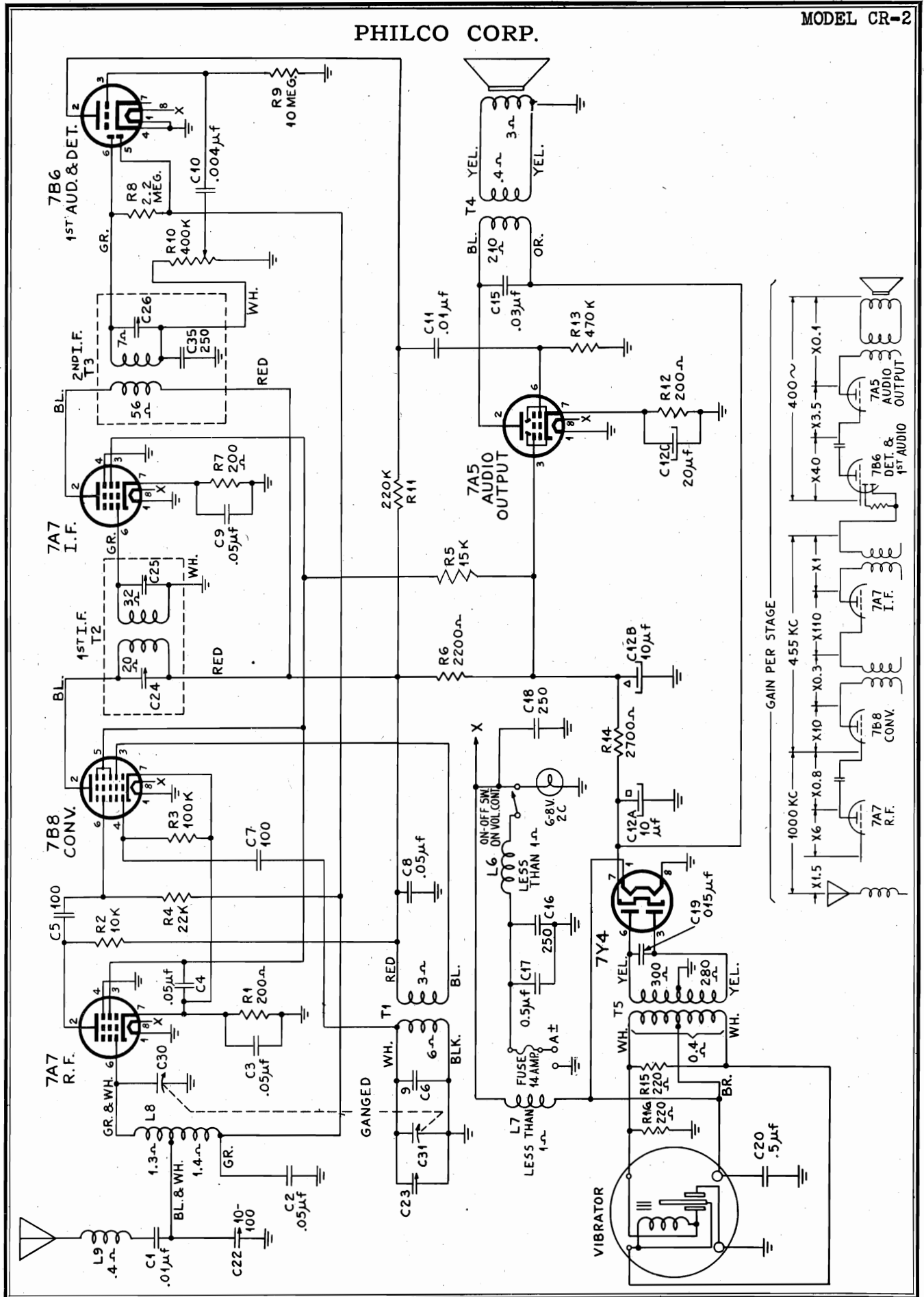


FIGURE 2—TRIMMER LOCATION

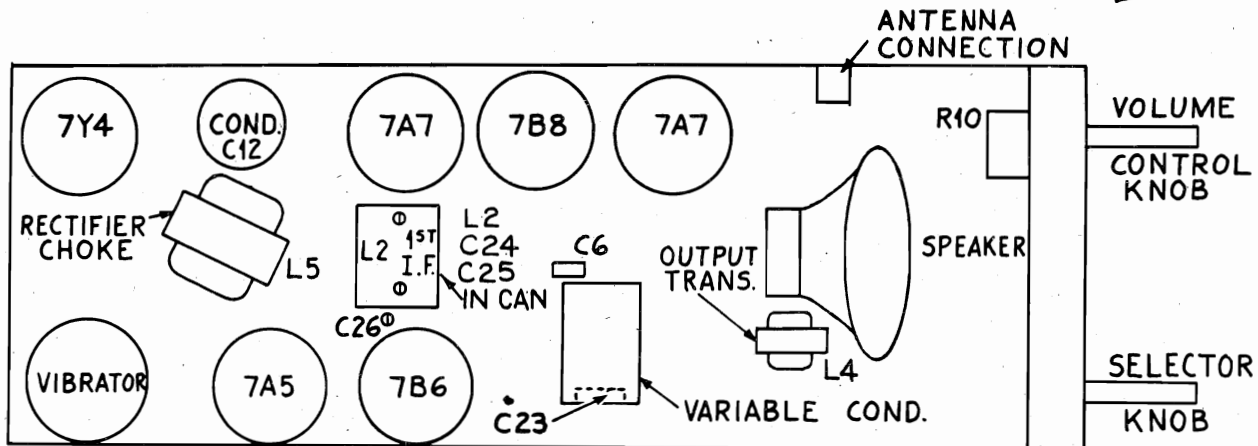
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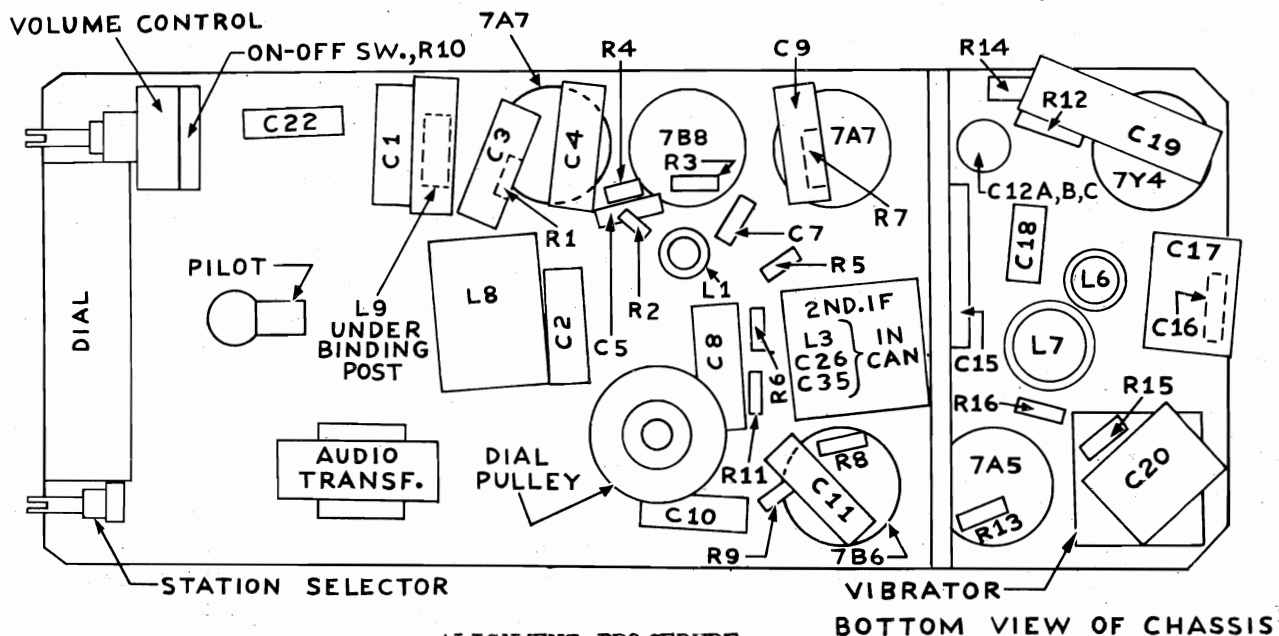
MODEL CR-2

PHILCO CORP.

FRONT



TOP VIEW OF CHASSIS



ALIGNMENT PROCEDURE

BOTTOM VIEW OF CHASSIS

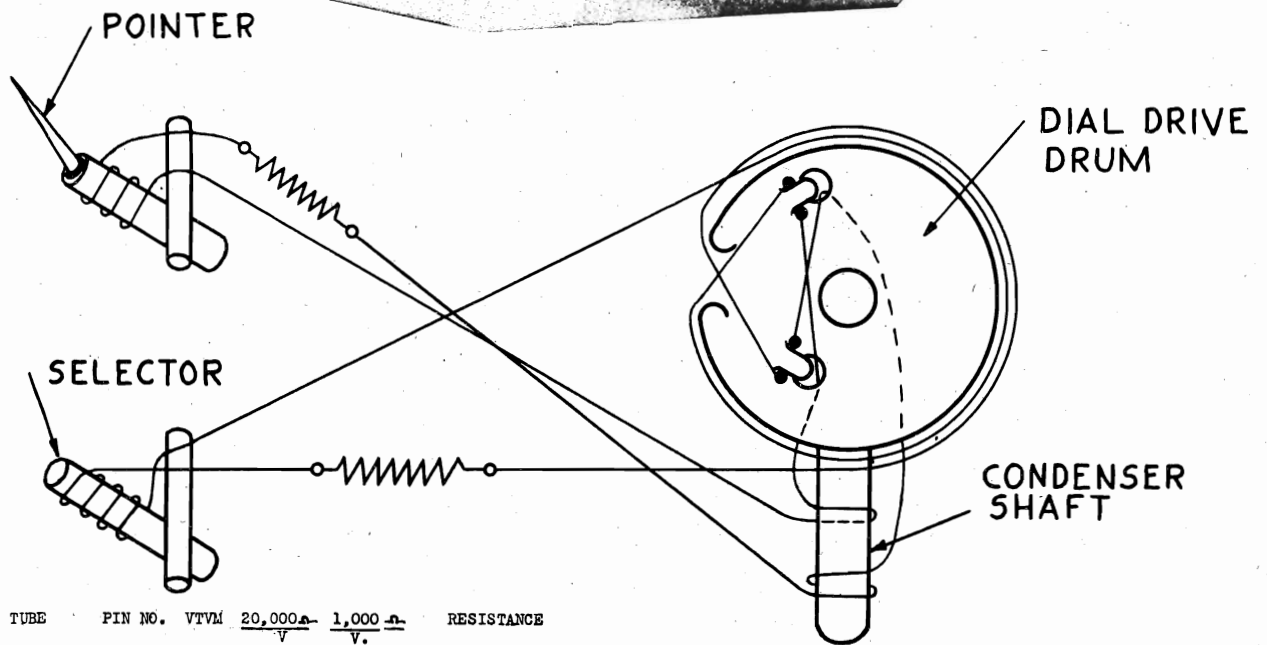
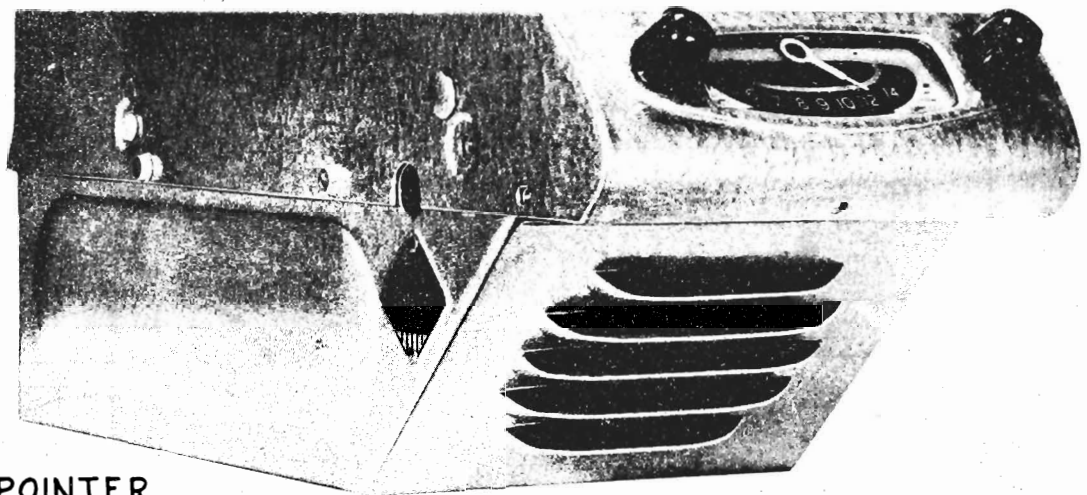
CONNECT AN OUTPUT METER ACROSS THE VOICE COIL AND THE SPEAKER. CONNECT A SIGNAL GENERATOR THRU A .01 mf CONDENSER TO THE ANTENNA LEAD. MESH THE VARIABLE TUNING CONDENSER FULLY. (PIN 4 OF THE 7B8 SHOULD BE GROUNDED WHILE ALIGNING THE IF STAGE) SET THE SIGNAL GENERATOR TO 455 KC. TURN THE VOLUME CONTROL OF THE RECEIVER TO MAXIMUM. TURN UP THE OUTPUT OF THE SIGNAL GENERATOR SO THAT THERE IS A SMALL DEFLECTION ON THE OUTPUT METER. NOW ADJUST IF TRIMMERS C26, C25 AND C24 FOR A MAXIMUM DEFLECTION ON THE METER.

TO ALIGN THE OSCILLATOR STAGE, CONNECT THE SIGNAL GENERATOR THRU A 50 MMF CONDENSER TO THE ANTENNA LEAD. TUNE BOTH THE RECEIVER AND THE SIGNAL GENERATOR TO 1600 KC. TURN UP THE OUTPUT OF THE SIGNAL GENERATOR SO THAT THERE IS A SMALL DEFLECTION ON THE OUTPUT METER. ADJUST OSCILLATOR TRIMMER C23, FOR A MAXIMUM DEFLECTION ON THE METER.

TO ALIGN RF STAGE FOLLOW ABOVE PROCEDURE EXCEPT THAT THE RECEIVER AND SIGNAL GENERATOR ARE TUNED TO 1400 KC AND TRIMMER C22 IS ADJUSTED FOR MAXIMUM DEFLECTION ON THE OUTPUT METER.

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MODEL CR-2

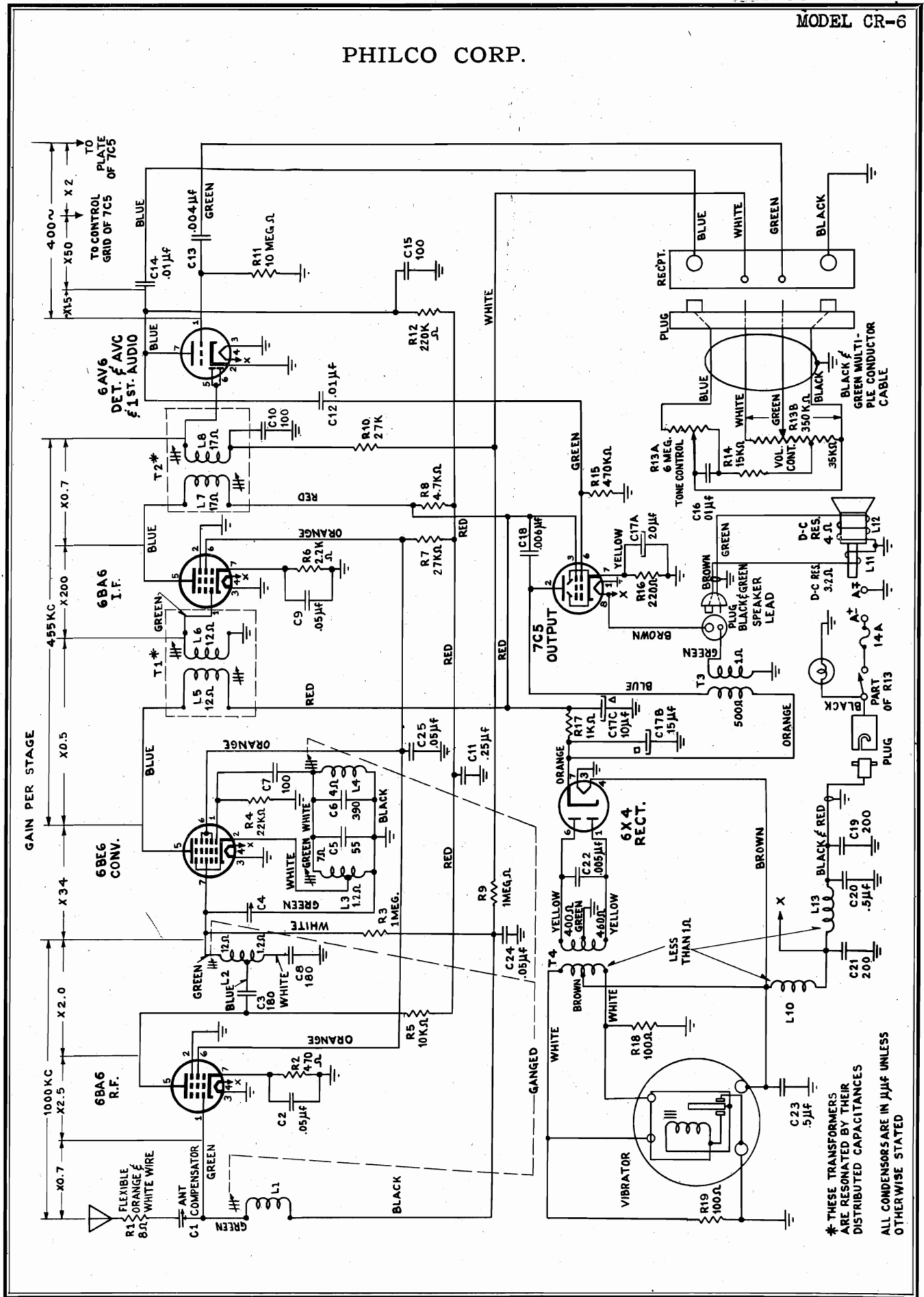


TUBE	PIN NO.	VTVM	20,000 Ω V	1,000 Ω V	RESISTANCE
7 A 7 RF	1	0	0	0	0
	2	55V.	51V.	46V.	OVER 5 MEG.
	3	47V.	46V.	43V.	OVER 5 MEG.
	4	0	0	0	0
	5	0	0	0	0
	6	-1.2V.	35V.	-.04V.	2.7 MEG.
	7	1.1V.	1V.	1V.	200 Ω
	8	6.2V.	6V.	6.1V.	.3 Ω
7 B 8 CONVERTER	1	0	0	0	0
	2	78V.	77V.	72V.	OVER 5 MEG.
	3	78V.	77V.	72V.	OVER 5 MEG.
	4	-12V.	-8.3V.	-3.3V.	125 K
	5	47V.	46 V	48V.	OVER 5 MEG.
	6	-1.05 V.	.16V.	-.01V.	2.8 MEG.
	7	1.15V.	1V.	1V.	200 Ω
	8	6.2V.	6V.	6V.	.3 Ω
7 A 7 IF	1	0	0	0	0
	2	78V.	76V.	71V.	OVER 5 MEG.
	3	48V.	46V.	43V.	OVER 5 MEG.
	4	0	0	0	0
	5	0	0	0	0
	6	0	0	0	30 Ω
	7	1.15V.	1V.	1V.	210 Ω
	8	6.2V.	6V.	6V.	.3 Ω
7 B 6 DET. & 1st AUDIC 2	1	0	0	0	0
	3	57V.	54V.	23V.	OVER 5 MEG.
	4	-.95V.	-.36V.	-.1V.	OVER 5 MEG.
	5	0	0	0	.2 Ω
	6	-1V.	-.29V.	-.03V.	2.7 MEG.
	7	-1.2V.	-.42V.	-.05V.	360 K.
	8	6.2V.	6V.	6V.	.3 Ω

7A5 AUDIO OUTPUT	1	0	0	0	0
	2	124V.	124V.	120V.	OVER 30 MEG.
	3	95V.	97V.	90V.	OVER 30 MEG.
	4	--	--	--	--
	5	--	--	0	650 K
	6	.05V.	0	0	210 Ω
	7	6.3V.	6V.	6V.	.3 Ω
	8	6.2V.	6V.	6V.	.3 Ω
7Y4 RECTIFIER	1	6.2V.	6V.	6.1V.	.3 Ω
	2	--	--	--	--
	3	A C	A C	A C	240 Ω
	4	--	--	--	--
	5	--	--	--	--
	6	A C	A C	A C	260 Ω
	7	130V.	120V.	120V.	OVER 5 MEG.
	8	0	0	0	0
VIBRATOR	1	0	0	0	0
	2 3	6V.	5.7V.	6V.	.6 Ω
	3	6V.	5.7V.	6V.	.6 Ω
	1 4	6.2V.	5.9V.	6.2V.	.4 Ω

VOLTAGE MEASURED WHEN "A" VOLTAGE = 6.4V.,
THE CONDENSER FULLY MESHED AND VOLUME CONTROL AT MINIMUM.

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* THESE TRANSFORMERS ARE RESONATED BY THEIR DISTRIBUTED CAPACITANCES
 ALL CONDENSORS ARE IN μJF UNLESS OTHERWISE STATED

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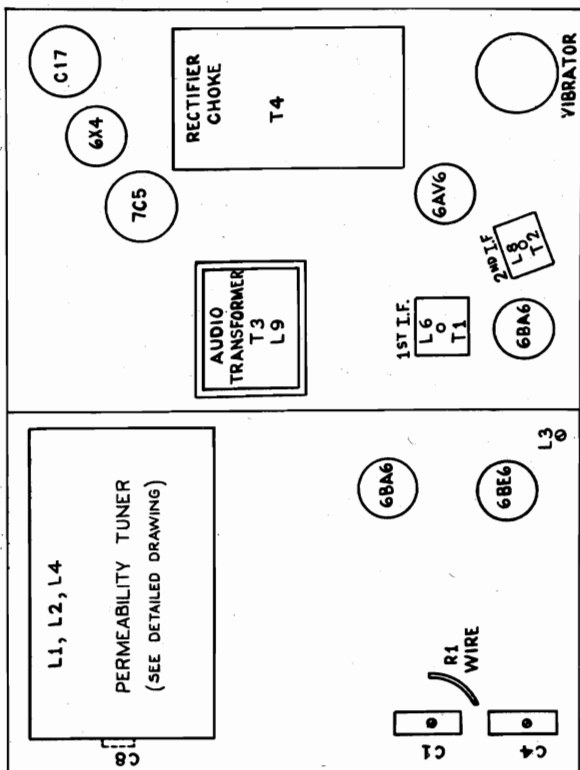
ALIGNMENT PROCEDURE

TO ALIGN SET, CONNECT ALL LEADS AND CABLES FROM THE CONTROL UNIT TO THE CHASSIS HOUSING. CONNECT THE SPEAKER TO THE CHASSIS HOUSING. CONNECT THE OUTPUT METER TO THE VOICE COIL OF THE SPEAKER. SET RECEIVER VOLUME CONTROL TO MAXIMUM. CONNECT THE SIGNAL GENERATOR THROUGH A .01 MF CONDENSER TO THE ANTENNA LEAD OF THE RECEIVER. TUNE RECEIVER TO ITS LOWEST FREQUENCY. (TUNING SLUG INSERTED IN COIL AS FAR AS POSSIBLE.

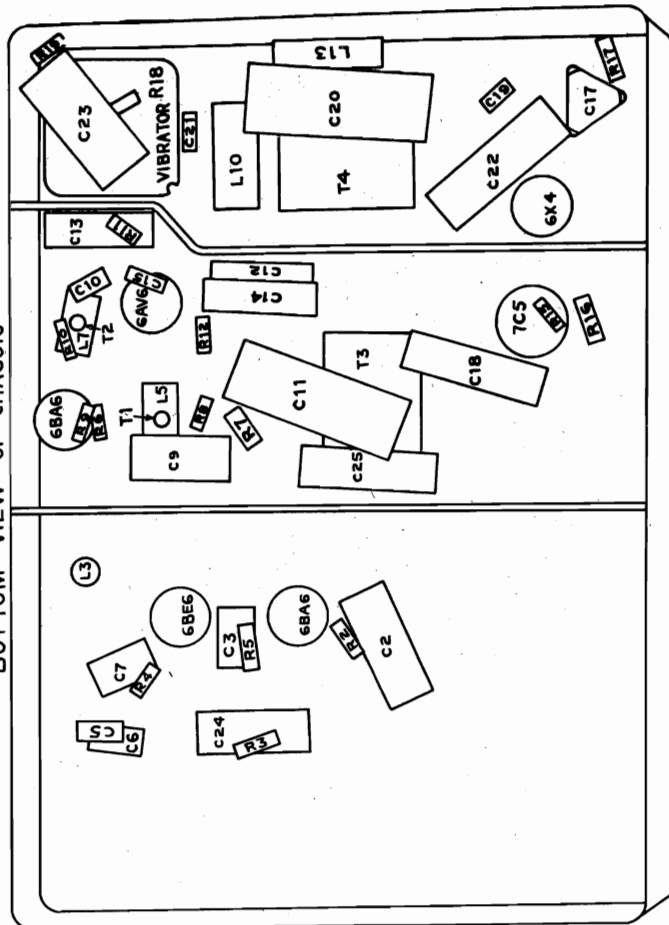
SET SIGNAL GENERATOR TO 455KC AND SET THE OUTPUT SO THAT A DEFLECTION ON THE OUTPUT METER IS JUST NOTICEABLE. ADJUST SLUGS L8, L7, L6, AND L5 (IN ORDER GIVEN) FOR A MAXIMUM DEFLECTION ON THE METER.

NEXT CONNECT THE SIGNAL GENERATOR THROUGH A 50MMF CONDENSER TO THE ANTENNA LEAD. SET THE SIGNAL GENERATOR AND THE RECEIVER TO 600KC. THE VOLUME OF THE RECEIVER SHOULD BE AT MAXIMUM AND THE OUTPUT OF THE SIGNAL GENERATOR IS GREAT ENOUGH SO THAT A DEFLECTION IS JUST POSSIBLE ON THE OUTPUT METER. ADJUST L3 FOR MAXIMUM DEFLECTION.

REPEAT THE ABOVE SETUP AT 800KC, AND ADJUST C4 FOR MAXIMUM DEFLECTION. REPEAT ABOVE SETUP AT 1400KC AND ADJUST C1 FOR MAXIMUM DEFLECTION.

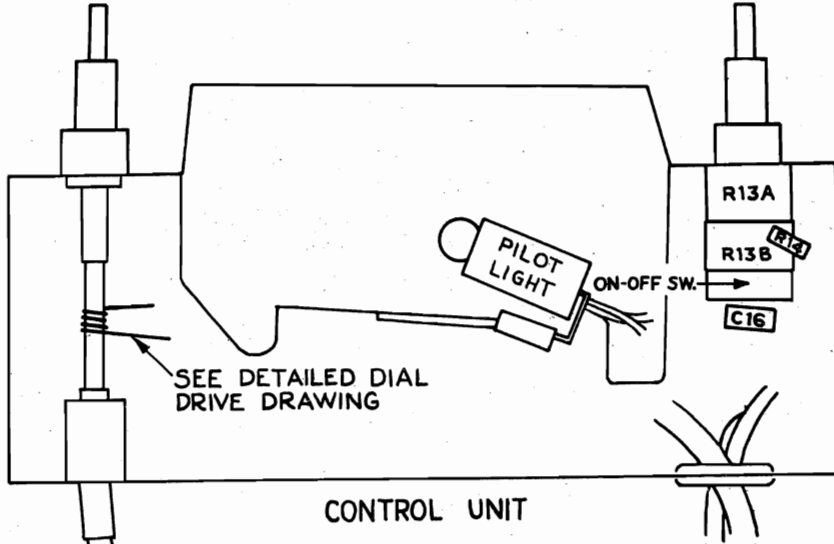
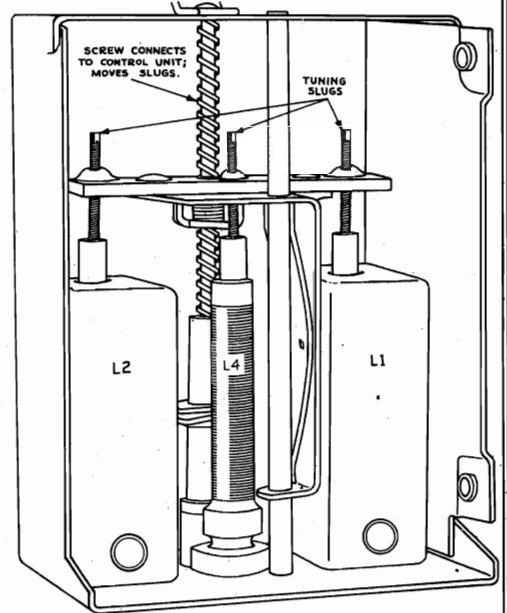
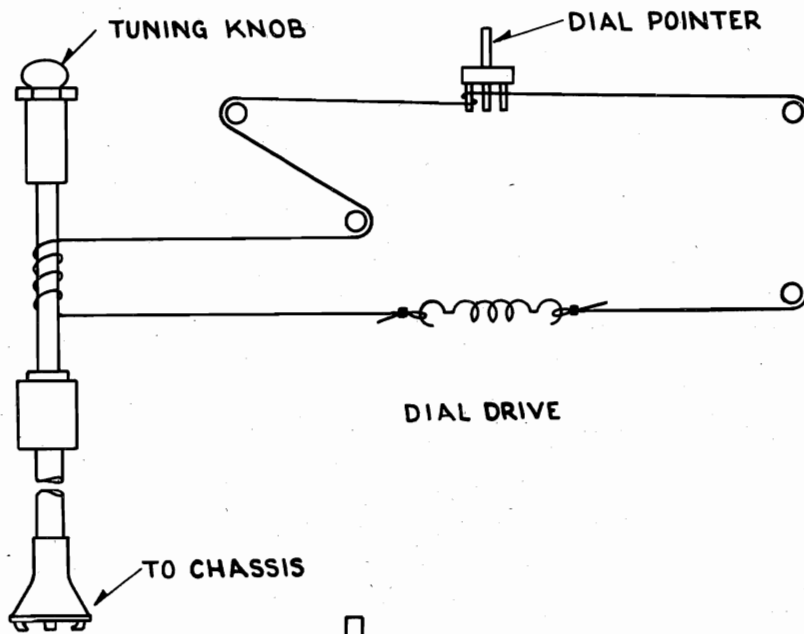


TOP VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

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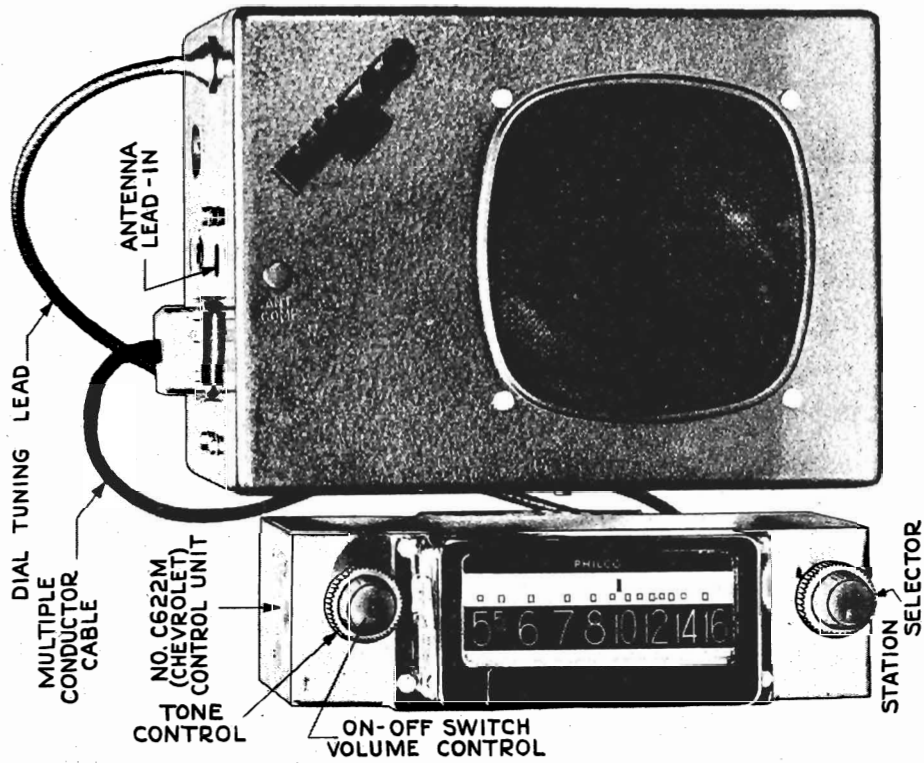


TUBE	PIN NO.	VTVM	20,000	1,000	RESISTANCE	7 C 5	1	0	0	0		
6 B A 6 RF	1	-0.65V	-2 V	0 V.	1.2 MEG.	AUDIO OUTPUT	2	220V	210V.	200V.	0	
	2	0V	0 V	0 V.	0		3	220V	210V.	200V.	OVER 5 MEG.	
	3	0V	0 V	0 V.	0		4	235V	230V	220V	OVER 5 MEG.	
	4	5.5V	5.3V.	5.4V.	0.5		5	—	—	—	—	
	5	160V	160V.	160V.	OVER 5 MEG.		6	0.05V	0V.	0V	400 K	
	6	60V	58V	52V.	OVER 5 MEG.		7	7.7V	8V.	8V	210	
	7	1.44 V	1.3 V.	1.3 V.	500		8	5.5V	5.3	5.5V	0.4	
6 B E 6 CONV	1	-3.5V	-2.5V	-1.2V.	24 K	6 X 4 RECTIFIER	1	A.C.	A.C.	A.C.	460	
	2	0V.	0V.	0V.	1.4		2	0V	0V.	0V.	0V.	0
	3	0V	0V.	0V.	0		3	0V	0V.	0V.	0V.	0
	4	5.5V	5.3V	5.4V	0.5		4	5.4V	5.2V.	5.3V.	5.3V.	0.5
	5	220V	220V.	200V.	OVER 5 MEG.		5	—	—	—	—	—
	6	60V	59V.	51V.	OVER 5 MEG.		6	A.C.	A.C.	A.C.	A.C.	420
	7	-0.6V	-0.1V.	0V.	2.2 MEG.		7	237V	220V.	220V.	220V.	OVER 5 MEG.
6 B A 6 IF	1	0V	0V	0V	17.5	VIBRATOR	1	0V	0V.	0V.	0	
	2	0V	0V	0V	0		2	5.3V	5.0V	5.2V	5.2V	.8
	3	0V	0V	0V	0		3	5.3V	5.0V	5.2V	5.2V	.8
	4	5.5V	5.4V	5.4V	0.4		4	5.4V	5.2V	5.3V	5.3V	.6
	5	220V	210V	210V	OVER 5 MEG.							
	6	60V	58V	52V	OVER 5 MEG.							
	7	3.5V	3.0V	2.8V	2K							
6 A V 6 DET & 1ST AUDIO	1	-0.7V	-0.4V.	-0.1V	10 MEG							
	2	0V	0V.	0V.	0							
	3	0V	0V	0V.	0							
	4	5.5V	5.3V.	5.4V.	0.4							
	5	-0.75V	-0.5V.	-0.2V.	280							
	6	-0.75V	-0.5V.	-0.2V.	300 K							
	7	105V	100V	54V	OVER 5 MEG.							

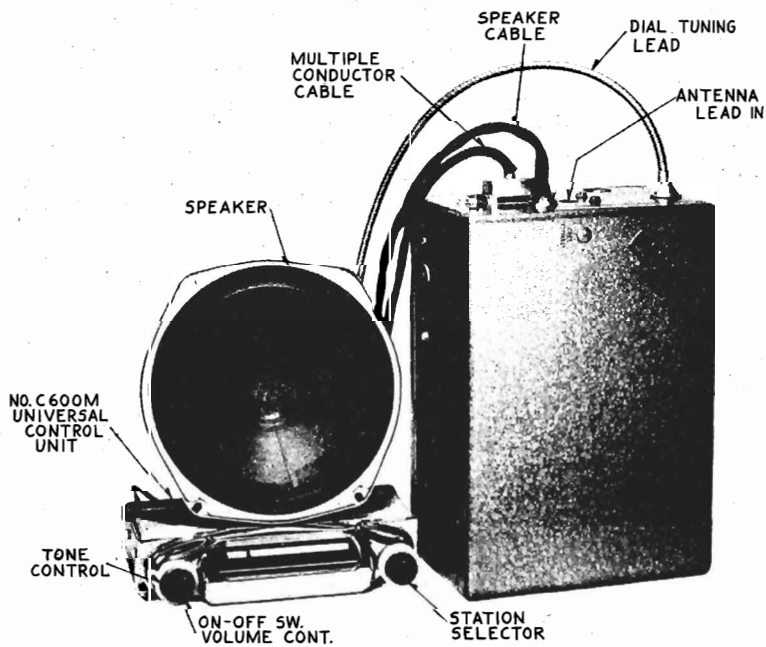
VOLTAGE MEASURED WHEN "A" VOLTAGE = 6.0 V, TUNING SLUG AT LOWEST FREQUENCY, VOLUME CONTROL AT MINIMUM, TONE CONTROL FULLY CLOCKWISE.

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CR-4

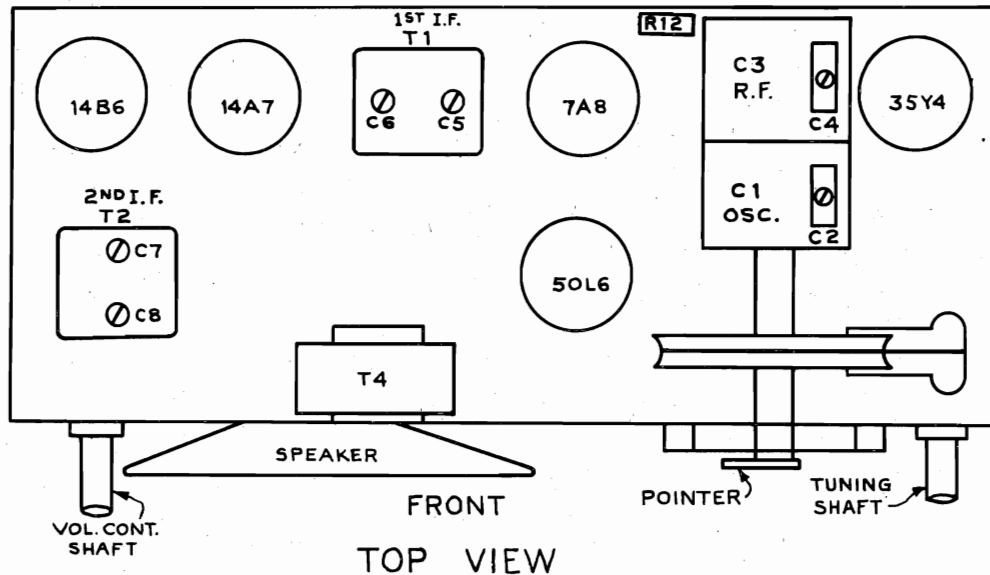


CR-6

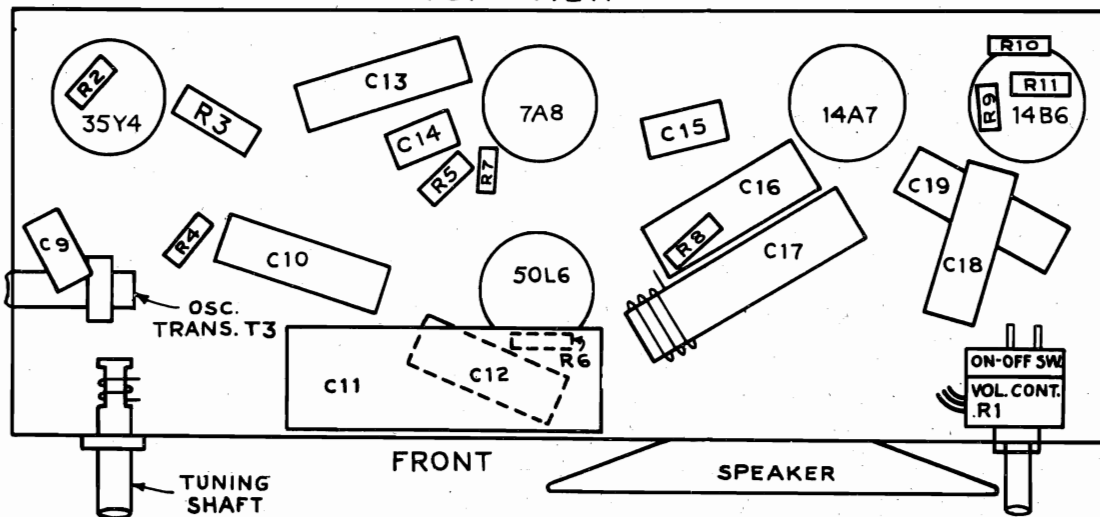


MODEL 46-200

PHILCO CORP.



TOP VIEW



BOTTOM VIEW

ALIGNMENT

Remove the chassis from the cabinet and connect the output meter to the left terminal (High) and the center terminal (Low) of the three lug terminal strip on the rear of the chassis.

Connect the Signal generator to the standard Hazeltine loop, Model 1150 and couple it loosely to the receiver loop.

Set the Volume at maximum, and fully mark the tuning condenser.

The output of the signal generator should be just sufficient to give a readable deflection on the output meter.

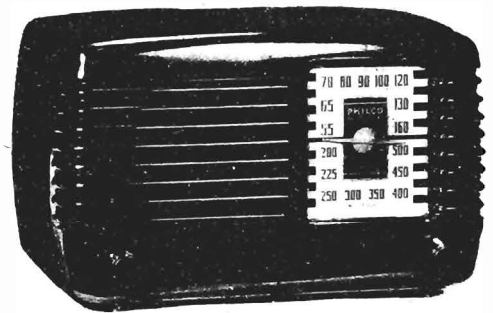
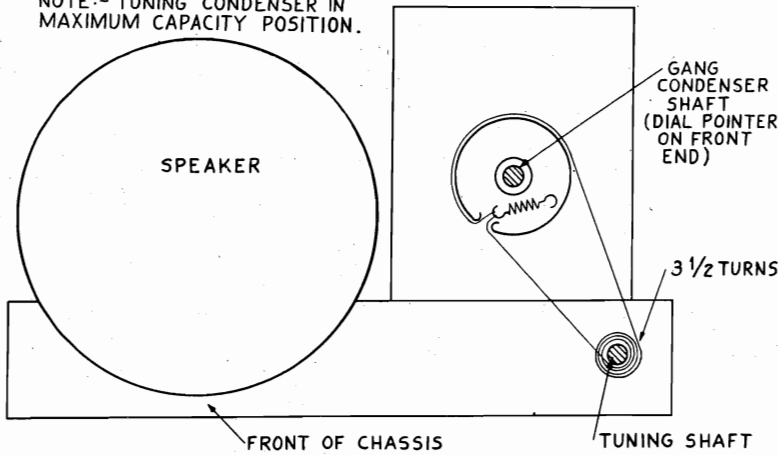
Set the signal generator to 455 KC and adjust the IF trimmers for maximum output in the following order: C8, C7, C6, C5.

Set the signal generator and receiver to 1600 KC and adjust the oscillator trimmer C2 for maximum output.

Set the signal generator and receiver to 1400 KC and adjust the RF trimmer C4 for maximum output.

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NOTE:- TUNING CONDENSER IN MAXIMUM CAPACITY POSITION.



SOCKET	PIN	VTVM	20,000 Ω / P.V.	1,000 Ω / P.V.	RESISTANCE
7A8 CONV.	1	AC	AC	AC	30 Ω
	2	100	100	100	OVER 2 MEGS.
	3	100	100	100	OVER 2 MEGS.
	4	-12	-8.6	-4.2	900 K
	5	44	44	38	OVER 2 MEGS.
	6	-1	-0.8	-0.4	2.8 MEGS.
	7	0	0	0	0
	8	AC	AC	AC	24 Ω
14A7 I-F AMPL.	1	AC	AC	AC	12 Ω
	2	100	100	100	OVER 2 MEGS.
	3	43	43	38	OVER 2 MEGS.
	4	0	0	0	0
	5	0	0	0	0
	6	-1	-0.8	-0.4	2.8 MEGS.
	7	0	0	0	0
	8	AC	AC	AC	24 Ω
14B6 DET. A.V.C. AUDIO	1	AC	AC	AC	12 Ω
	2	56	54	16	OVER 2 MEGS.
	3	-1	-0.6	-0.4	3 MEGS.
	4	0	0	0	0
	5	-1	-0.8	-0.4	2.8 MEGS.
	6	-1	-0.6	-0.3	5.2 MEGS.
	7	0	0	0	0
	8	0	0	0	0
50L6GT AUDIO OUTPUT	1	56	54	16	OVER 2 MEGS.
	2	AC	AC	AC	75
	3	105	105	105	OVER 2 MEGS.
	4	100	100	100	OVER 2 MEGS.
	5	0	0	0	400 K
	6	-1	-0.8	-0.4	2.8 MEGS.
	7	AC	AC	AC	32 Ω
	8	6	6	6	130 Ω
35Y4	1	AC	AC	AC	105 Ω
	2	AC	AC	AC	105 Ω
	3	-12	-8.6	-4.2	90 K
	4	AC	AC	AC	105
	5	100	100	100	OVER 2 MEGS.
	6	0	0	0	0
	7	125	125	125	OVER 2 MEGS.
	8	AC	AC	AC	75 Ω

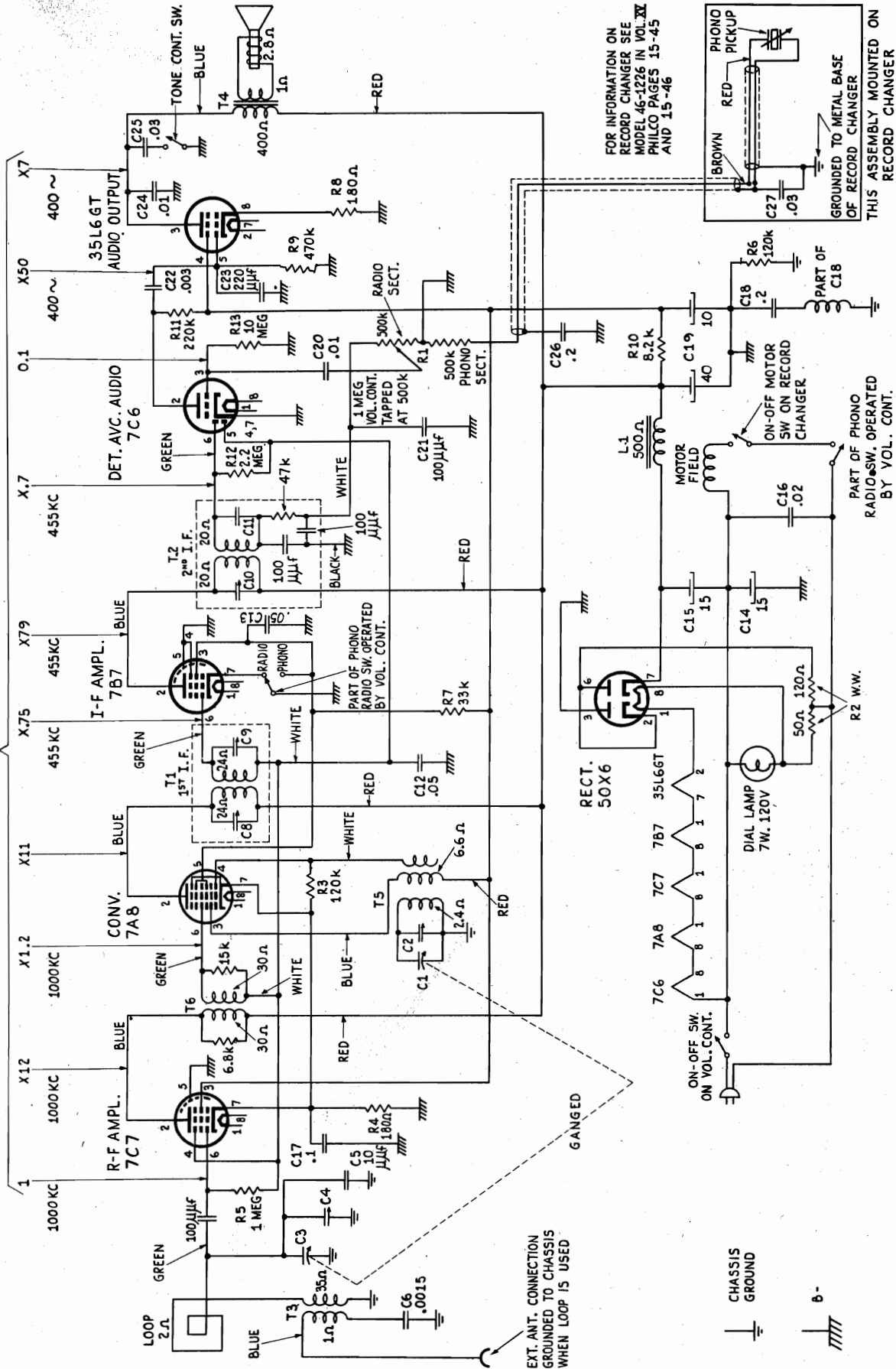
All voltage and resistance measurements made with respect to B-.
And with a line voltage of 116 V.A.C.

There is a resistance of 140 K. between B- and chassis ground.

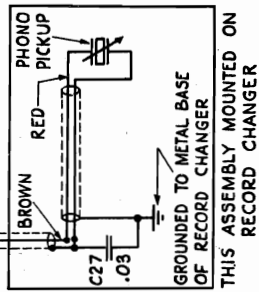
MODEL 46-1203

PHILCO CORP.

APPROX. GAIN PER STAGE USING CHANALYST AND WITH A FIXED BIAS OF -3 VOLTS



FOR INFORMATION ON RECORD CHANGER SEE MODEL 46-1226 IN VOL. XI PHILCO PAGES 15-45 AND 15-46

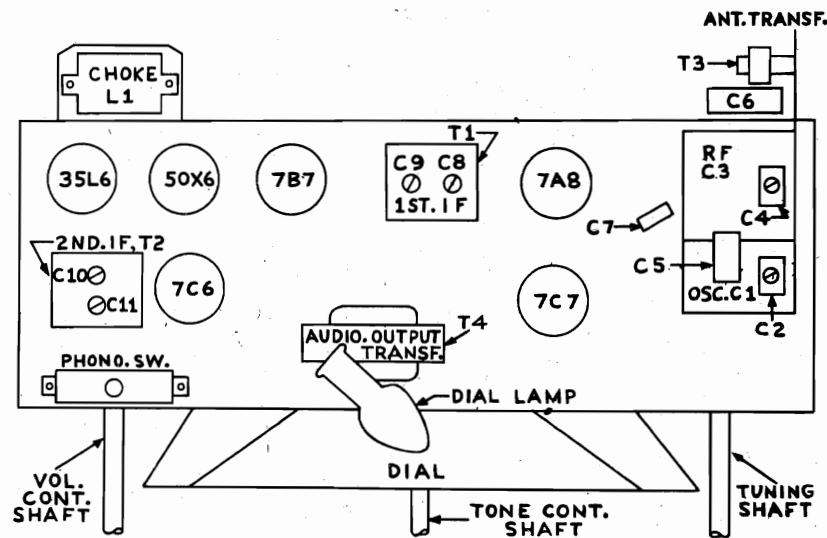


EXT. ANT. CONNECTION GROUNDED TO CHASSIS WHEN LOOP IS USED

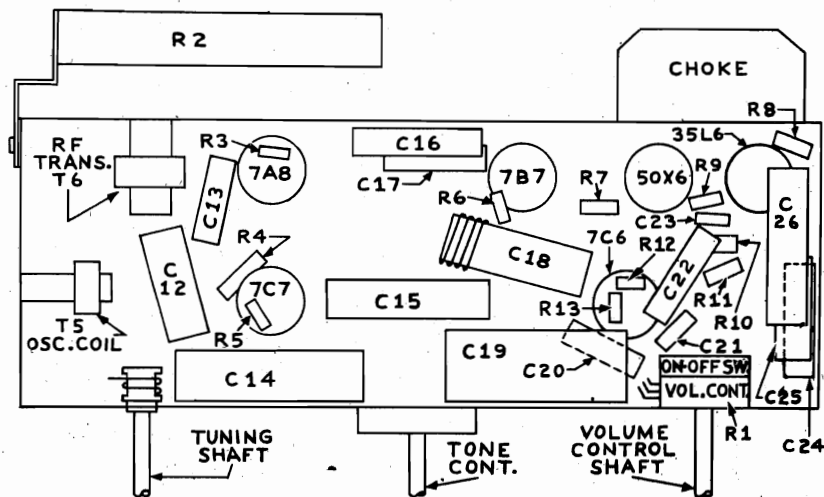


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MODEL 46-1203



TOP VIEW



BOTTOM VIEW

ALIGNMENT

This receiver may be aligned with the chassis in the cabinet.

Connect the output meter to the center terminal (Low) and the right terminal (High) of the three lug terminal strip mounted on the rear of the chassis.

Connect the signal generator to the standard Hazeltine loop Model 1150 and couple it loosely to the receiver loop. Set the volume control at maximum, and fully mesh the tuning condenser.

The output of the signal generator should be just sufficient to give a readable deflection on the output meter.

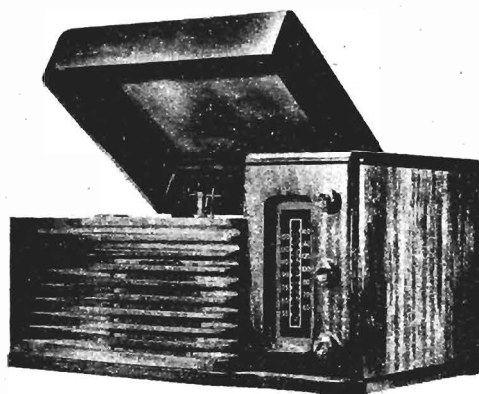
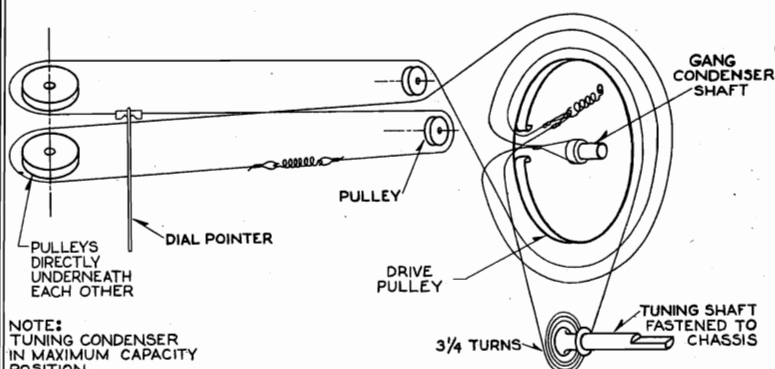
Set the signal generator to 455 KC and adjust the IF trimmers for maximum output in the following order: C11, C10, C9, C8.

Set the signal generator and receiver to 1600 KC and adjust the oscillator trimmer C2 for maximum output.

Set the signal generator and receiver to 1400 KC and adjust the RF trimmer C4 for maximum output.

MODEL 46-1203

PHILCO CORP.



NOTE: TUNING CONDENSER IN MAXIMUM CAPACITY POSITION.

SOCKET	PIN NO.	VTVM	20,000 μ / P.V.	1,000 μ / P.V.	RESISTANCE
7C7 RF	1	100 V	100 V	100 V	OVER 5 MEG
	2	170 V	165 V	165 V	OVER 5 MEG
	3	115 V	108 V	108 V	OVER 5 MEG
	4	-4.5 V	-2.2 V	-2 V	2.8 MEG
	5	0 V	0 V	0 V	0
	6	-1.3 V	-0.3 V	0 V	3.8 MEG
	7	1.3 V	0.8 V	.8 V	190 μ
	8	100 V	100 V	100 V	OVER 5 MEG
7A8 CONVERTER	1	100 V	100 V	100 V	OVER 5 MEG
	2	167 V	160 V	160 V	OVER 5 MEG
	3	113 V	110 V	110 V	OVER 5 MEG
	4	-12.5 V	-4.4 V	-2 V	130 K
	5	65 V	65 V	56 V	OVER 5 MEG
	6	-4.5 V	-2 V	-0.2 V	2.8 MEG
	7	1.3 V	0.8 V	0.9 V	190 μ
	8	100 V	100 V	100 V	OVER 5 MEG
7B7 IF	1	100 V	100 V	100 V	OVER 5 MEG
	2	170 V	160 V	160 V	4.4 MEG
	3	65 V	65 V	57 V	4.6 MEG
	4	0 V	0 V	0 V	0
	5	0 V	0 V	0 V	0
	6	-1.5 V	-0.4 V	-0.2 V	2.8 MEG
	7	0	0	0	0
	8	100 V	100 V	100 V	OVER 5 MEG
7C6 AVC DETECTOR	1	100 V	100 V	100 V	OVER 5 MEG
	2	78	74	35	OVER 5 MEG
	3	-0.8 V	-0.5 V	-0.2 V	10 MEGS.
	4	0 V	0 V	0 V	0
	5	-4.4 V	-1.2 V	-0.2 V	2.8 MEG
	6	-4.3 V	-1.5 V	-0.8 V	600 K
	7	0 V	0 V	0 V	0
	8	100 V	100 V	100 V	OVER 5 MEG
35L6GT/G	1	0 V	0 V	0 V	0
	2	100 V	100 V	100 V	OVER 5 MEG
	3	155 V	150 V	150 V	OVER 5 MEG
	4	118 V	115 V	115 V	OVER 5 MEG
	5	0 V	0 V	0 V	500 K
	6	173 V	165 V	165 V	OVER 5 MEG
	7	100 V	100 V	100 V	OVER 5 MEG
	8	7.9 V	7.6 V	7.8 V	190 μ
50X6 RECTIFIER	1	100 V	100 V	100 V	OVER 5 MEG
	2	100 V	100 V	100 V	OVER 5 MEG
	3	0 V	0 V	0 V	0
	4	173 V	170 V	170 V	OVER 5 MEG
	5	120 V	115 V	110 V	OVER 5 MEG
	6	100 V	100 V	100 V	OVER 5 MEG
	7	200 V	200 V	200 V	OVER 5 MEG
	8	100 V	100 V	100 V	OVER 5 MEG

With respect to B-: Line Voltage 116 V

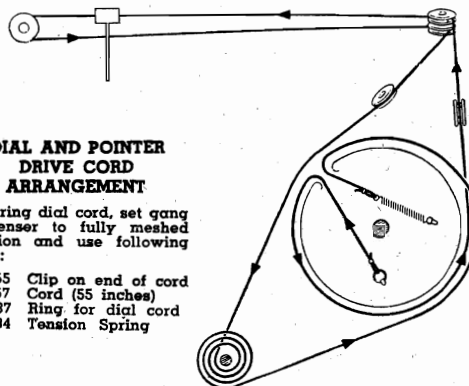
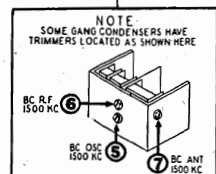
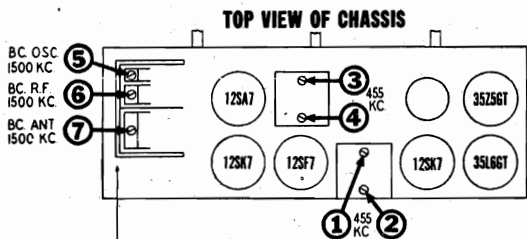
On-Off switch in off position Volume control at minimum

Radio-Phono switch on radio Tone control in left (counterclockwise position)

ALIGNMENT PROCEDURE

1. Remove chassis and loop antenna from cabinet. Reconnect loop to chassis and space it approximately same distance from chassis as when installed in cabinet.
2. Note that there are four calibrating lines stamped into the metal dial frame. When gang condenser is fully meshed, dial pointer should be in the position indicated by first line at the left. If it is set incorrectly, release pointer clip on dial cord and reposition pointer.
3. Connect an output meter across the speaker voice coil or from plate of 35L6GT tube to B— through a .1 Mfd. condenser (see voltage chart for convenient B— connection).
4. Connect ground lead from signal generator to B— through a .25 Mfd. condenser.
5. Set volume control at maximum volume position and use a weak signal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIG. GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
200 MMFD. Mica Condenser	Control Grid of 12SA7	455 KC	Any point where it does not affect the signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD. Mica Condenser	External Antenna Clip on Loop Frame	1500 KC	Set pointer to 1500 KC reference line stamped into metal dial plate (first line at the right)	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	External Antenna Clip on Loop Frame	1500 KC	Tune to 1500 KC generator signal	6	Broadcast R.F.	Adjust for maximum output.
200 MMFD. Mica Condenser	External Antenna Clip on Loop Frame	1500 KC	Tune to 1500 KC generator signal	7	Broadcast Antenna	Adjust for maximum output.

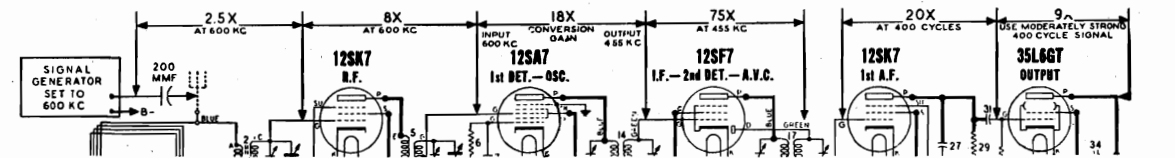


APPROXIMATE STAGE GAIN DATA

Be sure R.F. and I.F. stages are accurately aligned before measuring gain. R.F. gains can be measured with a "channel" type instrument containing a tuned and calibrated R.F. amplifier. A vacuum tube voltmeter may be used for audio gain measurements. Observe following precautions:

1. For all gain measurements connect signal generator as shown. Use 600 KC. signal with 400 cycle modulation (use nearby frequency if local station interferes.)
2. For R.F. and I.F. measurements connect negative terminal of a 3 volt battery (two 1½ volt cells in series) to A.V.C. lead and positive terminal to B—. This provides a definite operating point. IMPORTANT: Disconnect battery when measuring audio stage gains.
3. Be sure radio is carefully tuned to generator signal (use weak signal for sharp tuning.)
4. When using a "channel" type instrument carefully tune it for maximum output at desired frequency before making measurements.

The R.F. and I.F. stage gains shown below are less than under normal operating conditions due to the use of 3 volts fixed bias in order to establish a definite operating point. Therefore, these values are not intended to indicate the full capability of a stage.

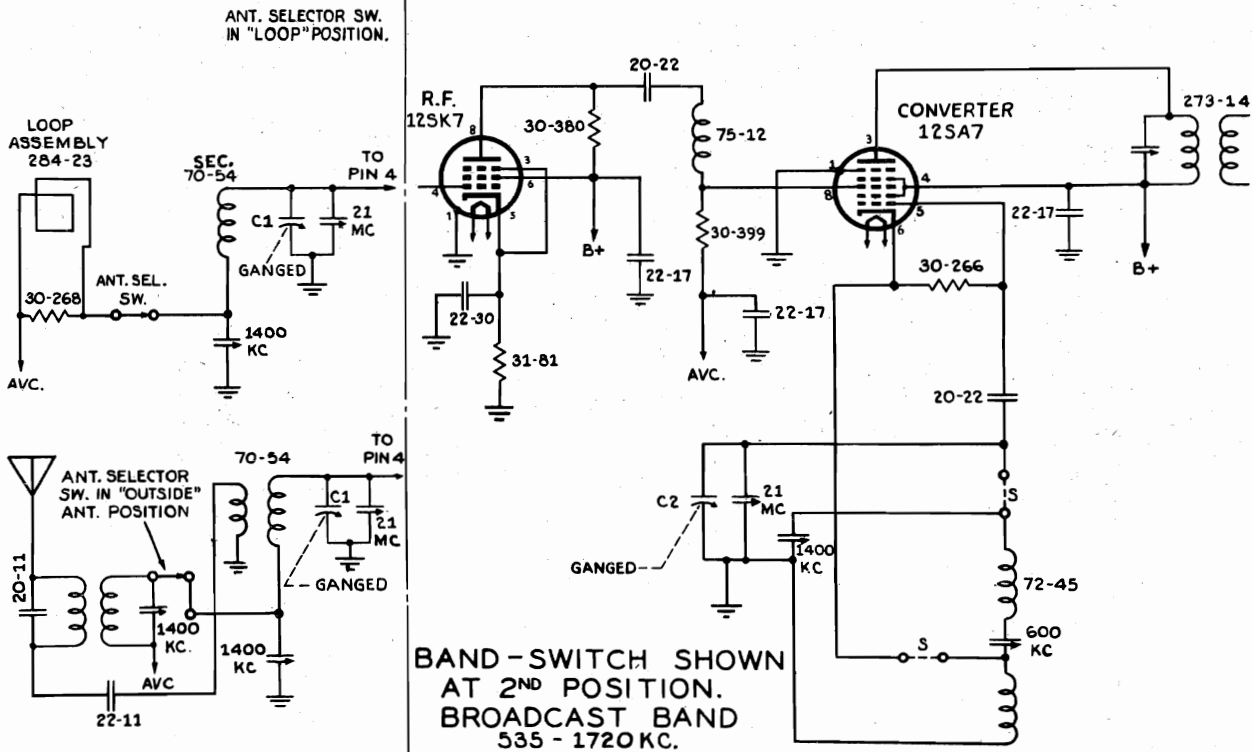
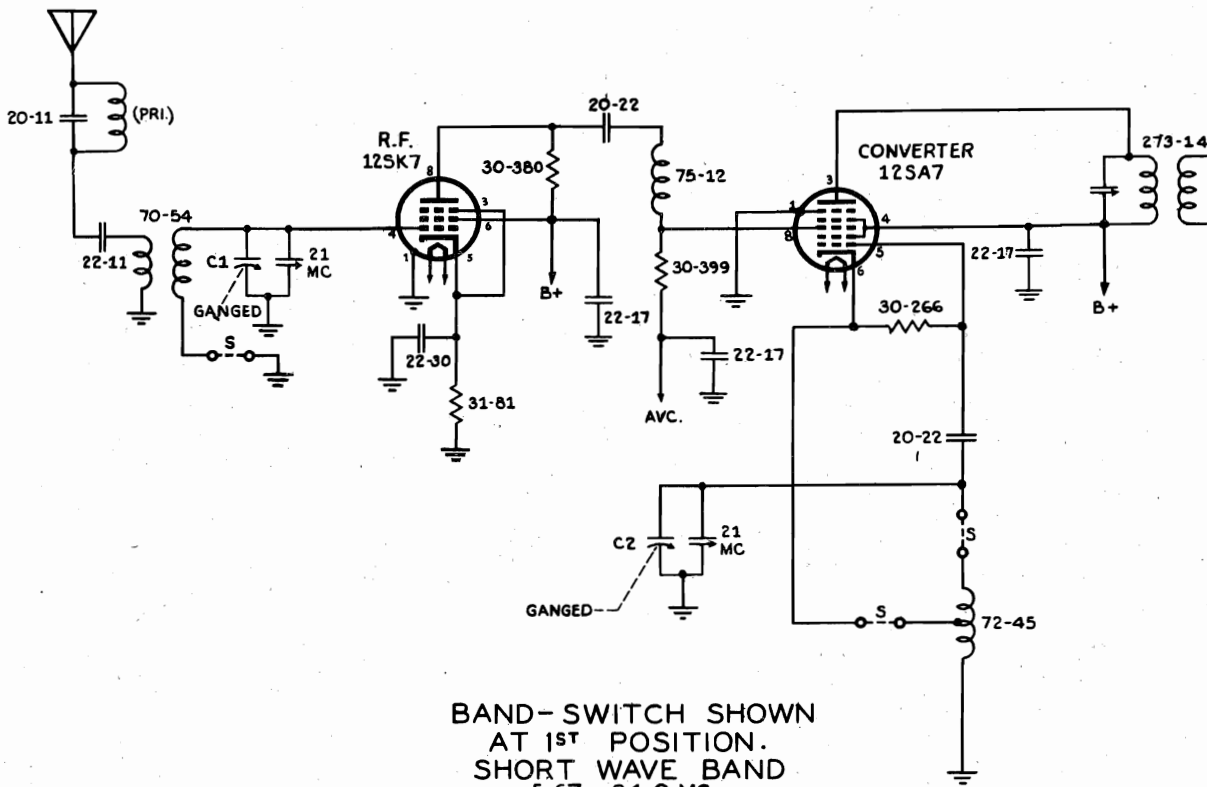


Differences in tube characteristics, tolerance of parts, adjustment of tuned circuits, and variations of line voltage will influence stage gain. Accuracy of measurements is dependent upon careful tuning of receiver to generator signal and experience in using your test equipment. These factors may create considerable variation in gain measurements.

"clarified schematics"

MODEL T-411-U

PILOT RADIO CORP.

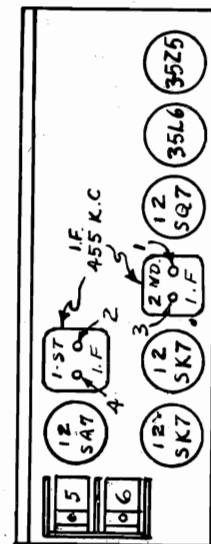


PILOT RADIO CORP.

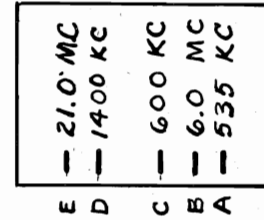
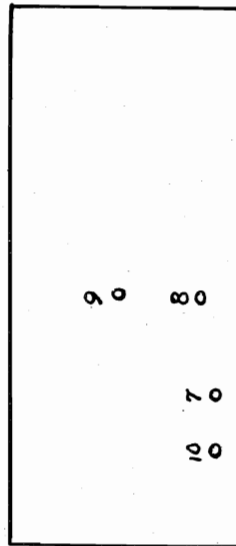
MODEL T-411-U

ALIGNMENT CHART

STEP	RECEIVER		SIGNAL GENERATOR		DUMMY ANTENNA	ADJUSTMENTS (All maximum output)
	CIRCUIT ALIGNED	BAND SWITCH	DIAL POINTER	FREQUENCY			CONNECTION
1	IF	BC	Low end of dial	455 KC	0.1 mfd.	#1, 2, 3, 4
2	SW	SW	E	21 MC	400 ohm carbon resistor	First #5 Then #6
3	BC	BC	D	1400 KC	200 mmfd. mica capacitor	#7
4	BC	BC	C	600 KC	200 mmfd. mica capacitor	#8
5	Repeat steps 3 and 4					
6	BC	BC		Set for broadcast station near 1400 KC		#9 and #10



TOP



BACK

Alignment should be attempted only if a low range A.C. meter, a signal generator, and insulated alignment tools are at your disposal. The A.C. meter is used as an outputmeter. The signal generator must cover a frequency range from 450 kc to 24 mc. The output of the signal generator must always be kept at its lowest possible value. This is to prevent the automatic volume control of the receiver from interfering with accurate alignment.

During alignment, the line voltage feeding the receiver power supply should be kept at approximately 117 volts. For all alignments, connect the outputmeter across the voice coil. With the volume control turned fully clockwise, tune for a maximum reading.

TUNING RANGE

Broadcast Band—535 to 1720 kc or 174 to 561 meters.
Short Wave Band—5.67 to 24.0 mc or 12.5 to 53.6 meters.

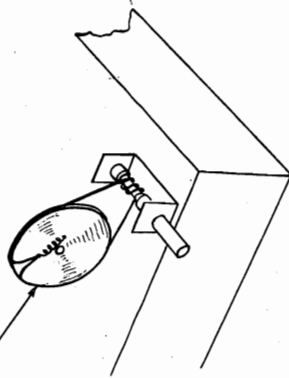
MODEL T-521

PILOT RADIO CORP.

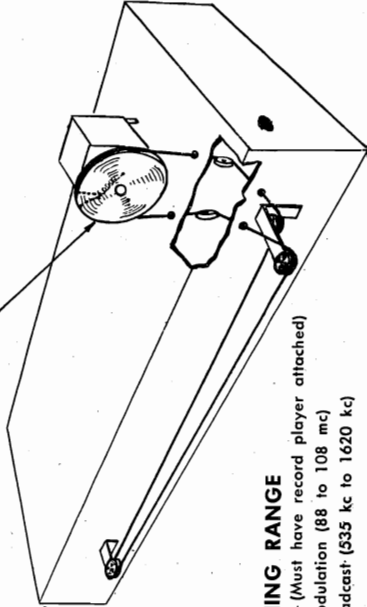
ALIGNMENT CHART
(FOLLOW SEQUENCE AS INDICATED)

CIRCUIT ALIGNED	RECEIVER		SIGNAL GENERATOR		METER CONNECTIONS		TRIMMER OR SLUG ADJUST	PROCEDURE
	BAND SWITCH	DIAL POINTER	FREQ.	CONNECTIONS	TYPE	See List		
AM I.F.	BC	55	455 KC	Through .1 MFD cap. to Grid of 6SB7Y	A	Across Voice-Coil of Speaker	1, 4, 9, 10	Adjust for Maximum Output
FM I.F.	FM	88	10.7 MC	Through .1 MFD cap. to Grid of 6SB7Y	A	Across Voice-Coil of Speaker	2, 3, 5, 6, 7, 8	Adjust for Maximum Output
Radio-detector	FM	88	10.7 MC	Through .1 MFD cap. to Grid of 6SB7Y	B	From: Junction of two 100K resistors connected across 47K load resistor of the ratio detector. To: Audio output of ratio detector. (See Circuit Diagram)	8	Adjust meter to zero. (Check proper zero set. Meters should register reverse polarity when trimmer is turned slightly to the right, and then to the left of zero output)
Broadcast R.F.	BC	150	1500 KC	Through 200 mmf. cap. to Antenna "A" Post on back.	A	Across Voice-Coil of Speaker	12, 13	Adjust for maximum output
	BC	60	600 KC	Through 200 mmf. cap. to Antenna "A" Post on back.	A	Across Voice-Coil of Speaker	11	Adjust for maximum output while rocking variable condenser
Frequency Modulation R.F.	FM	106	106 MC	To "D" and "G" Antenna Terminals	A	Across Voice-Coil of Speaker	15, 16	Adjust for maximum output
	FM	90	90 MC	To "D" and "G" Antenna Terminals	A	Across Voice-Coil of Speaker	14	Adjust for maximum output
	REPEAT STEPS 7 AND 8							
	REPEAT STEPS 4 AND 5 AND REPLACE BOTTOM COVER OF CHASSIS							

FRONT SECTION OF PULLEY



REAR SECTION OF PULLEY



TUNING RANGE

- Band (1) — Phonograph — (Must have record player attached)
- Band (2) — Frequency Modulation (88 to 108 mc)
- Band (3) — Standard Broadcast (535 kc to 1620 kc)

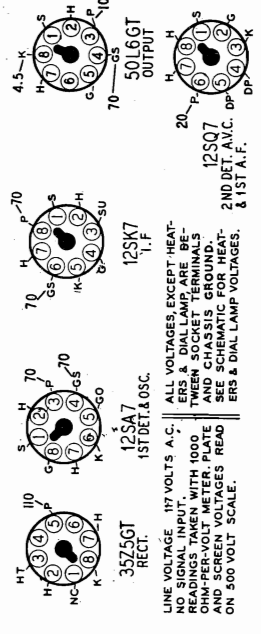
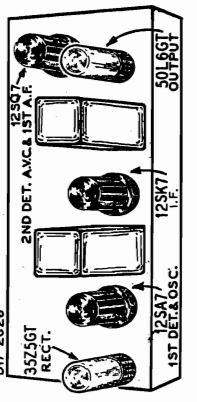
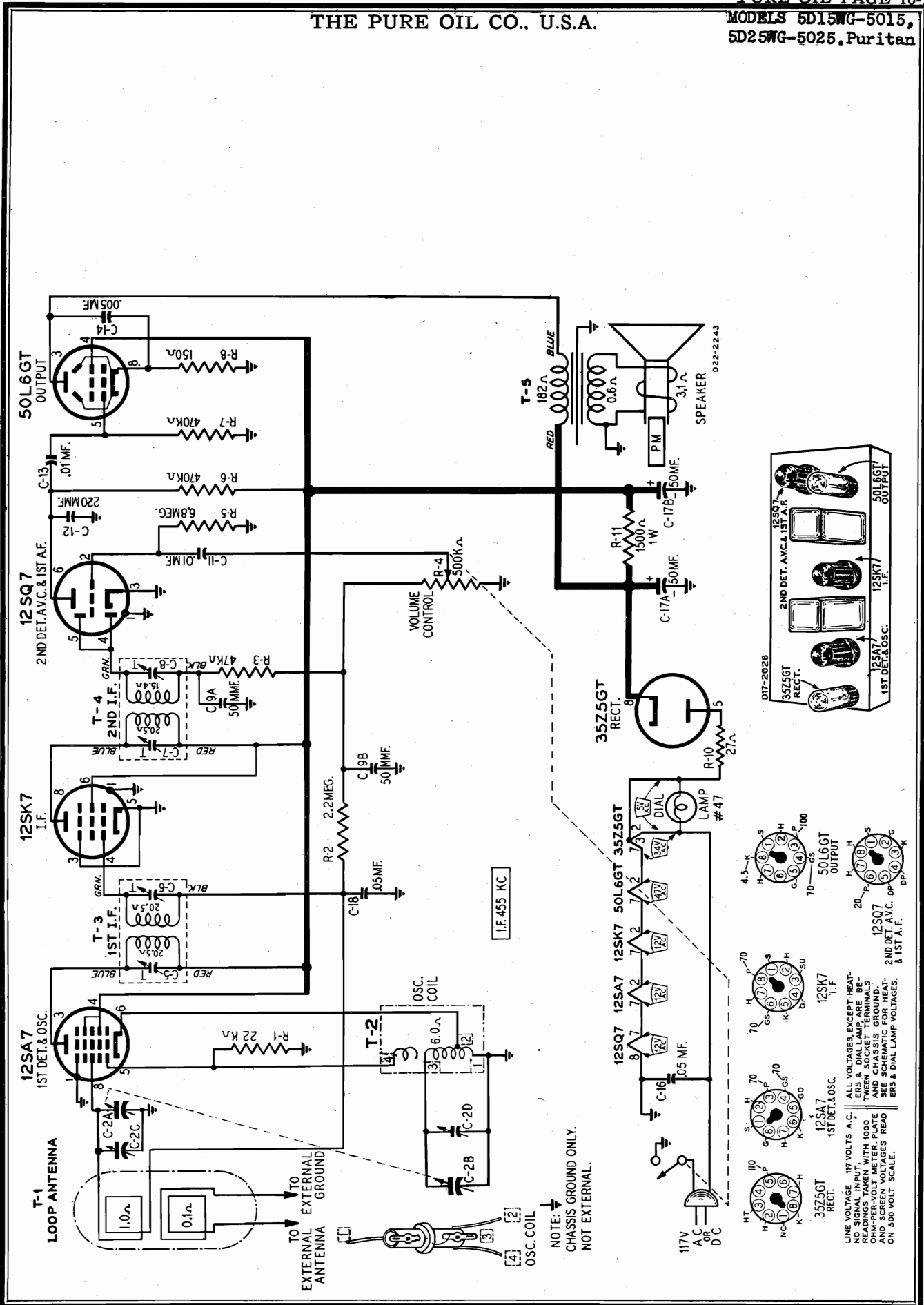
FM Antenna

Special attention should be given to the selection of the antenna used on F.M. The receiver as shipped from the factory contains a built-in "line-cord" aerial that is connected by a spade lug to terminal "D" on the rear of the receiver. This aerial will be found satisfactory for many conditions.

Improved results on weak or distant stations, or in locations unfavorable to F.M. reception, can be had by using the "Pilot" F.M. antenna, packed with each set.

To install the special "Pilot" F.M. antenna, connect the spade lugs at the base of the "T" shaped aerial to terminals "D" and "G" on the rear of the receiver. The two remaining ends may be stretched out under a rug or fastened to a moulding. Try to locate a favorable position in the room, preferably near the window, in order to take advantage of the directional effect of this antenna.

In rare cases, where the receiver is located a great distance from the station or is centrally located in a steel building, an outside dipole antenna may be found necessary. Where an outside dipole is used, the ends of the lead-in, should be connected to "D" and "G" terminals on the rear of the receiver.

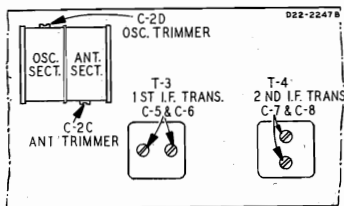


MODELS 5D15WG-5015,
5D25WG-5025, Puritan

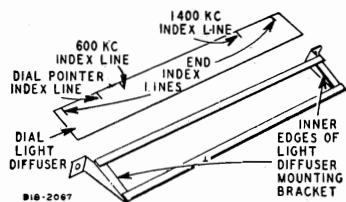
THE PURE OIL CO., U.S.A.

SPECIFICATIONS

5 Tube Superheterodyne, including Rectifier Tube
 Tuning Frequency Range.....540 to 1600 KC
 Power Consumption.....30 watts (At 117 volts AC)
 Power Output.....1.5 watt maximum, .9 watt (10% distortion)
 Intermediate Frequency.....455 KC
 Speaker.....5" PM Dynamic



DIAL CALIBRATION



In order to align the receiver, the dial pointer must be positioned on the dial string correctly with reference to the dial. Index lines are provided on the dial light diffuser for this purpose.

Before aligning the receiver (or when replacing the dial light diffuser) check the position of the diffuser strip, making certain that the two extreme index lines are aligned with the inner edges of the diffuser mounting bracket opening. The bracket should be crimped to prevent movement of the diffuser strip. To position

ALIGNMENT PROCEDURE

Check dial pointer position, see DIAL CALIBRATION paragraph.
 Volume Control—Maximum All Adjustments.
 Allow Chassis and Signal Generator to "Heat Up" for several Minutes.
 The equipment in column at right is required for aligning:
 Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
 Output Indicating Meter: Non-Metallic Screw-driver.
 Dummy Antennas—.1 mf., 50 mfm.
 Blocking Condenser—.1 mf.

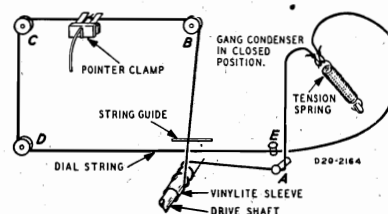
FREQUENCY SETTING	SIGNAL GENERATOR ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	GANG CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
455 KC	Control Grid 12SK7—I.F. Prong No. 4	Chassis Base Through .1 mf. Condenser	.1 mf.	Turn Rotor to full open	2nd I.F. (C-7) & (C-8)
455 KC	Control Grid 12SA7—1st Det. Prong No. 8	Same As Above	.1 mf.	Turn Rotor to full open	1st I.F. (C-5) & (C-6)
1620 KC	Control Grid 12SA7—1st Det. Prong No. 8	External Ground Clip On Loop	.1 mf.	Turn Rotor to full open	Oscillator (C-2D)
1400 KC	External Antenna Clip On Loop	Same As Above	50 mfm.	Turn dial to 1400 KC. See Note A	Antenna (C-2C)

the dial pointer, turn the large drive pulley to the maximum counterclockwise position. The dial pointer should be directly over the dial pointer index line. (See illustration).

installed, stretch the tension spring and tie free end of cord to spring.

DRIVE CORD REPLACEMENT

Turn the large drive pulley to the maximum counterclockwise position. Use a new 10X48 drive cord assembly, tie one end to the tension spring and fasten the other end of the spring to the drive pulley. Install the cord as shown in the illustration. Wind 2 3/4 turns counterclockwise around the tuning shaft with the turns progressing away from the chassis. After string is



REPLACEMENT PARTS LIST

NOTICE: There is a model number label on the chassis. This label identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

MISCELLANEOUS

- 12A432 5" Speaker.....
- 3A303 Tube Socket, Octal (8 prong) Molded.....
- 10A237 Knob (Brown).....
- 10A300 Knob (Ivory).....
- 55X255 Cabinet (Ivory).....
- 55X313 Cabinet (Brown).....
- 23X232 Snap Buttons (mounting loop to cabinet).....
- 14X334 Speaker Baffle.....
- 13X328 Line Cord Assembly.....

TRANSFORMERS AND COILS

- 9A1916 T-1 "B" Range Loop Antenna Assembly.....
- 9A1914 T-2 Oscillator Coil Assembly.....
- 9A1808 T-3 1st I-F Coil Assembly.....
- 9A1809 T-4 2nd I-F Coil Assembly.....
- 51X132 T-5 Output Transformer.....

CAPACITORS

- 14A194 { C-2A, C-2B, C-2C, C-2D } Gang Condenser Assembly.....
- C-7, C-8 Part of T-3 (1st I-F Coil).....
- C-7, C-8 Part of T-4 (2nd I-F Coil).....
- 47X112 C-9A, C-9B 50-50 mfm. Dual Mica.....
- B66103 C-11, C-13 .01 mf 200V. Tubular.....
- 47X458 C-12 .220 mfm Molded.....
- D65502 C-14 .005 mf 400V. Tubular.....
- D65503 C-16 .05 mf 400V. Tubular.....
- 45X341 { C-17A, C-17B } 50 mf 150V. Dry Electrolytic.....
- B66503 C-18 .05 mf 200V. Tubular.....

RESISTORS

- B84223 R-1 22,000 ohms 0.5 watt Carbon.....
- B85225 R-2 2.2 meg. 0.5 watt Carbon.....
- B85473 R-3 47,000 ohms 0.5 watt Carbon.....
- 36X352 R-4 500,000 ohms Volume control and line switch.....
- B85685 R-5 6.8 meg. 0.5 watt Carbon.....
- B84474 R-6 470,000 ohms 0.5 watt Carbon.....

- B85474 R-7 470,000 ohms 0.5 watt Carbon.....
- B84151 R-8 150 ohms 0.5 watt Carbon.....
- B84270 R-10 27 ohms 0.5 watt Carbon.....
- C85152 R-11 1500 ohms 1.0 watt Carbon.....

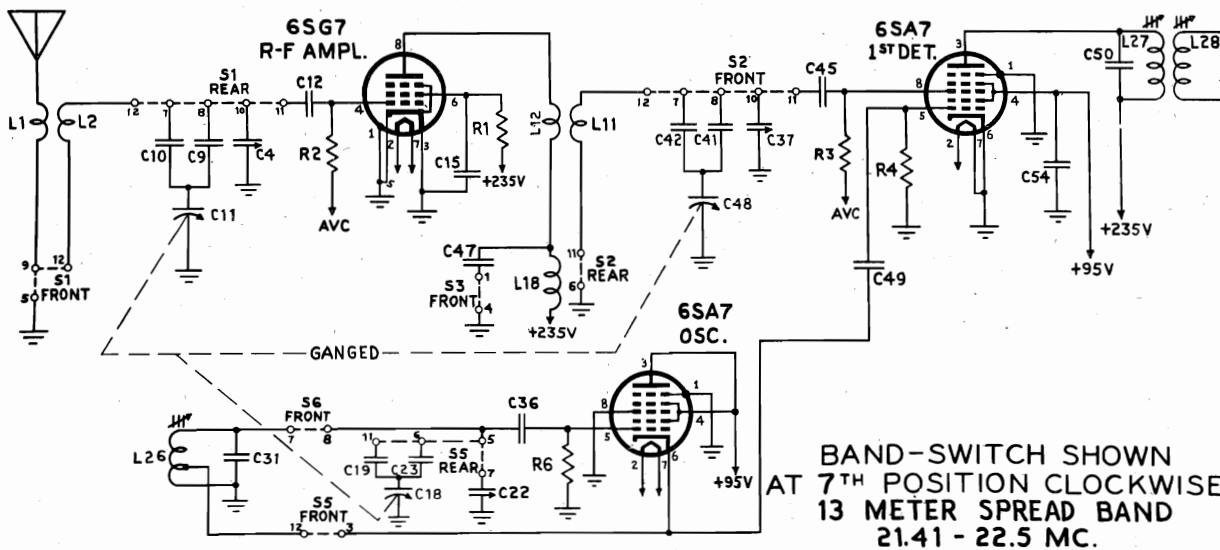
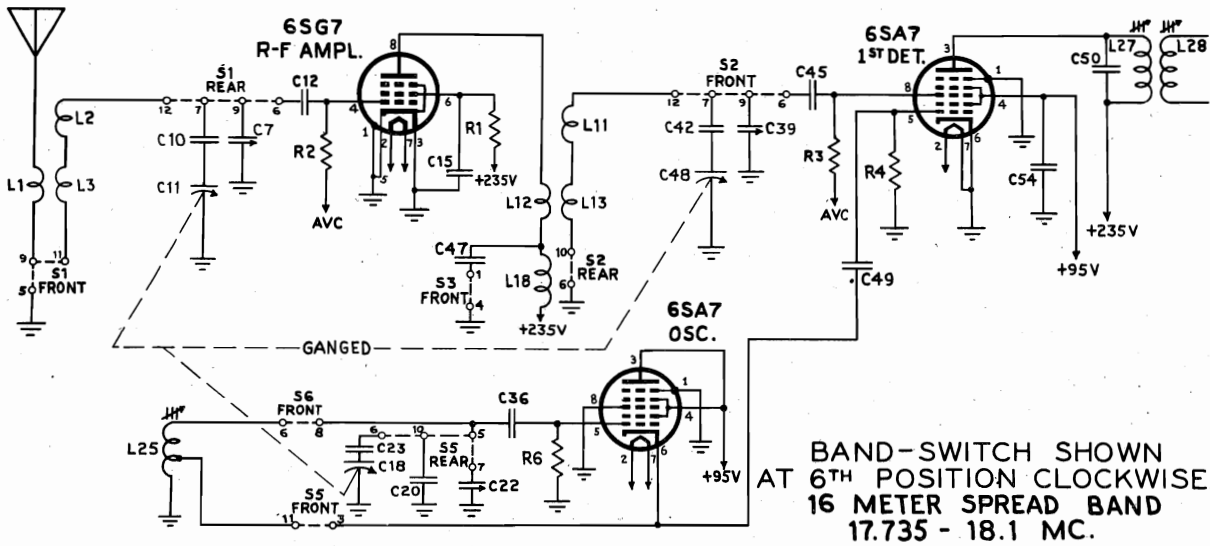
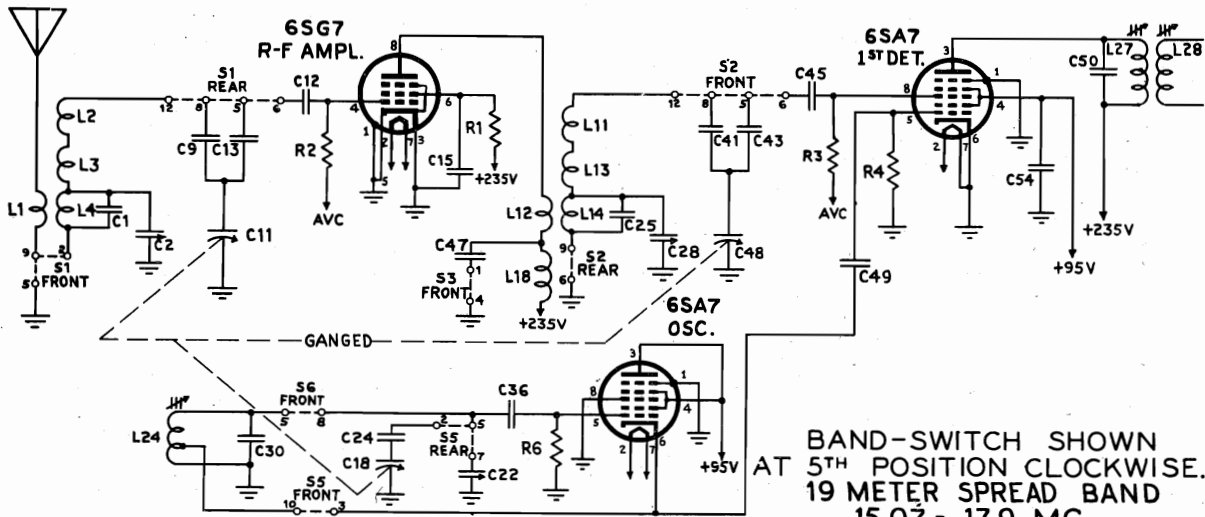
DIAL AND DRIVE ASSEMBLY

- 26A466 Pointer Bracket Assembly complete with light diffuser holder, string guide and idler pulleys.....
- 41X74 Dial light diffuser.....
- 15X223 Pointer.....
- 6X21 Rubber Grommet } Mts. gang condenser.....
- 20X329 Cond. Cushion Stud }.....
- 26X482 Drive shaft.....
- 19X192 "C" Washer (for drive shaft).....
- 10X48 Drive cord assembly.....
- 28X95 Drive cord tension spring.....
- 7A194 Pilot light socket assembly.....
- No. 47 Pilot light.....
- 58X688 Dial clamp (upper).....
- 30X508 Dial clamp.....
- 30X509 Dial clamp (lower).....

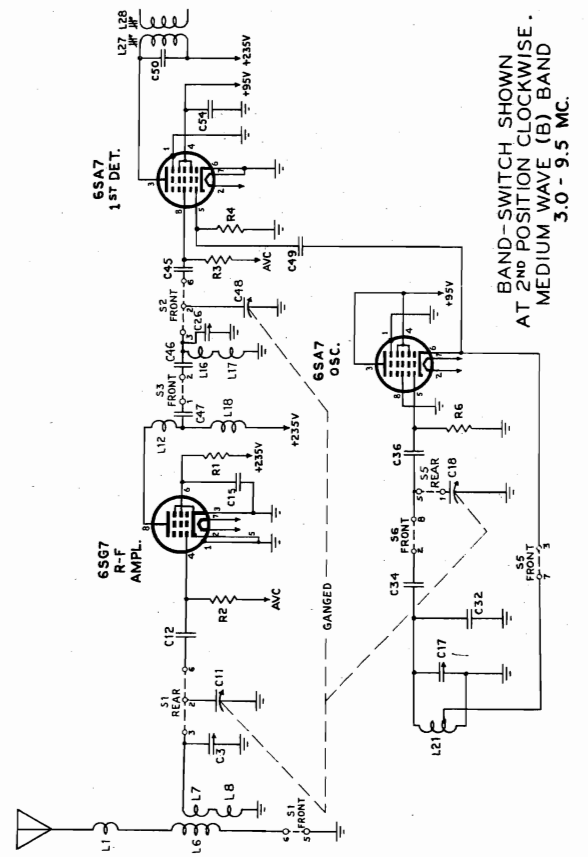
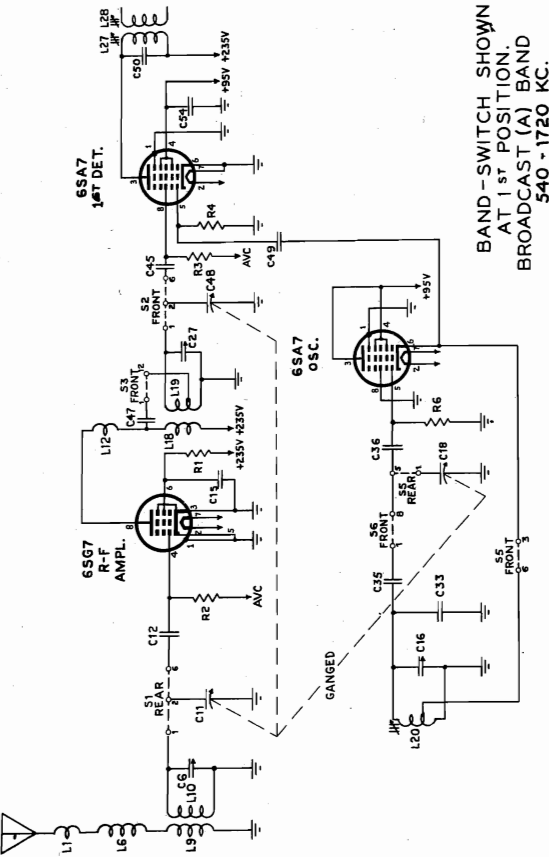
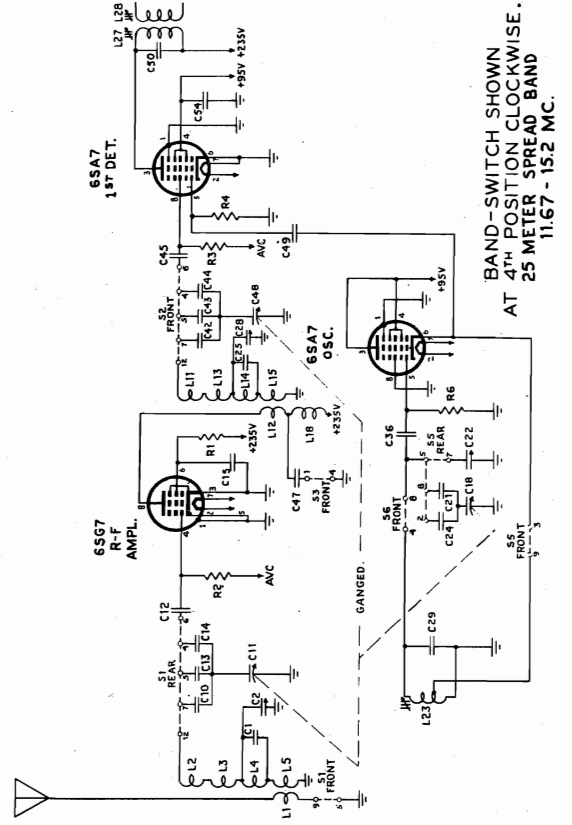
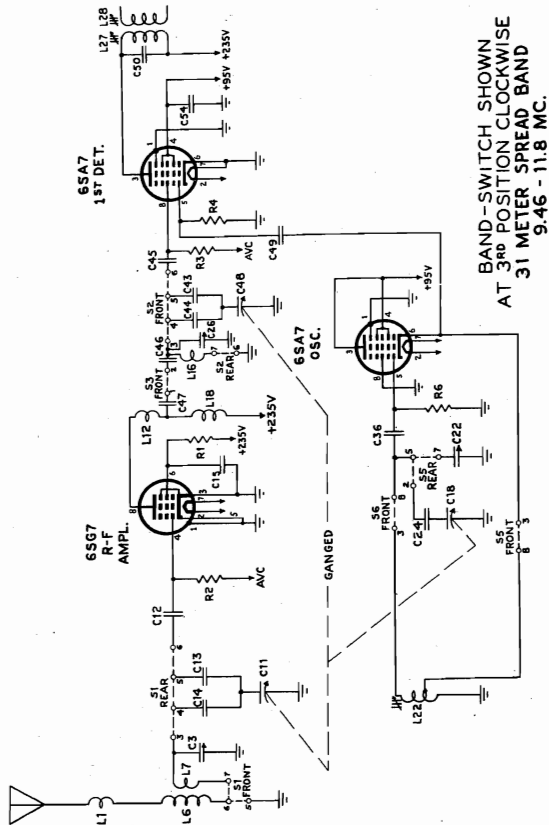
"clarified schematics"

MODEL Q36

RCA MFG. CO.



RCA MFG. CO.



Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscilloscope are shown on the Schematic Circuit Diagram.

Output Meter Alignment.—If this method is used, connect the meter across either voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser.

As the first step in r-f alignment, check the position of the drum, it should correspond to that shown in the Dial Indicator and Drive Mechanism drawing when the gang condenser plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

Receiver Dial with Calibration Scale.—To determine the corresponding frequency for any setting of the calibration scales, refer to the dial drawing.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the oscillator coil magnetite-core for each spread-band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal-controlled oscillator, or by zero-beating against standard broadcast stations.

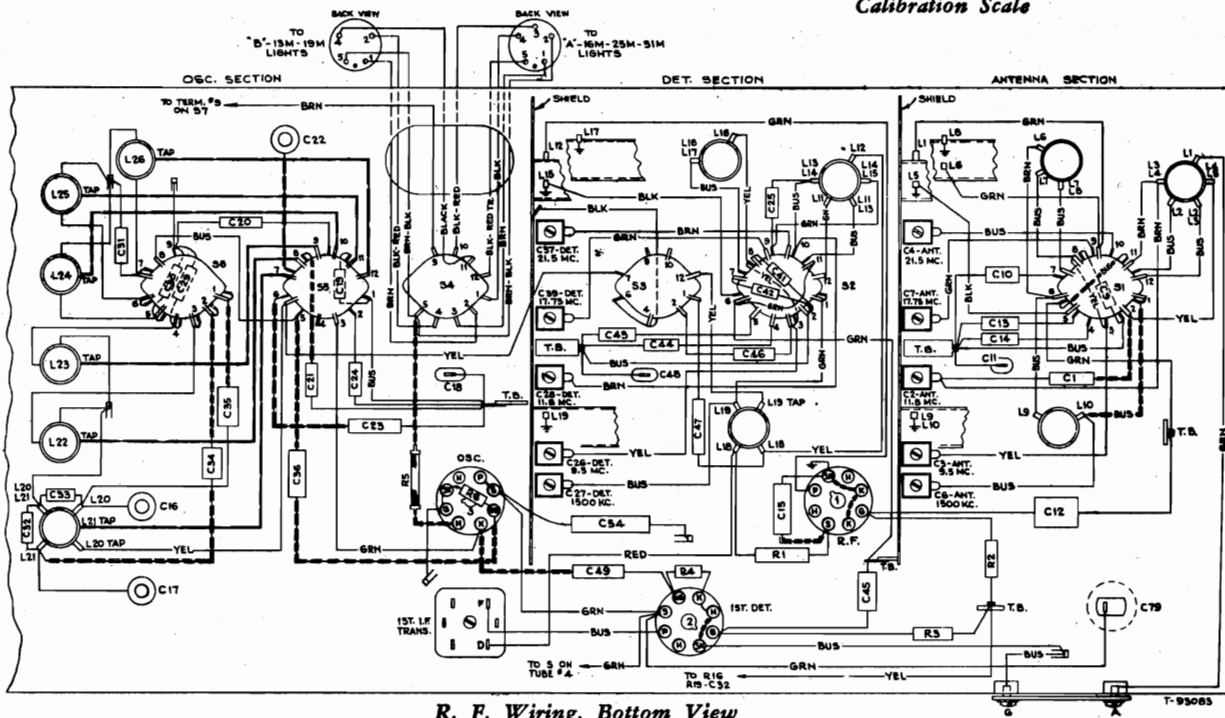
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the oscillator coil magnetite-core for each band should be retouched so that the stations come in at the correct points on the dial.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with the indicator to the line under "Spread Bands" on the glass dial plate with the gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

For additional information, refer to booklet "RCA Victor Receiver Alignment."

		SPREAD BANDS							
0									0
10	550	9.46	11.67	15.07				3.00	10
20		17.735	9.48	11.70	15.10	21.41			20
30	600		9.50	11.75	15.15	21.42	90m		30
40		17.74	9.55	11.80	15.20	21.43		4.00	40
50	700		9.60	11.90	15.30	21.47	4.00		50
60		17.75	9.70	12.00	15.40	21.50		4.50	60
70	800		9.78		15.50	21.54	60m		70
80		17.76	9.80					4.50	80
90	1000		17.78				60m		90
100		17.80	10.0	12.5	15.7	21.60		5.50	100
110		17.82				21.70	49m		110
120	1200		17.85	10.4	13.2	16.2	21.80	6.50	120
130		17.90				21.90	40m		130
140	1500		17.90					8.00	140
150		18.0	11.0	14.2	17.0	22.1			150
160	1700		18.1	11.8	15.2	17.9	22.5	9.50	160
170									170
180									180
		H C	mc	mc	mc	mc	mc	mc	
		(A)	(16)	(31)	(25)	(19)	(13)	(B)	

Receiver Dial with Calibration Scale



R. F. Wiring, Bottom View

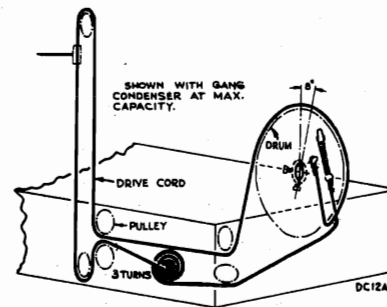
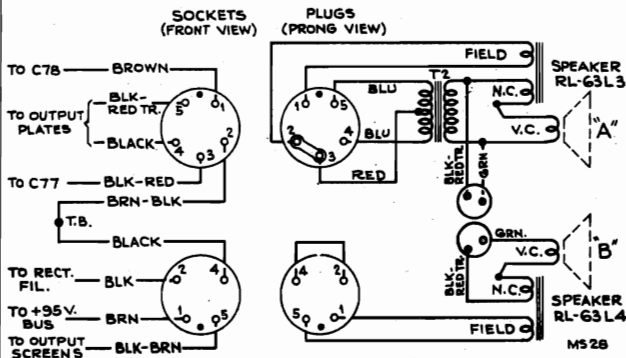
RCA MFG. CO.

Alignment Procedure

Precautionary Lead Dress.—

1. All leads in the R.F. assembly should be dressed away from coils, switch assemblies, capacitors, shield plates, and mounting plates.
2. All capacitors in the R.F. assembly should be dressed apart from each other and away from the Range Switch drive shaft.
3. All indicating light cable leads to S4 should be dressed toward the shield plate and away from all other leads and components.

4. Leads and components connected to the oscillator and 1st Detector tube sockets must not impede the flexible mounting.
5. The green lead from pin 4 of the oscillator tube socket to pin 4 of the 1st Detector should be dressed close to C54.
6. All excess power transformer leads should be dressed back between transformer and rear chassis apron and close to chassis base.
7. The capacitors that connect the volume control and tone control should be dressed away from other parts.



Loudspeaker Connections

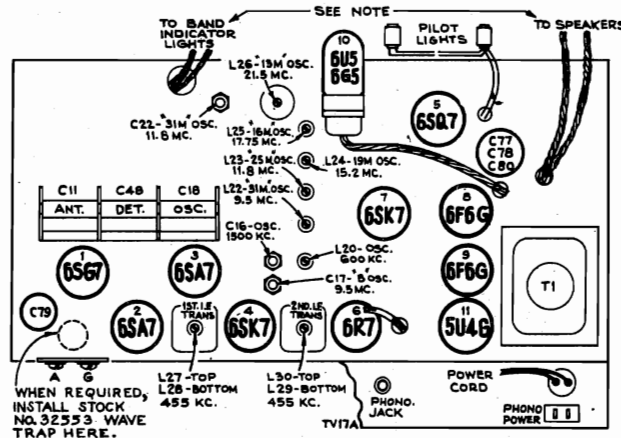
Loudspeaker.—It is essential that the two speaker cones move in and out together, i.e. in phase. For an outline of test methods refer to RCA Victor Supplementary Information—No. 5 "Speaker Phasing."

ALIGNMENT TABLE

Steps	Connect the high side of test osc. to—	Tune test osc. to—	Turn Range Switch to—	Turn Radio Dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band	Quiet point near 600 kc (35°)	L30-L29 2nd I-F trans.
2	6SA7 Det. grid in series with .01 mfd.				L28-L27 1st I-F trans.
3	Antenna terminal in series with 200 mmfd.	1500 kc	"A" Band	1500 kc (154°)	C16 (osc.) C27 (det.) C6 (ant.)
4		600 kc	"A" Band	600 kc (35°)	L20° Rock in
5	Repeat steps 3 and 4 until aligned				
6	Antenna terminal in series with 300 ohms	9.5 mc	"31M" Band	9.5 mc (30°)	L22 (osc.)* C26 (det.) C9 (ant.)
7		11.8 mc	"31M" Band	11.8 mc (170°)	C22 (osc.)**
8	Repeat steps 6 and 7				
9		9.5 mc	"B" Band	9.5 mc (175.5°)	C17 (osc.)**
10		11.8 mc	"25M" Band	11.8 mc (43°)	L23 (osc.)* C28 (det.) C2 (ant.)
11	Antenna terminal in series with 300 ohms	15.2 mc	"19M" Band	15.2 mc (50°)	L24 (osc.)*
12		17.75 mc	"16M" Band	17.75 mc (58°)	L25 (osc.)*** C39 (det.) C7 (ant.)
13		21.5 mc	"13M" Band	21.5 mc (77°)	L26 (osc.)*** C37 (det.) C4 (ant.)

* If two peaks can be obtained, use the one obtained when the core screw is farthest out (counter-clockwise).
 ** Use minimum capacity peak if two can be obtained.
 *** If two peaks can be obtained use the one obtained when the core screw is farthest in (clockwise).
 NOTE: Oscillator tracks above signal on all except the 16M and 13M bands.

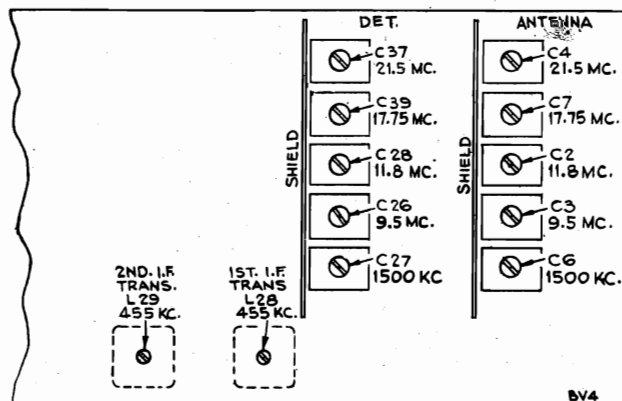
Dial-Indicator and Drive Mechanism



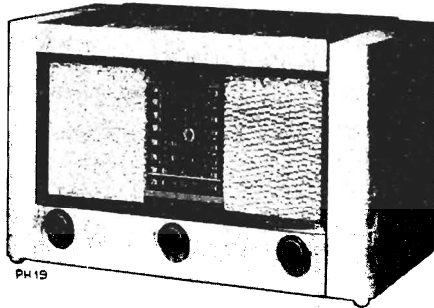
Tube and Trimmer Locations (Top View)

Caution.—The sockets used on the band indicator light cables are identical to those used on the speaker cables. In connecting, care should be taken to assure that the cables are plugged to the proper units.

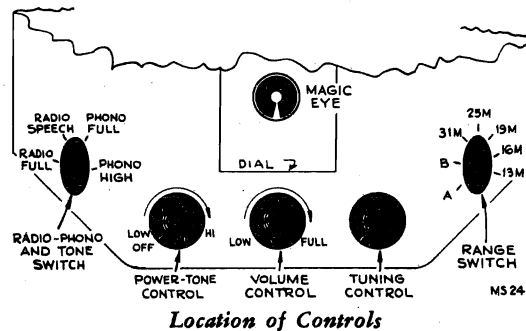
Use of Wave Trap.—Should interference from a powerful nearby station require the use of a wave trap, install a Stock No. 32553 trap behind antenna and ground terminal board as indicated above. Connect coil lug to antenna connection, ground connection is made to chassis through coil mounting foot. Adjust capacitor to resonance with interfering station.



Trimmer Locations (Bottom View)



Model Q36



Specifications

Frequency Ranges

Standard Broadcast ("A" Band)	540-1,720 kc (556-174 m)
Medium Wave ("B" Band)	3.0-9.5 mc (100-31.6 m)
"31" Meter Spread Band	9.46-11.8 mc (31.7-25.4 m)
"25" Meter Spread Band	11.67-15.2 mc (25.7-19.8 m)
"19" Meter Spread Band	15.07-17.9 mc (19.9-16.8 m)
"16" Meter Spread Band	17.735-18.1 mc (16.9-16.6 m)
"13" Meter Spread Band	21.41-22.5 mc (14.0-13.4 m)
Intermediate Frequency	455 kc

Tube Complement

- (1) RCA-6SG7 R-F Amplifier
 - (2) RCA-6SA7 1st Detector
 - (3) RCA-6SA7 Oscillator
 - (4) RCA-6SK7 I-F Amplifier
 - (5) RCA-6SQ7 A-F Amplifier
 - (6) RCA-6R7 Phase Inverter, 2nd Detector
 - (7) RCA-6SK7 Automatic Tone Control
 - (8) RCA-6F6G Power output
 - (9) RCA-6F6G Power output
 - (10) RCA-6U5/6G5 Tuning indicator
 - (11) RCA-5U4G Rectifier
- Pilot Lamps 9-type 47; 6.3 volts, 0.15 amps.

Power Output Rating

Undistorted	10 watts
Maximum	12 watts

Loudspeakers

One Model RL-63L3 and one model RL-63L4
 Type (Electrodynamic) 8 inches
 V-C Impedance at 400 c.p.s. 2.2 ohms

Automatic Tone Control.—

The Model Q36 incorporates a circuit for automatically attenuating noise and selective fading distortion components.

Basically the circuit is a combination of a high pass filter and variable inverse feedback controlled by the AVC voltage.

Capacitor C71 (100 mmf.) and resistor R34 (1.2 meg.) couple the plate of the 6R7 (tube 6) to the grid of the 6SK7 (tube 7). The plate of this tube is connected to the grid of the 6SQ7 (tube 5) through capacitor C67 (82 mmf.). The grid bias for the 6SK7 (tube 7) is obtained from the AVC bus through R16 (2.2 meg.) and R33 (68M).

The values of C71, R34, C67 and R33 are such that this inverse feedback loop passes only the high audio frequencies therefore they are the frequencies that are attenuated in the output of the audio system. The amount of attenuation of the "highs" is controlled by the negative voltage on the AVC bus.

When the incoming signal is weak the AVC voltage is close to zero, the gain of the ATC 6SK7 is large and the attenuation of the highs is a maximum; when the incoming signal is strong the AVC voltage becomes more negative thus decreasing the gain

Victrola Attachment

A jack is provided on the rear of chassis for connection to a Victrola Attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug.

A 110-volt outlet for Victrola attachment is available on back of the chassis.

Cabinet Dimensions

Height	14 3/4 inches
Width	24 3/4 inches
Depth	12 7/8 inches
Net Weight	approx. 49 pounds
Shipping Weight	approx. 56 pounds
Chassis Base Dimensions (inches) Height, 3 1/2; Length, 22; Depth 13	
Over-all Chassis Height	12 3/4 inches
Tuning Drive Ratio	25 to 1

Power Supply Ratings

Symbol	Voltages	Frequency (cycles)	Watts
Rating A	105 to 125, nominal 117	25 to 60	135
Rating B	105 to 125, nominal 117	50 to 60	135
Rating D	(See below)	40 to 60	135

110 position	100 min.	115 max.
125 position	115 min.	135 max.
150 position	135 min.	165 max.
210 position	190 min.	230 max.
240 position	220 min.	260 max.

Note: Shipped in 240-volt position. To change, remove round cover on top of transformer case and move link to required position.

CAUTION: Remove power cord from line receptacle before changing link position.

and thereby increasing the high frequency response of the audio system. The cathode of the 6SK7 (tube 7) is grounded only when S7 is switched to either "Radio" position; the ATC circuit is inoperative when S7 is in either of the "Phono" positions.

With an R.F. input of 100 microvolts the audio frequency response at 2000 cycles is down approximately 20 db. as compared to the response obtained with an RF input of 10,000 microvolts.

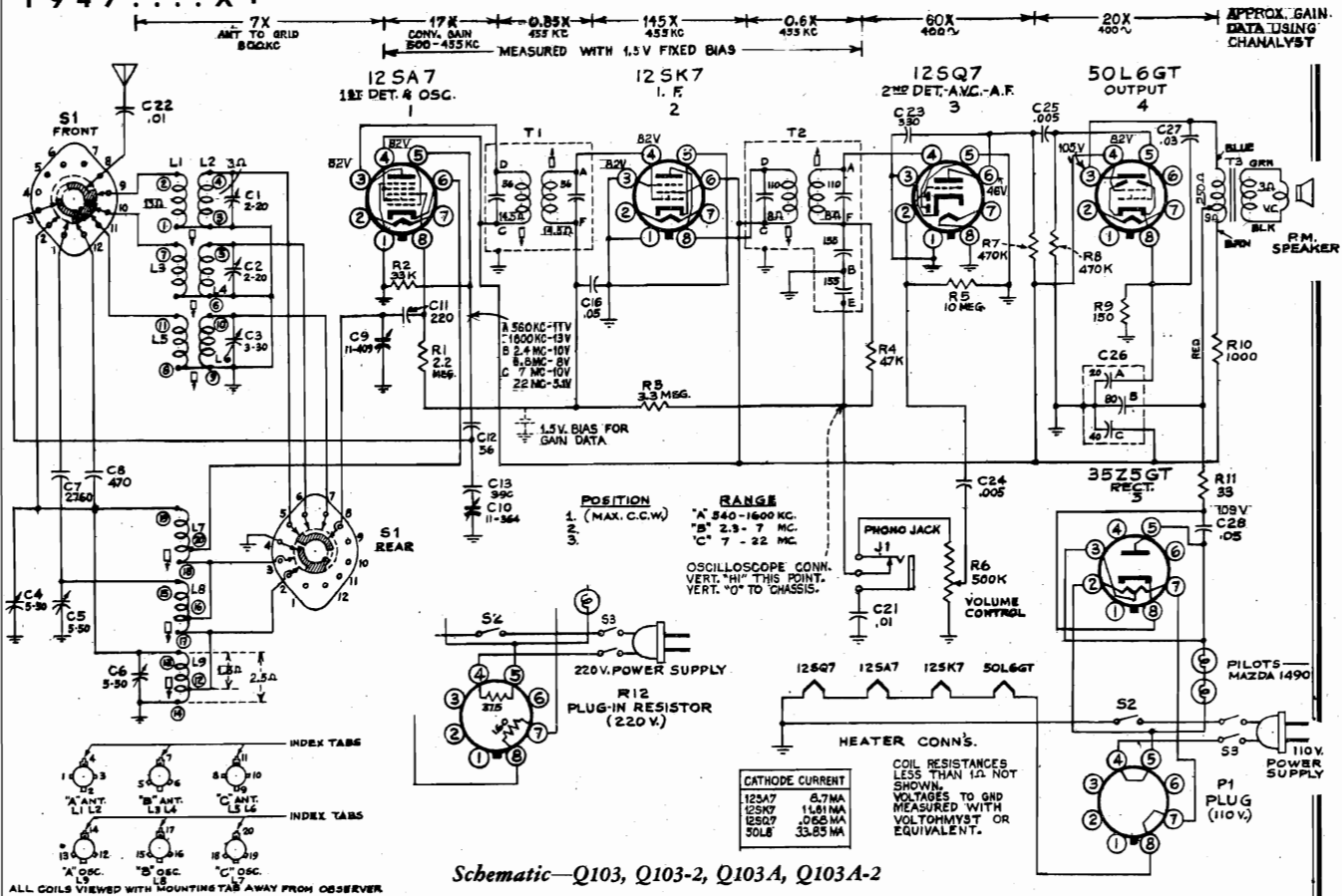
If desired, the amount of high frequency attenuation at a particular value of input signal below approximately 10,000 microvolts may be varied by changing the value of R33. Increasing R33 will increase the attenuation of the "highs"; decreasing R33 will decrease the attenuation.

A quick check of the operation of the circuit may be made by tuning in a weak station and then pulling the 6SK7 (tube 7) out of its socket, a very noticeable increase in the high frequency audio response will indicate that the circuit is functioning properly.

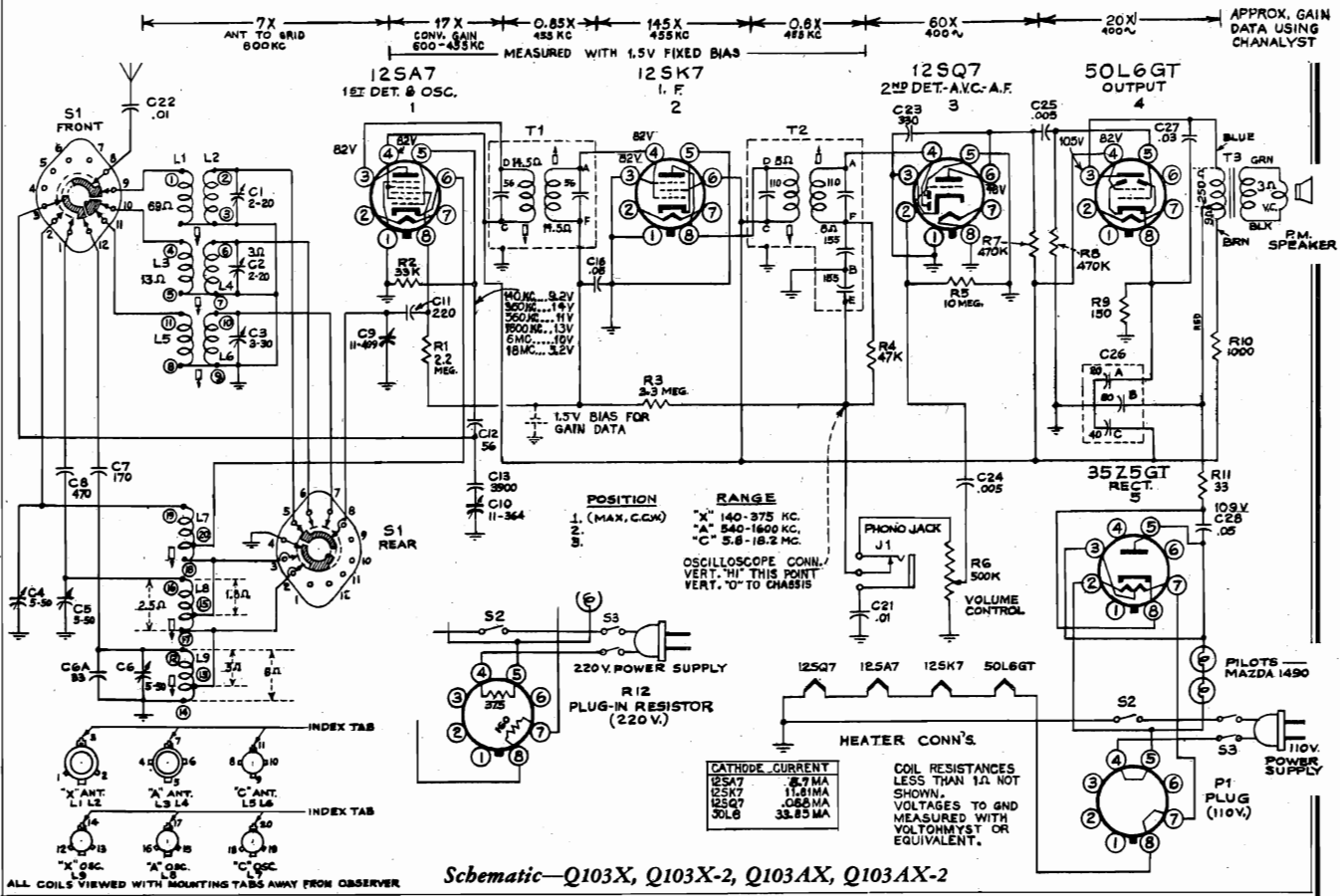
As can be well appreciated by the foregoing explanation of ATC operation, it is desirable to use an antenna with good signal pickup when full fidelity is required. Short length antennas should be avoided whenever possible.

MODELS Q103, -2, A, A-2, Ch. RC1044
 MODELS Q103X, -2, AX, AX-2, Ch. RC1044B
 1947 X 1

RCA MFG. CO.



Schematic—Q103, Q103-2, Q103A, Q103A-2

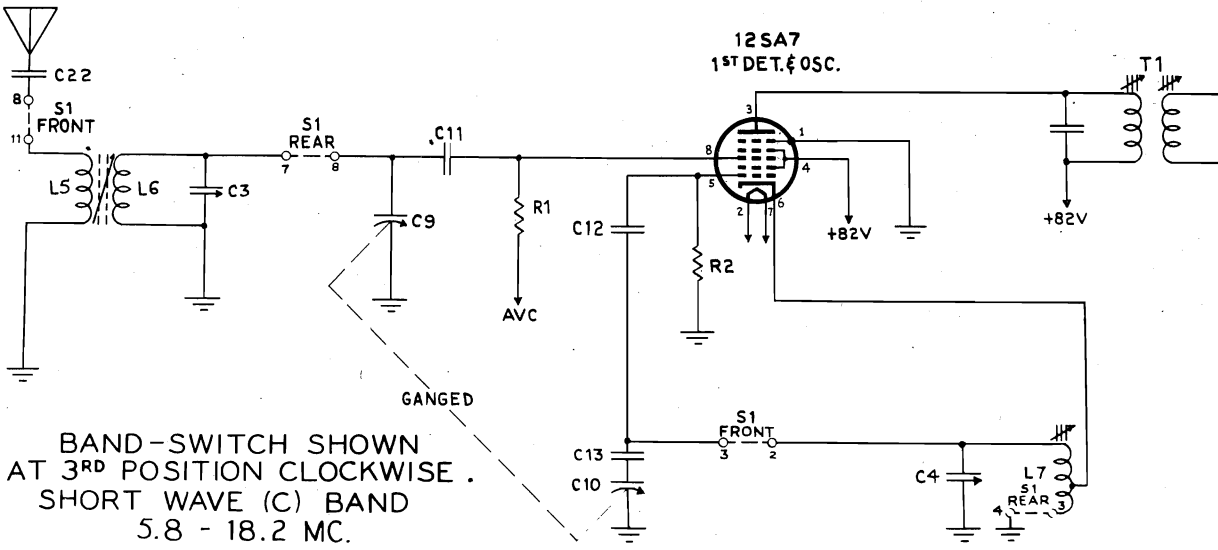
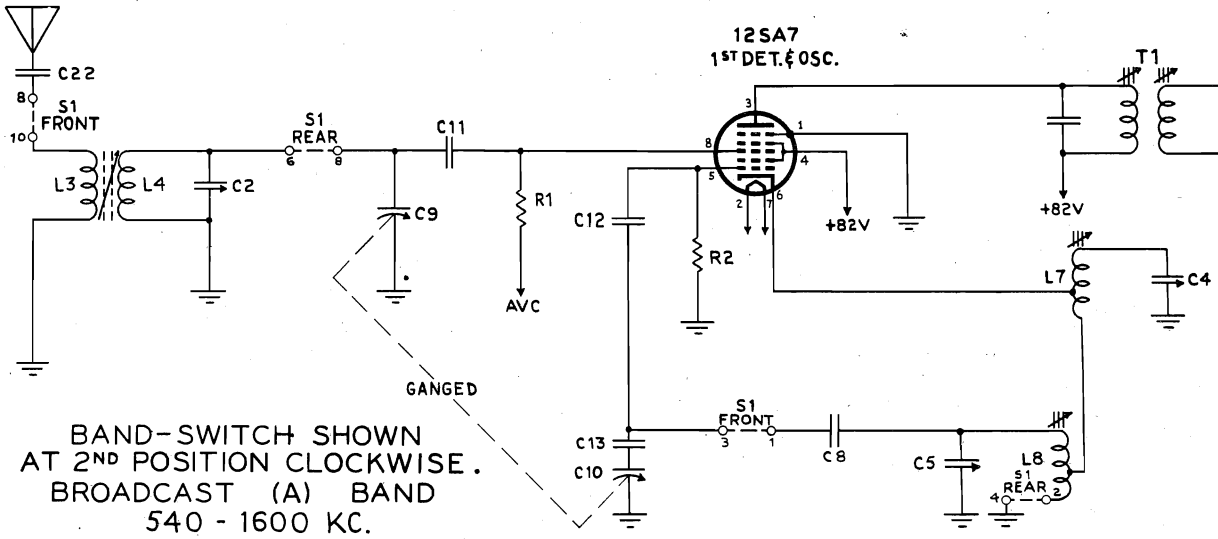
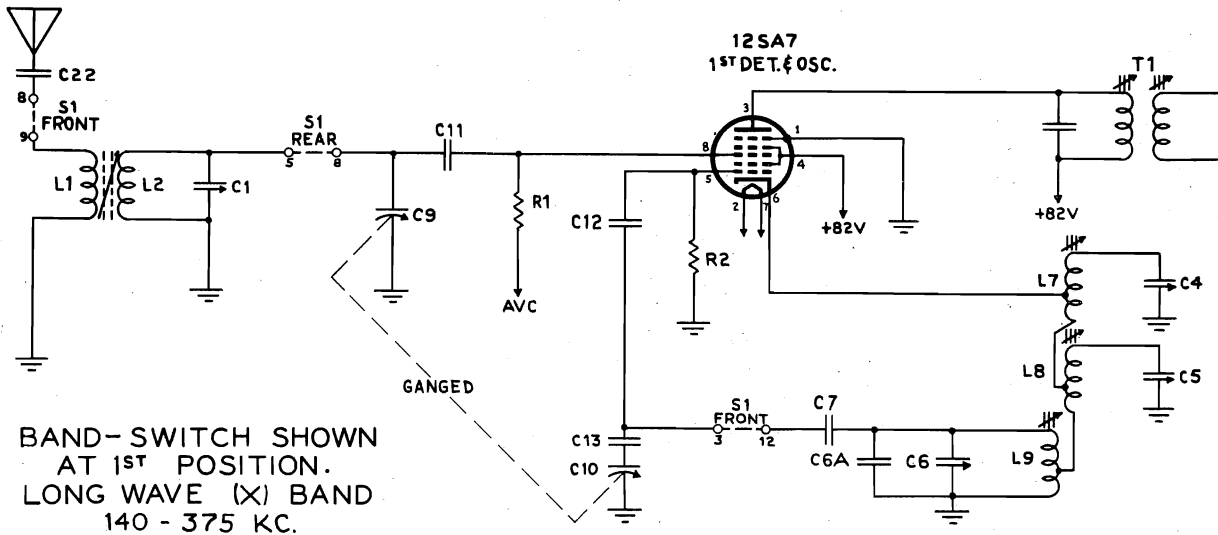


Schematic—Q103X, Q103X-2, Q103AX, Q103AX-2

"clarified schematics"

MODELS Q103X,-2,AX,AX-2

RCA MFG. CO.



MODELS Q103, -2, A, A-2
 MODELS Q103X, -2, AX, AX-2

RCA MFG. CO.

Specifications

Frequency Ranges Chassis No. RC-1044

Standard Broadcast ("A" Band)..... 540-1600 kc (555-187 m)
 Medium Wave ("B" Band)..... 2.3-7.0 mc (130-42.2 m)
 Short Wave ("C" Band)..... 7.0-22 mc (42.2-13.6 m)

Frequency Ranges Chassis No. RC-1044B

Long Wave ("X" Band)..... 140-375 kc (2,222-780 m)
 Standard Broadcast ("A" Band)..... 540-1600 kc (555-187 m)
 Short Wave ("C" Band)..... 5.8-18.2 mc (51.7-16.5 m)

Intermediate Frequency..... 455 kc

RCA Tube Complement

- (1) RCA-12SA7..... 1st Detector-Oscillator
- (2) RCA-12SK7..... I-F Amplifier
- (3) RCA-12SQ7..... 2nd Detector, A.V.C., and A-F Amplifier
- (4) RCA-50L6GT..... Power Output
- (5) RCA-35Z5GT..... Rectifier

Power Supply Ratings (D-C or 50 to 60 cycles A-C)

Q103, Q103-2, Q103X, Q103X-2—105-125 volts..... 30 watts
 Q103A, Q103A-2, Q103AX, Q103AX-2—210-250 volts..... 60 watts

Power Output Rating

Undistorted..... .9 watts
 Maximum..... 1.5 watts

Loudspeaker

Type..... 4 x 6 in. elliptical PM
 Voice Coil Impedance..... 3.4 ohms at 400 cycles

Tuning Drive Ratio..... 20 to 1

Dimensions (Inches)

	Width	Height	Depth
Cabinet (Outside).....	15	9 3/4	7
Chassis Base (Outside).....	13	2 3/8	4 1/2
Chassis Overall.....	13	9 3/4	4 1/2
Weight Net.....	9 lbs.		
Weight Shipping.....	11 lbs.		

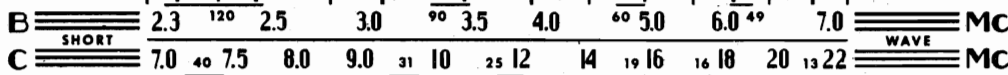
Phonograph Attachment.—A jack is provided on the bottom of the chassis for connection to a phonograph. The cable from the attachment should be terminated in a Stock No. 31048 plug. Plug must be removed when radio is in use.

When the phonograph is in use the volume control on the radio should be at minimum.

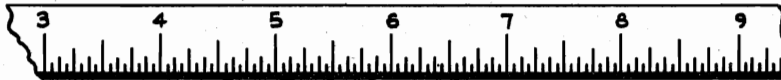
Plug-In Resistor.—Either a plug-in resistor or a shorting plug is used with these sets. The plugs are physically interchangeable and may be used to convert the set from 110 to 220 volts or from 220 to 110 volts. DANGER—Do not attempt to use these sets on 220 volts unless the plug-in RESISTOR is used. If the shorting plug is in place, serious damage will result. Consult the instrument label for original rating.

Disassembly.—Remove the screws holding the chassis bottom plate to the cabinet. Remove the chassis from the cabinet by removing the knobs and tilting the cabinet so that the chassis will slide back and out. Looking at the chassis from the front, a switch is visible on the left apron in the rear. This is an interlock switch. The set will not function out of the cabinet unless this switch is closed. A small screw through the interlock actuating arm and the hole in the chassis bottom plate will serve to keep the switch closed. When the chassis is replaced in the cabinet, remove the screw so that the switch will function.

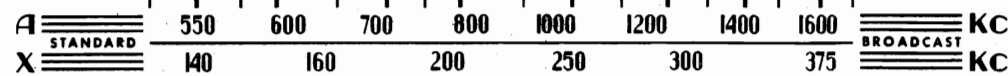
Model	Bands	Power Supply	Cabinet
Q103	"A" "B" "C"	110V	Brown
Q103A	"A" "B" "C"	220V	Brown
Q103-2	"A" "B" "C"	110V	Ivory
Q103A-2	"A" "B" "C"	220V	Ivory
Q103X	"X" "A" "C"	110V	Brown
Q103AX	"X" "A" "C"	220V	Brown
Q103X-2	"X" "A" "C"	110V	Ivory
Q103AX-2	"X" "A" "C"	220V	Ivory



935619-1



Reduced Reproduction of Receiver Dial, RC-1044, and Corresponding Rule Scales



935620-1

Reduced Reproduction of Receiver Dial, RC-1044B, and Corresponding Rule Scales

The corresponding position of the dial indicator in inches, from the left hand edge of the dial plate, for any frequency can be determined by drawing a line from the frequency to a point on the bottom rule scale passing through the same point on the top rule scale. For example 600 kc on the dial scale corresponds to a dial indicator setting of 4 1/8" from the left hand edge of the dial plate, etc. Read instructions under "Alignment Procedure."

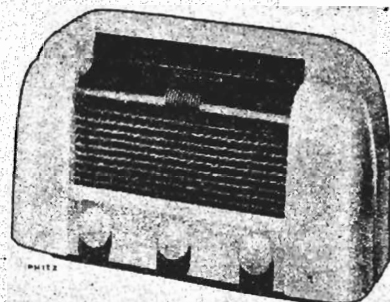
RCA MFG. CO.

MODELS Q103, -2, A, A-2
MODELS Q103X, -2, AX, AX-2

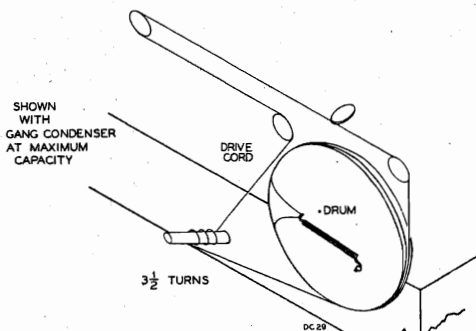
PRECAUTIONARY LEAD DRESS

1. Dress output plate capacitor and output transformer leads down next to chassis.
2. Dress 12SQ7 grid resistor down next to chassis, and away from power ground wire to switch.
3. Dress lead from 2nd I-F transformer to volume control down to chassis and away from adjacent parts.
4. Keep grid end of R1 as short as possible.

POWER SUPPLY POLARITY.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

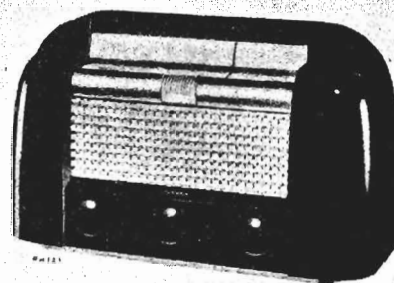


Q103-2, Q103A-2
Q103X-2, Q103AX-2



Dial-Indicator and Drive Mechanism

Q103, Q103A
Q103X, Q103AX

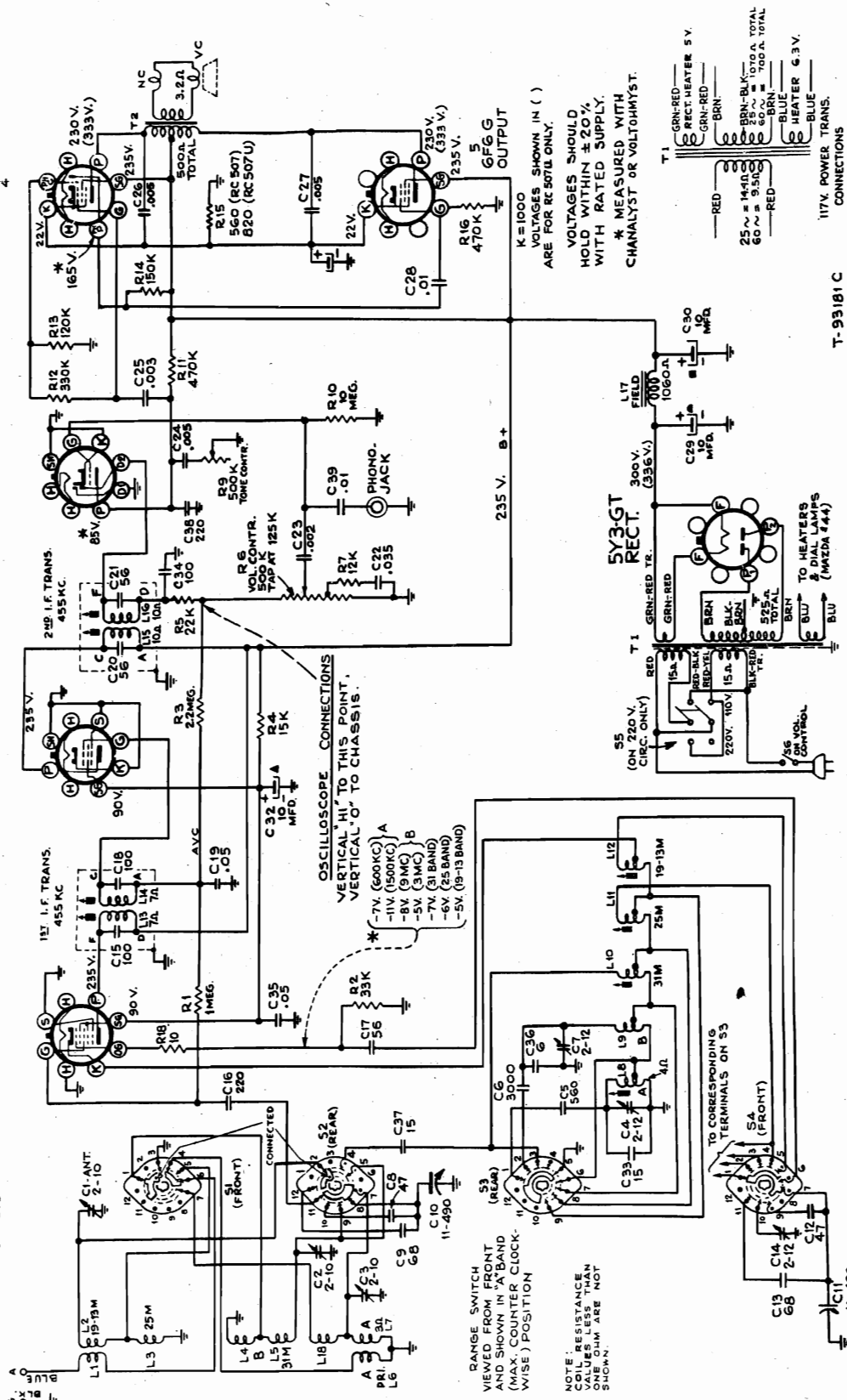


Replacement Parts

STOCK NO.	DESCRIPTION	STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLIES		
	RC-1044—Q103, Q103-2, Q103A, Q103A-2	30649	Resistor—2.2 megohms, 1/2 watt (R1)
	RC-1044B—Q103AX, Q103AX-2, Q103X, Q103X-2	31417	Resistor—3.3 megohms, 1/2 watt (R3)
*72306	Capacitor—Mica trimmer, 3-30 mmf. (C3)	30992	Resistor—10 megohms, 1/2 watt (R5)
*72307	Capacitor—Mica trimmer, 5-50 mmf. (C4)	*72577	Shaft—Tuning knob shaft
39616	Capacitor—Mica, 33 mmf. (C6A for Q103AX, Q103AX-2, Q103X, Q103X-2)	71115	Socket—Lamp socket
39622	Capacitor—Mica, 56 mmf. (C12)	*72295	Socket—Phono-input socket (J1)
*72794	Capacitor—Ceramic, 170 mmf. (C7 for Q103AX, Q103AX-2, Q103X, Q103X-2)	37605	Socket—Tube socket
39636	Capacitor—Mica, 220 mmf. (C11)	31319	Socket—Tube socket
72571	Capacitor—Mica, 330 mmf. (C23)	70390	Spring—Drive cord spring
*72814	Capacitor—Ceramic, 470 mmf. (C8)	*72745	Switch—Interlock switch, slide type, D.P.D.T. (S3)
*72305	Capacitor—Mica trimmer, comprising 2 sections of 2-20 mmf. and 2 sections of 5-50 mmf. (C1, C2, C5, C6)	*72304	Switch—Range switch (S1)
*72795	Capacitor—Mica, 2760 mmf. (C7 for Q103, Q103-2, Q103A, Q103A-2)	*72545	Transformer—First I. F. transformer (T1)
*72637	Capacitor—Mica, 3900 mmf. (C13)	70918	Transformer—Second I. F. transformer (T2)
*71699	Capacitor—Molded paper, .005 mfd., 400 volts (C24, C25)	*72296	Transformer—Output transformer (T3)
71770	Capacitor—Molded paper, .01 mfd., 400 volts (C21, C22)	33726	Washer—"C" washer for tuning shaft
*72815	Capacitor—Molded paper, .03 mfd., 400 volts (C27)		SPEAKER ASSEMBLIES
*71702	Capacitor—Molded paper, .05 mfd., 400 volts (C16, C28)		922258-2
*72281	Capacitor—Electrolytic, comprising 1 section of 80 mfd., 150 volts, 1 section of 40 mfd., 150 volts and 1 section of 20 mfd., 25 volts (C26)	71058	Speaker—4" x 6" P.M. speaker complete with cone and voice coil.
*72576	Coil—Antenna coil, "A" band (L1, L2 for Q103 and Q103A, Q103-2, Q103A-2; L3, L4 for Q103AX, Q103X, Q103X-2, Q103AX-2)		NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
*72298	Coil—Antenna coil, "B" band for Q103, Q103-2, Q103A, and Q103A-2 (L3, L4)		MISCELLANEOUS
*72299	Coil—Antenna coil, "C" band for Q103, Q103-2, Q103A, and Q103A-2 (L5, L6)	71122	Baffle—Speaker baffle
*72276	Coil—Antenna coil, "C" band for Q103AX, Q103AX-2, Q103X, Q103X-2 (L5, L6)	*71123	Bottom—Case bottom
*72297	Coil—Antenna coil, "X" band for Q103AX, Q103AX-2, Q103X, Q103X-2 (L1, L2)	Y1354	Cabinet—Brown plastic cabinet for Q103, Q103A, Q103X, Q103AX
*72575	Coil—Oscillator coil, "A" band (L9 for Q103, Q103A, Q103-2, Q103A-2, L8 for Q103AX, Q103X, Q103X-2, Q103AX-2)	Y1355	Cabinet—Ivory plastic cabinet for Q103-2, Q103A-2, Q103X-2, Q103AX-2
*72302	Coil—Oscillator coil, "B" band for Q103, Q103-2, Q103A, and Q103A-2 (L8)	*72578	Clamp—Dial clamp (2 required)
*72303	Coil—Oscillator coil, "C" band for Q103, Q103-2, Q103A, and Q103A-2 (L7)	*72686	Decal—Power switch decal
*72274	Coil—Oscillator coil, "C" band for Q103AX, Q103AX-2, Q103X, Q103X-2 (L7)	*72687	Decal—Range switch decal for Q103AX, Q103AX-2, Q103X, Q103X-2
*72300	Coil—Oscillator coil, "X" band for Q103AX, Q103AX-2, Q103X, Q103X-2 (L9)	*72747	Decal—Range switch decal for Q103, Q103-2, Q103A and Q103A-2
*72294	Condenser—Variable tuning condenser (C9, C10)	*72609	Dial—Glass dial scale for Q103, Q103A, Q103-2, Q103A-2
38410	Control—Volume control and power switch (R6, S2)	*72610	Dial—Glass dial scale for Q103AX, Q103X, Q103X-2, Q103AX-2
34662	Cord—Drive cord (approx. 56" overall length)	71127	Foot—Cabinet foot (walnut) for Q103, Q103A, Q103AX, Q103X (4 required)
70384	Drum—Drive drum	71128	Foot—Cabinet foot (ivory) for Q103-2, Q103A-2, Q103AX-2, Q103X-2 (4 required)
72283	Grommet—Rubber grommet for mounting tuning condenser and speaker	70473	Knob—Tuning knob (walnut) for Q103, Q103A, Q103AX, Q103X
70429	Grommet—Rubber grommet for mounting tube socket	70474	Knob—Tuning knob (ivory) for Q103-2, Q103A-2, Q103AX-2, Q103X-2
*72547	Indicator—Station selector indicator	*72549	Knob—Volume control or range switch knob (walnut) for Q103, Q103A, Q103AX, Q103X
71116	Lamp—Dial lamp, Mazda No. 1490	*72550	Knob—Volume control or range switch knob (ivory) for Q103-2, Q103A-2, Q103AX-2, Q103X-2
*72548	Plate—Dial back plate complete with drive cord pulleys	71126	Nut—Speed nut to fasten hand grip screen (4 required)
36230	Pulley—Drive cord pulley	*72291	Plug—Shorting plug for Q103, Q103-2, Q103X, Q103X-2
71290	Resistor—33 ohms, 1 watt (R11)	*72308	Resistor—Plug-in resistor for Q103A, Q103A-2, Q103AX and Q103AX-2 (R12)
30880	Resistor—150 ohms, 1/2 watt (R9)	71125	Screen—Protective screen for hand grip
71916	Resistor—1000 ohms, 1 watt (R10)	*72746	Slide—Interlock switch actuating slide
30685	Resistor—33,000 ohms, 1/2 watt (R2)	30900	Spring—Retaining spring for knobs
30787	Resistor—47,000 ohms, 1/2 watt (R4)	71130	Spring—Retaining spring for front strip
30648	Resistor—470,000 ohms, 1/2 watt (R7, R8)	71129	Strip—Finished strip for cabinet front
		34373	Washer—"C" washer to hold interlock actuating

*This is the first time this Stock No. has appeared in Service data.

1946 X7
BOTTOM VIEW OF
TUBE SOCKETS



(See separate diagram for Chassis No. RC-507U Power Supply Circuit)

Precautionary Lead Dress

All leads between antenna coils and switch must be as short as possible and kept away from oscillator coil, leads and switches. All oscillator coil leads must be kept apart from each other and other leads and parts.

Blue plate lead of 2nd I.F. transformer must be dressed down close to chassis and made as short as possible.

Power transformer leads to the 110-220 volt switch must be dressed away from the audio circuits.

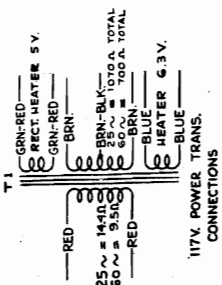
A.C. leads to the power switch must be twisted and dressed up towards the end of chassis apron and kept away from the volume control circuits.

NOTE: In some sets and on some replacement units, the power transformer color code may vary from that shown above. On universal transformers (Rating C), the primary No. 1 start may be black; primary No. 1 finish black/yellow; primary No. 2 start black/green; primary No. 2 finish black/red. On the 25 and 60 cycle transformers (Ratings A and B) the primary start and finish may be black. Secondaries of the three transformers would be: rectifier filament, yellow; high-voltage, red; high-voltage center tap, red/yellow; amplifier filament, green. In case of doubt, identify windings by resistance or voltage measurements.

VOLTAGES SHOWN IN () ARE FOR RC507B ONLY.

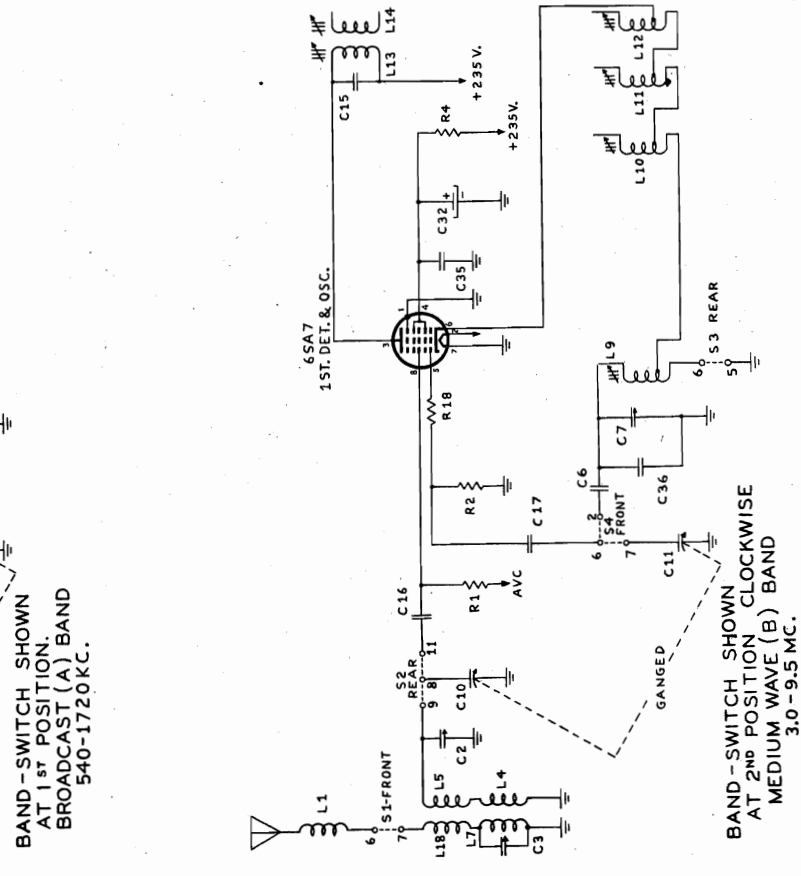
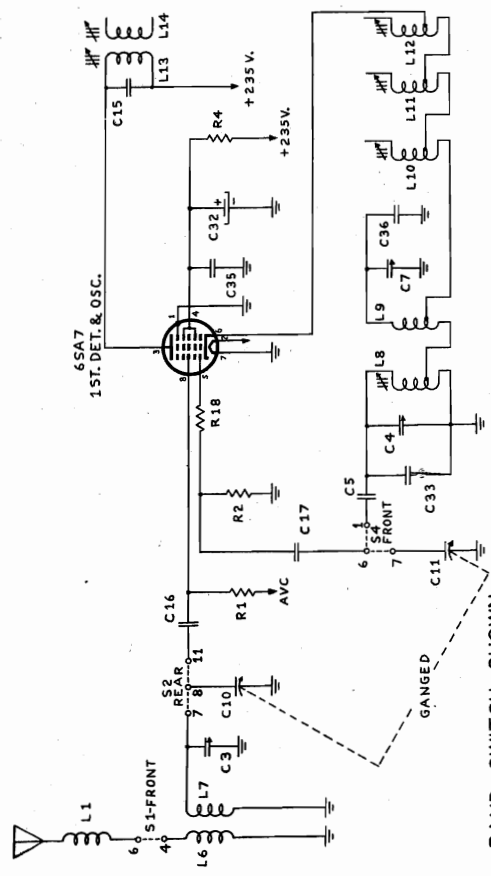
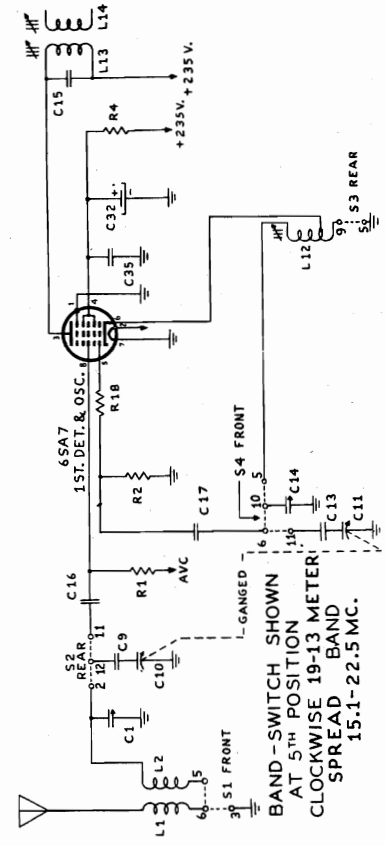
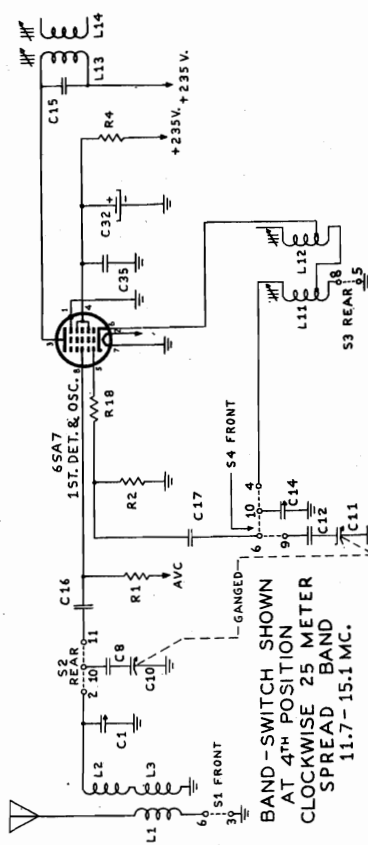
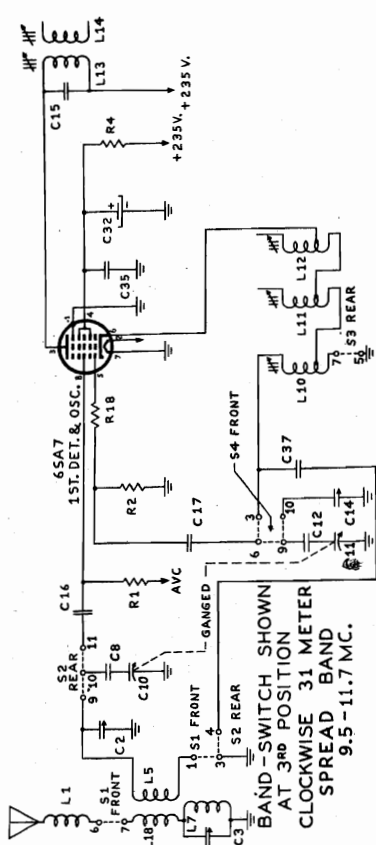
VOLTAGES SHOULD HOLD WITHIN ±20% WITH RATED SUPPLY.

* MEASURED WITH CHANALYST OR VOLTOHMYST.



RANGE SWITCH
VIEWED FROM FRONT
AND SHOWN IN "A" BAND
(MAX. COUNTER CLOCK-
WISE) POSITION

NOTE:
COIL RESISTANCE
VALUES LESS THAN
SHOWN ARE NOT
SHOWN



Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the Schematic Circuit Diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

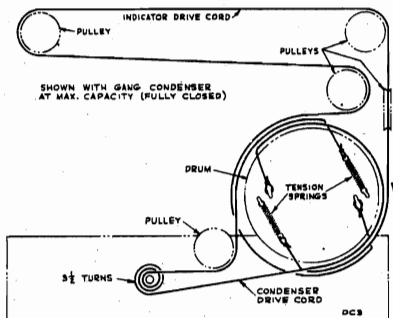
Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the calibration scale drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark (the first mark on "A" band to the left of "550"), and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Dial-Indicator and Drive Mechanism

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each spread-band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal-controlled oscillator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be retouched so that the stations come in at the correct points on the dial.

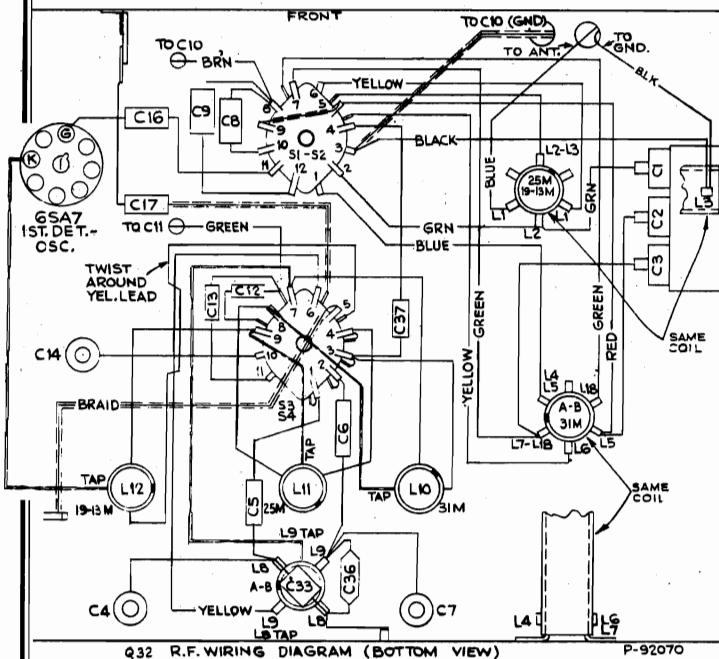
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.				L15 and L16 2nd I-F Trans.
2	6SA7 1st Det. grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L13 and L14 1st I-F Trans.
3	Ant. lead in series with 300 ohms	11.8 mc	25 M	138.5°	L11 (osc.)** C1 (ant.)
4		15.2 mc		17°	C14 (osc.)*
5		Repeat steps 3 and 4			
6		15.2 mc	19-13 M	156°	L12 (osc.)**
7		9.5 mc	31 M	156°	L10 (osc.)** C2 (ant.)
8		9.5 mc	B	11.5°	C7 (osc.)***
9	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C4 (osc.) C3 (ant.)
10		600 kc		150°	L8 (osc.) (Rock gang)
11	Repeat steps 9 and 10				

* Use minimum capacity peak if two can be obtained. Check image to determine that C14 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

** If two peaks can be obtained use the one obtained when the core screw is farthest out (counter-clockwise).

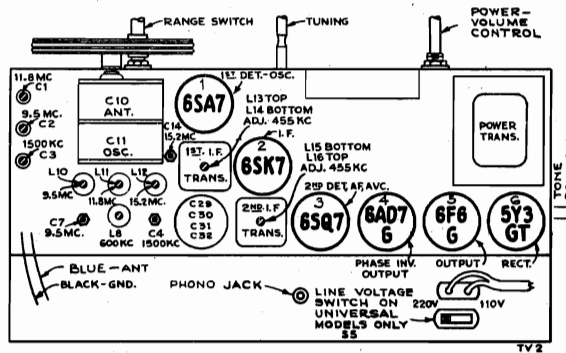
*** Peak at minimum capacity if two peaks can be obtained.

NOTE: Oscillator tracks above signal on all bands.



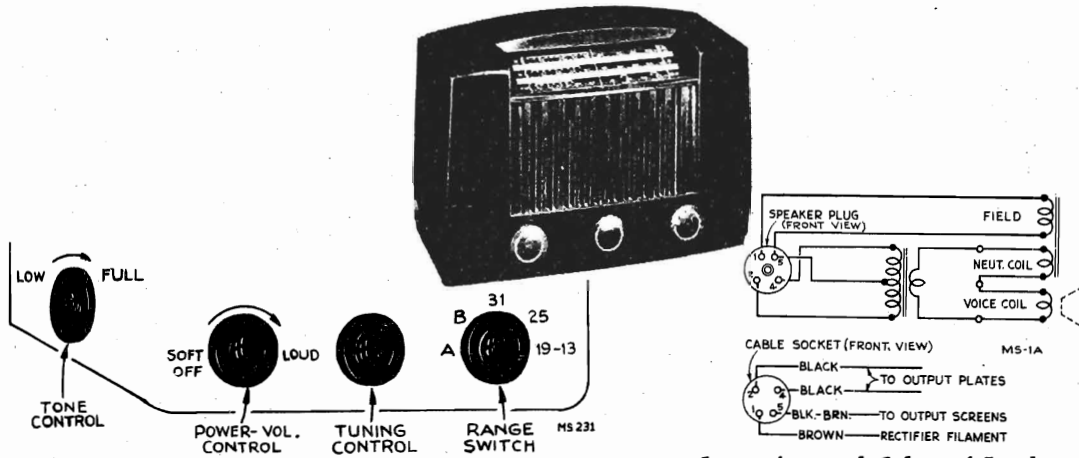
Q32 R.F. WIRING DIAGRAM (BOTTOM VIEW)

P-92070



Tube and Trimmer Locations

RCA MFG. CO.



Location of Controls

Connections and Colors of Loudspeaker and Cable for Chassis No. RC-507

Electrical and Mechanical Specifications

Chassis No. RC-507U differs from Chassis No. RC-507 in that it is equipped with a permanent magnet dynamic loudspeaker. Other

than the loudspeaker and required changes to the power supply filter, and output tubes bias circuits, the chassis are identical.

Frequency Ranges

- Standard Broadcast ("A" Band) 540-1,720 kc (556-174 m)
- Medium Wave ("B" Band) 3.0-9.5 mc (100-31.6 m)
- "31" Meter Spread Band 9.5-11.7 mc (31.6-25.6 m)
- "25" Meter Spread Band 11.7-15.1 mc (25.6-19.9 m)
- "19-13" Meter Spread Band 15.1-22.5 mc (19.9-13.3 m)

Intermediate Frequency 455 kc

Tube Complement

- (1) RCA-6SA7 1st Detector-Oscillator
- (2) RCA-6SK7 I-F Amplifier
- (3) RCA-6SQ7 2nd Detector, A-F Amplifier, A.V.C.
- (4) RCA-6AD7-G Phase Inverter, Power Output
- (5) RCA-6F6-G Power Output
- (6) RCA-5Y3-GT Rectifier

Power Output Rating

Undistorted 3 watts
Maximum 3.5 watts

Loudspeaker

Chassis No. RC-507 Identification No. 92517-1
Type (Electrodynamic) 6½ inches
V-C Impedance at 400 c.p.s. 3.4 ohms
Chassis No. RC-507U Identification No. 92570-1
Type (P.M. dynamic) 6½ inches
V-C Impedance at 400 c.p.s. 3.4 ohms

Cabinet Dimensions (Inches)

	Height	Width	Depth
Q121 (Plastic)	10 ⁷ / ₈	16 ¹ / ₄	7 ⁵ / ₈
Net Weight (pounds)	21		
Shipping Weight (pounds)	25		
Chassis Base Dimensions (inches)	Height, 2 ³ / ₄ ;	Width, 15 ¹ / ₈ ;	Depth, 5 ¹ / ₄
Over-all Chassis Height	9 ¹ / ₄ inches		
Tuning Drive Ratio	25 to 1		

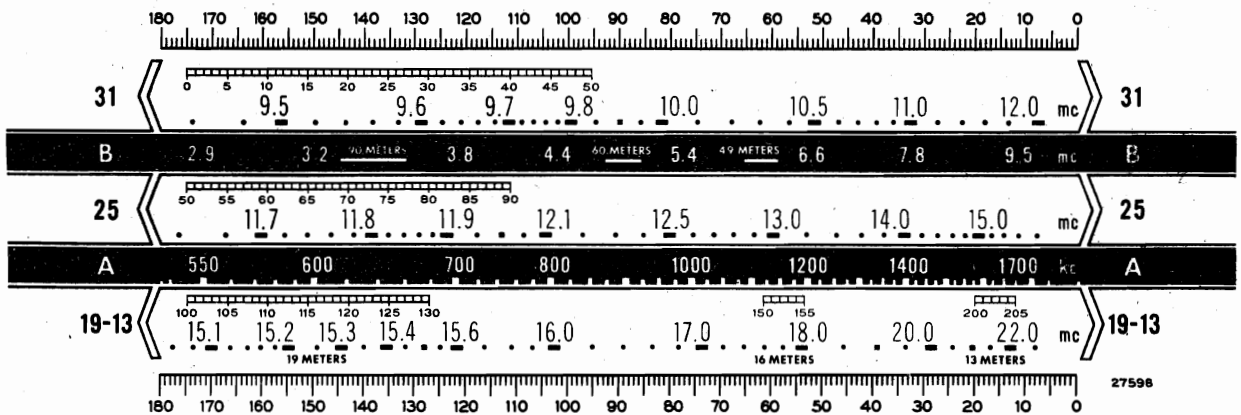
Power Supply Ratings

Symbol	Voltages	Frequency (cycles)	Watts
Rating A	105 to 125 volts, 117 nominal	25 to 60	65
Rating B	105 to 125 volts, 117 nominal	50 to 60	65
Rating C	{ 105 to 125 volts, 117 nominal 210 to 250 volts, 234 nominal }	50 to 60	65

(Shipped in 210-250 volt position)

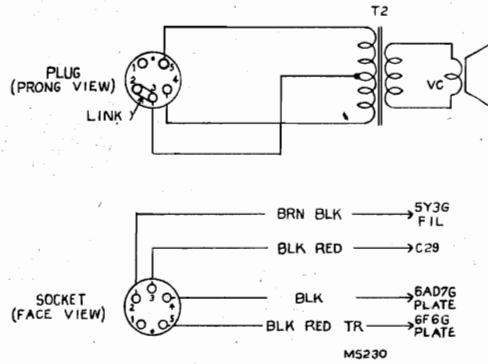
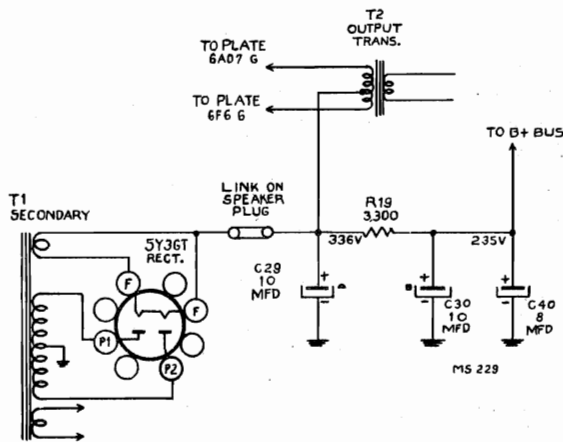
Phonograph Attachment.—A jack is provided on the rear of chassis for connection to a Phonograph Attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug.

When Phonograph is not in use its plug should be removed. When Phonograph is in use the volume control on the radio should be at minimum and, if necessary, tune set off frequency from any very strong station.



Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example 150° on the calibration scale corresponds to 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."



Connections and Colors of Loudspeaker and Cable for Chassis No. RC-507U

Chassis No. RC-507U Power Supply Circuit Diagram

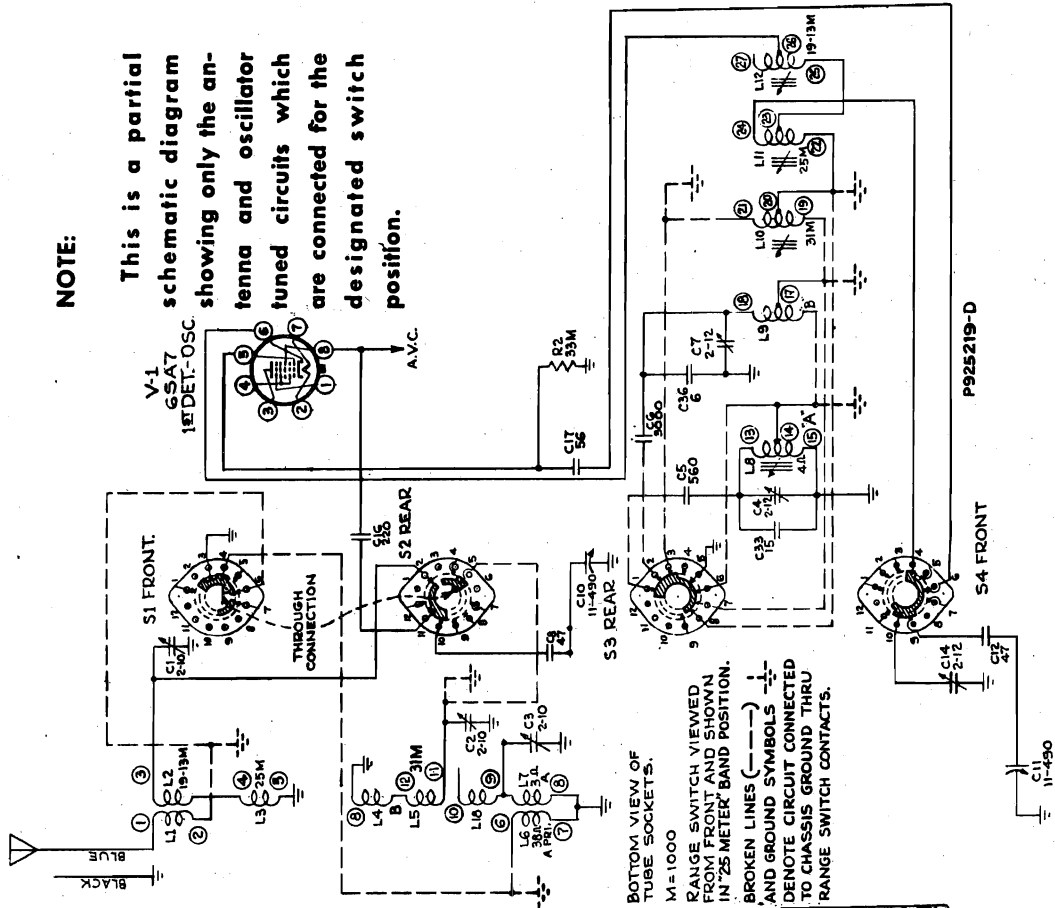
Replacement Parts

NOTE: The replacement parts listed below are applicable to both chassis except where specifically indicated.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
CHASSIS ASSEMBLIES RC-507 and RC-507U			
35622	Bracket—Flywheel and tuning shaft mounting support	30493	Resistor—150,000 ohms, 1/2 watt (R14)
37976	Bracket—Support bracket for tone control	14983	Resistor—330,000 ohms, 1/4 watt (R12)
35642	Calibrator—Drive drum calibrator	30648	Resistor—470,000 ohms, 1/2 watt (R11, R16)
12714	Capacitor—Air trimmer, 2-12 mmf. (C4, C7, C14)	30852	Resistor—1 megohm 1/4 watt (R1)
34654	Capacitor—Mica trimmer, comprising three sections of 2.5-10 mmf. (C1, C2, C3)	30649	Resistor—2.2 megohms, 1/4 watt (R3)
35646	Capacitor—Ceramic, 6 mmf. (C36)	30992	Resistor—10 megohms, 1/4 watt (R10)
36012	Capacitor—Ceramic, 15 mmf. (C37)	14350	Screw—#8-32 square head set screw for drive drum
39041	Capacitor—Ceramic, 18 mmf. (C33)	35633	Shaft—Extension shaft for range switch
70582	Capacitor—Ceramic, 47 mmf. (C8, C12)	35637	Shaft—Tuning knob shaft
39622	Capacitor—Mica, 56 mmf. (C17)	31364	Socket—Lamp socket
35645	Capacitor—Ceramic, 68 mmf. (C13)	14278	Socket—Phono input socket
70586	Capacitor—Mica, 68 mmf. (C9)	31251	Socket—Tube socket
39628	Capacitor—Mica, 100 mmf. (C15, C18, C34)	31261	Spring—Retaining spring for oscillator coils core and studs
39636	Capacitor—Mica, 220 mmf. (C16, C38)	31418	Spring—Tension spring for drive or indicator cord
70667	Capacitor—Mica, 560 mmf. (C5)	35640	Support—Drive cord pulley support complete with one pulley
70687	Capacitor—Mica, 3000 mmf. (C6)	35639	Support—Drive cord pulley support complete with three pulleys
70585	Capacitor—Tubular, .0015 mid., 1500 volts (C23)	35621	Switch—Range switch (S1, S2, S3, S4)
70644	Capacitor—Tubular, .0025 mid., 700 volts (C25)	32827	Switch—Voltage change switch (S5)
70627	Capacitor—Tubular, .005 mid., 500 volts (C24)	35636	Transformer—First I-F transformer (L13, L14, C15, C18)
70548	Capacitor—Tubular, .005 mid., 1000 volts (C27, C26)	35628	Transformer—Second I-F transformer (L15, L16, C20, C21)
70610	Capacitor—Tubular, .01 mid., 400 volts (C28, C39)	32852	Transformer—Power transformer, 117 or 235 volt, 50 to 60 cycle (Rating 'C') (T1)
70614	Capacitor—Tubular, .035 mid., 400 volts (C22)	35588	Transformer—Power transformer 117 volt, 25 to 60 cycle (Rating 'A') (T1)
70615	Capacitor—Tubular, .05 mid., 400 volts (C19, C35)	2917	Washer—"C" washer to fasten tuning shaft
39014	Capacitor—Electrolytic, comprising 3 sections of 10 mfd., 450 volts, and 1 section of 20 mfd., 25 volts (C29, C30, C31 C32)	33726	Washer—"C" washer to fasten idler pulley
72139	Capacitor—Electrolytic, 8 mid., 450 volts (RC-507U only) (C40)	SPEAKER ASSEMBLY Stamped 92517-1J (For RC-507 only)	
35632	Coil—Antenna coil, "A", "B" and 31 meter bands (L4, L5, L6, L7 L18)	70578	Cone—Cone and voice coil assembly
35631	Coil—Antenna coil, spread band (L1, L2, L3)	5118	Plug—4 prong male speaker plug
35623	Coil—Oscillator coil, "A" and "B" band (L8, L9)	70583	Speaker—6 1/2" E.M. speaker complete with cone and voice coil, less output transformer and plug
35624	Coil—Oscillator coil, 19-13 meter band (L12)	70584	Transformer—Output transformer (T2)
35625	Coil—Oscillator coil, 25 meter band (L11)	SPEAKER ASSEMBLY Stamped 92570-1J (For RC-507U only)	
35626	Coil—Oscillator coil, 31 meter band (L10)	72425	Speaker—6 1/2" P.M. speaker complete with cone and voice coil, less output transformer and plug
35619	Condenser—Variable tuning condenser (C10, C11)	31539	Plug—5 prong speaker plug
35629	Control—Tone control (R9)	70584	Transformer—Output transformer (T2)
35620	Control—Volume control and power switch (R6, S6)	MISCELLANEOUS	
32634	Cord—Drive cord (approx. 28" overall length)	*72143	Back—Cabinet back
34662	Cord—Indicator cord (approx. 53" overall length)	70833	Board—Baffle board and grille cloth
35788	Core—Adjustable core and stud for "A" and "B" band oscillator coil	Y1382	Cabinet—Plastic cabinet
31259	Core—Adjustable core and stud for 19-13 meter band, 25 meter band and 31 meter band oscillator coils	70579	Decal—Trade mark decal
35627	Drum—Drive drum less calibrator	35654	Dial—Glass dial scale
35638	Flywheel—Tuning shaft flywheel	35647	Frame—Dial frame only less indicator and dial
70930	Grommet—Rubber grommet for mounting tuning condenser (4 required)	70580	Indicator—Station selector indicator
5040	Plug—4 contact female plug for speaker cable (RC-507 only)	35651	Knob—Range switch knob
12493	Plug—5 contact female plug for speaker cable (RC-507U only)	35652	Knob—Range indicator knob
35641	Pulley—Drive cord pulley	35650	Knob—Tone control knob
35630	Pulley—Idler pulley	34489	Knob—Tuning or volume control knob
34761	Resistor—10 ohms, 1/4 watt (R18)	11891	Lamp—Lamp, Mazda 44
30735	Resistor—560 ohms, 1 watt (RC-507 only) (R15)	14270	Spring—Retaining spring for knobs #34489, 35650 or 35651
39050	Resistor—820 ohms, 1 watt (RC-507U only) (R15)	4982	Spring—Retaining spring for knob #35652
48674	Resistor—3,300 ohms, 4 watt (RC-507U only) (R19)		
30436	Resistor—12,000 ohms, 1/4 watt (R7)		
35595	Resistor—15,000 ohms, 3 watt (R4)		
30492	Resistor—22,000 ohms, 1/4 watt (R5)		
30685	Resistor—33,000 ohms, 1/4 watt (R2)		
30180	Resistor—120,000 ohms, 1/4 watt (R13)		

NOTE:

This is a partial schematic diagram showing only the antenna and oscillator tuned circuits which are connected for the designated switch position.

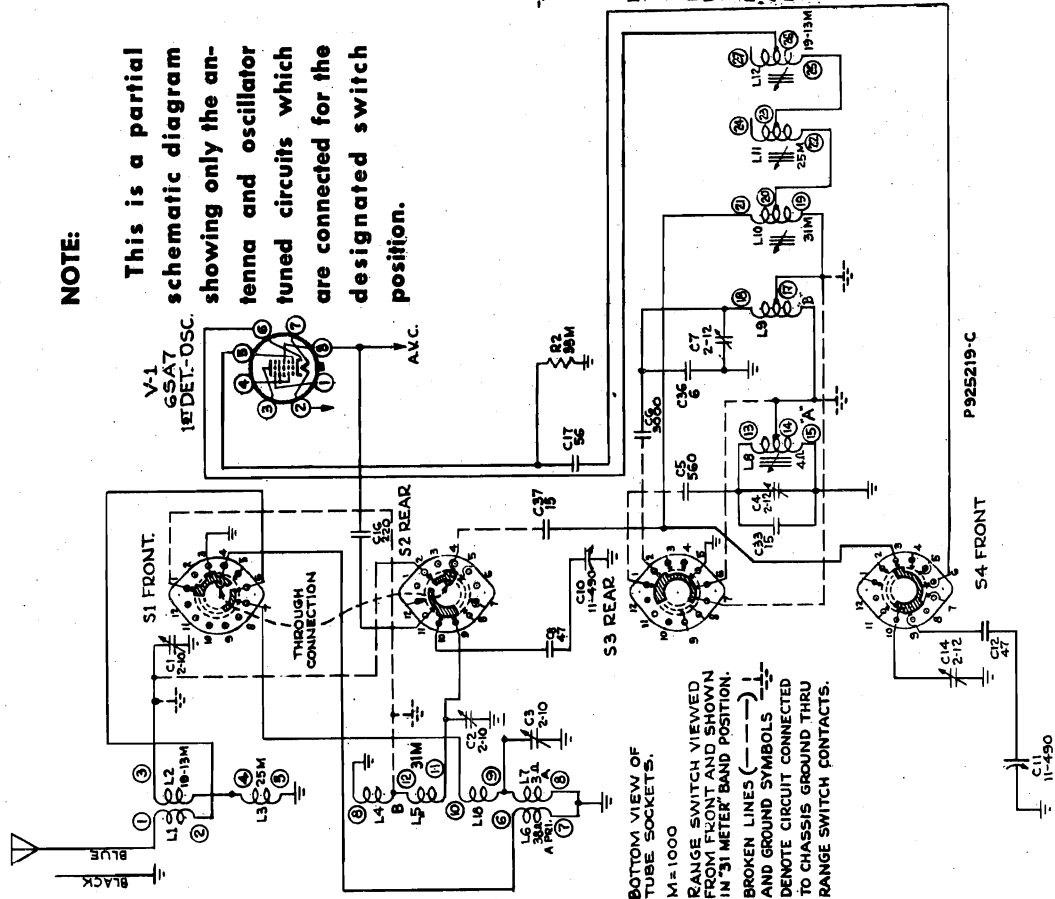


BOTTOM VIEW OF TUBE SOCKETS. M=1000 RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN '25 METER' BAND POSITION. BROKEN LINES (---) AND GROUND SYMBOLS DENOTE CIRCUIT CONNECTED TO CHASSIS GROUND THROUGH RANGE SWITCH CONTACTS.

Simplified Schematic Diagram Antenna & Oscillator Circuits "25 Meter Band"

NOTE:

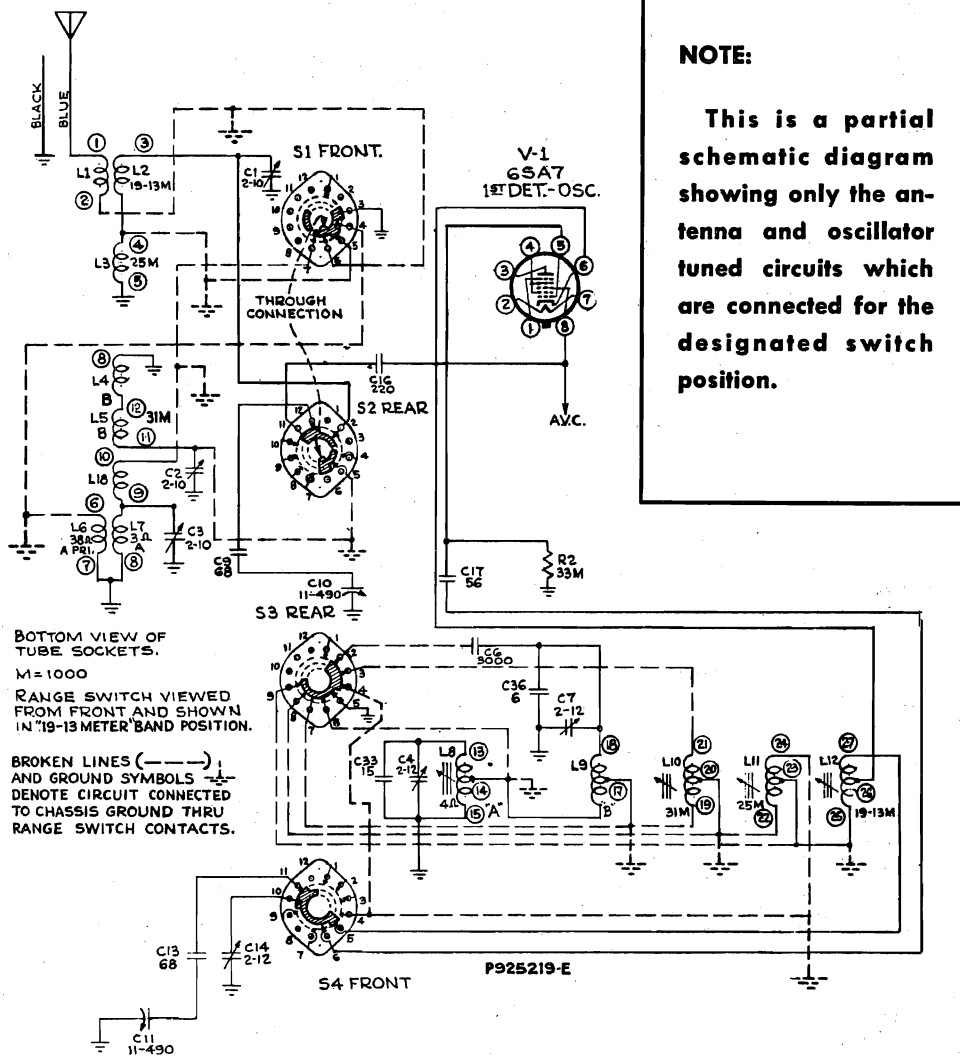
This is a partial schematic diagram showing only the antenna and oscillator tuned circuits which are connected for the designated switch position.



BOTTOM VIEW OF TUBE SOCKETS. M=1000 RANGE SWITCH VIEWED FROM FRONT AND SHOWN IN '31 METER' BAND POSITION. BROKEN LINES (---) AND GROUND SYMBOLS DENOTE CIRCUIT CONNECTED TO CHASSIS GROUND THROUGH RANGE SWITCH CONTACTS.

Simplified Schematic Diagram Antenna & Oscillator Circuits "31 Meter Band"

"clarified schematics"



Simplified Schematic Diagram
Antenna & Oscillator Circuits

"19-13 Meter Band"

RCA MFG. CO.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscilloscope are shown in the diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

Receiver Dial with Calibration Scale.—To determine the corresponding frequency for any setting of the calibration scales, refer to the dial with calibration scale drawing.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a clip for attachment to the cable.

Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the oscillator coil magnetite-core for each band so that these stations come in at the correct points on the dial.

In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of the test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the oscillator coil magnetite-core for each band should be re-touched so that the stations come in at the correct points on the dial.

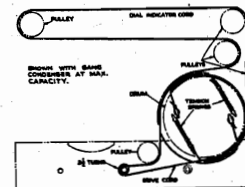
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid in series with .01 mfd.	455 kc	A	Quiet point near 180°	L16—L15 2nd I-F transformer
2	1st Det. grid, in series with .01 mfd.				L14—L13 1st I-F transformer
3		11.8 mc	25M	138.5°	L11 (osc.)* C1 (ant.)
4		15.2 mc		17°	C14 (osc.)***
5		Repeat steps 3 and 4.			
6	Ant. lead in series with 300 ohms	15.2 mc	19-13M	156°	L12 (osc.)*
7		9.5 mc	31M	156°	L10 (osc.)* C2 (ant.)
8		9.5 mc	B	11.5°	C7 (osc.)**
9	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C4 (osc.)** G3 (ant.)
10		600 kc		150°	L8 (osc.)* (Rock gang.)
11		Repeat steps 9 and 10.			

*If two peaks can be obtained, use the one obtained when the core screw is farthest out (counter-clockwise).

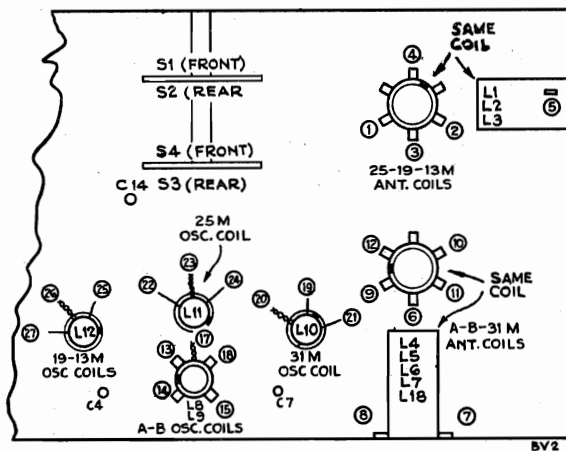
**Use minimum capacity peak if two can be obtained.

***Use minimum capacity peak if two can be obtained. Check image to determine that C14 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

NOTE: Oscillator tracks above signal on all bands.



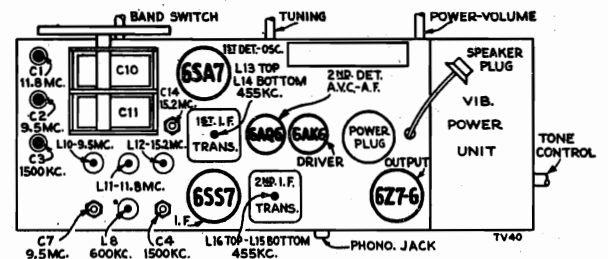
Dial-Indicator and Drive Mechanism



Coil and Band Switch Locations (Bottom Chassis View)

Precautionary Lead Dress.

1. Twist yellow lead from terminal 14 of L8 to terminal 6 of S3 with the lead from terminal 27 of L12 to terminal 5 of S4.
2. All other oscillator coil leads must be kept apart from each other as well as from other leads and parts. No two leads may be less than 1/4 inch apart.
3. The lead from the tap on 19-13 oscillator coil to pin number 6 (K) of 6SA7 socket should be dressed up and away from all parts as far as possible.
4. Condensers C8, C9 and C16 must be as far away from all metal parts as possible.
5. All leads from the antenna coil to the range switch should be dressed together.

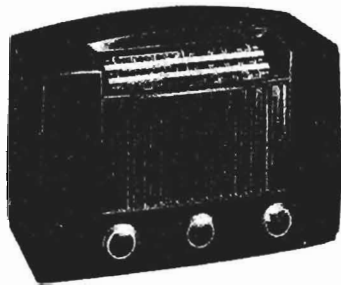


Tube and Trimmer Locations (Top Chassis View)

6. The green lead from pin 4 (SG) of 6SA7 socket to pin 6 (SG) of 6SS7 socket should be dressed down against the chassis and away from the I.F. terminals.
7. All leads and parts must clear the tuning flywheel by at least 1/4 inch.
8. The leads to the power switch should be twisted together and dressed away from other leads and parts as much as possible.
9. Capacitor C34 must be mounted edgewise and close to the chassis with the leads as short as possible.
10. The green lead from term. C of 1st I-F trans to pin 4 (G) of 6SS7 must be short and close to chassis under all other leads.

MODEL QB13

RCA MFG. CO.



Electrical and Mechanical Specifications

Frequency Ranges

Standard Broadcast ("A" Band).....	540-1,720 kc (555-174 m)
Medium Wave ("B" Band).....	2.9-9.5 mc (103-31.6 m)
"31" Meter Spread Band.....	9.5-12 mc (31.6-25 m)
"25" Meter Spread Band.....	11.7-15 mc (25.6-20 m)
"19-13" Meter Spread Band.....	15.1-22 mc (19.9-13.6 m)

Intermediate Frequency.....455 kc

RCA Tube Complement

RC-529A	RC-612	
(1) RCA-6SA7	RCA-6SA7.....	1st-Det.—Osc.
(2) RCA-6S7*	RCA-6SS7.....	I-F Amplifier
(3) RCA-6T7-G*	RCA-6AQ6.....	2nd-Det., A.V.C., and 1st Audio
(4) RCA-6J7	RCA-6AK6.....	Driver
(5) RCA-6Z7-G	RCA-6Z7G.....	Power Output

*In some units, a 6K7 may be substituted for the 6S7 and a 6Q7 in place of the 6T7G.

Power Supply Rating

With vibrator power supply unit (RS-115):	
6.3 volts, total current drain *RC-529A.....	3.35 amperes
RC-612.....	3.2 amperes

*If both tube substitutions are made, the total current consumption will be increased to 3.65 Amperes.

Power Output	RC-529A	RC-612
Undistorted.....	3.1 watts	2.1 watts
Maximum.....	4.5 watts	3.1 watts

Loudspeaker (92519-1)

Type.....6½ inch, permanent-magnet dynamic
Voice-coil Impedance at 400 cycles.....3.4 ohms

	Height	Length	Depth
Cabinet Dimensions { QB11.....	11¼"	17¼"	7¼"
{ QB12 & QB13.....	10¼"	16¼"	7¼"

Net Weight { QB11.....21.5 lbs.
{ QB12 & QB13.....20.0 lbs.

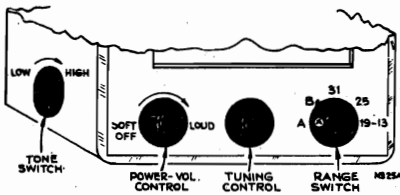
Tuning Drive Ratio.....25:1

Phonograph Attachment

A jack is provided on the rear of chassis for connecting a Phonograph attachment to the audio amplifying circuit.

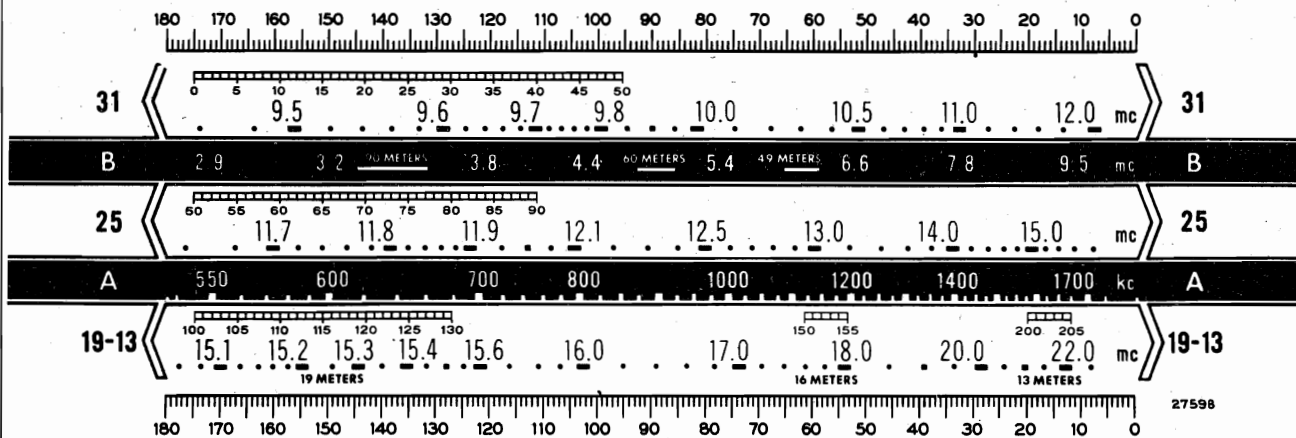
When Phonograph attachment is in use, the volume control on the radio should be at minimum, and, if necessary, tune set off frequency from any very strong station.

When Phonograph attachment is not in use its plug should be disconnected.



Location of Controls

RECEIVER DIAL WITH CALIBRATION SCALE

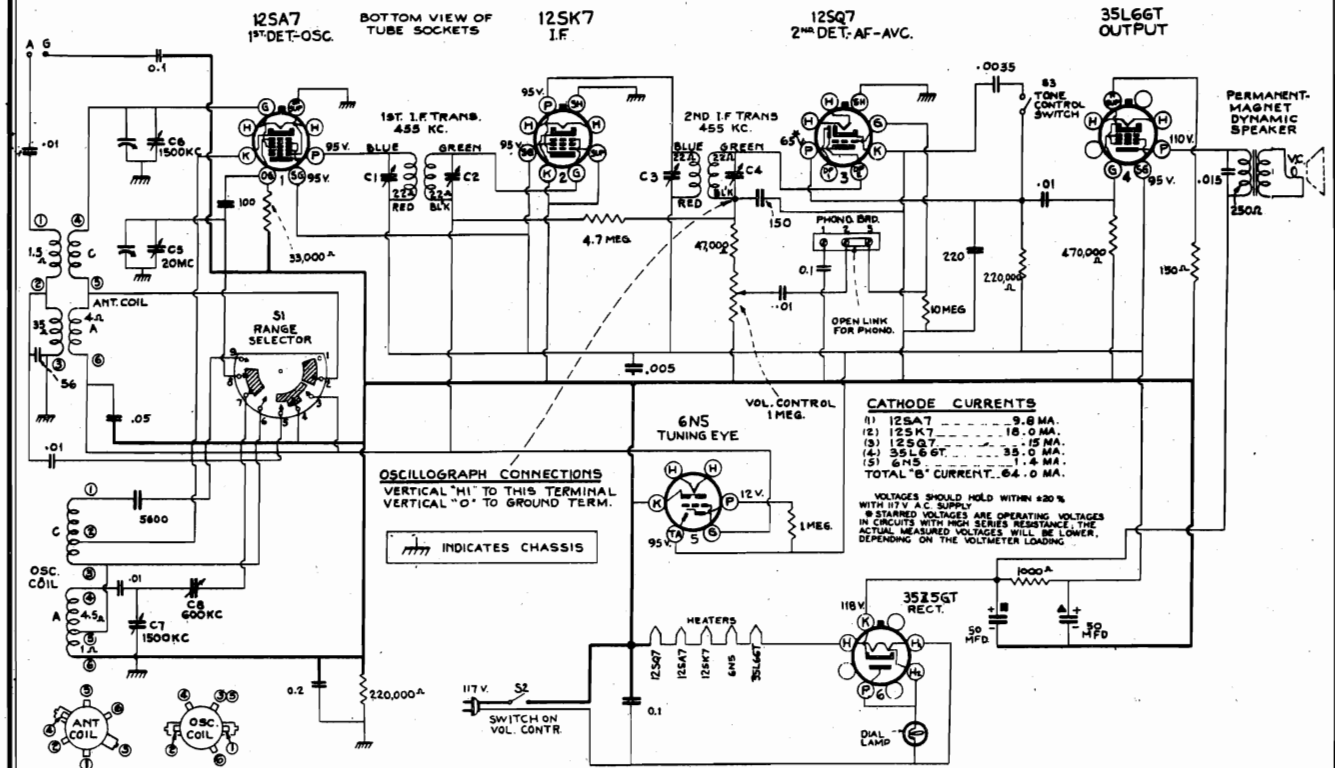


Reduced Reproduction of Receiver Dial and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 150° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

RCA MFG. CO.

MODEL X60, Chassis RC474D



STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
CHASSIS ASSEMBLIES (RC-474D)			
33719	Belt—Push button adjusting belts.....	14284	Resistor—22,000 ohms, 1/10 watt.....
34024	Board—"Antenna-Ground" board.....	13998	Resistor—22,000 ohms, 1/2 watt.....
34025	Board—"Radio-Phono" board.....	12454	Resistor—33,000 ohms, 1/2 watt.....
33731	Button—Push button.....	12412	Resistor—47,000 ohms, 1/2 watt.....
30766	Cap—Rubber shield for Magic Eye.....	12284	Resistor—220,000 ohms, 1/2 watt.....
33629	Capacitor—Trimmer capacitor comprising of 2 sections (C7, C8).....	12285	Resistor—470,000 ohms, 1/2 watt.....
12723	Capacitor—56 mmfd., moulded mica.....	30271	Resistor—4.7 megohm, 1/2 watt.....
12720	Capacitor—100 mmfd., moulded mica.....	13601	Resistor—10 megohm, 1/2 watt.....
12725	Capacitor—150 mmfd., moulded mica.....	33438	Screw—Magic Eye clip screw.....
12694	Capacitor—220 mmfd., moulded mica.....	33725	Shaft—Tuning knob drive shaft and retainer.....
13895	Capacitor—5,600 mmfd., moulded mica.....	31365	Socket—Dial lamp socket.....
30303	Capacitor—.0035 mfd., 700 volts.....	13871	Socket—Magic Eye socket.....
33584	Capacitor—.005 mfd., 1,200 volts.....	31319	Socket—Tube socket.....
4937	Capacitor—.01 mfd., 500 volts.....	31418	Spring—Tuning condenser drive cord spring.....
11315	Capacitor—.015 mfd., 400 volts.....	33720	Spring—Push arm return spring.....
4870	Capacitor—.025 mfd., 400 volts.....	33946	Switch—Range switch (S1).....
32787	Capacitor—.05 mfd., 400 volts.....	34336	Switch—Tone control switch (S3).....
4839	Capacitor—.1 mfd., 400 volts.....	33722	Transformer—First i-f transformer (C1, C2).....
34505	Capacitor—.2 mfd., 300 volts.....	34026	Transformer—Second i-f transformer (C3, C4).....
34212	Capacitor—Comprising 2 sections of 50 mfd., each, 150 volts.....	33726	Washer—"C" washer for drive shaft.....
30716	Clip—Magic Eye clip.....	SPEAKER ASSEMBLIES (RL 85-2)	
33732	Coil—Antenna coil.....	32907	Cap—Cone center dust cap.....
33733	Coil—Oscillator coil.....	34554	Cone—Speaker cone and voice coil.....
33635	Condenser—Tuning condenser and drum assembly.....	84803	Transformer—Output transformer.....
33631	Control—Volume control and power switch.....	MISCELLANEOUS ASSEMBLIES	
32634	Cord—Tuning condenser drive cord.....	31456	Cover—8-protective covers for push button markers.....
33633	Indicator—Station selector pointer.....	34270	Dial—Glass dial scale.....
11765	Lamp—Dial lamp—Mazda No. 51.....	33637	Escutcheon—Dial and button escutcheon.....
33734	Plate—Dial plate complete less condenser and button.....	30863	Knob—Tuning, tone, range or volume control.....
30880	Resistor—150 ohms, 1/2 watt.....	33973	Marker—1 set push button markers.....
30152	Resistor—1,000 ohms, 1 watt.....	30900	Spring—Retaining spring for knob or button.....

Short-Wave Sensitivity:

Where insufficient sensitivity is noted on the short-wave band of Model X-60, addition of capacity coupling of 3 or 4 mmfd. between signal and oscillator grids of converter tube will usually restore normal sensitivity to entire band. This coupling can be effected in several ways:

- Unsolder one grid lead, take several turns around other lead to give desired capacity, resolder.
- Twist several turns of insulated wire around both grid leads to give desired value of capacity coupling.
- Install a 3 to 4 mmfd. capacitor between tube grids.

RCA MFG. CO.

Electrical and Mechanical Specifications

FREQUENCY RANGES
 Standard Broadcast..... 540-1,720 kc
 Short Wave..... 5.6-20 mc
 Intermediate Frequency..... 455 kc
 Number of Push Buttons..... Six

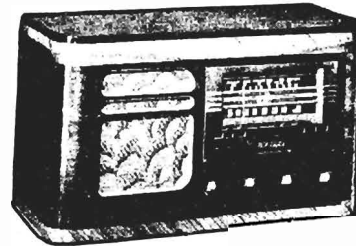
TUBE COMPLEMENT
 (1) RCA-12SA7..... First Detector-Oscillator
 (2) RCA-12SK7..... I-F Amplifier
 (3) RCA-12SQ7..... Second Detector, A-F, and A.V.C.
 (4) RCA-35L6GT..... Power Output
 (5) RCA-6N5..... Magic Eye
 (6) RCA-35Z5GT..... Rectifier
 Dial Lamp..... Mazda No. 51, 7.5 volts; 0.20 amp.

POWER OUTPUT (125 volts, 60 cycle supply)
 Undistorted..... 0.8 watts
 Maximum..... 1.4 watts

POWER SUPPLY RATINGS
 A-C Rating..... 105-125 volts, 50-60 cycles, 35 watts
 D-C Rating..... 105-125 volts, direct current, 35 watts

LOUDSPEAKER (RL 85-2)
 Type..... 5-inch permanent magnet dynamic
 V.C. impedance at 400 cycles..... 4.5 ohms

Height Width Depth
 Cabinet Dimensions (inches)..... 9 7/8 16 7
 Chassis Base Dimensions (inches)..... 2-3/16 12 1/4 5 1/2
 Overall Chassis Height..... 6 1/2 inches
 Shipping Weight..... 15 pounds
 Tuning Drive Ratio..... 10:1



Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button rods with a small screwdriver.
2. Check to be sure the link connection on back of chassis is in "Radio" position (connected between terminals 2 and 3).

3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the rod. Do not tighten more than 1/4 turn after the screw begins to grip or damage to the mechanism may result.

4. Replace the push-button on its shaft.
5. Proceed in a similar manner for the remainder of the push-buttons.
6. Insert the station marker tabs in the recesses above the push-buttons.

Alignment Procedure

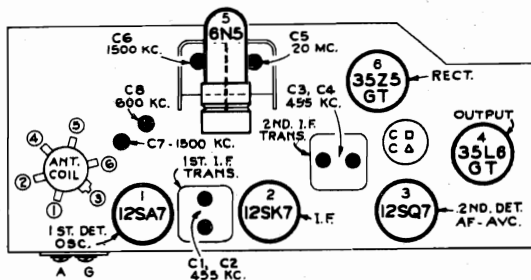
Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

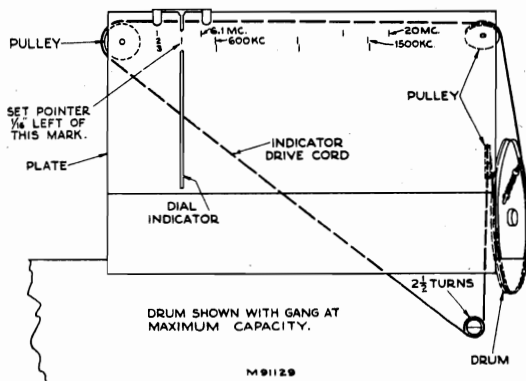
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground binding post, and keep the output as low as possible to avoid A.V.C. action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, 1,500 kc, 6.1 mc, and 20 mc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point 1/16 inch to the left of the mark at the extreme left (low frequency) end of the dial scale.



Tube and Trimmer Locations



Dial-Indicator and Drive Mechanism

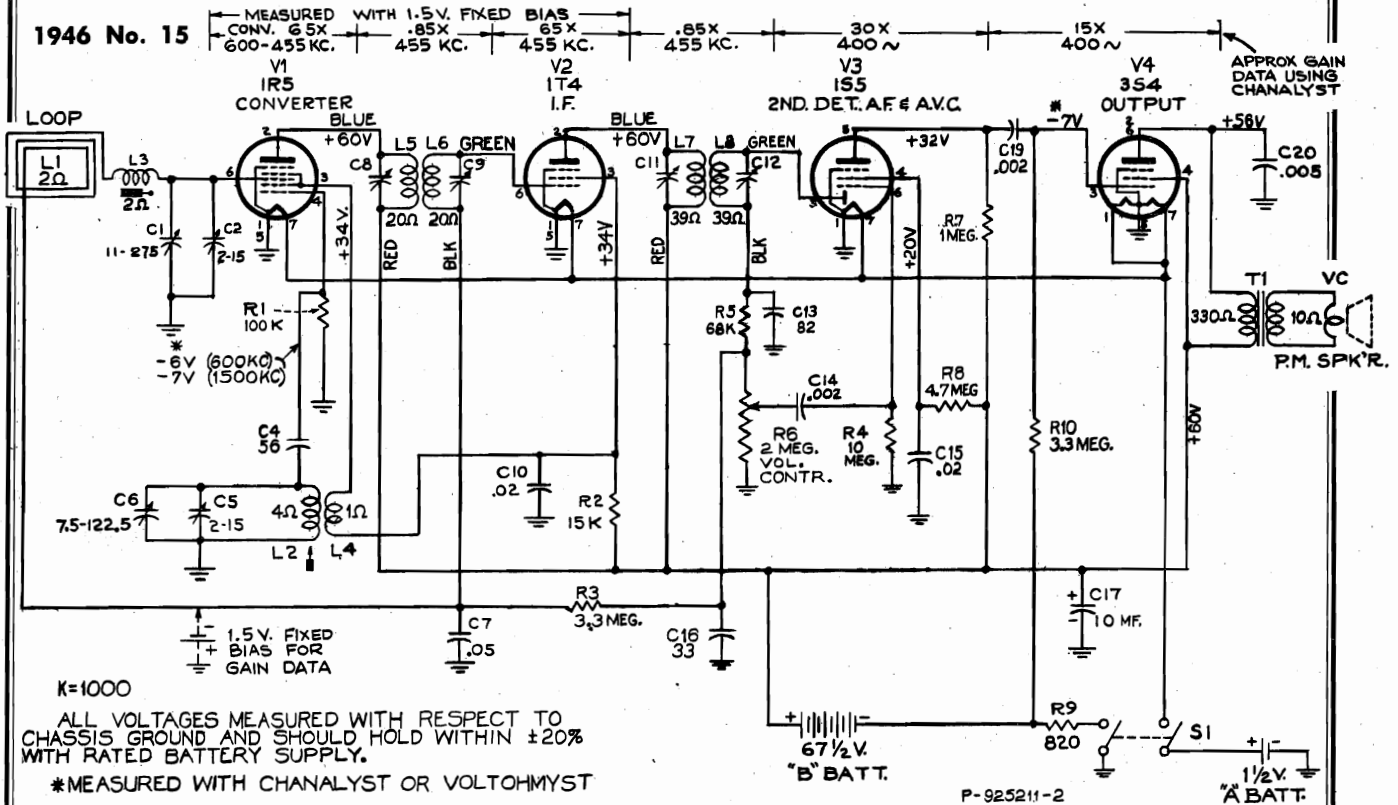
Steps	Connect the high side of the test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna terminal	455 kc	"A" Band Quiet Point between 550-750 kc	C3 and C4 (2nd I-F trans.)
2				C1 and C2 (1st I-F trans.)
3	Antenna terminal in series with 300 ohms	20 mc	"C" Band 20 mc calibration mark	C5 (osc.) *
4	Antenna terminal in series with 200 mmf.	1,500 kc	"A" Band 1,500 kc calibration mark	C7 (osc.) C8 (ant.)
5		600 kc	"A" Band 600 kc calibration mark	C8 (osc.) Rock gang
6	Repeat step 4			

* Use minimum peak if two can be obtained. Check to determine that C5 has been adjusted properly by tuning receiver to approximately 19.09 mc where a weaker signal should be received.
 Note: Oscillator tracks above signal on both bands.

MODEL 54B5, Chassis RC1047

RCA MFG. CO.

IF PEAK 455 KC



K=1000

ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS GROUND AND SHOULD HOLD WITHIN ±20% WITH RATED BATTERY SUPPLY.

*MEASURED WITH CHANALYST OR VOLTOHMYST

P-925211-2

Alignment Procedure

Test Oscillator.—Connect test oscillator as indicated in chart keeping the output as low as possible to avoid A V C action.

Output Meter.—Connect a high resistance AC voltmeter in series with a .1 mfd capacitor from top lug of TB1 (plate of 354) to ground. Turn volume control to maximum position.

Fig. 1 shows the modifications necessary to convert a case into a convenient shield to be used as a substitute for the regular case in the Ant. Osc. alignment.

When using the dummy case for the osc. alignment, the loop assembly must be raised slightly so that osc. trimmer becomes accessible.

Steps	Connect the high side of test osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	lug of C2, (located on rear of gang) through a .01 mfd. capacitor	455 kc	Quiet point near 1,600 kc	C11, C12 2nd I-F trans.
2		455 kc	Quiet point near 1,600 kc	C8, C9 1st I-F trans.
3	**Antenna coupling loop thru 200 mmf. capacitor	1,600 kc	1,600 kc	C5 (osc.)
4		1,500 kc	1,500 kc	C2 (ant.)
5		600 kc	600 kc	L2 (osc.) (Rock gang)
6	Repeat steps 4 and 5 for final adjustments.			

*The IF transformers can be aligned with chassis out of case.
 **Steps 3, 4 and 5 require a coupling loop from the signal generator to feed a signal into the receiver loop located in the back. This loop should be approximately one turn of 6 x 3½ inches coupled to the signal generator through a 200 mmf. capacitor, and loosely coupled to the receiver loop antenna at about 1¼ inches distance, so as not to disturb the receiver loop inductance. Ground test oscillator through .1 mf. capacitor to receiver chassis.

CRITICAL LEAD DRESS

1. Dress blue, green and black leads of second IF transformer as direct as possible. If excess lead exists, dress down side of socket and flat against chassis to transformer opening.
2. Cross the green and the black leads inside the first IF transformer can, keeping the green lead to the outside. Load coil bracket is to separate the blue and the green leads.

3. Dress audio coupling capacitor C14 and the lead to the volume control up and underneath shelf supporting the output transformer.
4. Wire in the three capacitors pyramided behind the speaker with enough space behind the battery holder to allow holder to move when battery is replaced. Dress the ground leads of these capacitors to keep from shorting the off-on switch.
5. Observe the outside foil connections on all paper capacitors, also the polarity of the electrolytic capacitor C17.
6. Keep blue and red leads of output transformer above the mounting shelf.
7. Dress all leads as far as possible from loading coil.
8. Dress leads to gang as far as possible from all metal parts.
9. Dress loop leads to keep from interfering with battery replacement.

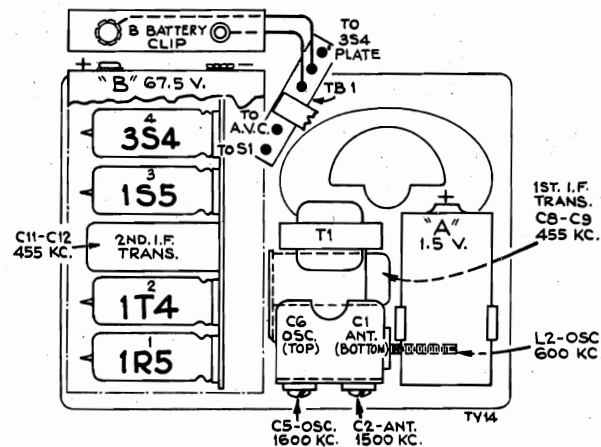


Fig. 4

NOTE:
 A rubber band should be placed around each tube for cushioning. Dirty tube contacts may be mistaken for a defective tube.

RCA MFG. CO.

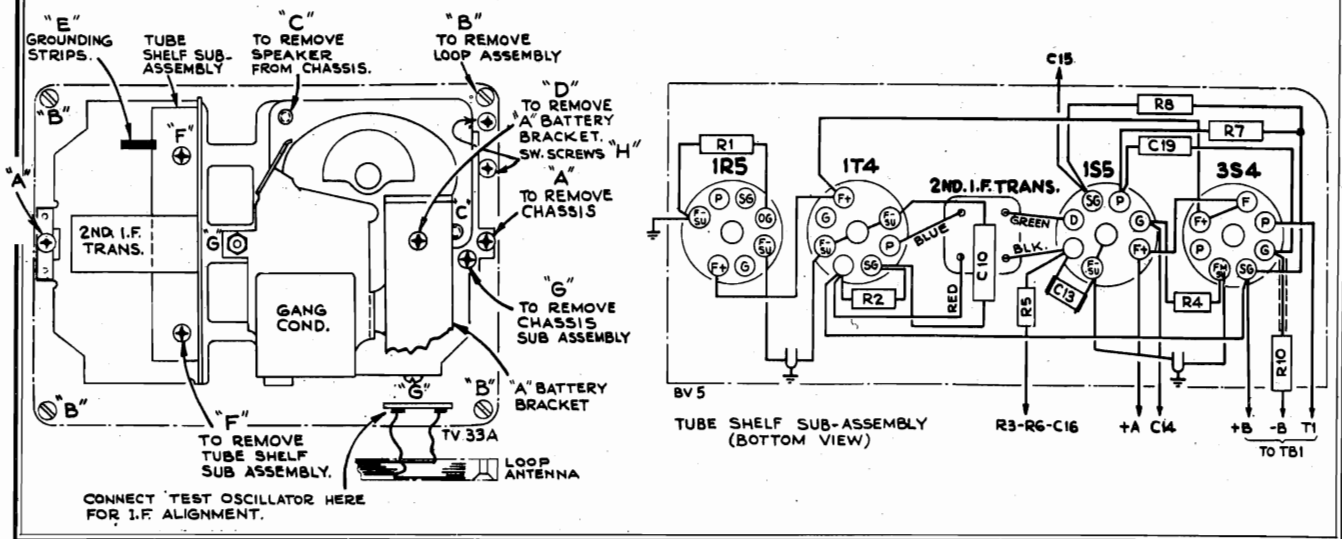
Replacement of Component Parts

- I. To remove tubes:**
 - a. Slide back cover towards handle.
 - b. Remove both batteries.
 - c. Pry tubes out of sockets by gently wedging small screwdriver between base of tubes and sockets.
- II. To replace batteries:**
 - a. Slide back cover towards handle.
 - b. Remove, either or both, the "A" and "B" battery as the case may warrant. The "B" battery snap fasteners can best be removed by inserting a screwdriver under the snap fastener strip and prying upward.
- III. To remove loop:**
 - a. Remove "A" and "B" batteries (see item II).
 - b. Unsolder loop leads from terminals on battery holder.
 - c. Remove four mounting screws "B" in the four corners as indicated in fig. 2 and lift off.
- IV. To remove chassis:**
 - a. Remove loop.
 - b. Remove the two screws "H" holding the switch bracket.
 - c. Remove the two chassis mounting screws "A", fig. 2.
- V. To remove speaker**
 - a. Remove volume control knob by loosening set screw and pull.
 - b. Unsolder voice coil leads, and remove the two mounting screws "C", fig. 2.
 - c. Slide speaker out.
- VI. To remove output transformer:**
 - a. Remove speaker and keep it clear of metal particles.
 - b. Drill out mounting rivet, and bend tabs (when replacing use small screw).
 - c. Unsolder leads and lift out.
- VII. To remove chassis mounting plate:**
 - a. Unsolder copper strip under 3S4 tube.
 - b. Remove two screws (F) holding tube shelf to front plate. These screws are located between tubes 1R5 and 1T4, also 3S4 and 1S5. Rubber shock mounts may stick on studs, pry loose.
 - c. Remove nut (G) beneath tube shelf below second I-F transformer.
 - d. Remove screw (G) beneath the negative terminal of "A" battery holder, and also screw (G) adjacent to volume control below "A" battery holder.
 - e. Carefully invert the chassis.
 - f. Remove volume control wheel (loosen set screw and pull off).
 - g. Lift the mounting plate off.
- VIII. To remove volume control:**
 - a. Remove "A" battery holder.
 - b. Unsolder volume control leads.
 - c. Remove chassis mounting plate (see item VII).
 - d. Remove volume assembly by bending tabs and lifting out.
- IX. To remove oscillator coil:**
 - a. Remove battery holder.
 - b. Remove chassis mounting plate.
 - c. Unsolder oscillator coil leads.
 - d. Remove coil by unsnapping spring mounting clips from angle bracket.
- X. To remove 1st I-F transformer:**
 - a. Remove speaker.
 - b. Unsolder four leads from 1st I-F transformer.
 - 1. Blue to plate of 1R5 tube.
 - 2. Green to grid of 1T4 tube.
 - 3. Red to B+ terminal of 5 lug terminal board adjacent to output transformer.
 - 4. Black to AVC terminal of same strip as above.
 - c. Remove connections as required from two lug terminal board adjacent to 1st I-F transformer to permit this terminal board to be moved to a position free of the 1st I-F transformer.
 - d. Unsolder and bend mounting tabs straight on the I-F transformer can. These tabs are immediately below the 2nd I-F transformer on tube shelf.
 - e. Slip 1st I-F transformer forward toward volume control and out.

Note: It is possible to fold the 1st I-F transformer out the front of the chassis if the front plate is removed. This will eliminate the unsoldering of leads from the two lug terminal board.

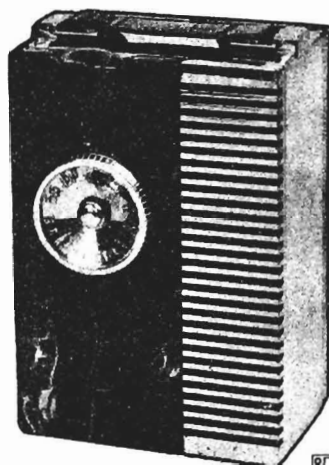
- XI. To remove 2nd I-F transformer:**
 - a. Carefully remove the two 0.02 uf C10, C15 capacitors.
 - b. Carefully depress the two leads (B+ and A+) near the I-F transformer case mounting lugs and unsolder these tabs from the tube mounting shelf and bend out.
 - c. Unsolder the blue (plate of 1T4), green (grid of 1S5), red (B+ on terminal board), and black leads.
 - d. Remove 2nd I-F transformer.
- XII. To remove tuning condenser:**
 - a. Remove chassis mounting plate (see item VII).
 - b. Unsolder leads to tuning gang.
 - c. Loosen loading coil if necessary.
 - d. Remove two mounting screws and lift out.

- Tools required:
- 1. One Phillips No. 1 screwdriver.
 - 2. One small insulated alignment tool.
 - 3. Allen wrench for a #6 set screw. (Use to remove volume control wheel.)



MODEL 54B5

RCA MFG. CO.



Specifications

Frequency Range.....	550-1,600 kc
Intermediate Frequency.....	455 kc
Power Supply	
Type Battery	Current Consumption Approximate Life (Intermittent Duty)
"A"—1.5 volt RCA-VS 036 or VS 001	0.25 amperes 5-6 hours
"B"—67.5 volts RCA-VS 016	8.5 milliamperes 25-40 hours
Power Output.....	Undistorted 0.05 watts..... Maximum 0.12 watts
Loudspeaker	
Type Permanent-Magnet Dynamic Elliptical.....	2 x 3 in.
Voice Coil Impedance.....	11 3/4 ohms at 1000 cycles

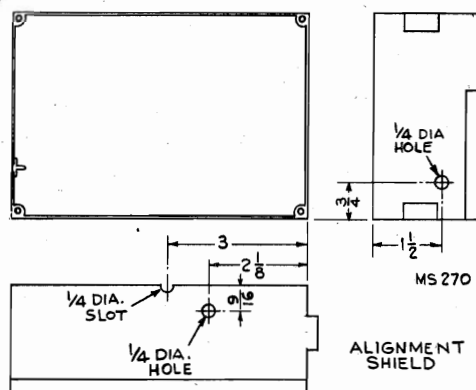


Fig. 1

Replacement Parts

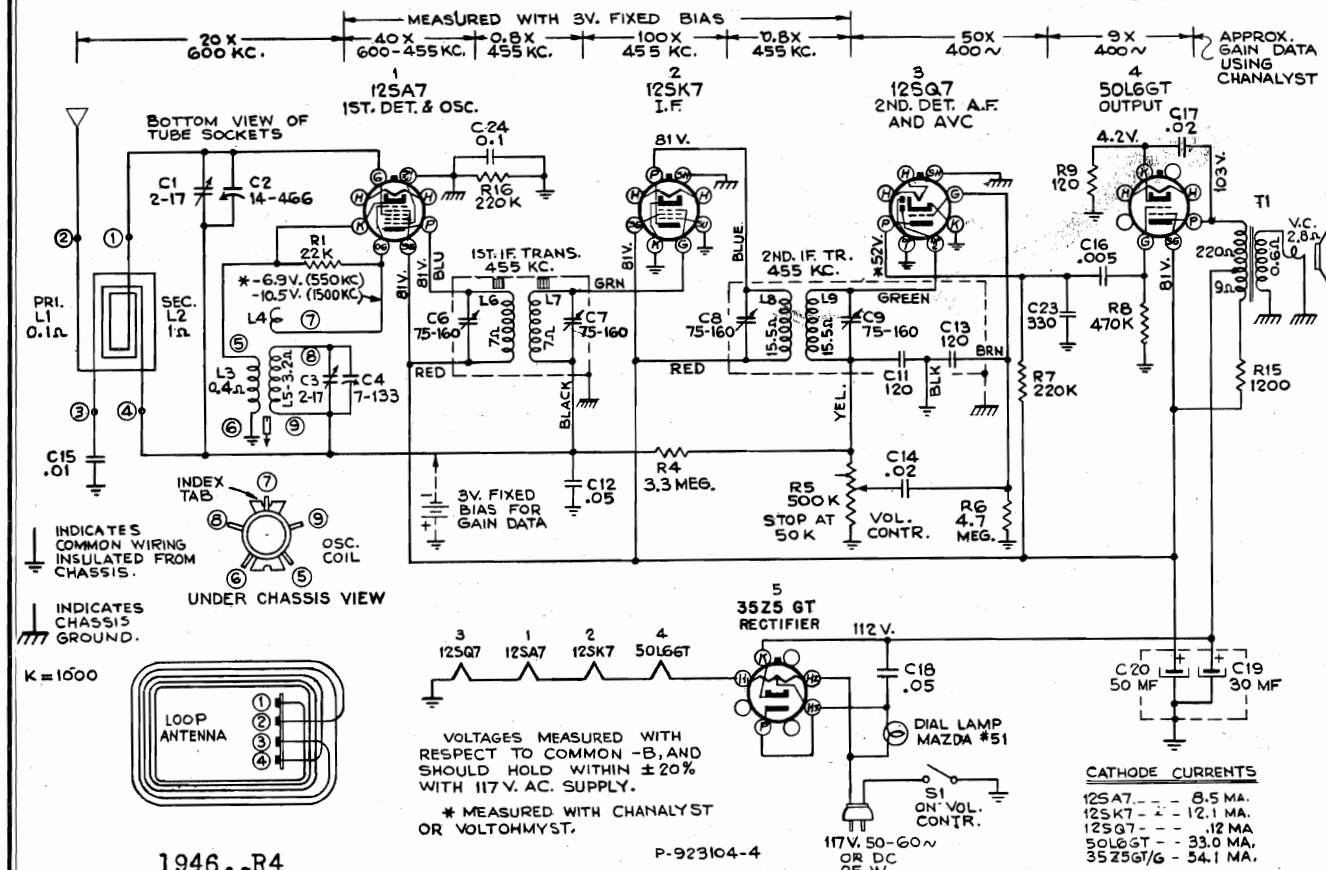
STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1047		
70423	Band—Rubber band for tubes	*72230	Support—Tube support less tube socket and transformer
70444	Board—Speaker terminal board (5 contact)	*72231	Switch—Power switch (S1)
70445	Board—Terminal board (1 contact)	70440	Transformer—Output transformer (T1)
33111	Capacitor—Ceramic, 33 mmf. (C16)	70442	Transformer—First I. F. transformer (L5, L6, C8, C9)
71924	Capacitor—Ceramic, 56 mmf. (C4)	70437	Transformer—Second I. F. transformer (L7, L8, C11, C12)
71514	Capacitor—Ceramic, 82 mmf. (C13)		SPEAKER ASSEMBLY 92523-3W RL95-4
72315	Capacitor—Tubular, .002 mfd., 150 volts (C14, C19)		
70627	Capacitor—Tubular, .005 mfd., 600 volts (C20)	70428	Speaker—2 x 3" P.M. speaker complete with cone and voice coil
70453	Capacitor—Tubular, .02 mfd., 100 volts (C10, C15)		NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
71013	Capacitor—Tubular, .05 mfd., 400 volts (C7)		MISCELLANEOUS
36718	Capacitor—Electrolytic, 10 mfd., 60 volts (C17)		
*72215	Coil—Loading coil (L3)	*72233	Back—Case back
70443	Coil—Oscillator coil (L2, L4)	*72238	Case—"Jewel Box" case less front cover and divider strip
*72227	Condenser—Variable tuning condenser (C1, C2, C5, C6)	*72241	Cover—Front cover only less screen
*72228	Control—Volume control (R6)	*72243	Frame—Loop frame only less loop winding
70429	Grommet—Rubber grommet to mount tube support assembly (2 required)	*72235	Handle—Carrying handle
*72229	Holder—Battery holder	*72232	Knob—Tuning knob
*72225	Insulator—Insulator for chassis panel	*72234	Link—Link for carrying handle (2 required)
*72226	Knob—Volume control knob	*72244	Loop—Loop winding only (L1)
*72224	Panel—Front panel	*72237	Mounting—One set of hardware to mount chassis
14076	Resistor—820 ohms, 1/4 watt (R9)	*72240	Screen—Front cover screen only
36714	Resistor—15,000 ohms, 1/4 watt (R2)	*72242	Screw—Drive screws for Divider strip and front panel (total of 4 required)
14138	Resistor—68,000 ohms, 1/4 watt (R5)	*72236	Screw—Flat head screw for mounting loop (4 required)
3252	Resistor—100,000 ohms, 1/4 watt (R1)	70425	Spring—Tuning knob spring clip
30652	Resistor—1 megohm, 1/4 watt (R7)	*72239	Strip—Divider strip
31417	Resistor—3.3 megohms, 1/4 watt (R3, R10)		
30931	Resistor—4.7 megohms, 1/4 watt (R8)		
30992	Resistor—10 megohms, 1/4 watt (R4)		
70527	Screw—#6-32 x 3/8" set screw for volume control knob		
70436	Socket—Tube socket		

*This is the first time this Stock No. has appeared in Service Data.

RCA MFG. CO.

MODELS 61-8, 61-9,
Chassis RC1034

IF PEAK 455 KC



1946..R4

P-923104-4

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn receiver the volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action.

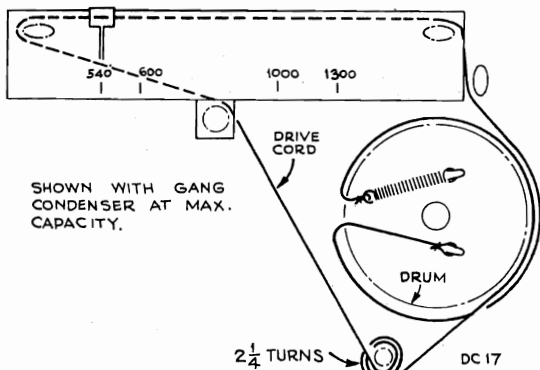
Calibration Scale.—The glass tuning dial may be removed from the cabinet and mounted above the pointer for reference during alignment. The extreme left hand mark of the Standard Broadcast scale must be in line with the left hand mark on the dial backing plate.

Dial Backing Plate.—In the event that the chassis is returned for service, the marks on the dial backing plate may be used during alignment; refer to the Dial Indicator and Drive Mechanism drawing for corresponding frequencies.

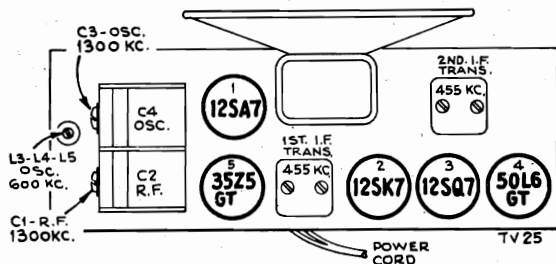
Dial Pointer.—With the gang condenser in full mesh the dial pointer should be set to the left hand reference mark on the dial backing plate. For additional information refer to booklet, "RCA Victor Receiver Alignment."

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	12SK7 I-F grid through 0.1 mfd. capacitor	455 kc	Quiet-point 1,600 kc end of dial	C8 and C9 2nd I-F transformer
2	Stator of C2 through 0.1 mfd.			*C6 and C7 1st I-F transformer
3	Ant. lead in series with 200 mmfd.	1,300 kc	1,300 kc	C3 (osc.) C1 (ant.)
4		600 kc	600 kc	L5 (osc.) Rock gang
5	Repeat steps 3 and 4			

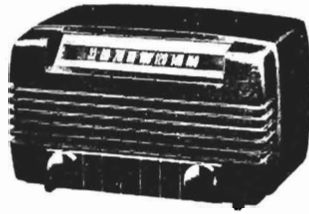
*Do not readjust C8 or C9 when test oscillator is connected to C2.



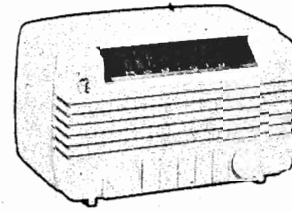
Dial-Indicator and Drive Mechanism



Tube and Trimmer Locations



61-8
(Brown Plastic)



61-9
(Ivory Plastic)

Specifications

Frequency Range..... 540-1600 kc
Intermediate Frequency..... 455 kc
Power Output
 Undistorted..... 1.0 watt
 Maximum..... 1.5 watts
Tube Complement
 (1) RCA Radiotron 12SA7..... Converter
 (2) RCA Radiotron 12SK7..... I-F Amplifier
 (3) RCA Radiotron 12SQ7..... 2nd Det., A.V.C., and A-F Amplifier
 (4) RCA Radiotron 50L6GT..... Power Output
 (5) RCA Radiotron 35Z5GT..... Rectifier
Pilot Lamp..... Mazda No. 51, 6-8 volts, 0.2 amp.
Loudspeaker (922258-1)
 Type..... 4" x 6" PM
 V. C. Impedance..... 3.4 ohms at 400 cycles
Cabinet Dimensions
 Cabinet (Outside)..... 7" 11 3/4" 7 1/2"
 Shipping Weight..... 9 lbs.
 Tuning Drive Ratio..... 20:1
Power Supply Rating
 105-125 volts, AC, 50 or 60 cycles, or DC..... 30 watts

POWER SUPPLY POLARITY.—For operation on DC, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On AC, reversal of the plug may reduce hum.

Critical Lead Dress

1. Dress blue and green leads of both I-F transformers back in shield cans, leaving them as short as possible.
2. Dress all heater leads next to chassis.
3. Dress power cord toward output transformer away from volume control and audio circuits.
4. Dress capacitor (C14) toward switch and parallel to chassis length.
5. Dress capacitor (C16) back against rear chassis apron.
6. Dress capacitor (C17) over and towards 50L6 socket perpendicular to capacitor (C14) and (C16).
7. Dress pilot lamp leads over second I-F transformer and away from tubes.
8. Dress blue lead from output transformer against front apron and away from I-F leads.
9. Dress contact on oscillator section of gang-condenser back away from oscillator coil (L3, 4, 5) adjustment.

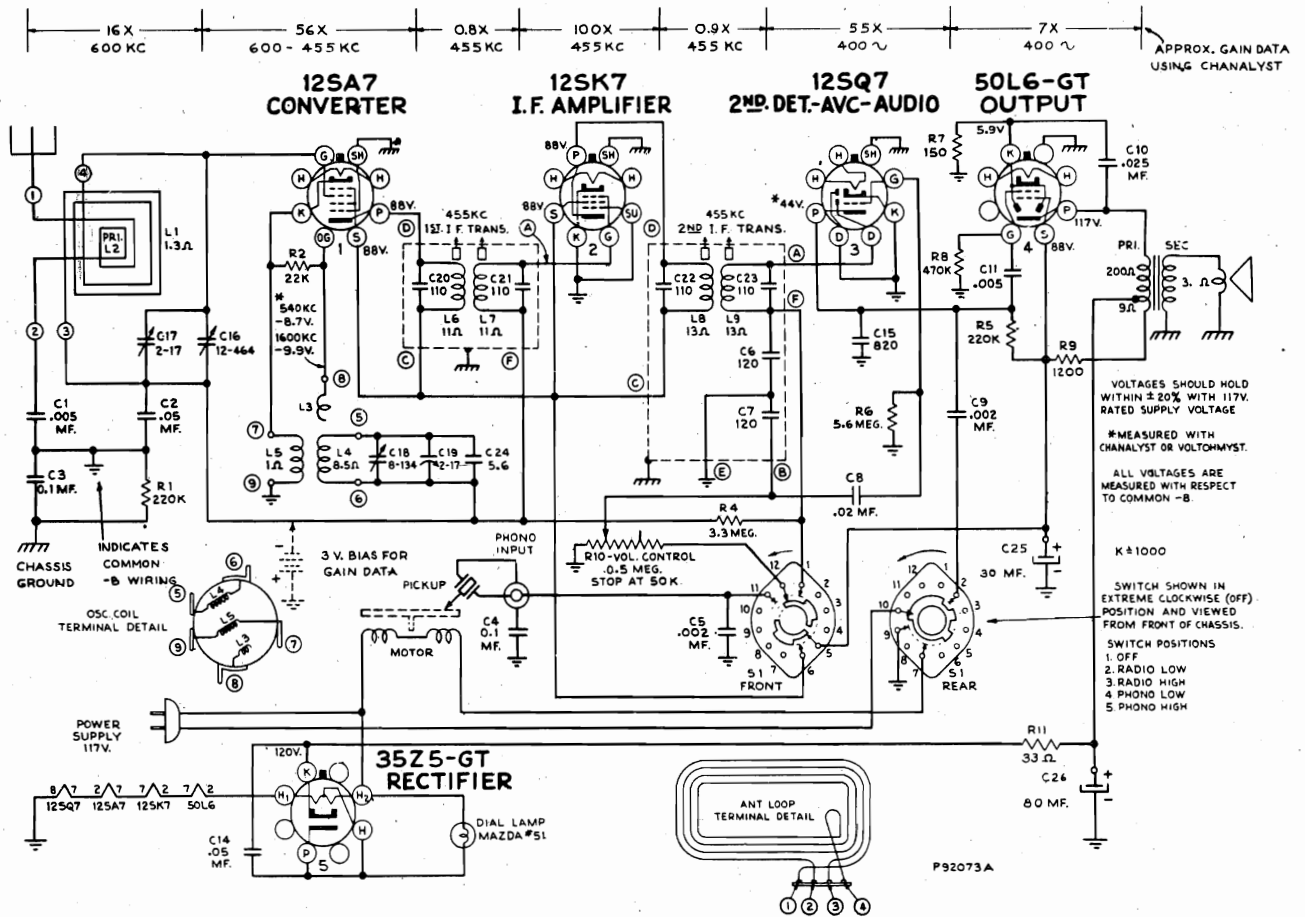
Replacement Parts

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1034		
70389	Bearing—Tuning knob shaft bearing	34449	Socket—Lamp socket
39640	Capacitor—Mica, 330 mmf. (C23)	37605	Socket—Tube socket—moulded
70606	Capacitor—Tubular, .005 mfd., 400 volts (C16)	70390	Spring—Drive cord tension spring
70610	Capacitor—Tubular, .01 mfd., 200 volts (C15)	70465	Transformer—First I.F. transformer (L6, L7, C6, C7)
70611	Capacitor—Tubular, .02 mfd., 400 volts (C14, C17)	70466	Transformer—Second I.F. transformer (L8, L9, C8, C9, C11, C13)
70615	Capacitor—Tubular, .05 mfd., 400 volts (C12, C18)	70385	Transformer—Output transformer (T1)
70617	Capacitor—Tubular, 0.1 mfd., 400 volts (C24)	33726	Washer—"C" washer for tuning knob shaft
70408	Capacitor—Electrolytic, comprising 1 section of 50 mfd., 150 volts and 1 section of 30 mfd., 150 volts (C19, C20)		SPEAKER ASSEMBLY 922258-1
70477	Coil—Oscillator coil (L3, L4, L5)	70470	Speaker—4" x 6" P.M. elliptical speaker complete
70463	Condenser—Variable tuning condenser complete with drum (C1, C2, C3, C4)		NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
70322	Control—Volume control and power switch (R5, S1)		MISCELLANEOUS
32634	Cord—Drive cord (approximately 38")	*71794	Back—Cabinet back for Radiola 61-8
70464	Drum—Drive drum	*71795	Back—Cabinet back for Radiola 61-9
70469	Indicator—Station selector indicator	Y1365	Cabinet—Brown plastic cabinet for Radiola 61-8
11765	Lamp—Dial lamp—Mazda 51	Y1366	Cabinet—Ivory plastic cabinet for Radiola 61-9
70468	Loop—Antenna loop (L1, L2)	70475	Clamp—Dial clamp (1 set)
70462	Plate—Dial back plate complete with drive cord pulleys less dial	*71796	Dial—Glass dial scale
36230	Pulley—Drive cord pulley	37831	Fastener—Push fastener (1 set) for cabinet back
30189	Resistor—120 ohms, 1/4 watt (R9)	70474	Knob—Control knob—ivory—for Radiola 61-9
6134	Resistor—1200 ohms, 1 watt (R15)	70473	Knob—Control knob—mottled walnut—for Radiola 61-8
30492	Resistor—22,000 ohms, 1/4 watt (R1)	30900	Spring—Retaining spring for knob
14583	Resistor—220,000 ohms, 1/4 watt (R7, R16)		
30648	Resistor—470,000 ohms, 1/4 watt (R8)		
31417	Resistor—3.3 megohms, 1/4 watt (R4)		
30931	Resistor—4.7 megohms, 1/4 watt (R6)		
70467	Shaft—Tuning knob shaft		

*THIS IS THE FIRST TIME THIS STOCK NUMBER HAS APPEARED IN PRINT.

RCA MFG. CO.

MODEL 62-1, Chassis RC1017A, RC-1017B



1946..R1 IF PEAK 455 KC

Replacement Parts—Radio Only

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLIES RC 1017A RC 1017B	70388	Shaft—Tuning knob shaft
70389	Bearing—Tuning knob shaft bearing	34449	Socket—Lamp socket
70407	Button—Plug button (2 required)	35787	Socket—Phono input socket
70997	Capacitor—Mica, 5.6 mmf. (C24)	27605	Socket—Tube socket—moulded
39650	Capacitor—Mica, 820 mmf. (C15)	70390	Spring—Drive cord tension spring
70601	Capacitor—Tubular, .002 mfd., 400 volts (C5, C9)	70396	Spring—Volume control gear tension spring
70606	Capacitor—Tubular, .005 mfd., 400 volts (C1, C11)	70394	Switch—Power or radio phono switch
70611	Capacitor—Tubular, .02 mfd., 400 volts (C8)	70386	Transformer—First I.F. transformer
70612	Capacitor—Tubular, .025 mfd., 400 volts (C10)	70387	Transformer—Second I.F. transformer
70615	Capacitor—Tubular, .05 mfd., 400 volts (C2, C14)	70385	Transformer—Output transformer
70617	Capacitor—Tubular, 0.1 mfd., 400 volts (C3, C4)	33726	Washer—"C" washer for tuning knob shaft
*72312	Capacitor—Electrolytic, comprising 1 section of 30 mfd., 150 volts and 1 section of 80 mfd., 150 volts (C25, C26)	70406	Washer—Spring washer for volume control
70403	Coil—Oscillator coil		SPEAKER ASSEMBLY 922279-1
70383	Condenser—Variable tuning condenser complete with drum	70405	Speaker—4" x 6" P.M. speaker complete
72756	Control—Volume control	70470	Speaker—4" x 6" elliptical P.M. speaker complete with cone and voice coil
32634	Cord—Drive cord (approx. 48" overall length)		SPEAKER ASSEMBLY 922258-2
70392	Cord—Power cord	71058	Speaker—4" x 6" P.M. elliptical speaker complete with cone and voice coil
70384	Drum—Drive drum		NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
70397	Gear—Power or radio-phono switch gear		MISCELLANEOUS
70395	Gear—Volume control gear and spring assembly	70398	Clamp—Dial clamps (1 set)
70404	Indicator—Station selector indicator	70709	Dial—Glass dial
70391	Insulator—Bakelite insulator for phono input socket	71595	Feet—Rubber feet (4 required)
11765	Lamp—Dial lamp	70707	Hinge—Lid hinge (2 required)
*72311	Loop—Antenna loop	70401	Knob—Power switch and radio-phono switch knob
70382	Plate—Dial back plate complete with pulleys less dial	70400	Knob—Tuning knob
30868	Plug—2 contact female plug for "AC" cable	70399	Knob—Volume control knob
36230	Pulley—Drive cord pulley	71815	Mounting—One set of hardware consisting of four springs, two spring washers and two rubber washers to mount record changer
*72313	Resistor—33 ohms, 1 watt (R11)	14270	Spring—Retaining spring for knobs
30880	Resistor—150 ohms, 1/4 watt (R7)	71824	Stud—Stud and screw to mount lid hinge (1 set)
6134	Resistor—1200 ohms, 1 watt (R9)	39545	Support—Lid support
30492	Resistor—22,000 ohms, 1/4 watt (R2)		
14583	Resistor—220,000 ohms, 1/4 watt (R1, R5)		
30648	Resistor—470,000 ohms, 1/4 watt (R8)		
12928	Resistor—3.3 megohms, 1/4 watt (R4)		
31455	Resistor—5.6 megohms, 1/4 watt (R6)		
14974	Screw—#8-32 x 3/16" long set screw for lower gear		

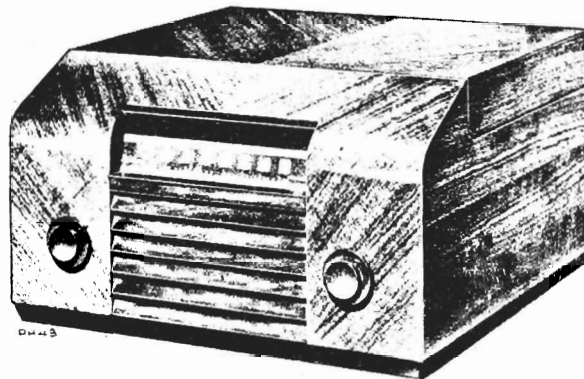
* THIS IS THE FIRST TIME THIS STOCK NUMBER HAS APPEARED IN PRINT.

Electrical and Mechanical Specifications

Five-Tube, Single-Band, Superheterodyne Receiver

Frequency Range 540-1,600 kc
 Intermediate Frequency 455 kc
 Power Output
 Undistorted 1.5 watts
 Maximum 2.4 watts
 Loudspeaker (922279-1) "PM" or 922258-2
 Size 4 x 6 inch, elliptical
 V.C. Impedance 3.4 ohms at 400 cycles
 Power Supply Rating
 105-125 volts, AC, 60 cycles 60 watts
IMPORTANT Do not plug instrument into a d-c supply.

	Height	Width	Depth
Cabinet dimensions (inches)	10½	17¼	17¼
Chassis overall (inches)	6⅝	14	6¼
Chassis base (inches)	1⅝	14	3¾
Tuning Drive Ratio	14:1		



Phonograph

Type Automatic (960260-2)
 Record Capacity Twelve 10-in., Ten 12-in.
 Turntable Speed 78 r.p.m.
 Type Pickup Crystal
 Motor Power Consumption 25 watts

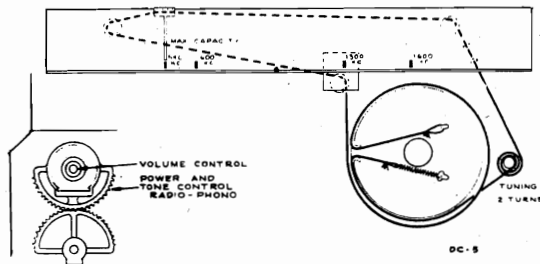
Alignment Procedure

CAUTION.—CLOSE TUNING CONDENSER PLATES COMPLETELY (C-C-W) BEFORE REMOVING CHASSIS FROM CABINET.

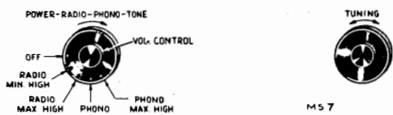
Take off both wooden strips on bottom of cabinet by removing wood screws before loosening chassis bolts.

CRITICAL LEAD DRESS.—

1. All filament wires should be dressed close to chassis.
2. Dress lead from switch to phono jack close to chassis and away from power cord.
3. Dress capacitor between 12SQ7 grid and terminal board away from chassis and away from other parts.
4. Dress all exposed leads away from each other and away from chassis to prevent short circuits.
5. In instrument assembly the lead from the rear section of gang to loop shall be dressed away from chassis and other wires to loop.



Dial Pointer Adjustment.—Rotate tuning condenser fully counter-clockwise (plates fully meshed). Adjust indicator pointer to left (max. cap.) mark on dial back plate.



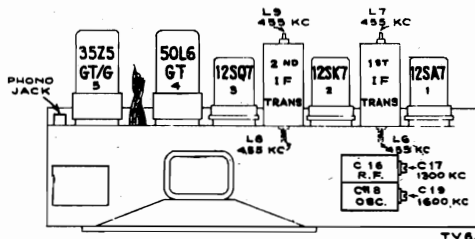
Control Positions

Test Oscillator.—Connect high side of test oscillator as shown in chart. Connect low side through a .01 mf capacitor to common "B." Keep the output signal as low as possible to avoid a.v.c. action.

Output Meter.—Connect meter across speaker voice coil. Turn volume control clockwise to radio maximum high position (3) for alignment.

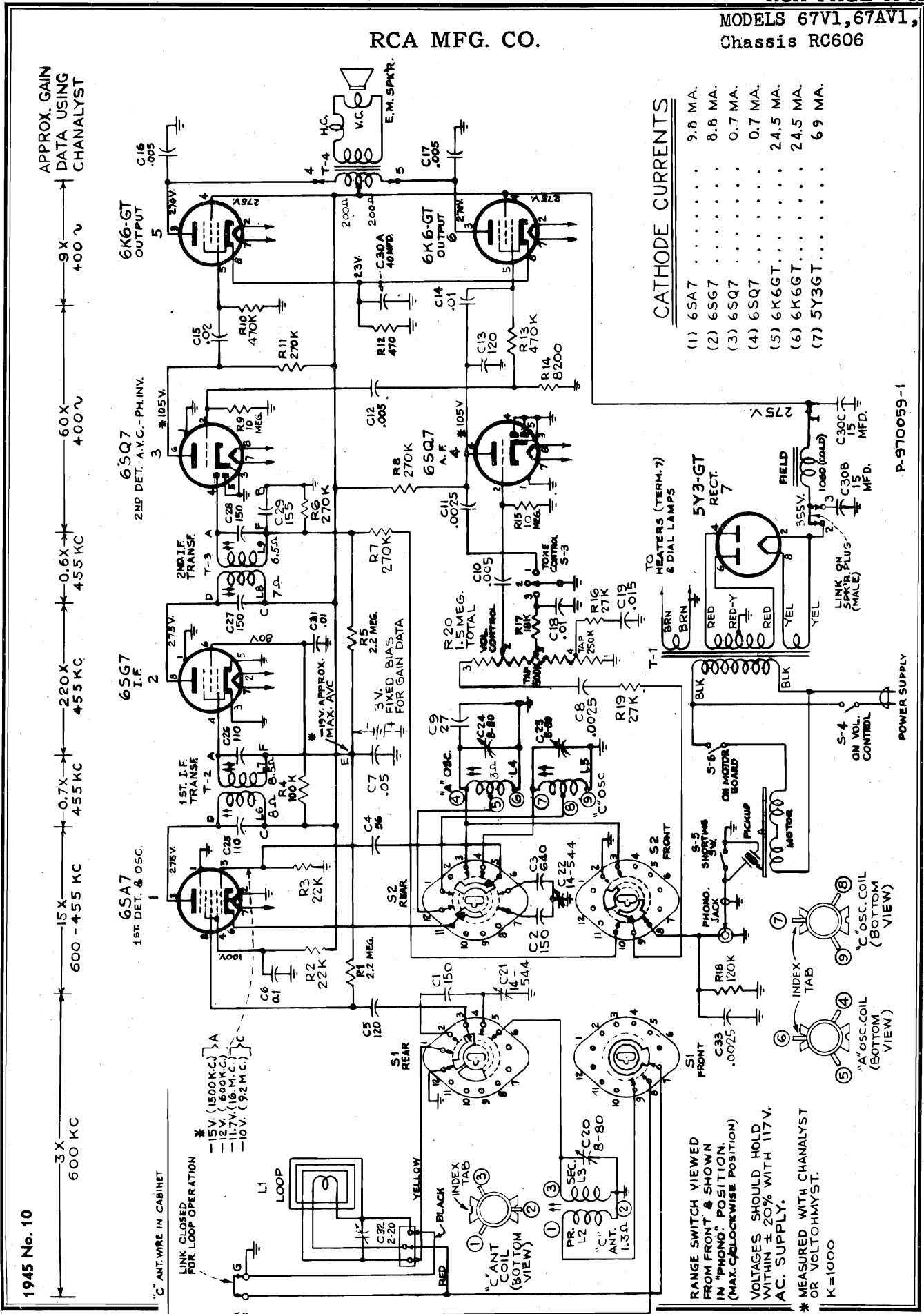
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I.F. grid, in series with .01 mfd.	455 kc	Quiet point 1600 kc end of dial	L8 and L9 2nd I.F. transformer
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I.F. transformer
NOTE.—ANTENNA LOOP AND RECORD CHANGER MUST BE IN CABINET				
3	Antenna terminal in series with 220 mmfd.	1600 kc	Gang at minimum	C19 (osc.)
4	Radiated signal 1300 kc		Signal frequency	C17 (amt.)
5	Repeat steps 3 and 4.			

* Do not readjust L8 or L9 when test oscillator is connected to 1st Det.



Power Supply.—Although this model employs an ac-dc chassis, it is not suitable for use on d.c., as this would damage the motor. Reversal of plug in outlet receptacle may reduce hum.

RCA MFG. CO.

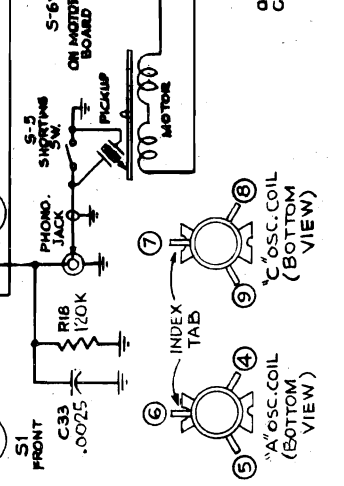
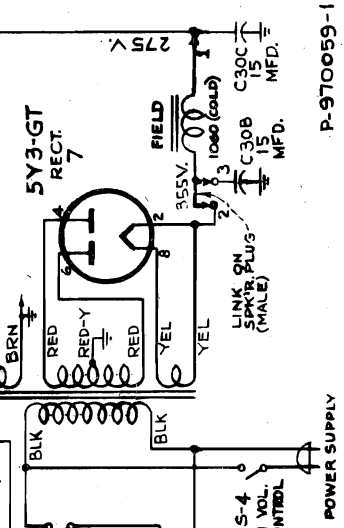


APPROX. GAIN
DATA USING
CHANALYST

3X 600 KC
15X 600 - 455 KC
0.7X 455 KC
220X 455 KC
0.6X 455 KC
60X 400V
9X 400 V

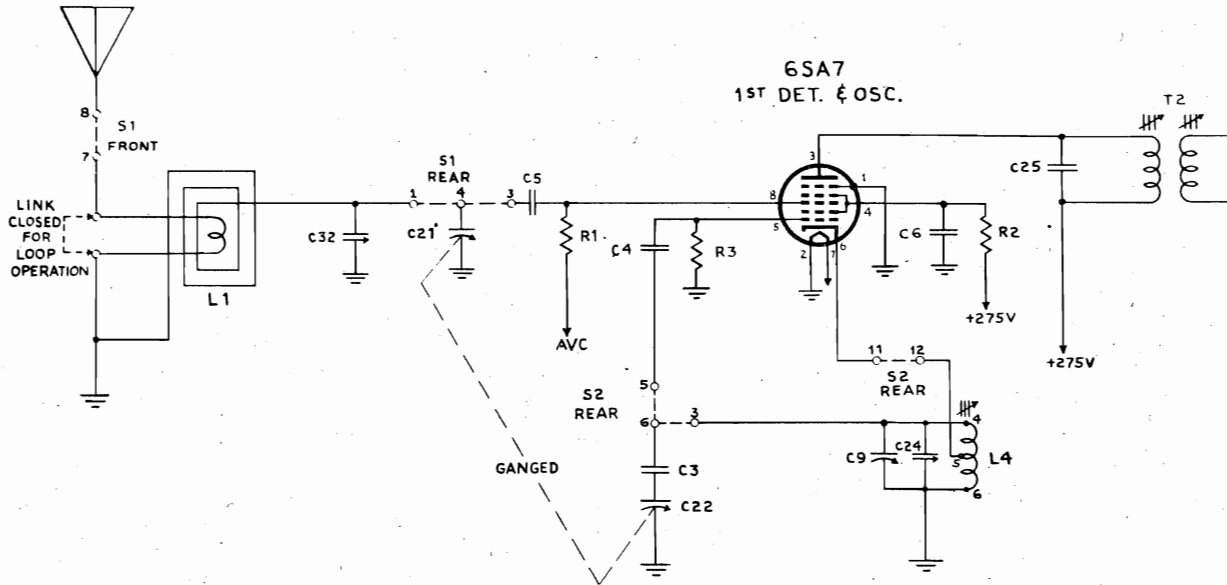
CATHODE CURRENTS

- (1) 6SA7 9.8 MA.
- (2) 6SQ7 8.8 MA.
- (3) 6SQ7 0.7 MA.
- (4) 6SQ7 0.7 MA.
- (5) 6K6GT 24.5 MA.
- (6) 6K6GT 24.5 MA.
- (7) 5Y3GT 6.9 MA.



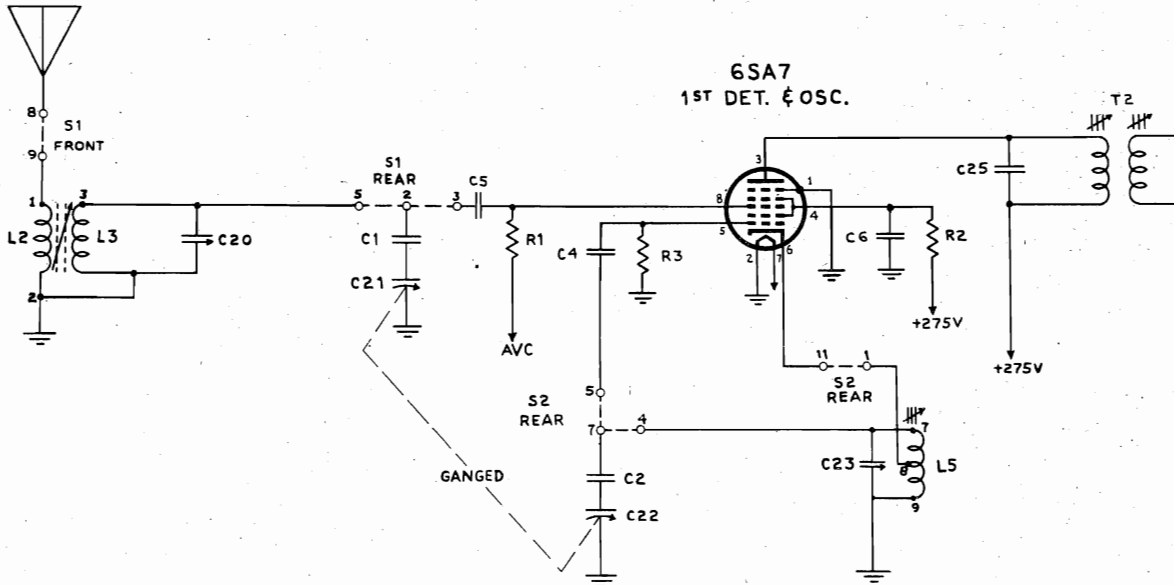
RANGE SWITCH VIEWED FROM FRONT & SHOWN IN "PHONO" POSITION. (MAX. COUNTERWISE POSITION)
VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V. AC. SUPPLY.
* MEASURED WITH CHANALYST OR VOLTOHMYST.
K=1000

"clarified schematics"

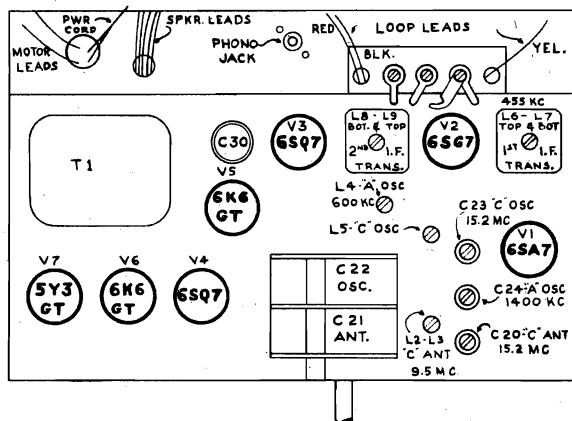


BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
BROADCAST BAND
540 - 1600 KC.

NOTE:
1ST POSITION (PHONO)
NOT SHOWN.



BAND-SWITCH SHOWN
AT 3RD POSITION CLOCKWISE.
SHORT WAVE BAND
9.2 - 16 MC.



TOP VIEW

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the oscillator output as low as possible to avoid a-v-c action

Calibration Scale.—The dial scale printed in this service note may be temporarily attached to the chassis for quick reference during alignment.

Using Printed Dial Scale.—

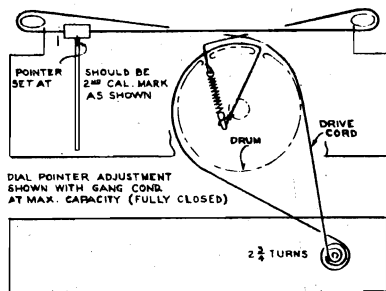
1. Cut out the printed dial scale, or, better still, make a tracing of the scale.
2. With gang at full mesh the pointer should be set to the second reference mark from the left hand end of the dial backing plate.
3. Place the printed dial scale or the tracing under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the dial scale in place.

Note.—It is not recommended that the glass dial scale in the cabinet be removed as an alignment reference. This glass dial scale is fastened to the bezel with sheet metal lugs bent over the scale to hold it in place. Removing the glass dial scale will necessitate bending the lugs, resulting in their weakening and subsequent breakage.

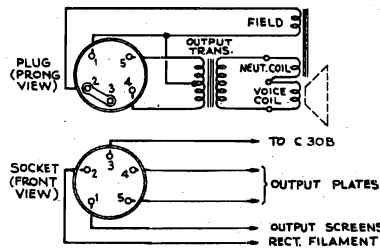
"C" Band Reception.—For best reception on "C" band with an outside antenna, adjust the trimmer screw of C20 on the antenna coil. Turn screw carefully with an insulated screwdriver (RCA Stock No. 31031) while the receiver is tuned to a station in the 31-meter band. If returning to internal antenna at any time, close the link on the center terminal and readjust "C" band antenna trimmer C20 for best reception on 31-meter band.

Steps	Connect high side of test oscillator to—	Tune test oscillator to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SG7 grid in series with .01 mfd.	455 kc.	Broadcast Quiet Point at 550 kc. end of dial	L8, L9 (2nd I-F Trans.)
2	6SA7 grid in series with .01 mfd.			L6, L7 (1st I-F Trans.)
3	Yellow lead on loop in series with 200 mmfd. (link closed)	1,400 kc.	Broadcast 1400 kc.	C24 (osc.)
4		600 kc.	Broadcast 600 kc.	L4 (osc.) Rock gang
5		Repeat steps 3 and 4.		
6	Antenna terminal in series with 47 mmfd.	15.2 mc.	Short Wave 15.2 mc.	C23 (osc.) C20 (ant.)
7		9.5 mc.	Short Wave 9.5 mc.	L5 (osc.) L3 (ant.)
8		Repeat steps 6 and 7		
9	Install and connect chassis in cabinet with link closed. Tune in a radiated signal of 1400 kc. on broadcast band and peak C32 on loop.			

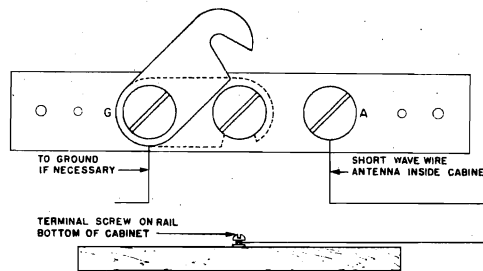
* Use minimum capacity peak if two can be obtained. Check for selection of correct peak by tuning the receiver to approximately 14.3 mc., where a weaker signal should be received. Oscillator tracks 455 kc. above signal on both bands.



DIAL INDICATOR AND DRIVE MECHANISM



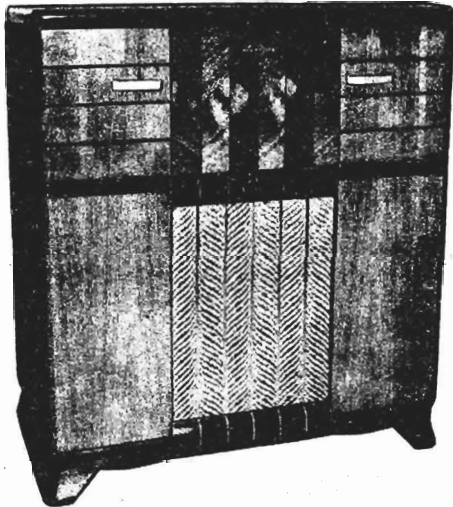
SPEAKER CONNECTIONS



EXTERNAL ANTENNA CONNECTIONS

FIG. 3

WHEN USING EXTERNAL ANTENNA, OPEN LINK AND CONNECT LEAD-IN TO TERMINAL SCREW.



Critical Lead Dress:

1. Dress speaker cable leads down next to chassis.
2. Dress output plate capacitors next to chassis.
3. Dress plate lead of output tube away from grid of audio amplifier.
4. Dress all a-c leads away from volume control down next to chassis.
5. Dress R16 away from a-c leads at on-off switch.
6. Dress R2 away from side of chassis.

Note.—In order to remove the chassis from the cabinet, remove the knobs and the connecting cables, then unscrew the four slotted hex head screws from the two "L" brackets bolted to the rear of the chassis. The chassis may then be slid out toward the bottom rear of the cabinet. Do not remove the hinge screws or the two large nuts in the rear of the chassis. When replacing the chassis, make sure that the tapered pins on the front of the chassis fit into the holes on the metal runners screwed to the cabinet door.

Specifications

Circuit Description

The receiver is a seven tube superheterodyne employing push-pull power output. AVC is applied to the converter and i-f tubes. The broadcast band utilizes a standard loop antenna, and the short wave antenna is a wire tacked in the cabinet.

Dimensions

	Cabinet	Chassis (overall)
Height (inches)	34	5 ⁵ / ₈
Width (inches)	31	11 ¹ / ₈
Depth (inches)	16 ¹ / ₄	8
Tuning Drive Ratio	14:1	

Frequency Ranges

Standard Broadcast "A"	540-1,600 kc
Short Wave "C"	9.2-16 mc

Intermediate Frequency 455 kc

Tube Complement

- (1) RCA-6SA7 1st Det., Oscillator
- (2) RCA-6SG7 I-F Amplifier
- (3) RCA-6SQ7 2nd Det., A. V. C. and Phase Inverter
- (4) RCA-6SQ7 A-F Amplifier
- (5) RCA-6K6-GT Power Output
- (6) RCA-6K6-GT Power Output
- (7) RCA-5Y3-GT Rectifier

Power Supply Rating (including Phono Motor)

105-125 volts, 60 cycles 95 watts

Pilot Lamps (2) Mazda No. 51, 6-8 volts, 0.2 amp.

Compartment Lamp (1) Mazda No. 55, 6-8 volts, 0.4 amp.

Loudspeaker

Electrodynamic 92566-1W

Size 12-inch

V. C. impedance at 400 cycles 2.2 ohms

Power Output Rating

Undistorted 5 watts

Maximum 6.5 watts

Phonograph

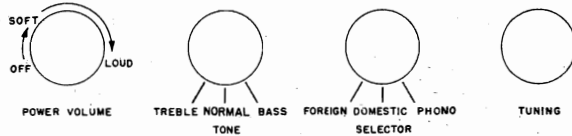
Type Automatic 960260-1

Record Capacity Twelve 10-in., Ten 12-in.

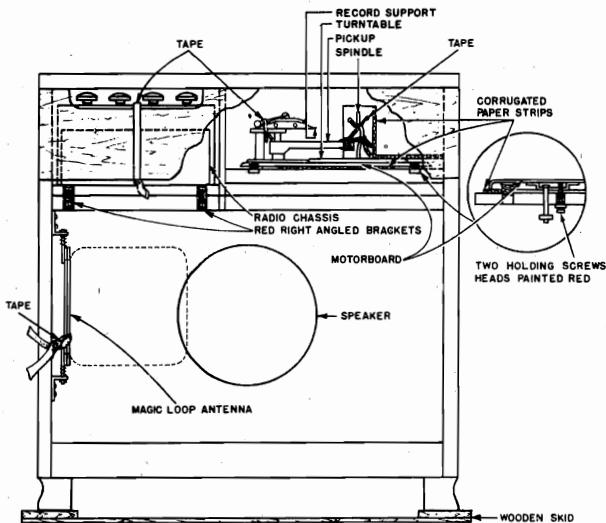
Turntable 78 r.p.m. type

Type Pickup Crystal

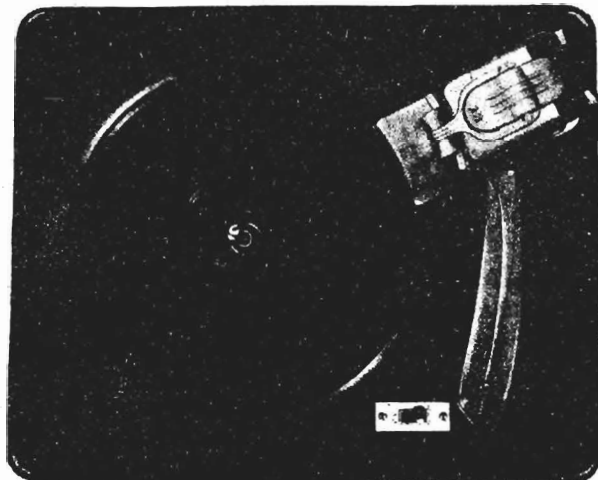
Motor Power consumption (115 v., 60 cycles) 30 watts



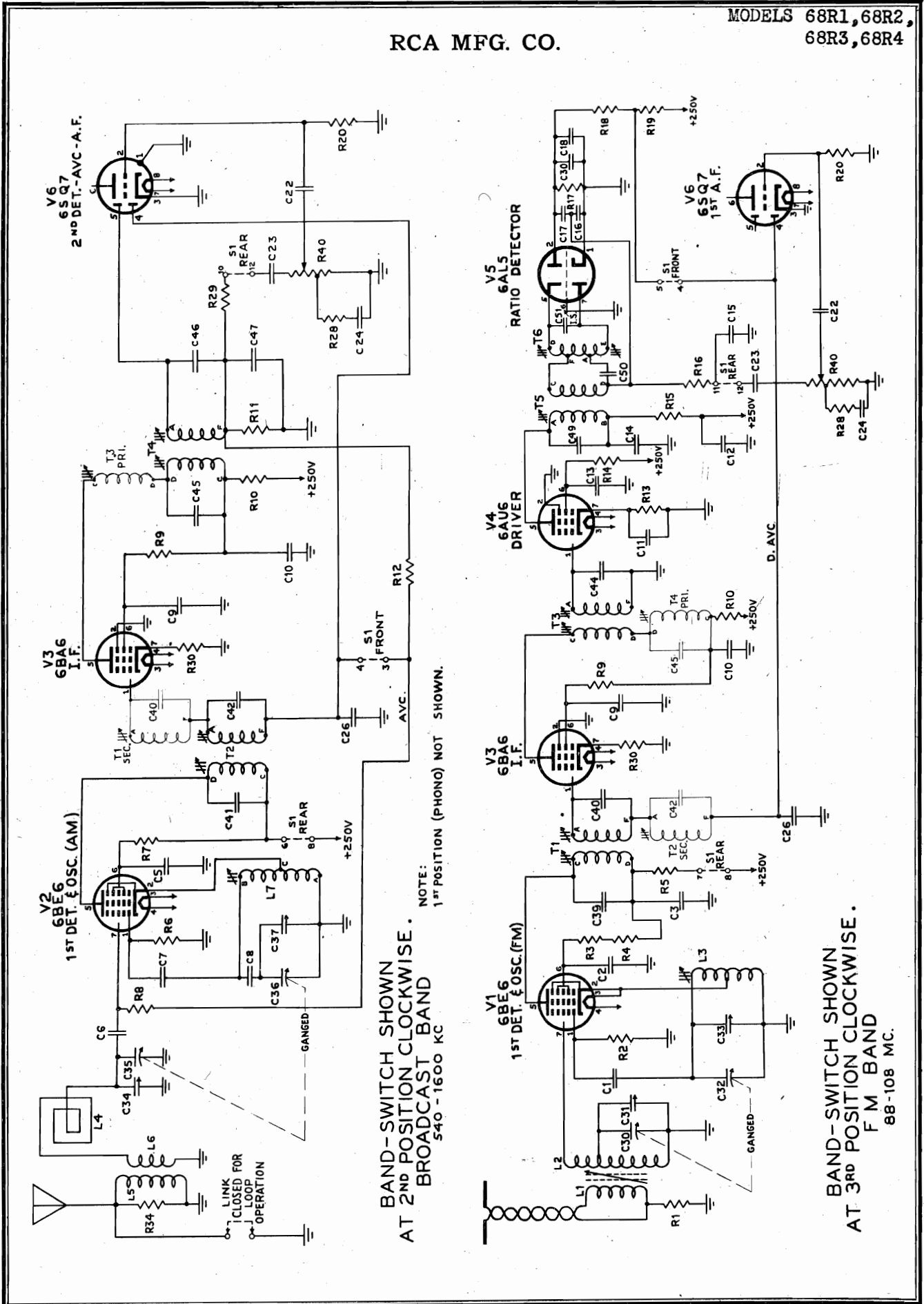
FRONT PANEL CONTROLS



BACK VIEW



RCA MFG. CO.



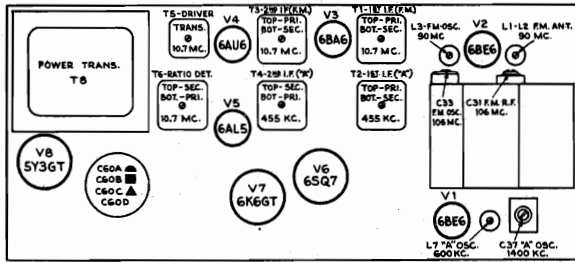
BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
BROADCAST BAND
540 - 1600 KC

BAND-SWITCH SHOWN
AT 3RD POSITION CLOCKWISE.
F.M. BAND
88 - 108 MC.

NOTE:
1ST POSITION (PHONO) NOT SHOWN.

MODELS 68R1, 68R2,
68R3, 68R4

RCA MFG. CO.



Tube and Trimmer Locations (Top View)

Alignment Procedure

Test Oscillator—

For all alignment operations, unless specified, keep the output as low as possible to avoid A.V.C. action. Ground lead of test-osc. to chassis ground, unless specified.

Output Meter—

To correctly observe the point of minimum a-f output, it is necessary to connect an output meter across the voice coil, and turn the receiver volume control to maximum.

"A" Band Alignment*

Range Switch in BC Position

Steps	Connect the high side of the test osc. to—	Tune test osc. to—	Turn the radio dial to—	Adjust for max. peak output.
1	AM converter grid, pin 1, 6BE6 in series with .01 mfd.	455 kc.	"A" Band Quiet point at high freq. end.	†T4—Top core
2				T4—Bottom core
3	Antenna lead in series with 200 mmf.	1400 kc.	"A" Band 1400 kc calibration pt.	C37—Osc.
4		600 kc.	"A" Band 600 kc calibration pt.	C34—Ant. (Loop)
5	Repeat steps 3 and 4 until aligned			
6	When chassis is installed, readjust C34 on the loop for max. output at 1400 kc.			

*Correct alignment of the 455 kc. I.F. requires that the 10.7 mc. FM I.F. be aligned previously.

†Align T4 and T2 by means of alternate loading. Use a 47,000 ohm resistor instead of a 680 ohm resistor. Alternate loading is explained in "FM I.F.-R.F. Alignment."

FM I.F. R.F. Alignment*

Range Switch in FM Position

Steps	Connect the high side of the test-osc. to—	Connect the ground side of the test-osc. to—	Tune test-osc. to—	Radio dial turned to—	Adjust
1	Connect the d-c probe of a VoltOhmyst to the negative lead of the 5 mfd. electrolytic condenser, C18, and the common lead of the meter to chassis ground.				
2	To one terminal of the FM antenna in series with .01 mfd.	To the other terminal of the FM antenna.	10.7 mc. 30% mod. at 400 cycles. (AM)	Maximum capacity. (Fully meshed)	†T3, bottom core for maximum d-c across C 18. Load the plate winding of T3 with a 680 ohm resistor. ‡
3	Same as 2.				T3, top core for maximum d-c across C 18. Load the grid winding of T3 with the 680 ohm resistor used in Step 2.
4	Same as 2.				T1, bottom core for maximum d-c across C 18. Load the plate winding of T1 with the 680 ohm resistor.
5	Same as 2.				T1, top core for maximum d-c across C 18. Load the grid winding of T1 with the 680 ohm resistor.
6	To one terminal of the FM antenna in series with a 120 ohm resistor.	To the other terminal of the antenna in series with a 120 ohm resistor.	106 mc.	106 mc. §	Condensers C33 and C31 for maximum d-c output across C18.
7	Same	Same	90 mc.	90 mc.	Coils L2 and L3 for maximum d-c output across C18.
8	Repeat steps 6 & 7 until further adjustment no longer improves calibration.				

*Correct alignment of the 455 kc. I.F. requires that the 10.7 mc. FM I.F. be aligned previously.

†This method is known as alternate loading which involves the use of a 680 ohm resistor to load the plate winding while the grid winding of the same transformer is peaked. Then the grid winding is loaded with the resistor while the plate winding is peaked.

‡When the windings are loaded it may be necessary to increase the 10.7 mc input since the gain will decrease resulting in a small or no reading across C18. This reading should be maintained at 2-4 volts, by adjusting the input, as each transformer is aligned.

§Completely mesh the gang and see that the pointer goes to mechanical maximum calibration point at low end of band. (Reference mark on dial back plate).

FM Ratio Detector Alignment

Range Switch in FM Position

Steps	Connect the high side of the test osc. to—	Tune test-osc. to—	Turn volume control to—	Adjust
1	Connect a 680 ohm resistor between pins 5 & 7 of the ratio detector tube 6AL5. Connect the d-c probe of a VoltOhmyst to the negative lead of the 5 mfd. electrolytic condenser, C18. The common lead of the meter to ground.			
2	Driver grid, pin 1, of the 6AU6 in series with .01 mfd.	10.7 mc. 30% mod. 400 cycles (AM) Approx. .25 Volt output	Maximum Volume	*Driver transformer, T5 for maximum d-c across C18.
3	Remove the meter leads and disconnect the 680 ohm resistor from the 6AL5. Connect two 68,000 ohms (±1%) resistors in series, across the 22,000 ohm ratio detector load resistor, R17. Connect the common lead of the VoltOhmyst to the center point of the 68,000 ohm resistors, and the d-c probe to terminal "A" of the ratio detector transformer, T6. Set the meter to the 0-30 VDC scale.			
4	Same as in Step 2.	Same as in Step 2. Approx. .25 Volt output.	Maximum volume.	†T6 bottom core for zero d-c balance. T6 top core for min. audio output. ‡
5	Reconnect VoltOhmyst as in Step 1, omitting 680 ohm resistor.			
6	Repeat Step 2.			
7	Remove ALL connections.			

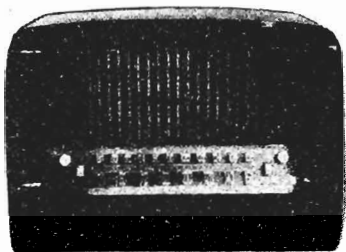
*Approximately 14.5 volts.

†Near the correct core position the zero point is approached rapidly and continued adjustment causes the indicated polarity to reverse. A slow approach to the zero point is an indication of severe detuning, and the bottom core should be turned in the opposite direction.

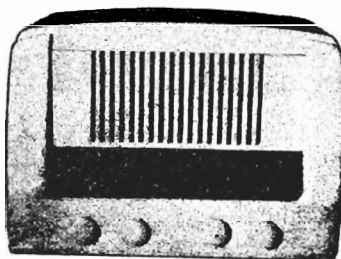
‡The zero d-c balance and the minimum a-f output should occur at the same point. If such is not the case, the two cores should be adjusted until both occur with no further adjustment of either core. It may be advantageous to adjust both cores simultaneously, watching the VoltOhmyst, and the output meter, hooked across the voice coil, for the point at which both zero d-c and minimum a-f output occur.

Note:—Two or more points may be found which will satisfy the condition required in Step 4. T6 top core should be correctly adjusted when approximately 1/4 inch of threads extend above the can, therefore, it is desirable to start adjustment with the top core in its furthest "in" position and turn out, while adjusting the bottom core, until the first point of minimum a-f and zero d-c is reached.

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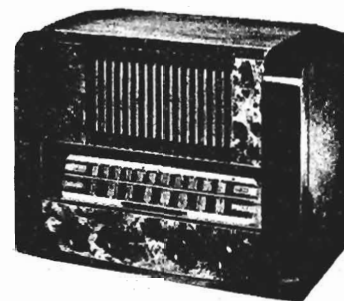
68R1



68R2



68R3



68R4

Circuit Description

These receivers are eight tube, table model, superhetrodyne radios, incorporating two separate converters, one for the FM band and the other for the broadcast band. The range switch has a position in which these models can be operated as a phonograph sound channel.

Ratio Detector—

These sets utilize a FM detector known as the "Ratio Detector." This type of circuit eliminates the necessity for a limiting stage preceding the detector, and has an inherent insensitivity to amplitude modulated signals. It is desirable, that before attempting to service these receivers, that this type of circuit be completely understood. Special care should be taken in alignment, and all precautions should be carefully observed.

Note:—Two antennas, a loop for broadcast reception and a folded dipole for FM, are contained in the cabinet. Because of the directional characteristic of these antennas, it may be necessary, when interference is encountered, to rotate the cabinet until a point of minimum interference is found. In some locations, a phenomenon known as "Multi-Path Reception" exists which produces distortion on FM. This is not a fault of the receiver. If this condition is suspected, remove the set to another location, and check it there. An external FM antenna, such as the RCA Dipole and Reflector, Stock #225, will eliminate, or appreciably reduce this effect.

Standard Broadcasts—

To install an external antenna for Standard Broadcasts, the link on the terminal board on the chassis in the back of the cabinet must be opened. Then connect the antenna, which should be a wire 40 to 60 feet long, to the terminal marked "A". A connection from "G" to ground should not be necessary but may be advantageous.

Electrical and Mechanical Specifications

Frequency Range

Broadcast ("A" Band)..... 540-1600 kc.
Frequency Modulation (FM Band)..... 88-108 mc.

Intermediate Frequency

Broadcast..... 455 kc.
Frequency Modulation..... 10.7 mc.

Tube Complement

- (1) RCA 6BE6..... 1st Det. & Osc. FM
- (2) RCA 6BE6..... 1st Det. & Osc. AM
- (3) RCA 6BA6..... I-F Amplifier
- (4) RCA 6AU6..... Driver
- (5) RCA 6AL5..... Ratio Detector
- (6) RCA 6SQ7..... 2nd Det., A.V.C., and A-F Amplifier
- (7) RCA 6K6 GT..... Power Output
- (8) RCA 5Y3 GT..... Rectifier

Power Supply Rating

105-125 volts, 60 cycles..... 64 watts

Pilot Lamps..... (2) Mazda No. 51, 6-8 volts, 0.2 amp.

Loudspeaker 940923-7

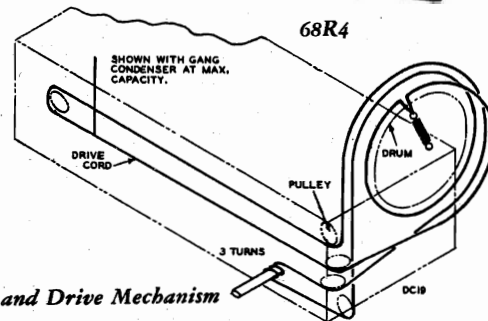
Size..... 5" x 7" elliptical PM
V.C. Impedance..... 3.4 ohms at 400 cycles

Power Output

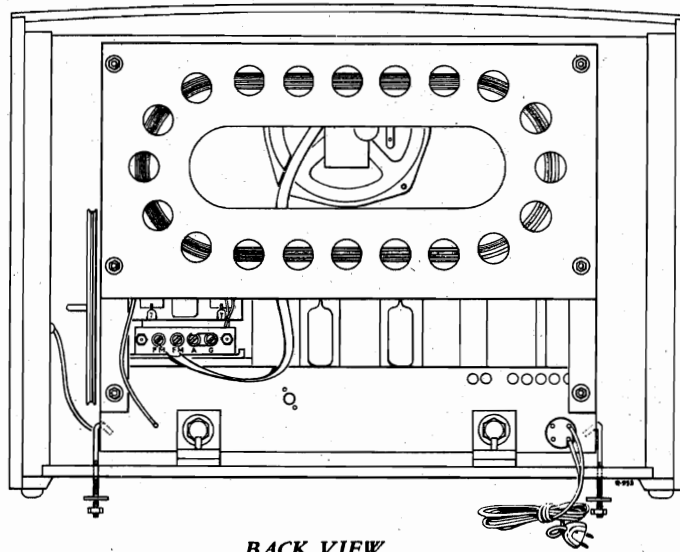
Undistorted..... 2.0 watts
Maximum..... 4.0 watts

Critical Lead Dress

1. Dress capacitor C-1 near chassis base.
2. Dress lead from pin No. 5, No. 1 6BE6 to terminal C₁ of transformer T1, as near the bottom of the FM shelf as possible.
3. Dress capacitor C-23 next to chassis.
4. The lead from capacitor C-23 to the high side of the volume control must be dressed next to chassis along front apron.
5. Dress resistor R-20 near chassis base.

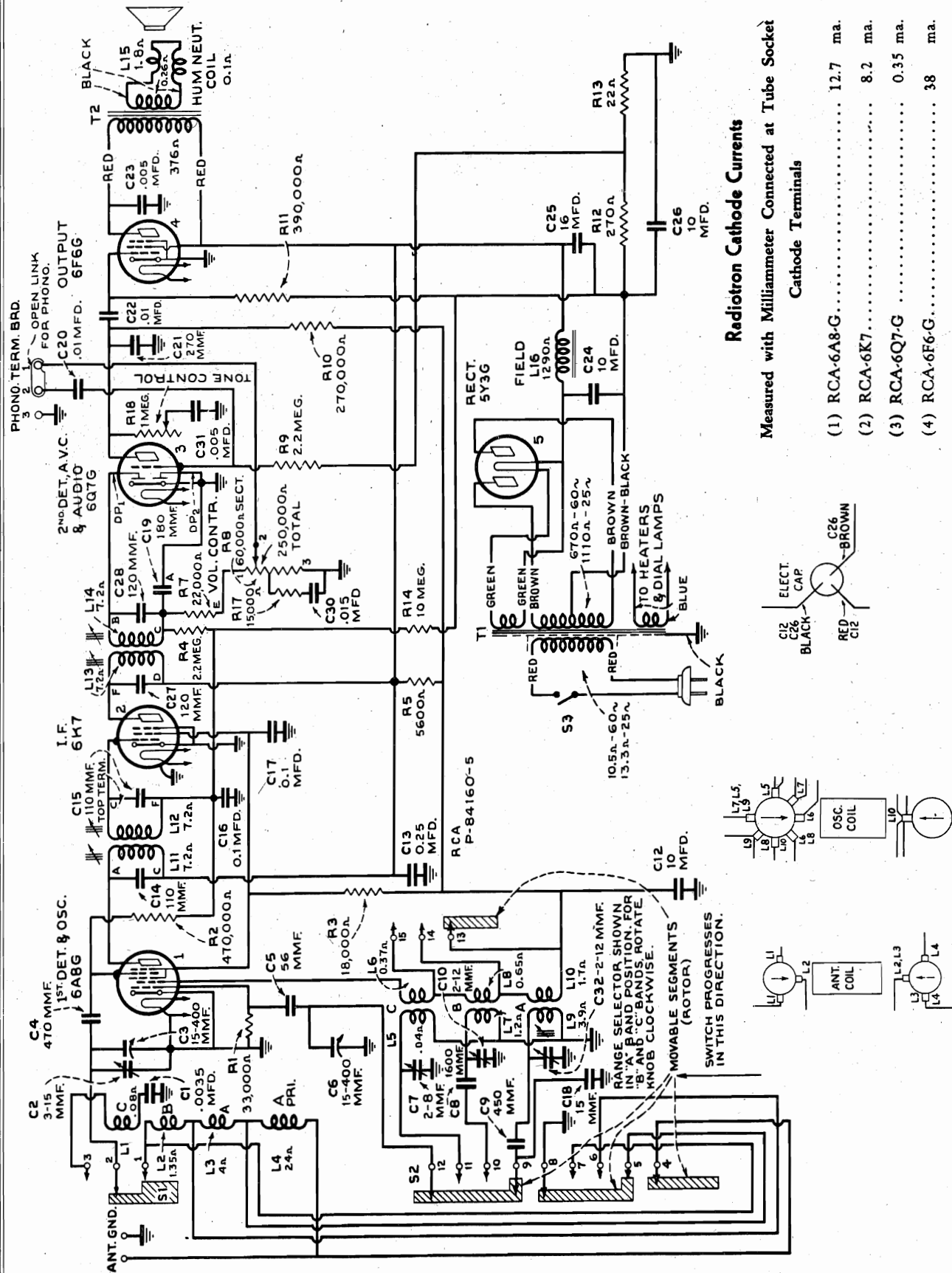


Dial-Indicator and Drive Mechanism



BACK VIEW

6. Dress all a-c leads away from volume control.
7. Solder FM antenna coil primary leads to terminal board with as short a lead length as practical.
8. Make all FM leads as short as possible. Dress of all other leads should be similar to original wiring.
9. The lead from pin No. 2, 6BA6, to ground must be dressed as close to the base and as near to the back apron as possible. This lead provides degeneration for the IF stage and neither its length, nor the point at which it is grounded to the chassis should be changed.

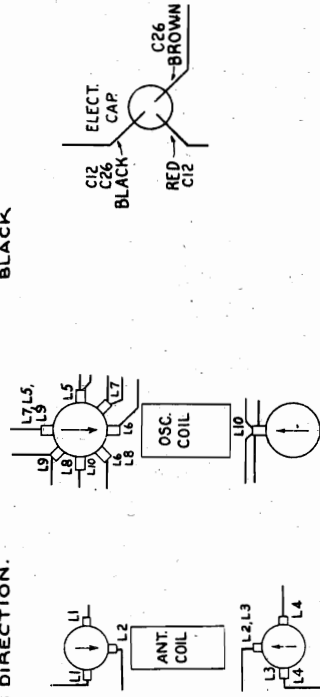


Radiotron Cathode Currents

Measured with Milliammeter Connected at Tube Socket

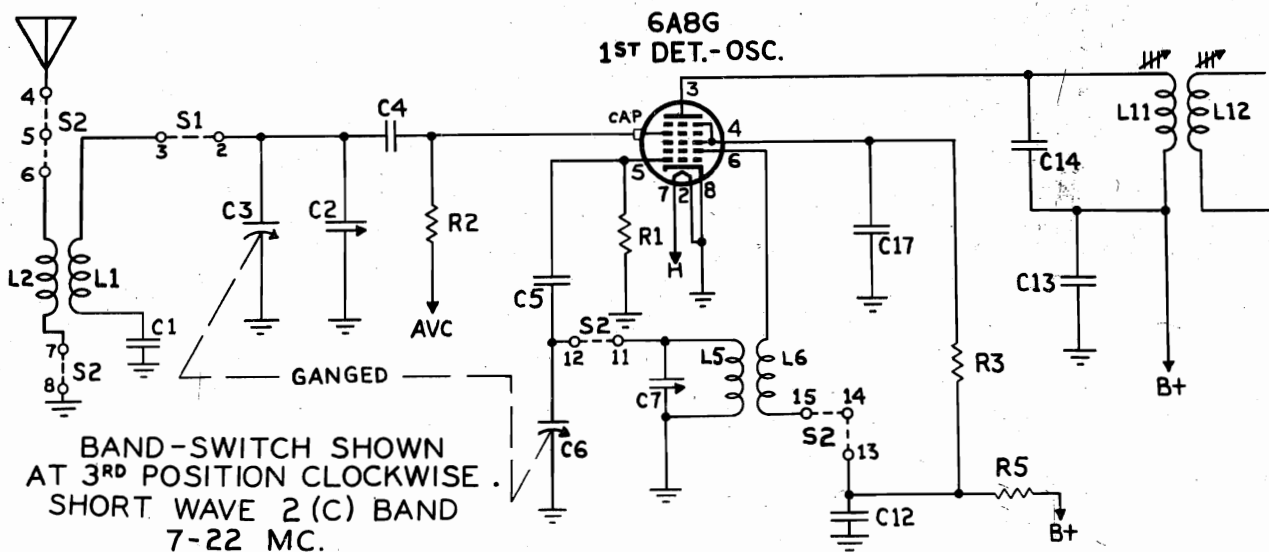
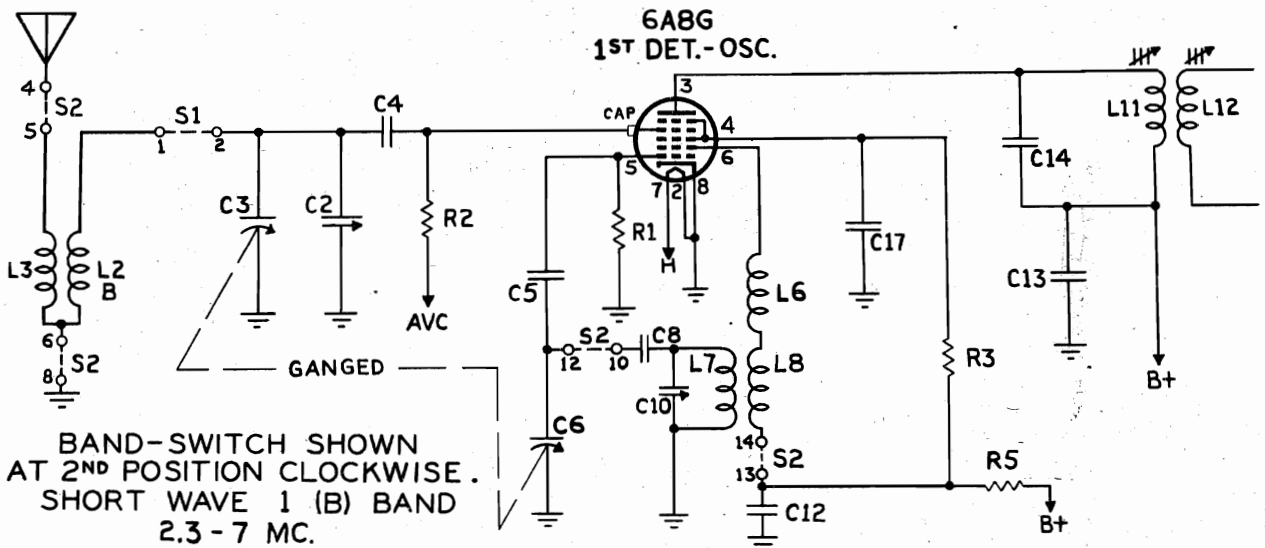
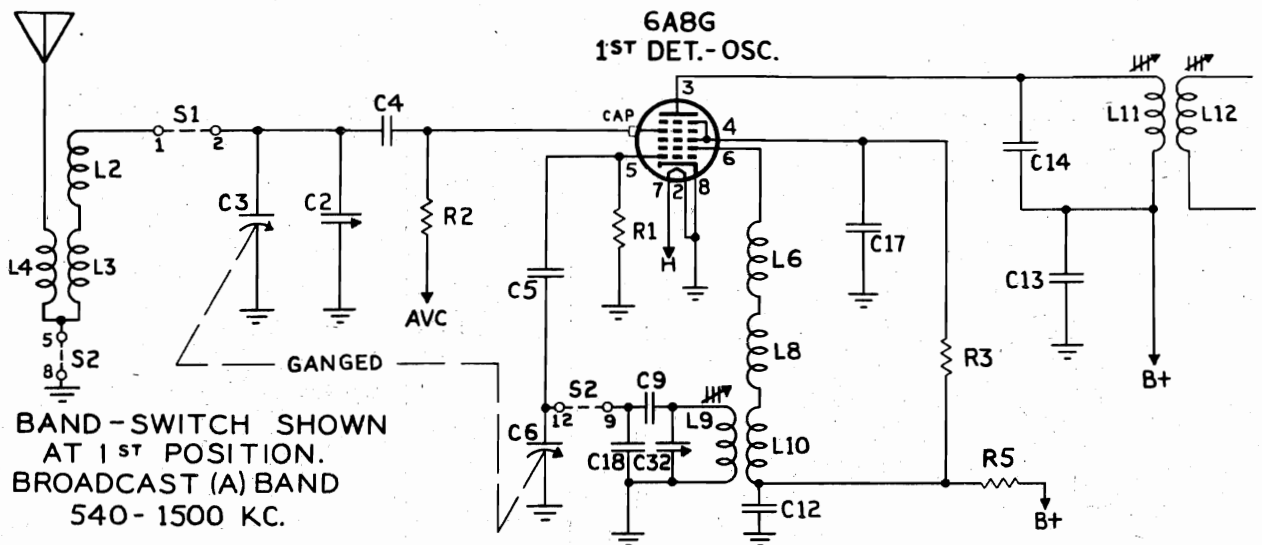
Cathode Terminals

- (1) RCA-6A8-G..... 12.7 ma.
- (2) RCA-6K7..... 8.2 ma.
- (3) RCA-6Q7-G 0.35 ma.
- (4) RCA-6F6-G..... 38 ma.
- (5) RCA-5Y3-G..... 59.5 ma.



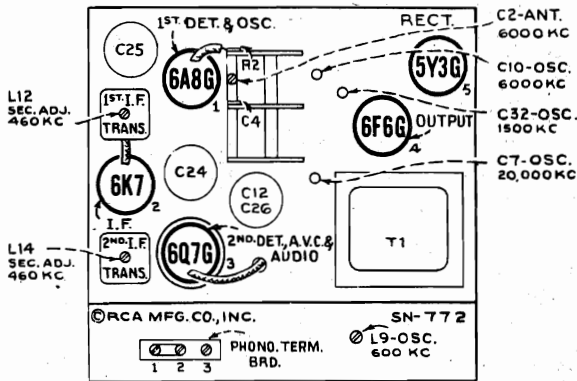
"clarified schematics"

RCA MFG. CO.



Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position. The pointer is soldered in place on the drive cable.

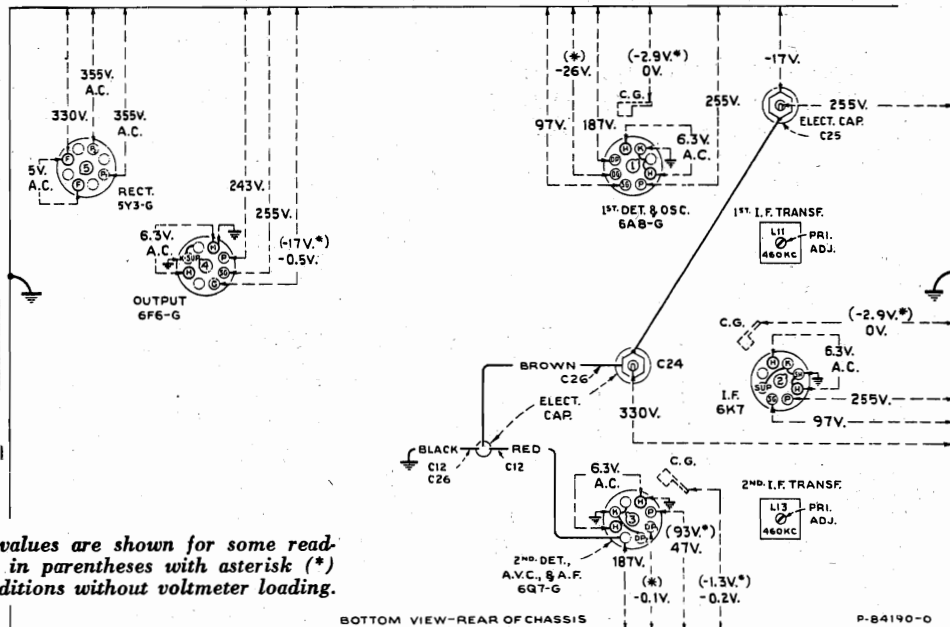
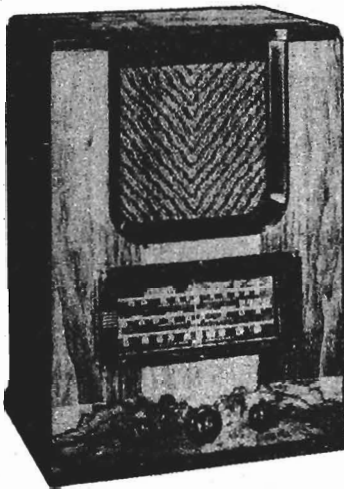


-Radiotron, Coil and Trimmer Locations

STEP	CONNECT HIGH SIDE OF TEST OSC. TO -	TUNE TEST OSC TO -	TURN RADIO DIAL TO	ADJUST THE FOLLOWING FOR MAX. OUTPUT
1	I-F Grid in series with 0.01 mfd	480 Kc	Quiet point near 600 Kc "A" Band	L14 L13 2nd I-F Trans.
2	1st Det. Grid in series with 0.01mfd			L12 L11 1st I-F Trans.
3	Antenna in series with 300 ohms	6000 Kc	6000 Kc "B" Band	C10 C2 Osc. Ant.
4		20000 Kc	20000 Kc "C" Band	C7 Osc.
5	Antenna in series with 200 mmfd	1500 Kc	1500 Kc "A" Band	C32 Osc.
6		600 Kc	600 Kc "A" Band	L9 L-F Osc. Rock Gang
7	Repeat Step 5			

▲ Use maximum capacity peak.

Osc. tracks 480 Kc below signal on "C" Band.



-Radiotron Socket Voltages and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")
No signal being received—Volume control minimum—Tone control optional

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Electrical Specifications

FREQUENCY RANGES
 "Standard Broadcast" (A)..... 540-1,500 kc
 "Short Wave—1" (B)..... 2,300-7,000 kc
 "Short Wave—2" (C)..... 7,000-22,000 kc

R-F ALIGNMENT FREQUENCIES
 "Short Wave—1" (B)..... 6,000 kc (osc., ant.)
 "Short Wave—2" (C)..... 20,000 kc (osc.)
 "Standard Broadcast" (A).. 600 kc (osc.), 1,500 kc (osc.)

INTERMEDIATE FREQUENCY..... 460 kc

RADIOTRON COMPLEMENT
 (1) RCA-6A8-G..... First Detector—Oscillator
 (2) RCA-6K7..... Intermediate Amplifier
 (3) RCA-6Q7-G.. Second Detector, A.V.C., and A-F Amp.
 (4) RCA-6F6-G..... Power Output
 (5) RCA-5Y3-G..... Full-Wave Rectifier

POWER SUPPLY RATINGS
 Rating A..... 105-125 volts, 50-60 cycles, 75 watts
 Rating B..... 105-125 volts, 25-60 cycles, 75 watts
 Rating C... 105-125/200-250 volts, 50-60 cycles, 75 watts

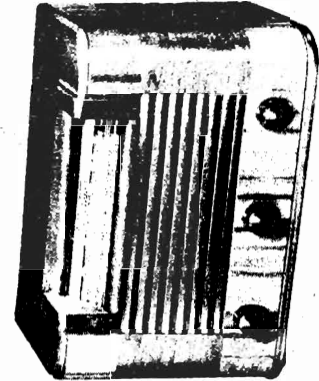
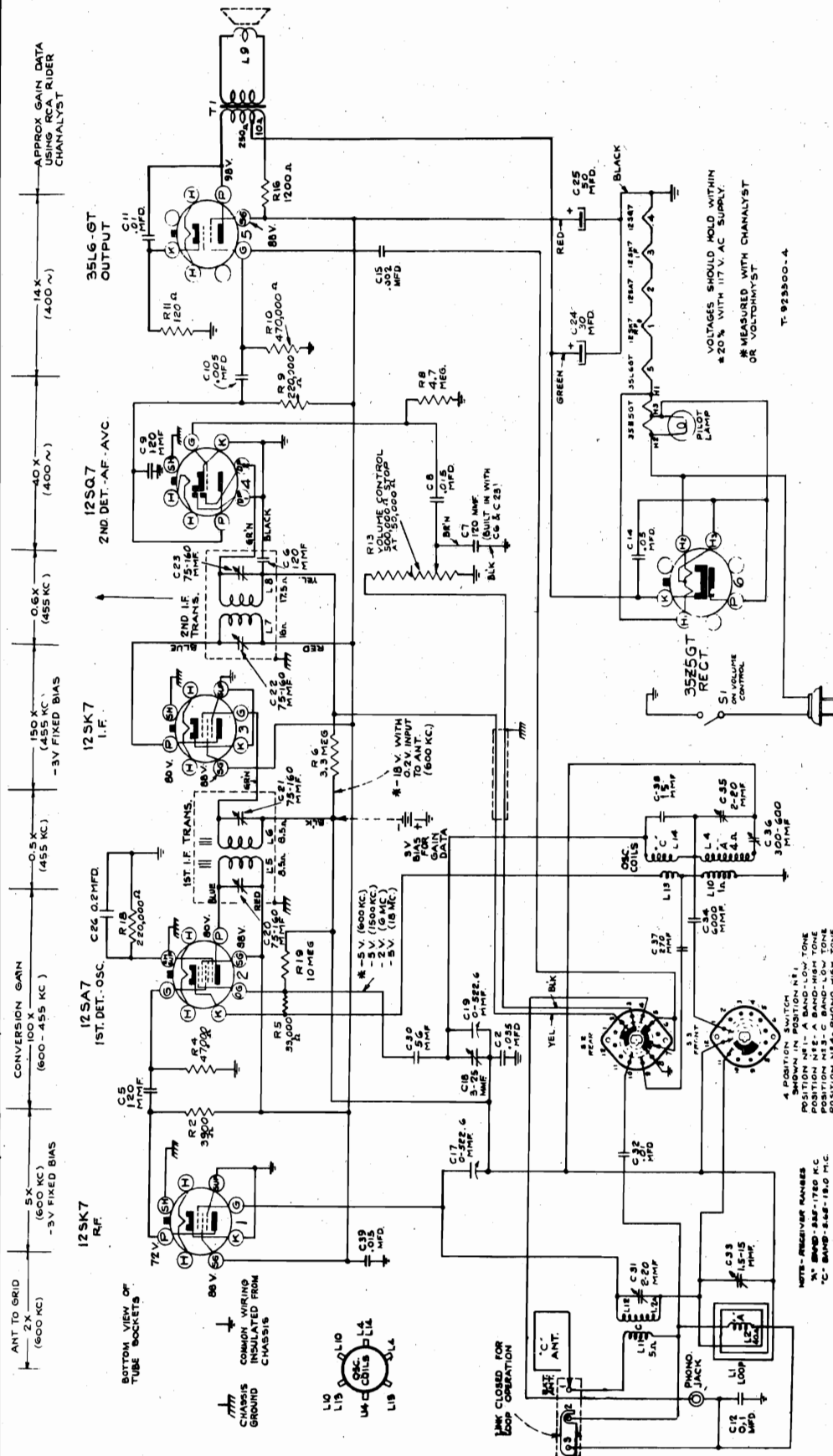
PILOT LAMPS (2)..... 6.3 volts, 0.25 amp.

POWER OUTPUT RATING
 Undistorted..... 2.5 watts
 Maximum..... 4.5 watts

LOUDSPEAKER
 Type..... 8-inch Electrodynamic
 V.C. Impedance..... 2.2 ohms at 400 cycles

REPLACEMENT PARTS

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
14380	Arm—Hub and arm for operating band indicator shutter—fastens on range switch shaft	30151	Resistor—18,000 ohms, insulated, 1 watt (R3)
14352	Belt—Station selector drive belt	14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R7)
13216	Board—Antenna and ground terminal board	12454	Resistor—33,000 ohms, insulated, 1/2 watt (R1)
12717	Board—Phonograph terminal board	12199	Resistor—270,000 ohms, insulated, 1/2 watt (R10)
12607	Cap—Top shield cap for first i-f transformer	13005	Resistor—390,000 ohms, carbon type, 1/10 watt (R11)
12581	Cap—Top shield cap for second i-f transformer	11452	Resistor—470,000 ohms, carbon type, 1/10 watt (R2)
11350	Cap—Grid contact cap	11626	Resistor—2.2 meg., carbon type, 1/2 watt (R4, R9)
12807	Capacitor—Adjustable trimmer (short) (C7)	13601	Resistor—10 meg., insulated, 1/2 watt (R14)
12714	Capacitor—Adjustable trimmer (medium) (C32)	30582	Retainer—Band indicator disc retainer
12896	Capacitor—15 mmfd. (C18)	14343	Ring—Retaining ring for range switch shaft
12723	Capacitor—56 mmfd. (C5)	14350	Screw—No. 8-32 x 3/16-inch square-head set screw for drum, Stock No. 30584; arm, Stock No. 14380, and pulley, Stock No. 30587
14262	Capacitor—110 mmfd. (C14, C15)	14340	Shaft—Drive pulley and knob shaft—fastens on range-switch shaft
12404	Capacitor—120 mmfd. (C27, C28)	3682	Shield—Radiotron shield
12406	Capacitor—180 mmfd. (C19)	12008	Shield—I-f transformer shield can
12488	Capacitor—270 mmfd. (C21)	5119	Socket—3-contact speaker cable socket
12812	Capacitor—450 mmfd. (C9)	11196	Socket—8-contact Radiotron socket
30433	Capacitor—470 mmfd. (C4)	14114	Socket—Dial lamp socket
30592	Capacitor—1,600 mmfd. (C8)	12007	Spring—Retaining spring for core, Stock No. 12006
30303	Capacitor—.0035 mfd. (C1)	30585	Spring—Tension spring for pointer cord
4838	Capacitor—.005 mfd. (C23, C31)	30588	Spring—Tension spring for idler pulley
14393	Capacitor—.01 mfd. (C20, C22)	30620	Switch—Range switch (S1, S2)
11315	Capacitor—.015 mfd. (C30)	30574	Tone control and power switch (R18, S3)
4839	Capacitor—.01 mfd. (C16, C17)	14376	Transformer—First i-f transformer (L11, L12, C14, C15)
12484	Capacitor—.025 mfd. (C13)	14308	Transformer—Second i-f transformer (L13, L14, C19, C27, C28, R7)
11203	Capacitor—10 mfd. (C24)	30571	Transformer—Power transformer, 105-125 volts, 25-80 cycles (T1)
30577	Capacitor Pack—Comprising two sections, each 10 mfd. (C12), (C26)	30617	Transformer—Power transformer, 105-125 and 200-250 volts, 50-60 cycles (T1)
5212	Capacitor—16 mfd. (C25)	30575	Volume Control (R8)
4358	Clamp—Mounting clamp for capacitor pack, Stock No. 30577	REPRODUCER ASSEMBLIES (RL-63F-1)	
30621	Coil—Antenna coil (L1, L2, L3, L4)	14356	Board—3-contact reproducer terminal board
30579	Coil—Oscillator coil (L5, L6, L7, L8, L9, L10)	13866	Cap—Cone center dust cap
30573	Condenser—2-gang variable tuning condenser (C2, C3, C6)	12012	Coil—Field coil (L16)
30586	Cord—Station selector indicator pointer cord	11469	Coil—Hum neutralizing coil (L17)
12800	Core—Adjustable core and stud for oscillator coil	12642	Cone—Reproducer cone and dust cap (L15)
12006	Core—Adjustable core and stud for i-f transformers	5118	Plug—3-contact male plug for reproducer
30622	Dial—Station selector dial scale	14360	Reproducer—Complete
30581	Disc—Band indicator disc with celluloid window	14358	Screw—Screw, washer, and lockwasher to hold core in yoke
30572	Drive—Vernier drive shaft and pinion gear for variable condenser	14355	Transformer—Output transformer (T2)
30584	Drum—Station-selector drive-cord drum with set screws	14357	Washer—Spring washer to hold field coil
30583	Indicator—Station-selector indicator pointer and holder assembly	MISCELLANEOUS ASSEMBLIES	
5226	Lamp—Dial lamp	30593	Escutcheon—Dial escutcheon and crystal
14028	Nut—Jamb nut for adjustable capacitor, Stock Nos. 12807 and 12714	14359	Knob—Station selector knob
30587	Pulley—Drive-belt pulley for condenser shaft	14269	Knob—Tone control, volume control, or range-switch knob
14636	Pulley—Drive-belt idler pulley	14267	Screw—Chassis mounting screw and washer assembly
14525	Resistor—22 ohms, carbon type, 1/2 watt (R13)	14270	Spring—Retaining spring for knob, Stock No. 14269
13819	Resistor—270 ohms, insulated, wire-wound, 1.1 watt (R12)	4982	Spring—Retaining spring for knob, Stock No. 14359
11298	Resistor—5,600 ohms, carbon type, 1 watt (R5)		
12695	Resistor—15,000 ohms, insulated, 1/2 watt (R17)		

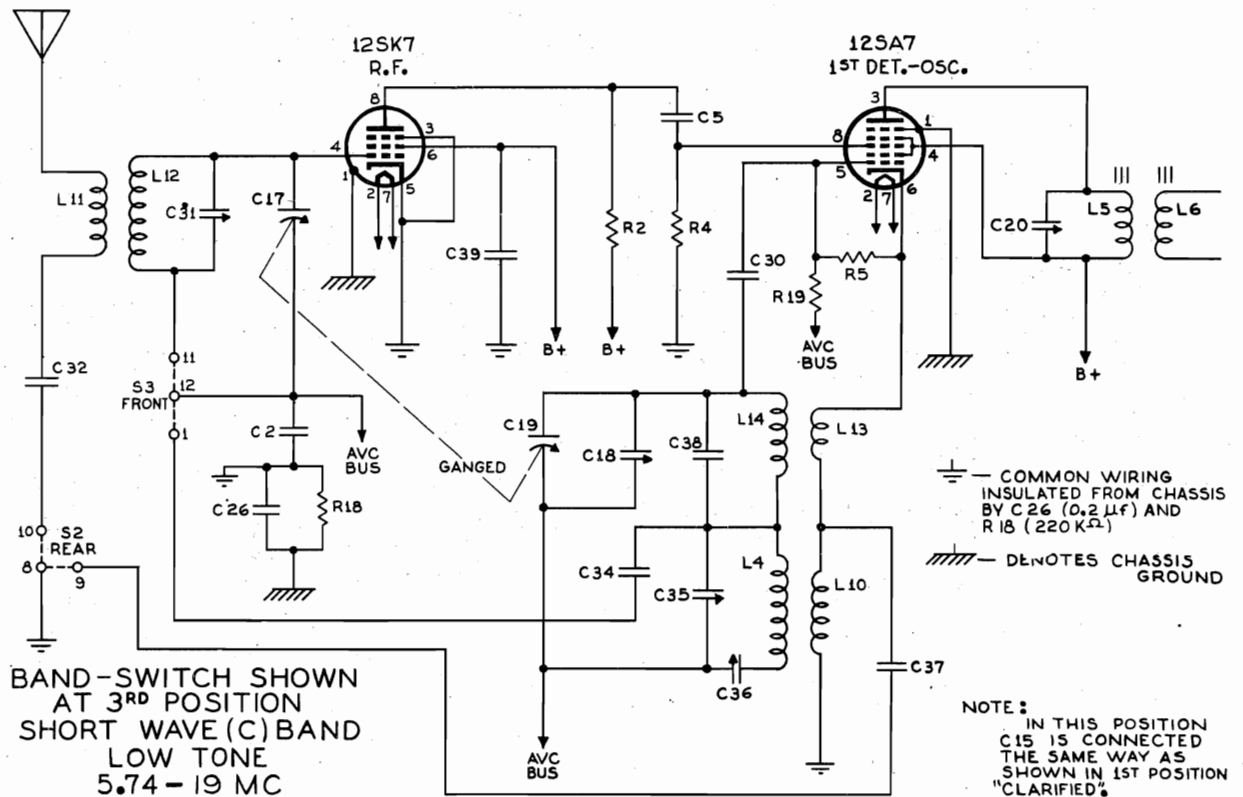
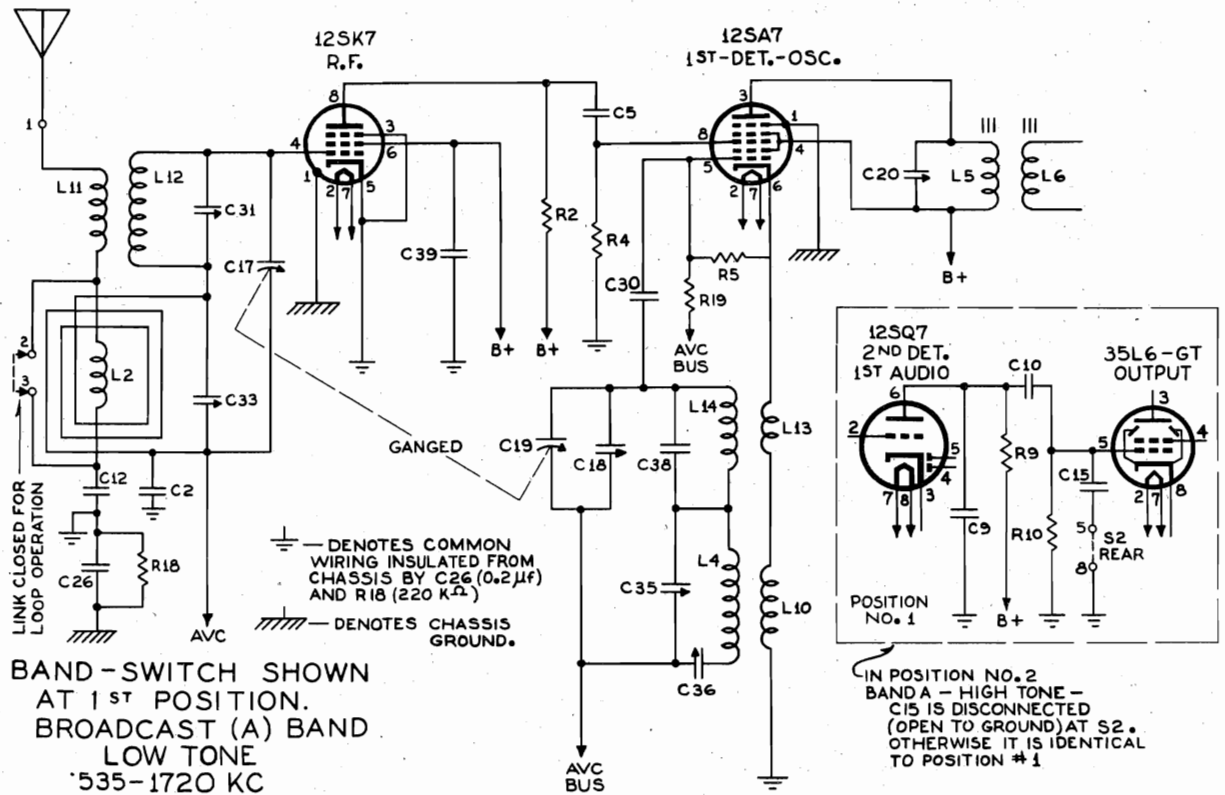


T-923500-4

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Specifications

FREQUENCY RANGE.....	535-1,720 kc
Intermediate Frequency.....	5.74-19 mc
POWER SUPPLY RATINGS	
AC Rating..	105-125 volts, direct current, or 50-60 cycles, 30 watts
POWER OUTPUT (125 volt, 60 cycle supply)	
Undistorted.....	0.9 watts
Maximum.....	1.4 watts
LOUDSPEAKER (RL-81-B2).....	.5-inch permanent-magnet dynamic
Voice Coil Impedance at 400 cycles.....	4 ohms

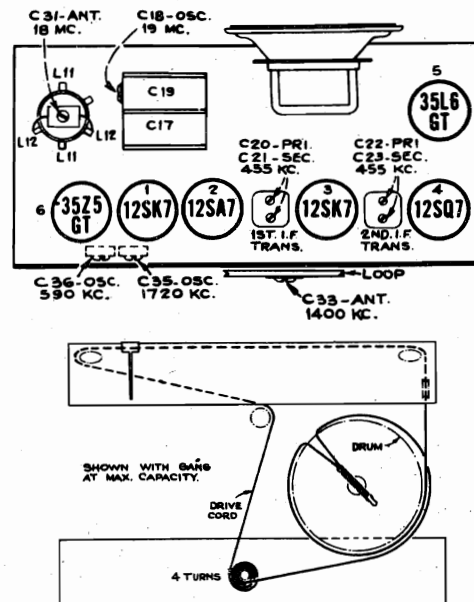


Alignment Procedure

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

Steps	Connect the high side of test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid in series with 0.1 mfd.	455 kc	"A" Band Quiet Point 1,800 kc end of dial	C23, C22 2nd I-F Trans.
2	1st Det. grid in series with 0.1 mfd.			C21, C20 1st I-F Trans.
3	Ant. terminal in series with 47 mmfd.	19 mc	"C" Band 19 mc	C18 (osc.)
Steps	Connect the high side of test-osc. to—	Tune test osc. to	Turn radio dial to—	Adjust the following for max. peak output—
4	Radiated Signal, 18 mc	1,720 kc	"C" Band Resonance on Signal	C31 (ant.)
5	Radiated Signal, 6.1 mc		L12*	
6	Ant. terminal in series with 200 mmfd.	1,720 kc	"A" Band 1,720 kc	C35 (osc.)
7	Radiated signal 1,400 kc (Link closed)	590 kc	Resonance on Signal	C33 (ant.)
8	Ant. terminal in series with 200 mmfd.		590 kc	"A" Band 590 kc	C36 (osc.)
9	Repeat steps 6, 7 and 8			

* Adjust by dressing proximity of AVC lead to coil.



Precautionary Lead Dress.—

1. Dress all capacitors, leads, etc., coming close to osc. coil rigidly and as far as possible from it.
2. Dress blue lead from loop trimmer against loop and around outside of 35Z5GT tube.
3. Dress leads of 120 mmfd. capacitor from terminal board to grid of 12SA7 as short and direct as possible.
4. Dress blue lead from SW ant. coil through same hole in base through which green lead from stator of rear section of the variable condenser passes.

Replacement Parts

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
CHASSIS ASSEMBLIES (RC-1000C)					
36947	Board—"Antenna-Ground" and phono input board	.25	6134	Resistor—1,200 ohms, 1 watt	.22
35998	Capacitor—Mica trimmer for loop	.25	12955	Resistor—3,900 ohms, 1/2 watt	.20
36880	Capacitor—Mica trimmer—1 section 2-20 mmfd. and 1 section 300-800 mmfd.	.60	12454	Resistor—33,000 ohms, 1/2 watt	.20
11859	Capacitor—Adjustable trimmer—3-30 mmfd.	.25	12412	Resistor—47,000 ohms, 1/2 watt	.20
12896	Capacitor—15 mmfd.	.35	12264	Resistor—220,000 ohms, 1/2 watt	.20
12723	Capacitor—56 mmfd.	.35	30648	Resistor—470,000 ohms, 1/2 watt	.20
12724	Capacitor—120 mmfd.	.35	12928	Resistor—3.3 meg., 1/2 watt	.20
12488	Capacitor—270 mmfd.	.35	30271	Resistor—4.7 meg., 1/2 watt	.20
31405	Capacitor—6,000 mmfd.	.75	30992	Resistor—10 meg., 1/2 watt	.20
34508	Capacitor—.0018 mfd.	.25	36897	Shaft—Tuning knob shaft	.10
33584	Capacitor—.005 mfd.	.25	34449	Socket—Dial lamp socket	.30
4937	Capacitor—.01 mfd.	.25	31251	Socket—Tube socket	.25
11315	Capacitor—.015 mfd.	.20	31418	Spring—Drive cord spring	.05
5196	Capacitor—.035 mfd.	.20	36881	Switch—Range switch	1.25
32787	Capacitor—.05 mfd.	.20	36232	Transformer—First I.F. transformer	1.50
4839	Capacitor—0.1 mfd.	.30	36233	Transformer—Second I.F. transformer	1.50
34505	Capacitor—0.2 mfd.	.30	36800	Transformer—Output transformer	1.30
36301	Capacitor—Electrolytic comprising 1 section of 30 mfd. 150 volts, and 1 section of 50 mfd. 150 volts	1.25	33726	Washer—"C" washer to hold tuning shaft	.02
35713	Coil—Antenna coil	.75	SPEAKER ASSEMBLIES (RL-81B2)		
35096	Coil—Loop primary coil	.50	35570	Cone—Cone complete with voice coil	1.20
36937	Coil—Oscillator coil	.85	37612	Speaker—6-inch permanent magnet speaker complete with cone and voice coil—less output transformer	3.50
36876	Condenser—Two gang variable tuning condenser	3.00	MISCELLANEOUS ASSEMBLIES		
36242	Control—Volume control and power switch	1.50	36302	Back—Cabinet back—less red lead wire and terminal	.15
32634	Cord—Drive cord (approx. 50 inches long overall)	.10	36873	Clamp—Dial clamp	.10
36237	Drum—Tuning condenser drive cord drum	.25	37929	Dial—Glass dial scale	.10
37068	Indicator—Station selector indicator	.20	37831	Fastener—Push-on fastener	.10
36882	Loop—Antenna loop complete	2.00	37386	Knob—Range switch knob	.25
36877	Loop—Loop winding only—less support, primary coil, and trimmer	.55	36541	Knob—Tuning or volume control knob	.20
37928	Plate—Dial back plate complete	1.00	11765	Lamp—Dial lamp, Mazda No. 51	.15
36230	Pulley—Drive cord pulley	.04	11349	Spring—Retaining rings for knobs	.05
30189	Resistor—120 ohms, 1/2 watt	.20			

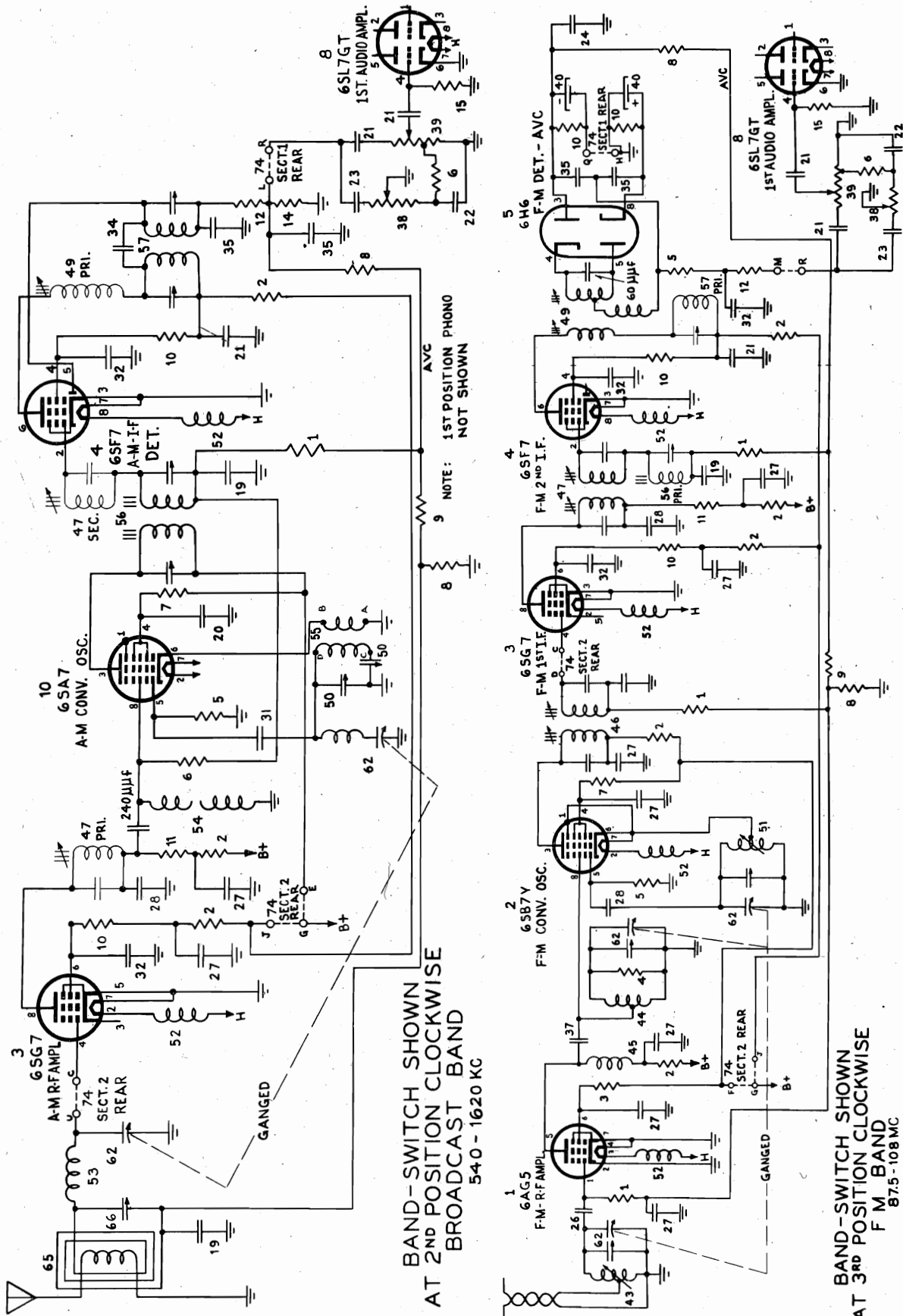
ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

"clarified schematics"

PAGE 16-2 BRUNSWICK

MODELS SF-6810, T-4000,
T-4000-1/2, D-6876

RADIO & TELEV. INC.



BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE
BROADCAST BAND
540 - 1620 KC

BAND-SWITCH SHOWN
AT 3RD POSITION CLOCKWISE
F M BAND
87.5-108 MC

OSCILLOSCOPE ALIGNMENT OF FM BAND

A. Equipment required will be an oscilloscope, a frequency modulated signal generator covering the range 87.5 to 108.5 mc on fundamentals, a sweep generator producing a signal of 10.7 mc and sweeping at least 150 kc each side of 10.7 mc, and an output meter.

B. The vertical or "Y" axis terminals of the oscilloscope should be connected between pin 3 of the 6H6 discriminator and ground. The sweep voltage of the sweep generator should be fed to the horizontal or "X" axis terminals of the 6SF7 tube through a condenser of approximately 3300 mmfd.

C. Remove the negative lead of the 4 mfd. electrolytic from pin #3 of 6H6 socket. Remove 6SL7 tube from socket. Turn the set on and turn both the tone control and the volume control all the way to the right. Detune the secondary of the third FM I.F. transformer by turning the bottom slug screw out as far as possible. Adjust the primary, top slug screw, until pattern (a) appears on the oscilloscope. Adjust the secondary, bottom slug screw, until pattern "b" is obtained on the oscilloscope and until both sides of this pattern are symmetrical.

D. Remove the 10.7 mc output of the sweep generator from the grid of the 6SF7 tube and connect to the grid of the 6SG7. Align the second FM I.F. transformer as in paragraph "C".

E. Connect the 10.7 ms output of the sweep generator to the signal grid of the 6SB7Y (pin 8). Detune secondary of the first FM I.F. transformer and tune primary as before for pattern (a). Tune secondary for pattern "c" and make both sides of pattern as symmetrical as possible. This completes alignment of the FM I.F. transformers.

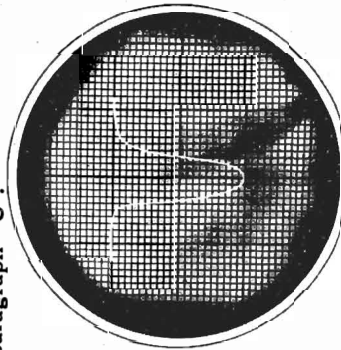
F. Reconnect the negative lead of the 4 mfd. electrolytic to pin #3 of the 6H6 socket and move the oscilloscope leads to pin #6 of the 6H6 socket and ground. With the sweep generator connected to the 6SB7Y signal grid as before, the discriminator pattern (d) should appear on the oscilloscope if the I.F. alignment instructions have been followed carefully. Remove the oscilloscope and sweep generator leads and reinstall 6SL7 tube in socket. Never adjust AM I.F. transformers without rechecking FM I.F. alignment.

G. Connect the 87.5 to 108.5 mc signal generator to the antenna socket of the receiver through a 300 ohm resistor. The generator should be frequency modulated at some frequency in the audible range. Connect output meter across secondary of output transformer. Tune receiver to channel 300 on FM dial. With signal generator set at 107.9 mc adjust oscillator trimmer condenser, third from front, for maximum read-

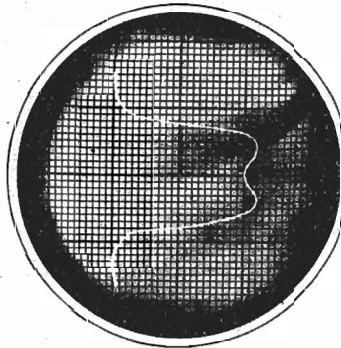
ing on output meter. Set signal generator to 87.9 mc and tune receiver to channel 200 on FM dial. Adjust oscillator coil screw, third from front, (see chassis layout) for maximum reading on output meter. Recheck oscillator setting for channel 300.

Tune signal generator and receiver to 5 mc (channel 285 approx.). Adjust converter signal grid trimmer condenser, second from front, for maximum reading on output meter. Tune signal generator and receiver to 92 mc, (channel 220 approx.) and adjust converter coil screw, (second from front), to maximum reading on output meter. Recheck converter trimmer setting at 105 mc (channel 285 approx.).

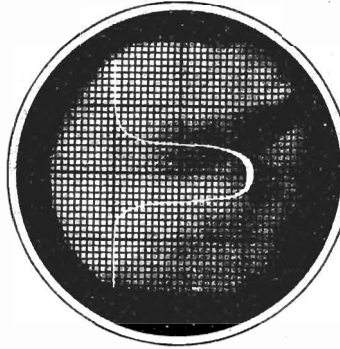
I. Repeat operations of paragraph (G) for antenna trimmer condenser and coil. This completes FM R.F. alignment.



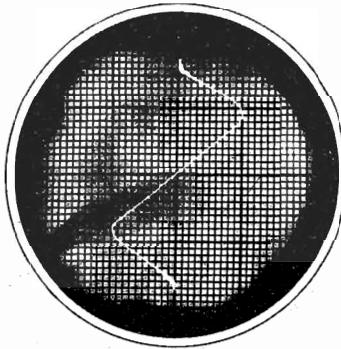
A



B



C



D

ALIGNMENT INSTRUCTIONS AM BAND

An output meter and a signal generator calibrated at 455 Kc., 600 Kc., 1500 Kc. and 1600 Kc., are required to properly align these receivers on AM band. Keep the output of the signal generator as low as possible to prevent AVC action and false settings. Connect the high side of the generator to the blue wire found at rear of set and low side to the black wire.

STEPS	DUMMY ANTENNA	SET GENERATOR AT	SET GANG AT	ADJUST	LOCATED
SET VOLUME AND TONE CONTROLS AT MAXIMUM					
1					
2		455 Kc.	Minimum	2nd. I.F. Trimmers *	Top of I.F. Transformers
3		1600 Kc.	1600 Kc.	1st. I.F. Trimmers *	
4	200 MMF.	1500 Kc.	1500 Kc.	B. C. Osc. Trimmer	See Chassis Layout
5		600 Kc.	600 Kc. Rock Gang	B. C. R. F. Trimmer	On Loop
6				600 Kc. Padder	See Chassis Layout
7				Recheck 1500 Kc.	

* Recheck after FM alignment.

ALTERNATE FM ALIGNMENT PROCEDURE

Necessary Equipment:
Signal Generator
Voltmyst

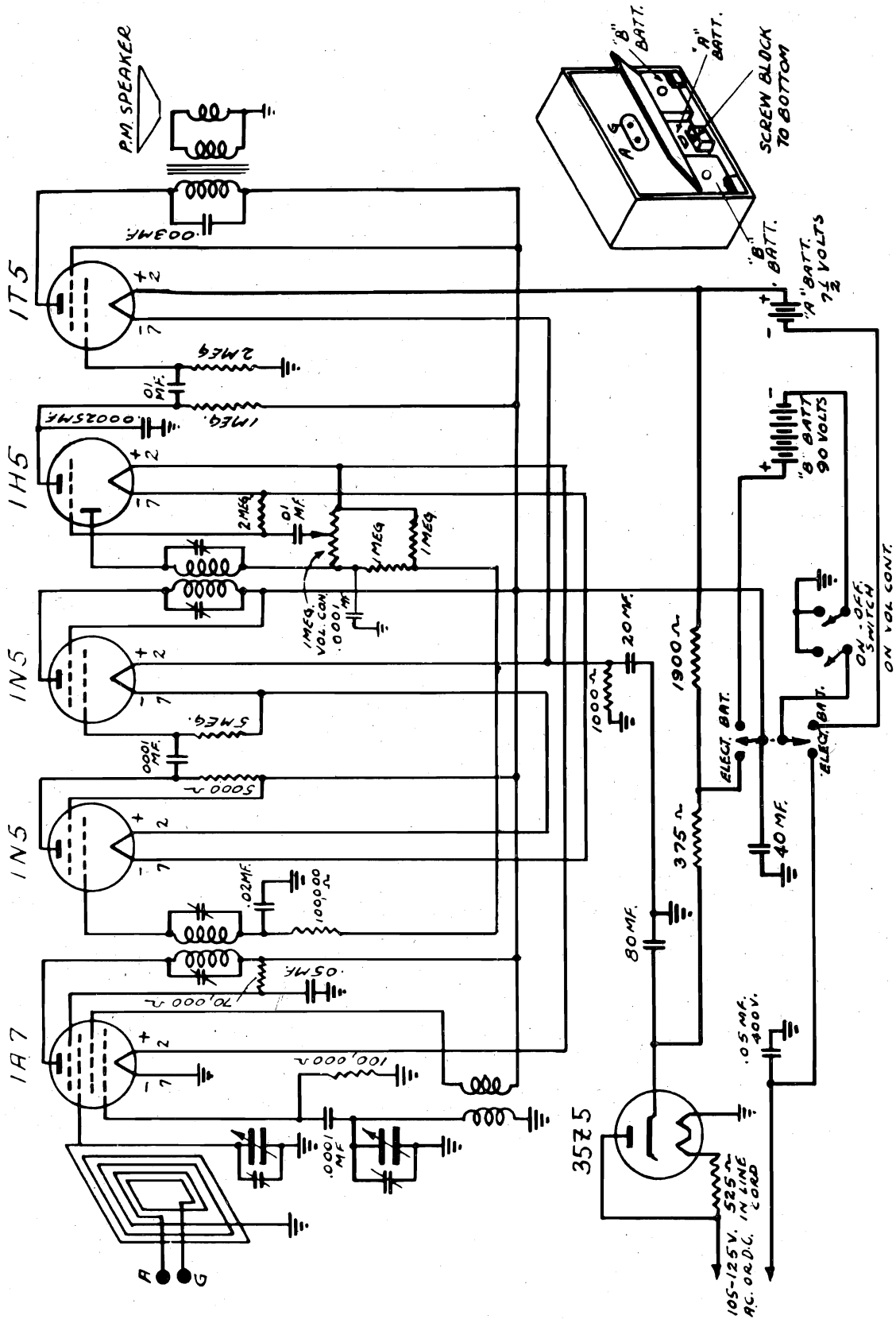
RF ALIGNMENT:

Connect Voltmyst from ground to pin 6 of 6H6 (audio, marked X on Schematic). Connect generator tuned to 10.7 mc. to pin #4 on 6SG7. Turn secondary slug of 3rd FM I.F. (closest to chassis) out as far as it will go. Tune Primary of 3rd I.F. for maximum negative voltage. Next tune Secondary slug for zero voltage. (As Sec. slug is tuned voltage will go up slowly then start decreasing rapidly, tune slug till it reaches zero). Next connect voltmeter between ground and pin #5 (marked Y on Schematic) on 6H6 socket (AVC). Turn Secondary slug of 2nd FM I.F. out as far as it will turn. Tune primary for maximum negative voltage. Then tune secondary for maximum negative voltage. Move generator to pin #8 of 6SB7Y socket. Follow same procedure as on 2nd I.F. for the 1st. I.F. transformer. I.F. is now aligned.

MODEL SF-6810—PARTS LIST

Ref. No.	Part No.	DESCRIPTION	List Price
1	77214	100M Ohms	.15
2	77262	1000 Ohms	.15
3	77265	15 M Ohms	.15
4	77212	10 M Ohms	.15
5	77216	220 M Ohms	.15
6	77218	10 M Ohms 2 Watt	.25
7	77013	1 Megohm	.15
8	77218	4.7 Megohms	.15
9	77272	33 M Ohms	.15
10	77267	470 M Ohms	.15
11	77211	470 M Ohms	.15
12	77217	470 M Ohms	.15
13	77274	10 Megohms	.15
14	77243	2700 Ohm Molded Resistor 4.7 Watt	.50
15	77189	270 Ohms, 2 Watt	.25
16	77504	1000 Ohms, 2 Watt	.25
17	77504	1000 Ohms, 2 Watt	.25
18	25183	.005 Mfd. 600 Volt	.15
19	25183	.005 Mfd. 600 Volt	.15
20	25184	.01 Mfd. 600 Volt	.20
21	25184	.01 Mfd. 600 Volt	.20
22	25184	.003 Mfd. 600 Volt	.15
23	25185	.002 Mfd. 600 Volt	.15
24	25215	.1 Mfd. 600 Volt	.20
25	25231	.005 Mfd. Butter Capacitor, 600 Volt	.25
26	25233	.005 Mfd. Butter Capacitor, 600 Volt	.25
27	25273	1500 MMF. Ceramic Capacitor	.30
28	25229	30 MMF. Ceramic Capacitor, N-150	.20
29	25271	47 MMF. Mica Capacitor	.30
30	25271	47 MMF. Mica Capacitor	.30
31	25271	4000 MMF. Ceramic Capacitor	.65
32	25271	4000 MMF. Ceramic Capacitor	.65
33	25227	4 MMF. Ceramic Capacitor	.90
34	25227	4 MMF. Ceramic Capacitor	.90
35	25235	100 MMF. Mica Capacitor	.20
36	78072	Tone Control, 3 Megohms	.80
37	78120	Volume Control, 3 Megohms	1.10
38	25216	Electrolytic Capacitor 20 Mfd., 20 Mfd., 30 Mfd., 450 volt	.80
39	25216	Electrolytic Capacitor 20 Mfd., 20 Mfd., 30 Mfd., 450 volt	.80
40	25216	Electrolytic Capacitor 20 Mfd., 20 Mfd., 30 Mfd., 450 volt	.80
41	25216	Electrolytic Capacitor 20 Mfd., 20 Mfd., 30 Mfd., 450 volt	.80
42	38690	25 Mfd., 25 Volt	3.10
43	38691	FM Converter Coil	1.05
44	58471	FM RF Choke	1.05
45	38683	1st. FM I.F. Transformer	3.75
46	38684	2nd. FM I.F. Transformer	4.05
47	38685	3rd. FM I.F. Transformer	4.55
48	38692	FM Oscillator Unit Strip	1.05
49	38692	FM Oscillator Unit Strip	1.05
50	38661	Heater Choke	.25
51	38661	Heater Choke	.25
52	38661	Heater Choke	.25
53	38845	Antenna Loading Coll.	.50
54	38484	Wave Trap Coil	.55
55	38694	BC Oscillator Coil	.65
56	38682	2nd. AM I.F. Transformer	2.40
57	38682	2nd. AM I.F. Transformer	2.40
58	94204	Power Transformer	7.90
59	94195	Output Transformer	4.55
60	81126	Speaker	20.05
61	81126	Speaker	20.05
62	26237	Gang Capacitor	1.15
63	11325	FM Dipole and Plug	1.15
64	38835	FM Dipole Socket	1.15
65	38835	FM Dipole Socket	1.15
66	26031	Loop Antenna Trimmer	.65
67	80256	Loop Antenna Socket	.35
68	80256	Loop Antenna Socket	.35
69	80256	Antenna 3-Prong Plug	1.10
70	80214	Band Switch Socket	2.65
71	42140	High Input Socket	1.15
72	42140	High Input Socket	1.15
73	80385	Speaker Socket	1.10
74	80385	Speaker Socket	1.10
75	27118	Line Cord	.75
76	11274	Phono AC Socket	1.10
77	31385	Glass Dial	2.95
78	94089	Dial Background	1.95
79	17019	Drive Drum	1.25
80	05089	Drive Cord (42 inches) and springs	.25
	67444	Knob	.20
	80325	Mica Filled Octal Socket for 6SB7Y	.25
	80139	Molded Octal Socket	.15
	80362	2-Prong FM Socket for Rectifier	.10
	80319	Miniature Tube Socket	1.85
	22147	Pickup Cable	1.20
	71223	Phono Needle	1.20

RADIO WIRE TELEVISION



SCHEMATIC CIRCUIT DIAGRAM
MODEL BP-12

I.F. = 455 K.C.

MODEL BP-12

RADIO WIRE TELEVISION

This receiver will operate either from batteries contained within the case or from the regular Electric mains (AC or DC) on voltages from 105 to 125. A self-contained antenna is built in and will give good performance from stations not too remote. Where signal strength is poor or where reception from great distances is required, Antenna (A) and Ground (G) terminals are provided. These are located on the rear of the case. An antenna from 50 to 100 feet long may be used.

BATTERIES - The following batteries are required where no electric power is available:

7½ Volt "A" - USALITE #687, BURGESS #G5, GENERAL #5-H-5 - or equivalent
(4-3/8" X 3½" X 2-3/4") - 1 Required

45 Volt "B" - USALITE #624, BURGESS #B30, GENERAL #V-30-B, EVEREADY #762
ADVANCE #267 - or equivalent
(5-11/32" X 2-17/32" X 4-3/16") - 2 Required

TO INSTALL BATTERIES - Access to the battery compartment may be had by opening the bottom flap on the back of the cabinet. Insert the "B" batteries on each side, slide the "A" into place, then screw the wood block to the bottom to hold batteries. (See diagram).

With the ELEC-BATT switch on the front panel in the BATT position, the receiver is now ready for operation as a portable unit. When prolonged operation in the "ELECTRIC" position is contemplated (as during the winter season), it is advisable to remove the batteries and store them in a cool, dry place. DO NOT leave exhausted batteries in the carrying case as chemical action may expand the batteries and make it difficult to remove them.

WAVE BAND: The range covered is as follows:
175 - 555 METERS (1720 - 540 KC)

OPERATIONBATTERY

After the batteries have been installed in accordance with the instructions given above, set the slide switch on the front of the cabinet to the right.

ELECTRIC

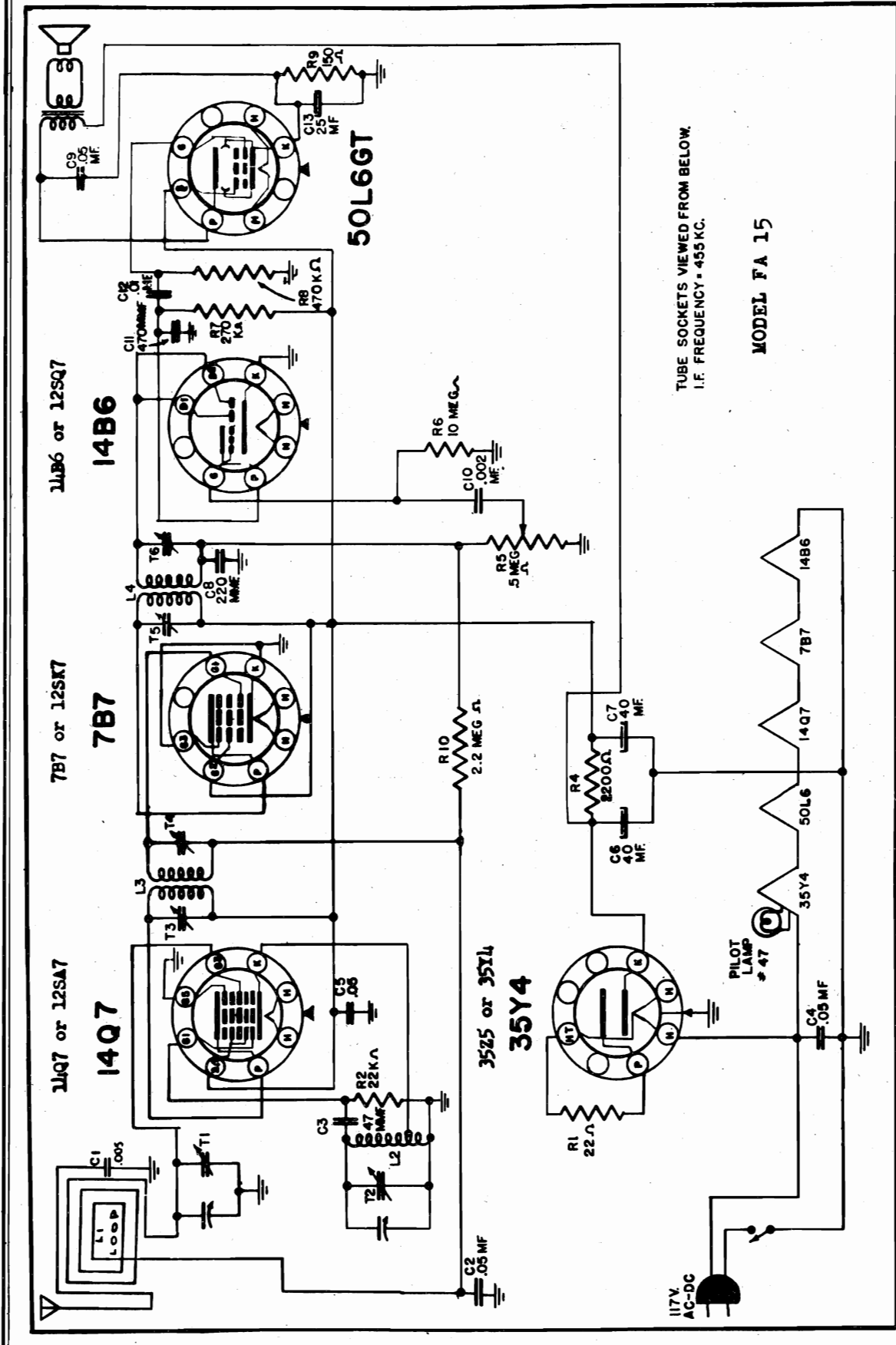
Open the small door on the rear of the cabinet providing access to the power cord which can be plugged into any outlet (105 to 125 Volts AC or DC.) Slide the switch on the front of the cabinet to the left.

The receiver may now be operated by turning the LEFT hand knob to the right, (Clockwise). The Volume is turned up and the station tuned in. (Right hand knob). By rotating the cabinet slowly (when the self-contained loop is used) maximum signal with minimum noise may be obtained. The direction effect is lost when a large antenna is used, but in this case, ample signal is obtained to be heard above the noise level. The volume is adjusted for the desired level.

NOTE:- When this set is to be operated from the 115-125 Volt DC line and no signal can be tuned in with the power switch in the "ELECTRIC" position, reverse the plug in the light socket one-half turn. When operating on AC, a slight hum may be heard on some stations. Reversing the line plug one-half turn in the socket will alleviate this condition.

RADIO WIRE TELEVISION

MODEL FA-15



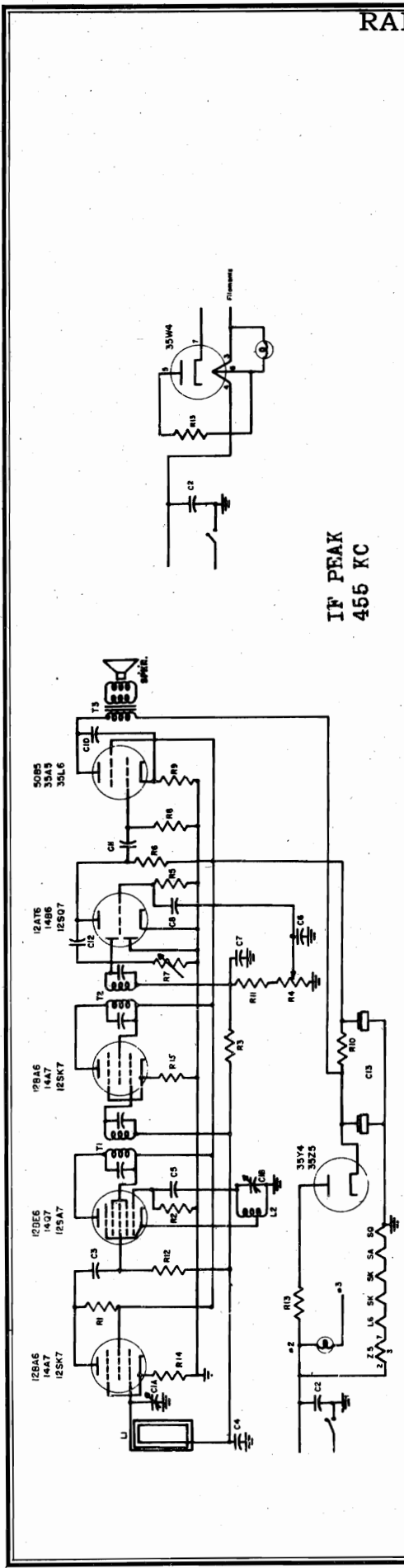
TUBE SOCKETS VIEWED FROM BELOW.
I.F. FREQUENCY = 455 KC.

MODEL FA 15

- | | | | |
|----------------|-------------------------------------------|------|-------------------------|
| C-1 | Paper, .005 mfd., 400 volts | R-9 | 150 ohms, 1 W. |
| C-2 | Paper, .05 mfd., 400 volts | R-10 | 2.2 Megohms, 1/4 W. |
| C-3 | Paper, .05 mfd., 400 volts | L-1 | Loop Aerial |
| C-4 | Mica, .47 mfd., 500 volts | L-2 | Oscillator Coil |
| C-5 | Paper, .05 mfd., 400 volts | L-3 | First I-F Transformer |
| C-6, C-7, C-13 | Electrolytic, 40x40, 150 V, 25 mfd., 25V. | L-4 | Second I-F Transformer |
| C-8 | Mica, 220 mmd., 500 volts | | |
| C-9 | Paper, .05 mfd., 400 volts | R-2 | 22,000 ohms, 2 W. |
| C-10 | Paper, .002 mfd., 400 volts | R-4 | Volume Control & Switch |
| C-11 | Mica, .470 mfd., 500 volts | R-5 | 10 Megohms, 1/4 W. |
| C-12 | Paper, .01 mfd., 400 volts | R-6 | 270,000 ohms, 1/2 W. |
| R-1 | 22 ohms, 1/2 W. | R-7 | 470,000 ohms, 1/4 W. |

RADIO WIRE TELEVISION

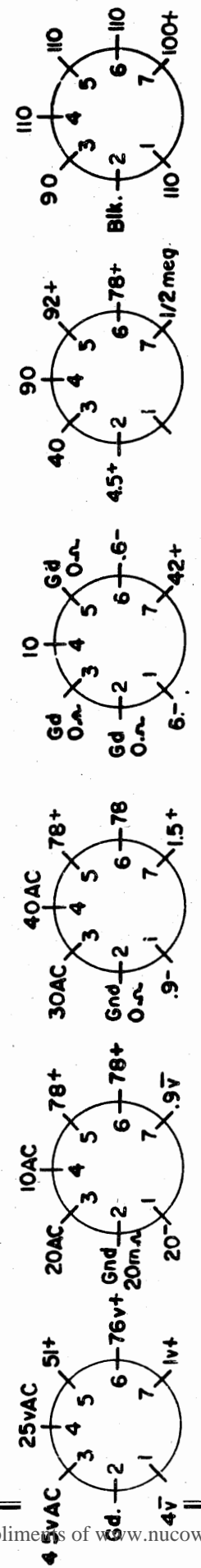
MODEL MC-11



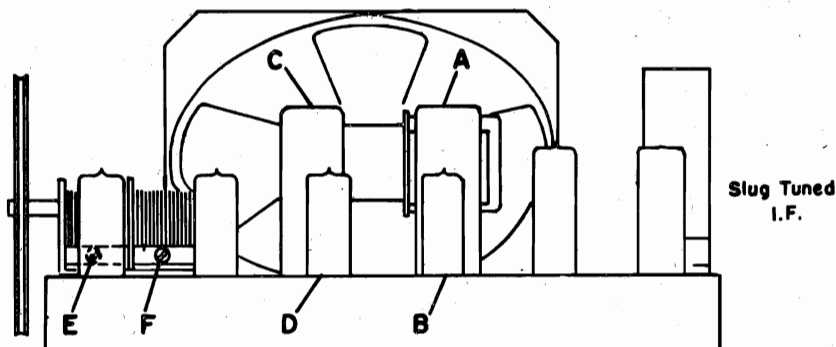
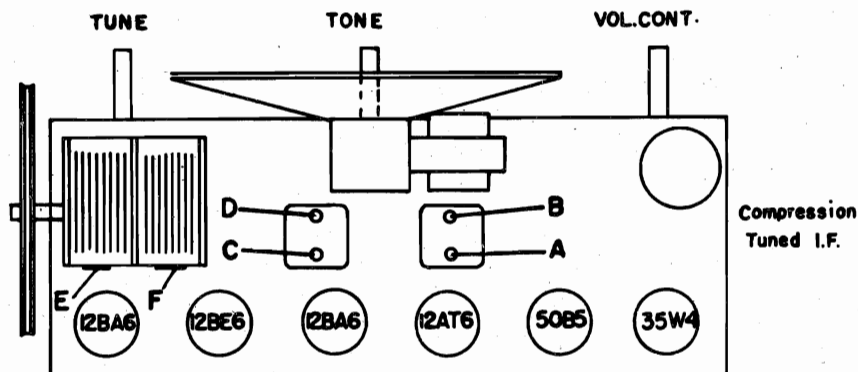
IF PEAK
455 KC

CIRCUIT SYMBOL	PART NO.	DESCRIPTION
C1	CV-10009	Condenser, Variable with Pulley.
C2	CP-14503	Condenser, Paper .05 Mfd. 400 volts.
C3	CH-15250	Condenser, Mica 25 mmf. 500 volts.
C4	CP-12503	Condenser, Paper .05 Mfd. 200 volts.
C5	CH-15500	Condenser, Mica 50 mmf. 500 volts.
C6-C7	CH-15251	Condenser, Mica 250 mmf. 500 volts.
C8, C11	CP-14103	Condenser, Paper .01 mfd. 400 volts.
C10	CP-14203	Condenser, Paper .02 mfd. 400 volts.
C12	CP-14302	Condenser, Paper .003 mfd. 400 volts.
C13	CL-10007	Condenser, Electrol. 50/30 mfd. 150 volts.
L1	AL-10010	Loop Antenna.
L2	TRC-10000D	Coil, Oscillator
R1	RC-34701	Resistor, Carbon 4700 ohm 1/2 watt.
R2	RC-32202	Resistor, Carbon 22000 ohm 1/2 watt.
R3	RC-32204	Resistor, Carbon 2.2 megohm 1/2 watt.
R4	VC-11105	Control, Volume 1 megohm with switch.
R5	RC-31005	Resistor, Carbon 10 megohm 1/2 watt.
R6	RC-32203	Resistor, Carbon 220,000 ohm 1/2 watt.
R7	VC-13105	Control, Tone 1 megohm.
R8, R12	RC-34703	Resistor, Carbon 470,000 ohm 1/2 watt.
R9, R14	RC-31500	Resistor, Carbon 150 ohm 1/2 watt.
R10	RC-41001	Resistor, Carbon 1000 ohm 1 watt.
R11	RC-31003	Resistor, Carbon 100,000 ohm 1/2 watt.
R13	RC-30220	Resistor, Carbon 22 ohm 1/2 watt.
R15	RC-33300	Resistor, Carbon 330 ohm 1/2 watt.
SPKR	SO-10002	Speaker, Oval 4 x 6.
T1	TS-10000	Transformer, I. F. Input.
T2	TS-10001	Transformer, I. F. Output.
T3	TO-10000	Transformer, Output.

All grid voltages measured with 200,000 ohms per volt meter and other voltages with 1000 ohms per volt meter.



12BA6 12BE6 12BA6 12AT6 35W4



Tubes used (6) 12BA6 RF amplifier; 12BE6 converter; 12BA6 IF amplifier; 12AT6 Det., AVC, AF; 50B5 power output; and 35W4 rectifier.

Power supply 110-125 volts AC/DC.

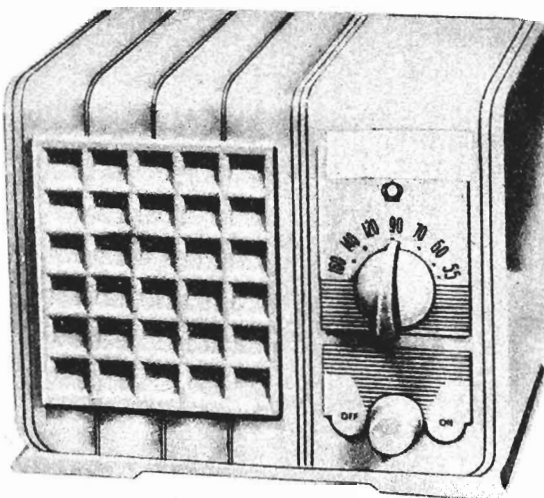
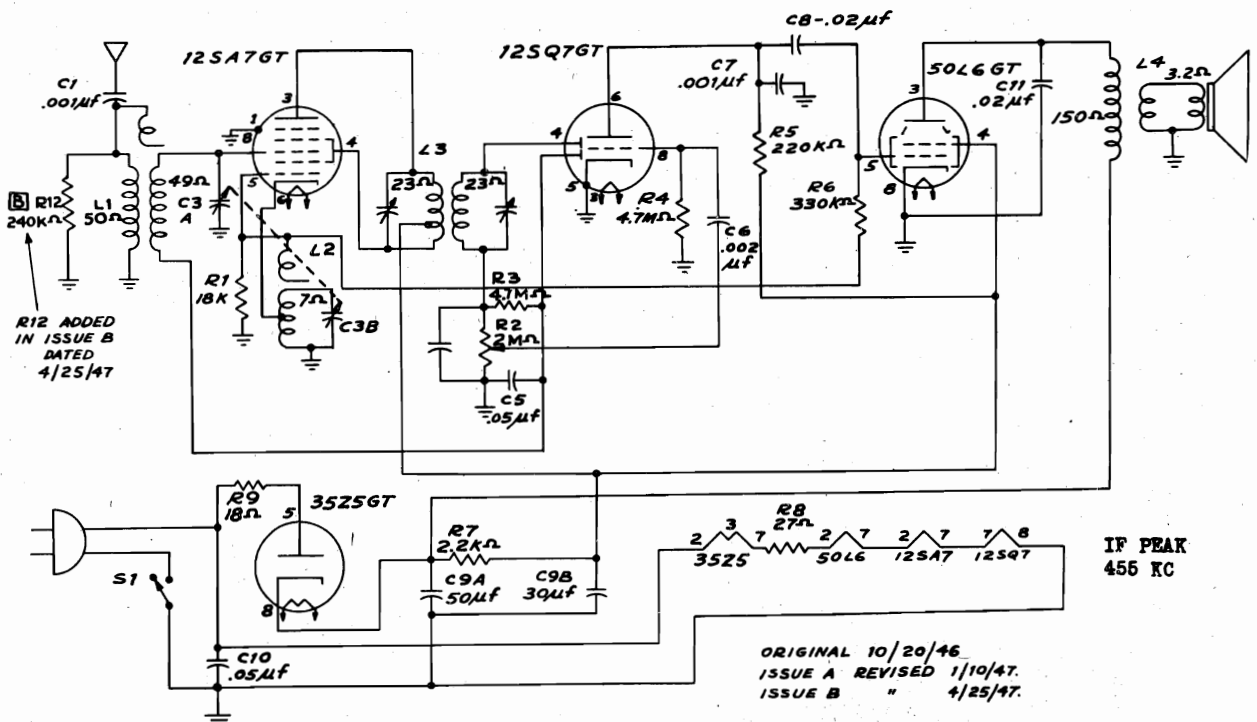
Tuning Range—Broadcast 550 Kc to 1720 Kc Rating .24 amp @ 117 volts AC/DC.

ALIGNMENT INSTRUCTIONS — READ CAREFULLY

Use isolation transformer if available. If not, connect a capacitor in series with low side to chassis. Volume control should be at a maximum and output of signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

Dummy Antenna	Signal Generator Coupling	Signal Generator Frequency	Gang Condenser Position	Output Meter	Adjust	Remarks
.05 Mfd.	High side of Mixer tube Grid (12BE6)	455 Kc	Stator Turned out to minimum Capacity position	Across Voice Coil	A, B, C, D	Adjust for maximum output. If isolation transformer is not used, reduce dummy ant. to .001 MFD. to reduce hum modulation.
	Loop	1720 Kc	Stator Turned out to minimum Capacity position	Across Voice coil	E	Fashion loop from few turns of wire and radiate signal into set. Adjust for maximum output.
	Loop	1500 Kc	Tune gang to resonance	Across Voice coil	F	Fashion loop from few turns of wire and radiate signal into set. Adjust for maximum output.

RADIONIC EQUIPMENT CO.

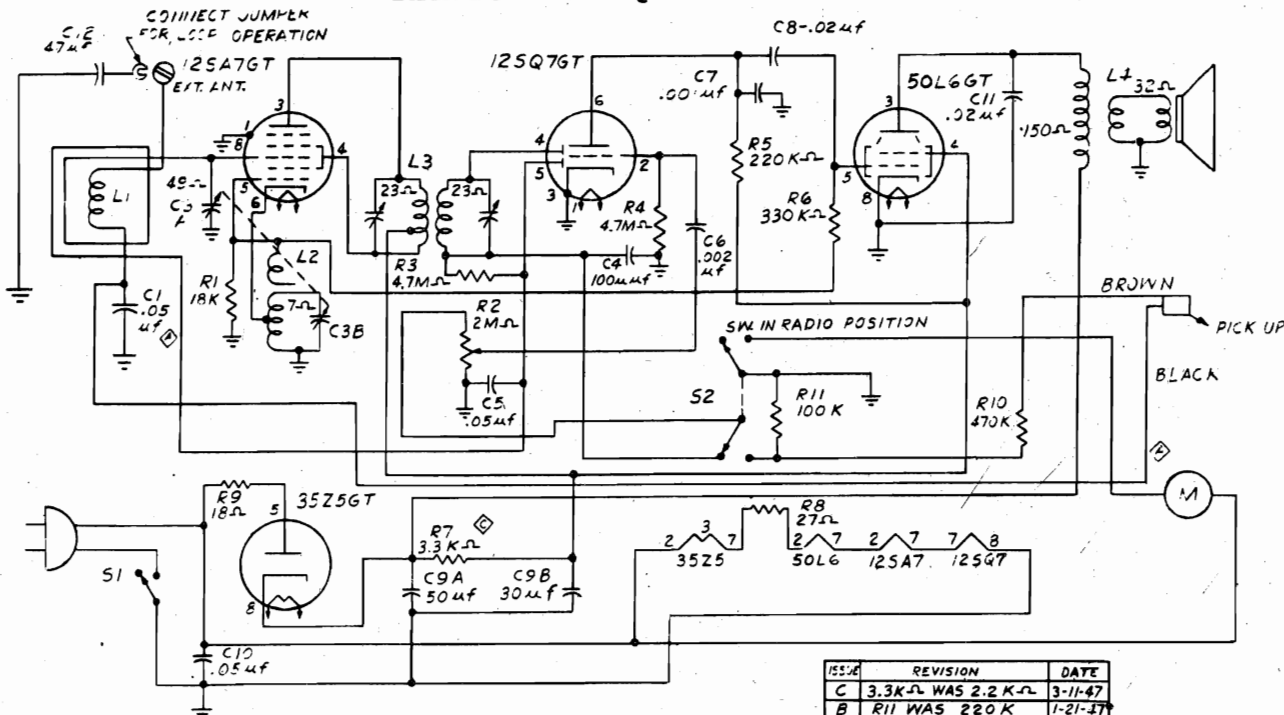


DESCRIPTION	PRICE
Paper condenser .05/400 v.	.21
" " .01/"	.18
" " .002/"	.17
" " .02/"	.18
" " .05/200 v.	.19
" " .005/"	.17
" " .001/500 v.	.18
Mica " 100 mmf	.19
" " 47	.17
Resistor 10K ohm 1/4 w.	.05
" 4.7 meg ohm 1/4 w.	.05
" 220 ohm 1/4 w.	.05
" 2200 ohm 2 w.	.18
" 18 ohm 1/4 w.	.05
" 47 " 1 w.	.10
" 330K ohm 1/4 w.	.05

DESCRIPTION	PRICE
5877 Plastic cabinet walnut	2.40
39156 Speaker and output transformers	3.19
39157 Plastic knob tuning	.30
62192 " volume	.13
Cabinet back	.25
Instruction book	.05
1673 Variable condenser	3.65
2073 Electrolytic condenser unit 50-30 mf 150 v.	1.60
2479 Volume control with switch 2 meg ohm	1.20
28182 Antenna coil	1.05
28184 Oscillator coil	.75
3376 I.F. transformer	2.05
5580 Antenna hank	.37
Line cord	.75

MODEL 240T

RADIONIC EQUIPMENT CO.

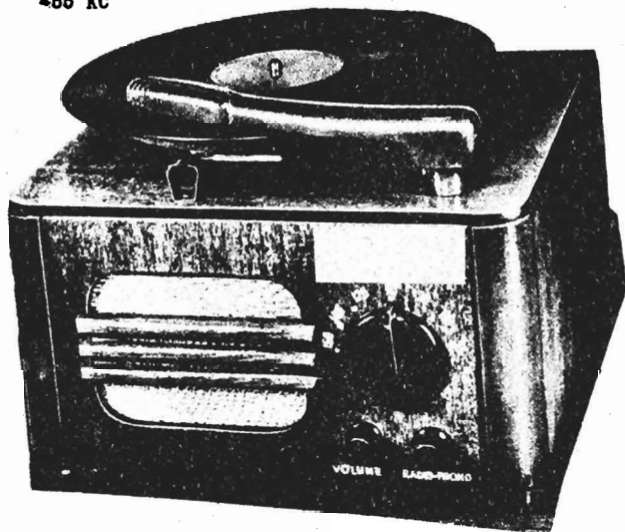


IF PEAK
455 KC

ISSUE	REVISION	DATE
C	3.3KΩ WAS 2.2KΩ	3-11-47
B	R11 WAS 220K	1-21-47
A	C2 & GROUND REMOVED - C1 WAS .001 BLK. LEAD BETWEEN XTAL & C1 ADDED	1-14-47

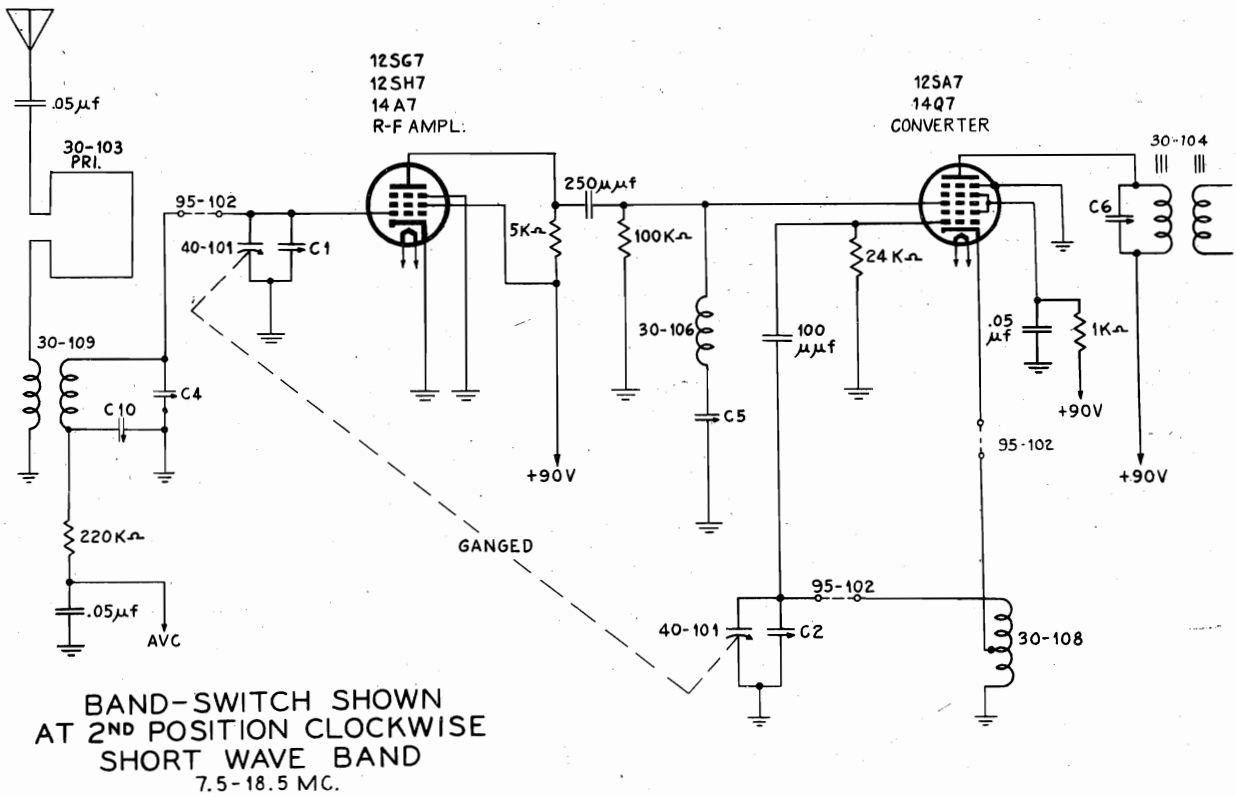
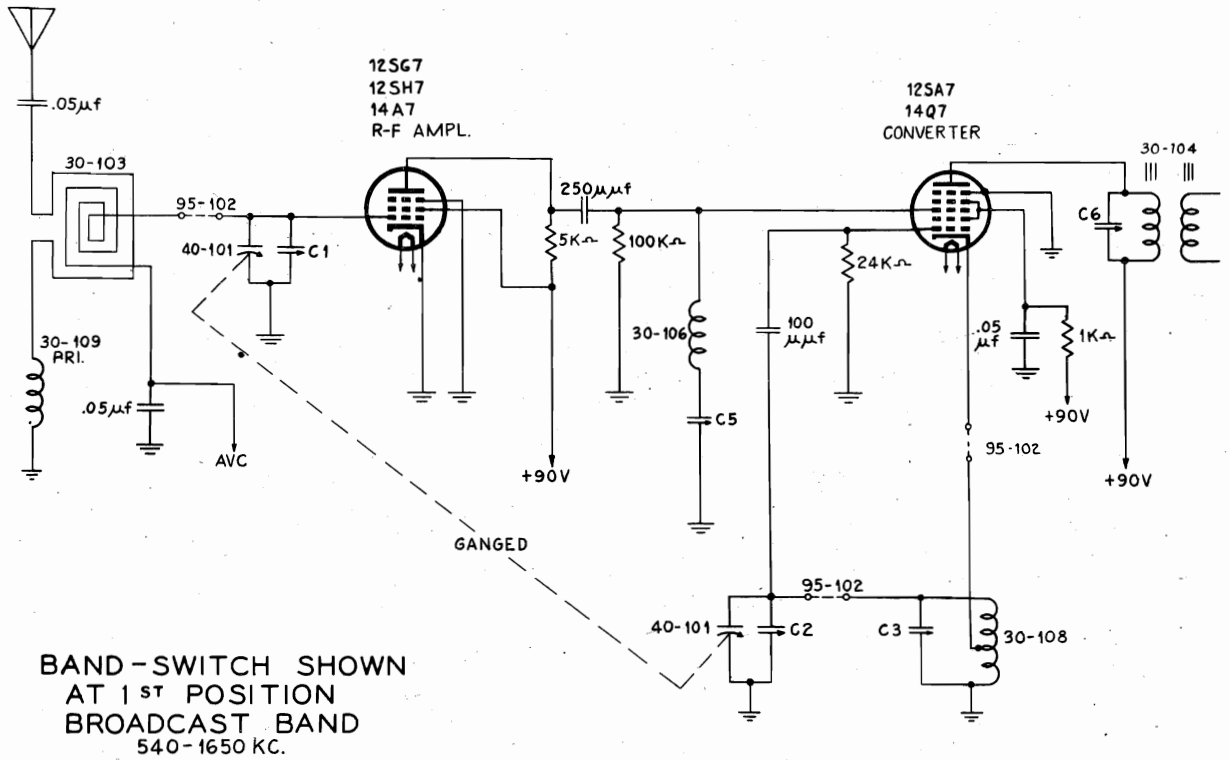
DESCRIPTION

DESCRIPTION	PRICE
Paper condenser .05 mf 400 v.	.21
" " .002 200 v.	.17
" " .02 "	.18
" " .05 "	.19
" " .001 "	.17
Ceramic 100 mmf 500 volts	.18
16K ohms 1/4 w.	.15
4.7 meg ohms 1/4 w.	.15
220K	.15
2200	.18
18	.15
47	.15
330K	.15
470K	.15

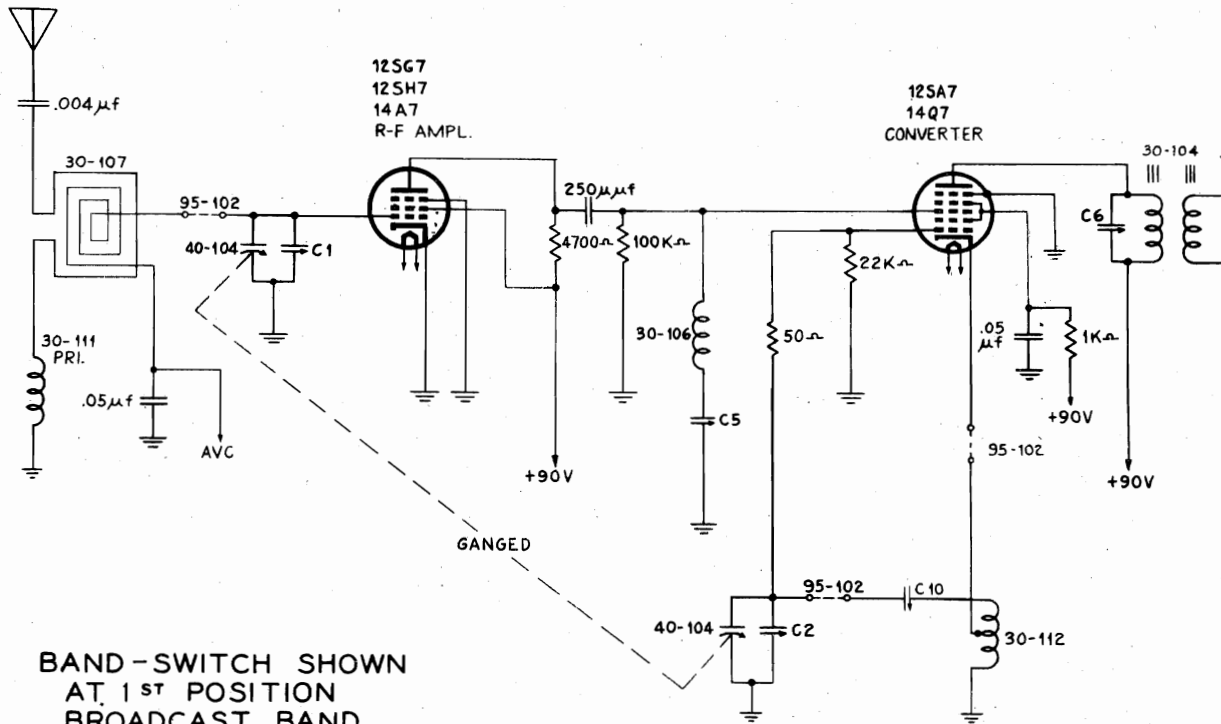


DESCRIPTION

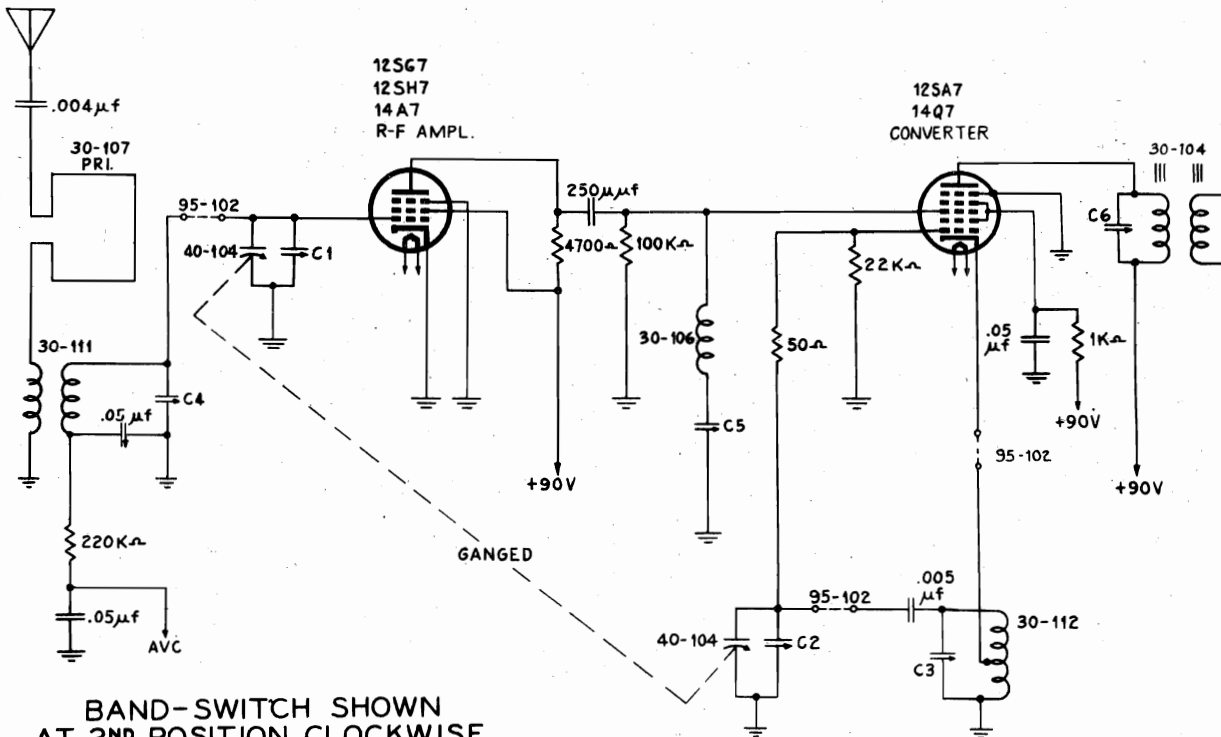
DESCRIPTION	PRICE
A403 Cabinet, wood less lid	13.35
5877 Speaker and output transformer	3.31
39160 Knob, tuning wood	.30
39161 Knob, (volume, phono-radio)	.15
59307 Instruction book	.05
1675 Variable condenser	4.00
2073 Electrolytic condenser unit 50-30 mf/150 v.	1.70
2480 Volume control 2 meg with switch	1.20
28184 Oscillator coil	.75
28185 Antenna coil (chassis 470-1)	.80
3376 I.F. transformer	2.20
28186 Loop and loading coil (chassis 470-2)	1.75
5559 Line cord	.75
3828 Switch radio/phono	.85
6343 Pick-up arm and rest	7.65
6418 Motor and turntable 8"	8.70
Lifetime needle	1.30



"clarified schematics"

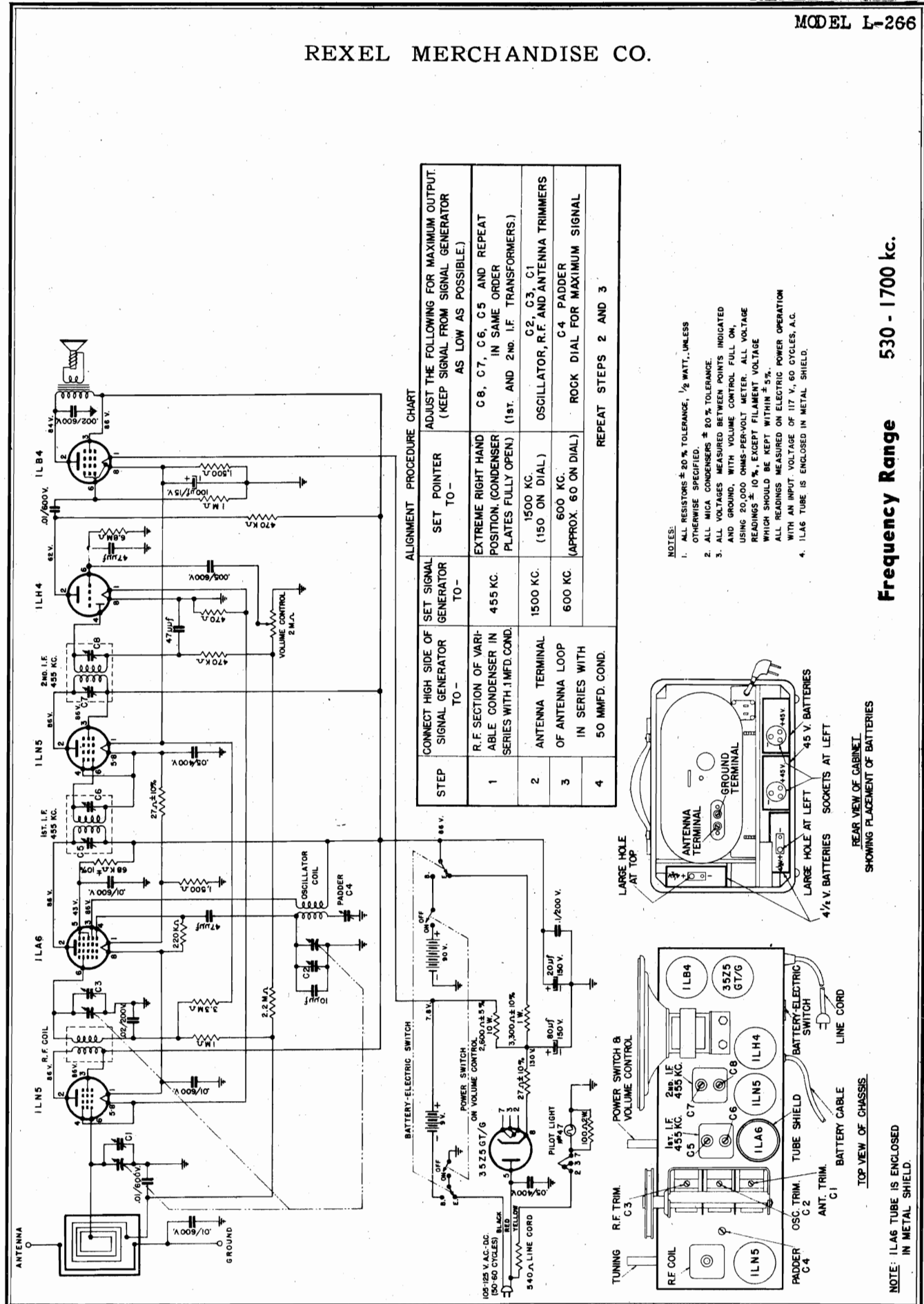


BAND-SWITCH SHOWN AT 1ST POSITION
BROADCAST BAND
540-1650 KC.



BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE
SHORT WAVE BAND
5.8-18.3 MC.

REXEL MERCHANDISE CO.

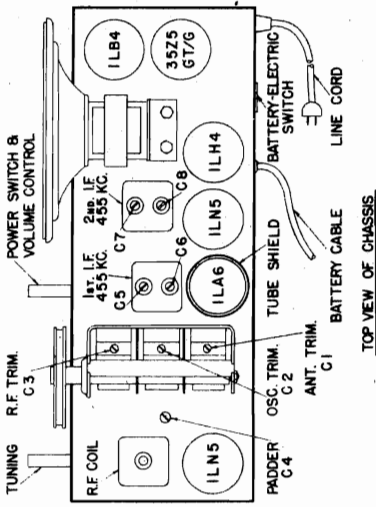
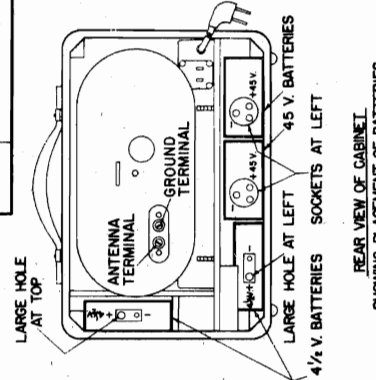


ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	SET POINTER TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH 1MFD. COND.	455 KC.	EXTREME RIGHT HAND POSITION. CONDENSER PLATES FULLY OPEN)	C8, C7, C6, C5 AND REPEAT IN SAME ORDER (1st. AND 2nd. I.F. TRANSFORMERS.)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1500 KC.	(150 ON DIAL)	C2, C3, C1 OSCILLATOR, R.F. AND ANTENNA TRIMMERS
3		600 KC.	(APPROX. 60 ON DIAL)	C4 PADDER
4				ROCK DIAL FOR MAXIMUM SIGNAL

REPEAT STEPS 2 AND 3

- NOTES:
1. ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
 2. ALL MICA CONDENSERS ± 20% TOLERANCE
 3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN ± 5%.
 4. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 V., 60 CYCLES, A.C.



Frequency Range 530 - 1700 kc.

REAR VIEW OF CABINET SHOWING PLACEMENT OF BATTERIES

TOP VIEW OF CHASSIS

NOTE: 1LA6 TUBE IS ENCLOSED IN METAL SHIELD.

REXEL MERCHANDISE CO.

WHEN SERVICING THIS RECEIVER DO NOT PLACE CHASSIS ON A GROUNDED METALLIC BENCH.

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

ALIGNMENT

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

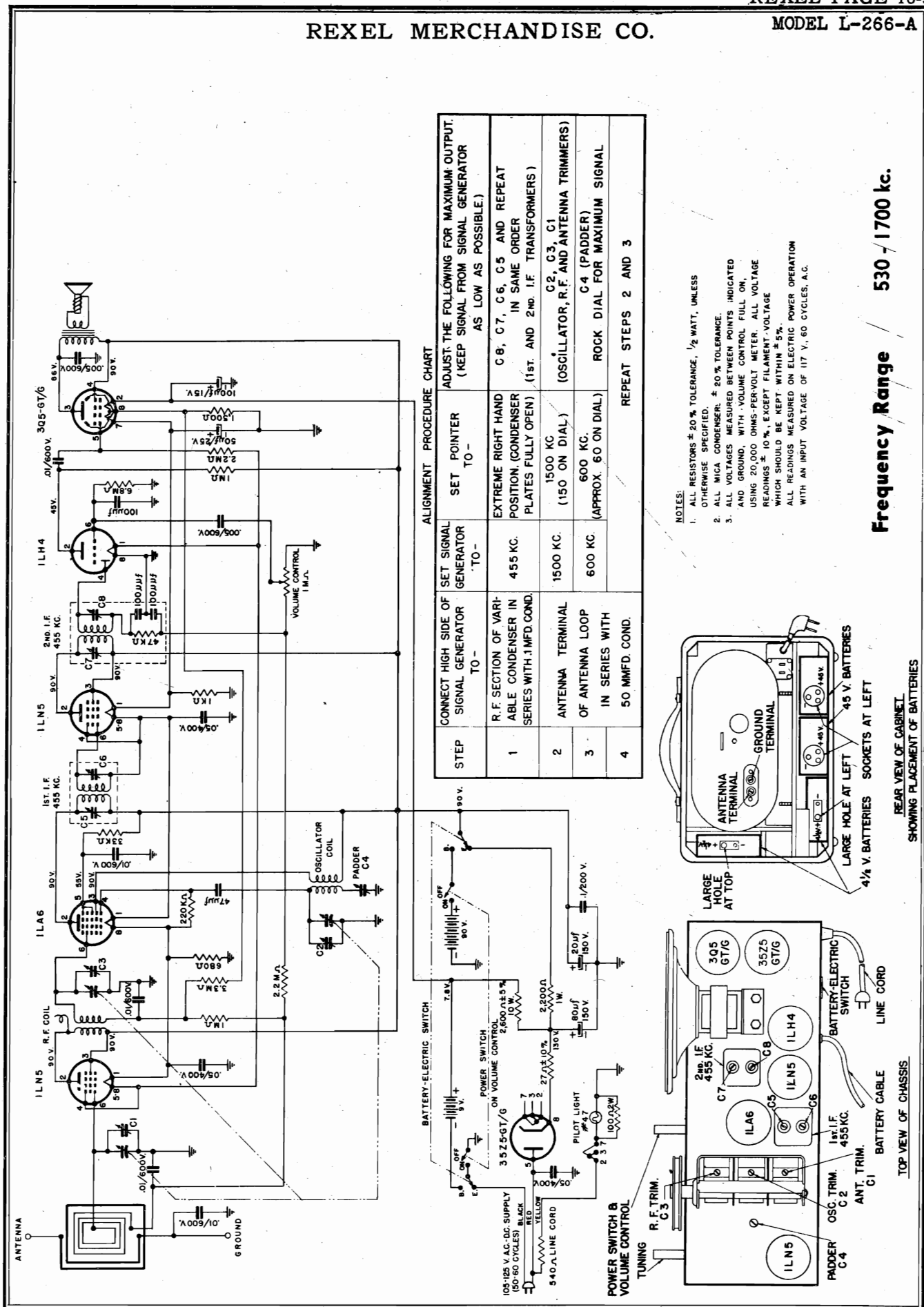
Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

BATTERIES

The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

REPLACEMENT PARTS

Part No.	Description	Part No.	Description
BK-405	Bracket-Resistor mounting bracket	RCPI0W6502A	Condenser-.005/600WV paper tubular condenser
BT-232	Battery-4½ volt battery (A)	RE-407	Resistor-2600 ohms ±5% 10 watt resistor
BT-233	Battery-45 volt battery (B)	REB105M	Resistor-1 megohm ±20% ½ watt resistor
BU-187	Bulb-pilot light bulb 6.3v (#47 Mazda)	REB152M	Resistor-1500 ohms ±20% ½ watt resistor
CA-472	Cabinet-portable cabinet	REB224M	Resistor-220,000 ohms ±20% ½ watt resistor
CB-335	Cable-battery cable	REB225M	Resistor-2.2 megohms ±20% ½ watt resistor
CL-176	Coil-R.F. coil, shielded	REB270K	Resistor-27 ohms ±10% ½ watt resistor
CL-177	Coil-oscillator coil	REB335M	Resistor-3.3 megohms ±20% ½ watt resistor
CO-182	Condenser-80/20/150WV & 100/15WV electrolytic condenser	REB471M	Resistor-470 ohms ±20% ½ watt resistor
CR-299	Crystal-dial crystal	REB474M	Resistor-470,000 ohms ±20% ½ watt resistor
CT-388	Condenser-220-680 mmfd padder condenser	REB683K	Resistor-68,000 ohms ±10% ½ watt resistor
CV-146	Condenser-3 gang variable condenser (with pulley)	REB685M	Resistor-6.8 megohms ±20% ½ watt resistor
DL-391	Dial-metal dial scale	REC332K	Resistor-3300 ohms ±10% 1 watt resistor
ES-274-3	Escutcheon-moulded escutcheon	RED101M	Resistor-100 ohms ±20% 2 watt resistor
KN-260	Knob-walnut knob	SD-607	Shield-Tube Shield
KN-261	Knob-walnut knob with dot	SK-156	Speaker-5" P.M. Speaker with output transformer
LC-315	Line Cord-540 ohms resistance line cord	SO-572	Socket-pilot light socket assembly
LP-178	Loop-Antenna	SP-191	Spring-Drive shaft retaining spring
PO-395	Pointer-dial pointer	SW-185	Switch-battery-electric D.P.D.T. slide switch
PT-383	Control-volume control 2 megohms with D.P.S.T. switch	TR-186	Transformer-I.F. 455 K.C. Transformer
RCM20A100M	Condenser-10 mmfd ±20% mica condenser		
RCM20A470M	Condenser-47 mmfd ±20% mica condenser		
RCPI0W2104A	Condenser-.1-200WV paper tubular condenser		
RCPI0W2203A	Condenser-.02/200WV paper tubular condenser		
RCPI0W4503A	Condenser-.05/400WV paper tubular condenser		
RCPI0W6103A	Condenser-.01/600WV paper tubular condenser		
RCPI0W6202M	Condenser-.002/600WV paper tubular condenser		

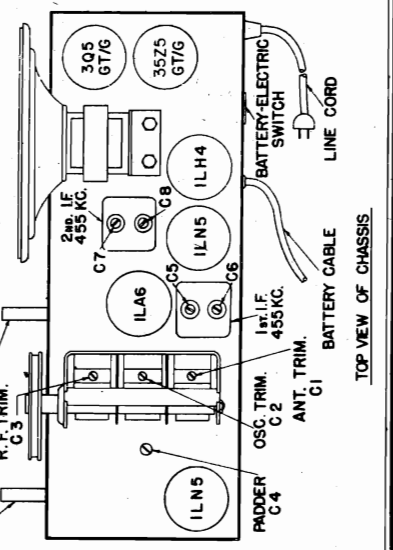
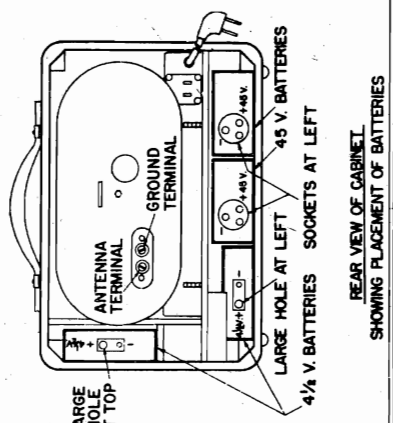


ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	SET POINTER TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH 1 MF. COND.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN)	C 8, C 7, C 6, C 5 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANSFORMERS)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1500 KC.	1500 KC. (150 ON DIAL)	C 2, C 3, C 1 (OSCILLATOR, R.F. AND ANTENNA TRIMMERS)
3		600 KC.	600 KC. (APPROX. 60 ON DIAL)	C 4 (PADDER)
4				ROCK DIAL FOR MAXIMUM SIGNAL

REPEAT STEPS 2 AND 3

- NOTES:
1. ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
 2. ALL MICA CONDENSERS: ± 20% TOLERANCE.
 3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND. WITH VOLUME CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN ± 5%. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 V, 60 CYCLES, A.C.



Frequency Range 530 - 1700 kc.

REAR VIEW OF CABINET SHOWING PLACEMENT OF BATTERIES

TOP VIEW OF CHASSIS

MODEL L-266-A

REXEL MERCHANDISE CO.

WHEN SERVICING THIS RECEIVER DO NOT PLACE CHASSIS ON A GROUNDED METALLIC BENCH

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

ALIGNMENT

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

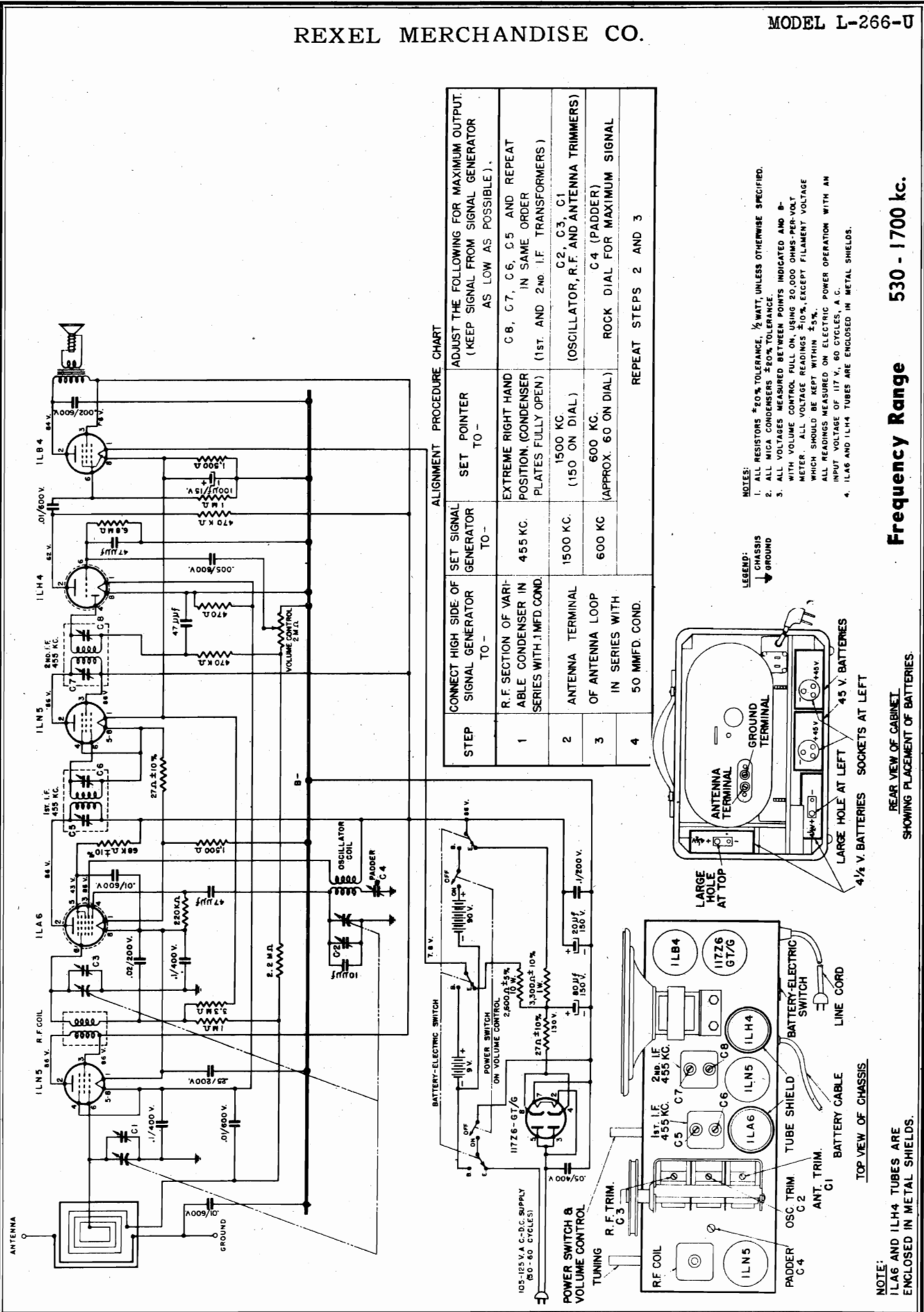
BATTERIES

The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

REPLACEMENT PARTS

Part No.	Description	Part No.	Description
BK-405	Bracket-Resistor mounting bracket	RCPI0W6502A	Condenser-.005/600WV paper tubular condenser
BU-187	Bulb-pilot light bulb 6.3v (#47 Mazda)	RE-407	Resistor-2600 ohms ±5% 10 watt resistor
CA-472	Cabinet-portable cabinet	REB102M	Resistor-1000 ohms ±20% ½ watt resistor
CB-335	Cable-battery cable	REB105M	Resistor-1 megohm ±20% ½ watt resistor
CL-177	Coil-oscillator coil	REB152M	Resistor-1500 ohms ±20% ½ watt resistor
CL-630	Coil-R.F. coil	REB224M	Resistor-220,000 ohms ±20% ½ watt resistor
CO-182	Condenser-80/20/150WV & 100/15WV electrolytic condenser	REB225M	Resistor-2.2 megohms ±20% ½ watt resistor
CO 808	Condenser-50 mfd /25 W.V. electrolytic condenser	REB270K	Resistor-27 ohms ±10% ½ watt resistor
CR-299	Crystal-dial crystal	REB333M	Resistor-33,000 ohms ±20% ½ watt resistor
CT-388	Condenser-220-680 mmfd padder condenser	REB335M	Resistor-3.3 megohms ±20% ½ watt resistor
CV-146	Condenser-3 gang variable condenser (with pulley)	REB681M	Resistor-680 Ohms ±20% ½ watt resistor
DL-391	Dial-metal dial scale	REB685M	Resistor-6.8 megohms ±20% ½ watt resistor
ES-274-3	Escutcheon-moulded escutcheon	REC 222M	Resistor-2200 ohms ±20% 1 watt resistor
KN-260	Knob-walnut knob	RED101M	Resistor-100 ohms ±20% 2 watt resistor
KN-261	Knob-walnut knob with dot	SK-476	Speaker-5" P.M. Speaker with output transformer
LC-315	Line Cord-540 ohms resistance line cord	SO-572	Socket-pilot light socket assembly
LP-178	Loop-Antenna	SP-191	Spring-Drive shaft retaining spring
PO-395	Pointer-dial pointer	SW-185	Switch-battery-electric D.P.D.T. slide switch
PT-576	Control-volume control 1 megohm with D.P.S.T. switch	TR-707	Transformer-I.F. 455 K.C. input-Transformer
RCM20A101M	Condenser-100 mmf ±20% mica condenser	TR-708	Transformer-Output I.F. 455 K.C. Transformer with built-in I.F. filter
RCM20A470M	Condenser-47 mmfd ±20% mica condenser		
RCPI0W2104A	Condenser-.1/200WV paper tubular condenser		
RCPI0W4503A	Condenser-.05/400WV paper tubular condenser		
RCPI0W6103A	Condenser-.01/600WV paper tubular condenser		

REXEL MERCHANDISE CO.

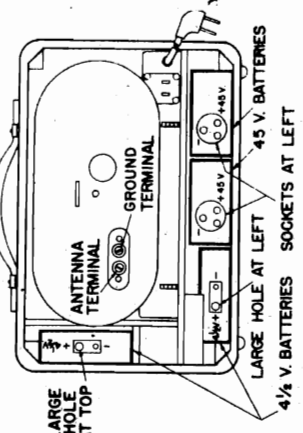


ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	SET POINTER TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE).
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH 1MFD COND.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN)	C8, C7, C6, C5 AND REPEAT (1ST. AND 2ND I.F. TRANSFORMERS)
2	ANTENNA TERMINAL IN SERIES WITH 50 MMFD. COND.	1500 KC.	1500 KC (150 ON DIAL)	C2, C3, C1 (OSCILLATOR, R.F. AND ANTENNA TRIMMERS)
3	OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	600 KC	600 KC (APPROX. 60 ON DIAL)	C4 (PADDER)
4				ROCK DIAL FOR MAXIMUM SIGNAL
REPEAT STEPS 2 AND 3				

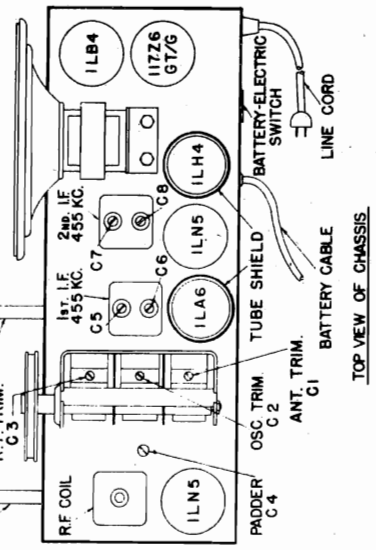
- NOTES:
1. ALL RESISTORS $\pm 20\%$ TOLERANCE, $\frac{1}{2}$ WATT, UNLESS OTHERWISE SPECIFIED.
 2. ALL MICA CONDENSERS $\pm 20\%$ TOLERANCE.
 3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND B- WITH VOLTAGE CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS $\pm 10\%$, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN $\pm 5\%$.
 4. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 V., 60 CYCLES, A.C.

LEGEND:
 CHASSIS
 GROUND



Frequency Range 530 - 1700 kc.

REAR VIEW OF CABINET SHOWING PLACEMENT OF BATTERIES.



NOTE: 1LA6 AND 1LH4 TUBES ARE ENCLOSED IN METAL SHIELDS.

MODEL L-266-U

REXEL MERCHANDISE CO.

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

ALIGNMENT

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

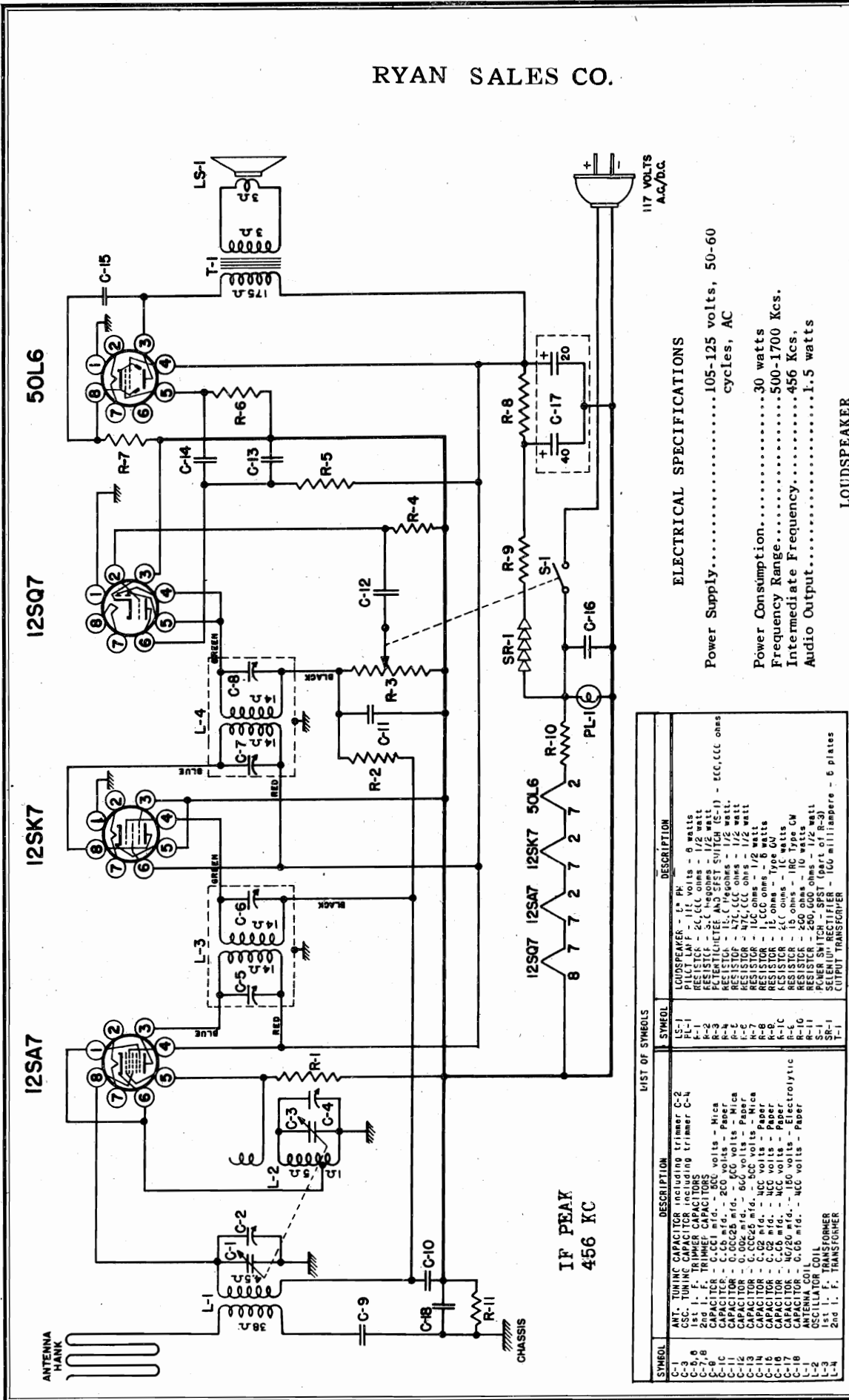
BATTERIES

The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

REPLACEMENT PARTS

Part No.	Description	Part No.	Description
BK-405	Bracket-Resistor mounting bracket	RCPI0W6202M	Condenser-.002/600W.V. paper tubular condenser
CA-472	Cabinet-portable cabinet	RCPI0W6502A	Condenser-.005/600W.V. paper tubular condenser
CB-335	Cable-battery cable	RE-407	Resistor-2600 ohms ±5% 10 watt resistor
CL-176	Coil-R.F. coil, shielded	REB105M	Resistor-1 megohm ±20% ½ watt resistor
CL-177	Coil-oscillator coil	REB152M	Resistor-1500 ohms ±20% ½ watt resistor
CO-182	Condenser-80/20/150W.V. & 100/15W.V. electrolytic condenser	REB224M	Resistor-220,000 ohms ±20% ½ watt resistor
CR-299	Crystal-dial crystal	REB225M	Resistor-2.2 megohms ±20% ½ watt resistor
CT-388	Condenser-220-680 mmfd padder condenser	REB270K	Resistor-27 ohms ±10% ½ watt resistor
CV-146	Condenser-3 gang variable condenser (with pulley)	REB335M	Resistor-3.3 megohms ±20% ½ watt resistor
DL-391	Dial-metal dial scale	REB471M	Resistor-470 ohms ±20% ½ watt resistor
ES-274-1	Escutcheon-moulded escutcheon	REB474M	Resistor-470,000 ohms ±20% ½ watt resistor
KN-260	Knob-walnut knob	REB683K	Resistor-68,000 ohms ±10% ½ watt resistor
KN-261	Knob-walnut knob with dot	REB685M	Resistor-6.8 megohms ±20% ½ watt resistor
LC-223	Line Cord	REC332K	Resistor-3300 ohms ±10% 1 watt resistor
LP-178	Loop-Antenna	SD-607	Shield-Tube Shield
PO-395	Pointer-dial pointer	SK-156	Speaker-5" P.M. Speaker with output transformer
PT-383	Control-volume control 2 megohms with D.P.S.T. switch	SP-191	Spring-Drive shaft retaining spring
RCM20A100M	Condenser-10 mmfd ±20% mica condenser	SW-193	Switch-battery-electric T.P.D.T. slide switch
RCM20A470M	Condenser-47 mmfd ±20% mica condenser	TR-186	Transformer-I.F. 455 K.C. Transformer
RCPI0W2104A	Condenser-.1/200W.V. paper tubular condenser		
RCPI0W2203A	Condenser-.02/200W.V. paper tubular condenser		
RCPI0W2254A	Condenser-.25/200W.V. paper tubular condenser		
RCPI0W4104L	Condenser-.1/400W.V. paper tubular condenser		
RCPI0W4503A	Condenser-.05/400W.V. paper tubular condenser		
RCPI0W6103A	Condenser-.01/600W.V. paper tubular condenser		

RYAN SALES CO.



117 VOLTS
A.C./D.C.

ELECTRICAL SPECIFICATIONS

- Power Supply.....105-125 volts, 50-60 cycles, AC
- Power Consumption.....30 watts
- Frequency Range.....500-1700 Kcs.
- Intermediate Frequency.....456 Kcs.
- Audio Output.....1.5 watts

LOUDSPEAKER

- Permanent Magnet.....5" Diameter
- INSTALLATION FACILITIES PROVIDED
- Power.....5' cord and plug
- Antenna.....10' indoor type
- Ground.....None required

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
C-1	ANT. TUNING CAPACITOR including trimmer	LS-1	LOUDSPEAKER - 8" PH
C-2	OSC. TUNING CAPACITOR including trimmer	PL-1	PILIT LAMP - 117 volts - 6 watts
C-3	1st I. F. TRIMMER CAPACITOR	R-1	RESISTOR - 2k, 500 ohms - 1/2 watt
C-4	2nd I. F. TRIMMER CAPACITOR	R-2	RESISTOR - 500 ohms - 1/2 watt
C-5	CAPACITOR - 0.001 mfd. - 500 volts - Mica	R-3	RESISTOR - 100 ohms - 1/2 watt
C-6	CAPACITOR - 0.0025 mfd. - 200 volts - Mica	R-4	RESISTOR - 100 ohms - 1/2 watt
C-7	CAPACITOR - 0.0025 mfd. - 500 volts - Mica	R-5	RESISTOR - 100 ohms - 1/2 watt
C-8	CAPACITOR - 0.0025 mfd. - 500 volts - Mica	R-6	RESISTOR - 100 ohms - 1/2 watt
C-9	CAPACITOR - 0.0025 mfd. - 500 volts - Mica	R-7	RESISTOR - 100 ohms - 1/2 watt
C-10	CAPACITOR - 0.0025 mfd. - 500 volts - Mica	R-8	RESISTOR - 100 ohms - 1/2 watt
C-11	CAPACITOR - 0.0025 mfd. - 500 volts - Mica	R-9	RESISTOR - 100 ohms - 1/2 watt
C-12	CAPACITOR - 0.0025 mfd. - 500 volts - Mica	R-10	RESISTOR - 100 ohms - 1/2 watt
C-13	CAPACITOR - 0.0025 mfd. - 500 volts - Mica	SR-1	SELENIUM RECTIFIER - 100 milliamperes - 6 plates
C-14	CAPACITOR - 0.0025 mfd. - 500 volts - Mica	T-1	TRANSFORMER
C-15	CAPACITOR - 0.0025 mfd. - 500 volts - Mica		
C-16	CAPACITOR - 0.0025 mfd. - 500 volts - Mica		
C-17	CAPACITOR - 0.0025 mfd. - 500 volts - Mica		
L-1	ANTENNA COIL		
L-2	OSCILLATOR COIL		
L-3	1st I. F. TRANSFORMER		
L-4	2nd I. F. TRANSFORMER		

TUBE COMPLEMENT

- Converter and Oscillator.....12SA7
- I. F. Amplifier.....12SK7
- Detector-AVC-Audio.....12SQ7
- Power Output.....50L6GT
- Rectifier.....Selenium
- Dial Lamp.....Mazda #656

RYAN SALES CO.

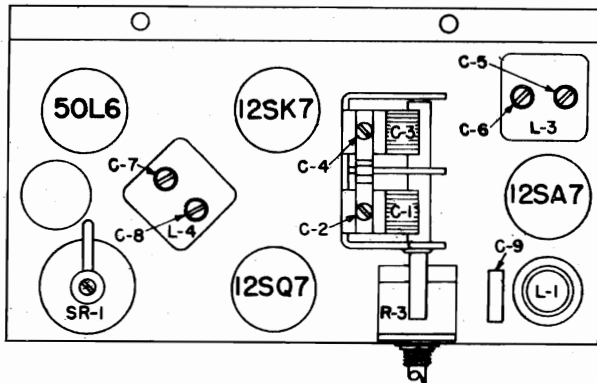


FIG. 1 - Tube and Trimmer Locations (Top View)

ALIGNMENT PROCEDURE

Alignment Frequencies:

- I.F.456 Kcs.
- R.F.1500 Kcs.

I. F. Alignment:

Connect output meter across the voice coil. Turn the receiver volume control to maximum. Connect high side of the alignment oscillator, through a .05 mfd. capacitor, to the converter grid.

Set alignment oscillator at 456 Kcs. and adjust output to give the lowest conveniently readable indication on the output meter. Adjust trimmers C-7 and C-8 in 2nd I.F. transformer to give maximum indication on output meter. Repeat this procedure for trimmers C-5 and C-6 in the 1st I.F. transformer. Repeat procedure to check accuracy.

R. F. Alignment:

Retain output meter connected as above and receiver volume control set at maximum. Connect alignment oscillator to antenna.

Set alignment oscillator at 1500 Kcs. and place in operation. Rotate receiver tuning capacitor (C-1 and C-3) to give maximum signal indication on output meter. Adjust output of alignment oscillator to give the lowest conveniently readable indication on the output meter. Adjust oscillator trimmer C-4 to peak the signal indication on output meter. Then, adjust antenna trimmer C-2 to further peak the signal. Repeat procedure to check accuracy.

Trimmer locations are shown in Figure 1.

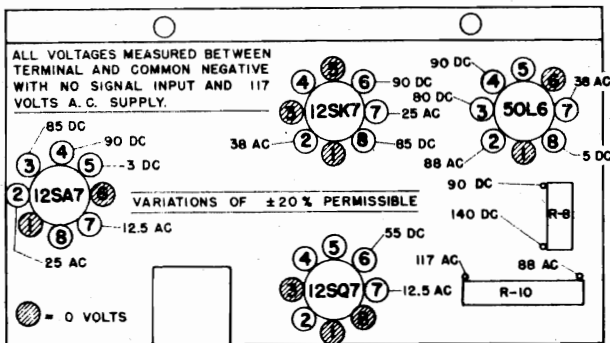


FIG. 2 - Socket Terminal Voltages (Bottom View)

NOTES:

An electronic voltmeter may be connected to the AVC bus and used for alignment indication in lieu of the output meter across the voice coil.

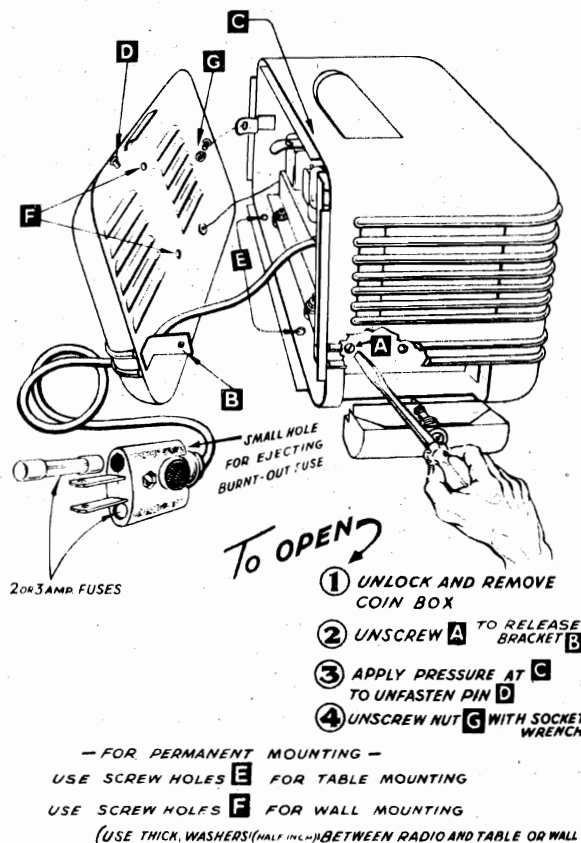
An electronic voltmeter or a voltmeter with a minimum resistance of 20,000 ohms per volt should be used for voltage measurements.

The polarity of the power connection must be correct when operating the receiver on direct current. If the receiver does not operate when the power plug is first inserted, remove and re-insert in opposite position. Reversal of plug position on alternating current supply may reduce hum in some cases.

If the ELECTONE is to be used in a location remote from broadcasting stations or the reception of distant stations is desired, an outdoor antenna and a ground connection may be utilized. The outdoor antenna should be connected to the indoor antenna and the ground lead to the chassis.

GENERAL DESCRIPTION

The Model C5TS3 ELECTONE is a four tube and rectifier super-heterodyne broadcast entertainment receiver designed for operation from either a direct or alternating current power source. The circuit utilizes multi-unit tubes and incorporates automatic volume control. The chassis is enclosed in an all-metal cabinet of modern styling and having the following dimensions: Width 12"; Depth 7"; Height 7".



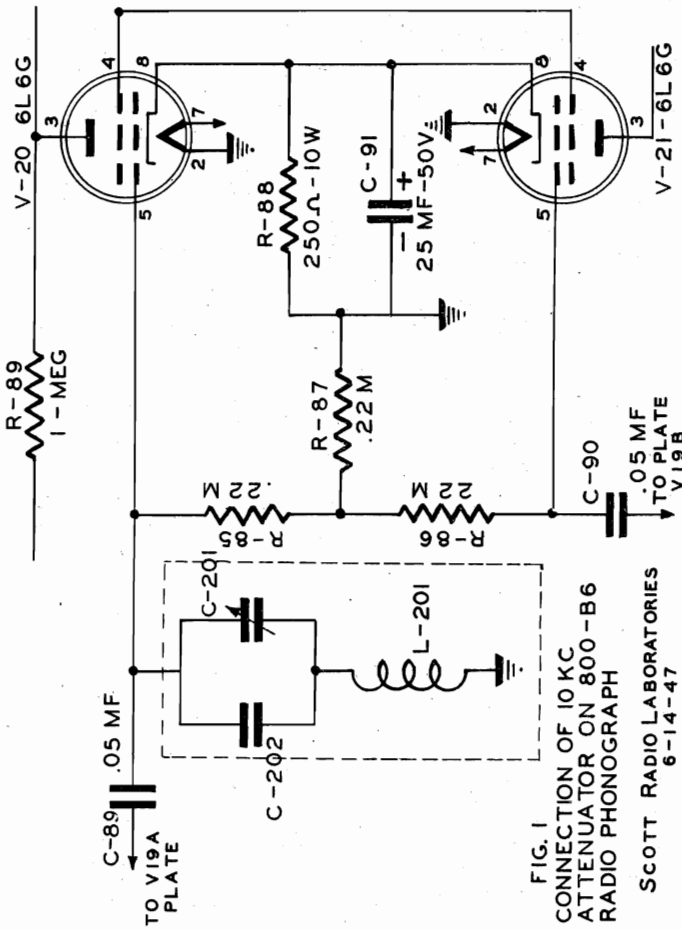


FIG. 1

CONNECTION OF 10 KC ATTENUATOR ON 800-B6 RADIO PHONOGRAPH

SCOTT RADIO LABORATORIES 6-14-47

10 KC Attenuator for Model 800-B6 Radio-Phonograph

For use in locations where trouble is encountered from a 10 KC whistle caused by two adjacent channel stations, an attenuator unit is provided which is easily installed and wired into the grid circuit of the 6L6G tube V-20 in the power supply unit of the Model 800-B6 Radio-Phonograph.

The attenuator unit is installed in the power supply unit adjacent to the terminal strip which holds the 6SH7GT tube sockets, resistors and capacitors for the input grid of the 6SH7GT tube V-19A. The choke is fastened to the base using the screw, nut and lockwasher furnished as shown in Figure 2. It is necessary to drill one hole for mounting the choke. The most convenient location being the center mounting hole of the output transformer which is not used for mounting the transformer. The trimmer capacitor C-101 is mounted on the top of the choke with this same screw and nut. Capacitor C-202 is connected directly across the trimmer capacitor C-201, one lead of choke L-201 is then connected to one side of trimmer capacitor C-201, the other side of C-201 is connected to contact No. 5 of 6L6G tube socket V-20 with a short length of wire, the other lead of choke L-201 is then grounded preferably to a lug fastened under one of the output transformer mounting nuts.

The filter is tuned to resonance either by operating the receiver and adjusting the trimmer capacitor C-201 until the 10 KC whistle disappears, or is at minimum level, or by using an audio generator connected to the PHONO-GND terminal strip, adjusting the receiver as for record operation, then by use of a meter connected across the secondary of the output transformer and with the audio generator adjusted to provide a 10,000 cycle signal. The filter is adjusted for minimum reading on the meter.

Although the adjustment of trimmer capacitor C-201 is not extremely critical, caution must be taken to set the audio generator to exactly 10,000 cycles since the width of the attenuated band is very narrow, and maximum attenuation at 10 KC can be obtained only if the audio generator is adjusted to this frequency.

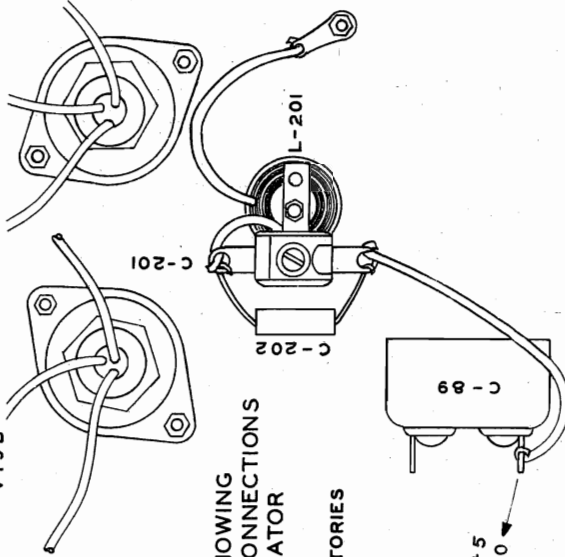


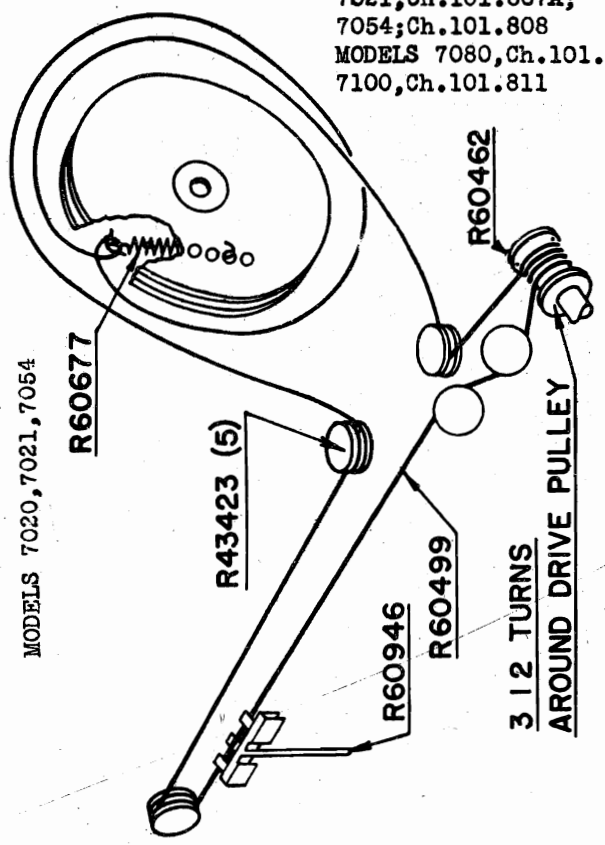
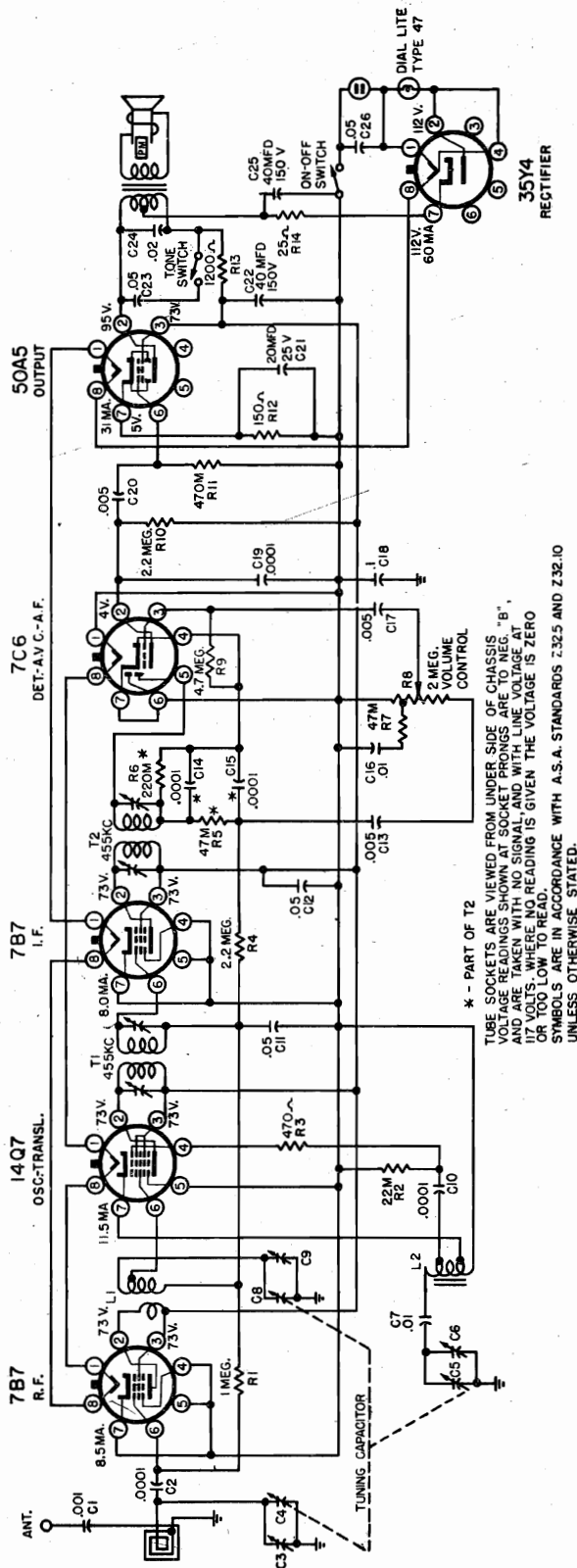
FIG. 2 CUTAWAY VIEW SHOWING LOCATION AND CONNECTIONS OF 10 KC ATTENUATOR

SCOTT RADIO LABORATORIES 6-12-47

Parts List for 10 KC Attenuator Unit		Part No.
Symbol	Description	
C-201	Capacitor, mica compression trimmer 30-200 MF	15E2675
C-202	Capacitor, silver mica, 1000 MF plus or minus 10% 500 V DC wkty., bakelite case	15A86
L-201	Inductor, 200 MH ± 1000 CPS, DC resis. 525 ohms, air core, mounted on wood dowel	17E2676
Quan.	Hardware	Part No.
1	Screw - 6-32 x 2" RMHPB	77E2177
1	Nut - 6-32 x 1/4" hex	59A177
1	Washer - #6 external tooth lock	95A255

SEARS ROEBUCK & CO.

MODELS 7020, Ch. 101.807;
7021, Ch. 101.807A;
7054; Ch. 101.808
MODELS 7080, Ch. 101.809;
7100, Ch. 101.811



MODELS 7020, 7021, 7054

MODELS 7020, 7021, 7054, 7080, 7100

ALIGNMENT PROCEDURE

Output Meter Connection.....Across Loud Speaker Voice Coil
Output Meter Reading to Indicate .05 Watts (Standard Output).....0.4 Volts
Generator Ground Lead Connection.....I. F. Alignment - Negative B Lead
Dummy Antenna Value to be in Series with Generator Output.....See Chart Below
Connection of Generator Output Lead.....See Chart Below
Generator Modulation.....30%, 400 Cycles
Position of Volume Control.....Fully on
Position of Tone Control.....Trebble
Position of Pointer with Tuner Fully Closed.....Last Line Below 540 Calibration Mark

POSITION OF GENERATOR VARIABLE	DUMMY ANTENNA	GENERATOR CONNECTION	ADJUSTMENTS IN ORDER SHOWN	TRIMMER FUNCTION
Closed	0.1 Mfd.	Transistor Grid	T2-T1	I. F. Oscillator
1500 KC	.0002 Mfd.	Antenna	C6	R. F. Antenna
1500 KC	.0002 Mfd.	Antenna	C9	
1500 KC	.0002 Mfd.	Antenna	C3	

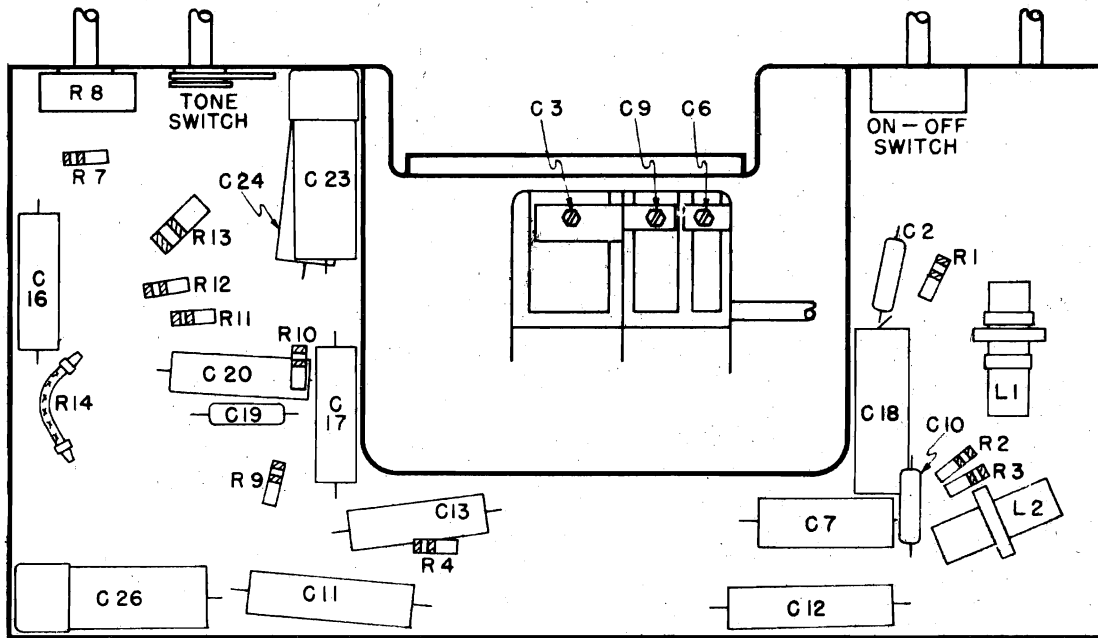
IMPORTANT ALIGNMENT NOTES

The alignment must be done in the order given.
The Alignment Procedure should be repeated step by step in the original order for greatest accuracy.
Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

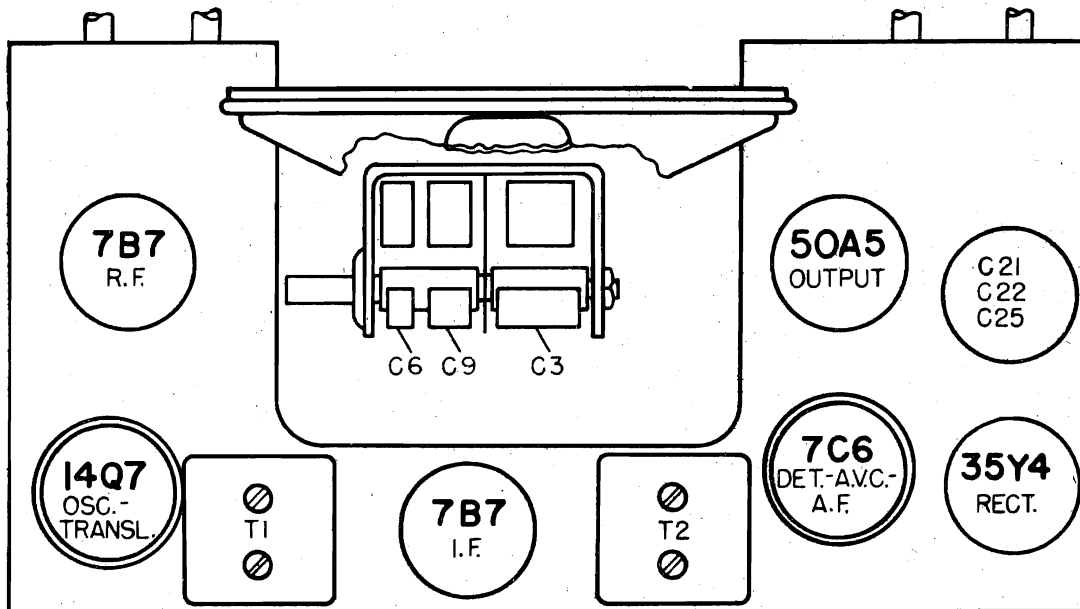
Power Output Undistorted 1.1 Watts Maximum 1.9 Watts

MODELS 7020, 7021, 7054

SEARS ROEBUCK & CO.



LOCATION OF PARTS UNDER CHASSIS



LOCATION OF PARTS ON TOP OF CHASSIS

Power Supply:

All models available.....117 Volts DC 25-60 Cycles AC 30 Watts

Frequency Range:

Broadcast.....540-1600 KC

Difference between 101.807 and 101.807-A

101.807-A same as 101.807 except ivory cabinet instead of brown.

Recommended Antenna Equipment:

- Catalog #6703 Conventional Antenna
- Catalog #6704 Noise Reducing Antenna
- Catalog #6705 Greatest Reception and Noise Reduction Antenna

SEARS ROEBUCK & CO.

MODELS 7020,7021,7054

MODEL 101.807, 101.807A

HOW TO ORDER PARTS

- Use Correct Order Form.
- On the Purchase Order always give the following information:
 - PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
 - THE CHASSIS NUMBER, which is 101.807 or 101.807-A. This number is found on a metal plate (pictured above) at the rear of the chassis.
- ORDERING INSTRUCTIONS:

Send Purchase Orders DIRECT to SOURCE No. 101. See "DIV. 57 STANDARD NOMENCLATURE INDEX" for source name and address.
- MARK-UP: Selling Prices in the following list produce a mark-up of AA5, unless otherwise noted in the M. U. Code Column. See "DIV. 57 STANDARD NOMENCLATURE INDEX" for explanation of mark-up code.

REPAIR PARTS LIST

THE RETAIL SELLING PRICES SHOWN BELOW ARE VOID AFTER AUGUST 1, 1947. AFTER THIS DATE REFER TO DIV. 57 REPAIR PARTS STRAIGHT LIST. ALL PRICES PREPAID.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SEARS LIST PRICE EACH	MU CODE	SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SEARS LIST PRICE EACH	MU CODE
	R60426	Button - Push, Brown (101.807)	.11			R60484	Knob - Volume, Ivory (101.807-A)	.14	
	R60486	Button - Push, Ivory (101.807-A)	.14			R60494	Knob - On-Off, Brown (101.807)	.14	
	R61846	Button - Snap	.02			R60483	Knob - On-Off, Ivory (101.807-A)	.14	
	R60415	Cabinet - Brown (101.807)	4.17	AO		R20963	Lamp - Dial #47	.15	
	R60950	Cabinet - Ivory (101.807-A)	5.40	AO		R54929	Leaflet - Instruction	.20	
C4, C5, C8	R60413	Capacitor - Variable Tuning	5.35			R60541	Loop Assembly with Back Cover	2.08	AO
C1		Capacitor - .001 Mfd. 600 V.	.15			R60464	Plunger and Yoke Assembly	.43	
C7		Capacitor - .01 Mfd. 600 V.	.18			R60946	Pointer - Dial	.09	
C11, C12		Capacitor - .05 Mfd. 200 V.	.21			R43423	Pulley - Wood	.01	
C13, C17, C20		Capacitor - .005 Mfd. 600 V.	.17		R14	R40232	Resistor - Glasohm, 25 Ohm, 1 Watt	.14	
C16		Capacitor - .01 Mfd. 400 V.	.18		R1		Resistor - 1 Megohm, 1/3 Watt	.15	
C18		Capacitor - .1 Mfd. 200 V.	.27		R2		Resistor - 1 Megohm, 1/3 Watt	.15	
C23, C26		Capacitor - .05 Mfd. 600 V.	.26		R3		Resistor - 470 Ohm, 1/3 Watt	.15	
C24		Capacitor - .02 Mfd. 600 V.	.27		R4, R10		Resistor - 2.2 Megohm, 1/3 Watt	.15	
C2, C10, C19		Capacitor - .0001 Mfd. Mica	.20		R7		Resistor - 47,000 Ohm, 1/3 Watt	.15	
C21, C22, C25	R60416	Capacitor - Electrolytic, 40 Mfd. 150 V. 40 Mfd. 150 V., 20 Mfd. 25 V.	1.91		R9		Resistor - 4.7 Megohm, 1/3 Watt	.15	
	R61836	Cloth - Grille, Gold (101.807)	.34		R11		Resistor - 470,000 Ohm, 1/3 Watt	.15	
	R60952	Cloth - Grille, Tan (101.807-A)	.43		R12		Resistor - 150 Ohm, 1/3 Watt	.15	
L1	R60465	Coil - R. F.	1.25		R13		Resistor - 1200 Ohm, 1 Watt	.21	
L2	R60448	Coil - Oscillator	1.53			R60462	Shaft - Tuning Assembly	.17	
	R60430	Control - Volume - 2 Megohm	.80			R57049	Socket - Tube	.13	
	R16706	Cord - Power	.77			R60401	Socket - Pilot Lamp	.29	
	R60540	Covers - Tab	.01			WHEN ORDERING SPEAKER PARTS ALWAYS GIVE THE PART NUMBER ON THE SPEAKER			
	R60458	Covers - Dial	.14			R60431	Speaker - P. M. 5"	6.76	AO
	R60446	Dial	.23			R60467	Cone and Voice Coil	2.51	
	R60461	Drum and Pinion Assembly	.68			R60575	Output Transformer	2.74	
	R60459	Gear and Hub Assembly	.46			R60427	Spring - Extension	.06	
	R60444	Grille - Cabinet	.93			R60437	Spring - Compression	.01	
	R60455	Knob - Tone, Brown (101.807)	.14			R60499	String - Dial Drive Assembly	.31	
	R60485	Knob - Tone, Ivory (101.807-A)	.14			R60447	Switch - Tone	.68	
	R60486	Knob - Tuning, Brown (101.807)	.14			R60432	Switch - On-Off	.63	
	R60480	Knob - Tuning, Ivory (101.807-A)	.14			R60474	Tab - Station	.26	
	R60483	Knob - On-Off	.14			R60417	Transformer - 1st I. F.	2.24	
	R60457	Knob - Volume, Brown (101.807)	.14		T1	R60418	Transformer - 2nd I. F.	2.71	
		Lamp - Dial Mazda Type #47	.18		T2				
		Leaflet - Instruction	.20						

MODEL 101.808

HOW TO ORDER PARTS

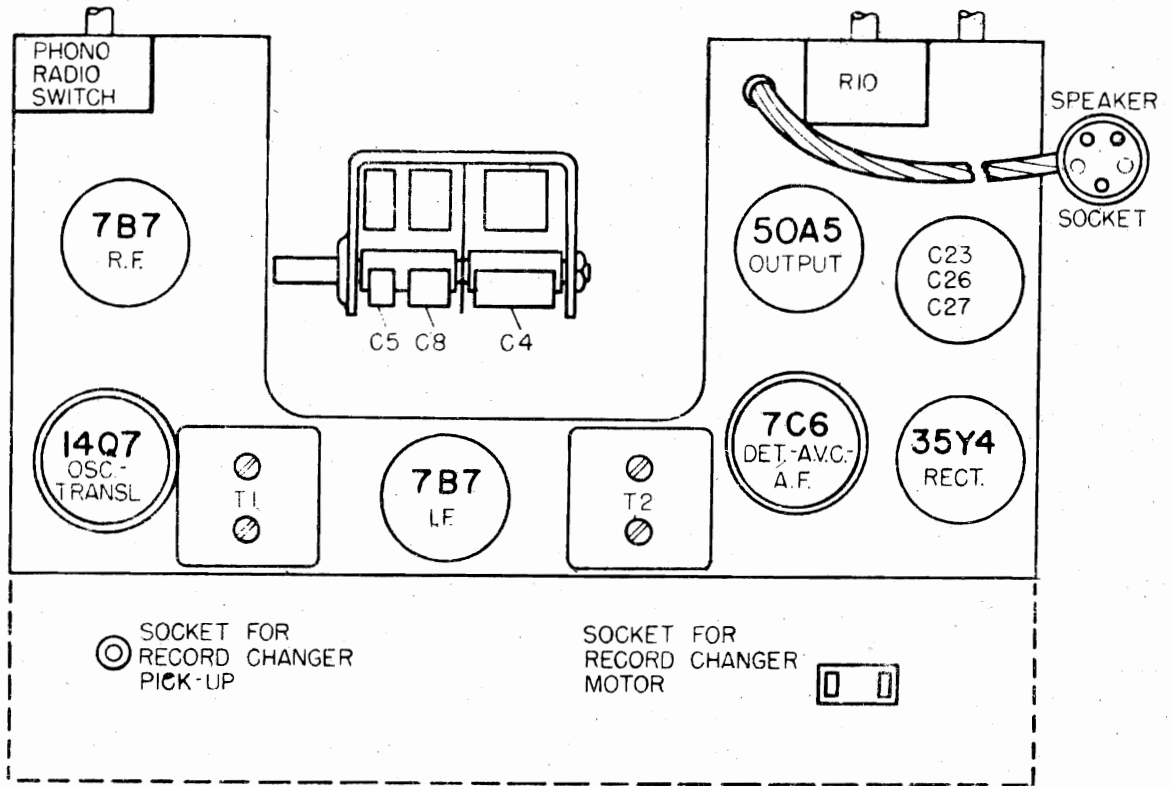
- Use Correct Order Form.
- On the Purchase Order always give the following information:
 - PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
 - THE CHASSIS NUMBER, which is 101.808. This number is found on a metal plate (pictured above) at the rear of the chassis.
- ORDERING INSTRUCTIONS:

Send Purchase Orders DIRECT to SOURCE No. 101. See "DIV. 57 STANDARD NOMENCLATURE INDEX" for source name and address.
- MARK-UP: Selling Prices in the following list produce a mark-up of AA5, unless otherwise noted in the M. U. Code Column. See "DIV. 57 STANDARD NOMENCLATURE INDEX" for explanation of mark-up code.
- In all correspondence relating to cabinets, always mention the source code letter stamped into the upper rear rail of consoles or the bottom of table models, and the CATALOG NUMBER shown on the sticker on the back, bottom or inside of cabinet.

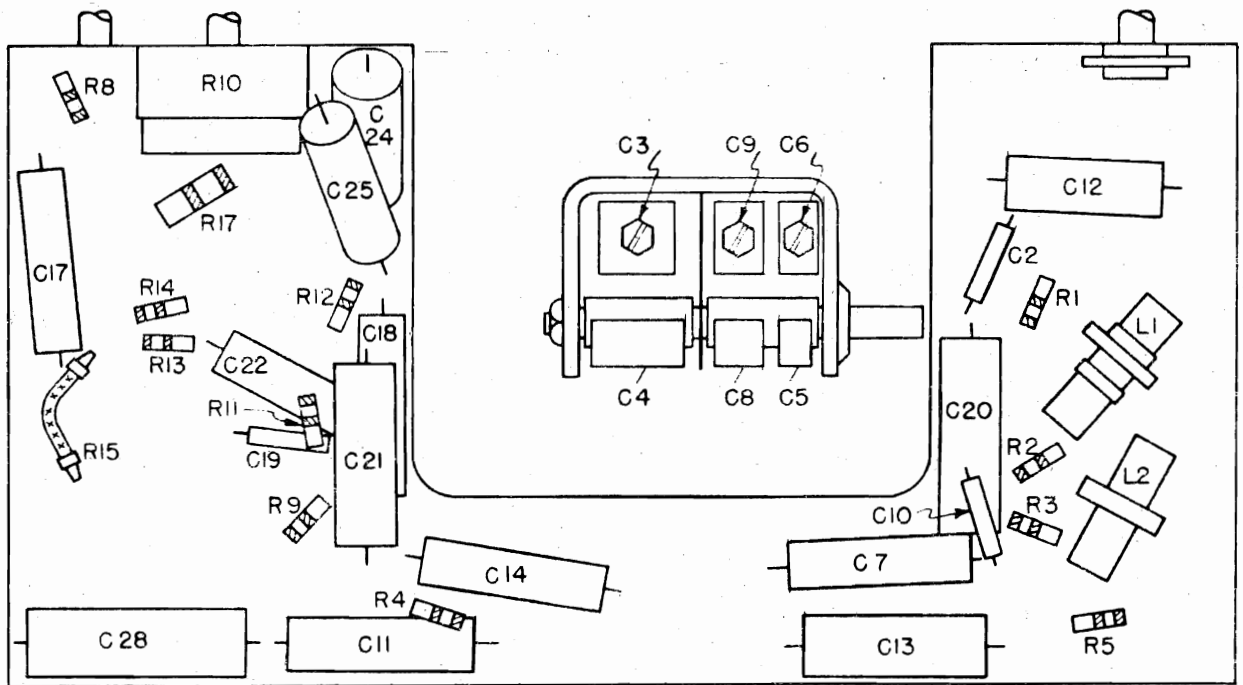
REPAIR PARTS LIST

THE RETAIL SELLING PRICES SHOWN BELOW ARE VOID AFTER AUGUST 1, 1947. AFTER THIS DATE REFER TO DIV. 57 REPAIR PARTS STRAIGHT LIST. ALL PRICES PREPAID.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SEARS LIST PRICE EACH	MU CODE	SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SEARS LIST PRICE EACH	MU CODE
	R60486	Button - Push	.14			R60549	Loop Assembly with Back Cover	2.12	AO
	R61846	Button - Snap	.01			R60464	Plunger and Yoke Assembly	.43	
	R60413	Capacitor - Variable Tuning	5.35			R60946	Pointer - Dial	.09	
C4, C5, C7		Capacitor - .001 Mfd. 600 V.	.15			R43423	Pulley - Wood	.01	
C1		Capacitor - .01 Mfd. 600 V.	.18		R4	R40232	Resistor - Glasohm, 25 Ohm, 1 Watt	.14	
C7		Capacitor - .05 Mfd. 200 V.	.21		R1		Resistor - 1 Megohm, 1/3 Watt	.15	
C11, C12		Capacitor - .005 Mfd. 600 V.	.17		R2		Resistor - 22,000 Ohm, 1/3 Watt	.15	
C13, C17, C20		Capacitor - .01 Mfd. 400 V.	.18		R3		Resistor - 470 Ohm, 1/3 Watt	.15	
C16		Capacitor - .1 Mfd. 200 V.	.27		R4, R10		Resistor - 2.2 Megohm, 1/3 Watt	.15	
C18		Capacitor - .05 Mfd. 600 V.	.26		R7		Resistor - 47,000 Ohm, 1/3 Watt	.15	
C24		Capacitor - .02 Mfd. 600 V.	.27		R9		Resistor - 4.7 Megohm, 1/3 Watt	.15	
C23, C26		Capacitor - .0001 Mfd. Mica	.20		R11		Resistor - 470,000 Ohm, 1/3 Watt	.15	
C2, C10, C25		Capacitor - Electrolytic, 40 Mfd. 150 V. 40 Mfd. 150 V., 20 Mfd. 25 V.	1.91		R12		Resistor - 150 Ohm, 1/3 Watt	.15	
C21, C22, C25	R60416	Capacitor - Electrolytic, 40 Mfd. 150 V. 40 Mfd. 150 V., 20 Mfd. 25 V.	1.91		R13		Resistor - 1200 Ohm, 1 Watt	.21	
	R60465	Coil - R. F.	1.25			R60462	Shaft - Tuning Assembly	.17	
L1	R60448	Coil - Oscillator	1.53			R57049	Socket - Tube	.13	
L2	R60430	Control - Volume - 2 Megohm	.80			R60401	Socket - Pilot Lamp	.29	
	R16706	Cord - Power	.77			WHEN ORDERING SPEAKER PARTS ALWAYS GIVE THE PART NUMBER ON THE SPEAKER			
	R60540	Covers - Tab	.01			R61627	Speaker - P. M. 5"	6.76	AO
	R60458	Covers - Dial	.14			R61634	Cone and Voice Coil	2.51	
	R60579	Dial	.23			R61635	Output Transformer	2.74	
	R60461	Drum and Pinion Assembly	.68			R60427	Spring - Extension	.06	
	R60459	Gear and Hub Assembly	.46			R60437	Spring - Compression	.01	
	R60485	Knob - Tone	.14			R60499	String - Dial Drive Assembly	.31	
	R60480	Knob - Tuning	.14			R60447	Switch - Tone	.68	
	R60484	Knob - Volume	.14			R60432	Switch - On-Off	.63	
	R60483	Knob - On-Off	.14			R60474	Tab - Station	.26	
		Lamp - Dial Mazda Type #47	.18		T1	R60417	Transformer - 1st I. F.	2.24	
		Leaflet - Instruction	.20		T2	R60418	Transformer - 2nd I. F.	2.71	



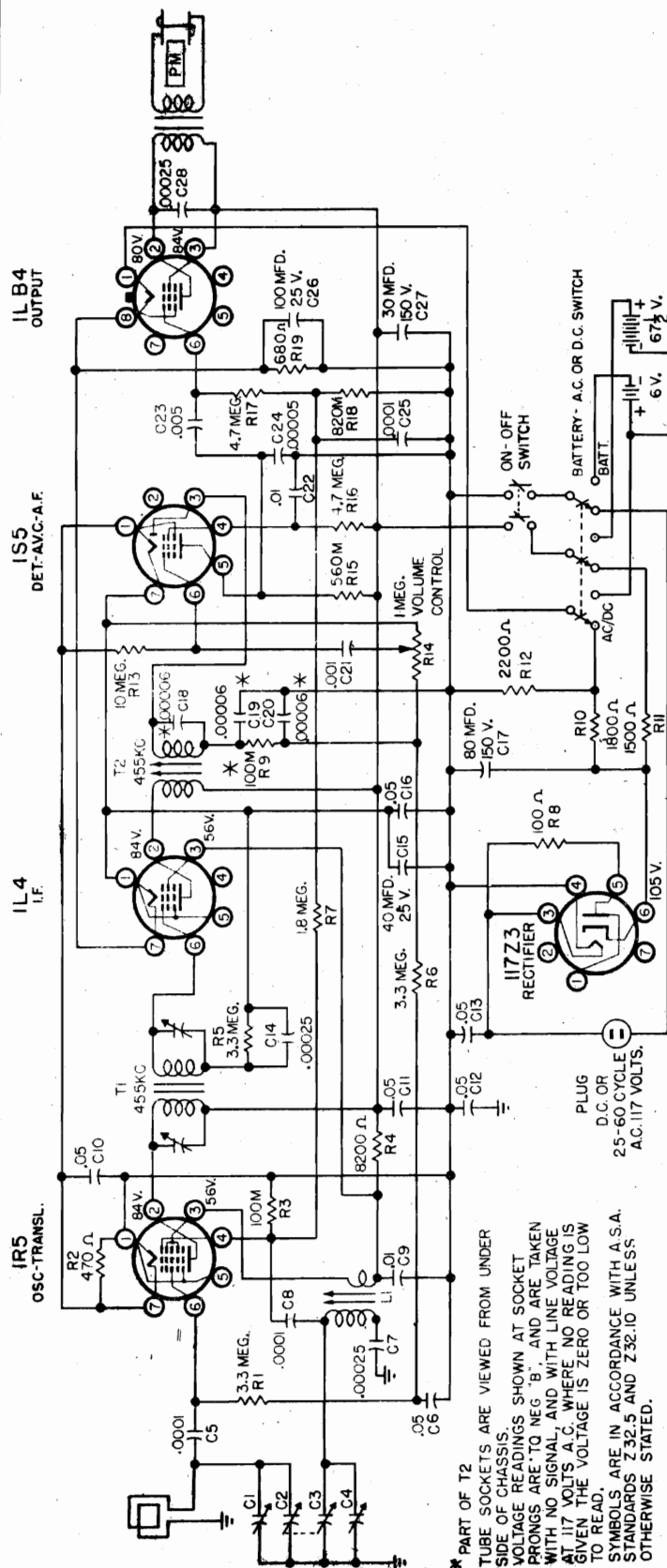
LOCATION OF PARTS ON TOP OF CHASSIS



LOCATION OF PARTS UNDER CHASSIS

MODELS 7165, Ch. 101.823,
101.823-1; 7166, Ch. 101.823A,
101.823-1A

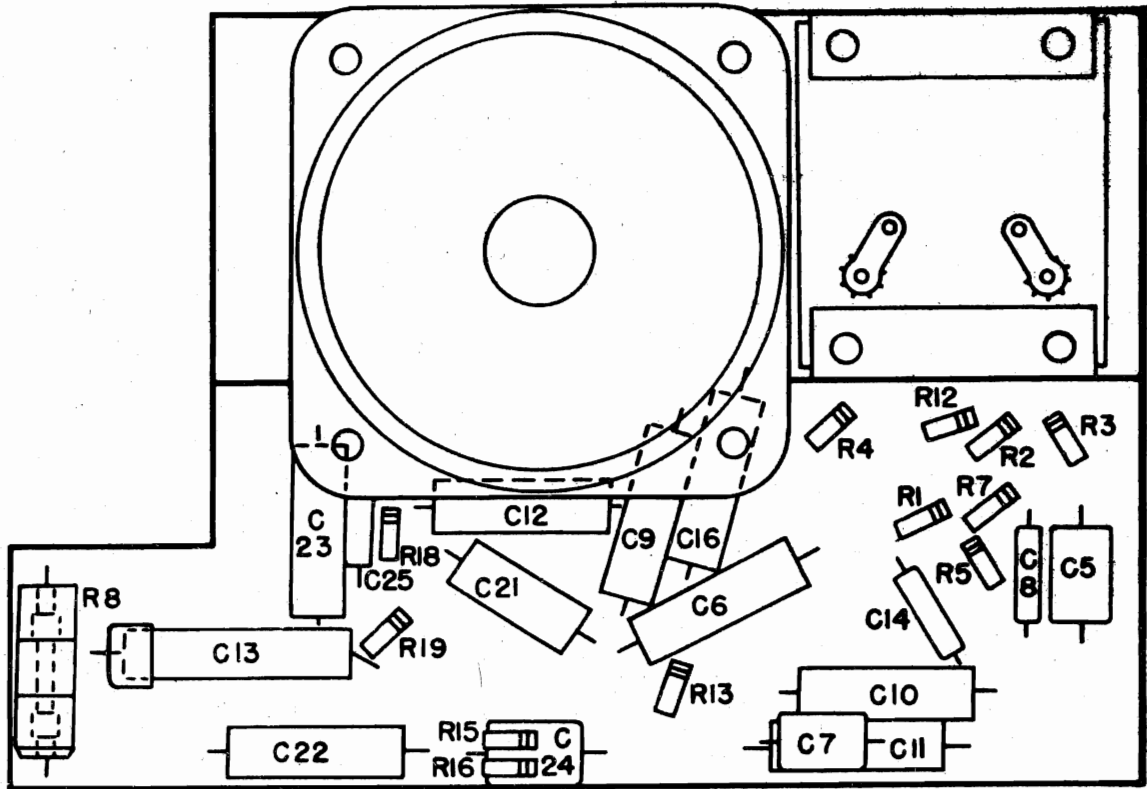
SEARS ROEBUCK & CO.



REPAIR PARTS LIST

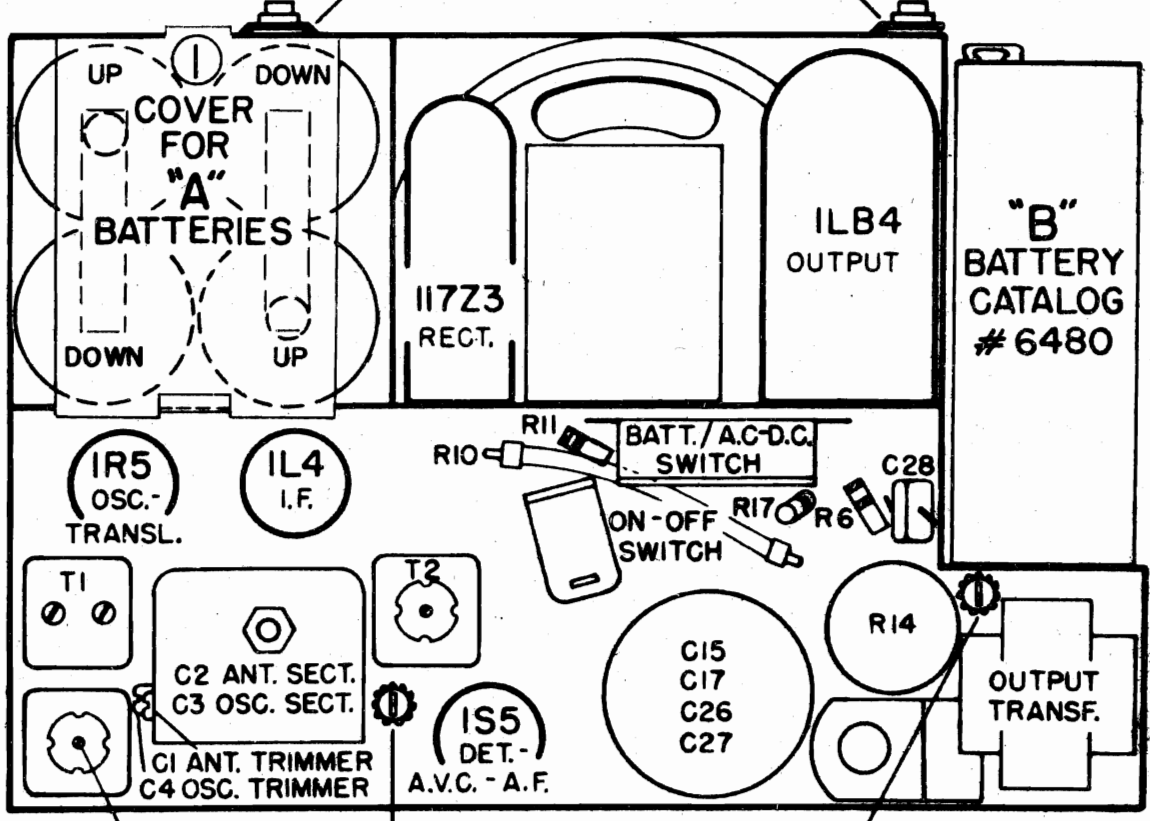
THE RETAIL SELLING PRICES SHOWN BELOW ARE
VOID AFTER MARCH 1 1947. AFTER THIS DATE
REFER TO "DIV. 57 REPAIR PARTS STRAIGHT
LIST" - ALL PRICES PREPAID.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SEARS LIST PRICE EACH	WH CODE
C15	R60859	"A" Battery Reel Assembly (Black)	\$.41	
C16	R60860	"B" Battery Reel Assembly (Removable)	.41	
C17	R60965	Button - On-Off Switch (101.823)	.41	
C18	R60966	Button - On-Off Switch (101.823-A)	.41	
C19	R60863	Capacitor - 40 Mfd. 25 Volts	2.61	
C20	R60864	Capacitor - 100 Mfd. 25 Volts	4.19	A0
C21	R60804	Capacitor - Variable	.16	
C22	R42877	Capacitor - .01 Mfd. - 400 V. H.T.	.18	
C23	R43661	Capacitor - .05 Mfd. - 400 V. H.T.	.16	
C24	R52846	Capacitor - .05 Mfd. - 200 V. H.T.	.20	
C25	R60846	Capacitor - .05 Mfd. - 400 V. H.T.	.17	
C26	R60847	Capacitor - .001 Mfd. - 400 V.	.24	
C27	R60848	Capacitor - 50 Mfd. - Mica	.20	
C28	R60849	Capacitor - 100 Mfd. - Mica	.28	
C29	R60850	Capacitor - 250 Mfd. - Mica 250V	.41	
C30	R60851	Capacitor - 500 Mfd. - Mica 500V	.87	
C31	R60852	Case Assy.-Loop & Covers (Ivory 101.823)	8.57	B0
C32	R60853	Case Assy.-Loop & Covers (Black 101.823-A)	8.22	B0
C33	R60854	Coil - 455KC	2.04	
C34	R44584	Coil - 117Z3	.03	
C35	R60855	Coil - 100 Mfd. - Mica	.28	
C36	R60856	Coil - 250 Mfd. - Mica 250V	.41	
C37	R60857	Coil - 500 Mfd. - Mica 500V	.87	
C38	R60858	Coil - 1000 Mfd. - Mica 1000V	1.74	
C39	R60859	Coil - 2000 Mfd. - Mica 2000V	3.48	
C40	R60860	Coil - 4000 Mfd. - Mica 4000V	6.96	
C41	R60861	Coil - 8000 Mfd. - Mica 8000V	13.92	
C42	R60862	Coil - 16000 Mfd. - Mica 16000V	27.84	
C43	R60863	Coil - 32000 Mfd. - Mica 32000V	55.68	
C44	R60864	Coil - 64000 Mfd. - Mica 64000V	111.36	
C45	R60865	Coil - 128000 Mfd. - Mica 128000V	222.72	
C46	R60866	Coil - 256000 Mfd. - Mica 256000V	445.44	
C47	R60867	Coil - 512000 Mfd. - Mica 512000V	890.88	
C48	R60868	Coil - 1024000 Mfd. - Mica 1024000V	1781.76	
C49	R60869	Coil - 2048000 Mfd. - Mica 2048000V	3563.52	
C50	R60870	Coil - 4096000 Mfd. - Mica 4096000V	7127.04	
C51	R60871	Coil - 8192000 Mfd. - Mica 8192000V	14254.08	
C52	R60872	Coil - 16384000 Mfd. - Mica 16384000V	28508.16	
C53	R60873	Coil - 32768000 Mfd. - Mica 32768000V	57016.32	
C54	R60874	Coil - 65536000 Mfd. - Mica 65536000V	114032.64	
C55	R60875	Coil - 131072000 Mfd. - Mica 131072000V	228065.28	
C56	R60876	Coil - 262144000 Mfd. - Mica 262144000V	456130.56	
C57	R60877	Coil - 524288000 Mfd. - Mica 524288000V	912261.12	
C58	R60878	Coil - 1048576000 Mfd. - Mica 1048576000V	1824522.24	
C59	R60879	Coil - 2097152000 Mfd. - Mica 2097152000V	3649044.48	
C60	R60880	Coil - 4194304000 Mfd. - Mica 4194304000V	7298088.96	
C61	R60881	Coil - 8388608000 Mfd. - Mica 8388608000V	14596177.92	
C62	R60882	Coil - 16777216000 Mfd. - Mica 16777216000V	29192355.84	
C63	R60883	Coil - 33554432000 Mfd. - Mica 33554432000V	58384711.68	
C64	R60884	Coil - 67108864000 Mfd. - Mica 67108864000V	116769423.36	
C65	R60885	Coil - 134217728000 Mfd. - Mica 134217728000V	233538846.72	
C66	R60886	Coil - 268435456000 Mfd. - Mica 268435456000V	467077693.44	
C67	R60887	Coil - 536870912000 Mfd. - Mica 536870912000V	934155386.88	
C68	R60888	Coil - 1073741824000 Mfd. - Mica 1073741824000V	1868310773.76	
C69	R60889	Coil - 2147483648000 Mfd. - Mica 2147483648000V	3736621547.52	
C70	R60890	Coil - 4294967296000 Mfd. - Mica 4294967296000V	7473243095.04	
C71	R60891	Coil - 8589934592000 Mfd. - Mica 8589934592000V	14946486190.08	
C72	R60892	Coil - 17179869184000 Mfd. - Mica 17179869184000V	29892972380.16	
C73	R60893	Coil - 34359738368000 Mfd. - Mica 34359738368000V	59785944760.32	
C74	R60894	Coil - 68719476736000 Mfd. - Mica 68719476736000V	119571895520.64	
C75	R60895	Coil - 137438953472000 Mfd. - Mica 137438953472000V	239143791041.28	
C76	R60896	Coil - 274877906944000 Mfd. - Mica 274877906944000V	478287582082.56	
C77	R60897	Coil - 549755813888000 Mfd. - Mica 549755813888000V	956575164165.12	
C78	R60898	Coil - 1099511627776000 Mfd. - Mica 1099511627776000V	1913150328330.24	
C79	R60899	Coil - 2199023255552000 Mfd. - Mica 2199023255552000V	3826300656660.48	
C80	R60900	Coil - 4398046511104000 Mfd. - Mica 4398046511104000V	7652601313320.96	
C81	R60901	Coil - 8796093022208000 Mfd. - Mica 8796093022208000V	15305202626641.92	
C82	R60902	Coil - 17592186444416000 Mfd. - Mica 17592186444416000V	30610405253283.84	
C83	R60903	Coil - 35184372888832000 Mfd. - Mica 35184372888832000V	61220810506567.68	
C84	R60904	Coil - 70368745777664000 Mfd. - Mica 70368745777664000V	122441621013135.36	
C85	R60905	Coil - 140737491553328000 Mfd. - Mica 140737491553328000V	244883242026270.72	
C86	R60906	Coil - 281474983106656000 Mfd. - Mica 281474983106656000V	489766484052541.44	
C87	R60907	Coil - 562949966213312000 Mfd. - Mica 562949966213312000V	979532968105082.88	
C88	R60908	Coil - 1125899932426624000 Mfd. - Mica 1125899932426624000V	1959065936210165.76	
C89	R60909	Coil - 2251799864853248000 Mfd. - Mica 2251799864853248000V	3918131872420331.52	
C90	R60910	Coil - 4503599729706496000 Mfd. - Mica 4503599729706496000V	7836263744840663.04	
C91	R60911	Coil - 9007199459412992000 Mfd. - Mica 9007199459412992000V	15672527489681326.08	
C92	R60912	Coil - 18014398918825984000 Mfd. - Mica 18014398918825984000V	31345054979362652.16	
C93	R60913	Coil - 36028797837651968000 Mfd. - Mica 36028797837651968000V	62690109958725304.32	
C94	R60914	Coil - 72057595675303936000 Mfd. - Mica 72057595675303936000V	125380219917450608.64	
C95	R60915	Coil - 144115191350607872000 Mfd. - Mica 144115191350607872000V	250760439834901217.28	
C96	R60916	Coil - 288230382701215744000 Mfd. - Mica 288230382701215744000V	501520879669802434.56	
C97	R60917	Coil - 576460765402431488000 Mfd. - Mica 576460765402431488000V	1003041759339604869.12	
C98	R60918	Coil - 1152921530804862976000 Mfd. - Mica 1152921530804862976000V	2006083518679209738.24	
C99	R60919	Coil - 2305843061609725952000 Mfd. - Mica 2305843061609725952000V	4012167037358419476.48	
C100	R60920	Coil - 4611686123219451904000 Mfd. - Mica 4611686123219451904000V	8024334074716838952.96	
C101	R60921	Coil - 9223372246438903808000 Mfd. - Mica 9223372246438903808000V	16048668149433677905.92	
C102	R60922	Coil - 18446744492877807616000 Mfd. - Mica 18446744492877807616000V	32097336298867355811.84	
C103	R60923	Coil - 36893488985755615232000 Mfd. - Mica 36893488985755615232000V	64194672597734711623.68	
C104	R60924	Coil - 73786977971511230464000 Mfd. - Mica 73786977971511230464000V	12838935199546942247.36	
C105	R60925	Coil - 147573955843022460928000 Mfd. - Mica 147573955843022460928000V	25677870399093884494.72	
C106	R60926	Coil - 295147911686044921856000 Mfd. - Mica 295147911686044921856000V	51355740798187768989.44	
C107	R60927	Coil - 590295823372089843712000 Mfd. - Mica 590295823372089843712000V	102711481596375537978.88	
C108	R60928	Coil - 1180591646744179687424000 Mfd. - Mica 1180591646744179687424000V	205422963192751075957.76	
C109	R60929	Coil - 2361183293488359374848000 Mfd. - Mica 2361183293488359374848000V	410845926385502151915.52	
C110	R60930	Coil - 4722366586976718749696000 Mfd. - Mica 4722366586976718749696000V	821691852771004303831.04	
C111	R60931	Coil - 9444733173953437499392000 Mfd. - Mica 9444733173953437499392000V	1643383705542008607662.08	
C112	R60932	Coil - 1888946634910687499776000 Mfd. - Mica 1888946634910687499776000V	3286767411084017215324.16	
C113	R60933	Coil - 3777893269821374999552000 Mfd. - Mica 3777893269821374999552000V	6573534822168034430648.32	
C114	R60934	Coil - 7555786539642749999104000 Mfd. - Mica 7555786539642749999104000V	13147069644336068861296.64	
C115	R60935	Coil - 15111573079285499998208000 Mfd. - Mica 15111573079285499998208000V	26294139288672137722593.28	
C116	R60936	Coil - 30223146158570999996416000 Mfd. - Mica 30223146158570999996416000V	52588278577344275445186.56	
C117	R60937	Coil - 60446292317141999992832000 Mfd. - Mica 60446292317141999992832000V	10517655715468855089037.12	
C118	R60938	Coil - 120892584642283999985664000 Mfd. - Mica 120892584642283999985664000V	21035311430937710178074.24	
C119	R60939	Coil - 241785169284567999971328000 Mfd. - Mica 241785169284567999971328000V	42070622861875420356148.48	
C120	R60940	Coil - 483570338569135999942656000 Mfd. - Mica 483570338569135999942656000V	84141245723750840712236.96	
C121	R60941	Coil - 967140677138271999885312000 Mfd. - Mica 967140677138271999885312000V	168282491447501681424473.92	
C122	R60942	Coil - 1934281354276543999770624000 Mfd. - Mica 1934281354276543999770624000V	336564982895003362848947.84	
C123	R60943	Coil - 3868562708553087999541248000 Mfd. - Mica 3868562708553087999541248000V	673129965790006725697795.68	
C124	R60944	Coil - 7737125417106175999082496000 Mfd. - Mica 7737125417106175999082496000V	1346259931580013513955591.36	
C125	R60945	Coil - 15474250834212351998164992000 Mfd. - Mica 15474250834212351998164992000V	2692519863160027027911182.72	
C126	R60946	Coil - 30948501668424703996329984000 Mfd. - Mica 30948501668424703996329984000V	5385039726320054055822365.44	
C127	R60947	Coil - 61897003336849407992659968000 Mfd. - Mica 61897003336849407992659968000V	10770079452640108117644730.88	
C128	R60948	Coil - 123794006673698815985319936000 Mfd. - Mica 123794006673698815985319936000V	21540158905280216235289461.76	
C129	R60949	Coil - 247588013347397631770639872000 Mfd. - Mica 247588013347397631770639872000V	43080317810560432470578923.52	
C130	R60950	Coil - 495176026694795263541279744000 Mfd. - Mica 495176026694795263541279744000V	86160635621120864941157847.04	
C131	R60951	Coil - 990352053389590527082559688000 Mfd. - Mica 990352053389590527082559688000V	172321271242241729822315794.08	
C132	R60952	Coil - 19807041067791810541651195776000 Mfd. - Mica 19807041067791810541651195776000V	34464254248448345964463548.96	
C133	R60			



PARTS LAYOUT - FRONT

HANDLE CARRYING CLIP SCREW BUSHINGS



CHASSIS MOUNTING SCREWS

PARTS LAYOUT - BACK

MODELS 7165, 7166
MODELS 7080, 7100

SEARS ROEBUCK & CO.

SPECIFICATIONS

Power Supply:
1. Large Flashlight "A" Batteries
1 #6/80 - 67.5 Volt "B" Battery
105-125 Volts AC or DC
Frequency Range

CHASSIS DIFFERENCES: Chassis 101.823 and 101.823A are mounted by two machine screws through the chassis. (See Page 2 "Parts Layout Back" for location of mounting screws.) Chassis 101.823-1 and 101.823-1A are mounted by one machine screw through the outside bottom of the case into the chassis. Both types of chassis are held at the top by machine screws through the carrying handle escutcheons.

HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order always give the following information:
(1) PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
(2) THE CHASSIS NUMBER, which is 101.823 or 101.823-A. This number is found on a metal plate (pictured above) at the rear of the chassis.
3. ORDERING INSTRUCTIONS:
Send Purchase Orders DIRECT to SOURCE No. 101. See "DIV. 57 STANDARD NOMENCLATURE INDEX" for source name and address.
4. MARK-UP: Selling Prices in the following list produce a mark-up of 44%, unless otherwise noted in the M. U. Code Column. Refer to "DIV. 57 STANDARD NOMENCLATURE INDEX" for explanation of Mark-up Code.

REMOVING CHASSIS FROM CASE:

1. Open front cover, turn tuning knob to low frequency stop (54 on dial).
2. Remove volume and tuning knobs and dial pointer.
3. Close front cover.
4. Remove two screws holding carrying handle clips.
5. Open back cover.
6. Remove batteries.
7. Unsolder loop lead from variable capacitor and pull this lead out of the vinylite protective tubing.
8. Unsolder second loop lead at ground lug.
9. Remove two chassis mounting screws (See Tube and Battery Layout Illustration).
10. Pull chassis carefully from the case as far as it will go keeping the chassis square with the case.
11. Insert a screw driver or similar tool between chassis and case at the hinges and carefully bend the case to allow carrying strap screw anchors (riveted to the chassis) to clear hinges (See Parts Layout Front Illustration).
12. Pull chassis again squarely until speaker housing holds at the hinge side of the case.
13. Insert the screw driver between chassis and case at or near the speaker housing lifted clear of the case.

REPLACING CHASSIS INTO CASE:

To replace the chassis into the case the above procedure should be reversed and the following precautions taken:

1. Dress the loop leads in such manner as not to cut insulation against the edge of the chassis or case.
2. Guide the "on off" switch button through the hole in the front panel.

HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order always give the following information:
(1) PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
(2) THE CHASSIS NUMBER, which is 101.811. This number is found on a metal plate (pictured above) at the rear of the chassis.
3. ORDERING INSTRUCTIONS:
Send Purchase Orders DIRECT to SOURCE No. 101. See "DIV. 57 STANDARD NOMENCLATURE INDEX" for source name and address.
4. MARK-UP: Selling Prices in the following list produce a mark-up of 44%, unless otherwise noted in the M. U. Code Column. Refer to "DIV. 57 STANDARD NOMENCLATURE INDEX" for explanation of mark-up code.
5. In all correspondence relating to cabinets, always mention the source code letter stamped into the upper rear rail of consoles or the bottom of table models, and the CATALOG NUMBER shown on the sticker on the back, bottom or inside of cabinet.

REPAIR PARTS LIST
THE RETAIL SELLING PRICES SHOWN BELOW ARE VOID AFTER AUGUST 1, 1947. AFTER THIS DATE REFER TO DIV. 57 REPAIR PARTS STRAIGHT LIST. ALL PRICES PREPAID.

REPAIR PARTS LIST

THE RETAIL SELLING PRICES SHOWN BELOW ARE VOID AFTER AUGUST 1, 1947. AFTER THIS DATE REFER TO DIV. 57 REPAIR PARTS STRAIGHT LIST. ALL PRICES PREPAID.

MODEL 101.809, 101.811

MODEL 101.823, 101.823-1. IMPORTANT ALIGNMENT NOTES 101.823A, 101.823-1A

An isolation transformer between the power source and the receiver is recommended during any service or alignment operation which requires that service equipment be connected to the receiver. Failure to observe this precaution might damage service equipment.

*The variable should be rocked back and forth a degree or two while making the 600 KC adjustment.

The Alignment Procedure should be repeated in the original order, step by step, to insure greater accuracy.

Always keep the output power from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

ALIGNMENT PROCEDURE

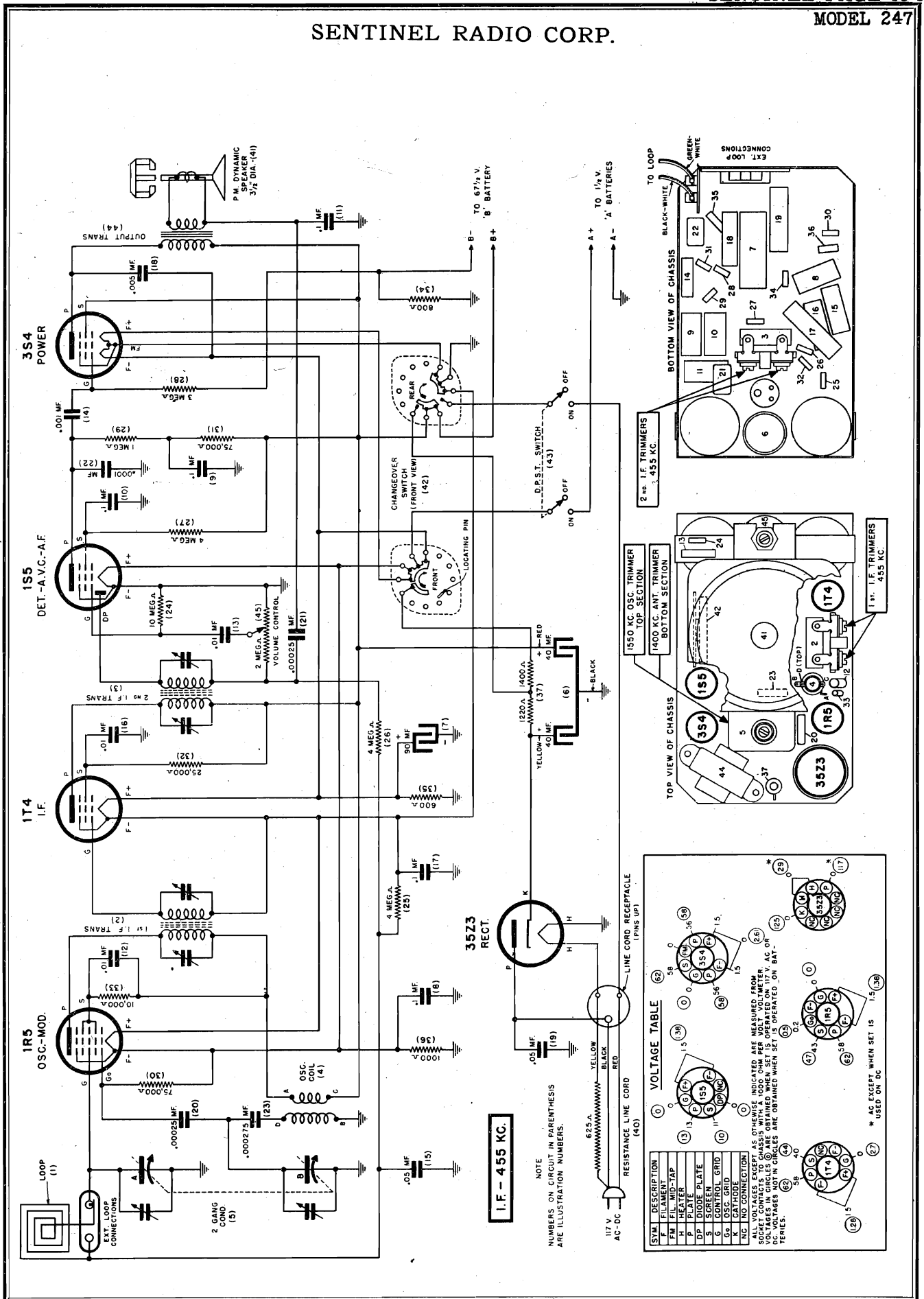
Output Meter Connection.....Across Speaker Voice Coil
Generator Ground Lead Connection.....To B- through .1 Mfd. Capacitor
Generator Output Lead.....See Chart Below
Position of Volume Control.....Fully On (Clockwise)
Position of Pointer with Variable Fully Closed.....To right of 540 KC Calibration Mark

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA CONNECTION	GENERATOR CONNECTION	ADJUSTMENTS IN ORDER SHOWN	TRIMMER FUNCTION
Closed	455	0.05 Mfd.	1R5 Translator Grid	T2-T1	I. F.
Open	1610	0.05 Mfd.	Hazeltine Loop	C4	Oscillator
1400	1400	0.05 Mfd.	Hazeltine Loop	C1	Antenna
*600	600	0.05 Mfd.	Hazeltine Loop	L1	Padder

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SEARS LIST PRICE	MANUFACTURER
C4-C8, C5	R1391	Button Snap Variable Tuning	\$.01	
C7	R6043	Capacitor - .001 Mfd. 600 V.	.12	
C11, C12, C13	R6044	Capacitor - .01 Mfd. 600 V.	.18	
C14, C15, C22	R6045	Capacitor - .05 Mfd. 200 V.	.17	
C16	R6046	Capacitor - .05 Mfd. 200 V.	.17	
C17	R6047	Capacitor - .01 Mfd. 400 V.	.18	
C20	R6048	Capacitor - .1 Mfd. 200 V.	.27	
C21	R6049	Capacitor - .1 Mfd. 200 V.	.27	
C23, C28	R6050	Capacitor - .02 Mfd. 600 V.	.22	
C24	R6051	Capacitor - .02 Mfd. 600 V.	.22	
C25, C10, C19	R6052	Capacitor - .0001 Mfd. Mica	.20	
C26, C27	R6053	Capacitor - Electrolytic, 20 Mfd., 25 V. 40 Mfd., 150 V.	1.91	
L2	R6046	Coil - Oscillator	1.25	
R16	R6048	Control - Tone and On-Off	1.08	
R17	R6052	Control - Volume - 2 Megohm	.97	
R18	R6056	Dial - Power	.26	
R19	R6052	Drum - Drum & Bushing Assembly	.42	
R20	R6050	Escutcheon - Plastic	1.19	
R21	R6052	Knob - Volume	.14	
R22	R6048	Knob - Tuning	.14	
R23	R6048	Knob - Volume	.14	
R24	R6048	Knob - Tuning	.14	
R25	R6048	Knob - Volume	.14	
R26	R6048	Knob - Tuning	.14	
R27	R6048	Knob - Volume	.14	
R28	R6048	Knob - Tuning	.14	
R29	R6048	Knob - Volume	.14	
R30	R6048	Knob - Tuning	.14	
R31	R6048	Knob - Volume	.14	
R32	R6048	Knob - Tuning	.14	
R33	R6048	Knob - Volume	.14	
R34	R6048	Knob - Tuning	.14	
R35	R6048	Knob - Volume	.14	
R36	R6048	Knob - Tuning	.14	
R37	R6048	Knob - Volume	.14	
R38	R6048	Knob - Tuning	.14	
R39	R6048	Knob - Volume	.14	
R40	R6048	Knob - Tuning	.14	
R41	R6048	Knob - Volume	.14	
R42	R6048	Knob - Tuning	.14	
R43	R6048	Knob - Volume	.14	
R44	R6048	Knob - Tuning	.14	
R45	R6048	Knob - Volume	.14	
R46	R6048	Knob - Tuning	.14	
R47	R6048	Knob - Volume	.14	
R48	R6048	Knob - Tuning	.14	
R49	R6048	Knob - Volume	.14	
R50	R6048	Knob - Tuning	.14	
R51	R6048	Knob - Volume	.14	
R52	R6048	Knob - Tuning	.14	
R53	R6048	Knob - Volume	.14	
R54	R6048	Knob - Tuning	.14	
R55	R6048	Knob - Volume	.14	
R56	R6048	Knob - Tuning	.14	
R57	R6048	Knob - Volume	.14	
R58	R6048	Knob - Tuning	.14	
R59	R6048	Knob - Volume	.14	
R60	R6048	Knob - Tuning	.14	
R61	R6048	Knob - Volume	.14	
R62	R6048	Knob - Tuning	.14	
R63	R6048	Knob - Volume	.14	
R64	R6048	Knob - Tuning	.14	
R65	R6048	Knob - Volume	.14	
R66	R6048	Knob - Tuning	.14	
R67	R6048	Knob - Volume	.14	
R68	R6048	Knob - Tuning	.14	
R69	R6048	Knob - Volume	.14	
R70	R6048	Knob - Tuning	.14	
R71	R6048	Knob - Volume	.14	
R72	R6048	Knob - Tuning	.14	
R73	R6048	Knob - Volume	.14	
R74	R6048	Knob - Tuning	.14	
R75	R6048	Knob - Volume	.14	
R76	R6048	Knob - Tuning	.14	
R77	R6048	Knob - Volume	.14	
R78	R6048	Knob - Tuning	.14	
R79	R6048	Knob - Volume	.14	
R80	R6048	Knob - Tuning	.14	
R81	R6048	Knob - Volume	.14	
R82	R6048	Knob - Tuning	.14	
R83	R6048	Knob - Volume	.14	
R84	R6048	Knob - Tuning	.14	
R85	R6048	Knob - Volume	.14	
R86	R6048	Knob - Tuning	.14	
R87	R6048	Knob - Volume	.14	
R88	R6048	Knob - Tuning	.14	
R89	R6048	Knob - Volume	.14	
R90	R6048	Knob - Tuning	.14	
R91	R6048	Knob - Volume	.14	
R92	R6048	Knob - Tuning	.14	
R93	R6048	Knob - Volume	.14	
R94	R6048	Knob - Tuning	.14	
R95	R6048	Knob - Volume	.14	
R96	R6048	Knob - Tuning	.14	
R97	R6048	Knob - Volume	.14	
R98	R6048	Knob - Tuning	.14	
R99	R6048	Knob - Volume	.14	
R100	R6048	Knob - Tuning	.14	

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SENTINEL RADIO CORP.



ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right. If more than one adjustment is required, make the adjustment marked (1) first, (2) next. **IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA AND BATTERIES IN THE SAME POSITION THEY WILL BE IN WHEN THE SET IS IN THE CABINET.**

When adjusting 1550 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Set receiver dial to:	TEST OSCILLATOR		Refer to parts layout diagram for location of trimmers mentioned below:
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:		Attach output of test oscillator to:
Any point where no interfering signal is received	Exactly 455 K.C.	0.3 Mfd condenser	Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1 Exactly 1550 K.C.	Exactly 1400 K.C.	None	Adjust 1650 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K.C.	Approx. 1400 K.C.	None	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.

BATTERY INSTALLATION

The plastic case is made in two sections. To install batteries in receiver, push the slide lock button underneath the carrying handle and gently separate the case.

Place the batteries in the exact position shown on the diagram. Press the snap buttons on the end of the short flexible wire leads into the terminals on top of "B" battery.

After batteries have been installed, gently press the two sections of the case together and lock in place with slide button underneath case handle.

WHEN INSTALLING BATTERIES BE CAREFUL NOT TO INJURE ANY OF THE EXPOSED RADIO PARTS.

BATTERY LIFE

The life of the batteries depends on the number of hours the set is operated.

Based on average usage, the flashlight "A" batteries will supply approximately ten hours' service—the "B" battery approximately forty hours' service.

Because the "A" batteries become exhausted much faster than the "B" battery, six to eight "A" batteries may be used during the life of a single "B" battery.

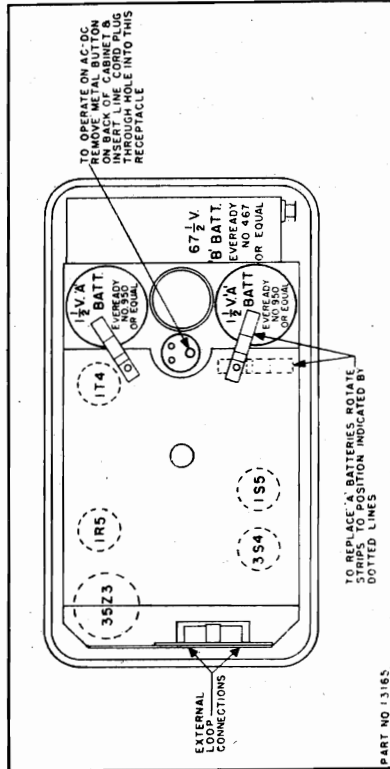
Be sure to try new "A" batteries before replacing the "B" battery.

115 VOLT D.C. OR 115 VOLT 50-60 CYCLE ELECTRIC INSTALLATION AND OPERATION

To operate the receiver on 110-120 volt direct current or 50-60 cycle alternating current, just:

- (a) Remove metal button on back of cabinet and insert plug on end of AC-DC line cord into receptacle in back of the small hole that will be exposed when metal button is removed.
- (b) Place battery or AC-DC selector knob in AC/DC position.

If the radio does not operate on "DC", current after approximately one minute, remove the plug on the end of radio set power cord from the house current receptacle, turn it half way around (180°) and reinsert it into the power receptacle.



THIS RECEIVER CAN BE OPERATED EITHER WITH DRY BATTERIES OR FROM 110-120 VOLT DIRECT CURRENT OR 50-60 CYCLE ALTERNATING CURRENT.

THUS THE SET MAY BE OPERATED ON FARMS, IN SUMMER CAMPS, HUNTING LODGES, BOATS, OR IN ANY ISOLATED DISTRICTS WHERE ELECTRIC SERVICE IS NOT AVAILABLE BY USING BATTERIES. WHERE 110-120 VOLT DIRECT CURRENT OR 50-60 CYCLE ALTERNATING CURRENT IS AVAILABLE, THE RADIO MAY BE OPERATED DIRECT FROM THE ELECTRIC LINES WITHOUT USING THE BATTERIES OR MAKING ANY CHANGE IN THE RECEIVER.

WHEN THE "BATTERY OR AC-DC" SWITCH KNOB IS IN THE AC-DC POSITION THE BATTERIES ARE ENTIRELY DISCONNECTED AND THE SET RECEIVES ALL ITS POWER FROM THE AC OR DC ELECTRIC LINE.

PART NO. 19335-262A

ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. **IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.**

When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna and R.F. trimmers, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator near set loop—**BE SURE THAT NEITHER MOVES WHILE ALIGNING.**

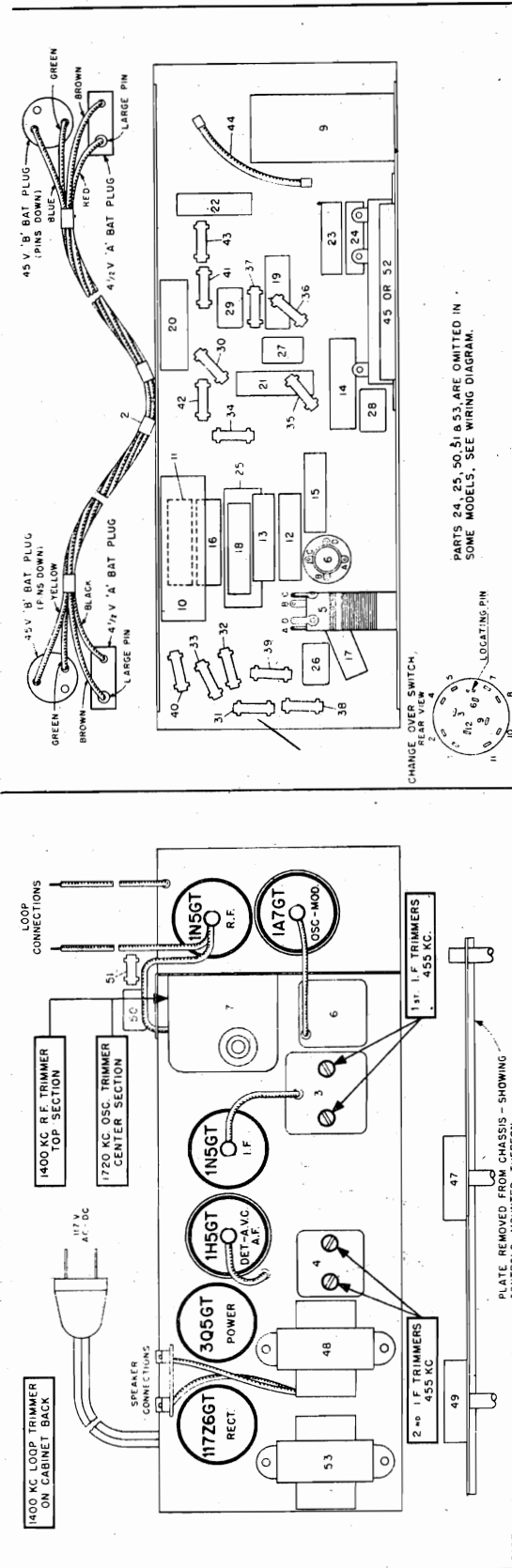
Set receiver dial to:	TEST OSCILLATOR	
	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:
Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser
1	Exactly 1730 K.C.	None
2	Approx. 1400 K.C.	None

Refer to parts layout diagram for location of trimmers mentioned below:

Adjust each of the second I.F. transformer trimmers for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.

Adjust 1730 K. C. oscillator trimmer for maximum output.

Adjust 1400 K.C. loop and R.F. trimmers for maximum output.



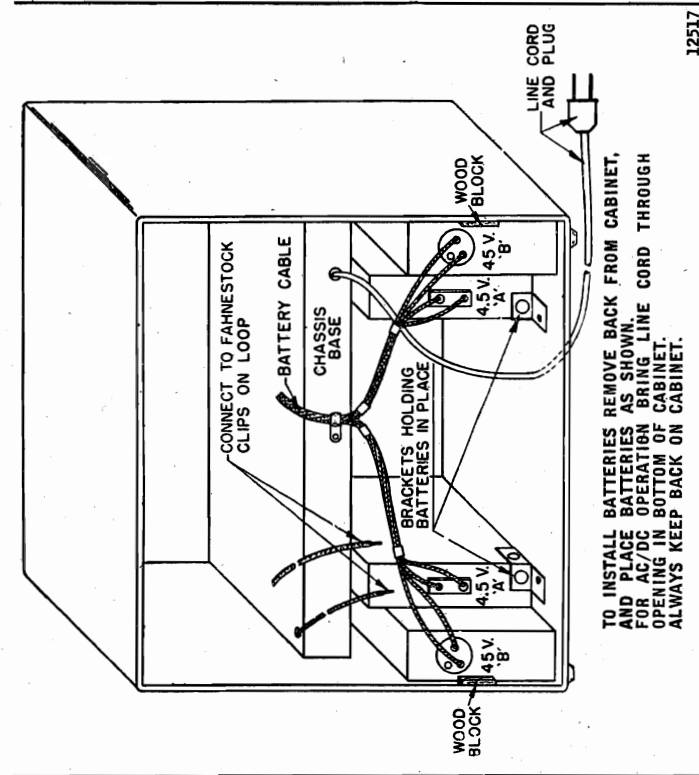
VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE WITH BATTERIES OR ON EITHER 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT (DC). **IMPORTANT**—If hum is high when set is operated on A.C. current, reverse position of set power cord plug in house current socket.

GROUND

WHEN AN EXTERNAL AERIAL IS ATTACHED TO THE RADIO A GOOD GROUND MUST BE USED. A wire placed underneath the lower left hand screw on back of cabinet and firmly attached to a metal stake driven two to four feet in moist ground, or attached to a cold water pipe will provide a suitable ground.

SENTINEL RADIO CORP.



TO INSTALL BATTERIES REMOVE BACK FROM CABINET, AND PLACE BATTERIES AS SHOWN. FOR AC/DC OPERATION BRING LINE CORD THROUGH OPENING IN BOTTOM OF CABINET. ALWAYS KEEP BACK ON CABINET.

CONTROLS

THE LEFT HAND KNOB controls the volume control.
 THE CENTER KNOB is the voltage selector and on-off switch.
 THE RIGHT HAND KNOB is the station selector.

BATTERY INSTALLATION AND OPERATION

BATTERY EQUIPMENT:
 Diagram shows proper location and connections of the following and similar types of batteries:
 2—4½ VOLT "A" BATTERIES such as Eveready type 746.
 2—4½ VOLT "B" BATTERIES such as Eveready type 482.

115 VOLT D.C. OR 115 VOLT 50-60 CYCLE ELECTRIC INSTALLATION AND OPERATION

To operate the receiver on 110-120 volt direct current or 50-60 cycle alternating current, just:
 (a) Bring line cord through opening in bottom of cabinet.
 (b) Insert line cord plug into 110-115 volt AC or DC electric power socket.
 (c) Rotate voltage selector knob to left hand AC/DC position.
 If the radio does not operate on DC current after approximately one minute remove the plug on the end of radio line cord from the house current receptacle, turn it half way around (180°) and reinsert it into the power receptacle.

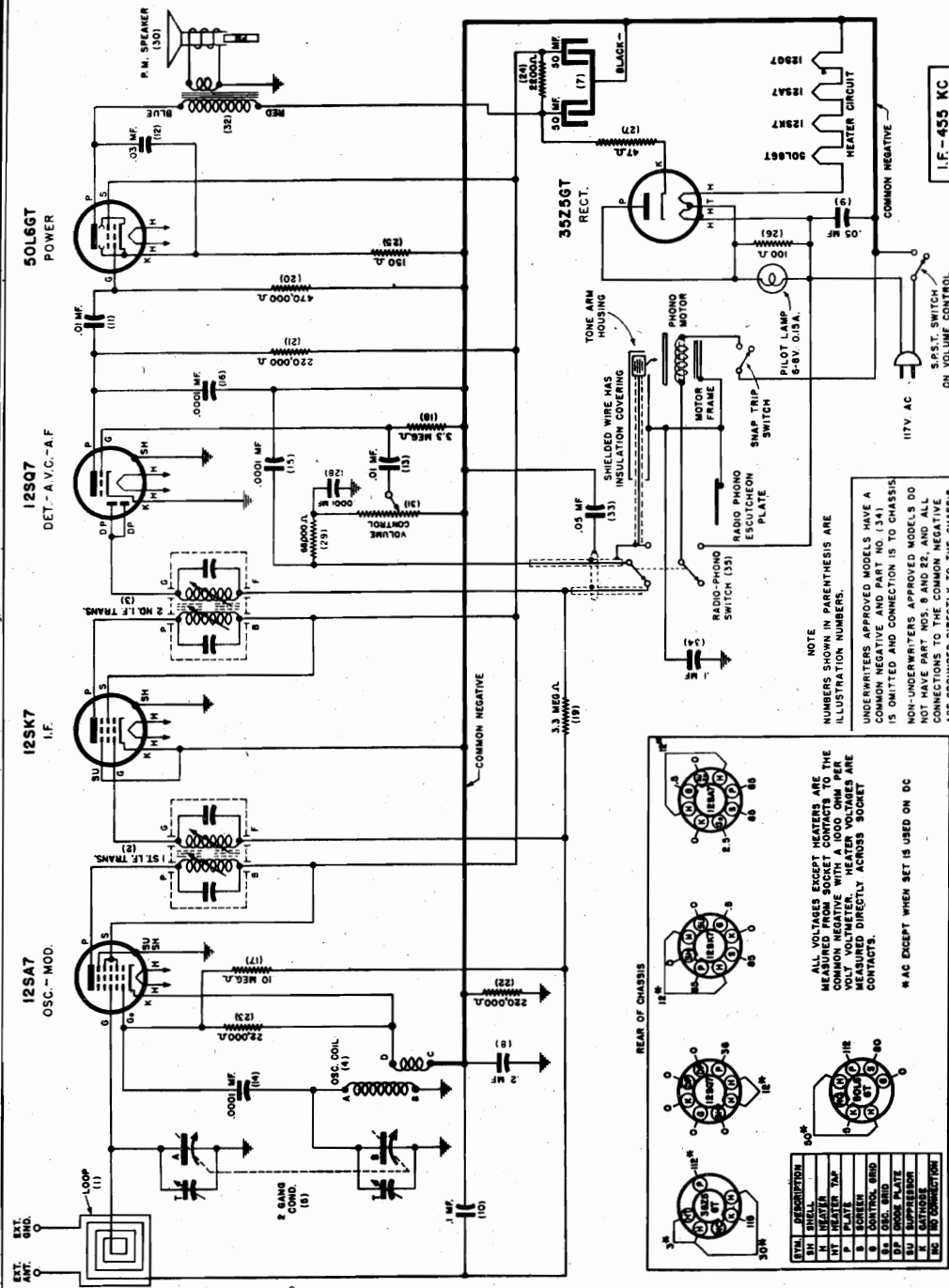
PARTS LIST

Illus. Part No.	Part Name	Description	List Price
1	13331 Antenna	Loop Assembly	\$1.50
2	12204 Cable	2' with 2 Three Prong "B" and 2 Three Prong "A" Plugs	.55
3	12182 Coil	First I.F. Transformer	1.05
4	11988 Coil	Second I.F. Transformer	.75
5	12184 Coil	Oscillator—used in Models not having common ground	.60
5	13566 Coil	Oscillator—used in Models having common ground	.60
6	13323 Coil	Tuning (Three Gang)	.50
7	12188 Condenser	Trimmer (2-40 M.M.F.)	2.50
8	11636 Condenser	Tubular Dry Elec. (50-50 Mfd. 150 Volt)	.75
9	13326 Condenser	Tubular Dry Elec. (40-40 Mfd. 25 Volt)	.50
10	13242 Condenser	Tubular .1 Mfd. 200 Volt	.25
11	1151 Condenser	Tubular .25 Mfd. 200 Volt	.25
12	1032 Condenser	Tubular .5 Mfd. 200 Volt	.25
13	1151 Condenser	Tubular .1 Mfd. 200 Volt	.20
14	1151 Condenser	Tubular .1 Mfd. 200 Volt	.20
15	1151 Condenser	Tubular .1 Mfd. 200 Volt	.20
16	1147 Condenser	Tubular .05 Mfd. 200 Volt	.19
17	1147 Condenser	Tubular .05 Mfd. 200 Volt	.19
18	1147 Condenser	Tubular .05 Mfd. 200 Volt	.19
19	1147 Condenser	Tubular .05 Mfd. 200 Volt	.19
20	9457 Condenser	Tubular .05 Mfd. 400 Volt	.20
21	1368 Condenser	Tubular .003 Mfd. 400 Volt	.17
22	1356 Condenser	Tubular .003 Mfd. 400 Volt	.17
23	1275 Condenser	Mica .0025 Mfd.	.26
24	10762 Condenser	Mica .001 Mfd.	.21
25	12099 Condenser	Mica .002 Mfd.	.21
26	9458 Condenser	Mica .0025 Mfd.	.26
27	7934 Condenser	Mica .001 Mfd.	.21
28	2873 Condenser	Mica .002 Mfd.	.21
29	4804 Resistor	Carbon 10 Megohm 1/3 Watt	.19
30	2333 Resistor	Carbon 75,000 Ohm 1/3 Watt	.19
31	2333 Resistor	Carbon 100,000 Ohm 1/3 Watt	.19
32	2333 Resistor	Carbon 250,000 Ohm 1/3 Watt	.19
33	2705 Resistor	Carbon 1 Megohm 1/3 Watt	.19
34	8906 Resistor	Carbon 250,000 Ohm 1/3 Watt	.19
35	7998 Resistor	Carbon 1 Megohm 1/3 Watt	.19
36	7998 Resistor	Carbon 1 Megohm 1/3 Watt	.19
37	2873 Resistor	Carbon 75,000 Ohm 1/3 Watt	.19
38	2873 Resistor	Carbon 100,000 Ohm 1/3 Watt	.19
39	8907 Resistor	Carbon 25,000 Ohm 1/3 Watt	.19
40	1562 Resistor	Carbon 600 Ohm 1/3 Watt	.19
41	1152 Resistor	Carbon 600 Ohm 1/3 Watt	.19
42	1152 Resistor	Carbon 600 Ohm 1/3 Watt	.19
43	1152 Resistor	Carbon 400 Ohm 1/3 Watt	.19
44	12084 Resistor	Carbon 400 Ohm 1/3 Watt	.19
45	13327 Resistor	Flexible 1900 Ohm 2 Watt	.50
46	12211 Speaker	P. M. Dynamic (3")	3.23
47	12183 Switch	Volume Control used in Models having common ground	.60
48	13055 Transformer	Volume Control used in Models having common ground	.70
49	13324 Transformer	Volume Control used in Models having common ground	.60
50	9458 Resistor	Carbon 1 Megohm 1/3 Watt	.19
51	10831 Resistor	Wire Wound 1900 Ohm 6W used in Model having common ground	.55
52	12069 Filter Choke	Used in Model having common ground	1.00
53	12069 Filter Choke	Used in Model having common ground	1.00

MISCELLANEOUS PARTS

Illus. Part No.	Part Name	Description	List Price
10292	Bulb	6.3 Volt .250 Amp. Dial Light No. 24" of No. 18 Lb. Drive Cord	\$0.10
8184	Dial Cord	3/4" of No. 18 Lb. Drive Cord	.15
12191	Dial Shaft	Drive Shaft	.20
12221	Dial Pointer	For Dial	.10
13325	Dial Scale	AC-DC Battery Indicator	.35
12208	Dial Crystal	Calibrated Scale	.10
12096	Knob	For Dial	.30
11642	Plug	Three Prong "B"	.10
12205	Plug	Two Prong "A"	.08
13330	Plate	Metal Control Face Plate for Cabinet	1.00

SENTINEL RADIO CORP.



GROUND

When a regular aerial is used, best result will be obtained with a ground attached to the black lead coming out of the rear of the chassis. **WARNING — DO NOT ATTACH A GROUND DIRECT TO THE RADIO CHASSIS—ANY EXTERNAL GROUND CONNECTION TO ANY METAL PART OF THE CHASSIS WILL CAUSE A SHORT AND POSSIBLE DAMAGE.**

DIAL LIGHT

It is normal for the dial light to be dim for approximately 60 seconds after set is turned "on" and then attain normal brilliance—also, on very loud signals the light may fluctuate. When replacing light, always use a 6.3 volt .150 ampere dial light.

VOLTAGE TABLE (BOTTOM VIEW OF CHASSIS)

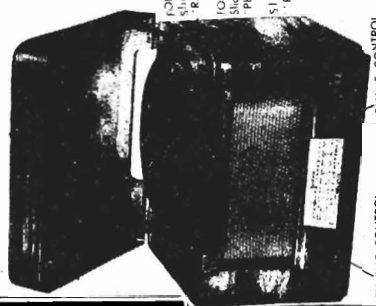
LOOP AERIAL supplied with the radio should provide ample reception in average locations. Loop aeriels are directional—the volume of a weak station may be improved, or undesired electrical noise may be reduced, by lifting and turning the radio to a different position. A trial will reveal position of best reception with least interference.

OUTSIDE AERIAL

If the radio is used in shielded areas or located a great distance from broadcast stations, the volume of some or all stations may not be ample, in which case it would be necessary to ATTACH A 25-50 ft. OUTDOOR AERIAL TO THE BLUE LEAD COMING OUT OF THE REAR OF THE CHASSIS.

INSTRUCTIONS FOR PLAYING A 7", 10" OR 12" RECORD:

- LIFT CABINET LID AND PLACE RECORD ON TURNABLE.
- SLIDE RECORD SIZE SELECTOR BUTTON TO PROPER POSITION. FOR 12" RECORD, SLIDE BUTTON TO 12" POSITION. SLIDE BUTTON TO 10" POSITION. SLIDE BUTTON TO 7" POSITION. MARKED 10, 12, AND 7.
- PLACE "RADIO-PHONO" SWITCH IN PHONO POSITION.
- CLOSE LID—THIS WILL AUTOMATICALLY START RECORD PLAYING. WHEN RECORD HAS BEEN COMPLETELY PLAYED, THE LID WILL AUTOMATICALLY TURN ON. TO PLAY SAME RECORD AGAIN, JUST LIFT LID ALL THE WAY UP AND RE-CLOSE.
- TO PLAY ANOTHER RECORD, REPLACE RECORD ON TURNABLE AND PROCEED AS ABOVE.
- DO NOT HAVE MORE THAN ONE RECORD ON TURNABLE.



TUNING CONTROL: Use this knob to tune in desired station.

VOLUME CONTROL: Turn clockwise to increase volume.

FOR RADIO RECEPTION: Slide knob to "RADIO" position.

FOR RECORD PLAYING: Slide knob to "PHONO" position.

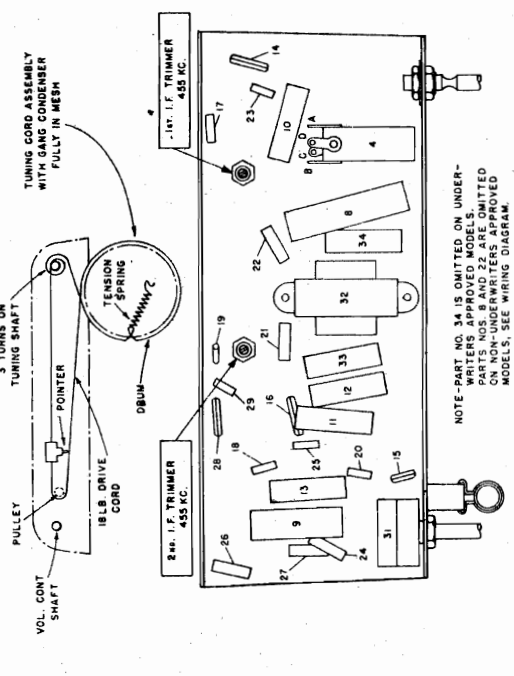
Slide switch knob to "PHONO" position.

ALIGNMENT PROCEDURE

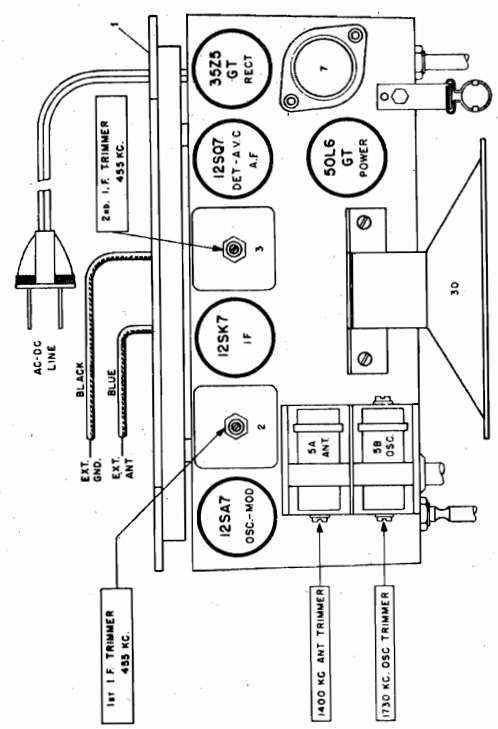
For alignment procedure read tabulations from left to right, and make the adjustment marked (1) first, (2) next, (3) third. Before starting alignment:

- (a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.
- (b) Use an accurately calibrated test oscillator with some type of output measuring device.
- (c) PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

Steps	Set receiver dial to:	TEST OSCILLATOR		Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:		
1	Any point where no interfering signal is received.	455 K. C.	.02 MFD. condenser	High side to rear stator plates of tuning condenser. Low side to frame of condenser through a .02 Mfd. blocking condenser.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
2	Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD. condenser	Receiver blue antenna lead Receiver black ground lead	Adjust 1730 K. C. oscillator trimmer for maximum output.
3	Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD. condenser	Receiver blue antenna lead Receiver black ground lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.



NOTE—PART NO. 34 IS OMITTED ON UNDERWRITERS APPROVED MODELS. PARTS NOS. 8 AND 22 ARE OMITTED ON UNDERWRITERS APPROVED MODELS. SEE WIRING DIAGRAM.



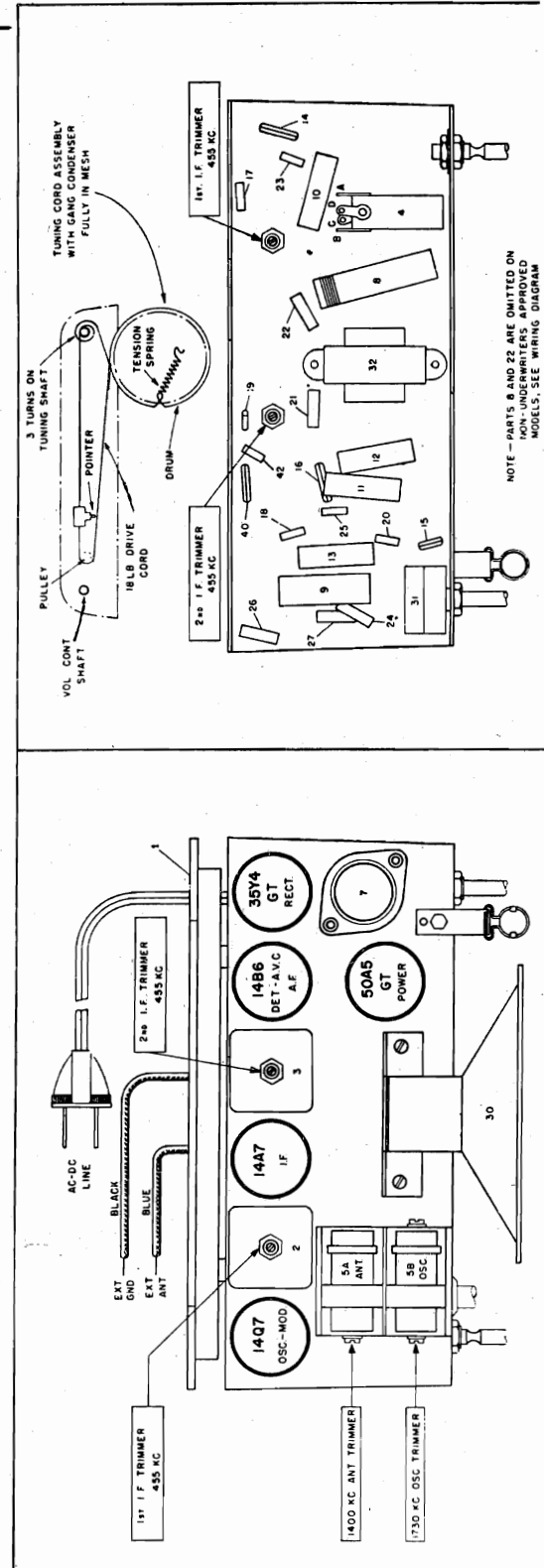
ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right, and make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

- (a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.
- (b) Use an accurately calibrated test oscillator with some type of output measuring device.
- (c) PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

Steps	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:		Attach output of test oscillator to:
1	Any point where no interfering signal is received.	455 K. C.	.02 MFD. condenser	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
2	Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD. condenser	Adjust 1730 K. C. oscillator trimmer for maximum output.
3	Approx. 1400 K. C.	Exactly 1400 B. C.	.00025 MFD. condenser	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.



SENTINEL RADIO CORP.

MODELS L-284I, L-284NA, L-284NI, L-284NR, L-284W
MODEL 247

MODEL L-284W, L-284I, L-284NI, L-284NA, L-284NR
VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON EITHER:
110-120 VOLTS 50-60 CYCLES ALTERNATING
CURRENT (AC) OR 110-120 VOLTS DIRECT CURRENT
(DC). IF THE RADIO DOES NOT OPERATE AFTER
APPROXIMATELY ONE MINUTE, REMOVE THE PLUG
ON THE END OF THE RADIO LINE CORD FROM THE
POWER RECEPTACLE, TURN IT HALF WAY AROUND
AND RE-INSERT IT INTO THE RECEPTACLE.

DIAL LIGHT

IT IS NORMAL FOR THE DIAL LIGHT TO BE DIM
FOR APPROXIMATELY 60 SECONDS AFTER SET IS
TURNED "ON" AND THEN ATTAIN NORMAL BRILLIANCE
-ALSO, ON VERY LOUD SIGNALS THE LIGHT MAY
FLUCTUATE.
ALWAYS USE A 6.3 VOLT .150 AMPERE DIAL
LIGHT.

PARTS LIST

Ill. No.	Part No.	Description	Part No.	Part Name	Description	Part No.	List Price
1	20E24	Antenna	27E106	Resistor	Carbon, 10 Megohm 1/3 Watt	106	.07
2	20E21	Coil	27E335	Resistor	Carbon, 3.3 Megohm 1/3 Watt	335	.07
2	20E261	Coil	27E335	Resistor	Carbon, 3.3 Megohm 1/3 Watt	335	.07
3	20E22	Coil	27E474	Resistor	Carbon, 470,000 Ohm 1/3 Watt	474	.07
3	20E21A-2	Coil	27E474	Resistor	Carbon, 470,000 Ohm 1/3 Watt	474	.07
4	20E162	Coil	27E224	Resistor	Carbon, 220,000 Ohm 1/3 Watt	224	.08
5	24E2	Condenser	27E224	Resistor	Carbon, 220,000 Ohm 1/3 Watt	224	.08
5	24E18	Condenser	27E223	Resistor	Carbon, 22,000 Ohm 1/3 Watt	223	.14
7	25E1	Condenser	27E223	Resistor	Carbon, 2,200 Ohm 1 Watt	223	.14
8	23E41	Condenser	27E151	Resistor	Carbon, 150 Ohm 1/3 Watt	151	.08
9	23E418	Condenser	27E101	Resistor	Carbon, 100 Ohm 1/3 Watt	101	.08
10	23E418	Condenser	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt	470-2	.08
11	23E211	Condenser	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt	470-2	.08
12	23E211	Condenser	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt	470-2	.08
13	23E211	Condenser	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt	470-2	.08
14	23E39	Condenser	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt	470-2	.08
15	23E39	Condenser	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt	470-2	.08
16	23E39	Condenser	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt	470-2	.08

MISCELLANEOUS PARTS

Part No.	Description	Part No.	List Price
7E31-1	Walnut Plastic Cabinet	9E2	Dial Crystal
7E31-2	Cabinet	36E10	Dial Scale
7E1-1	Cabinet	20E225-3	Dial Shaft Assembly
7E1-5	Cabinet	35E8	Dial Pointer
7E1-6	Cabinet	6E52	Dial Spring
7E70	Cabinet Back	37E17-1	Knob
7E72	Cabinet Back	37E17-3	Knob
41E1	Cord	37E29-4	Knob
20E12	Dial Plate Assem.	20E43	Pilot Lamp Socket
4E1	Dial Cord	40E1	Pilot Lamp

MODEL 247

Illus. No.	Description	Part No.	List Price
1	Loop Assembly Mounted in Lid Cover	13276	Antenna
2	First I.F. Transformer	13283	Coil
3	Second I.F. Transformer	13284	Coil
4	Detector Transformer	13285	Coil
5	Detector Transformer	13286	Coil
6	Detector Transformer	13287	Coil
7	Detector Transformer	13288	Coil
8	Detector Transformer	13289	Coil
9	Detector Transformer	13290	Coil
10	Detector Transformer	13291	Coil
11	Detector Transformer	13292	Coil
12	Detector Transformer	13293	Coil
13	Detector Transformer	13294	Coil
14	Detector Transformer	13295	Coil
15	Detector Transformer	13296	Coil
16	Detector Transformer	13297	Coil
17	Detector Transformer	13298	Coil
18	Detector Transformer	13299	Coil
19	Detector Transformer	13300	Coil
20	Detector Transformer	13301	Coil
21	Detector Transformer	13302	Coil
22	Detector Transformer	13303	Coil
23	Detector Transformer	13304	Coil
24	Detector Transformer	13305	Coil
25	Detector Transformer	13306	Coil
26	Detector Transformer	13307	Coil
27	Detector Transformer	13308	Coil
28	Detector Transformer	13309	Coil
29	Detector Transformer	13310	Coil
30	Detector Transformer	13311	Coil

MISCELLANEOUS PARTS

Part No.	Description	Part No.	List Price
13276	Antenna	13312	Battery Spring
13283	Coil	13313	Battery Plug
13284	Coil	13314	Bottom Section of Cabinet Only
13285	Coil	13315	Chassis Plate
13286	Coil	13316	Chassis Fastener
13287	Coil	13317	Handle Rise
13288	Coil	13318	Knob Pointer
13289	Coil	13319	Knob
13290	Coil	13320	Knob
13291	Coil	13321	Knob
13292	Coil	13322	Knob
13293	Coil	13323	Knob
13294	Coil	13324	Knob
13295	Coil	13325	Knob
13296	Coil	13326	Knob
13297	Coil	13327	Knob
13298	Coil	13328	Knob
13299	Coil	13329	Knob
13300	Coil	13330	Knob
13301	Coil	13331	Knob
13302	Coil	13332	Knob
13303	Coil	13333	Knob
13304	Coil	13334	Knob
13305	Coil	13335	Knob
13306	Coil	13336	Knob
13307	Coil	13337	Knob
13308	Coil	13338	Knob
13309	Coil	13339	Knob
13310	Coil	13340	Knob

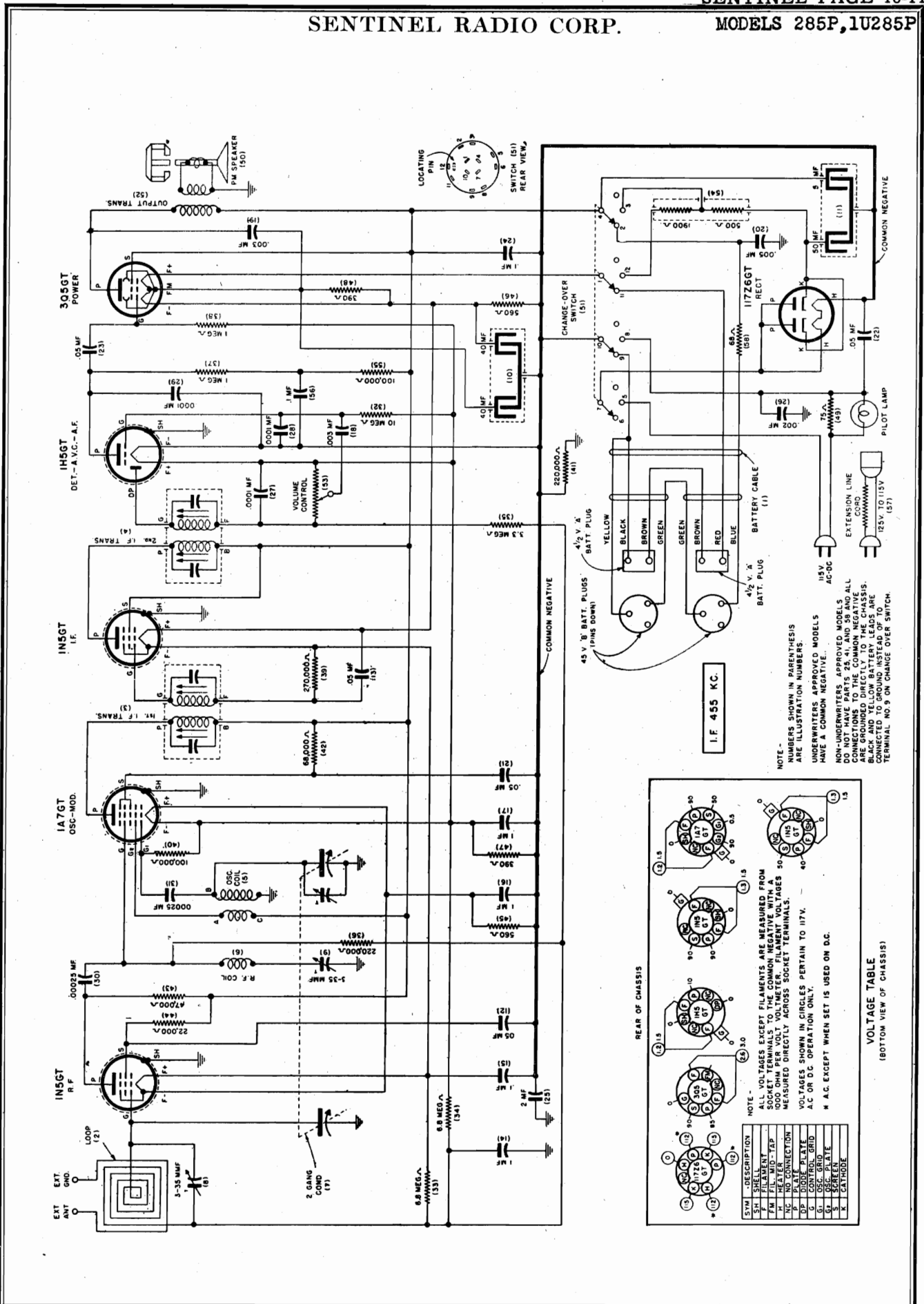
*NOTE: These resistors have been used in first production only, they were replaced with I No. 13249a 500 Ohm Wire Wound and I No. 13287a 270 Ohm 1 Watt Resistor.

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SENTINEL RADIO CORP.

MODELS 285P, 1U285P



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure read tabulations from left to right. Make the adjustment marked (1) first, (2) next, (3) third, etc. Before starting alignment:

- (a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.
- (b) Use an accurately calibrated test oscillator with some type of output measuring device.
- (c) **WHEN ADJUSTING 1650 KC OSCILLATOR TRIMMER AND 455 KC TRIMMER** remove chassis from cabinet and disconnect the white-green and white-black loop connection wires from the 1400 KC loop antenna trimmer. Attach a 1 megohm resistor across these wires and feed output of test oscillator across the 1 megohm resistor.
- (d) **THE 1400 KC LOOP ANTENNA TRIMMER** is accessible through hole in cabinet back. It should be adjusted only after all other adjustments have been made and with the set mounted in the cabinet and the back **IN CLOSED** position. When aligning the 1400 KC trimmer connect test oscillator output to the "ANT" and "GND" clips that are attached to the inside of the cabinet back.

TEST OSCILLATOR			
Steps	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna series with output of test oscillator consisting of:
1	Any point where no interfering signal is received	Exactly 455 K. C.	High side to grid of 1A7GT tube, Low side to chassis (if non-Underwriter Approved) or Common Negative (if Underwriter Approved).
2	Rotate gang condenser to maximum capacity	Exactly 455 K. C.	See paragraph (C) above
3	Rotate gang condenser to minimum capacity	Exactly 1650 K. C.	See paragraph (D) above
4	Approximately 1400 K. C.	Approx. 1400 K. C.	See paragraph (D) above

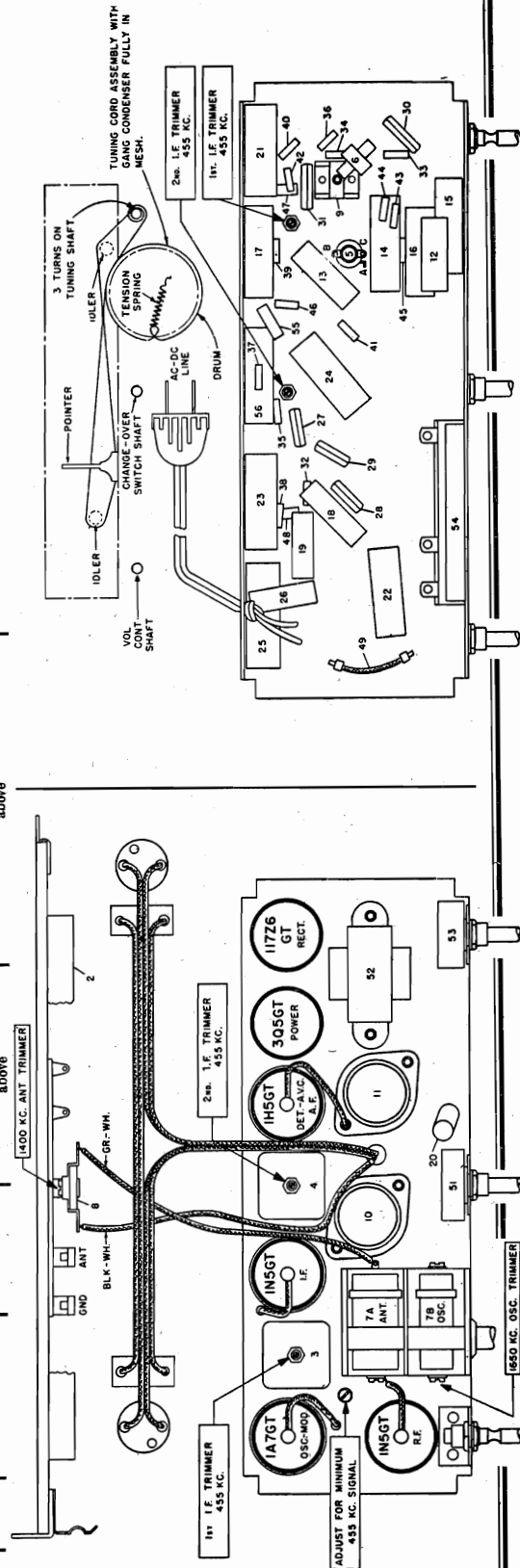
Refer to parts layout diagram for location of trimmers mentioned below:

Adjust each of the 2nd I.F. transformer trimmer adjustment screws for maximum output, then adjust each of the 1st I.F. transformer trimmer adjustment screws for maximum output.

Adjust R. F. coil trimmer for minimum 455 K. C. signal.

Adjust 1650 K. C. oscillator trimmer for maximum output.

Adjust 1400 K. C. antenna trimmer for maximum output.



SENTINEL RADIO CORP.

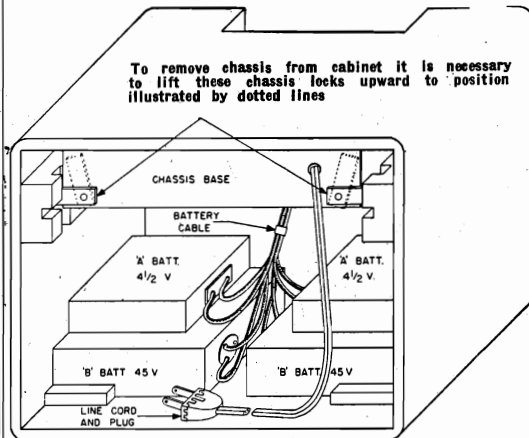
MODELS 285P, 1U285P

PARTS LIST

Illus. No.	Part No.	Part Name	Description	Illus. No.	Part No.	Part Name	Description
1	20E79	Cable	Battery with 2 "B" and 2 "A" Plugs.....	27	23E39	Condenser	Mica, .0001 Mfd.....
2	20E82	Coil	Honey Comb Type Loop with Back.....	28	23E39	Condenser	Mica, .0001 Mfd.....
		or		29	23E39	Condenser	Mica, .0001 Mfd.....
2	20E160-1	Coil	Flat Type Loop with Back.....	30	23E42	Condenser	Mica, .00025 Mfd.....
3	20E53	Coil	1st I.F. Transformer.....	31	23E42	Condenser	Mica, .00025 Mfd.....
4	20E54	Coil	2nd I.F. Transformer.....	32	27E106	Resistor	Carbon, 10 Megohm, 1/3 W.....
5	20E52	Coil	Oscillator.....	33	27E685	Resistor	Carbon, 6.8 Megohm, 1/3 W.....
6	2E19	Coil	R. F.	34	27E685	Resistor	Carbon, 6.8 Megohm, 1/3 W.....
7	24E2	Condenser	Tuning, 2 Gang, 2 Hole Mtg—with Pulley	35	27E335	Resistor	Carbon 3.3 Megohm, 1/3 W.....
		or		36	27E224	Resistor	Carbon, 220,000 Ohm, 1/3 W.....
7	24E18	Condenser	Tuning, 2 Gang, 3 Hole Mtg—with Pulley	37	27E105	Resistor	Carbon, 1 Megohm, 1/3 W.....
8	24E3	Condenser	Trimmer, 3-35 MMF.....	38	27E105	Resistor	Carbon, 1 Megohm, 1/3 W.....
9	24E3	Condenser	Trimmer, 3-35 MMF.....	39	27E1002	Resistor	Carbon, 270,000 Ohm, 1/3 W.....
10	25E4	Condenser	Dry Elec. 40-40 Mfd. 25 Volt.....	40	27E104	Resistor	Carbon, 100,000 Ohm, 1/3 W.....
		or		41	27E224	Resistor	Carbon, 220,000 Ohm, 1/3 W.....
10	25E18	Condenser	Dry Elec. 50-50 Mfd. 150 Volt, Und. Approved Models only.....	42	27E683	Resistor	Carbon, 68,000 Ohm, 1/3 W.....
11	25E1	Condenser	Dry Elec. 50-50 Mfd. 150 Volt.....	43	27E473	Resistor	Carbon, 47,000 Ohm, 1/3 W.....
		or		44	27E223	Resistor	Carbon, 22,000 Ohm, 1/3 W.....
11	25E17	Condenser	Dry Elec. 40-40 Mfd. 25 Volt, Und. Approved Models only.....	45	27E561	Resistor	Carbon, 560 Ohm, 1/3 W.....
12	23E216	Condenser	Tubular, .05 Mfd. 200 Volt.....	46	27E561	Resistor	Carbon, 560 Ohm, 1/3 W.....
13	23E216	Condenser	Tubular, .05 Mfd. 200 Volt.....	47	27E391	Resistor	Carbon, 390 Ohm, 1/3 W.....
14	23E218	Condenser	Tubular, .1 Mfd. 200 Volt.....	48	27E391	Resistor	Carbon, 390 Ohm, 1/3 W.....
15	23E218	Condenser	Tubular, .1 Mfd. 200 Volt.....	49	27E1001	Resistor	Flexible Wire Wound 75 Ohm, 2 W.....
16	23E218	Condenser	Tubular, .1 Mfd. 200 Volt.....	50	1E12	Speaker	5" PM.....
17	23E218	Condenser	Tubular, .1 Mfd. 200 Volt.....	51	29E5	Switch	Changeover.....
18	23E406	Condenser	Tubular, .003 Mfd. 400 Volt.....	52	22E9	Transformer	Output.....
19	23E406	Condenser	Tubular, .003 Mfd. 400 Volt.....			or	
20	23E408	Condenser	Tubular, .005 Mfd. 400 Volt.....	52	22E7	Transformer	Output—Und. Approved Models only.....
21	23E416	Condenser	Tubular, .05 Mfd. 400 Volt.....	53	28E6	Volume Control	1 Megohm.....
22	23E416	Condenser	Tubular, .05 Mfd. 400 Volt.....			or	
23	23E416	Condenser	Tubular, .05 Mfd. 400 Volt.....	53	28E12	Volume Control	1 Megohm—Und. Approved only.....
24	23E418	Condenser	Tubular, .1 Mfd. 400 Volt.....	54	27E1000	Resistor	Fixed Wire Wound 2 Sect. Candohm.....
25	23E421	Condenser	Tubular, .2 Mfd. 400 Volt Und. App'd Only	55	27E104	Resistor	Carbon, 100,000 Ohm, 1/3 W.....
26	23E405	Condenser	Tubular, .002 Mfd. 400 Volt.....	56	23E218	Condenser	Tubular, .1 Mfd. 200 Volt.....
				58	27E680	Resistor	Carbon 68 Ohm 1/3 W.....

MISCELLANEOUS PARTS

Part No.	Part Name	Description	Part No.	Part Name	Description
20E79	Battery Cable	Complete with "A" & "B" Batt. Plugs.....	48E1	Dial Escutcheon	Plastic Escutcheon.....
17E3-2	"A" Battery Plug	2 Prong "A" Battery Plug.....	36E15	Dial Scale	Calibrated Dial Scale.....
17E3-5	"B" Battery Plug	3 Prong "B" Battery Plug.....	65E2	Dial Spring	Tension Spring for Drive Cord.....
7E43-1	Cabinet	Complete Cabinet, less Back.....	68E5	Dial Shaft	Dial Drive Shaft.....
7E44-1	Cabinet Back	Back only, for Honey-Comb Type Loop.....	35E10	Dial Pointer	For Dial.....
7E87-1	Cabinet Back	Back only, for Flat Type Loop.....	37E21-1	Knob	
20E78	Dial Plate Assem.	Dial Back Plate.....	37E21-3	Knob	Marked "AC-DC-OFF-BATT".....
9E4	Dial Crystal	Acetate Crystal.....	20E25	Pilot Lamp Socket	Pilot Lamp Socket Assembly.....
4E1	Dial Cord	18 lb. Dial Drive Cord.....	40E2	Pilot Lamp	6-8 Volt .250 Amp. Type No. 44 Lamp.....



TO INSTALL BATTERIES, OPEN CABINET BACK AND PLACE BATTERIES AS SHOWN.

FOR AC/DC OPERATION, BRING LINE CORD THROUGH OPENING IN RIGHT SIDE OF CABINET BACK.

ALWAYS KEEP BACK CLOSED.

ELECTRIC OPERATION

To operate the receiver on 110 to 120 Volt direct current or 110 to 120 Volt, 50 to 60 Cycle, alternating current:

- (A) Open hinged cabinet back outward by pulling on the tab attached to the right side of the back, then take out the power line cord, and reclose back.
- (B) Insert line cord plug into 110 to 120 Volt AC or DC electric power outlet.
- (C) Turn voltage selector knob to center "AC-DC" position.

If the current supply is DIRECT CURRENT and the radio does not play after it has been turned on for approximately one minute, reverse radio plug connection at electric power receptacle.

INSTALLATION OF REQUIRED BATTERIES

Diagram shows proper location and connections of the following required types of batteries.

- 2 Sentinel number 38A 4 1/2 Volt "A" Batteries or equivalent such as Ray-O-Vac type 83A, etc.
- 2 Sentinel number 3870 45 Volt "B" Batteries or equivalent such as Ray-O-Vac type 7830.

POWER SUPPLY

THIS RADIO CAN BE OPERATED ON EITHER:

110 TO 120 VOLTS DIRECT CURRENT

OR

110 TO 120 VOLT, 50 TO 60 CYCLE ALTERNATING CURRENT

OR

BATTERIES—2 - 4 1/2 VOLT "A" AND 2 - 45 VOLT "B"

SENTINEL RADIO CORP.

ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure, read tabulations from left to right. Make the adjustment marked (1) first, (2) next, (3) third. **ALWAYS HAVE METAL BOTTOM PLATE MOUNTED ON CHASSIS WHEN ALIGNING SET.**

Before starting alignment:

- (A) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial indicator must be exactly even with the bottom edge of the large 5 in the 55 calibration number at the low frequency end of the dial scale. If dial indicator does not point exactly to the bottom edge of the large 5, move knob to correct position.
- (B) Use an accurately calibrated test oscillator with some type of output measuring device.
- (C) **WHEN ADJUSTING THE 1620 KC OSCILLATOR TRIMMER**, remove chassis from cabinet and disconnect the loop connection wires from the loop. Attach a 1 megohm resistor across these connections and feed output of test oscillator across the 1 megohm resistor.
- (D) **THE 1400 KC LOOP ANTENNA TRIMMER** should be adjusted only after all other adjustments have been made and with the set mounted in the cabinet, and the loop in an upright position. When aligning the 1400 KC Antenna Trimmer, couple test oscillator to receiver loop by: (1) make loop consisting of five to ten turns of No. 20 to No. 30 size wire, wound on a 2" or 3" form; (2) connect this loop across output of test oscillator; (3) place test oscillator loop near radio loop. **BE SURE THAT NEITHER LOOP MOVES WHILE ALIGNING.**

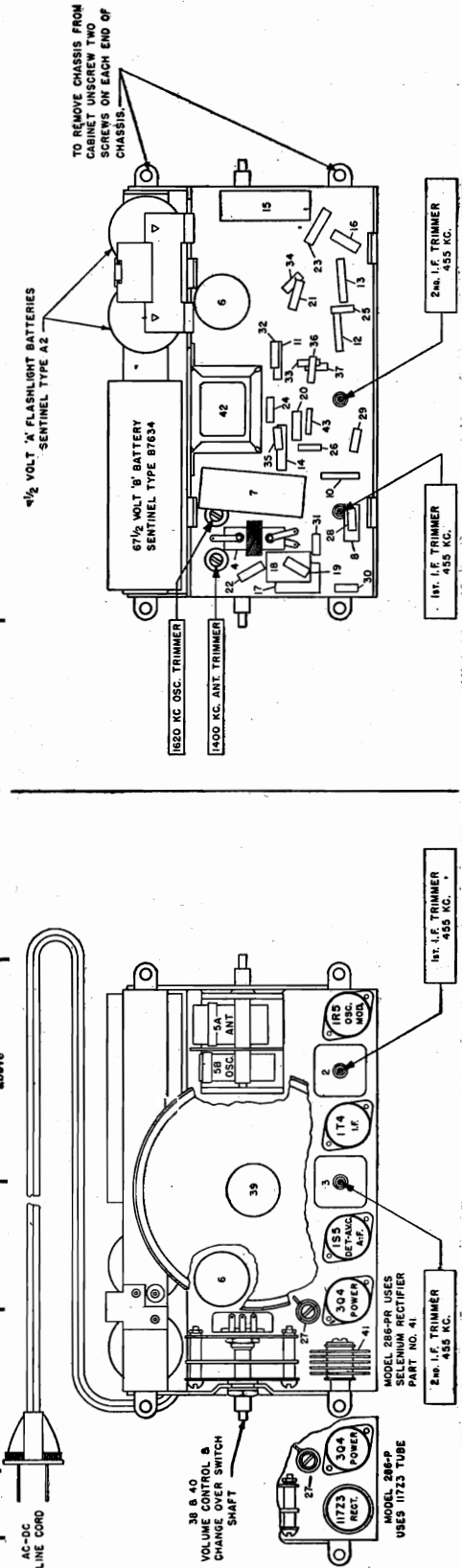
TEST OSCILLATOR			
Steps	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:
1	Any point where no interfering signal is received	Exactly 455 K. C.	0.2 Mfd. Condenser
2	Rotate gang condenser to minimum capacity	Exactly 1620 K. C.	See paragraph (C) above
3	Approximately 1400 K. C.	Approx. 1400 K. C.	See paragraph (D) above

Refer to parts layout diagram for location of trimmers mentioned below:

Adjust each of the 2nd I.F. transformer trimmer adjustment screws for maximum output, then adjust each of the 1st I.F. transformer trimmer adjustment screws for maximum output.

Adjust 1620 K. C. oscillator trimmer for maximum output.

Adjust 1400 K. C. antenna trimmer for maximum output.



PARTS LIST

Illus. No.	Part No.	Part Name	Description	List Price	Illus. No.	Part No.	Part Name	Description	List Price
1	20E134	Antenna	Loop with Cabinet Lid Assem.....	\$3.55	24	27E101-7	Resistor	Carbon, 100 Ohm, 1/4 W.....	.07
2	20E125	Coil	1st I.F. Transformer.....	3.00	25	27E471-7	Resistor	Carbon, 470 Ohm, 1/4 W.....	.06
3	20E125	Coil	2nd I.F. Transformer.....	3.00	26	27E561-7	Resistor	Carbon, 560 Ohm, 1/4 W.....	.06
4	20E127	Coil	Oscillator.....	1.00	27	27E1003	Resistor	Wire Wound 1750 and 610 Ohms, 7 W.....	.85
5	24E20	Condenser	Tuning, 2 Gang.....	3.40	28	27E682-7	Resistor	Carbon, 6,800 Ohm, 1/4 W.....	.06
6	25E13	Condenser	Tubular, Dry Elect. 40-40 Mfd. 150 Volt.....	1.15	29	27E223-7	Resistor	Carbon, 22,000 Ohm, 1/4 W.....	.06
7	25E12	Condenser	Tubular, Dry Elect. 100 Mfd. 10 Volt.....	.80	30	27E683-7	Resistor	Carbon, 68,000 Ohm, 1/4 W.....	.06
8	23E2004-5	Condenser	Tubular, .01 Mfd. 150 V.....	.40	31	27E475-7	Resistor	Carbon, 4.7 Megohm, 1/4 W.....	.06
10	23E2004-5	Condenser	Tubular, .01 Mfd. 150 V.....	.40	32	27E271-7	Resistor	Carbon, 270 Ohm, 1/4 W.....	.08
11	23E2004-5	Condenser	Tubular, .01 Mfd. 150 V.....	.40	33	27E105-7	Resistor	Carbon, 1 Meg Ohm, 1/4 W.....	.06
12	23E2004-5	Condenser	Tubular, .01 Mfd. 150 V.....	.40	34	27E105-7	Resistor	Carbon, 1 Meg Ohm, 1/4 W.....	.06
13	23E2004-5	Condenser	Tubular, .01 Mfd. 150 V.....	.40	35	27E475-7	Resistor	Carbon, 4.7 Meg Ohm, 1/4 W.....	.06
14	23E2004-7	Condenser	Tubular, .05 Mfd. 150 V.....	.40	36	27E475-7	Resistor	Carbon, 4.7 Meg Ohm, 1/4 W.....	.06
15	23E416	Condenser	Tubular, .05 Mfd. 400 V.....	.25	37	27E475-7	Resistor	Carbon, 4.7 Meg Ohm, 1/4 W.....	.06
16	23E2004-2	Condenser	Tubular, .002 Mfd. 150 V.....	.40	38	28E14	Vol. Control	2 Megohm.....	.80
17	23E2004-8	Condenser	Tubular, .1 Mfd. 150 V.....	.45	39	1E19	Speaker	4 Inch P.M.....	4.00
18	23E2004-8	Condenser	Tubular, .1 Mfd. 150 V.....	.45	40	29E11	Switch	Power Selector.....	2.25
19	23E9	Condenser	Mica, .0001 Mfd.....	.20	41	57E1	Rectifier	Selenium (Used in Model 286PR only).....	2.00
20	23E9	Condenser	Mica, .0001 Mfd.....	.20		OR	Selenium (Used in Model 286PR only).....	2.00	
21	23E9	Condenser	Mica, .0001 Mfd.....	.20	41	57E1-4	Rectifier	Model 286PR only.....	2.00
22	23E8	Condenser	Mica, .000025 Mfd.....	.23	42	22E16	Transformer	Output.....	2.25
23	27E680-2	Resistor	Carbon, 68 Ohm 1/2 W. (used in Model 286PR only).....	.0743	27E106-7	Resistor	Carbon, 10 Megohm, 1/4 W.....	.06	

MISCELLANEOUS PARTS

Part No.	Part Name	Description	List Price	Part No.	Part Name	Description	List Price
20E128	"A" Batt. Con. Bracket Assembly	With 4 No. 10E43 Trimount Studs.....	.60	30E25-1	Cab. Center Section	Less Lid and Bottom Assemblies, with Handle, Spkr. Screen, Lid Catch & Push Button.....	4.30
20E130-1	Cab. Assembly	Complete Cabinet Assembly with Lid & Loop, Handle, Lid Catch & Push Button Assembly & Bottom Assembly.....	9.00	20E131	Chassis Plate	Bottom Shield Plate for Chassis.....	.85
20E134	Cab. Lid. Assembly	Lid Assembly with Loop and Hinges.....	3.55	20E136-1	Hinge	Hinge & Spring Assembly with 2 No. 82E36-F10 No. 4 24x1/4 Mtg. Screws.....	.40
20E135-1	Cab. Bottom	Bottom Assem. with Locking Slotted Head Stud.....	2.10	37E44-1	Knob	Calibrated Dial Knob.....	.88
				37E34-1	Knob	"Off-AC-DC-Batt.".....	.85
				37E32-1	Knob	Tuning and Volume Knobs.....	.53
				20E129	"B" Batt. Connector	B- and B+ Batt. Connector Assembly.....	.50

HARDWARE

Part No.	Part Name	Description	List Price	Part No.	Part Name	Description	List Price
15E41	Lid Catch Bracket	Bracket for Mounting Lid Catch, With 2 No. 82E3-F10 Screws.....	.12	78E142-F50	Screw	No. 2 56x3/16 Rec. Oval Hd. B.M.....	1.25/C
20E138	Lid Catch	Lid Catch with Screw.....	.25	82E3-F10	Screw	No. 4 24x1/4 Rec. Hd. Type 25.....	.93/C
37E35-1	Lid Catch Button	Button for Lid Catch with No. 13E3-F10 No. 4 40x1/4 Hex Screw and No. 11E3-F10 Lockwasher.....	.14	82E36-F10	Screw	No. 6 20x5/16 Rec. Hd. Type 25.....	2.25/C
55E22-1	Handle	Leather.....	.50	10E41	Stud	Trimount for Mounting Chassis Bottom Shield.....	1.15/C
55E21-1	Handle Bracket	Bracket for Mounting Handle.....	.25	10E43	Stud	Trimount for Mounting "A" Batt. Contact Brkt. Assem.....	1.15/C
71E42-F10	Screw	No. 4 40x3/16 Slot B.H.I.M.....	.30/C	65E8	Spring	Lid Index Spring.....	.09
				66E12-1	Screen	Speaker Screen Grille.....	.60

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

VOLTAGE SELECTOR

For BATTERY operation, turn to maximum right hand "BATT" position.
For AC-DC operation, turn to middle "AC-DC" position.

BE SURE TO TURN TO MAXIMUM LEFT HAND "OFF" POSITION WHEN THROUGH LISTENING.

VOLUME CONTROL

Turn clockwise to increase volume.

TO OPEN LID

Depress this button.

LOOP AERIAL

Always have Loop in upright position when operating set.

TUNING CONTROL

Use this control to tune receiver to desired station.

67 1/2 Volt "B" Battery SENTINEL Type B7634

TWO 1 1/2 Volt "A" Batteries SENTINEL Type A2
TO REMOVE: Press lightly on battery contact plate.

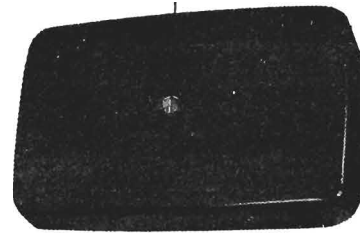
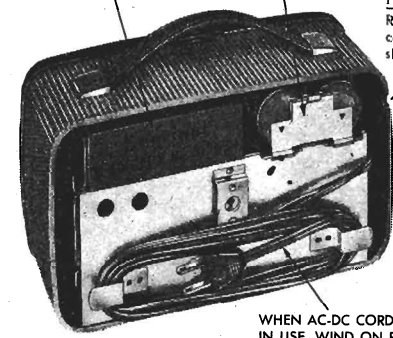
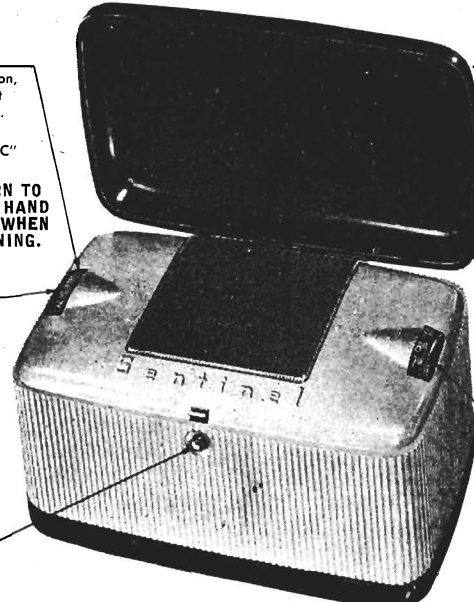
FOR AC-DC OPERATION

Remove back, unwind line cord from reel, place in slot and close back.

WHEN AC-DC CORD IS NOT IN USE, WIND ON REEL.

TO REMOVE CABINET BACK

Turn slotted screw with thin dime or screw driver and gently separate.



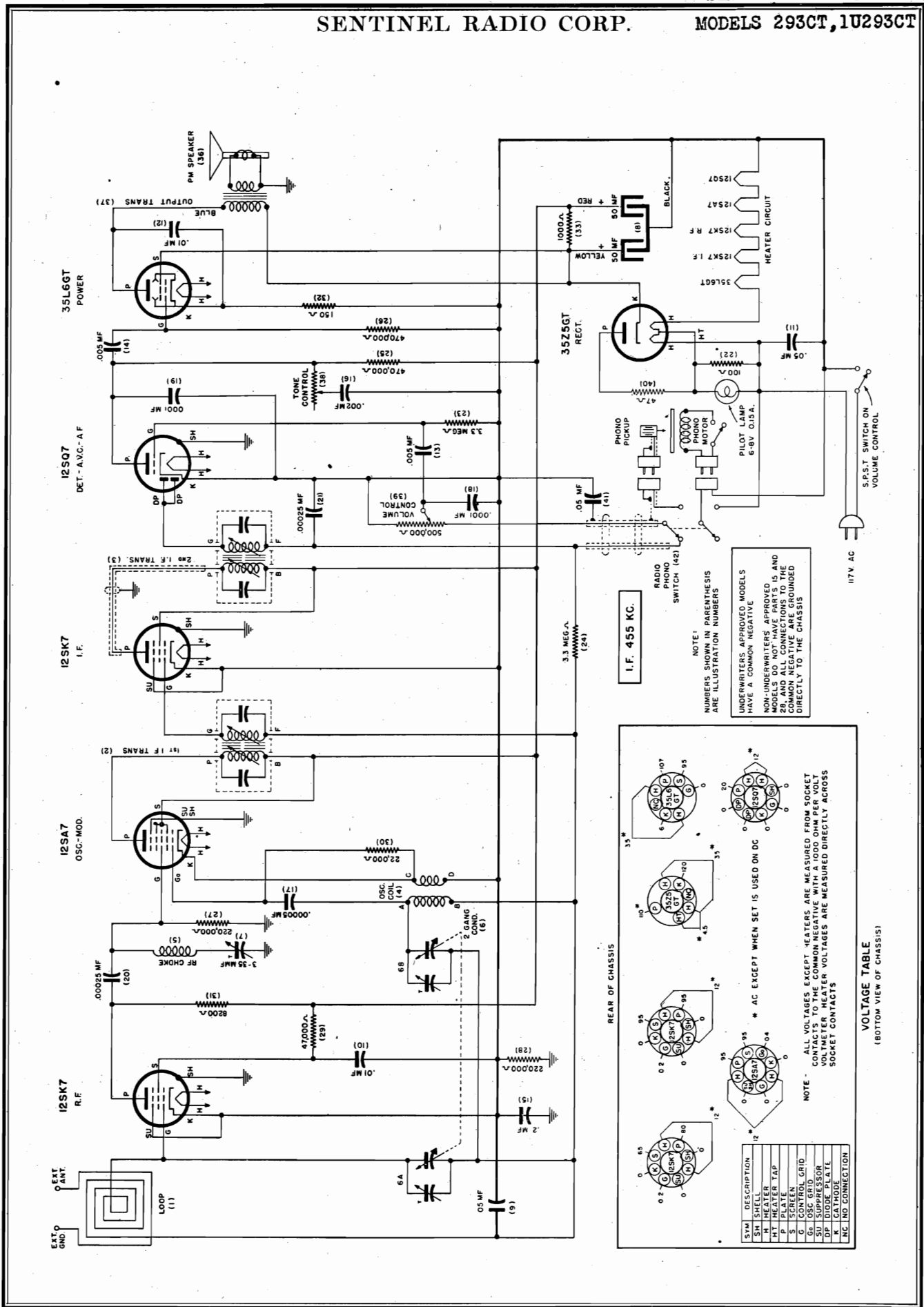
INSTALLATION OF REQUIRED BATTERIES

Diagram shows proper location and connections of the following required types of batteries:

- Two SENTINEL, Type A2, 1 1/2 Volt "A" batteries, or equivalent, such as Ray-O-Vac Type No. 2, Eveready 750, etc.
- One SENTINEL Type B7634, 67 1/2 Volt "B" battery, or equivalent, such as Ray-O-Vac Type 4367, Eveready 467, etc.

SENTINEL RADIO CORP.

MODELS 293CT, 1U293CT



NOTE:
NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS

UNDERWRITERS APPROVED MODELS HAVE A COMMON NEGATIVE

NON-UNDERWRITERS APPROVED MODELS INCLUDE ADVANTAGES AND 28, AND ALL CONNECTIONS TO THE COMMON NEGATIVE ARE GROUNDED DIRECTLY TO THE CHASSIS

REAR OF CHASSIS

NOTE - ALL VOLTAGES EXCEPT HEATERS ARE MEASURED FROM SOCKET CONTACTS TO THE COMMON NEGATIVE WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES ARE MEASURED DIRECTLY ACROSS SOCKET CONTACTS

SYM	DESCRIPTION
SH	SHELL
H	HEATER TAP
P	PLATE
S	SCREEN
G	CONTROL GRID
D	DIODE
SO	SUPPLY
DP	DIODE PLATE
K	CATHODE
NC	NO CONNECTION

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

ALIGNMENT PROCEDURE

For Alignment procedure read tabulations from left to right, and make the adjustment marked (1) first, (2) next, (3) third. **IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET. BE SURE THAT IT DOES NOT MOVE WHILE ALIGNING.**

When adjusting 1650 kilocycle oscillator trimmer, 455 K.C. R.F. trimmer and 1400 kilocycle antenna trimmer, connect test oscillator to loop external antenna and ground connections with a .0002 Mfd. condenser in series with antenna lead.

TEST OSCILLATOR			
Steps	Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:
	Any point where no interfering signal is received	Exactly 455 K. C.	0.2 Mfd. Condenser
1	Rotate gang condenser to maximum capacity	Exactly 455 K. C.	.0002 Mfd. Condenser
2	Rotate gang condenser to minimum capacity	Exactly 1650 K. C.	.0002 Mfd. Condenser
3	Approximately 1400 K. C.	Approx. 1400 K. C.	.0002 Mfd. Condenser

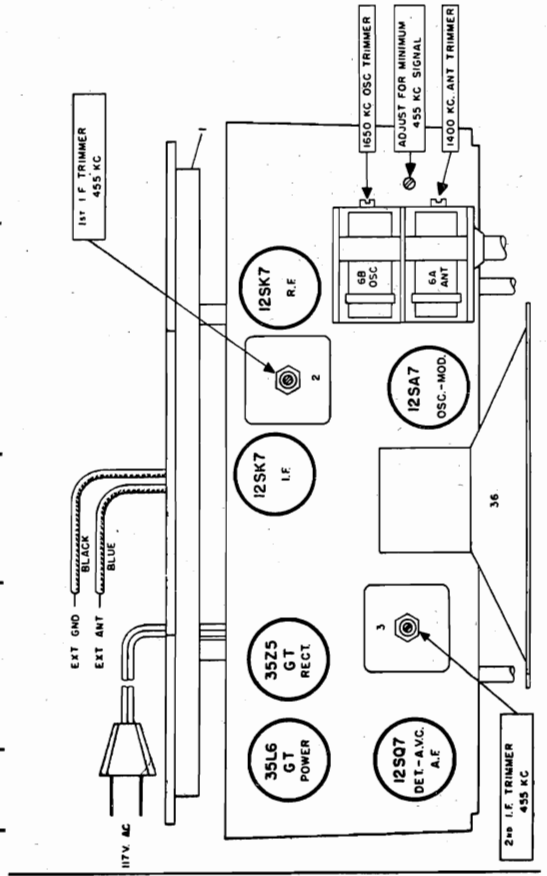
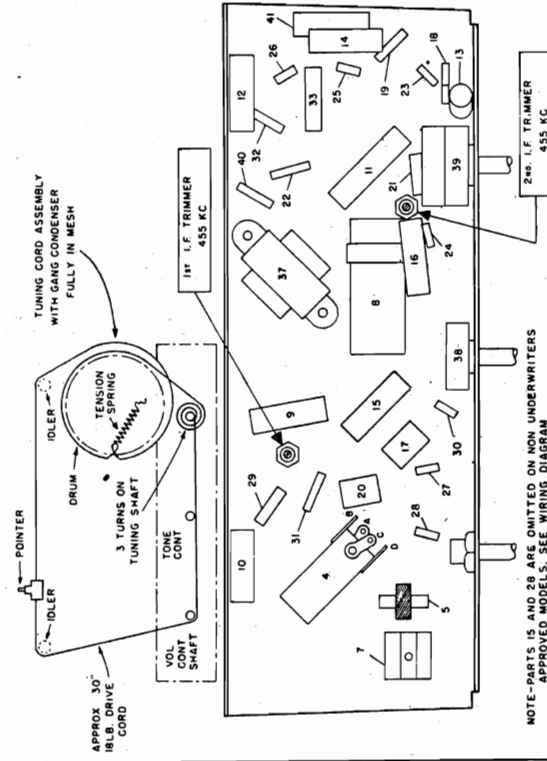
Refer to parts layout diagram for location of trimmers mentioned below:

Adjust each of the 2nd I.F. transformer trimmer adjustment screws for maximum output, then adjust each of the 1st I.F. transformer trimmer adjustment screws for maximum output.

Adjust R. F. coil trimmer for minimum 455 K. C. signal.

Adjust 1650 K. C. oscillator trimmer for maximum output.

Adjust 1400 K. C. antenna trimmer for maximum output.



SENTINEL RADIO CORP.

MODELS 293CT, 1U293CT
MODELS 284GA, 1U284GA

RADIO PARTS LIST

GROUND

When a regular aerial is used, best results will be obtained with a ground attached to the black lead coming out of the rear of the chassis.

WARNING—DO NOT ATTACH A GROUND DIRECT TO THE RADIO CHASSIS OR RECORD CHANGER. Any external ground connection to any metal part of the chassis or record changer may cause a short and possible damage.

FUNCTION OF CONTROLS

THE LEFT HAND KNOB controls the volume control and off-and-on switch.

THE RIGHT HAND KNOB is the station selector.

THE CENTER KNOB is the tone control.

THE "PHONO-RADIO" SWITCH is located in the lower left hand corner of the record-changer compartment.

MODEL 293-CT, 1U-293-CT

Illus. No.	Part Name	Description	List Price
1	20E67	Antenna Loop & Mounting Assembly	\$1.70
2	20E21	Coil	2.75
3	20E261	1st I. F. Transformer	2.75
4	20E22	Coil	2.75
5	20E64	Oscillator	1.10
6	24E8	Condenser	3.50
7	24E6	Condenser	3.50
8	25E6	Condenser	1.15
9	23E216	Condenser	.18
10	23E211	Condenser	.20
11	23E416	Condenser	.18
12	23E411	Condenser	.18
13	23E408	Condenser	.18
14	23E408	Condenser	.18
15	23E421	Condenser	.30
16	23E405	Condenser	.18
17	23E37	Condenser	.22
18	23E39	Condenser	.25
19	23E39	Condenser	.25
20	23E42	Condenser	.25
21	23E42	Condenser	.25
22	27E101-2	Resistor	.08
23	27E335	Resistor	.07
24	27E335	Resistor	.07
25	23E474	Resistor	.07
26	27E474	Resistor	.07
27	27E224	Resistor	.08
28	27E224	Resistor	.08
29	27E473	Resistor	.07
30	27E223	Resistor	.08
31	27E822	Resistor	.07
32	27E151	Resistor	.08
33	27E102-3	Resistor	.11
34	1E1	Speaker	4.00
35	22E8	Transformer	1.70
36	28E8	Tone Control	.60
37	28E7	Volume Control	.80
38	27E470-2	Resistor	.20
39	23E416	Condenser	.20
40	20E203	Switch	.70
41	20E203	Switch	.70
42	20E203	Switch	.70

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MISCELLANEOUS PARTS

Part No.	Description	List Price
40E1	Bulb	.10
6E2	Dial Cord Spring	.10
4E1	Dial Cord	.05
20E225-7	Dial Shaft	.40
20E65	Dial Back Plate	.90
36E16	Dial Scale	.60
35E13	Dial Pointer	.15
37E21-17	Knob	.10
20E184-1	Socket Assem.	.55
20E185-1	Socket Assem.	.64

PARTS LIST

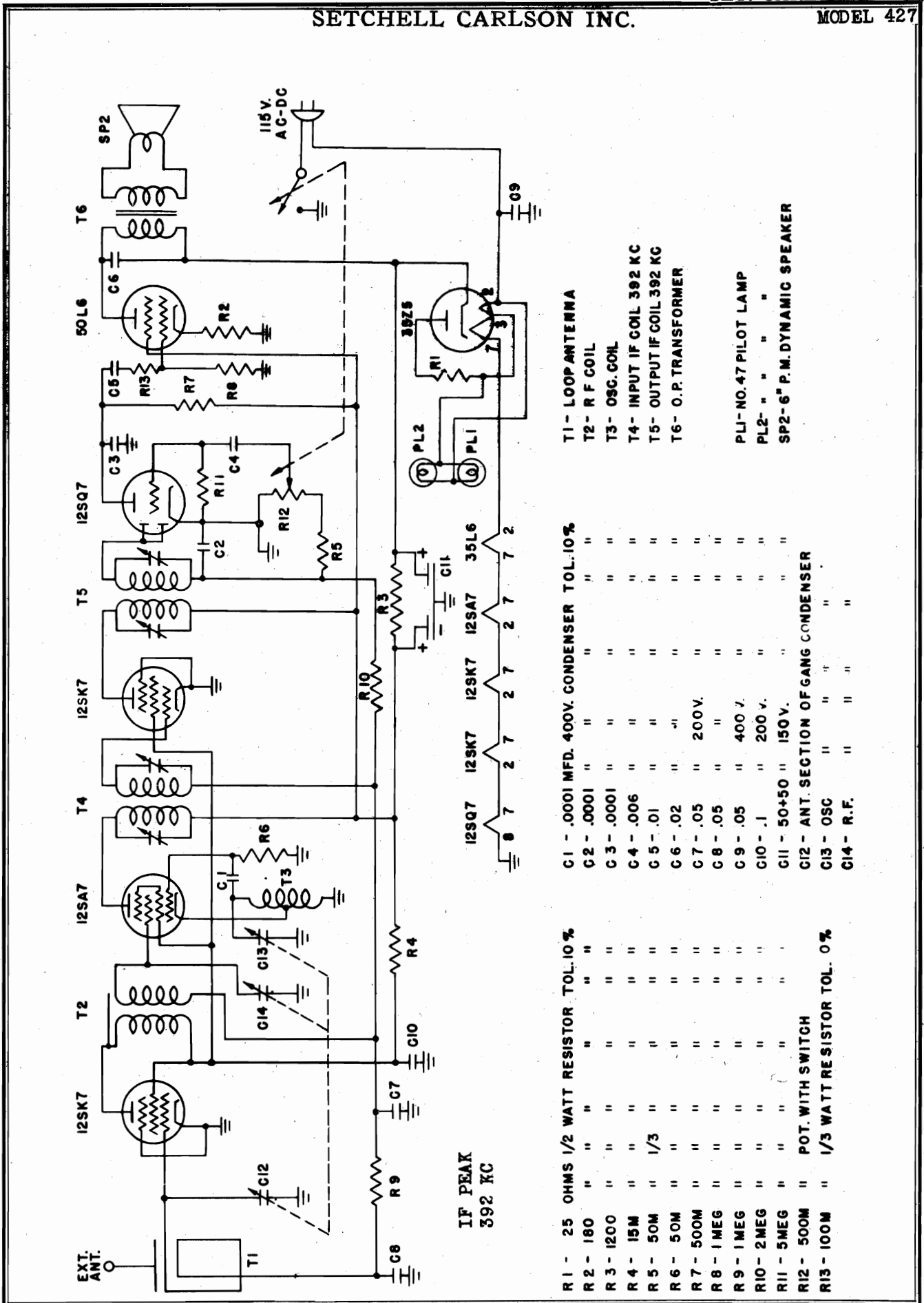
Illus. No.	Part Name	Description
1	20E24	Antenna
2	20E21	Coil
2	20E261	Coil
3	20E22	Coil
3	20E261-2	Coil
4	20E162	Coil
5	24E2	Condenser
5	24E18	Condenser
7	25E1	Condenser
7	25E18	Condenser
8	23E421	Condenser
9	23E416	Condenser
10	23E418	Condenser
11	23E211	Condenser
12	23E414	Condenser
13	23E211	Condenser
14	23E39	Condenser
15	23E39	Condenser
16	23E39	Condenser
17	23E106	Resistor
18	27E335	Resistor
19	27E335	Resistor
20	27E474	Resistor
21	27E224	Resistor
22	27E224	Resistor
23	27E223	Resistor

MODEL 284GA, 1U284GA

Illus. No.	Part Name	Description
24	27E222-3	Resistor
25	27E151	Resistor
26	27E101	Resistor
27	27E470-2	Resistor
28	23E39	Condenser
29	27E683	Resistor
30	1E1	Speaker
31	28E1	Vol. Control
32	22E2	Transformer
33	23E416	Condenser
34	23E418	Condenser
35	20E203-2	Switch
35	20E203-4	Switch

MISCELLANEOUS PARTS

Part No.	Description
7E106	Cabinet
7E59	Cabinet Back
41E1	Line Cord
8E14-1	Dial Plate Assembly
4E1	Dial Cord
36E10-2	Dial Scale
20E225-3	Dial Shaft
35E8	Dial Pointer
6E2	Dial Spring
37E21-1	Knob
20E43	Pilot Lamp Socket
40E1	Pilot Lamp

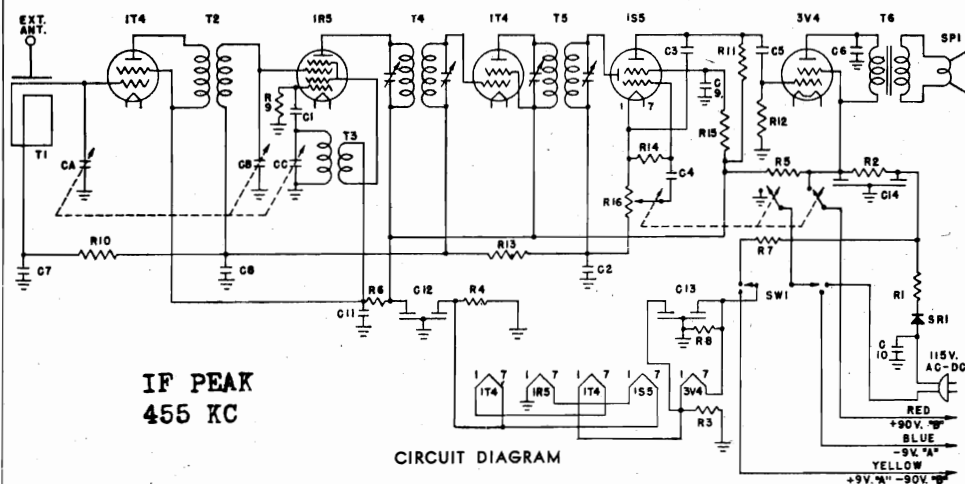


- T1 - LOOP ANTENNA
- T2 - R F COIL
- T3 - OSC. COIL
- T4 - INPUT IF COIL 392 KC
- T5 - OUTPUT IF COIL 392 KC
- T6 - O.P. TRANSFORMER
- PL1 - NO. 47 PILOT LAMP
- PL2 - " " " "
- SP2 - 6" P.M. DYNAMIC SPEAKER

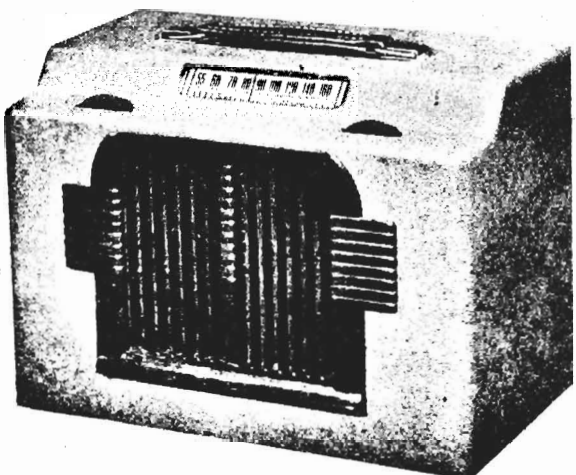
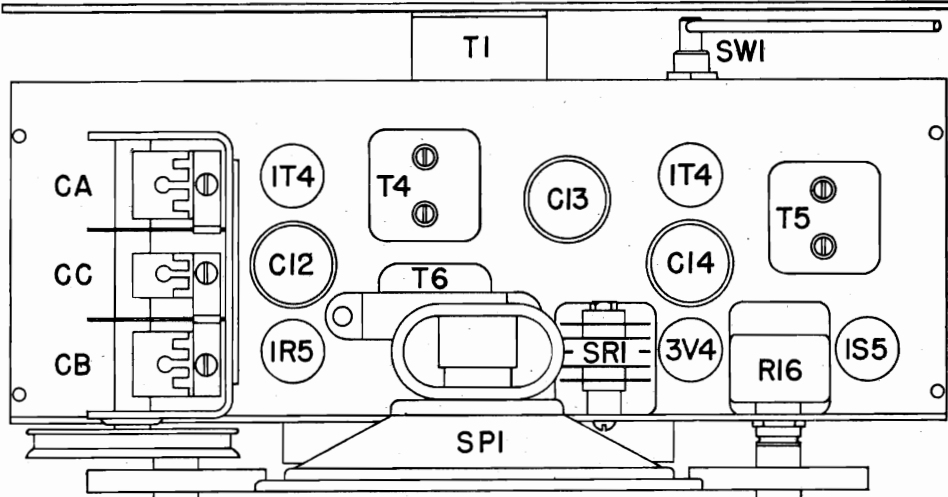
C1 - .0001 MFD. 400V. CONDENSER	TOL. 10%
C2 - .0001 " " " "	" " " "
C3 - .0001 " " " "	" " " "
C4 - .006 " " " "	" " " "
C5 - .01 " " " "	" " " "
C6 - .02 " " " "	" " " "
C7 - .05 " " " "	" " " "
C8 - .05 " " " "	" " " "
C9 - .05 " " " "	" " " "
C10 - .1 " " " "	" " " "
C11 - 50+50 " " " "	" " " "
C12 - ANT. SECTION OF GANG CONDENSER	" " " "
C13 - OSC " " " "	" " " "
C14 - R.F. " " " "	" " " "

R1 - 25 OHMS	1/2 WATT	RESISTOR	TOL. 10%
R2 - 180 " " " "	" " " "	" " " "	" " " "
R3 - 1200 " " " "	" " " "	" " " "	" " " "
R4 - 15M " " " "	" " " "	" " " "	" " " "
R5 - 50M " " " "	1/3 " " " "	" " " "	" " " "
R6 - 50M " " " "	" " " "	" " " "	" " " "
R7 - 500M " " " "	" " " "	" " " "	" " " "
R8 - 1MEG " " " "	" " " "	" " " "	" " " "
R9 - 1MEG " " " "	" " " "	" " " "	" " " "
R10 - 2MEG " " " "	" " " "	" " " "	" " " "
R11 - 5MEG " " " "	" " " "	" " " "	" " " "
R12 - 500M " " " "	POT. WITH SWITCH	" " " "	" " " "
R13 - 100M " " " "	1/3 WATT	RESISTOR	TOL. 0%

IF PEAK
392 KC

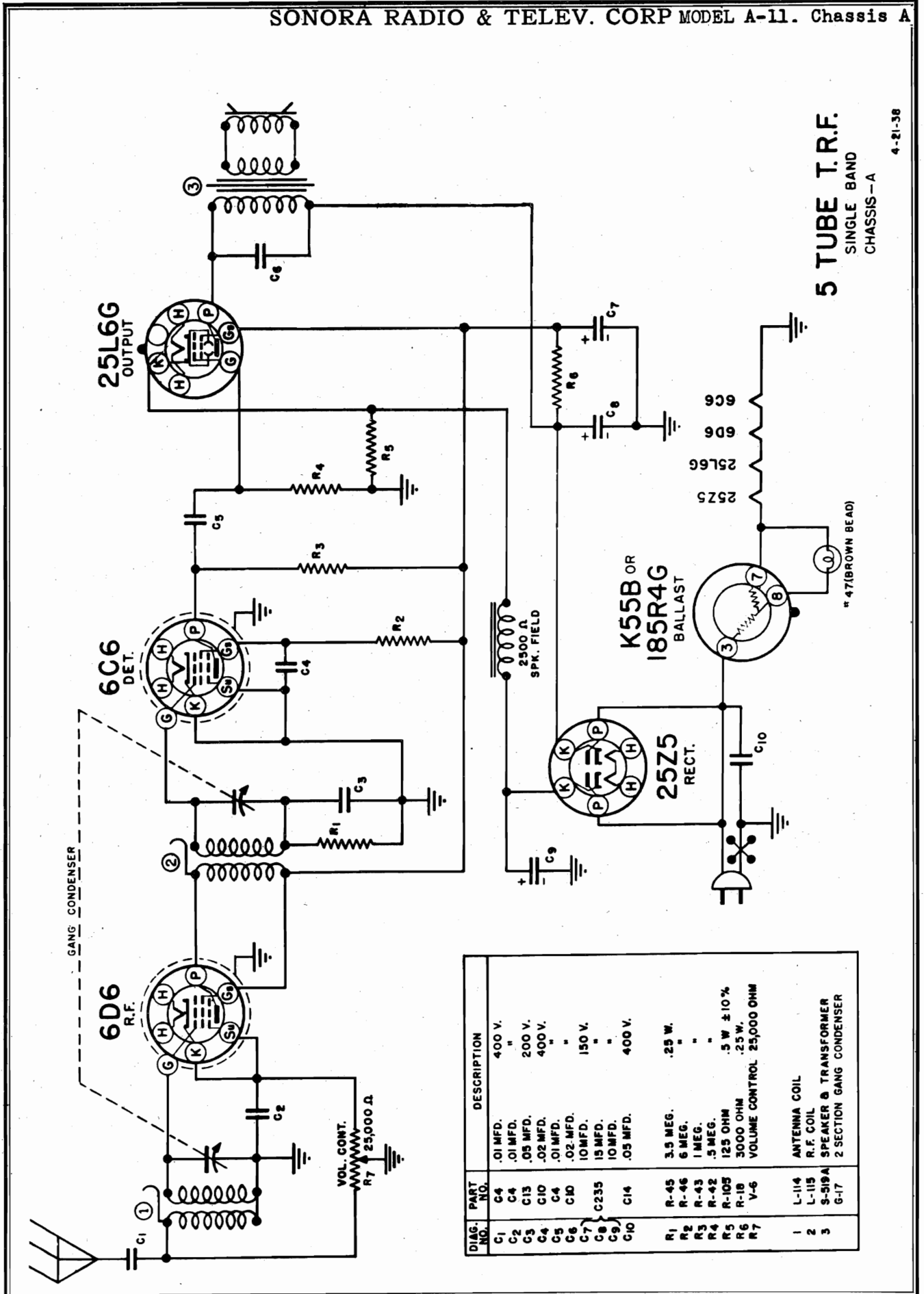


- T1 — LOOP ANTENNA
 - T2 — R. F. COIL
 - T3 — OSC. COIL
 - T4 — 455 KC. IF. COIL
 - T5 — 455 KC. IF. COIL
 - T6 — OUTPUT TRANSFORMER
 - SPI — 5" PM SPEAKER
 - SW1 — 2 POLE 2 POS. SWITCH
 - SRI — SELENIUM RECTIFIER
- ALIGNMENT PROCEDURE**
 I. F. Alignment 455 KC (Connect to IR5 Grid) Loop and R. F. Alignment—1400, 1000 and 600 KC. Dial Pointer Setting—535 KC with fully closed condenser.



- Three-gang tuning condenser (selectivity).
- Tuned R. F. stage (sensitivity).
- Super-het circuit.
- Band coverage—540 KC to 1650 KC.
- Five miniature tubes—
 1—IT4-RF, 1—IR5-Mixer, 1—IT4-IF, 1—IS5-Det. and 1st Audio, 1—3V4-Pr. output. Plus selenium rectifier (6-tube performance).
- Instant heating—no waiting for tube warm-up.
- Battery life—approximately 170 hours.
 Burgess No. F6A60, Eveready No. 753, Ray-O-Vac No. AB994.
- Trigger switch automatically prevents battery drain when operating on A.C. or D.C.
- Five-inch P. M. dynamic speaker—1.47 oz. Alnico 5.
- Sealed filter for long-life hum-free operation.
- Finger-tip controls.
- Inverted aluminum chassis.
- Heavy leather snap-down handle.
- Weight with batteries 12 1/2 lbs.
- Size: 11 3/4" wide, 6 3/4" deep, 8 1/4" high.
- Color optional: Brown with walnut grille or maroon with ivory grille.

SONORA RADIO & TELEV. CORP MODEL A-11. Chassis A

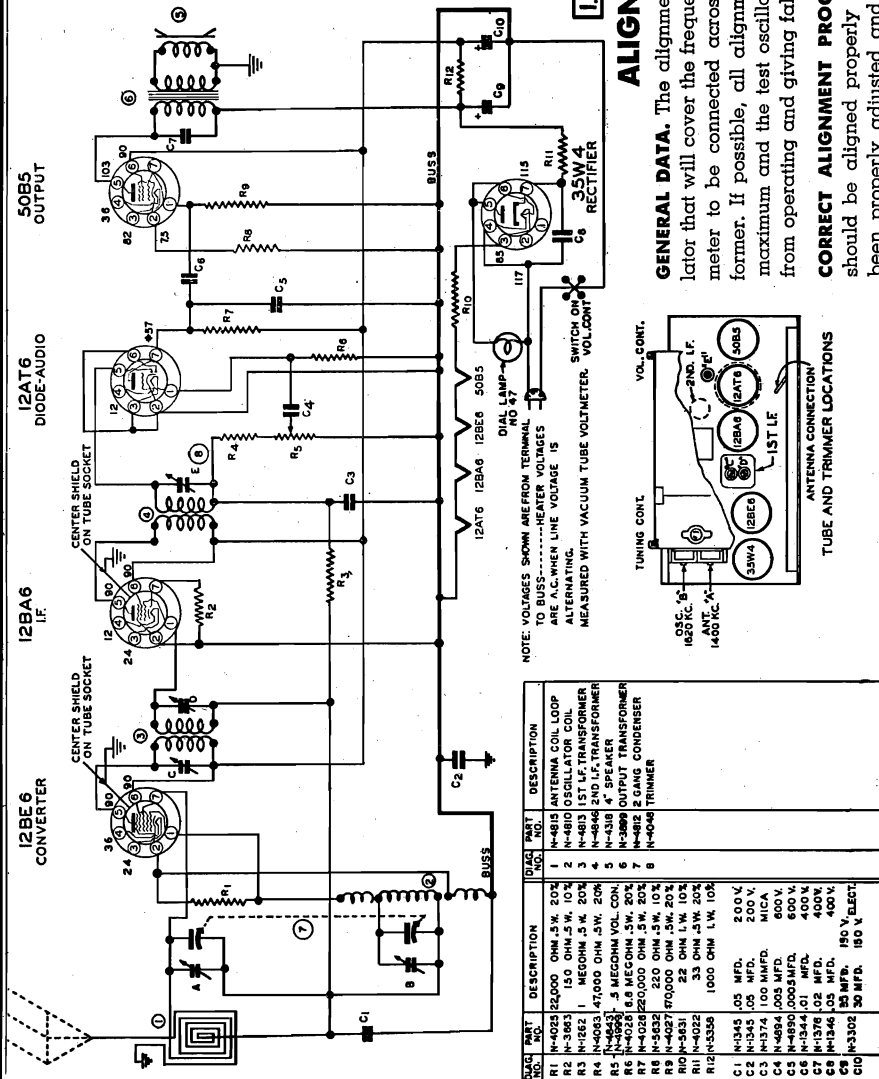


DIAG. NO.	PART NO.	DESCRIPTION
C1	G4	.01 MFD. 400 V.
C2	C4	.01 MFD. "
C3	C13	.05 MFD. 200 V.
C4	C10	.02 MFD. 400 V.
C5	C4	.01 MFD. "
C6	C10	.02 MFD. 150 V.
C7	C235	10 MFD. "
C8	C10	10 MFD. "
C9	C14	.05 MFD. 400 V.
C10	C10	.05 MFD. 400 V.
R1	R-45	3.5 MEG. .25 W.
R2	R-46	6 MEG. "
R3	R-43	1 MEG. "
R4	R-42	.5 MEG. "
R5	R-105	125 OHM .5 W. ± 10%
R6	R-18	3000 OHM .25 W.
R7	V-6	VOLUME CONTROL 25,000 OHM
1	L-114	ANTENNA COIL
2	L-115	R.F. COIL
3	S-519A	SPEAKER & TRANSFORMER
	G-17	2 SECTION GANG CONDENSER

5 TUBE T.R.F.
SINGLE BAND
CHASSIS-A

4-21-38

ALIGNMENT PROCEDURE FOR
 MODEL RBMU-176, RK/RKRU-215
 SCHEMATIC FOR MODEL RBMU-176



ALIGNMENT PROCEDURE

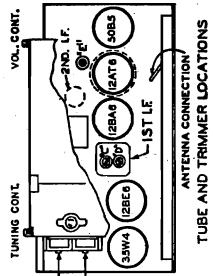
GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective position on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12BE6) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on the gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

I.F. 455KC.

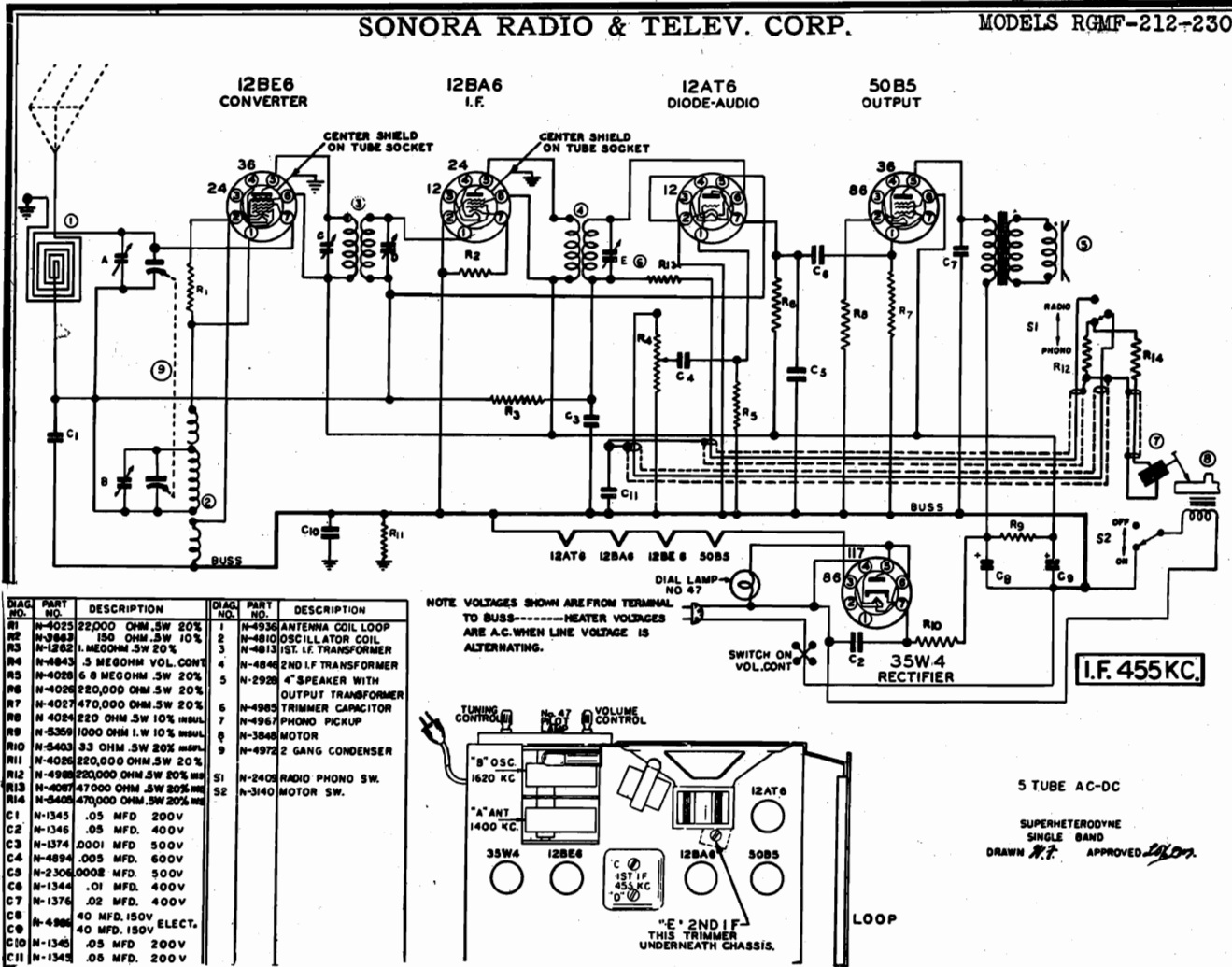


Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

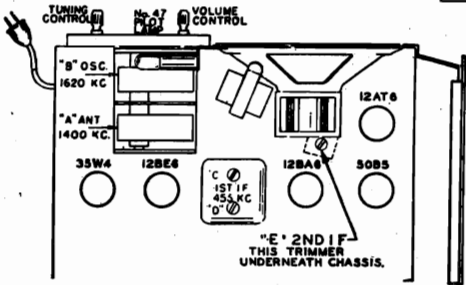
SONORA RADIO & TELEV. CORP.

MODELS RGMF-212-230



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R1	N-4025	22,000 OHM .5W 20%	1	N-4936	ANTENNA COIL LOOP
R2	N-3883	150 OHM .5W 10%	2	N-4810	OSCILLATOR COIL
R3	N-1262	1.1 MEGOHM .5W 20%	3	N-4813	1ST. I.F. TRANSFORMER
R4	N-4843	.5 MEGOHM VOL. CONT.	4	N-4846	2ND I.F. TRANSFORMER
R5	N-4028	6.8 MEGOHM .5W 20%	5	N-2928	4\"/>

NOTE VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS-----HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.



CONNECTING THE UNIT

Before connecting the unit, be sure that your house is wired for the voltage and current for which the set is designed. If in doubt, call your local power company for the necessary information. Connecting the set to a supply outlet furnishing the wrong type of current will result in improper operation or damage.

POWER SUPPLY. This Radio-Phonograph is designed to operate on an alternating current supply (AC) ranging from 110 to 120 volts.

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

The current must be 60 cycles. Never plug into a D.C. outlet.

GROUND. No ground connection should be used when operating this receiver. The receiver gets its ground connection through the power line and any external connection to the chassis may cause a short circuit and consequent damage.

CAUTION. Do not place receiver on hot objects such as stoves, radiators, etc. Heat will damage the internal components of the unit.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near

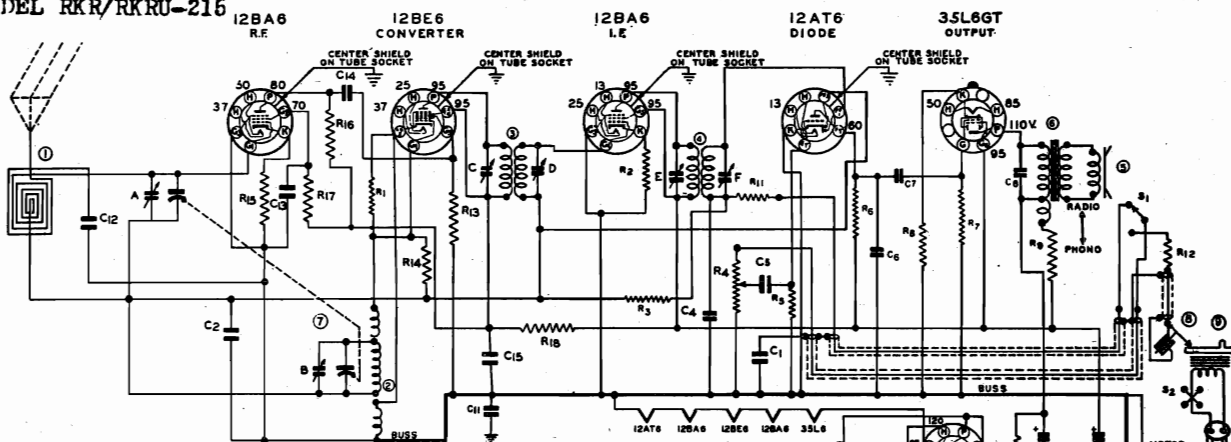
the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the converter tube through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next — set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

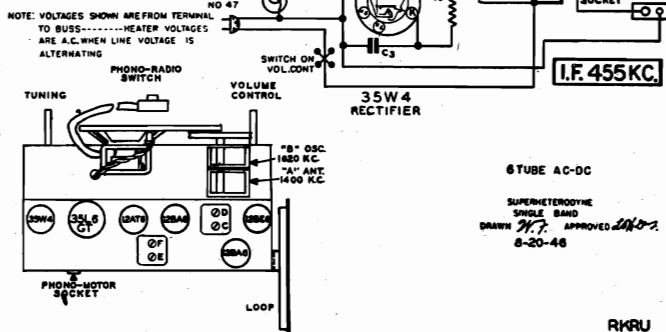
MODELS RK-215, RKRU-215
MODELS WA, WAU

SONORA RADIO & TELEV. CORP.

MODEL RKR/RKRU-215



PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
R1 N-4025	22,000 OHM .5 W. 20%	C7 N-1344	.01 MFD 400V.
R2 N-3883	150 OHM .5 W. 10%	C8 N-1376	.02 MFD 400V.
R3 N-4052	33 MEGOHM .5 W. 20%	C9 N-5051	40 MFD 150V. ELECT.
R4 N-4076	3 MEGOHM VOL. CONT.	C10	40 MFD 150V.
R5 N-4028	68 MEGOHM .5 W. 20%	C11 N-5160	2 MFD 200V.
R6 N-4028	220,000 OHM .5 W. 20%	C12 N-1344	.01 MFD 400V.
R7 N-4027	470,000 OHM .5 W. 20%	C13 N-1343	.05 MFD 200V.
R8 N-4087	180 OHM .5 W. 10%	C14 N-2369	.00015 MFD MICA
R9 N-3336	1000 OHM 1/2 W. 10%	C15 N-1351	.1 MFD 200V.
R10 N-4022	33 OHM .5 W. 20%		
R11 N-4039	47,000 OHM .5 W. 20%		
R12 N-1352	1 MEGOHM .5 W. 20%		
R13 N-4059	47,000 OHM .5 W. 20%		
R14 N-1293	100 MEGOHM .5 W. 20%	1 N-5133	LOOP COIL
R15 N-1815	100 OHM .5 W. 10%	2 N-4810	OSCILLATOR COIL
R16 N-4276	4700 OHM .5 W. 10%	3 N-4813	1ST I.F. COIL
R17 N-4025	22,000 OHM .5 W. 20%	4 N-5771	2ND I.F. COIL
R18 N-3348	220 OHM .5 W. 20%	5 N-4857	478 M. SPEAKER
		6 N-4875	OUTPUT TRANSFORMER
		7 N-4812	2 GANG CAPACITOR
		8	
		9 N-4885	RECORD CHANGER
C1 N-4857	.05 MFD 200V.		
C2 N-1343	.05 MFD 500V.		
C3 N-1346	.05 MFD 400V.		
C4 N-1374	.0001 MFD MICA	31 N-2408	RADIO-PHONO SWITCH
C5 N-4894	.005 MFD 600V.	32	MOTOR SW. ON CHANGED
C6 N-4890	.0005 MFD 600V.		



CONNECTING THE UNIT

Before connecting the unit, be sure that your house is wired for the voltage and current for which the set is designed. If in doubt, call your local power company for the necessary information. Connecting the set to a supply outlet furnishing the wrong type of current will result in improper operation or damage.

POWER SUPPLY. This Radio-Phonograph is designed to operate on an alternating current supply (AC) ranging from 110 to 120 volts.

The current must be 60 cycles. Never plug into a D.C. outlet.

GROUND. No ground connection should be used when operating this receiver. The receiver gets its ground connection through the power line and any external connection to the chassis may cause a short circuit and consequent damage.

CAUTION. Do not place receiver on hot objects such as stoves, radiators, etc. Heat will damage the internal components of the unit.

MODEL WA/WAU

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all three I.F. trimmers to peak or maximum reading on the output meter.

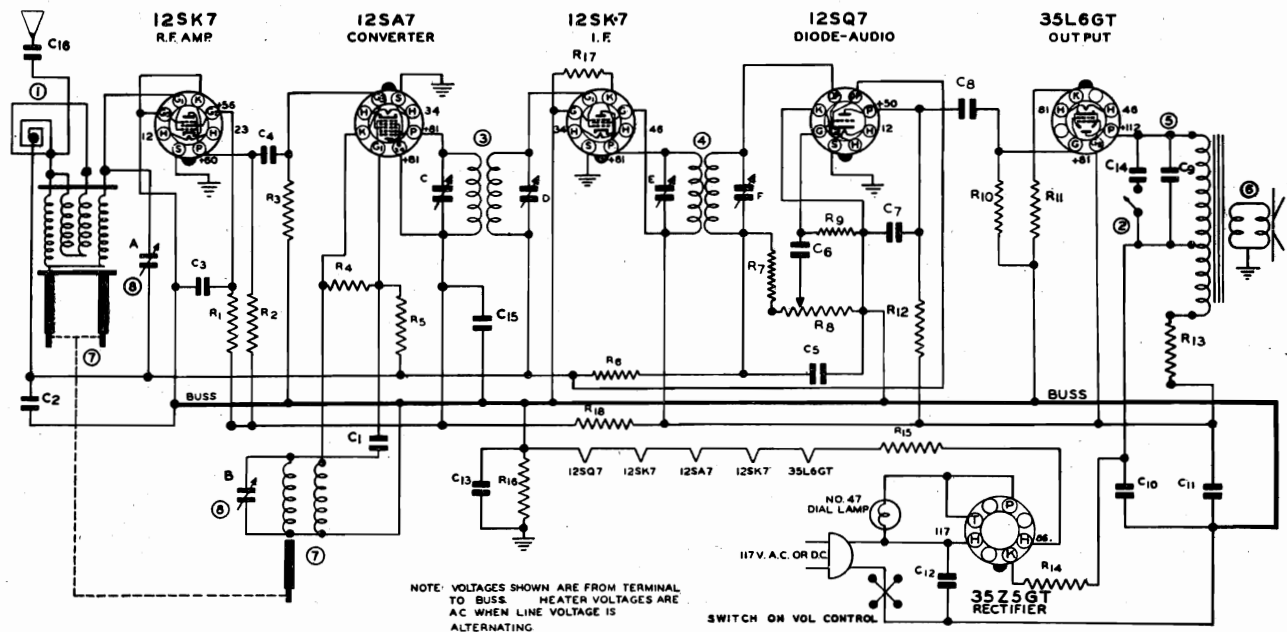
CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1720 KC, and adjust the oscillator (or 1720 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang

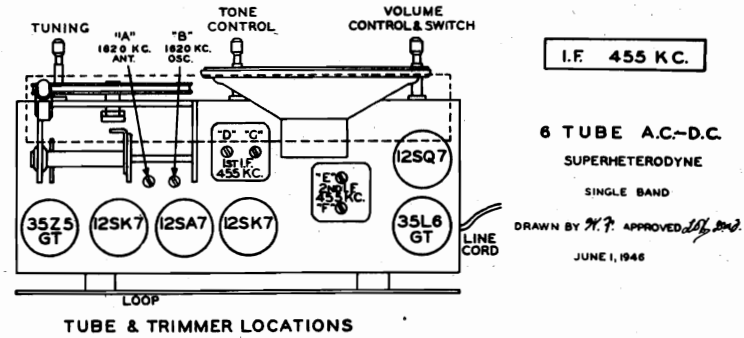
SONORA RADIO & TELEV. CORP.

MODELS RQ-222, RQU-222



DIAL PART NO.	DESCRIPTION	QTY	PART NO.	DESCRIPTION
C1	50 MMFD MICA	20%	R6	N-4082 3.3 MEGOHM 5W 20%
C2	.05 MFD 200V	20%	R7	N-4083 47,000 OHM 5W 20%
C3	.05 MFD 200V	20%	R8	N-5026 0.5 MEGOHM VOL. CONT.
C4	150 MMFD MICA	20%	R9	N-4081 47 MEGOHM 5W 20%
C5	N-4374 100 MMFD MICA	20%	R10	N-4027 470,000 OHM 5W 20%
C6	N-4894 .005 MFD 600V -15+40%		R11	N-4067 180 OHM 5W 10%
C7	N-4890 .0005 MFD 600V -25+40%		R12	N-4988 220,000 OHM 5W 10%
C8	N-4344 .01 MFD 400V 20%		R13	N-5823 1500 OHM 1W 10%
C9	N-4344 .01 MFD 400V 20%		R14	N-4022 33 OHM 5W 20%
C10	N-3058 40 MFD 150 V.V. ELECTRO		R15	N-4828 33 OHM 1W 10%
C11	40 MFD 150 V.V. LYTC		R16	N-4026 220,000 OHM 5W 20%
C12	N-4348 .05 MFD 400V 20%		R17	N-4022 33 OHM 5W 20%
C13	N-5160 .2 MFD 200V -10+10%		R18	N-4066 470 OHM 5W 10%
C14	N-4348 .05 MFD 400V 20%			
C15	N-1351 .1 MFD 200V -10+20%		1	N-5374 LOOP COIL
C16	N-1342 50 MMFD MICA 20%		2	N-4942 TONE SWITCH
			3	N-4872 1ST I.F. TRANSFORMER
			4	N-5371 2ND I.F. TRANSFORMER
			5	N-4875 OUTPUT TRANSFORMER
			6	N-4268 8" SPEAKER
			7	N-5640 PERMEABILITY TUNER
			8	N-5552 2 SECTION TRIMMER
R1	N-5351 22,000 OHM 5W 10%			
R2	N-4278 4,700 OHM 5W 10%			
R3	N-4087 47,000 OHM 5W 10%			
R4	N-5351 22,000 OHM 5W 10%			
R5	N-5624 15 MEGOHM 5W 10%			

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS. HEATER VOLTAGES ARE AC WHEN LINE VOLTAGE IS ALTERNATING



Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 1000 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the pointer at right end of dial adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter.

PERMEABILITY TUNER ALIGNMENT. To align the tuner requires four separate steps which must be followed in the order given.

1. **Marking Test Points on Dial Plate.** Use an accurate scale or ruler.

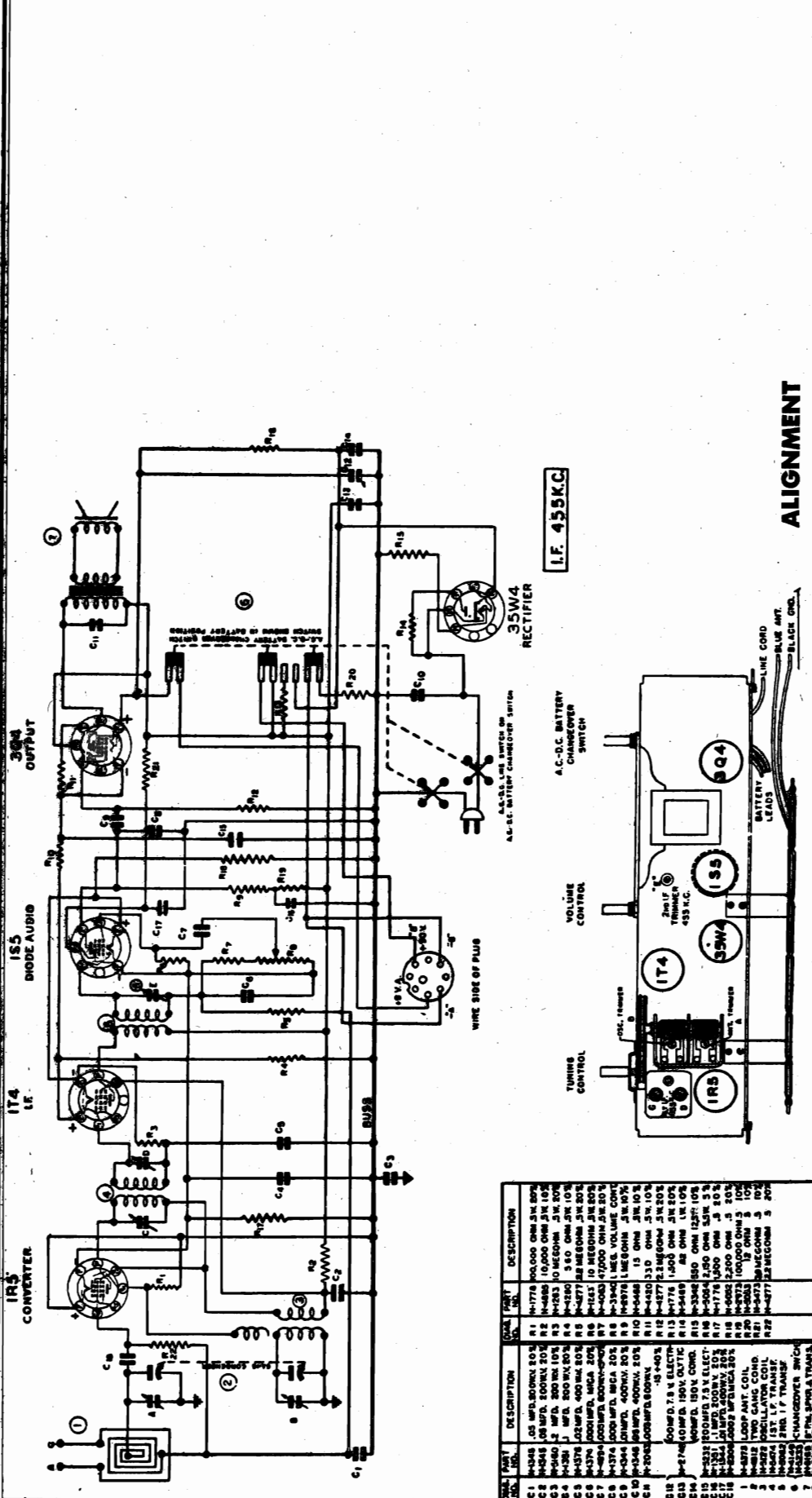
Make a pencil mark at 1-13/16 inches and another at 4-3/16 inches from the right hand edge of the dial plate.

2. **Location of Pointer.** Turn right hand knob all the way to the right. This moves the slugs to the left out of the coils. The pointer should be at the 1-13/16 inch mark. If the pointer is not in this position, slide pointer on string and crimp in place.

3. **Oscillator Alignment.** Connect the test oscillator to the grid of the 12SA7 tube through a .05 or .1 mfd. condenser. Set test oscillator at 1620 KC, turn right hand knob all the way to the right and adjust oscillator trimmer "B" for maximum signal. Set test oscillator at 1000 KC, tune in signal using right hand knob. Pointer should now be at the 4-3/16 inch mark in dial plate. If not, adjust oscillator tuning slug (located beneath chassis) so that 1000 KC comes in at this mark.

4. **Antenna Alignment.** Connect the test oscillator to the antenna lead through a 100 mfd (.0001) condenser. Set the test oscillator at 1620 KC, turn right hand knob all the way to the right and adjust antenna trimmer "A" for maximum signal. Set test oscillator at 1000 KC. Tune in signal using right hand knob. Adjust antenna tuning slugs (located above chassis) for maximum signal.

In adjusting these slugs, it is best to turn one core about a half turn, then remove the hand or tool and tune in the signal. Repeat this until the adjustment for maximum signal is reached. Keep the two antenna slugs as even as possible.



ALIGNMENT

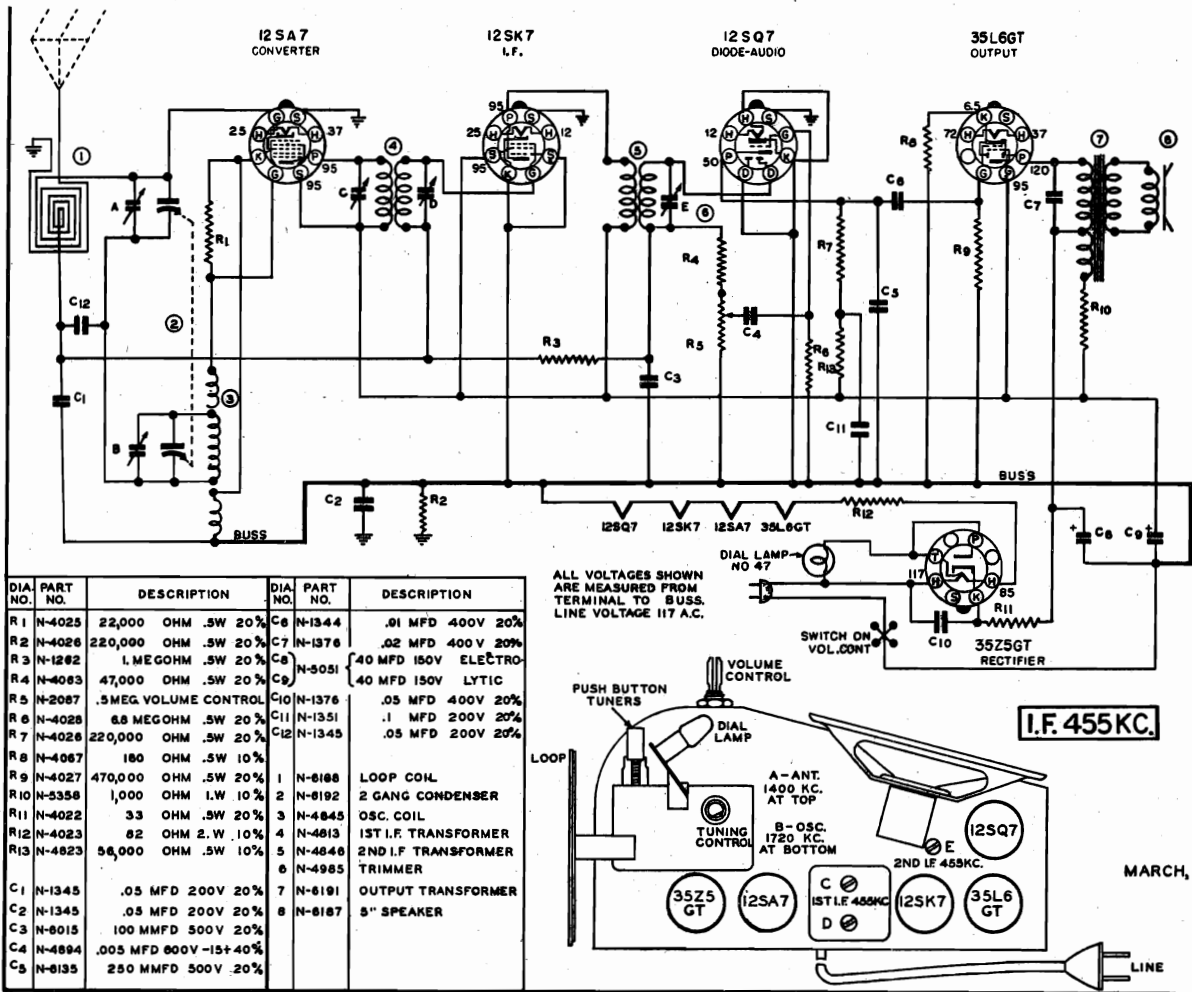
Oper- ation	Connect Oscillator To:	Dummy Ant.	Set Osc. To:	Set Dial To:	Adjust Trimmers	Purpose
1	Converter Grid	.05 MFD.	455 KC	Min. Cap.	C, D, E	Align IF
2	Antenna	100 MMF.	1620 KC	Min. Cap.	B	Set Oscillator
3	Antenna	100 MMF.	1400 KC	1400 KC	A	Adjust Ant.
4	Antenna	100 MMF.	600 KC	600 KC	....	Check Calibration

BATTERY. To install a new battery or replace an old one, remove the screws holding the back in place and lift off the back. Remove the battery and pull out the plug. Insert plug in new battery and place battery in bottom of cabinet. Replaces back.

The batteries listed below are satisfactory for service in your receiver. They are combination "A" and "B" packs having 90 volts "B" and 7½ volts "A".

- Type Number
- F6A60
 - G6M60
 - 754
 - 60B6F6-S
 - AB878
 - AB994
- Manufacturer
- Burgess
 - Burgess
 - Eveready
 - General Dry Battery
 - Ray-O-Vac
 - Ray-O-Vac

NO.	PART NO.	DESCRIPTION	QTY.	UNIT	DESCRIPTION
C1	M-3435	100 MFD. 50V. 20%	1	PCB	100,000 OHM 5% 20%
C2	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C3	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C4	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C5	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C6	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C7	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C8	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C9	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C10	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C11	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C12	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C13	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C14	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C15	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C16	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C17	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C18	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C19	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C20	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C21	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C22	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C23	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C24	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C25	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C26	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C27	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C28	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C29	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C30	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C31	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C32	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C33	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C34	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C35	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C36	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C37	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C38	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C39	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C40	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C41	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C42	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C43	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C44	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C45	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C46	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C47	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C48	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C49	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C50	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C51	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C52	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C53	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C54	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C55	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C56	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C57	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C58	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C59	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C60	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C61	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C62	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C63	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C64	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C65	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C66	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C67	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C68	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C69	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C70	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C71	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C72	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C73	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C74	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C75	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C76	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C77	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C78	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C79	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C80	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C81	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C82	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C83	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C84	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C85	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C86	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C87	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C88	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C89	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C90	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C91	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C92	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C93	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C94	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C95	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C96	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C97	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C98	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C99	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%
C100	M-3435	100 MFD. 50V. 20%	1	PCB	10,000 OHM 5% 20%



AUTOMATIC TUNING

Automatic tuning is a standard feature on this Model. It provides instantaneous selection of any four favorite stations by simply depressing a button. The automatic unit is wholly mechanical in operation and of rugged construction to assure greater accuracy over a longer period of time.

ADJUSTMENT. All adjustments are simply made from the front of the cabinet using an ordinary screw driver.

To make adjustments remove all four buttons, which pull off readily. The center buttons should be removed first, since by depressing the adjacent buttons with thumb and finger a firm grip may be secured on either center button. The top and bottom buttons can then be easily removed.

Loosen the screw of the desired button and with the manual tuning knob tune to any desired station. Hold the manual tuning knob in position and depress the button shaft as far as possible. With the button fully depressed, tighten the screw firmly.

Be sure the push button knob is held down in position while being tightened.

After the stations are adjusted, it is advisable to check each button to assure sufficient tightening.

To assure accurate adjustment, the volume control should be set

at a moderate level and the station tuned in slowly to a point of maximum volume and clarity.

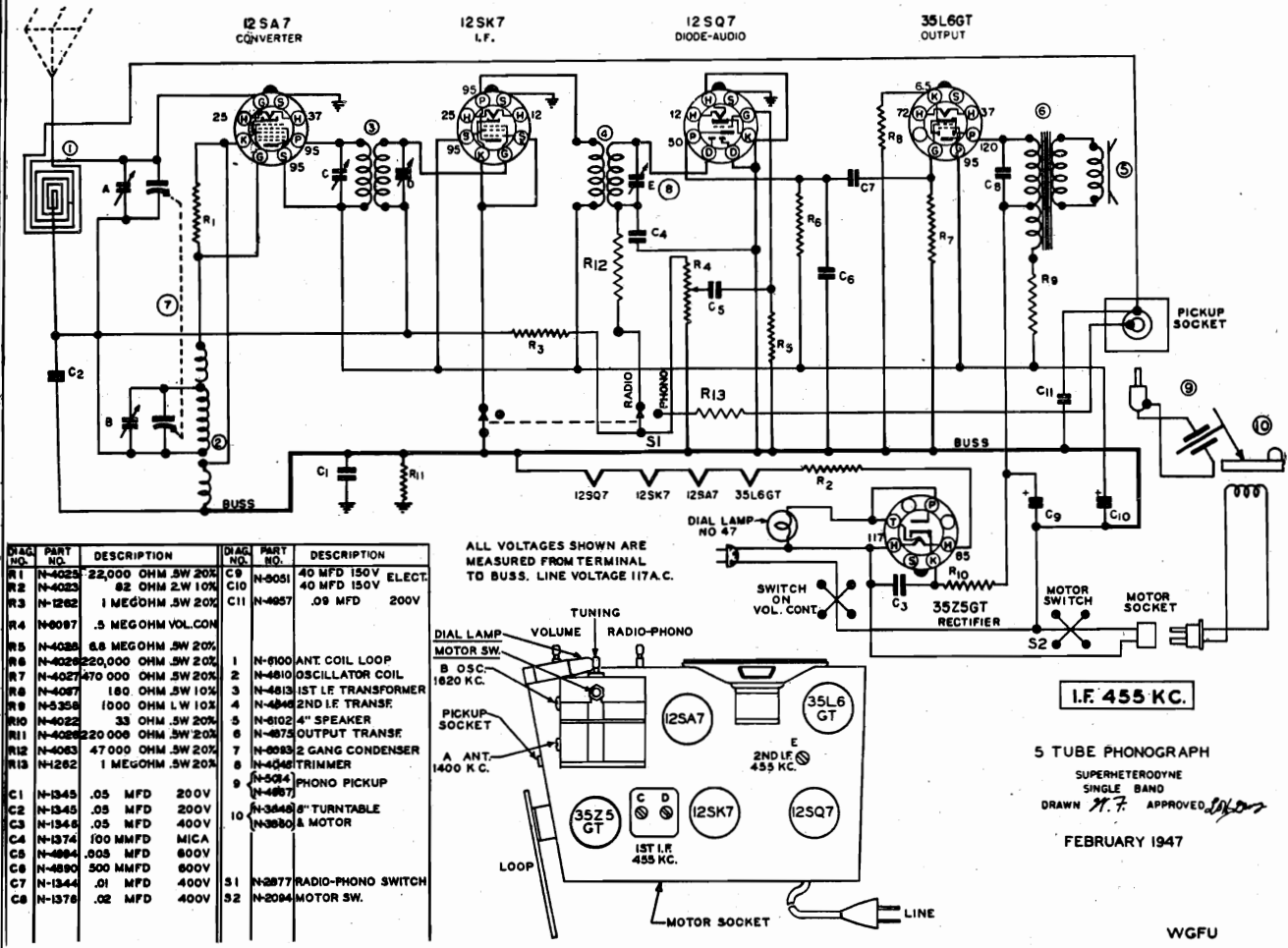
It is not necessary to follow any particular sequence of stations since each button is adjustable to any station.

With each button definitely set and securely tightened to the selected station, the tuner is ready for operation.

OPERATION. With the set turned on to a moderate level of volume, the automatic tuner is operated by merely pressing a button set to the desired station.

Station selection may be made automatically or manually at will, since the manual tuning control functions integrally with the automatic unit.

The station call letter tabs enclosed in the Operating Instruction Sheet envelope should be inserted into the slot of the push-buttons, using designations corresponding to the station selected for each button. After inserting call letter tabs, the buttons may be replaced.



AERIAL SYSTEM

The receiver has a built-in "loop" aerial. Its excellent design is such as to increase pick-up from stations having wide variations in signal strength. The efficiency and selectivity of the loop provide outstanding reception without the use of an external aerial. The "loop" aerial used on this receiver is somewhat directional so reception from weak stations can be improved by turning the set in the proper direction. In or near metal buildings, iron ore deposits

or steel structures or in localities remote from broadcasting stations, reception can be improved by using an outside aerial 50 feet to 100 feet in length including lead-in. Connect the outside aerial to the aerial lead. When using the outside aerial it may be necessary to reverse the power cord plug in wall socket to eliminate hum or distortion.

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED. OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.

ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench so that they occupy exactly the same respective positions on the bench as they did in the cabinet. Care should be taken to have no iron or other metal near

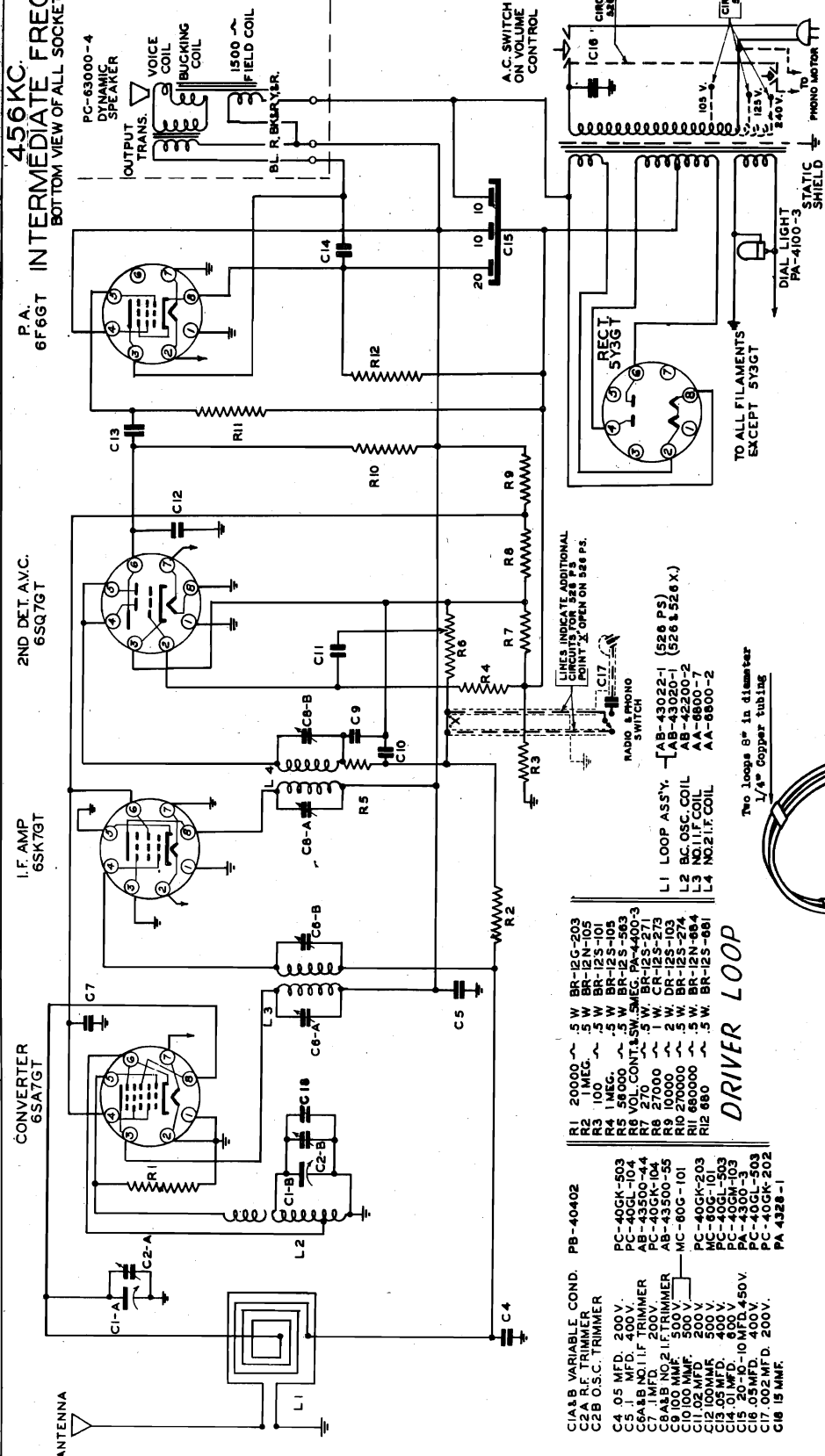
the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) condenser. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.

MODELS 5-26, 5-26X, 5-26FS

THE SPARKS WITHINGTON CO.

456 KC. INTERMEDIATE FREQUENCY
BOTTOM VIEW OF ALL SOCKET CONNECTIONS



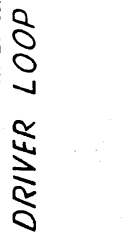
VOLTAGE CHART
Line Voltage: 117 Volts AC

TUBE	FUNCTION	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SA7GT	Converter	0	0	250	85	**	**	**	0.3*
6SK7GT	I.F. Amp.	0	6.2*	0	-0.45	0	85	0	250
6SQ7GT	2nd. Det. A.V.C.	0	-0.95	-0.9	-1.2	1.25	0.2*	0	0
6F6GT	P.A.	0	6.2*	215	250	**	-1.9	0	15
5Y3GT	Rect.	0	290	0	280	0	280	0	290

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% +/- on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. *DC volts. **AC volts.

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% +/- on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. *DC volts. **AC volts.

- RESISTOR LIST:
- R1 20000 ~ 5 W BR-12G-203
 - R2 100 ~ 5 W BR-12N-105
 - R3 100 ~ 5 W BR-12S-101
 - R4 500 ~ 5 W BR-12S-05
 - R5 500 ~ 5 W BR-12S-05
 - R6 VOL CONT. 5W. S.W.G. PA-4003
 - R7 270 ~ 5 W BR-12S-273
 - R8 27000 ~ 1 W CR-12S-273
 - R9 10000 ~ 2 W DR-12S-103
 - R10 270000 ~ 5 W BR-12S-274
 - R11 200000 ~ 5 W BR-12S-284
 - R12 660 ~ 5 W BR-12S-661
- Capacitor List:
- C1A B VARIABLE COND. PB-40402
 - C2A R.F. TRIMMER
 - C2B O.S.C. TRIMMER
 - C4 .05 MFD. 200V.
 - C5 .1 MFD. 400V.
 - C6A B NO. 11 F. TRIMMER
 - C6B NO. 11 F. TRIMMER
 - C7 100 MFD. 200V.
 - C8 100 MFD. 500V.
 - C9 100 MFD. 500V.
 - C10 100 MFD. 500V.
 - C11 .02 MFD. 200V.
 - C12 .005 MFD. 500V.
 - C13 .01 MFD. 600V.
 - C14 .01 MFD. 600V.
 - C15 20-10 MFD. 450V.
 - C16 .05 MFD. 400V.
 - C17 .002 MFD. 200V.
 - C18 .15 MFD.



DRIVER LOOP
Two loops 8" in diameter
1/4" spaced
400 ohm resistor in series
400 ohm resistor inside shield
Resistor shield
Mounting Base
Shielded lead wire 16" long
Phone tips

Specifications:
Two loops of 1/4" copper tubing 8" in diameter spaced 1/4" apart with 400 ohm resistor in series. Connecting cable and resistor must be shielded. The loop should be spaced twice the diameter of the loop from the receiver being aligned to prevent an over modulated signal and poor alignment of the receiver.

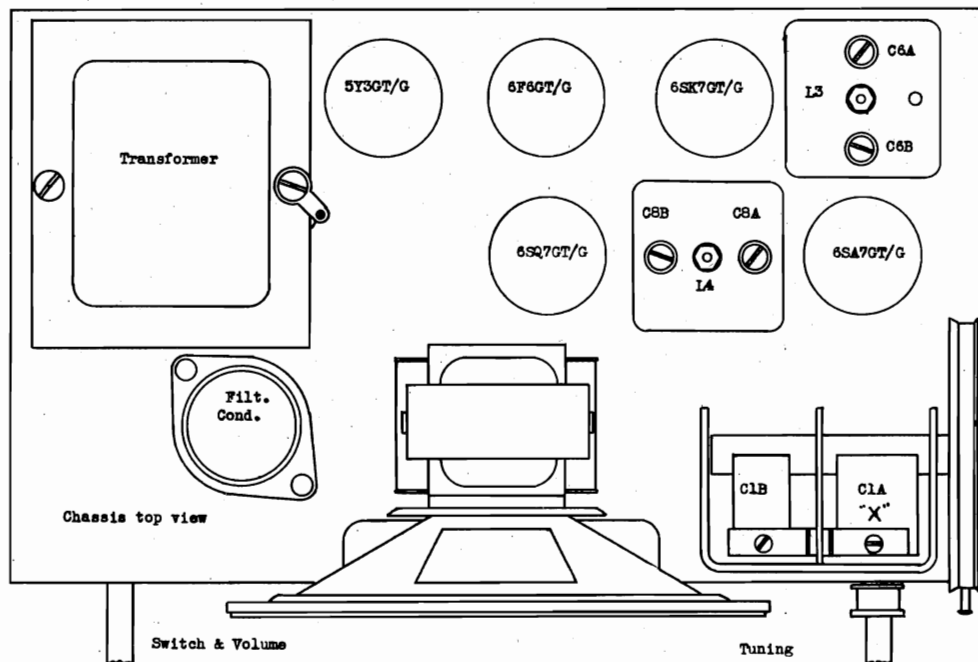
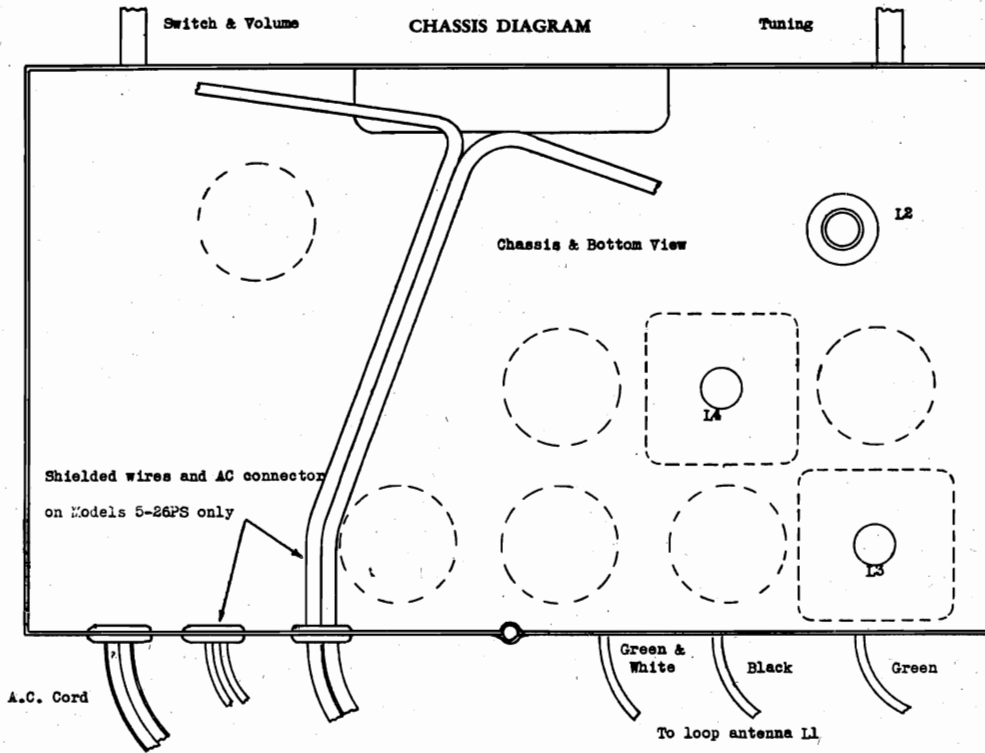
MODELS 5-26,
5-26X, 5-26PS

THE SPARKS WITHINGTON CO.

ALIGNMENT DATA

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING CONDENSER SETTING	TRIMMER	REMARKS
1	Set pointer to last calibration mark at low end of dial with condenser gang fully closed.						
2	I.F.	*	.02MFD	456 KC	Open	C5A&B	Peak accurately
						C6A&B	Peak accurately
3	Broadcast	**	Driver Loop	1500 KC	1500 KC	C2B Osc.	Peak accurately
						C2A Ant.	Peak accurately
4	(Repeat operation No. 3)						
5	(Check calibration at 600 KC, 900 KC and 1500 KC)						
6	(Check operations 1 to 5 inclusive)						

Notes: * X on chassis diagram.
** Driver loop see diagram below.



MODEL 6F1

THE SPARKS WITHINGTON CO.

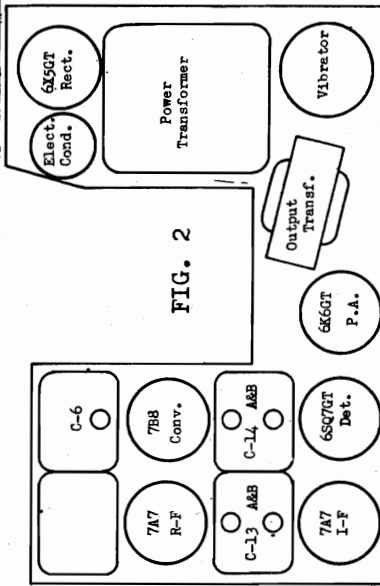


FIG. 2

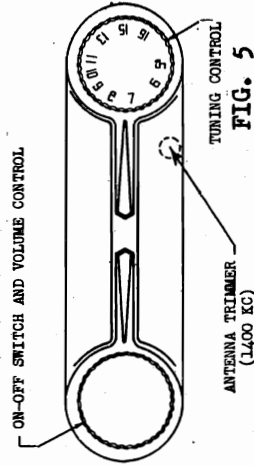


FIG. 5

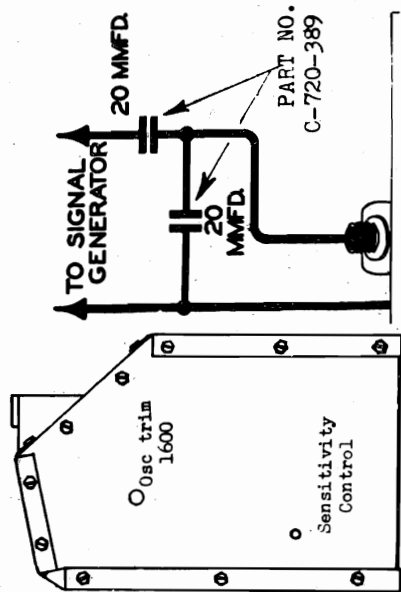


FIG. 3

FIG. 4

Power Output: 3.5 watts measured at voice coil.

Speaker: Full electro dynamic (5 inch.)

Sensitivity: 7 microvolts at 1 watt output.

Tuning Range: 540 to 1600 KC.

Current Consumption: 8.5 amps.

ALIGNMENT INSTRUCTIONS

Note: The alignment of a radio receiver is one of the most important functions that a service man performs. The following instructions must be followed carefully and in detail.
CAUTION

When making any adjustment on the receiver, be sure to have the volume control turned full on. If it is necessary to reduce the intensity of the test signal, reduce the volume at the signal generator.

Dummy antenna should be used through out the entire alignment procedure. The correct dummy antenna is composed of two 20 mmf. condensers (SPARTON Part C-720-389). The condenser should be connected in the line between the test oscillator or signal generator and the receiver as shown in Fig. 3. These capacities are identical with the actual capacities provided by the Ford antenna.

Note: The Model 6F1 is equipped with an adjustable sensitivity control located in the position indicated in Fig. 4. This control is properly adjusted at the factory to provide a sensitivity of 7 microvolts at one watt output. The factory adjustment of this control provides as high a sensitivity level as possible without introducing excessive background noise. No attempt should be made to change the setting of the control unless laboratory equipment is available for measuring sensitivity.

I-F ALIGNMENT

1. Set signal generator at 455 KC and connect through the dummy antenna to the receiver.

2. Adjust trimmers C-14 A&B and C-13 A&B to maximum response. (See Fig. 2)

3. Adjust code rejector trimmer C-6 for minimum response. (See Fig. 2).

R-F ALIGNMENT

1. Turn the manual tuning knob until the variable condenser plates are completely out of mesh (1600 KC).

2. Set signal generator 1600 KC.

3. Adjust oscillator trimmers C-2B for maximum response. (See Fig. 4).

4. Set signal generator to 1400 KC and rotate the manual tuning control until a signal is heard.

5. Adjust the antenna trimmer C-20 (See Fig. 5) for maximum response.

6. After receiver has been installed in car the antenna trimmer (C-20) must be adjusted for maximum response on a weak station at or near 1400 KC.

MISCELLANEOUS DATA

TEST JACK

It will be noted that a test jack is provided in the output circuit. The jumper must be connected to the jack in order to have the loud speaker operate properly. This jumper may be conveniently removed to permit the connection of an output meter to the voice coil side of the output transformer.

THE SPARKS WITHINGTON CO.

MODEL 6F1
MODEL 6F1D

MODEL 6F1 VOLTAGE CHART

Input Voltage: 6.6 volts at panel. Volume Control Full On with Antenna Disconnected

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Schematic Diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7A7	R-F Amplifier	H 0	P 187	Gs 68	Gsu 3.8	S 0	G 0	K 3.8	H 6.4
7B8	Osc - Converter	H 0	P 225	Ga 137	Go -10	Gs 68	G 0	K 3.8	H 6.4
7A7	I-F Amplifier	H 0	P 244	Gs 68	Gsu 2.6	S 0	G 0	K 2.6	H 6.4
6SQ7 GT	Det - AVC - 1st A-F	S 0	G 0	K 0	Dp 0	Dp 0	P 98	H 6.4	H 0
6K6G T	Power Amplifier	S 0	H 0	P 255	Gs 242	G 0	-	H 6.4	K 18.
6X5G T	Rectifier	S 0	H 0	P 320*	-	P 320*	-	H 6.5	K 275

Notes: Voltage readings are for schematic diagram on page 3. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All D-c measurements made with 20000 ohms per volt voltmeter. All A-c voltages measured with rectifier type meter. Unless otherwise designated, voltages in table are - D-c volts. *Indicates AC volts.

Explanation of Symbols: H - Heater, P - Plate, Ga - Oscillator Anode, Go - Oscillator Grid, Gs - Screen Grid, Gsu - Suppressor Grid, S - Shield, Dp - Diode Plate, K - Cathode.

VOLTAGE CHART

MODEL 6F1D

Input Voltage: 6.6 volts at panel. Volume Control Full On with Antenna Disconnected

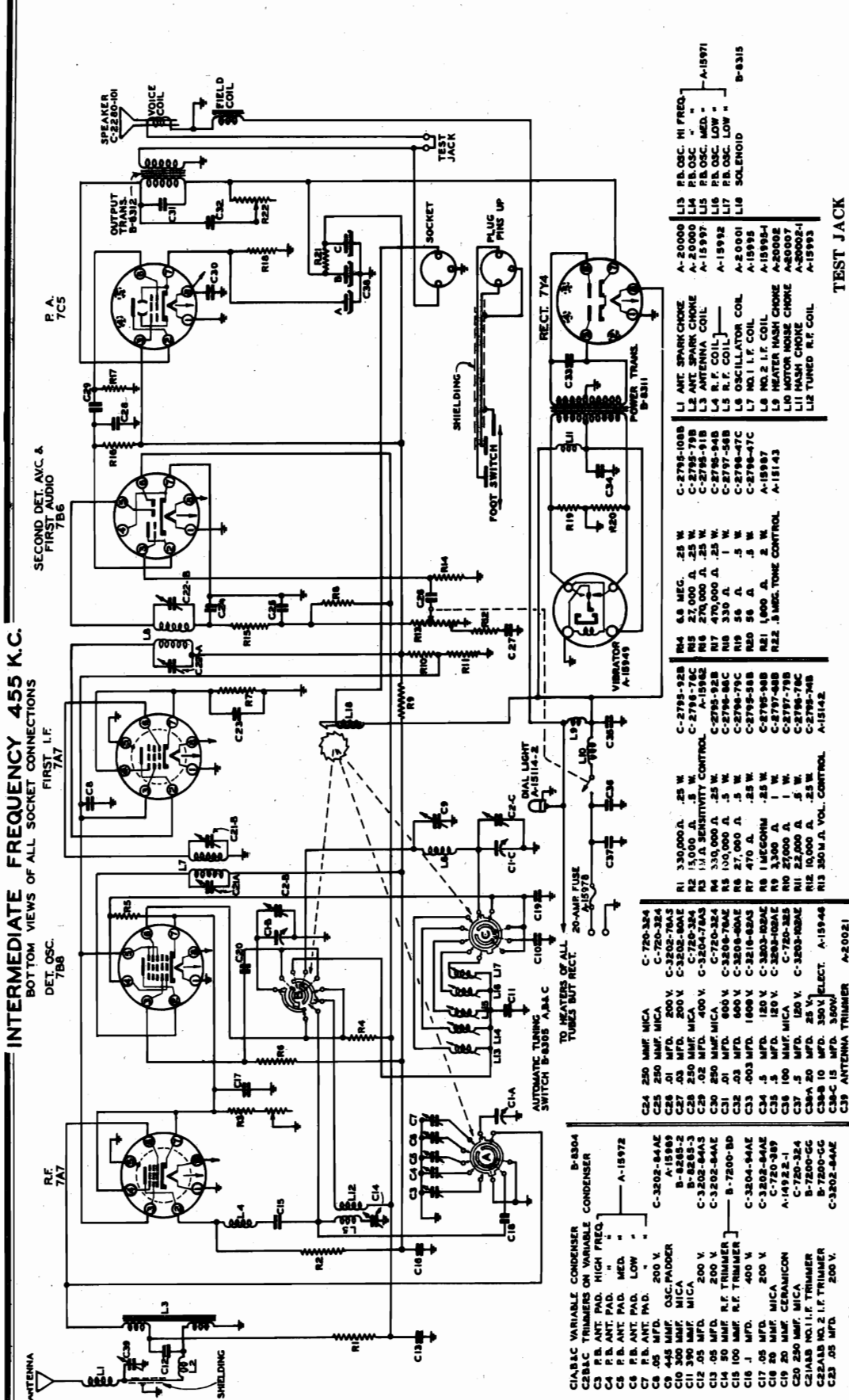
TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Schematic Diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7A7	R-F Amplifier	H 0	P 153	Gs 72	Gsu 3.5	S 0	G -.1	K 3.5	H 6.3*
7B8	Osc - Converter	H 0	P 205	Ga 130	Go -7	Gs 72	G -.1	K 3.5	H 6.3*
7A7	I-F Amplifier	H 0	P 227	Gs 72	Gsu 2.6	S 0	G 0	K 2.6	H 6.3*
7B6	Det-AVC-1st A-F	H 0	P 94	G -.5	K 0	Dp 0	Dp -.1	K 0	H 6.3*
7C5	Power Amplifier	H 0	P 250	Gs 230	-	-	G 0	K 12	H 6.3*
7Y4	Rectifier	H 0	-	P 275*	-	-	P 275*	K 255*	H 6.4*

Notes: Voltage readings are for schematic diagram on page . Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All D-c measurements made with 20000 ohms per volt voltmeter. All A-c voltages measured with rectifier type meter. Unless otherwise designated, voltages in table are - D-c volts. *Indicates AC volts.

Explanation of Symbols: H - Heater, P - Plate, Ga - Oscillator Anode, Go - Oscillator Grid, Gs - Screen Grid, Gsu - Suppressor Grid, S - Shield, Dp - Diode Plate, K - Cathode.

MODEL 6FLD

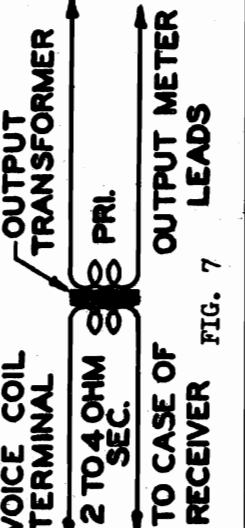
THE SPARKS WITHINGTON CO.



INTERMEDIATE FREQUENCY 455 K.C.
 BOTTOM VIEWS OF ALL SOCKET CONNECTIONS
 FIRST I.F. 7A7
 DET. OSC. 7B6
 SECOND DET. AVC. & FIRST AUDIO 7B6
 P.A. 7C5

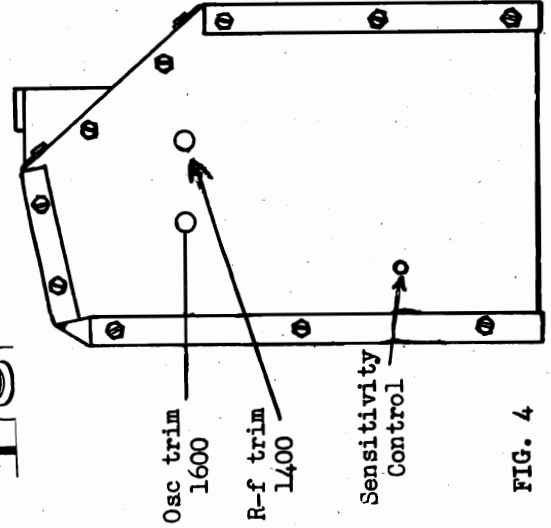
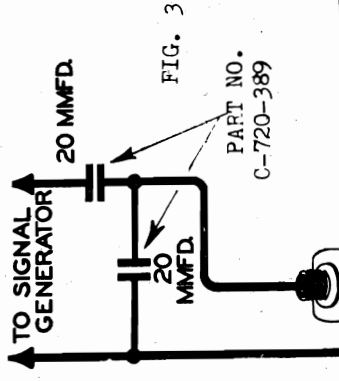
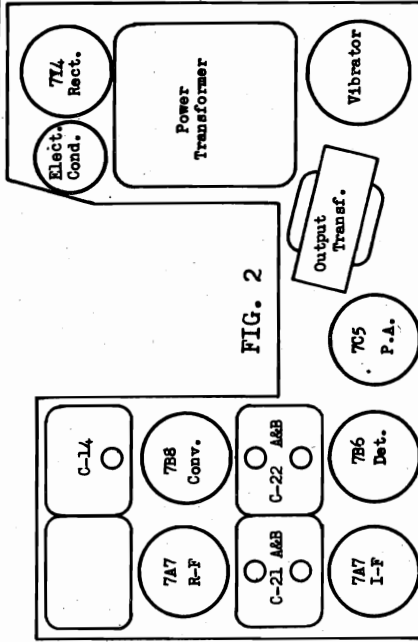
©John F. Rider

It will be noted that a test jack is provided in the output circuit. The jumper must be connected to the jack in order to have the loud speaker operate properly. This jumper may be conveniently removed to permit the connection of an output meter to the voice coil side of the output transformer.



In case it is desired to use the type of output meter which usually is connected to the plate circuit of an output tube the diagram shown in Fig. 7 should be noted. The output transformer in this circuit is identical to the regular output transformer part No. B-8312 used in the Model 6FLD receiver.

- TEST JACK**
- A-20000 LI3 PR. OSC. HI FREQ.
 - A-15997 LI5 PR. OSC. MED.
 - A-15992 LI6 PR. OSC. LOW
 - A-20001 LI8 SOLENOID
 - A-15995 LI9
 - A-15994 LI10
 - A-20002 LI11
 - A-20007 LI12
 - A-20002-1 LI2 TUNED R.F. COIL
 - A-15993 LI1
 - A-15994 LI2
 - A-15995 LI3
 - A-15996 LI4
 - A-15997 LI5
 - A-15998 LI6
 - A-15999 LI7
 - A-15994 LI8
 - A-15995 LI9
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3. Adjust trimmers C-22 A&B and C-21 A&B to maximum response. (See Fig. 2).
4. Adjust code rejector trimmer C-14 for minimum response. (See Fig. 2).

R-F ALIGNMENT

1. Turn selector switch to "Manual Tuning" (D).
2. Turn the manual tuning knob until the variable condenser plates are completely cut of mesh (1600 KC).
3. Set signal generator 1600 KC.
4. Adjust oscillator trimmer C-2C for maximum response. (See Fig. 4).
5. Set signal generator to 1400 KC and rotate the manual tuning control until a signal is heard.
6. Adjust R-F trimmer C-2B (See Fig. 4) and the antenna trimmer C-39 (See Fig. 4) or maximum response.

7. Set the signal generator to 600 KC and rotate the manual tuning control until a signal is heard.

8. The variable condenser should then be rocked slightly while adjusting the oscillator padder condenser C-9. (See Fig. 5).

9. Repeat adjustments described in step 6 to make sure that condensers C-2B and C-39 are peaked for maximum response.

10. After receiver has been installed in car the antenna trimmer (C-39) must be adjusted for maximum response on a weak station at or near 1400 KC.

ALIGNMENT INSTRUCTIONS

Note: The alignment of a radio receiver is one of the most important functions that a service man performs. The following instructions must be followed carefully and in detail.

CAUTION

When making any adjustment on the receiver, be sure to have the volume control turned full on. If it is necessary to reduce the intensity of the test signal, reduce the volume at the signal generator.

Dummy antenna should be used through out the entire alignment procedure. The correct dummy antenna is composed of two 20 mmf. condensers (SPARTON Part C-720-389). The condenser should be connected in the line between the test oscillator or signal generator and the receiver as shown in Fig. 3. These capacities are identical with the actual capacities provided by the Ford antenna.

Note: The Model 6FLD is equipped with an adjustable sensitivity control located in the position indicated in Fig. 4. This control is properly adjusted at the factory to provide a sensitivity of 7 microvolts at one watt output. The factory adjustment of this control provides as high a sensitivity level as possible without introducing excessive background noise. No attempt should be made to change the setting of the control unless laboratory equipment is available for measuring sensitivity.

I-F ALIGNMENT

1. Turn selector switch to the No. 1 (Automatic) position (580 KC).
2. Set signal generator at 455 KC and connect through the dummy antenna to the receiver.

MODEL 6F1D

THE SPARKS WITHINGTON CO.

SETTING THE ROTO-SELECTOR

1. Turn receiver on and allow it to operate for approximately $\frac{1}{2}$ hour. (This is necessary in order that the operating temperature may reach normal and to be assured of accurate adjustment).
2. Remove the plastic escutcheon over the tuning control by first pulling off the three (3) knobs and removing the lock nuts on the tuning and volume control shafts. With the escutcheon removed, the automatic adjusting screws become accessible as shown in Fig. 5. The adjustments are easily made by means of a small screw driver.
3. Select five stations within the frequency range shown under each set of adjustment screws in Fig. 5.
4. With the selector switch in the "D" position, tune in manually the broadcast station to be set up on position No. 1 and identify the program. Note: Due to the net-work programs broadcast by many stations, it is advisable to wait until the station announces its call letters before completing the adjustments.
5. With the desired station accurately tuned in turn selector switch to the No. 1 position. Now using the screw driver turn the top screw at position No. 1 until the station selected is brought in with the loudest volume, then adjust the larger screw at the bottom until maximum volume is obtained. Note: Stations of the higher frequencies are tuned in by turning the screws to the left (counter-clockwise). Lower frequency stations are tuned by turning the screws to the right (clockwise).

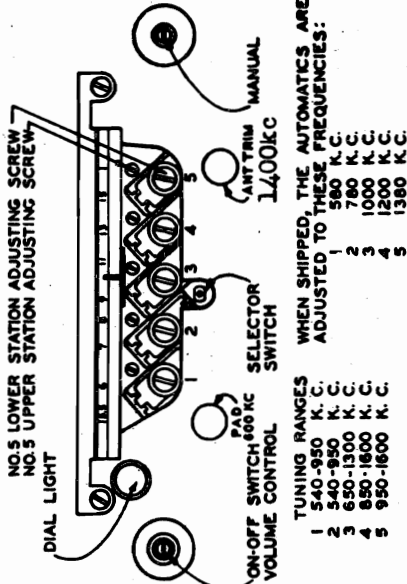


FIG. 5

6. Proceed with setting up the remaining four stations in the same manner as described under paragraphs 4 and 5.
7. Recheck the screws for each station to make sure that each one of the selected stations is tuned in as accurately as possible. It is advisable for the final rechecking of adjustments to be made in an area of low signal strength or in some known "dead spot", where radio signals are difficult to receive.

SOLENOID PLUNGER

The solenoid plunger is fully lubricated at the factory and normally no special lubrication service will be required. However, it is good practice to place one or two drops of lubricant on the plunger at such times as the receiver may be in the service shop. Use only Super Pyroil "B" as a plunger lubricant. It is readily obtainable from any auto supply house or from the factory.

DIAL CORD

Fig. 6 shows the correct way to string the dial cord. Unless the dial cord is strung properly it may have a tendency to jump off the pulley or otherwise operate improperly.

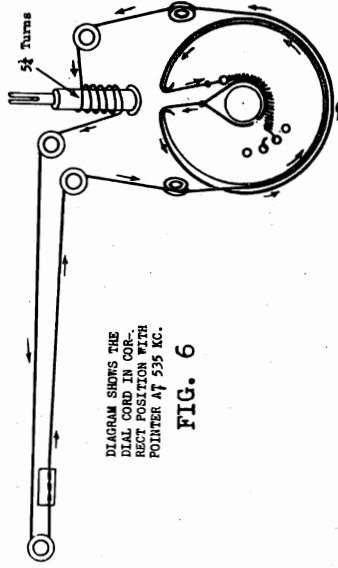
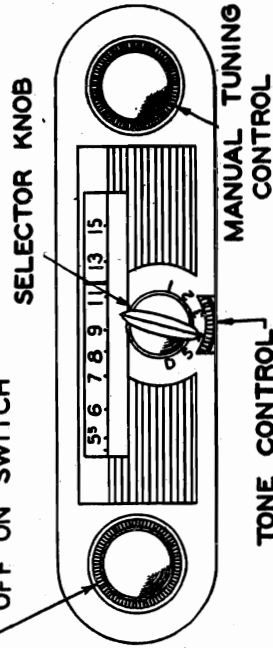


FIG. 6

ELECTRICAL SPECIFICATIONS

Sensitivity: 7 microvolts at 1 watt output.
Power Output: 4.5 watts measured at voice coil. Full electro dynamic (7 inch diameter).
Roto-Selector Tuning: Automatic tuning for five stations.
Current Consumption: 8.5 amps.

Foot Control Switch (Optional): Automatic tuning for five stations and automatic reduction of volume by floor-mounting foot control switch.
VOLUME CONTROL AND OFF ON SWITCH



SELECTOR KNOB

TONE CONTROL
 MANUAL TUNING CONTROL

MODEL 6F2D

THE SPARKS WITHINGTON CO.

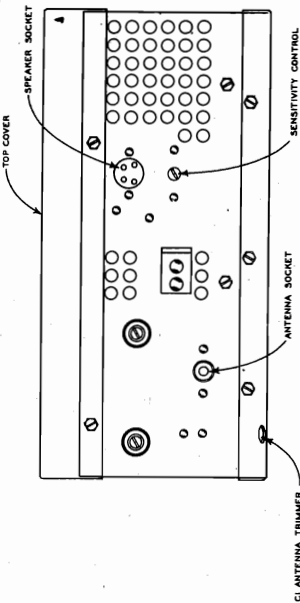


FIG. 4 BACK VIEW OF SET

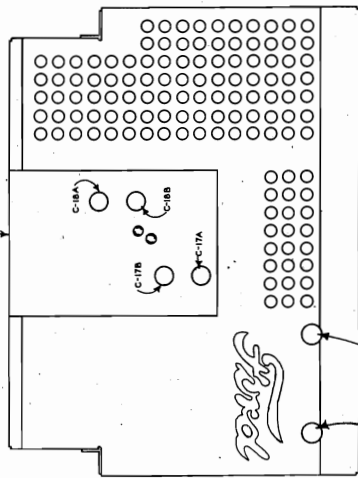


FIG. 5

TOP VIEW OF SET
TO SIGNAL GENERATOR

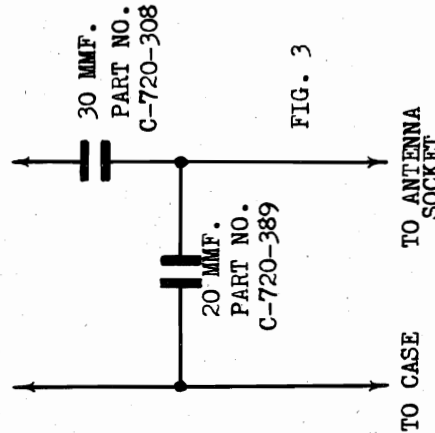


FIG. 3

2. Set the signal generator at 265 KC and connect through the dummy antenna to the receiver.

3. Adjust trimmers C-18 A&B and C-17 A&B for maximum response. (See Fig. 5.)

R-F ALIGNMENT

1. Tune the set to 1610 KC by rotating the tuning knob as far as it will go clockwise.
2. Set the signal generator to 1610 KC.
3. Adjust the oscillator trimmer C-11, the RF trimmer C-7 and the antenna trimmer C-1 for maximum response, in the sequence given. (See Fig. 4 & 5 for trimmer locations.)
4. After the receiver has been installed in the car the antenna trimmer C-1 must be adjusted for maximum response with the set tuned to a weak station near 1600 KC.

SOLENOID PLUNGER

The solenoid plunger is fully lubricated at the factory and normally no special lubrication service will be required. However, it is good practice to place one or two drops of lubricant on the plunger at such times as the receiver may be in the service shop. Use only Super Pyroil "B" as a plunger lubricant. It is readily obtainable from any auto supply house or from the factory.

DIAL CORD

The dial pointer should be so adjusted that when the iron slugs are in the maximum out position with respect to the coils the dial pointer should be the pointer width to the right hand side of 1600 KC on the dial scale.

ALIGNMENT INSTRUCTIONS

Note: The alignment of a radio receiver is one of the most important functions that a service man performs. The following instructions must be followed carefully and in detail.

CAUTION

When making any adjustment on the receiver, be sure to have the volume control turned full on. If it is necessary to reduce the intensity of the test signal, reduce the volume at the signal generator.

A dummy antenna should be used through out the entire alignment procedure. The correct dummy antenna is composed of one 20 mmf. condenser (SPARTON Part C-720-389) and one 30 mmf. condenser (SPARTON Part C-720-308). The condenser should be connected in the line between the test oscillator or signal generator and the receiver as shown in Fig. 3. These capacities are identical with the actual capacities provided by the Ford antenna.

Note: The Model 6F2D is equipped with an adjustable sensitivity control located in the position indicated in Fig. 4. This control is properly adjusted at the factory to provide a sensitivity of 6 microvolts at one watt output. The factory adjustment of this control provides as high a sensitivity level as possible without introducing excessive background noise. No attempt should be made to change the setting of the control unless laboratory equipment is available for measuring sensitivity.

I-F ALIGNMENT

1. Index the tuner to dial position and tune the set to 550 KC.

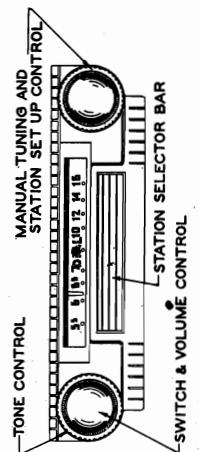
THE SPARKS WITHINGTON CO.

MODEL 6F2D

SETTING THE ADJUST-O-MATIC TUNER

1. Turn receiver on and allow it to operate for approximately $\frac{1}{2}$ hour. (This is necessary in order that the operating temperature may reach normal and to be assured of accurate adjustment).
2. With the tuning knob in its normal position and the tuner indexed so that the word DIAL in the pointer background is illuminated, the set is ready for manual operation.
3. By indexing the tuner with the push bar the first automatic position is ready for setting up. The station is tuned in by retracting the manual knob and tuning to the desired station as indicated by the dial pointer.
4. The manual knob should then be pushed back to its normal position.
5. The next automatic position may then be indexed and the desired station set up in the same manner as mentioned in paragraph 3 and 4.
6. After all five automatic positions are set up the manual knob should be returned to its normal position. If desired, the manual position may also be set up and used as an automatic position. Any station may be set up in any desired automatic position.

Note: Due to the net-work programs broadcast by many stations, it is rather difficult to determine the station until the station call letters have been announced.



Input Voltage: 6.6 Volts. Volume Control Full on with Antenna Disconnected

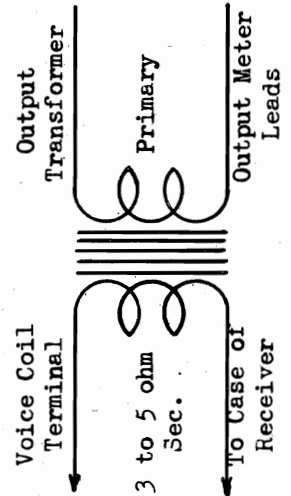
TUBE	FUNCTION	Voltage of socket prongs to gnd. (See schematic dia.)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7A7	R-F Amplifier	H 0	P 132	Gs 0	Gsu 0	S 0	G 0	K -.03	H 6.25
7B8	Osc-Converter	H 0	P 208	Ga 142	Go -.75	Gs 60	G 0	K -.03	H 6.25
7A7	I-F Amplifier	H 0	P 223	Gs 62	Gsu 0	S 0	G 0	K 2.1	H 6.25
6SQ7GT	Det-AVC-1st AF	S 0	G -.22	K 0	Dp -.3	Dp -.3	P 95	H 6.25	H 0
6V6GT	Power Amplifier	-	H 0	P 235	Gs 225	G 0	-	H 6.25	K 12
6X5GT	Rectifier	-	H 0	P 230*	-	P 230*	-	H 6.2	K 250

Notes: Voltage readings are for schematic diagram on page 3. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages measured with rectifier type meter. Unless otherwise designated, voltages in table are + DC volts. *Indicates AC volts. Explanation of Symbols: H-Heater, P-Plate, G-Oscillator Anode, Go-Oscillator Grid, Gs-Screen Grid, Gsu-Suppressor Grid, S-Shield, Dp-Diode Plate, K-Cathode.

OUTPUT METER

In case it is desired to use the type of output meter which usually is connected to the plate circuit of an output tube the diagram shown in Fig. 6 should be noted.

The output transformer in this circuit is identical to the regular output transformer part No. B-8312-1 used in the Model 6F2D receiver.

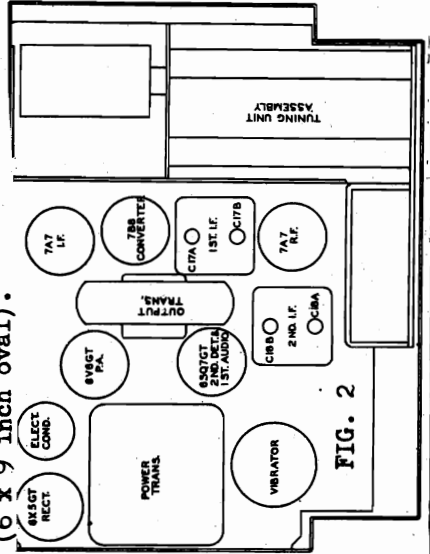


Sensitivity: 6 microvolts at 1 watt output.

Power Output: 4.5 watts measured at voice coil.

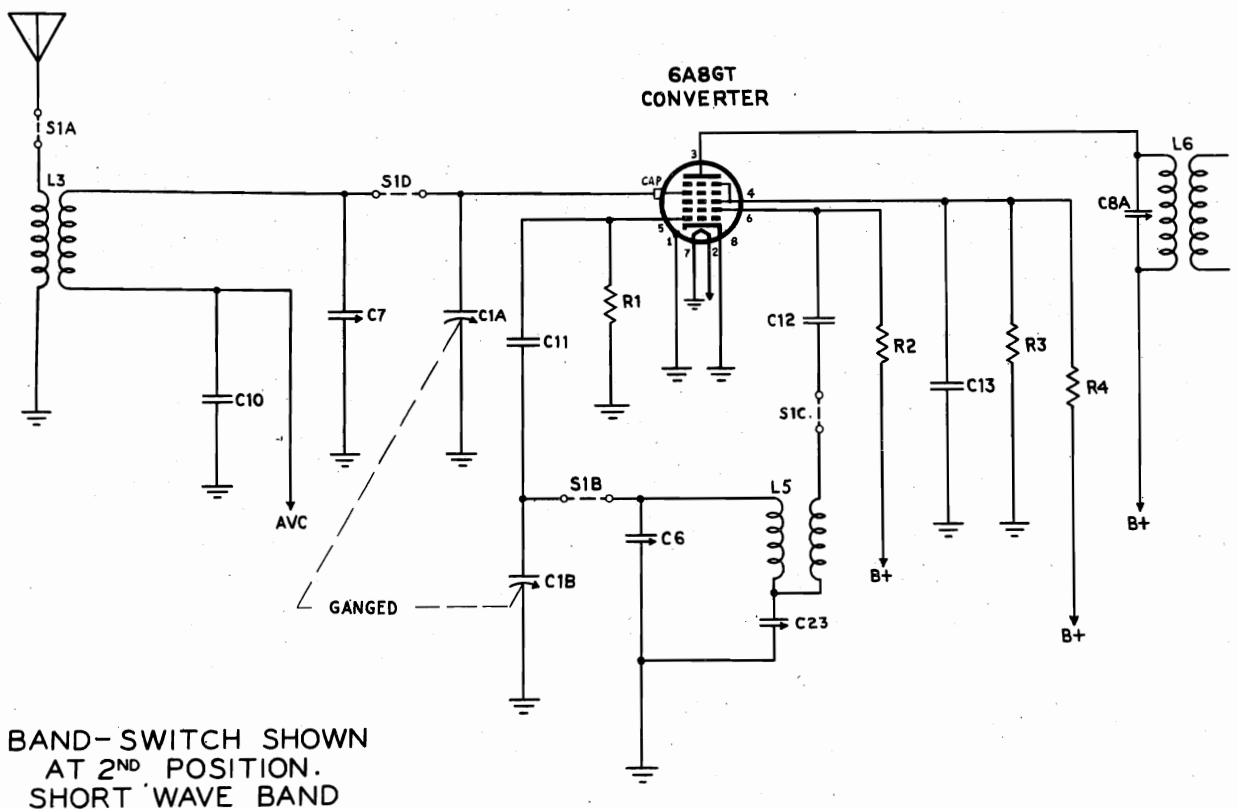
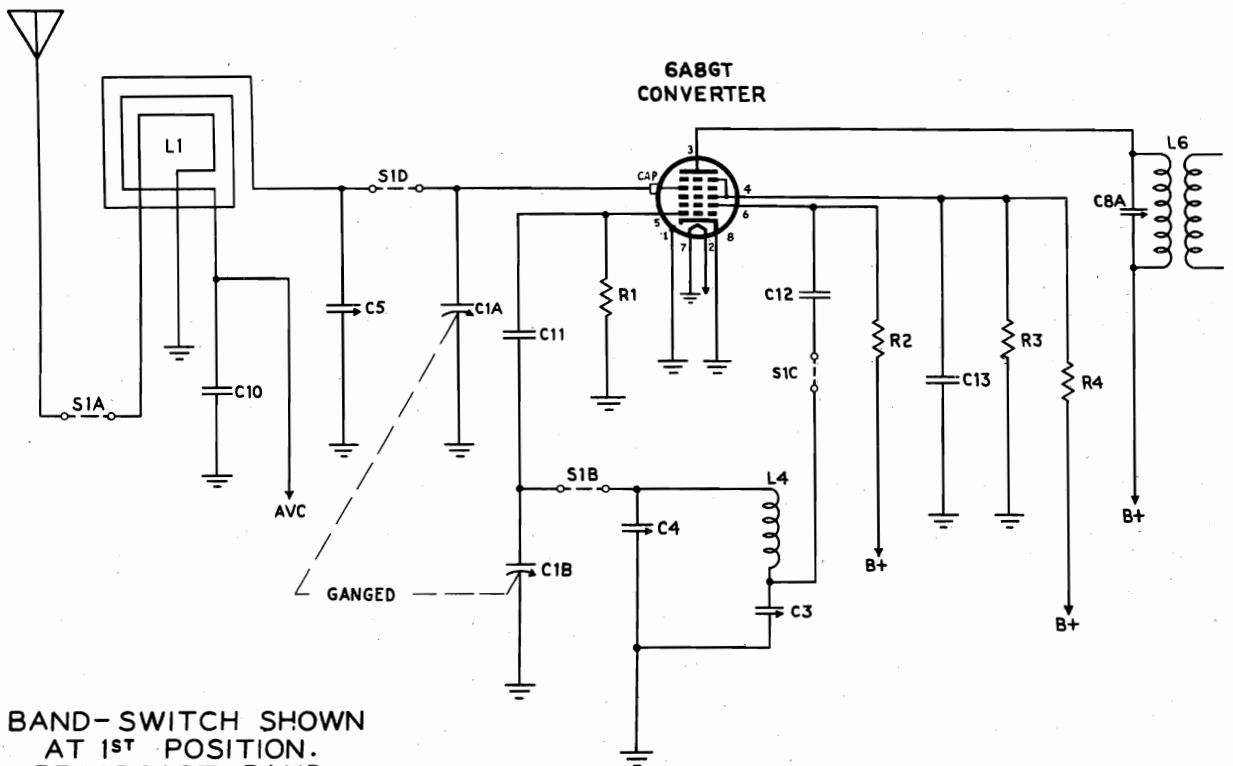
Current Consumption: 8.5 Amps.

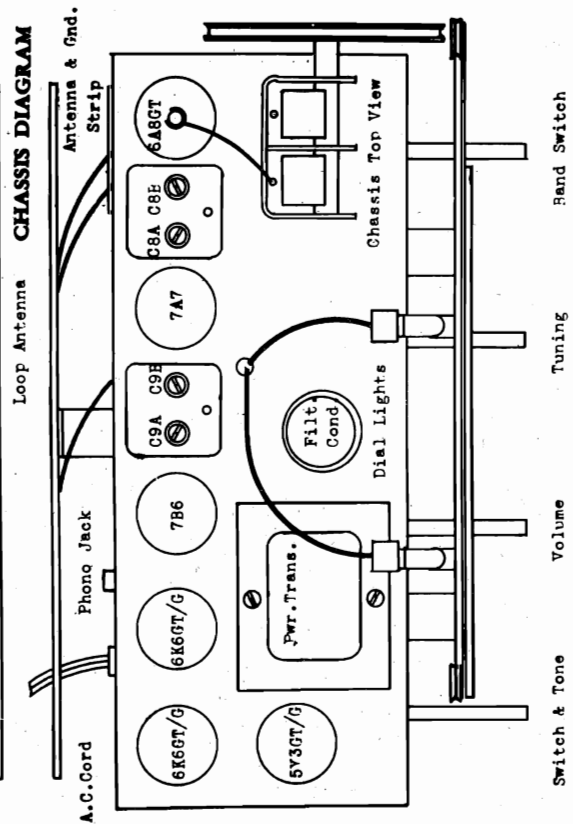
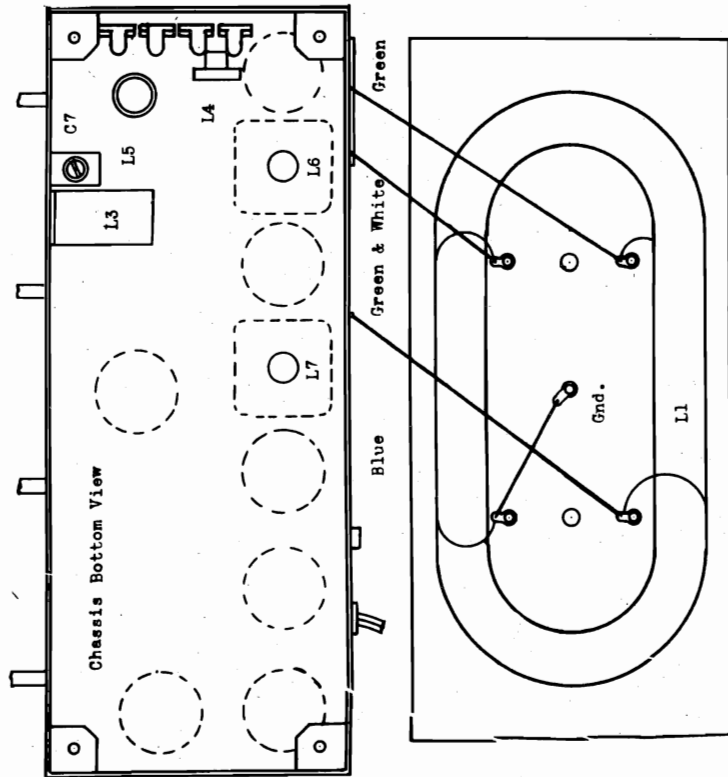
Speaker: Full electro dynamic (6 x 9 inch oval).



THE SPARKS WITHINGTON CO.

MODELS 6-26, 6-26PA





C3, C4, C5, C6, REFER TO TRIMMERS ON THE RIGHT SIDE OF CHASSIS IN THE BOTTOM VIEW.



ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING CONDENSER SETTING	TRIMMERS	REMARKS
1				Set dial pointer even with L.H. stop line with condenser gang fully closed.				
2	I.F.	G.C. 6A8GT	.02 MFD.	456 KC.	BC	OPEN	C9 A & B C8 A & B	Peak Accurately Peak Accurately
3	BC	Driver Loop	*	1500 KC.	BC	1500 KC.	C4 Osc.Trim. C5 Ant.Trim.	Peak Accurately Peak Accurately
4				600 KC.	BC	600 KC.	C3 Osc.Pad.	Peak Accurately
(Repeat Operation #3)								
5				Check Calibration at 600 KC., 1000 KC., and 1500 KC.				
6	S.W.	"A" on Antenna Strip	**	18 MC.	S.W.	18 MC.	C6 Osc.Trim. C7 Ant.Trim. C23 Osc.Pad.	Peak Accurately *** See Operation #7
7				Osc. pad C23 is precision set at the factory and should not be readjusted in the field.				
8				(Repeat Operation #6)				
9				Check calibration at 6 MC., 11 MC., and 18 MC.				
10				Check Operations 1 to 6 inclusive.				

NOTES: * Driver Loop. See manual 5, Bulletin 1-1 for diagram.
 ** Standard Dummy. See diagram below.
 *** Rock dial while making this adjustment.

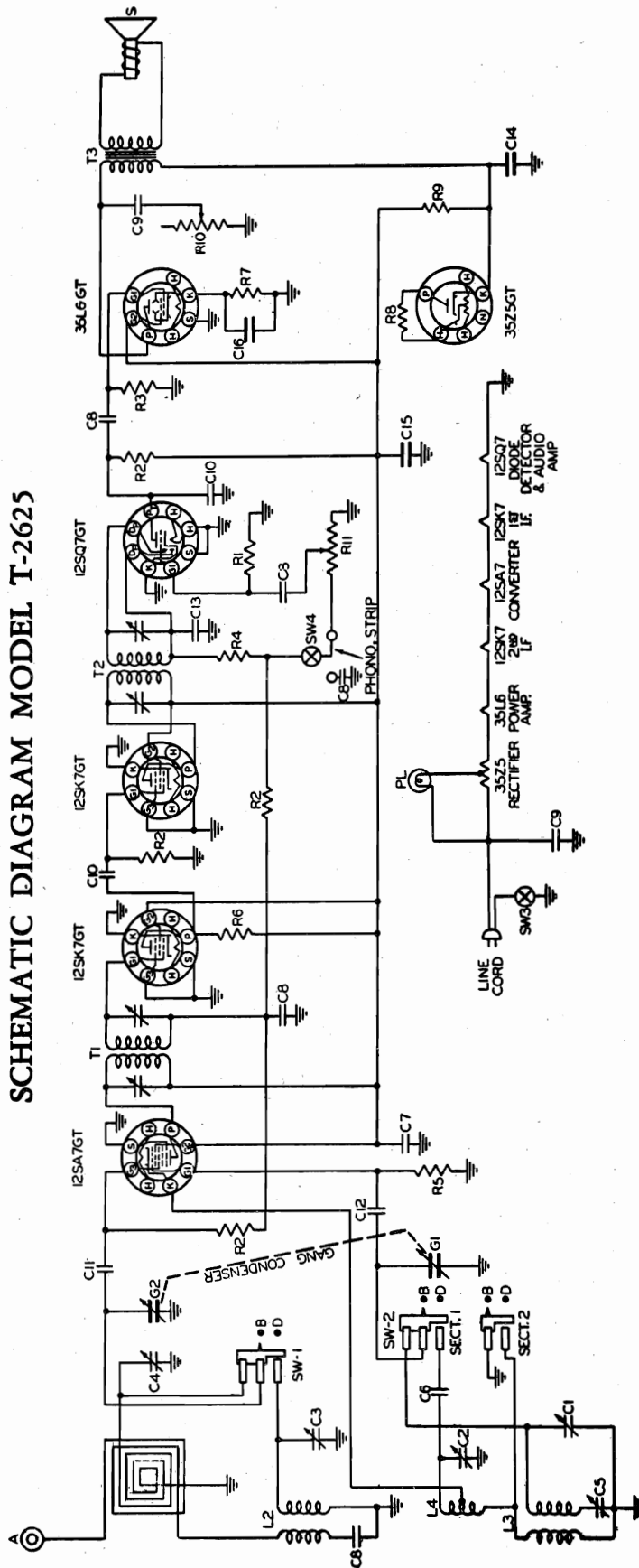
VOLTAGE CHART

TUBE	FUNCTION	Position of Volume Control: Full with set tuned to quiet channel. Position of Band Switch: Broadcast								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	
6A8GT/G	Converter	0	6.4*	233	87.5	6.6	150	C	0	- .98
7A7	I.F. Amplifier	6.4*	230	85	0	0	-1.03	C	0	-
786	2nd. det. AVC. 1st A.F.	6.4*	97.5	-1.15	-1.0	-1.15	-1.23	-1.0	C	-
6K6GT/G	Phase Invt. output	0	0	217.5	217.5	**	0	6.4*	13.5	-
6K6GT/G	Push-Full Output	0	0	217.5	230	**	0	6.4*	13.5	-
5Y3GT/G	rectifier	0	237.5	C	320	0	320	0	237.5	-

NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% / or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.
 * AC volts.
 ** Cannot be measured with 20,000 ohms/volt voltmeter.

SPIEGEL

SCHEMATIC DIAGRAM MODEL T-2625

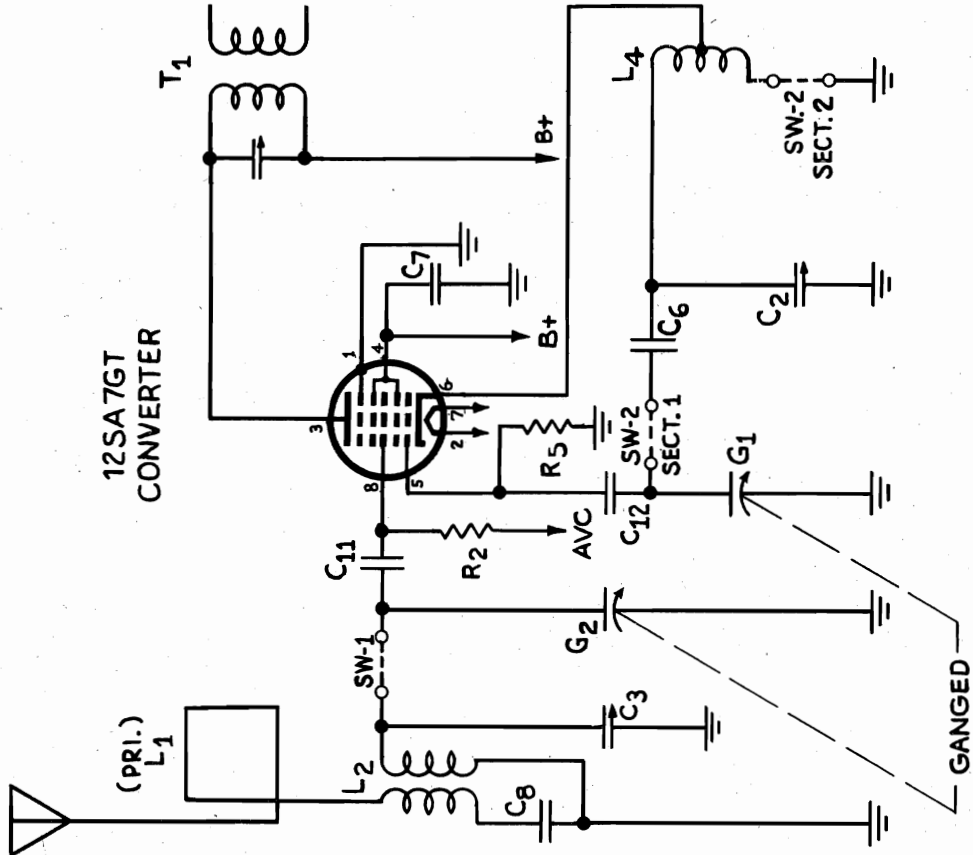


PART NO	SCHEMATIC LOCATION	DESCRIPTION
3-2	R1	2 MEG. 1/2 W 20% RESISTOR
3-6	R2	1 MEG. 1/2 W 20% RESISTOR
3-1	R3	500K. 1/2 W 20% RESISTOR
3-4	R4	50K. 1/2 W 20% RESISTOR
3-16	R5	30K. 1/2 W 20% RESISTOR
3-32	R6	10K. 1/2 W 20% RESISTOR
3-34	R7	100. 1/2 W 20% RESISTOR
3-174	R8	50. 1/2 W 20% RESISTOR
3-37	R9	2500. 1/2 W 20% RESISTOR
5-31	R10	25M. 1/2 W 20% RESISTOR
5-30	R11	1M. 1/2 W 20% RESISTOR
9-305	C1	BC OSC. TRIMMER COND.
	C2	SW ANT. TRIMMER COND.
	C3	BC ANT. TRIMMER COND.
9-47	C4	BC OSC. PADDER COND.
9-27	C5	BC OSC. PADDER COND.
6-26	C6	SW OSC. PADDER COND. 250WV (ON COIL)
6-3	C7	0.1MFD. 400VDC PAPER COND.
6-14	C8	0.05MFD. .
8-10	C9	0.0025MFD. 20K MICA COND.
8-43	C10	0.0005MFD. .
8-13	C11	0.0005MFD. .
8-8	C12	0.001MFD. .
	C13	80MFD. 150WV ELECTROLYTIC COND.
A7-302	C14	10 MFD. 25 WV
	C15	10 MFD. 25 WV
15-315	L1	BC LOOP
15-316	L2	SW ANTENNA COIL
15-317	L3	BC OSCILLATOR COIL
43-301	L4	SW. .
	S	P.M. SPEAKER
16-39	T1	INPUT IF TRANSFORMER
16-40	T2	OUTPUT IF TRANSFORMER (ON SPKR)
14-307	T3	BAND SWITCH
28-303	SW1	ON-OFF SWITCH ON VOL. CONTROL
47	SW2	PHONO JACK & SWITCH
40-306	SW3	CONVERTER
	SW4	1B & 2B IF
10-304	PL	PILOT LIGHT
	12SA7GT	CONVERTER
	12SK7GT	DETECTOR & AUDIO AMP.
	35L6GT	POWER AMPLIFIER
	35Z5GT	RECTIFIER
	C1	OSCILLATOR TUNING COND.
	C2	ANTENNA TUNING COND.

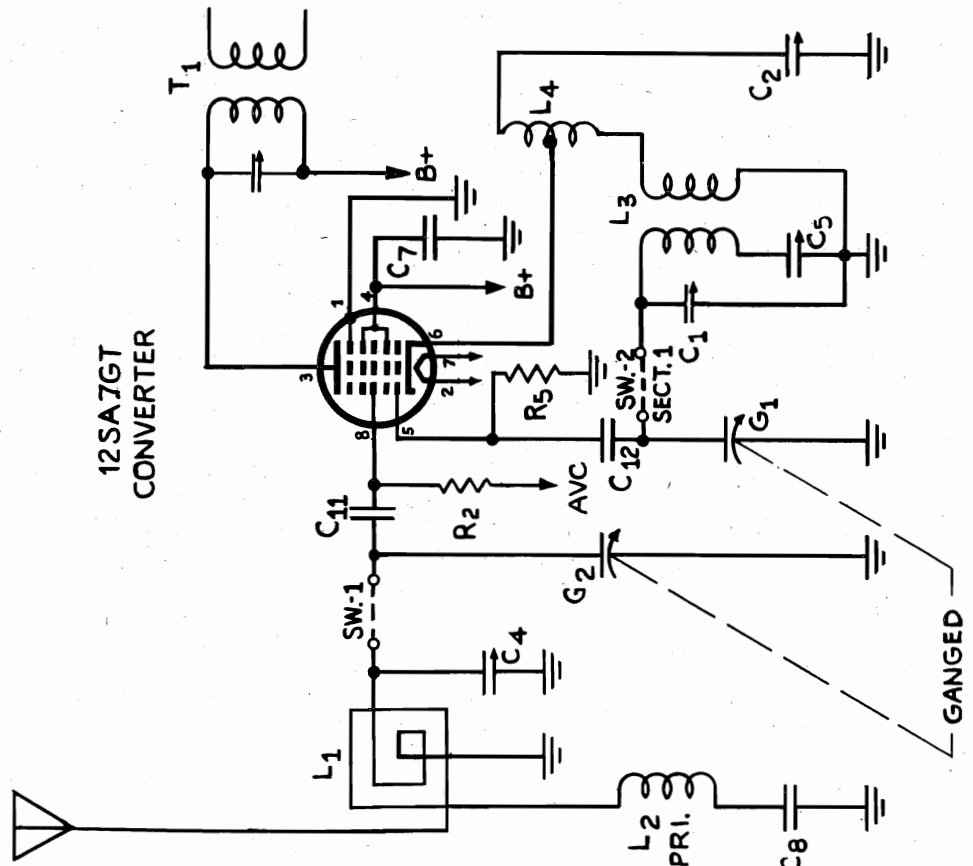
DESIGNED BY [Signature] APPROVED BY [Signature]
MARCH 2, 1958

"clarified schematics"

SPIEGEL



BAND-SWITCH SHOWN AT 2ND POSITION. SHORT WAVE BAND



BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND

SPIEGEL

INSTRUCTIONS FOR CONNECTING
F.M., TELEVISION OR PHONOGRAPH CONVERTOR

MODEL T-2625

ALIGNMENT AND SERVICE DATA

Remove the chassis from the cabinet for alignment.

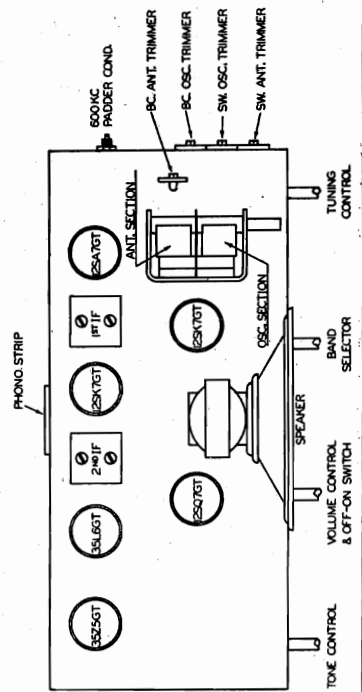
A signal generator is required having the following frequencies: 456KC, 1400KC, 1720KC, 6MC, 16MC, 18.3MC. An output meter should be connected across the speaker.

I. F. Alignment: Connect the generator lead through a .1MFD condenser to the terminal lug on the "Antenna" section of the gang condenser. The ground lead from the generator should be connected to the chassis base. Set the generator at 456KC. Adjust the trimmer screws in the 1st and 2nd I. F. cans (see Fig. No. 1) until a maximum reading is noted on the output meter.

The receiver volume control should be turned to maximum during the I F and all subsequent alignments, to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

BC or Broadcast Alignment: With the generator leads still connected as in I. F. Alignment, rotate the tuning condenser to complete minimum capacity. Set the generator to 1720KC. Adjust the BC oscillator trimmer until the signal is tuned in. Next, remove the generator leads and connect them to the antenna lead of the loop antenna, through a 100 MMFD condenser. Set the generator to 1400KC and rotate the tuning condenser until the signal is tuned in. Adjust the BC antenna trimmer until a maximum reading is noted on the output meter. Set the generator to 600KC and turn the tuning condenser until the signal is tuned in. Rock the tuning control back and forth slowly until a maximum reading is noted on the output meter. It is advisable to return to the 1720KC adjustment and recheck that setting to make sure it has not changed while padding at 600KC.

SW or Short Wave Alignment: Set the generator at 18.3MC. Turn the receiver band switch to short wave position. Turn the tuning condenser to complete minimum capacity. The generator leads should be connected to the antenna lead of the loop through a 400 Ohm resistor. Adjust the S. W. oscillator trimmer slowly until the 18.3MC signal is tuned in. At this point, it will be well to make sure that the fundamental signal is tuned in. Turn up the generator output and tune the receiver to approximately 17.3MC. At this point, the 18.3MC signal will be heard again but much weaker. This is the image frequency. If the image is not heard, then turn the tuning condenser back to complete minimum and readjust the SW oscillator trimmer. Remember the image must always be heard (at 2 times the IF frequency in KC) lower in frequency than the fundamental signal. After the oscillator has been properly set, tune the signal generator to 16MC and rotate the tuning control until the signal is tuned in. Adjust the SW antenna trimmer until a maximum reading is noted on the output meter. It is advisable to rock the gang slowly while adjusting the antenna trimmer. Set the generator to 6MC and tune the signal in on the receiver. Check the alignment at this frequency. No adjustment should be necessary, as the coils have been carefully checked before leaving the factory. A fixed oscillator padding condenser is used at 6MC.



A shielded lead wire is usually provided with the aforementioned instruments. To connect them to this receiver, plug the insulated wire into the hole on the connector strip which is marked with red paint. The shield or bare wire is plugged into the unmarked hole. When the wires are plugged in, the radio portion of the receiver is automatically cut off. It is only necessary to turn the volume control to increase or decrease volume.

When you desire to use the receiver for radio reception, it is necessary to pull out the external plugs.

MODEL 5020 BATTERY SUPPLIERS

The batteries for this receiver may be purchased from any reliable radio dealer.

For proper operation of this receiver, you must use, two (2) 4 1/2 Volt "A" batteries, and two (2) 45 Volt "B" batteries.

The following is a table of manufacturers and their battery type number:

"B" BATTERIES

Mfr.	Volts	Type No.
Burgess	45 "B"	M30
General	45 "B"	W30B
Bright Star	45 "B"	3033
Usalite	45 "B"	640
Rayovac	45 "B"	P7830
Eveready	45 "B"	482

"A" BATTERIES

Mfr.	Volts	Type No.
Burgess	4 1/2 "A"	G3
General	4 1/2 "A"	3H3
Bright Star	4 1/2 "A"	361
Usalite	4 1/2 "A"	683
Rayovac	4 1/2 "A"	P83A
Eveready	4 1/2 "A"	746

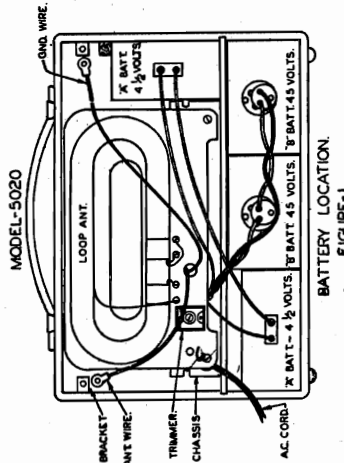


FIGURE-1
BATTERY LOCATION

BATTERY SERVICING

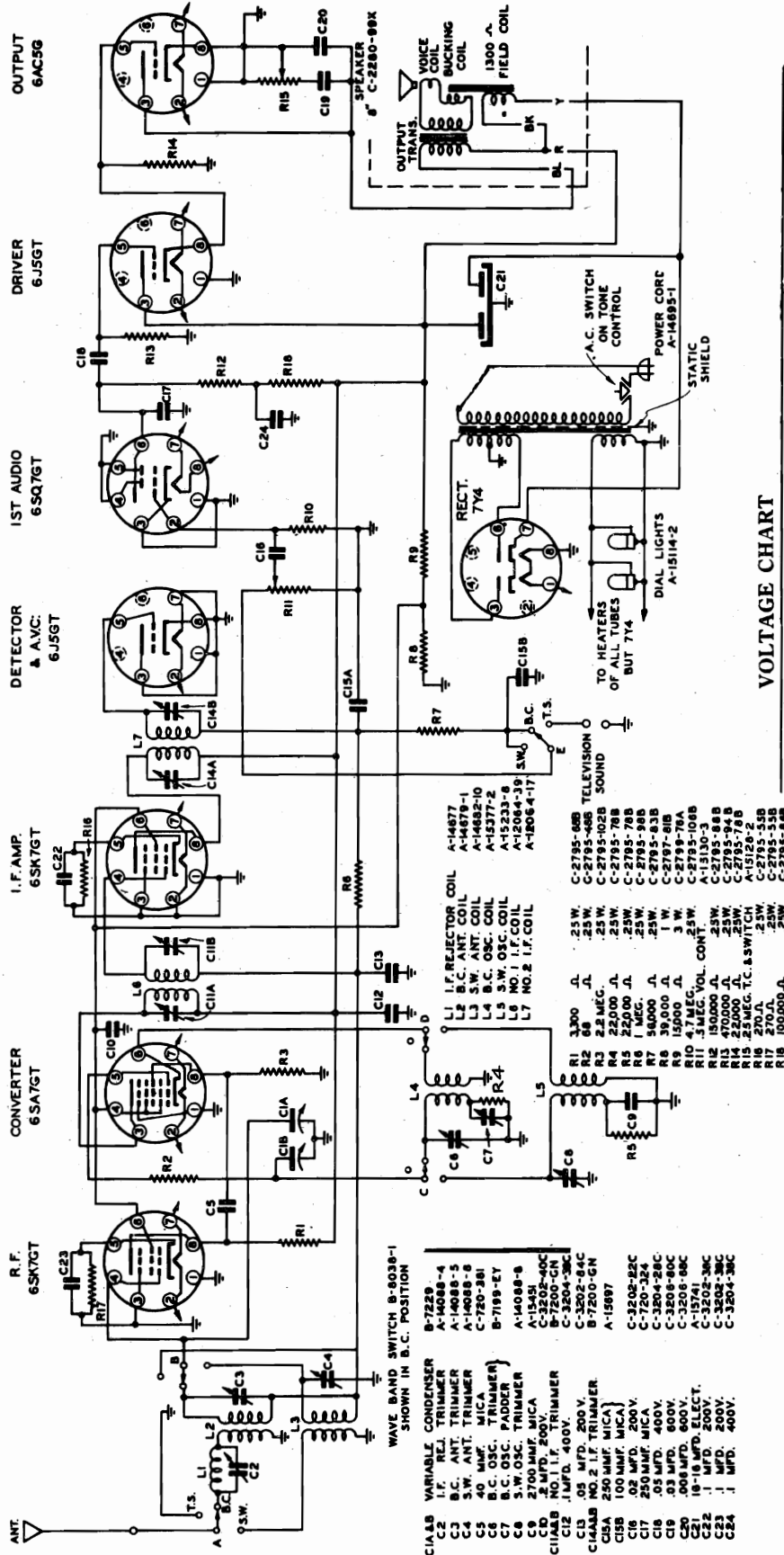
(See Figure No. 1)

To replace batteries, loosen and remove the two screws at the upper left and right hand corners of the cabinet back. Remove the back and pull out the plug from each battery. Never pull on the wires connected to the plugs as they may break. Always grasp the plug form between the fingers, or use a flat blade to pry out the plug. Observe with care the position of the batteries and plugs when replacing. Be sure that batteries and plugs are replaced as shown in the "Battery Location" diagram. (Figure No. 1)

After the batteries have been installed, replace the back, making sure that the two washers riveted to the bottom of the back, fit into the slots near the bottom edge of the cabinet. Also make sure that the two wires from the loop antenna are held in place between the top brackets of the cabinet and the back by the two fastening screws.

MODEL 831

SPIEGEL



VOLTAGE CHART

Position of Volume control: Full with Antenna disconnected
Position of Band Switch: Broadcast

Function		No 1	No 2	No 3	No 4	No 5	No 6	No 7	No 8
6SK7GT	R-f Amplifier	0	0	0	**	1.6	76	6.2*	237
6SA7GT	Oscillator-Converter	0	0	24.5	76	0	**	6.2*	0
6SK7GT	I-f Amplifier	0	0	0	**	1.6	76	6.2*	24.5
6J5GT	Detector-AVC	0	0	0	0	**	155	6.2*	0
6SQ7GT	1st Audio Amplifier	0	**	0	0	0	60	6.2*	0
6J5GT	Audio Driver	0	0	255	77	0	0	6.2*	11
6AC5G	Power Amplifier	0	0	240	0	11	0	6.2*	0
7Y4	Rectifier ***	0	0	300*	0	0	0	300*	0

Line voltage: 117 volts

MODEL 831

INTERMEDIATE FREQUENCY 456 K.C Tube
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

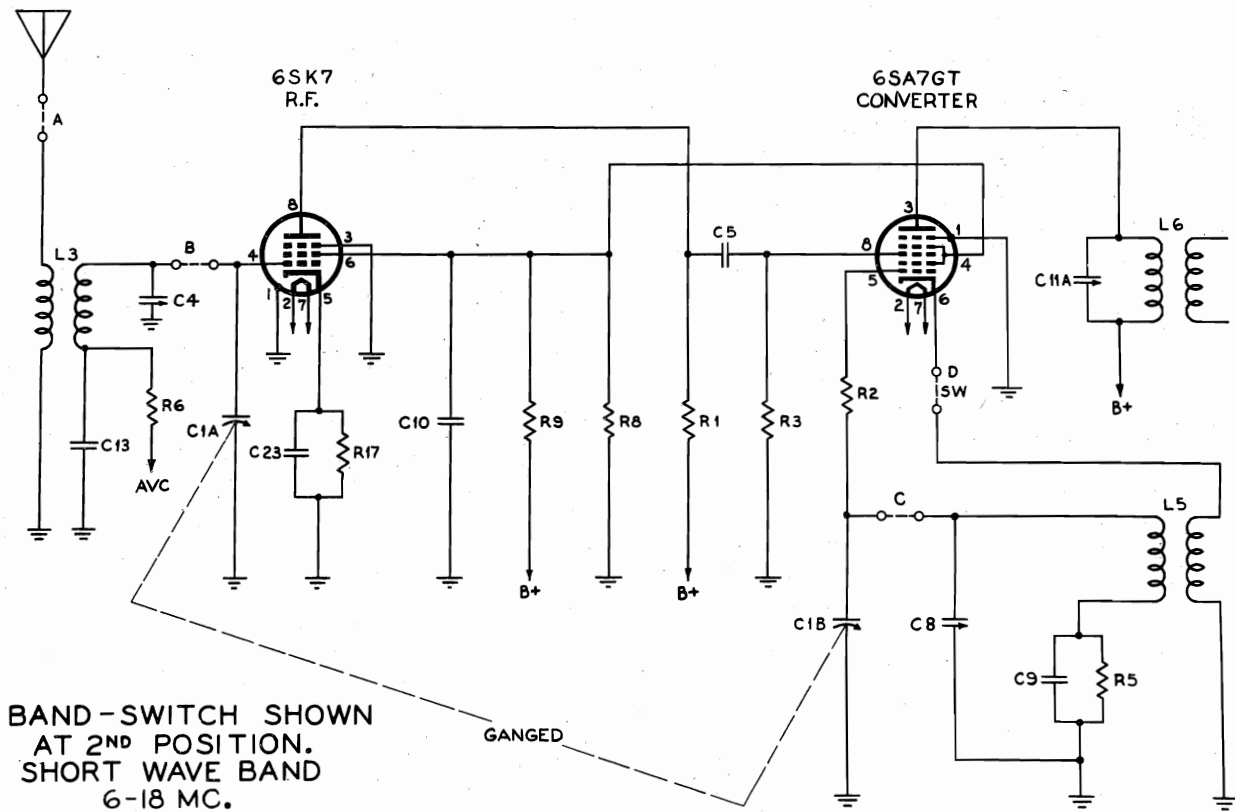
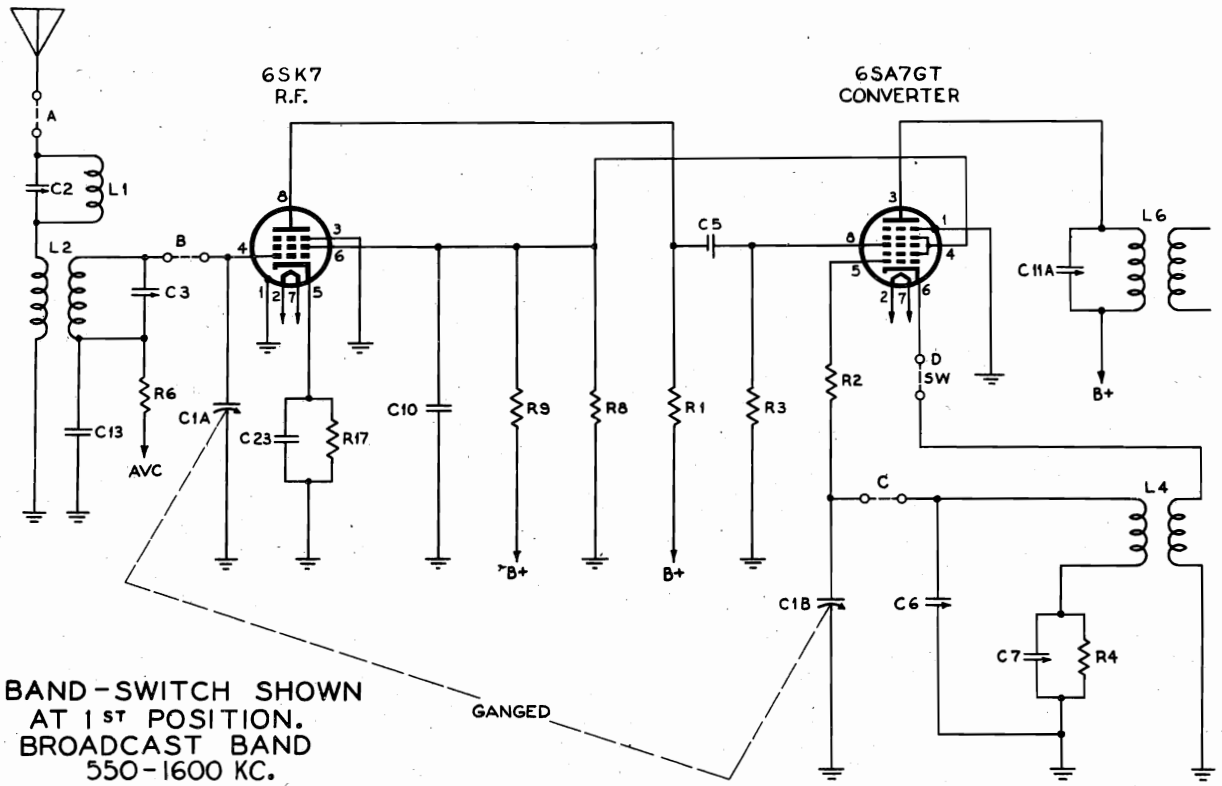
Tube	Function
6SK7GT	R-f Amplifier
6SA7GT	Oscillator-Converter
6SK7GT	I-f Amplifier
6J5GT	Detector-AVC
6SQ7GT	1st Audio Amplifier
6J5GT	Audio Driver
6AC5G	Power Amplifier
7Y4	Rectifier ***

* AC volts
** Cannot be measured with 1000 ohms/volt voltmeter.
*** Tube removed from socket to enable test prods to reach socket prongs.

August 1, 1940

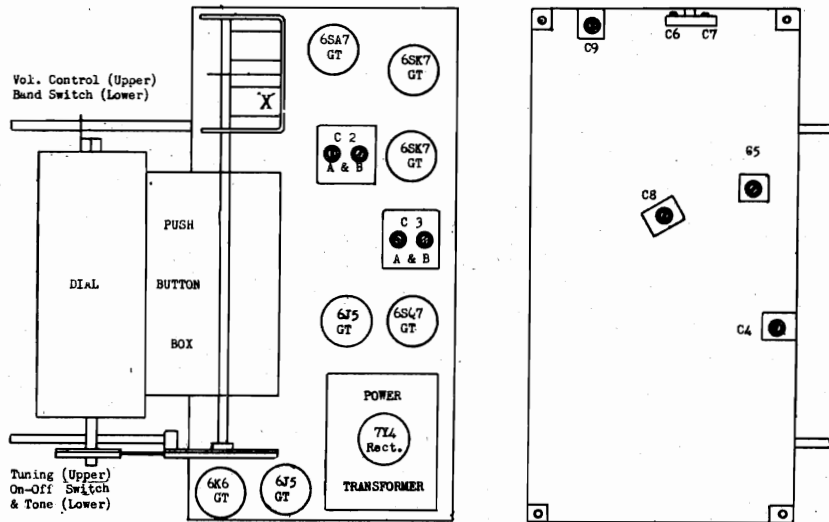
SPIEGEL

MODEL 831



MODEL 831

SPIEGEL



TOP VIEW OF CHASSIS

BOTTOM VIEW OF CHASSIS

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that last mark on BC scale is directly toward front of set when condenser plates are fully meshed.)							
2	I-F.	*	.1 mf.	456 KC	BC	Open	C3 A&B	2nd I-F
3	Rejector	Ant.	200 mf.	456 KC	BC	Closed	C2 A&B	1st I-F
4	Broad-cast Band	Ant.	200 mf.	1500 KC	BC	1500 KC	C4	Adjust to minimum
5				600 KC	BC	600 KC	C6 Osc.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	Shortwave Band	Ant.	*	18 MC	SW	18 MC	C9 Osc.	Rock dial while adjusting for maximum output
9	(Check calibration and sensitivity at 6 MC and 18 MC)							
10	(Check operations 1 to 9 inclusive)							

Notes: *Connect to point "X" on Variable Condenser. See drawing below.
 **100 ohm and 200 mf. in series

ADJUSTING THE PUSH-BUTTON TUNER

1. Select six favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets.
2. Any tab may be used for any button, but it is usually more convenient for the operator if the tabs are arranged in sequence so that the tab for the lowest frequency station (station having lowest number of kilocycles [K. C.]) will be at the low frequency end of the dial.
3. Using a small screwdriver or other tool that will fit the screw in the end of the button, push the button in as far as it will go and turn to the right or left until the dial pointer has moved to the desired station frequency. Be sure the button is pushed all the way in and the station is tuned in accurately.
4. Repeat the procedure in Paragraph 3 for each of the remaining five buttons.
5. Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned properly.
6. Insert the proper tab in each button by pressing it in position.
7. Any of the six stations to which the push-button tuner has been adjusted may now be received simply by pushing the button for the desired station.

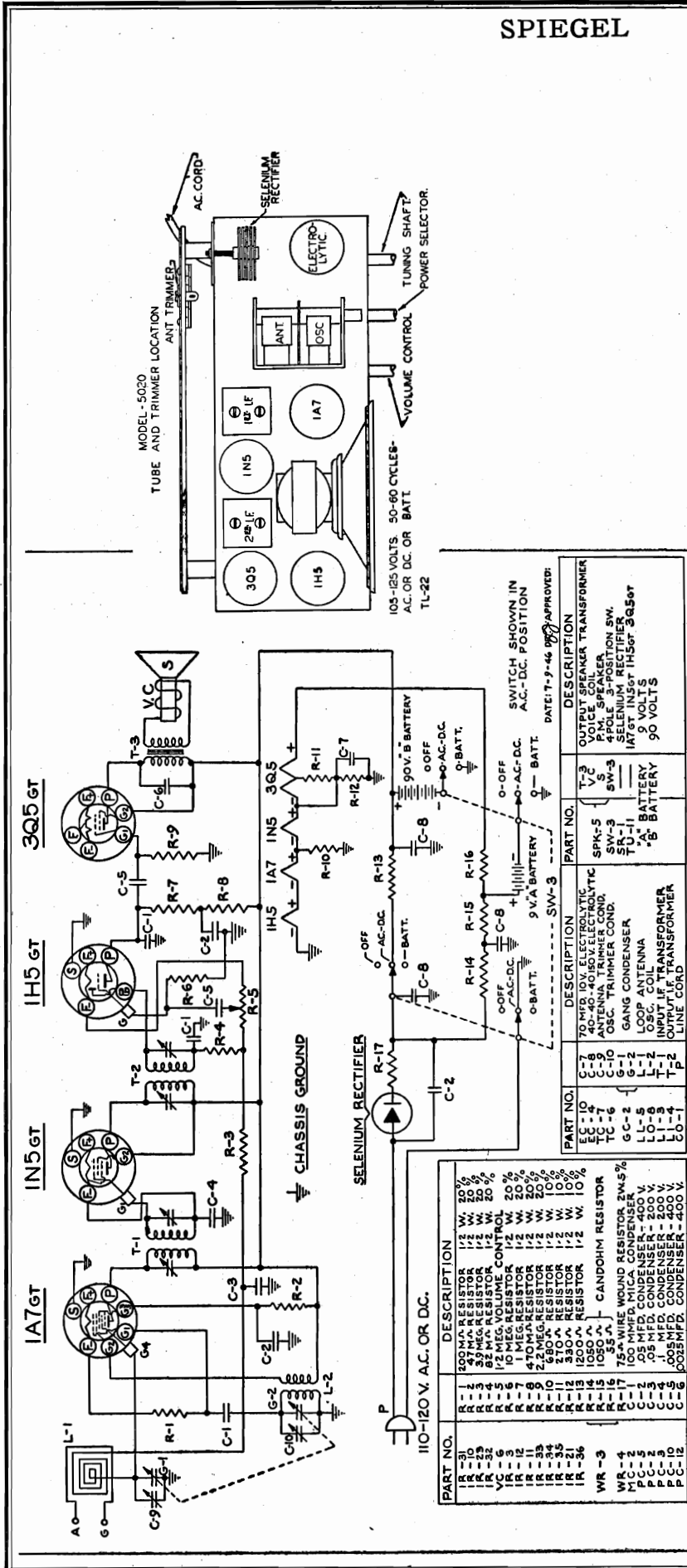
The tuning range of each band is as follows.

Position of Band Selector Switch	Dial Scale	Meters	or	Kilocycles	or	Megacycles
"B" Broadcast	Right hand	545. to 187		550 to 1600		.55 to 1.6
"S" Short-Wave	Left hand.....	50 to 16.6		6000 to 18000		6. to 18

"T" (Use pin jacks at back of chassis for phono or television sound.)

SPIEGEL

MODEL 5020



THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the antenna lead wire that projects from the back of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

CAUTION: When the receiver is not in use, the power selector knob must be turned to "OFF." If the knob is allowed to remain in "BATT" position, the batteries will be in use constantly. The volume control does not control the batteries and they are still in operation even though the volume control is turned all the way off.

ALIGNMENT AND SERVICE DATA

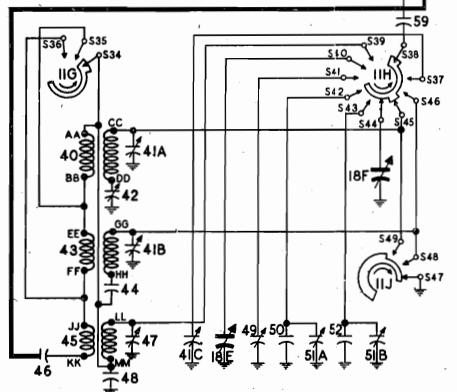
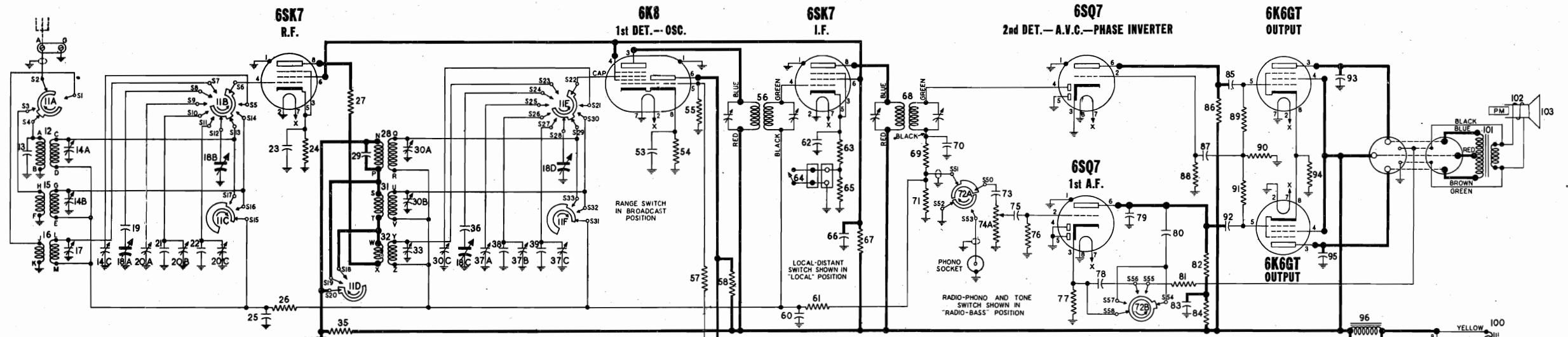
Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the metal frame of the gang condenser. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the top of the oscillator section of the gang condenser. Adjust this trimmer until the 1720 KC signal is tuned in.

STEWART WARNER CORP.



AUDIO OSCILLATION
The audio system of this receiver utilizes a two stage type of inverse feed-back arrangement and should it ever be necessary to replace the speaker or output transformer it is important to maintain a definite phase relationship in the feed-back circuit. If the connections to the output transformer are reversed or if the feed-back connection is made to the wrong side of the output transformer secondary, the system will become regenerative instead of degenerative. Under those conditions audio oscillation may result. If that occurs, oscillation may be prevented by reversing the connections to the primary of the output transformer.

I.F. 455 KC.

SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

BE SURE THAT SWITCH ON POWER TRANSFORMER IS SET TO POSITION WHICH MOST NEARLY MATCHES LINE VOLTAGE
RADIO-PHONO AND TONE SWITCH IN "RADIO-BASS" POSITION
VOLUME ON FULL WITH NO SIGNAL
DIAL TUNED TO 540 KC
BAND SWITCH IN BROADCAST POSITION

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

STAGE GAIN MEASUREMENT PROCEDURE

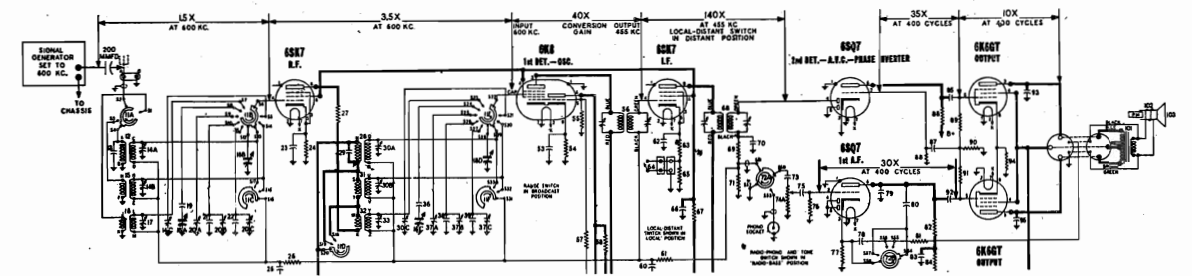
REQUIRED INSTRUMENTS: The amount of amplification or "gain" of each of the stages of this receiver may be measured with an A.C. Vacuum Tube Voltmeter or a "channel" type instrument containing a tuned and calibrated amplifier.

PROCEDURE: It is exceedingly important to adhere to the procedure outlined below since the accuracy of these measurements will be affected to a considerable extent by the failure to establish proper operating conditions.

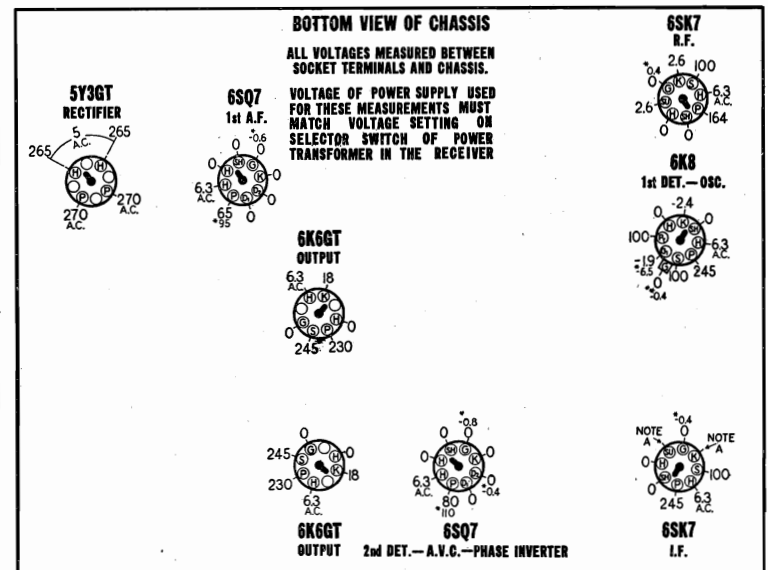
1. Be sure that R.F. and I.F. stages are carefully and accurately aligned by utilizing the alignment procedure given above.
2. Connect Signal Generator as shown below.
3. The values of stage gain which are given here were measured with a fixed bias of 3 volts on the control grids of all R.F. and I.F. tubes which are connected to the A.V.C. circuit. Therefore, these values are not intended to indicate the full capability of a stage but they will serve as a convenient basis for determining proper operation. In order to duplicate the fixed bias voltage, connect the negative terminal of a 3 volt battery to A.V.C. at the

black lead of the 1st I.F. transformer and connect the positive battery lead to the receiver chassis.

4. Set Signal Generator for operation at 600 Kc with 400 cycle modulation and carefully tune radio receiver to this signal by using an output meter to indicate peak output. If a local station interferes, set generator to a nearby frequency and re-tune the receiver.
5. R.F. and I.F. circuits are slightly de-tuned when contact is made with an instrument probe and this action, which is indicated by a change in the output meter reading, may seriously affect the gain measurement. Therefore, it is important to adjust the associated circuit trimmer for a maximum output meter reading and to set the input signal level to a convenient reference point on the gain measuring instrument while the probe is making contact. After removing the probe it is again necessary to adjust the trimmer so as to obtain the same output meter reading and thereby assure that the signal voltage at the specified point has not changed as a result of circuit de-tuning.
6. When using a "channel" type instrument, carefully tune it for maximum output at desired frequency before making measurements.

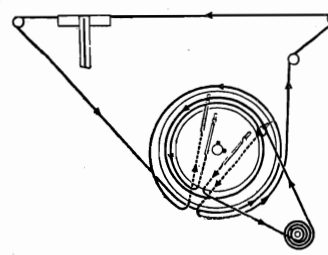


DIFFERENCES in tube characteristics, tolerance of parts, adjustment of tuned circuits and variations in line voltage will influence stage gain. These factors should be given due attention in event the gain of a stage varies extensively from the values shown above.



DIAL AND POINTER DRIVE CORD ARRANGEMENT

To string dial cord, set gang condenser to fully meshed position and use following parts:
113177 Tension Spring
114955 Clip on end of cord
119087 Ring
502773 Cord (8 feet)
4 1/2 ft. for pointer drive
3 1/2 ft. for tuning drive



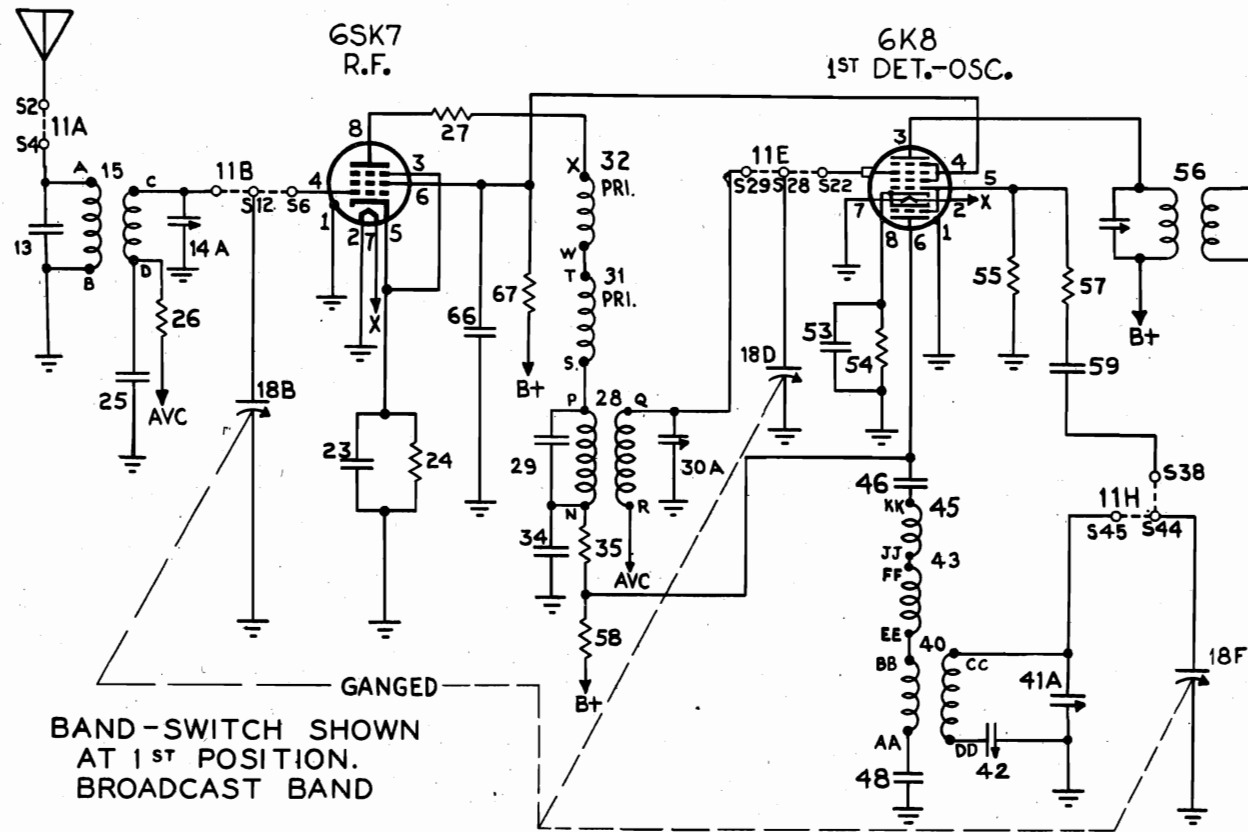
REAR OF CHASSIS

NOTE A: The voltage at the cathode or suppressor terminals of this tube is 13 volts when Local-Distant switch is in "Local" position and 2.4 volts when switch is set to "Distant" position.

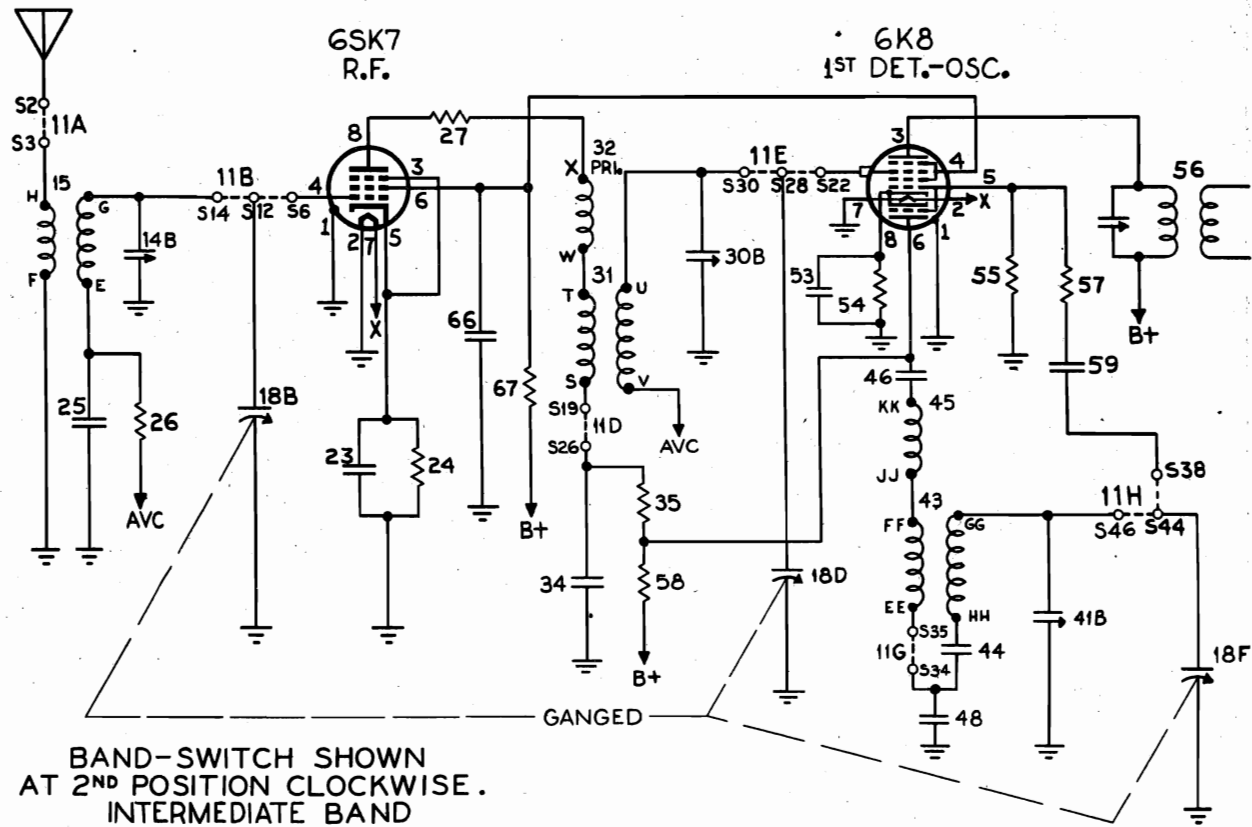
"clarified schematics"

STEWART WARNER CORP.

MODEL 9010-A



BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND

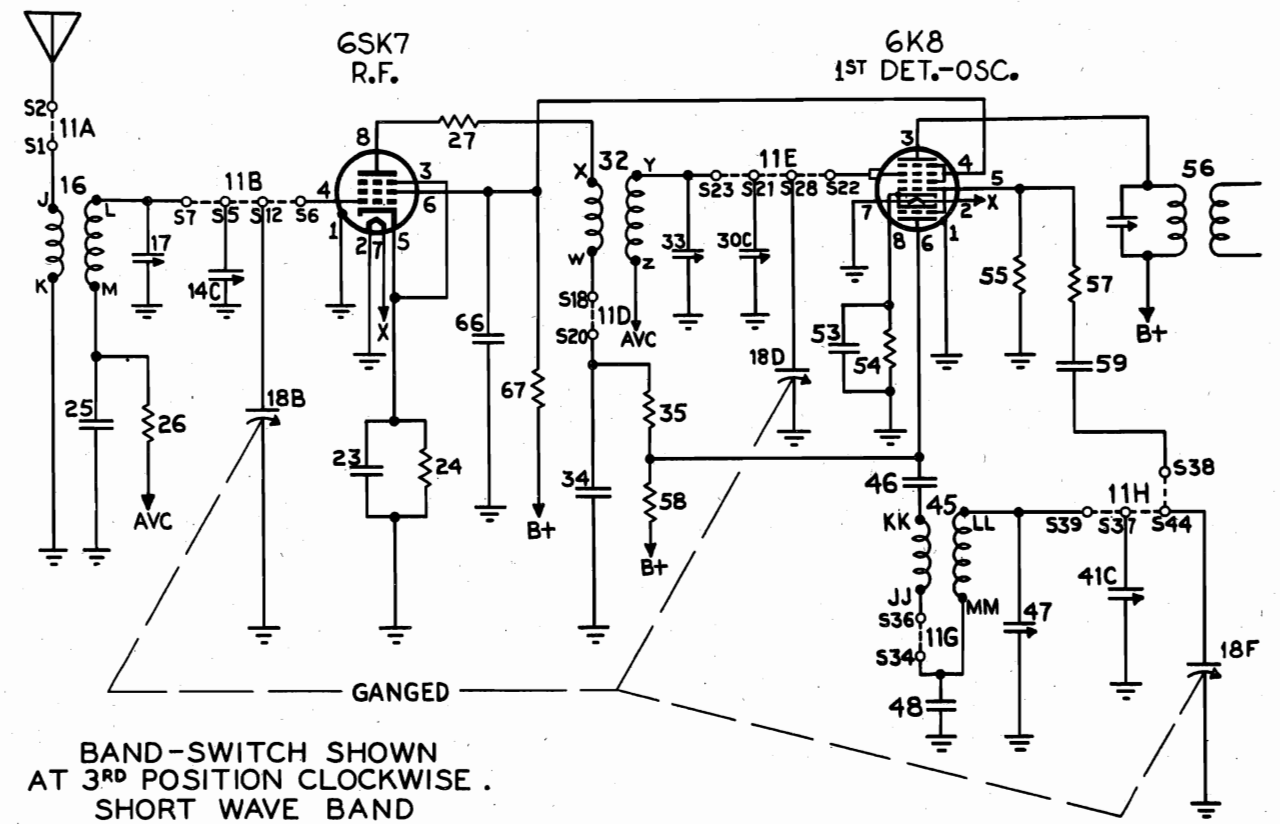


BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE. INTERMEDIATE BAND

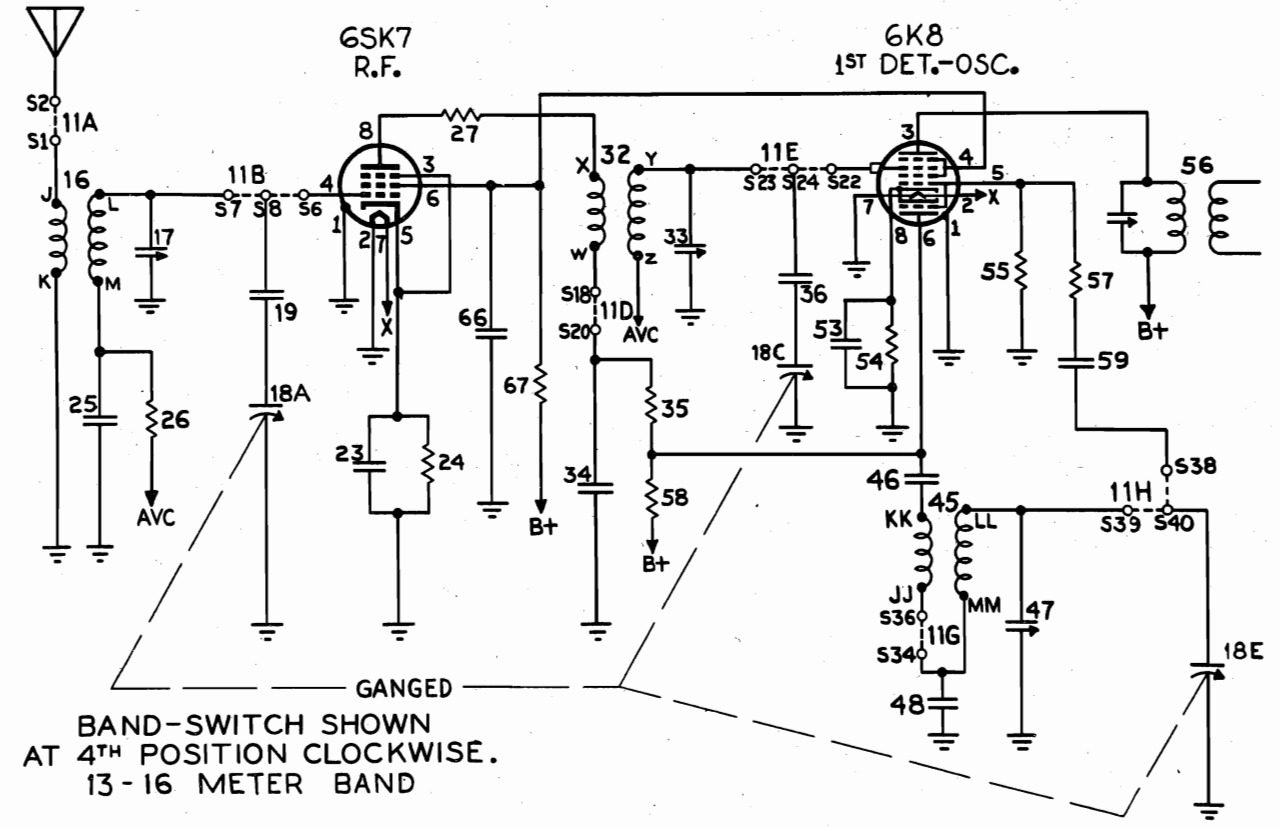
"clarified schematics"

STEWART WARNER CORP.

MODEL 9010-A



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE. SHORT WAVE BAND

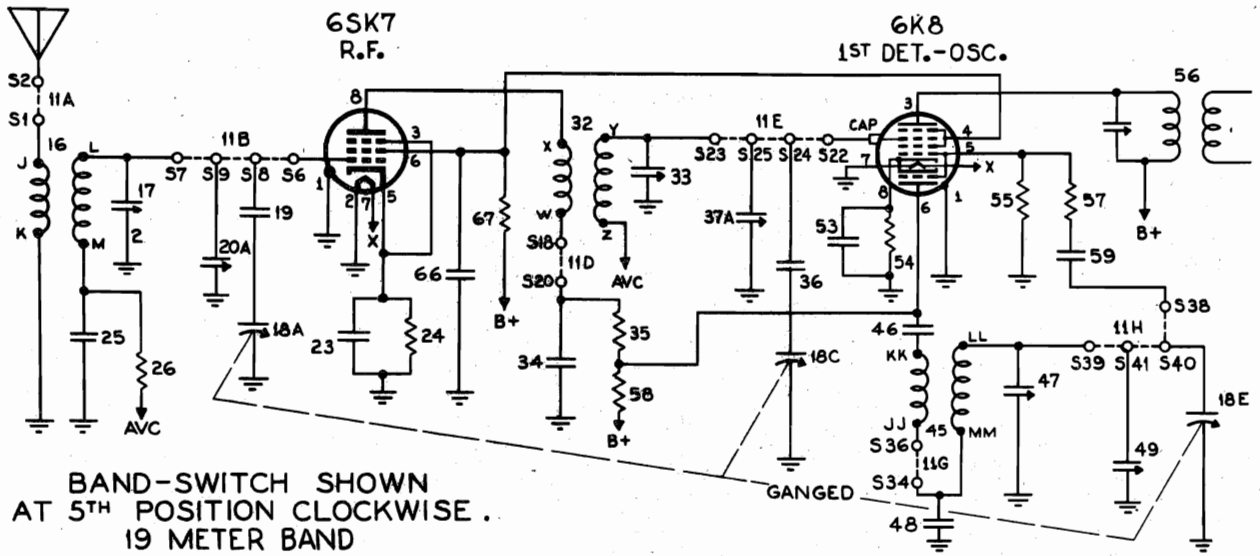


BAND-SWITCH SHOWN AT 4TH POSITION CLOCKWISE. 13-16 METER BAND

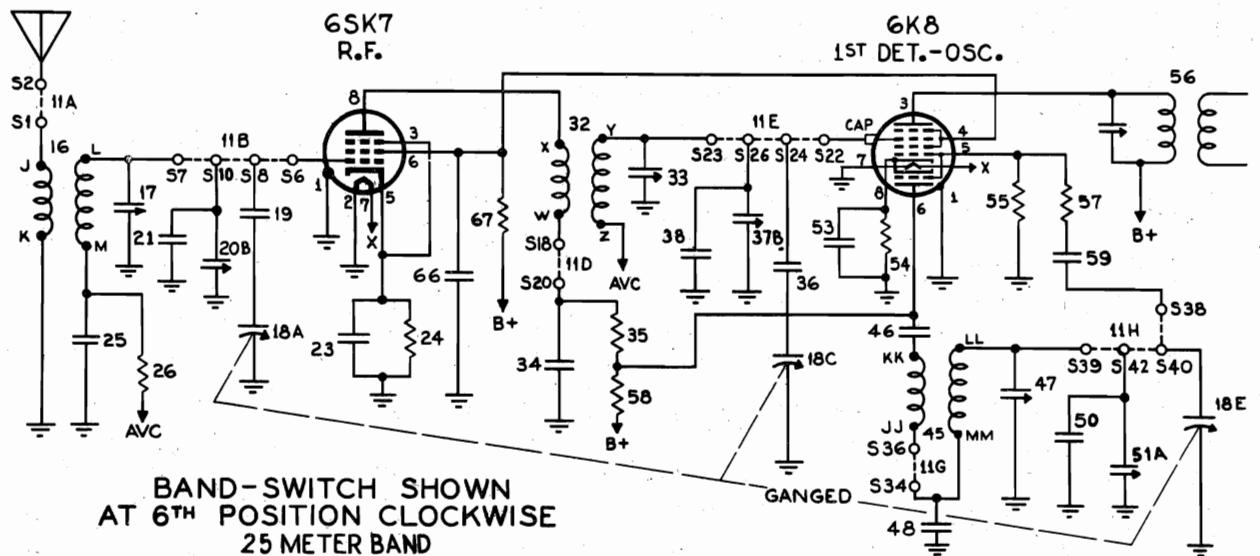
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STEWART WARNER CORP.

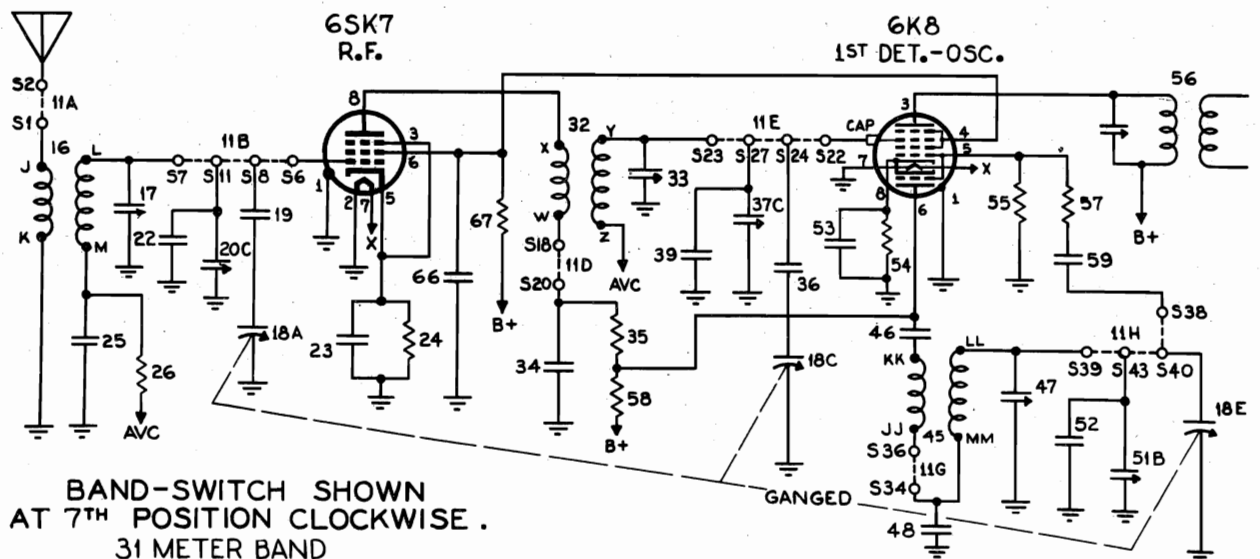
MODEL 9010-A



BAND-SWITCH SHOWN AT 5TH POSITION CLOCKWISE . 19 METER BAND



BAND-SWITCH SHOWN AT 6TH POSITION CLOCKWISE 25 METER BAND



BAND-SWITCH SHOWN AT 7TH POSITION CLOCKWISE . 31 METER BAND

ALIGNMENT PROCEDURE

1. When gang condenser is fully meshed, dial pointer should be in the position indicated by the last division below 550 on the dial. If it is set incorrectly, release pointer clip on dial cord and reposition pointer.
2. Connect on output meter across the speaker voice coil or from the plate of the 6K6GT tube to chassis through a 0.1 Mfd. condenser.
3. Connect the ground lead of the signal generator to the receiver chassis.
4. Set volume control to maximum volume position and use a weak signal from the signal generator.
5. Set Radio-Phono and Tone switch to "Radio-Bass" position.
6. Set Local-Distant switch to "Distant" position.

IMPORTANT: Align this receiver in exactly the order shown below. The 13-16 Meter band must be aligned before any of the other short wave bands.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT	
200 MMFD. Mica Condenser	Cap of 6K8	455 KC	Broadcast (*Position 1)	Any point where it does not affect the signal.	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.	
					3-4	1st I.F.		
200 MMFD. Mica Condenser	"A" terminal at rear of chassis.	1500 KC	Broadcast (*Position 1)	1500 Kc.	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.	
200 MMFD. Mica Condenser	"A" terminal at rear of chassis.	1500 KC	Broadcast (*Position 1)	Tune to 1500 Kc. generator signal.	6	Broadcast Antenna	Adjust for maximum output.	
					7	Broadcast R.F.		
200 MMFD. Mica Condenser	"A" terminal at rear of chassis.	600 KC	Broadcast (*Position 1)	Tune to 600 Kc. generator signal.	8	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.	
200 MMFD. Mica Condenser	"A" terminal at rear of chassis.	Repeat adjustment of trimmers 5, 6, and 7 at 1500 Kc. Then re-check adjustment of trimmer 8 at 600 Kc.						
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	5.5 MC	Intermediate (*Position 2)	5.5 Mc.	9	Intermediate Oscillator	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 4.6 MC. If image does not appear, realign at 5.5 MC, with trimmer screw farther out. Recheck image.	
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	5.5 MC	Intermediate (*Position 2)	Tune to 5.5 Mc. generator signal.	10	Intermediate Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.	
					11	Intermediate R.F.		
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	20 MC	13-16 Meter (*Position 4)	20 Mc.	12	13-16 Meter Oscillator	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 19.1 MC. If image does not appear, realign at 20 MC, with trimmer screw farther out. Recheck image.	
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	20 MC	13-16 Meter (*Position 4)	Tune to 20 Mc. generator signal.	13	13-16 Meter Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.	
					14	13-16 Meter R.F.		
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	16 MC	19 Meter (*Position 5)	16 Mc.	15	19 Meter Oscillator	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 15.1 MC. If image does not appear, realign at 16 MC, with trimmer screw farther out. Recheck image.	
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	16 MC	19 Meter (*Position 5)	Tune to 16 Mc. generator signal.	16	19 Meter Antenna	Adjust for maximum output.	
					17	19 Meter R.F.		
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	12 MC	25 Meter (*Position 6)	12 Mc.	18	25 Meter Oscillator	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 11.1 MC. If image does not appear, realign at 12 Mc, with trimmer screw farther out. Recheck image.	

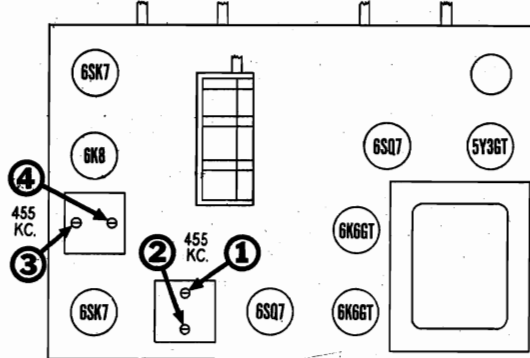
STEWART WARNER CORP.

MODEL 9010-A

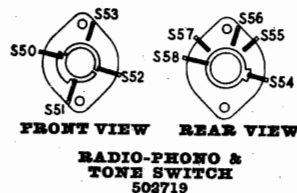
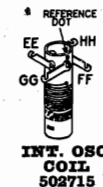
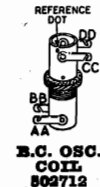
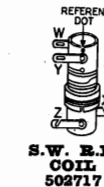
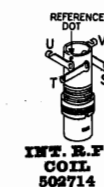
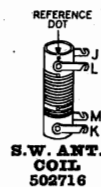
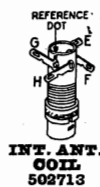
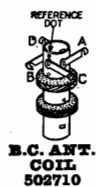
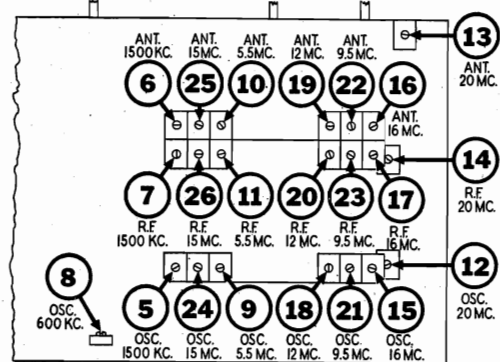
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	12 MC	25 Meter (*Position 6)	Tune to 12 Mc. generator signal.	19	25 Meter Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
					20	25 Meter R.F.	
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	9.5 MC	31 Meter (*Position 7)	9.5 Mc.	21	31 Meter Oscillator	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 9.8 MC. If image does not appear, realign at 9.5 MC, with trimmer screw farther out. Recheck image.
					22	31 Meter Antenna	
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	9.5 MC	31 Meter (*Position 7)	Tune to 9.5 Mc. generator signal.	23	31 Meter R.F.	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
					24	S.W. Oscillator	
400 OHM Carbon Resistor	"A" terminal at rear of chassis.	15 MC	S.W. (*Position 3)	15 Mc.	25	S.W. Antenna	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 14.1 MC. If image does not appear, realign at 15 MC, with trimmer screw farther out. Recheck image.
					26	S.W. R.F.	

* Position 1 corresponds to extreme counter-clockwise setting of band switch. Succeeding positions are numbered in ascending order as switch is rotated clockwise.

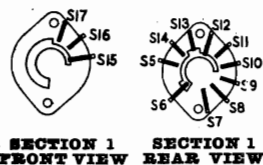
TOP VIEW OF CHASSIS



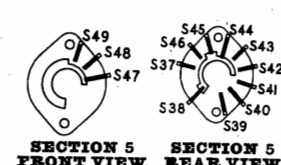
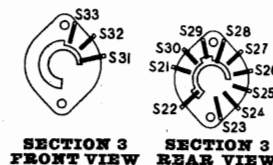
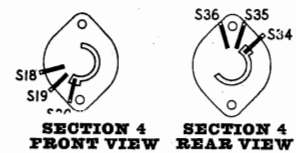
BOTTOM VIEW OF CHASSIS



BAND SWITCH 502748



*No connection



MODEL 9010-A
MODEL 9013-A

STEWART WARNER CORP

PARTS LIST

ORDER PARTS FROM YOUR STEWART-WARNER DISTRIBUTOR ONLY

DIA-GRAM PART NO.	MODEL 9010-A NO.	DESCRIPTION	LIST PRICE
CONDENSERS			
13	502787	Condenser—mica 100 Mmfd. 500 volt.	\$.024
14A, B, C	502753	Condenser—trimmer assembly	
		A—1.6 to 18 Mmfd.	
		B—1.6 to 18 Mmfd.	1.25
		C—3 to 35 Mmfd.	
17	502758	Condenser—trimmer; 1.6 to 18 Mmfd.	.35
18A to E	502749	Condenser—variable gang	9.00
19	502778	Condenser—ceramic 200 Mmfd. 500 volt.	.40
20A, B, C	502754	Condenser—trimmer assembly	
		A—3 to 35 Mmfd.	
		B—3 to 35 Mmfd.	1.25
		C—1.6 to 18 Mmfd.	
21	502779	Condenser—ceramic 56 Mmfd. 500 volt.	.45
22	502788	Condenser—mica 130 Mmfd. 500 Volt.	.45
23	502806	Condenser—.05 Mfd. 200 volt.	.36
24	502806	Condenser—.05 Mfd. 200 volt.	.36
25	502787	Condenser—mica 100 Mmfd. 500 volt.	.24
30A, B, C	502753	Condenser—trimmer assembly	
		A—1.6 to 18 Mmfd.	
		B—1.6 to 18 Mmfd.	1.25
		C—3 to 35 Mmfd.	
33	502758	Condenser—trimmer; 1.6 to 18 Mmfd.	.35
34	502807	Condenser—.05 Mfd. 400 volt.	.37
36	502778	Condenser—ceramic 200 Mmfd. 500 volt.	.40
37A, B, C	502754	Condenser—trimmer assembly	
		A—3 to 35 Mmfd.	
		B—1.6 to 18 Mmfd.	1.25
		C—3 to 35 Mmfd.	
38	502779	Condenser—ceramic 56 Mmfd. 500 volt.	.45
39	502788	Condenser—mica 130 Mmfd. 500 volt.	.45
41A, B, C	502753	Condenser—trimmer assembly	
		A—1.6 to 18 Mmfd.	
		B—1.6 to 18 Mmfd.	1.25
		C—3 to 35 Mmfd.	
42	502922	Condenser—trimmer; 300 to 600 Mmfd.	.85
44	502791	Condenser—mica 1600 Mmfd. 500 volt.	.80
46	502792	Condenser—mica 4000 Mmfd. 500 volt.	.80
47	502756	Condenser—trimmer; 2 to 6 Mmfd.	.60
48	502793	Condenser—mica 5600 Mmfd. 500 volt.	1.15
49	502757	Condenser—trimmer; 6.5 to 35 Mmfd.	.60
50	502167	Condenser—ceramic 68 Mmfd. 500 volt.	.40
51A, B	502755	Condenser—trimmer assembly	
		A—3 to 35 Mmfd.	90
		B—1.6 to 18 Mmfd.	
52	502789	Condenser—mica 160 Mmfd. 500 volt.	.45
53	502806	Condenser—.05 Mfd. 200 volt.	.36
59	502790	Condenser—mica 200 Mmfd. 500 volt.	.24
60	502806	Condenser—.05 Mfd. 200 volt.	.36
62	502806	Condenser—.05 Mfd. 200 volt.	.36
66	502807	Condenser—.05 Mfd. 400 volt.	.37
70	502787	Condenser—mica 100 Mmfd. 500 volt.	.24
73	502802	Condenser—.004 Mfd. 600 volt.	.30
75	502802	Condenser—.004 Mfd. 600 volt.	.30
78	502808	Condenser—.25 Mfd. 200 volt.	.45
79	502787	Condenser—mica 100 Mmfd. 500 volt.	.24
80	502803	Condenser—.006 Mfd. 600 volt.	.30
83	502809	Condenser—.25 Mfd. 400 volt.	.36
85	502805	Condenser—.02 Mfd. 400 volt.	.36
87	502804	Condenser—.01 Mfd. 400 volt.	.30
92	502805	Condenser—.02 Mfd. 400 volt.	.36
93	502802	Condenser—.004 Mfd. 600 volt.	.30
95	502802	Condenser—.004 Mfd. 600 volt.	.30
97A, B	502720	Condenser—electrolytic	2.10
		A—15 Mfd. 400 volt	
		B—20 Mfd. 400 volt	
RESISTORS			
24	502125	Resistor—carbon 220 ohms 1/4 watt.	.12
26	502134	Resistor—carbon 470,000 ohms 1/4 watt.	.12
27	502478	Resistor—carbon 1000 ohms 1/4 watt.	.12
35	502795	Resistor—carbon 4700 ohms 1/2 watt.	.12
54	502125	Resistor—carbon 220 ohms 1/4 watt.	.12
55	502131	Resistor—carbon 47,000 ohms 1/4 watt.	.12
57	502794	Resistor—carbon 68 ohms 1/4 watt.	.12
58	502801	Resistor—carbon 39,000 ohms 1/2 watt.	.12
61	502135	Resistor—carbon 2.2 Meg. 1/4 watt.	.12
63	502125	Resistor—carbon 220 ohms 1/4 watt.	.12
65	502796	Resistor—carbon 8200 ohms 1/4 watt.	.12
67	502981	Resistor—carbon 15,000 ohms 2 watt.	.25
69	502131	Resistor—carbon 47,000 ohms 1/4 watt.	.12
71	502134	Resistor—carbon 470,000 ohms 1/4 watt.	.12
74A, B	502750	Volume control—with switch; 2 meg.	1.50
76	502136	Resistor—carbon 10 meg. 1/4 watt.	.12
77	502794	Resistor—carbon 68 ohms 1/4 watt.	.12
81	502126	Resistor—carbon 470 ohms 1/4 watt.	.12
82	502133	Resistor—carbon 220,000 ohms 1/4 watt.	.12
84	502132	Resistor—carbon 100,000 ohms 1/4 watt.	.12
86	502133	Resistor—carbon 220,000 ohms 1/4 watt.	.12
88	502136	Resistor—carbon 10 meg. 1/4 watt.	.12
89	502133	Resistor—carbon 220,000 ohms 1/4 watt.	.12
90, 91	502133	Resistor—carbon 220,000 ohms 1/4 watt.	.12
94	502813	Resistor—wire wound 300 ohms 2 watt.	.25
COILS AND TRANSFORMERS			
12	502710	Coil—BC. antenna	2.10
15	502713	Coil—Int. antenna	1.40
16	502716	Coil—S.W. antenna	1.40

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

DIA-GRAM PART NO.	NO.	DESCRIPTION	LIST PRICE
28	502711	Coil—BC. R.F.	2.30
31	502714	Coil—Int. R.F.	1.50
32	502717	Coil—S.W.R.F.	1.40
40	502712	Coil—BC. oscillator	1.80
43	502715	Coil—Int. oscillator	1.80
45	502718	Coil—S.W. oscillator	1.70
56	502725	Transformer—1st I.F.	2.15
68	502726	Transformer—2nd I.F.	2.15
96	502751	Coil—filter choke	4.60
100	502747	Transformer—power	12.50
101	502776	Transformer—output for M-502775 spkr.	2.75
OTHER ELECTRICAL PARTS			
11A to J	502748	Switch—band	7.00
64	502916	Switch—local-distant	.80
72A, B	502719	Switch—tone control	1.40
98, 99	110629	Lamp—dial (Mazda No. 44) 6.3V 0.25 Amps.	.15
102	502775	Speaker—P.M. dynamic (8 inch)	12.50
103	502777	Cone & voice coil for M-502775 speaker	3.00
MISCELLANEOUS			
502724		Background for dial	.35
160026		Base for mtg. electrolytic condenser	.04
500420		Clamp—for dial glass	.15
112745		Clip—coil mtg.	.01
114955		Clip—retainer on end of dial cord	.01
502773		Cord—dial drive (8 ft. required)	Per ft. .05
502921		Dial scale—glass	2.25
117029		Drum—for dial drive	.70
501458		Knob—tone or band switch	.16
501449		Knob—volume or tuning	.15
502762		Plug—for Local-Distant switch	.15
502772		Pointer	.50
8145		Retaining ring for tuning shaft	.01
113087		Ring for dial cord	.01
113463		Rubber pad for mtd. chassis	.03
116584		Rubber spacer for mtg. dial scale	.02
85827		Screw—No. 8-32 for dial drum	.02
112874		Screw—No. 10 x 1 1/8 for mtg. chassis	.03
504990		Shaft—tuning control	.12
502770		Socket—for dial lamp	.18
502761		Socket—for Local-Distant switch	.20
502769		Socket—for speaker	.30
114876		Socket—octal base	.15
160039		Socket—phono. plug	.08
113177		Spring—dial cord tension	.08
502767		Terminal strip—"A G"	.18
500487		Washer—felt for knobs	.01
111456		Washer—spring washer for tuning shaft	.005

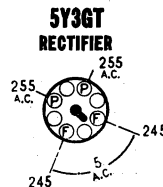
SOCKET VOLTAGES

Measured with voltmeter having sensitivity of 1000 ohms per volt except where indicated by (*).

BE SURE THAT SWITCH ON POWER TRANSFORMER IS SET TO POSITION WHICH MOST NEARLY MATCHES LINE VOLTAGE
VOLUME ON FULL WITH NO SIGNAL DIAL TUNED TO 540 KC.
BAND SWITCH IN BROADCAST POSITION

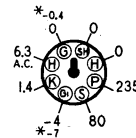
MODEL 9013-A

BOTTOM VIEW OF CHASSIS

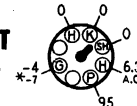


ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS.

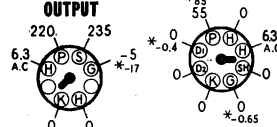
6SA7
1st DET.



6J5GT
OSC.



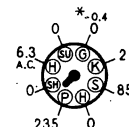
6K6GT
OUTPUT



6SQ7
2nd DET.—A.V.C.—A.F.

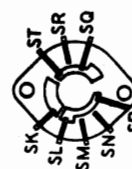
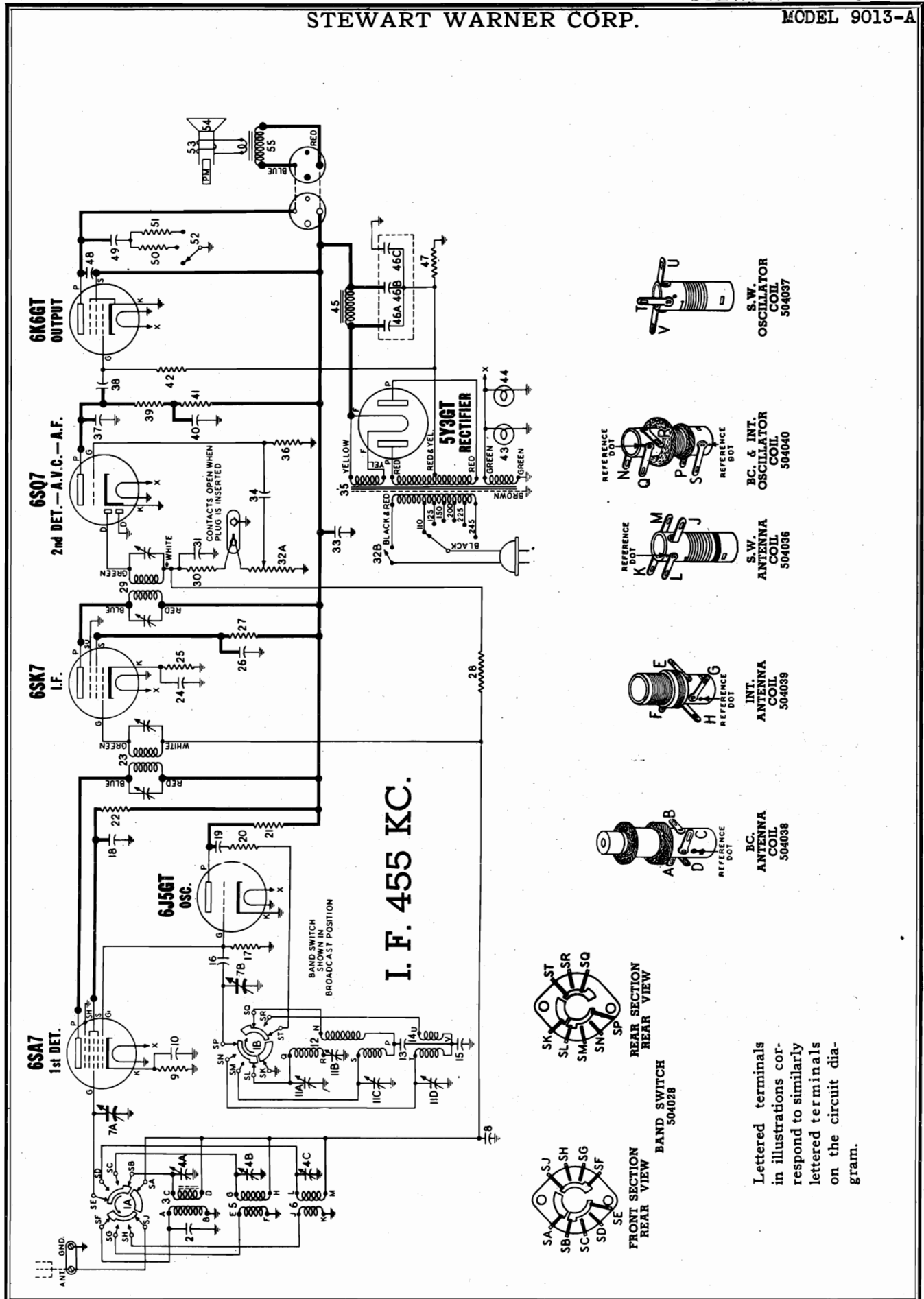
REAR OF CHASSIS

6SK7
I.F.



*—Measured with vacuum tube voltmeter.

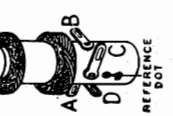
NOTE:—The 6K6GT grid bias of —17 volts can be measured across resistor No. 47



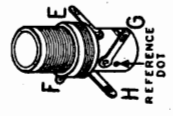
FRONT SECTION
REAR VIEW

BAND SWITCH
504028

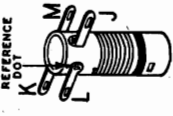
REAR SECTION
REAR VIEW



BC.
ANTENNA
COIL
504038



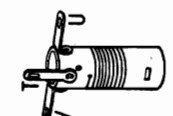
INT.
ANTENNA
COIL
504039



S.W.
ANTENNA
COIL
504036



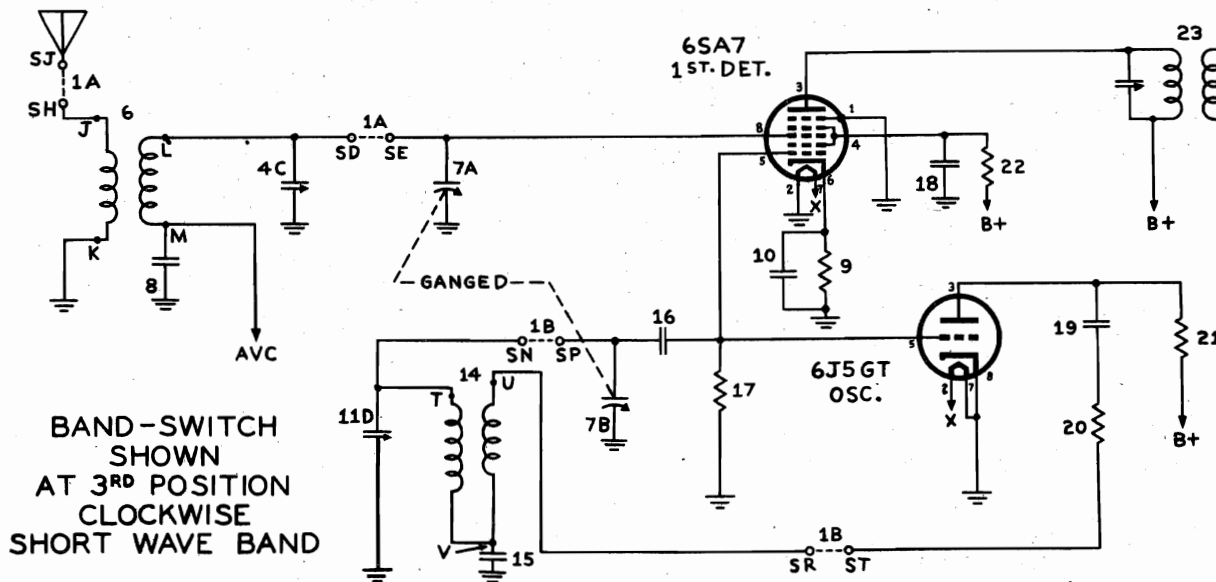
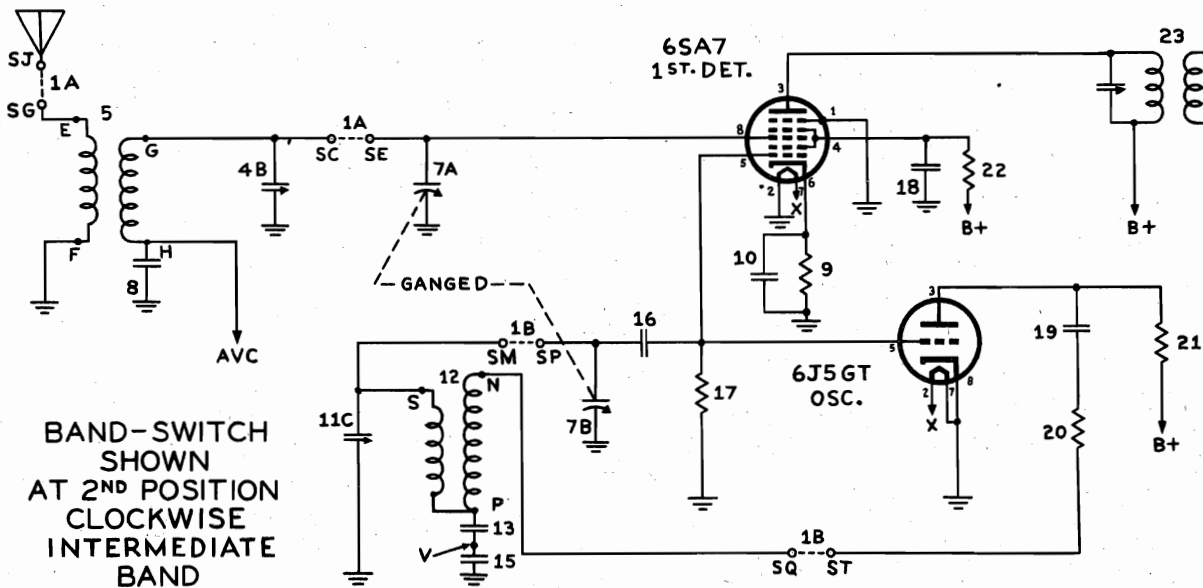
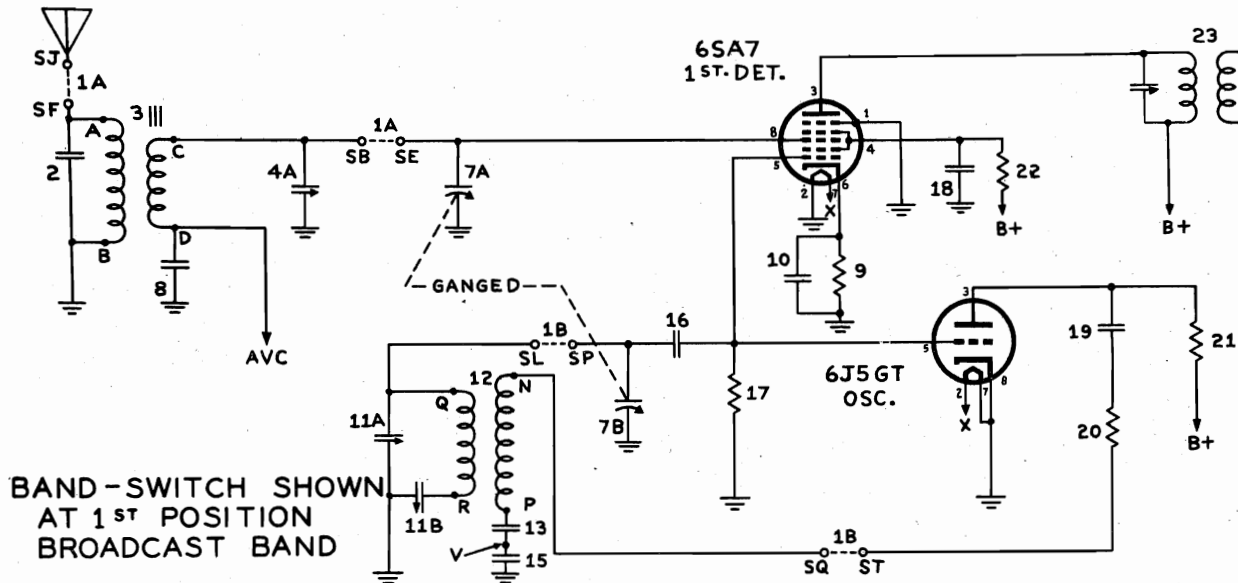
BC. & INT.
OSCILLATOR
COIL
504040



S.W.
OSCILLATOR
COIL
504037

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

"clarified schematics"



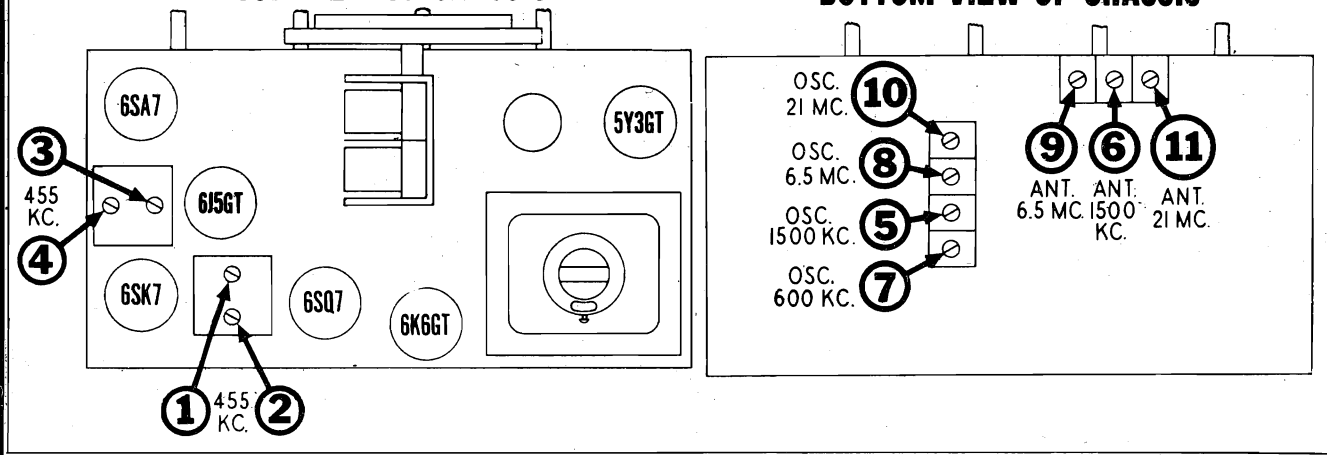
ALIGNMENT PROCEDURE

1. When gang condenser is fully meshed, dial pointer should be in the position indicated by the last division below 55 on the dial. If it is set incorrectly, release pointer clip on dial cord and reposition pointer.
2. Connect on output meter across the speaker voice coil or from the plate of the 6K6GT tube to chassis through a 0.1 Mfd. condenser.
3. Connect the ground lead of the signal generator to the receiver chassis.
4. Set volume control to maximum volume position and use a weak signal from the signal generator.

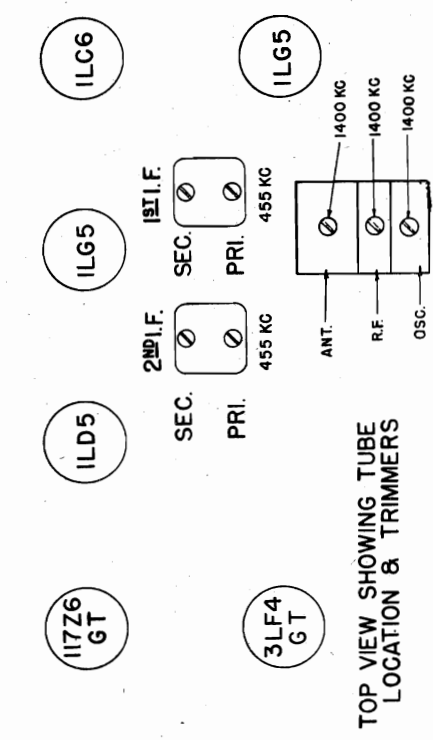
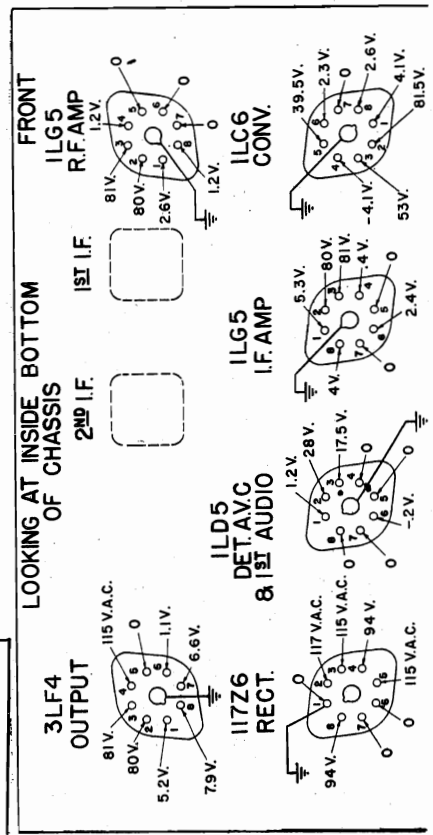
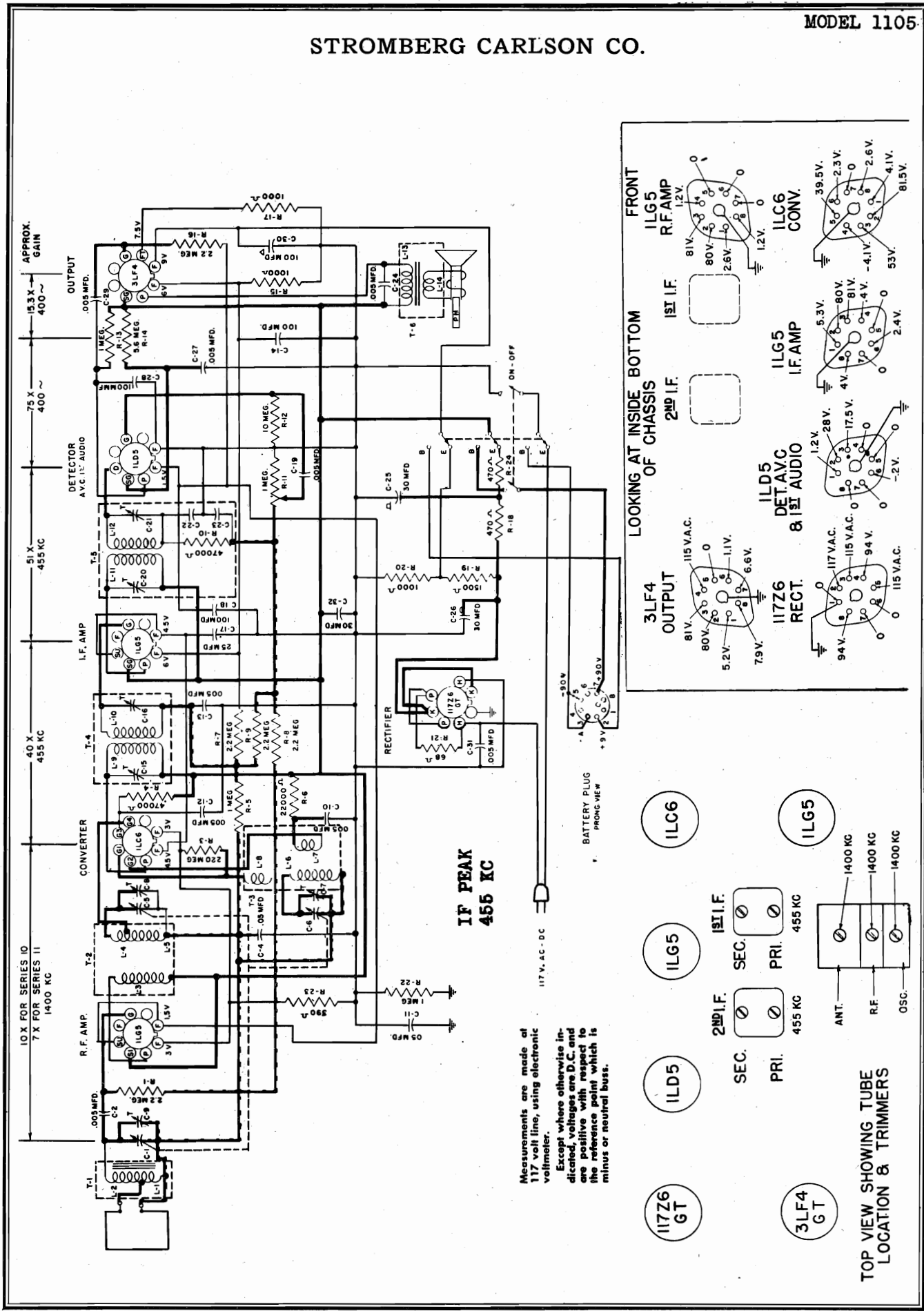
DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
1 MFD. Condenser	Lug on front section of gang.	455 KC.	Broadcast (counter-clockwise)	Any point where it does not affect the signal.	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	"ANT" terminal at rear of chassis.	1500 KC	Broadcast (counter-clockwise)	1500 Kc.	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	"ANT" terminal at rear of chassis.	1500 KC	Broadcast (counter-clockwise)	Tune to 1500 Kc. generator signal.	6	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	"ANT" terminal at rear of chassis.	600 KC	Broadcast (counter-clockwise)	Tune to 600 Kc. generator signal.	7	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	"ANT" terminal at rear of chassis.	6.5 MC	Intermediate (middle)	6.5 Mc.	8	Intermediate Oscillator	Adjust to bring in signal. Check to see if proper peak was obtained by tuning in image at approx. 5.6 Mc. If image does not appear, realign at 6.5 Mc. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	"ANT" terminal at rear of chassis.	6.5 MC	Intermediate (middle)	Tune to 6.5 Mc. generator signal.	9	Intermediate Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
400 OHM Carbon Resistor	"ANT" terminal at rear of chassis.	21 MC	Short wave (clockwise)	21 Mc.	10	S.W. Oscillator	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 20.1 Mc. If image does not appear, realign at 21 Mc. with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	"ANT" terminal at rear of chassis.	21 MC	Short wave (clockwise)	Tune to 21 Mc. generator signal.	11	S.W. Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.

TOP VIEW OF CHASSIS

BOTTOM VIEW OF CHASSIS



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IF PEAK
455 KC

Measurements are made at 117 volt line, using electronic voltmeter. Except where otherwise indicated, voltages are D.C. and are positive with respect to the reference point which is minus or neutral buss.

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ALIGNING

Never realign unless absolutely necessary.

Use a good signal generator modulated at 400 or 1000 cycles with variable output voltage. Use a sensitive output meter across the voice coil of the speaker. Always align using the smallest possible input from the signal generator. A strong signal makes adjustments approximate. Always have volume control "full on".

Refer to Location Chart on page two for trimmer locations.

Aligning Procedure (follow this order exactly)

Intermediate Frequency Adjustments

The built-in loop should remain connected to the antenna and ground terminals. (or use a dummy loop).

1. Turn the tuning control to the extreme low frequency position (*Variable capacitor plates all the way in*).
2. Connect both signal generator leads to an 8 inch radiating loop (*1 turn*).

Place the radiating loop close to the antenna of the receiver. The antenna in the 1105 is built around the carrying case.

3. Introduce a modulated signal of 455 KC to the radiating loop.

4. Adjust the I.F. aligners for maximum output in the following order:

- A. Secondary of second I.F. Transformer
- B. Primary of second I.F. Transformer
- C. Secondary of first I.F. Transformer
- D. Primary of first I.F. Transformer

Dial Pointer Adjustment

Align the two arrow pointers, located at the extreme ends of the dial, horizontal with respect to the chassis base.

Radio Frequency Adjustments

The built-in antenna should remain connected to the antenna and ground terminals of the receiver.

1. Leave signal generator and radiating loop connected in same position as for I.F. Transformer.
2. Set signal generator and receiver tuning dial to 1400 kilocycles. Arrow on dial scale indicates 1400 kilocycles.
3. Adjust the oscillator, radio frequency and antenna trimmers for maximum output.
4. Set both the signal generator's frequency and the receiver's tuning dial to 600 kilocycles and check calibration.

Note: If the calibration is off at 600 kilocycles, operations 2 and 3 may be repeated until the best results are obtained.

IDENTIFICATION TABLE

Model	Chassis	Cabinet	Speaker
1105	112009	108025	155013

SPECIFICATIONS

Voltage Rating.....105-125 Volts
 Type of Circuit.....Superheterodyne
 Tuning Range.....540 Kc. to 1600 Kc.
 Number and type of Tubes—6
 1—11G5.....R.F. Amplifier
 1—11C6.....Converter
 1—11G5.....I.F. Amplifier
 1—11D5.....Demodulator, A.V.C., 1st Audio
 1—31F4.....Power Output
 1—11Z6GT.....Rectifier
 Input Power Rating.....25 Watts
 Input Power Frequency.....25-60 Cycles AC-DC
 Intermediate Frequency.....455 Kc.
 Speaker Voice Coil Impedance .at 400 Cycles 3.5 Ohms
 Speaker.....PM
 Power Output ... 170 Milliwatts AC; 180 Milliwatts Batt.

Resistors

27407	R-6
28153	R-23
28154	R-18-24
28158	R-15-17
28177	R-4
28183	R-3
28191	R-5-13-22
28195	R-1-7-8-9-16
28200	R-14
28203	R-12
45529	R-20
114310	R-10
145007	R-11
149015	R-19
149206	R-21

Capacitors

27760	C-2-10-12-13-19-24-27-29-31	.005 mf.
34800	C-28	100 mmf.
40632	C-4-11	.05 mf.
110001	C-1-9-5-8-6-7	Variable Capacitor
110010	C-18	100 mfd. Electrolytic
111008	C-14-25-26-30	100 mfd., 30 mfd., 30 mfd., 100 mfd. Electrolytic
111013	C-32	30 mfd. Electrolytic
110421	C-17	.25 mfd.

Transformers, and Coils

114001	T-2 (L-3-4-5)	RF Coil
114023	T-1 (L-1-2)	Antenna Coil
114024	T-3 (L-6-7-8)	Oscillator Coil
114025	T-5	R.F. Coil used on Series 10
114309	T-4 (L-9-10-C-15-16)	1st I.F. Transformer
114310	T-5 (L-11-12-C-20-21-22-23-R-10)	2nd I.F. Transformer
155006		Speaker Cone Assembly
155011		Output Transformer
155013	T-6 (L-13-14)	Speaker Assembly

Miscellaneous

22,000 Ohm	30151	Socket, Tube 117Z6
390 Ohm	33218	Cord, AC
470 Ohm	34590	Socket, Tube (4)
1,000 Ohm	109008	Cable Plug Assembly, Battery
47,000 Ohm	116001	Contact Strip, Antenna
.22 Meg.	122010	Dial Scale
1. Meg.	124002	Cord, Dial Drive
2.2 Meg.	131001	Grommet, Variable Mounting
5.6 Meg.	131003	Grommet, Tube Socket 11D5
10. Meg.	144005	Indicator, Off-On
1,000 Ohm 1 W	150011	Shaft, Dial Drive
47,000 Ohm	151015	Shield, Tube
1. Meg. Volume Control	152008	Socket, Tube 11D5
Off-On Switch	156009	Spring, Indicator
1,500 Ohm Voltage Divider	158008	Switch, AC-Batt.
68 Ohm 2 W	159011	Cord Tip, Antenna Red
	159012	Cord Tip, Antenna Black
	168004	Battery Pack

Knobs and Cabinet Parts

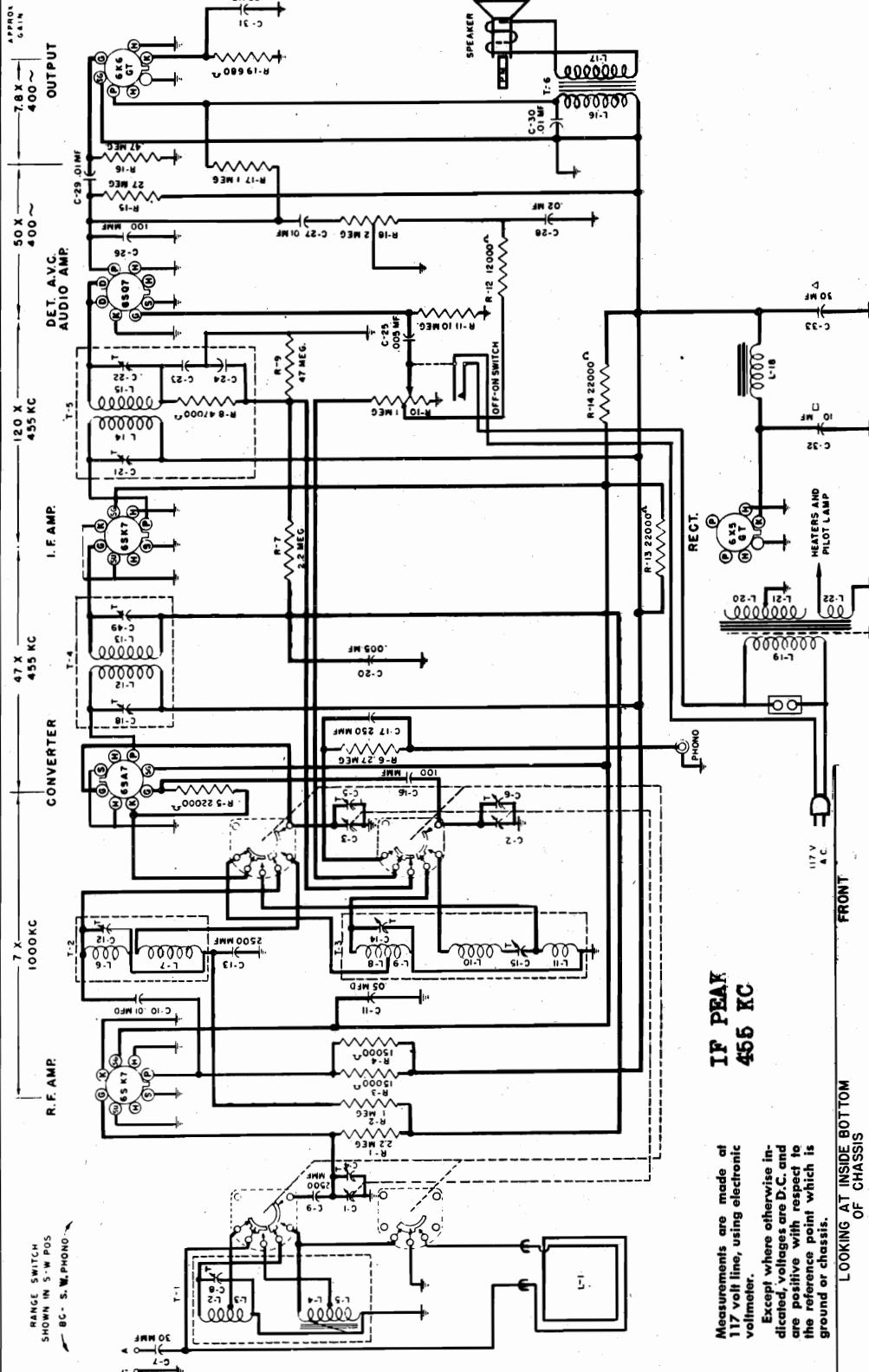
24135	Tips, Felt
130013	Grille
132041	Handle, Carrying
132042	Handle, Panel
134015	Knob (2)
138007	Lens, Dial

Series 10 employed R.F. Coil 114025. This has been superseded by coil No. 114001. Rewire to use 114001 as shown on Schematic and Wiring Diagram.

NOTE—When ordering replacement parts always specify series number as well as model and part number. Series number is stamped on back of chassis.

MODEL 1110

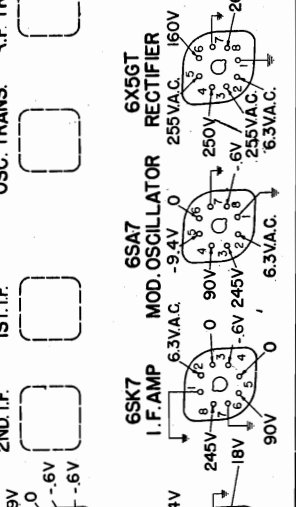
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- Capacitors**
- 250 mmf.
 - .02 mf.
 - .01 mf.
 - .005 mf.
 - 2500 mmf.
 - 100 mmf.
 - 30 mmf.
 - .05 mf.
 - Variable Capacitor
 - 20-10-30 mfd. Electrolytic

- Resistors**
- 27407
 - 28171
 - 28184
 - 28187
 - 28191
 - 28195
 - 28203
 - 145004
 - 145005
 - 149011
 - 149174
 - 149186

- Capacitors**
- 22,000 Ohm
 - 12,000 Ohm
 - .27 Meg.
 - .47 Meg.
 - 1 Meg.
 - 2.2 Meg.
 - 10 Meg.
 - Tone Control
 - Volume Control, Off-On
 - 22,000 Ohm
 - 680 Ohm
 - 15,000 Ohm



Measurements are made at 117 volt line, using electronic voltmeter. Except where otherwise indicated, voltages are D.C. and are positive with respect to the reference point which is ground or chassis.

LOOKING AT INSIDE BOTTOM OF CHASSIS

FRONT

117 V A.C.

PHONO

RECT.

HEATERS AND PILOT LAMP

OFF-ON SWITCH

DET. A.V.C. AUDIO AMP

I.F. AMP

CONVERTER

R.F. AMP

APPROX. GAIN

78 X 400

50 X 400

120 X 455 KC

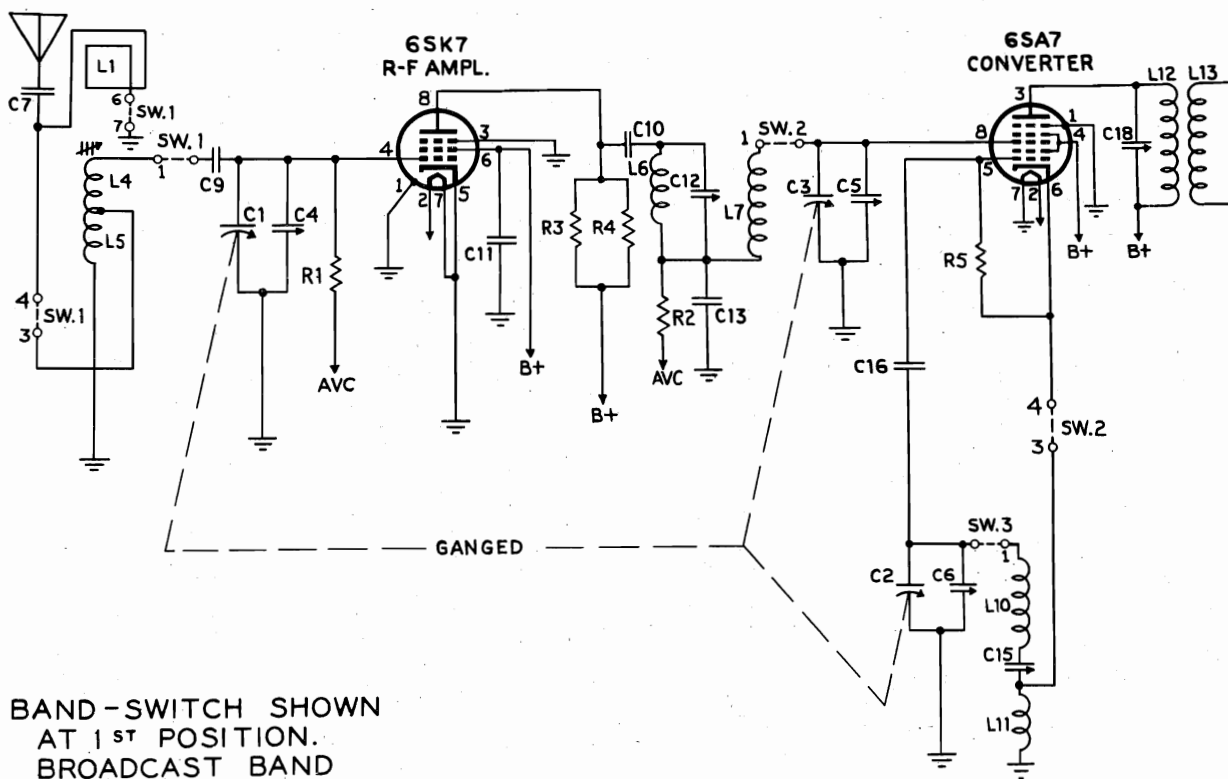
47 X 455 KC

7 X 1000 KC

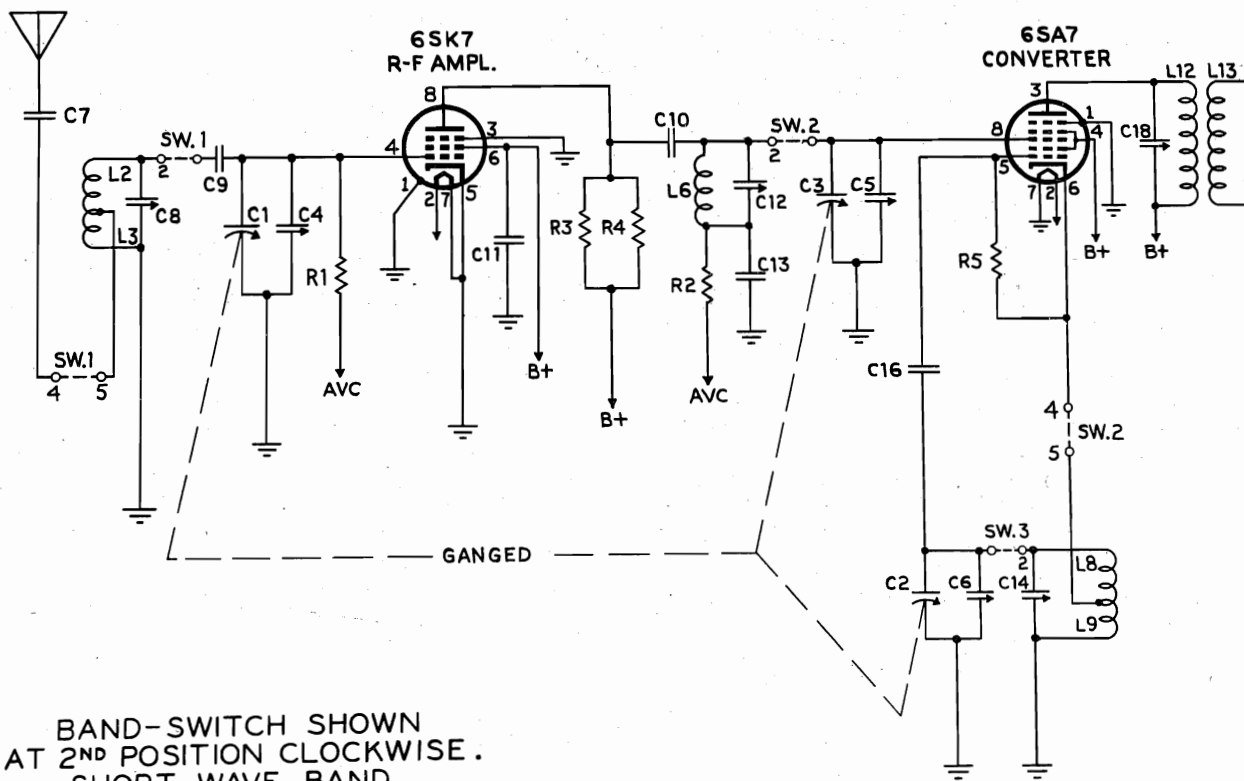
RANGE SWITCH SHOWN IN S-W POS BC - S.W. PHONO

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MODEL 1110



BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
540 - 1600 KC.

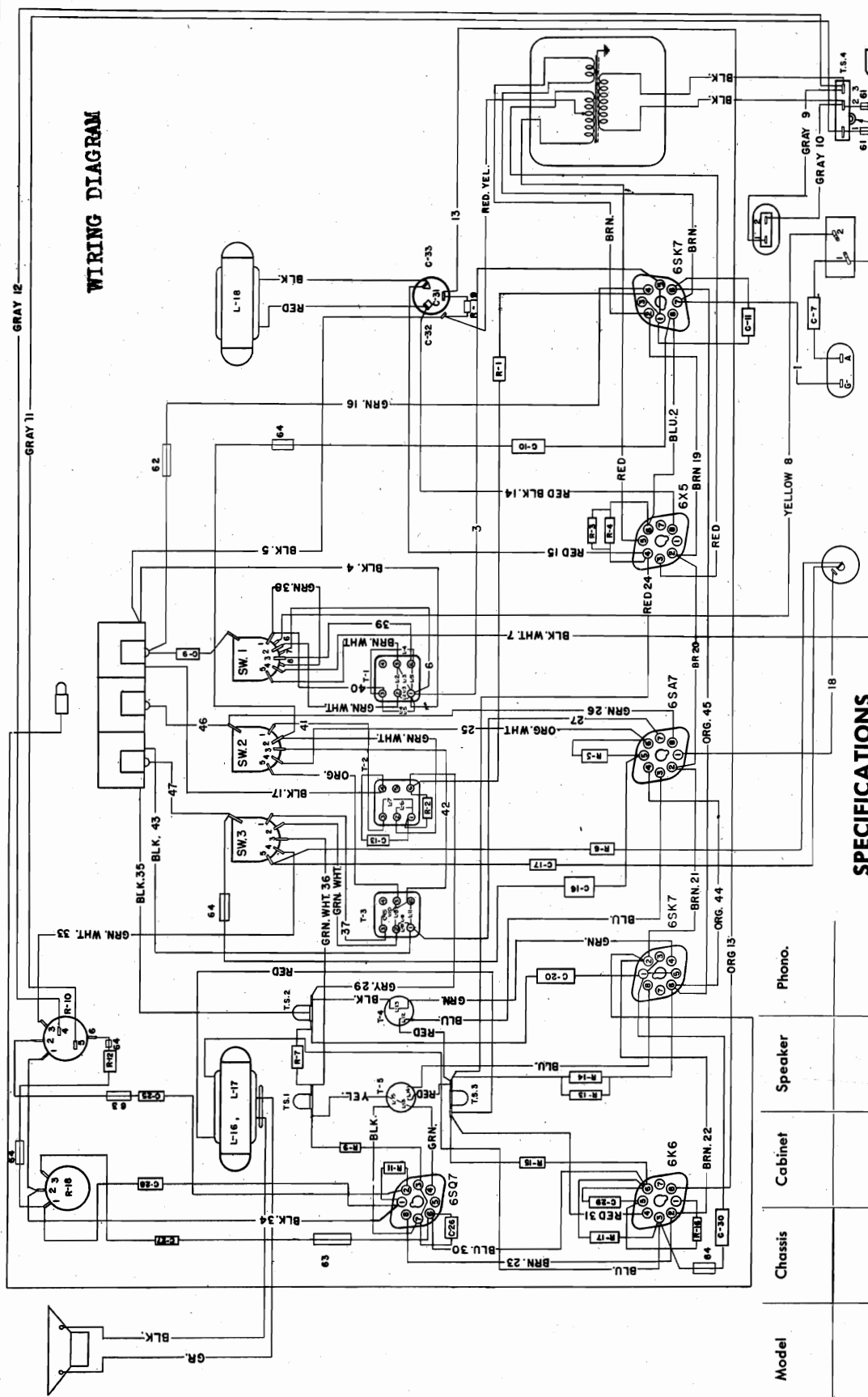


BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
SHORT WAVE BAND
8.7-15.5 MC.

MODEL 1110

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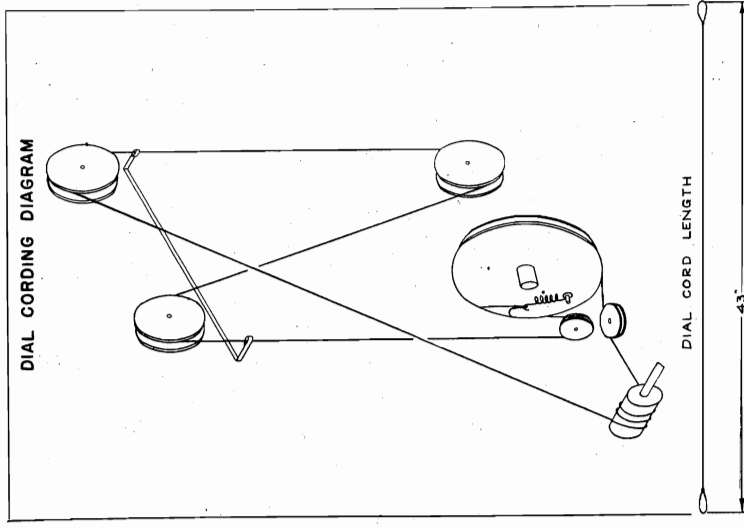
WIRING DIAGRAM



SPECIFICATIONS

- Voltage Rating 105-125 Volts
- Type of Circuit Superheterodyne
- Tuning Range .. S.W. 8.7 — 15.5 MC. Broadcast 540 KC. — 1600 KC.
- Input Power Rating Radio. 45 Watts, Phono. 60 Watts
- Input Power Frequency 60 Cycles AC.
- Intermediate Frequency 455 KC.
- Speaker Voice Coil Impedance at 400 Cycles 3.5 Ohms
- Power Output 2 Watts

Model	Chassis	Cabinet	Speaker	Phono.
1110-HW Walnut	112006	108021	155013 PM	
1110-PTW Walnut	112006	108023	155013 PM	148007



PART No. 124005

Transformers, and Coils

114011	T-1 (L-2-3-4-5) (C-8)	Antenna Coil
114012	T-2 (L-6-7) (C-12)	R.F. Coil
114013	T-3 (L-8-9-10-11) (C-14-15)	Oscillator Coil
114307	T-4 (L-12-13) (C-18-19)	1st I.F. Transformer
114308	T-5 (L-14-15) (C-21-22-23-24-R-8)	2nd I.F. Transformer
155006	L-18	Speaker Cone
155013	T-6 (L-16-17)	PM Speaker Assembly
161001	L-19-20-21-22	Choke
161207		Output Transformer
161402		Power Transformer

Knobs and Cabinet Parts

32224	Knob,—Volume, Tone, Tuning
35725	Knob,—Range
80874	Decal—Tone, Volume-Off-on, Stations, Range
80875	Grille and Baffle, Assembly—Left Hand
80876	Grille and Baffle, Assembly—Right Hand
80877	Lid Support
80878	Hinge
107003	Push Button
125005	Escutcheon and Lens, Dial

Radio Frequency Adjustments

Standard Broadcast Range.

Antenna must remain connected for R.F. adjustments.

1. With the signal generator output lead connected to the Antenna and Ground terminal of the receiver, tune the signal generator frequency and receiver tuning dial to 1400 KC.
2. Adjust the oscillator, R.F. and antenna trimmers of the gang condenser for maximum signal.
3. Set the signal generator frequency and receiver tuning dial to 600 KC.
4. Adjust the 600 KC. padding condenser in oscillator coil shield for maximum signal.
5. Adjust the iron core in antenna transformer for maximum output. (Underside of chassis)
6. Repeat the above procedure until no further change is required.

Radio Frequency Adjustments

Short Wave Range

1. Set the range switch to Short Wave position.
2. Set the signal generator frequency and receiver tuning dial to 14 MC.
3. Connect the output of the signal generator to the antenna terminal on the chassis.
4. Adjust the oscillator, R.F. and antenna trimmers for maximum output.
5. Repeat the above procedure until no further change is required.

ALIGNING

Never realign unless absolutely necessary.

Use a good signal generator modulated at 400 or 1,000 cycles, with variable output voltage and a sensitive output meter across the voice coil of the speaker.

Always align using the lowest possible input from the signal generator. A strong signal makes adjustments approximate.

Always have the volume control "full on."

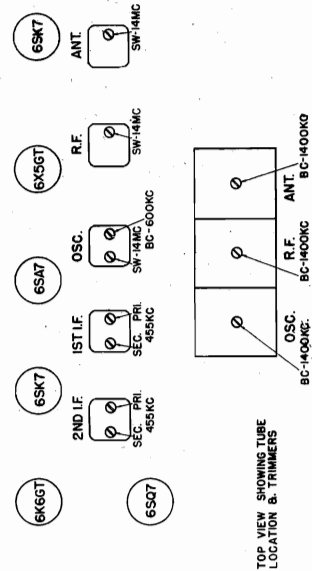
Aligning Procedure (follow this order exactly)

Intermediate Frequency Adjustments.

1. Set range switch to Standard Broadcast Position.
2. Tune set to extreme high frequency end of dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 KC. to the grid of the 6SA7 Converter tube (middle section of gang condenser) using a 0.1 mfd. capacitor in series with the output lead of the signal generator.
5. Adjust the I.F. aligners for maximum output in the following order:
 - a. Secondary of second I.F. transformer.
 - b. Primary of second I.F. transformer.
 - c. Secondary of first I.F. transformer.
 - d. Primary of first I.F. transformer.

Dial Pointer Adjustment

With plates of the gang tuning capacitor fully engaged make certain that the dial pointer is in a horizontal position directly on the calibration marks located at the low frequency end of dial scale. Adjust the dial pointer if necessary.



Switches

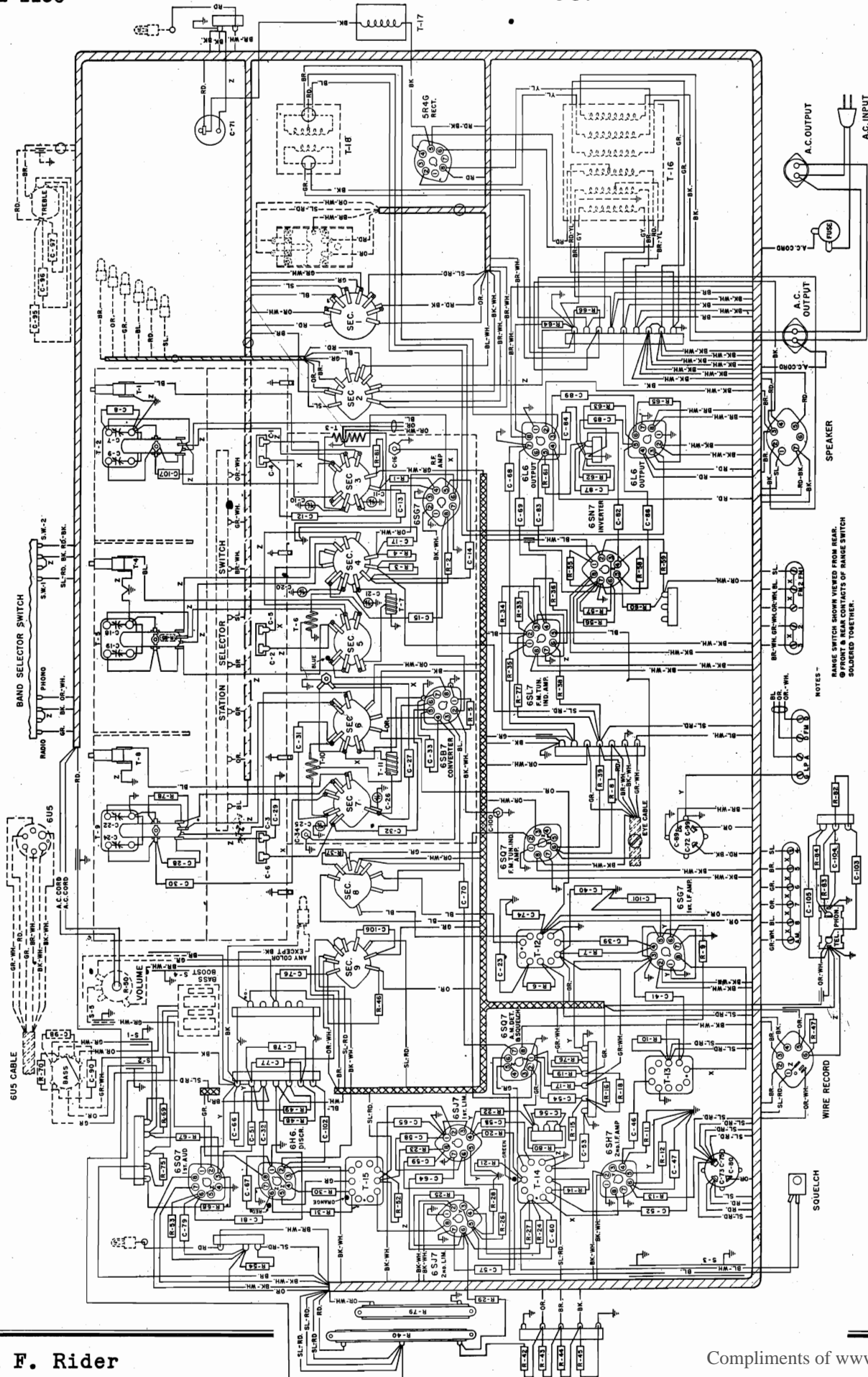
145005	Volume Control, Off-on Switch
158004	Range Switch

24135	Felt Tips
26122	Antenna—Ground Strip
28694	Socket, Pilot
29956	Lamp, Pilot
32048	Socket, A.C. Outlet
32075	Pulley, Small
32076	Pulley, Medium
32077	Pulley, Large
33218	Cord, A.C.
34421	Connector, Phono
40546	Clip, Pulley
80881	Crystal Cartridge (L-70)
101047	Back
122007	Dial Scale
124005	Dial Card
129003	Gear Assembly, Switch Drive
143001	Plug, Antenna
144004	Station Call Letters
146025	Pointer, Dial
150007	Shaft Assembly, Dial Drive
150008	Shaft, Switch Drive
152002	Socket, Tube
152005	Socket, Loop
156008	Spring, Dial Cord

MODEL 1135

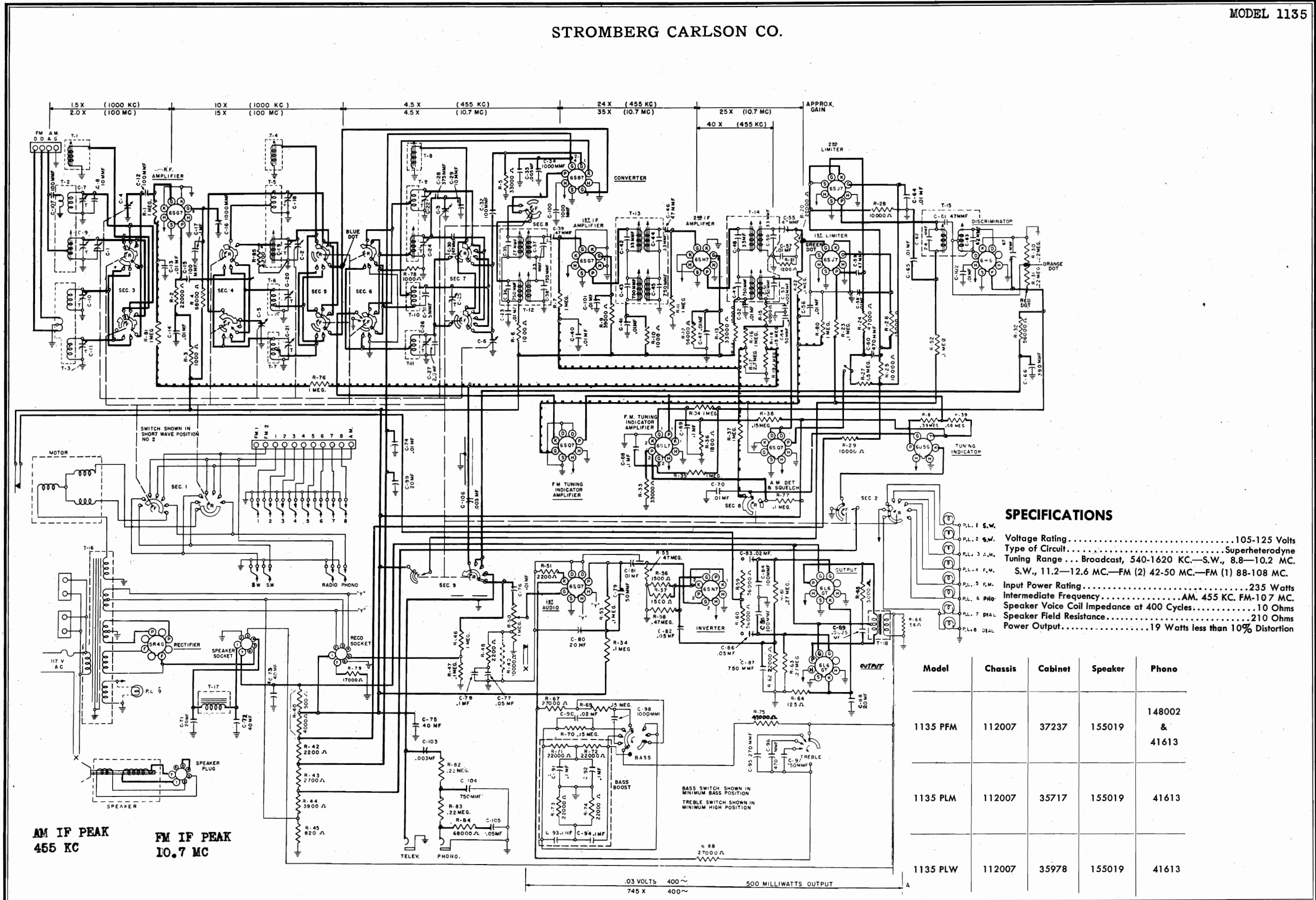
STROMBERG CARLSON CO.

WIRING DIAGRAM



NOTES -
 RANGE SWITCH SHOWN VIEWED FROM REAR.
 FRONT & REAR CONTACTS OF RANGE SWITCH
 SOLDERED TOGETHER.

STROMBERG CARLSON CO.



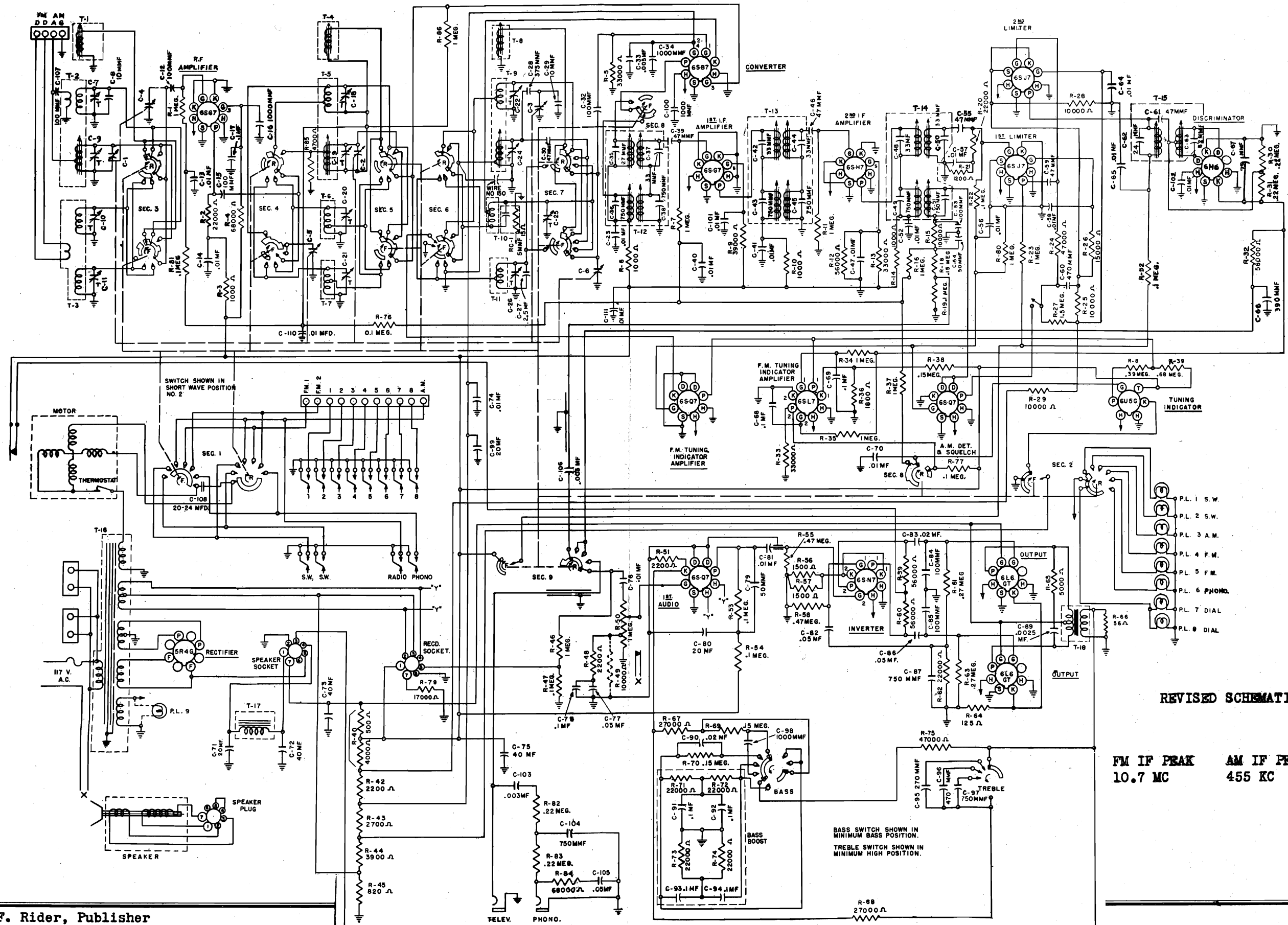
SPECIFICATIONS

- Voltage Rating 105-125 Volts
- Type of Circuit Superheterodyne
- Tuning Range ... Broadcast, 540-1620 KC.—S.W., 8.8—10.2 MC.
S.W., 11.2—12.6 MC.—FM (2) 42-50 MC.—FM (1) 88-108 MC.
- Input Power Rating 235 Watts
- Intermediate Frequency AM, 455 KC. FM-107 MC.
- Speaker Voice Coil Impedance at 400 Cycles 10 Ohms
- Speaker Field Resistance 210 Ohms
- Power Output 19 Watts less than 10% Distortion

Model	Chassis	Cabinet	Speaker	Phono
1135 PFM	112007	37237	155019	148002 & 41613
1135 PLM	112007	35717	155019	41613
1135 PLW	112007	35978	155019	41613

MODEL 1135A

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REVISED SCHEMATIC

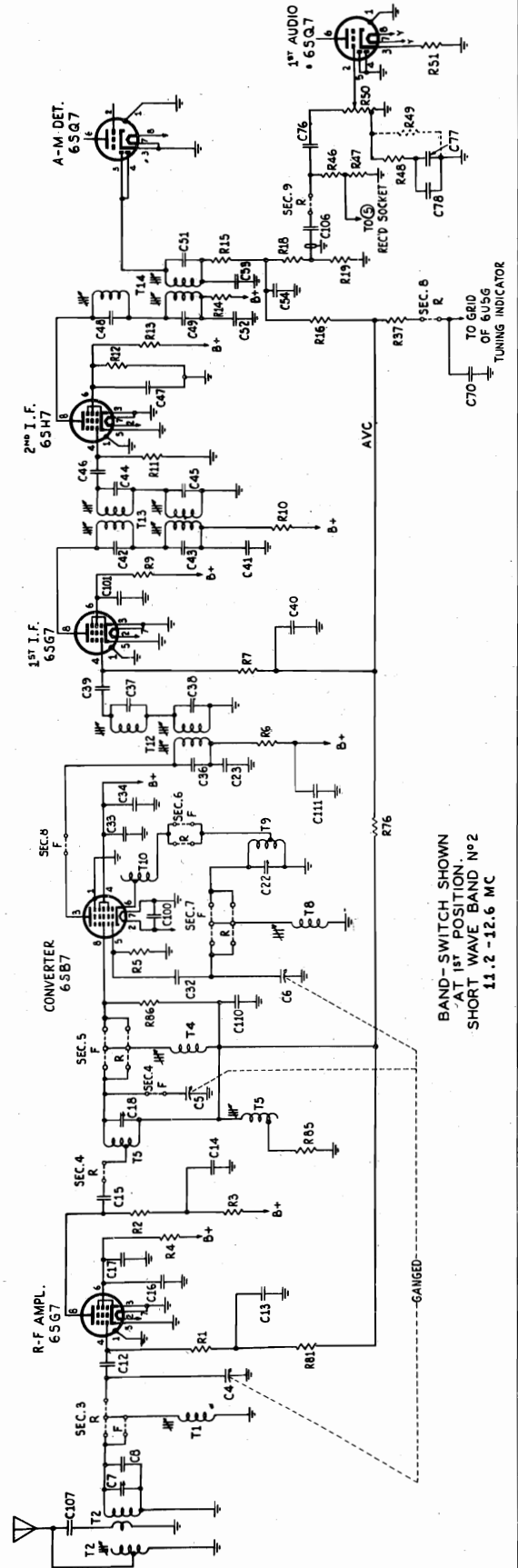
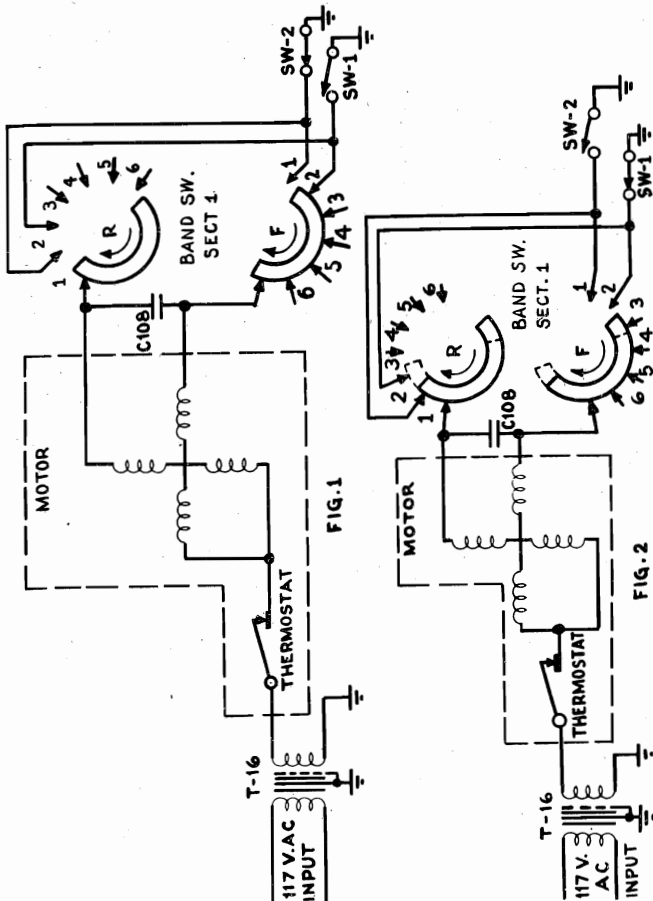
FM IF PEAK 10.7 MC AM IF PEAK 455 KC

BASS SWITCH SHOWN IN MINIMUM BASS POSITION.
TREBLE SWITCH SHOWN IN MINIMUM HIGH POSITION.

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NOTES: - FIGS. 1 AND 2 SHOW SCHEMATICALLY HOW THE BAND SWITCH IS ROTATED BY THE MOTOR WHEN THE DESIRED PUSHBUTTON IS DEPRESSED. PUSHBUTTONS 1 (SHORT WAVE 2-BAND) AND 2 (SHORT WAVE 1-BAND) ARE THE ONLY ONES SHOWN FOR CLARITY OF DIAGRAM. THE OTHER PUSHBUTTONS OPERATE IN A SIMILAR MANNER. FIG. 1 SHOWS THE MOTOR AT REST WITH THE BAND SWITCH AT SW-2 POSITION, NO. 1 BUTTON DEPRESSED. IF SW-1 BAND IS DESIRED THEN NO. 2 BUTTON IS CLOSED AND NO. 1 - OPENS, THIS PUTS A GROUND THROUGH SECTION 1-F OF THE BAND SWITCH ON ONE WINDING OF THE MOTOR, COMPLETING THE CIRCUIT, WHICH CAUSES THE MOTOR TO TURN THE BAND SWITCH IN THE DIRECTION OF THE ARROWS SHOWN TO POSITION OF FIG. 2 (SOLID LINES). THE GROUND WILL THEN BE DISCONNECTED FROM THE MOTOR WINDING, OPENING THE CIRCUIT AND CAUSING THE MOTOR TO STOP. IF THE MOTOR DOESN'T STOP FAST ENOUGH AND THE BAND SWITCH IS ROTATED TOO FAR, THEN IT WILL HAVE TO ASSUME THE POSITION SHOWN IN DOTTED LINES. THIS WILL PUT A GROUND ON THE OTHER WINDING OF THE MOTOR, THROUGH CONTACT 2 OF SECTION 1-R OF THE BAND SWITCH, MAKING THE MOTOR REVERSE ITS DIRECTION OF ROTATION TO ITS NORMAL POSITION (SOLID LINES) FOR SW-1.

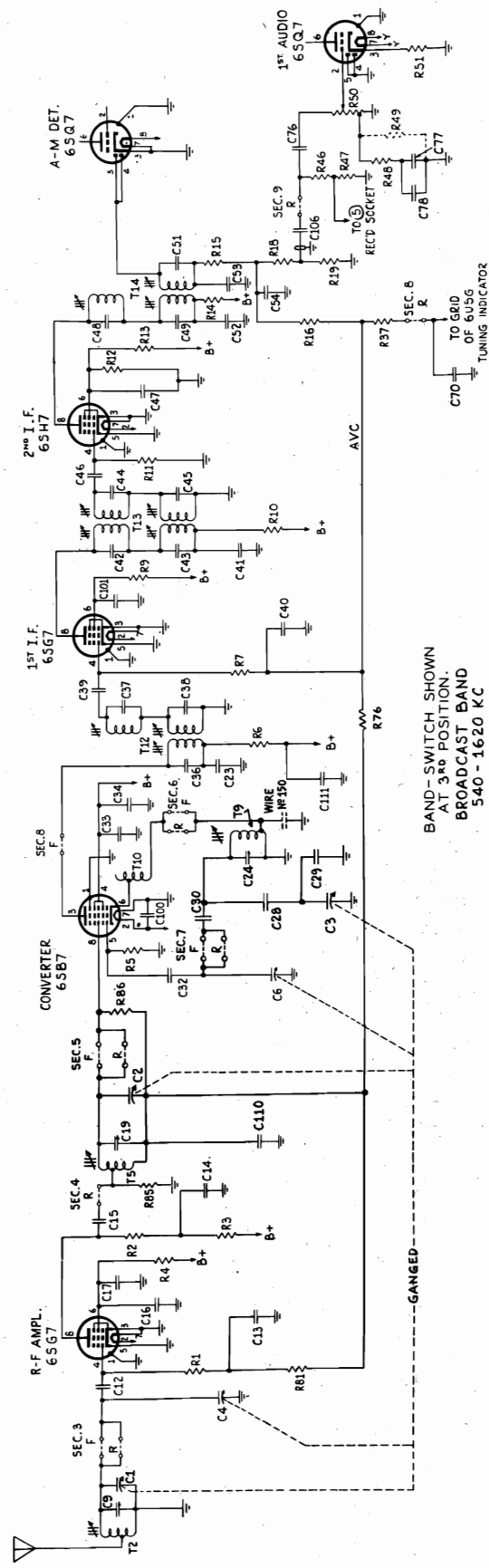
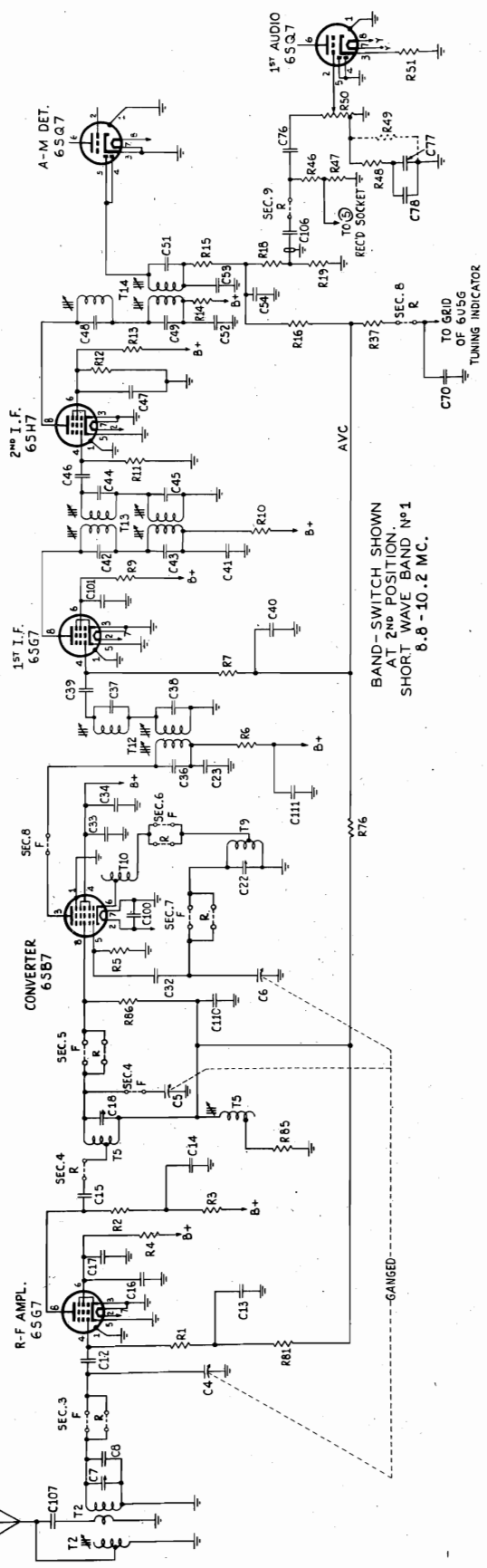
MOTOR BREAKDOWN FOR MODEL 1135A ONLY



BAND-SWITCH SHOWN AT 1ST POSITION, SHORT WAVE BAND No 2 11.2 - 12.6 MC

MODEL 1135A

STROMBERG CARLSON CO.

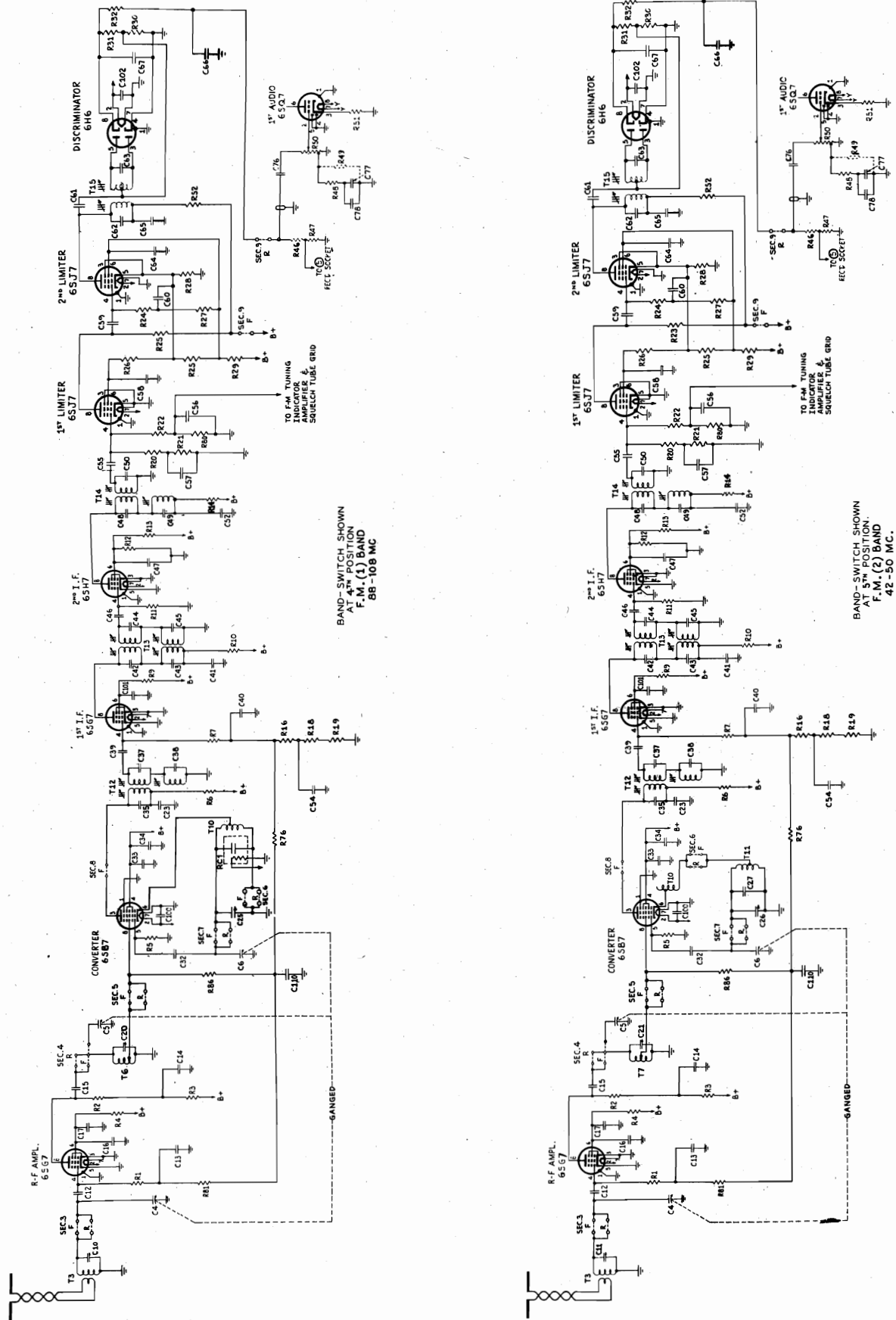


BAND-SWITCH SHOWN AT 2ND POSITION. SHORT WAVE BAND No 1 8.8-10.2 MC.

BAND-SWITCH SHOWN AT 3RD POSITION. BROADCAST BAND 540-1620 KC

STROMBERG CARLSON CO.

MODEL 1135A



ALIGNING**Never realign unless absolutely necessary.**

Refer to "Location Chart" for alignment adjusters. Allow set to warm up 10 to 15 minutes before attempting to align.

Always align using the smallest possible input from the signal generator. A strong signal makes adjustments approximate.

Always have volume full on.

The alignment of this receiver does not require special equipment or information; however, it is well to adhere to the standard procedure as outlined.

The required equipment is: 1 Electronic Voltmeter, 1 Output Meter, 1 Standard Signal Generator, 1 High Frequency Signal Generator, 1 No. 80777 Aligning Tool.

ALIGNING PROCEDURE (follow this order exactly)**Intermediate Frequency Adjustments****Amplitude Modulation**

The I.F. aligners that are used to adjust the amplitude modulation (AM) channel are found on the top side of the chassis. They consist of 6 adjustable iron cores used to tune the inductance of the 1st, 2nd and 3rd I.F. transformers (161202, 161200, 161201). These cores are found inside the plastic tubes protruding from the top of the I.F. transformers and are equipped with small screw-driver slots.

Caution: These cores are made of high quality R.F. iron and are fragile; therefore care must be used in adjusting them.

1. Connect the signal generator to the modulator grid, terminal number 8 of the 6SB7 converter tube which is connected to the wave band switch, and is identified by a blue dot.
2. Connect the output meter across the voice coil of the speaker (green and black wires from cable).
3. Adjust the signal generator to 455 KC. Use 30% modulation at 400 cycles.
4. Adjust volume control full on.
5. Adjust tone control to maximum high, minimum bass.
6. Adjust range switch to standard broadcast band, actuate any AM. push button.
7. Adjust the tuning selector to approximately 600 KC.
8. Adjust I.F. cores for maximum output with a reduced signal input.

Frequency Modulation

The I.F. Aligners may be found from the underside of the chassis. The adjusters are 6 iron cores used to tune the

inductance of the high frequency coils.

1. Connect the signal generator to the modulator grid, terminal number 8 of the 6SB7 converter tube, which is connected to the wave band switch, and is identified by a blue dot.

2. Connect the electronic voltmeter to the junction of the 22,000 ohm and the 100,000 ohm resistors in the first limiter grid circuit identified by a green dot. This junction point will be found underneath the limiter shield.

3. Adjust the voltmeter to the lowest negative voltage scale.

4. Actuate push button on extreme right of row of eight.

5. Adjust the tuning selector to approximately 21 on this band.

6. Adjust the signal generator to 10.7 megacycles. No modulation is required.

7. Adjust the cores for maximum output of the voltmeter.

Reduce the input signal and readjust until the maximum output is secured for minimum input. (Approximately 1 volt output).

Discriminator Alignment (FM)

Caution: Discriminator secondary must be zeroed at same generator setting used for FM I.F. alignment.

1. Connect the signal generator to the grid of the second I.F. tube, terminal No. 4 of the 6SH7.

2. Connect the electronic voltmeter to the center of the diode load resistors at the point indicated by the orange dot.

3. Adjust the primary for maximum output with .1 volt from signal generator set at 10.7 megacycles.

4. Switch the electronic voltmeter to the high side of the diode load resistors, identified by a red dot.

5. Adjust the secondary for zero output.

6. Swing generator to 75 KC. higher and 75 KC. lower in frequency and note the plus and minus voltage. If these voltage values are not approximately equal, repeat operations 3, 4 and 5.

R.F. Adjustment—Amplitude Modulation

The Broadcast band should be adjusted first.

The built-in loop should remain connected to the antenna and ground terminals.

1. Connect the signal generator to the AM antenna terminals leaving the loop antenna connected. A 400 ohm resistor must be used in series with the signal generator. Use of a 30% modulated signal of 400 cycles is recommended.
2. Adjust the signal generator to 1500 KC.
3. Adjust station selector to 1500 KC.

4. Adjust range switch to AM Broadcast. Actuate any AM push button.

5. Adjust the oscillator, R.F. and antenna trimmer for maximum output.

6. Reduce the input signal and readjust the trimmers until the maximum output is secured for minimum input.

7. Adjust station selector to 600 KC.

8. Set signal generator to 600 KC.

9. Adjust iron cores in oscillator, R.F. and antenna coils for maximum output.

10. Repeat 1500 KC. and 600 KC. alignments until no further change is required.

R.F. Adjustment—Short Wave (9-10 MC. Band)
The built-in loop should remain connected to the antenna and ground terminals.

1. Connect the signal generator to the antenna and ground terminals of the receiver using a 400 ohm resistor.

2. Set the dial pointer to 10 MC.

3. Adjust signal generator to 10 MC.

4. Actuate left S.W. push button.

5. Adjust oscillator, R.F., and antenna trimmer for maximum output. (No further alignment is required on this band.)

R.F. Adjustment—Short Wave (11.2-12.6 MC. Band)

1. Connect the signal generator to the antenna and ground terminals of the receiver using a 400 ohm resistor in series with the signal generator.

2. Set dial pointer to 12.4 MC.

3. Adjust signal generator to 12.4 MC.

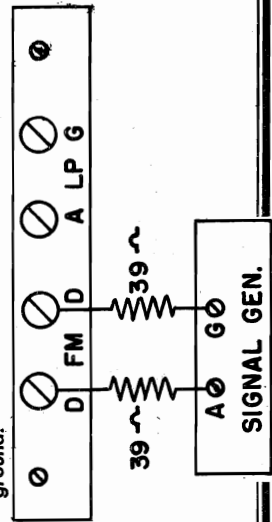
4. Actuate right S.W. push button.

5. Adjust oscillator, R.F. and antenna iron cores for maximum output.

R.F. Adjustments—Frequency Modulation

Align the FM (2) Band first.

1. Set dial pointer to channel 90 (49 MC.)
2. Connect the signal generator to FM dipole terminals using 39 ohm resistors as indicated (disconnect dipole antenna). Connect signal generator ground to chassis ground.



MODEL 1135

CANNOT EMPHASIZE TOO STRONGLY THAT THAT ALL THE BENEFITS TO BE DERIVED FROM THE DYNATENNA CAN ONLY BE REALIZED IF ALL THE TUNED CIRCUITS ARE IN RESONANCE.

- 1 - AFTER DYNATENNA HAS BEEN INSTALLED AND PROPERLY CONNECTED TO THE RECEIVER TUNE IN THE WEAKEST STATION THAT CAN BE HEARD OR ONE IN OR NEAR THE CENTER OF THE FREQUENCY BAND ASSIGNED TO YOUR AREA.

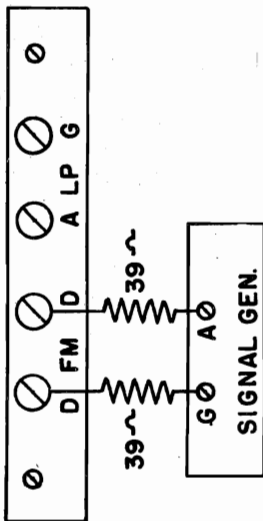
- 2 - IN THE CASE OF RECEIVERS THAT HAVE TUNING EYE TUBES (1135), REMOVE THE TUBE FROM HOLDER IN ORDER THAT IT MAY BE SEEN FROM BACK OF SET.

- 3 - ADJUST ANTENNA AND RF-FM TRIMMERS (SEE CHART BELOW) FOR GREATEST DEFLECTION OF EYE. IN THE CASE OF SETS THAT DO NOT HAVE AN EYE TUBE, SOME ADJUSTMENT IS MADE. OPTIMUM SIGNAL STRENGTH IS DETERMINED BY INCREASE IN RATIO OF AUDIBLE SIGNAL TO NOISE LEVEL.

3. Set signal generator to 49 MC.
4. Actuate FM (2) push button (extreme right hand button in row of 8 buttons).
5. Connect electronic voltmeter to the junction of the 22,000 and the 100,000 ohm resistors in the first limiter grid circuit (identified by green dot).
6. Adjust oscillator R.F. and antenna trimmers for maximum output on electronic voltmeter.

FM (1) Band

Adjust the same as the FM (2) band using 106 MC., setting the dial pointer to channel 290. Connect the generator to the dipole input using 39 ohm resistors as indicated. Actuate 3rd push button from right in row of 8 buttons. Connect signal generator ground to chassis ground. Note reverse signal generator connection.



Dial Pointer Adjustment

Check dial pointer to see that it is aligned with the two diamond shaped markers at the extreme left of the dial scale, when the variable capacitor plates are completely engaged.

IN ALMOST EVERY LOCATION FM PERFORMANCE IS IMPROVED WITH THE ADDITION OF A DYNATENNA. IN REMOTE OR FRINGE AREAS THIS FOLDED DIPOLE IS A MUST IF GOOD RESULTS ARE TO BE EXPECTED FROM THE STATIONS NOW ON THE AIR.

WHEN INSTALLING A DYNATENNA, IT IS MOST IMPORTANT THAT THE INSTRUCTIONS BE FOLLOWED VERY CLOSELY. GET IT HIGH, STAY AWAY FROM METAL CONDUCTORS OF ALL TYPES, AND ORIENT IT CAREFULLY. AFTER FOLLOWING THESE FUNDAMENTALS CLOSELY, THERE ARE SIMPLE ADJUSTMENTS THAT MAY BE MADE THAT WILL ADD TO THE OVERALL GAIN CONSIDERABLY, AS FOLLOWS:

Cabinet Parts

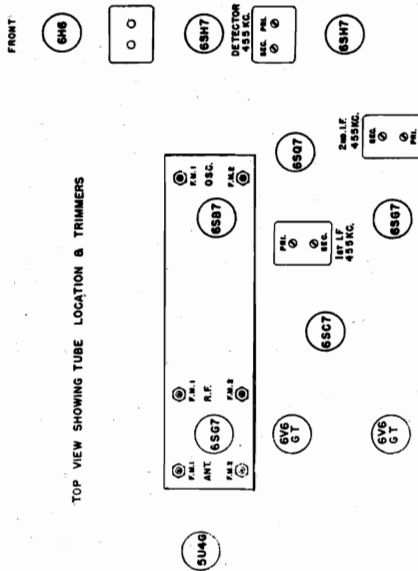
PF	PL
29597	29597
35852	35852
37083	37083
37139	37139
37140	37140
37145	39024
37149	37168
37169	130017
37239	—
37240	—
37242	—
37579	35726
38442	38442
39200	—
80681	80681
—	108035
—	132021
150024	132022
801401	130023
—	801401

Knobs—Push Buttons

Part No.	Description
32156	Push Button
32172	Lens, Push Button
32224	Off-On, Volume
35866	Call Letter Kit
37007	Indicator Lever, Tone
37093	Tuning
121007	"S.W." Push Button Tab
121008	"Radio" Push Button Tab
121009	"Record" Push Button Tab

Controls—Switches

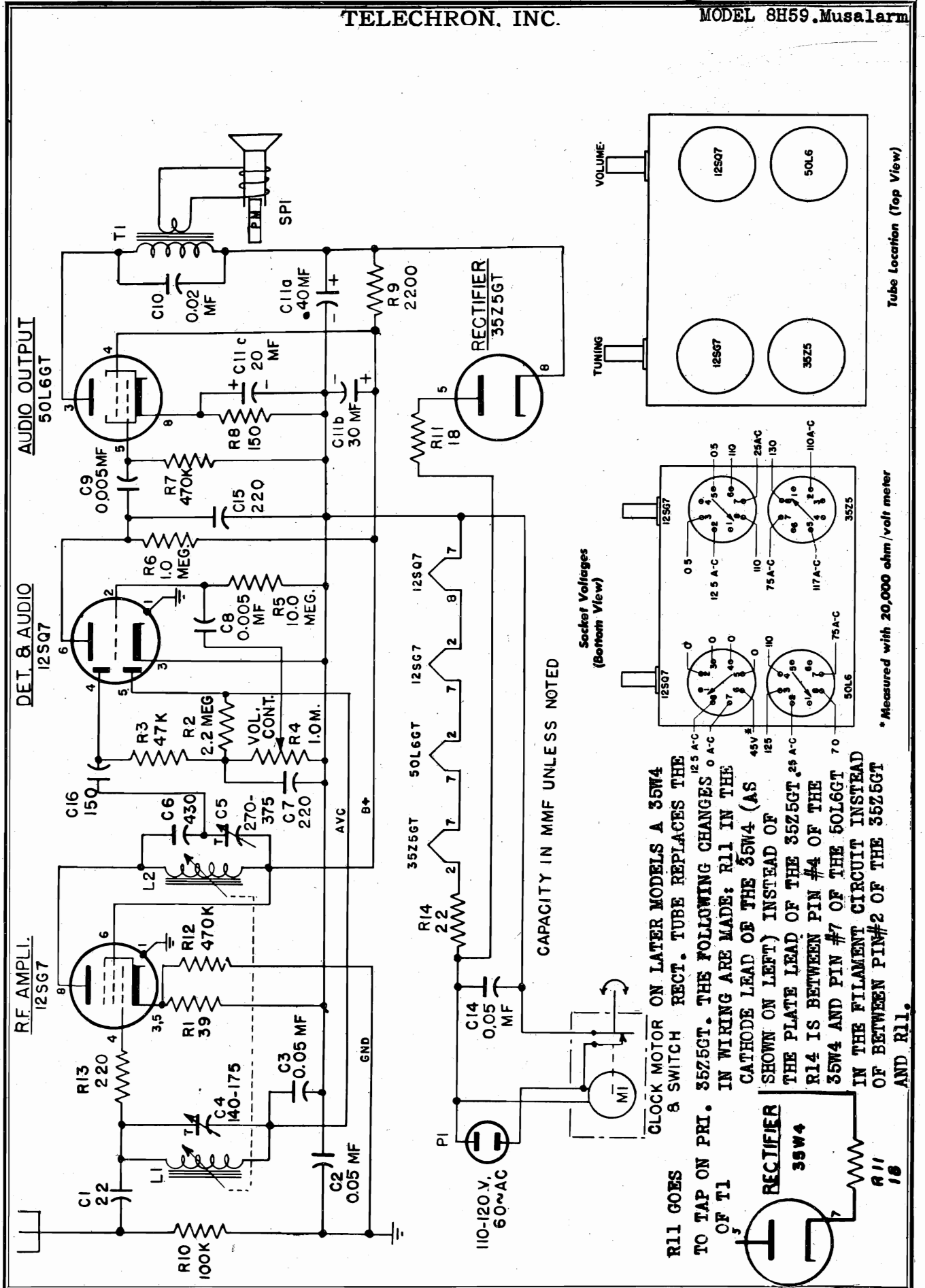
Part No.	Description
37238	Phono. Compartment Switch
145002	1 Meg. Volume Control and Switch
158005	Tone Switch, Bass
158006	Tone Switch, Treble
158014	Squealch Switch
158019	Switch, S.W., Radio, Phono



TOP VIEW SHOWING TUBE LOCATION & TRIMMERS

THE TRIMMERS REFERRED TO ARE EASILY ACCESSIBLE AND MAY BE REACHED FROM THE BACK OF THE CABINET WITHOUT REMOVING THE CHASSIS.

THIS RECOMMENDED ADJUSTMENT WILL MAKE A VERY NOTICEABLE IMPROVEMENT IN SIGNAL STRENGTH IN ANY INSTALLATION THAT IS MADE A FEW MILES FROM THE TRANSMITTER. WE



SPECIFICATIONS

CABINET:

Height	5¾ inches
Width	10½ inches
Depth	4¾ inches

ELECTRICAL RATING (INPUT):

Voltage	105-125 volts, a-c
Frequency	60 cycles
Wattage	30 watts

TUNING FREQUENCY (RADIO):

Broadcast Band	540-1600 kc
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POWER OUTPUT (117 VOLTS LINE):

Undistorted	1.5 watts
Maximum	2.2 watts

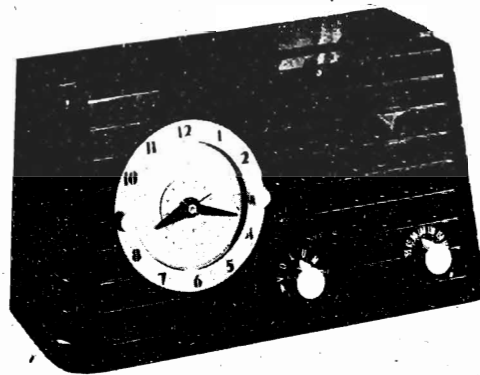
LOUDSPEAKER:

Type	Alnico P.M.
Outside Cone Diameter	4 inch
Voice Coil Impedance (400 Cycles)	3.5 ohms

TUBE COMPLEMENT:

R-F Amplifier	Type 12SG7
Detector-Audio	Type 12SQ7
Output Power	Type 50L6GT
Rectifier	Type 35Z5GT

Note: Order tubes from Tube Division, Replacement Parts Section, General Electric Co., Schenectady, N. Y.



EQUIPMENT REQUIRED

1. Test oscillator with audio tone modulation.
2. A-C output meter, 1½ volts full scale.
3. 100 mmf. mica capacitor.
4. Insulated screwdriver.

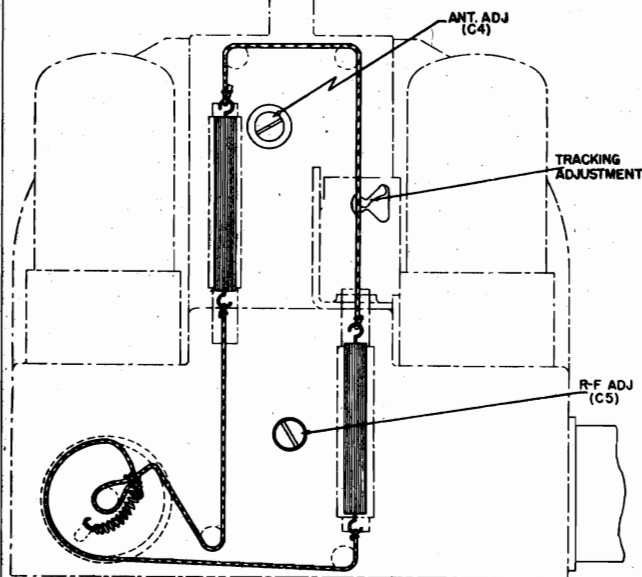
PROCEDURE

1. Connect test oscillator through 100 mmf. to antenna lead; connect output meter across the loudspeaker voice coil leads.
2. Turn dial pointer as far clockwise as it will go.
3. Set test oscillator to 1620 kc with tone modulation. Keeping the radio volume control set for maximum and attenuating test oscillator so that the output meter reading never exceeds 1¼ volts, trim antenna (C4) and RF (C5) trimmers for maximum output.
4. Set test oscillator to 580 kc with tone modulation. While rocking tuning control in vicinity of this dial calibration, adjust tracking adjustment platform up or down to give maximum output meter reading.
5. Recheck 1620 calibration adjustment. If RF (C5) trimmer has to be changed appreciably for maximum output, recheck step 4.

RADIO CIRCUIT ALIGNMENT

ALIGNMENT FREQUENCIES

R-F	1620 kc and 580 kc
---------------	--------------------



GENERAL

DRIVE CORD REPLACEMENT

When replacing the drive cord, it is essential that the measurements shown in Figure 2 be maintained very accurately, otherwise alignment and dial calibration difficulties will be experienced. Use a 3/2-inch diameter nylon jacketed cord, Part No. RDC-015, for replacement.

RADIO STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring devices may be used to check circuit performance and isolate trouble. The gain values listed may have tolerances of 20 per cent. Readings are taken with low signal input.

- (1) R-F Stage Gains.

Antenna lead to 12SG7 grid	8 at 1000 kc
12SG7 grid to 12SQ7 diode plate	50 at 1000 kc
- (2) Audio Gain.

0.06 volts at 400 cycles across volume control (R4) with control set at maximum will give approximately ½-watt output across speaker voice coil.
- (3) Socket Pin Voltages.

Figure 4 shows voltages from all points to B-. Voltage readings much lower than those specified may help localize defective components or tubes.

Drive Stringing and Trimmer Location

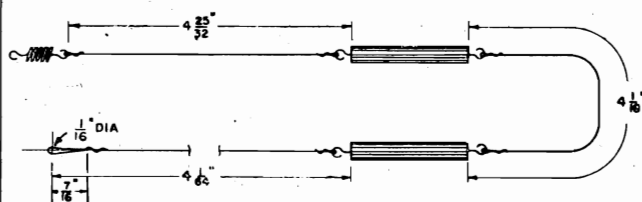
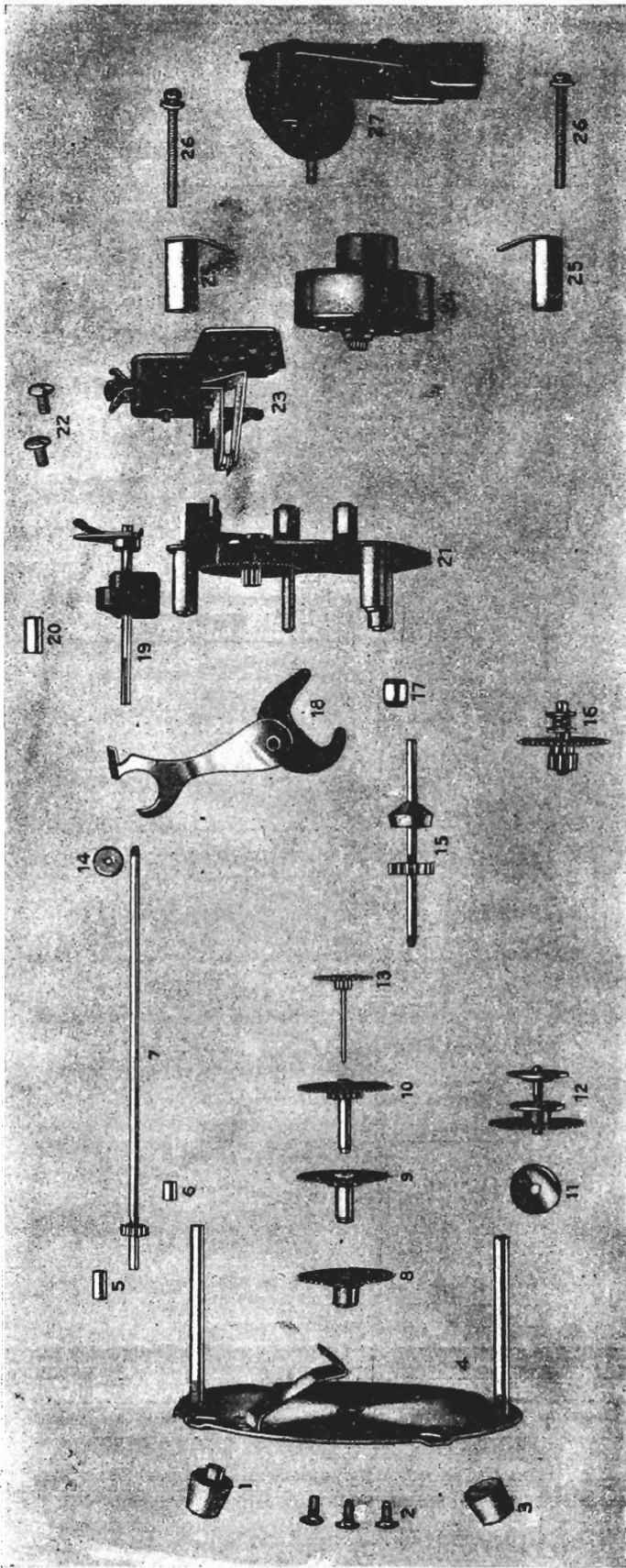


Fig. 2. Drive Cord Assembly



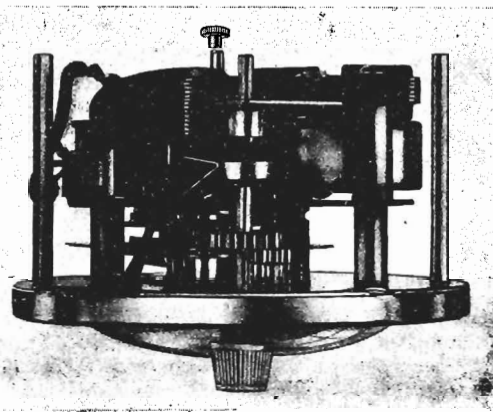
EXPLODED VIEW OF H21 MOVEMENT

1. Switch Knob (C40X75)
2. Front Plate Screws (C64X1)
3. Alarm Set Knob (C4X6)
4. Front Plate Assem. (C34X111)
5. Time Set Shaft Spacer (C40X262)
6. Time Set Shaft Spacer (C40X261)
7. Time Set Shaft Assem. (C10X115)
8. Alarm Hand Sleeve Assem. (C15X3)
9. Hour Hand Sleeve Assem. (C13X11)
10. Minute Hand Sleeve Assem. (C14X15)
11. Cam Friction Washer (C40X252)
12. Cam Shaft Assem. (C17X8)
13. Sweep Second Shaft Assem. (C16X14)
14. Time Set Knob (C3X49)
15. Alarm Set Shaft Assem. (C11X8)
16. Intermediate Gear Shaft Assem. (C40X77)
17. Alarm Set Shaft Spacer (C40X263)
18. Switch Lever Assem. (C40X78)

19. Switch Shaft Assem. (C40X73)
20. Switch Shaft Spacer (C40X260)
21. Base Plate Assem. (C35X39)
22. Front Plate Screws (C64X1)
23. Switch Assem. (C40X76)
24. Rotor Unit M1630 (C44X38)
25. Spreader Posts (C40X202)
26. Motor Mtg. Screws (C1X1)
27. Field and Coil Assem. (C45X69)

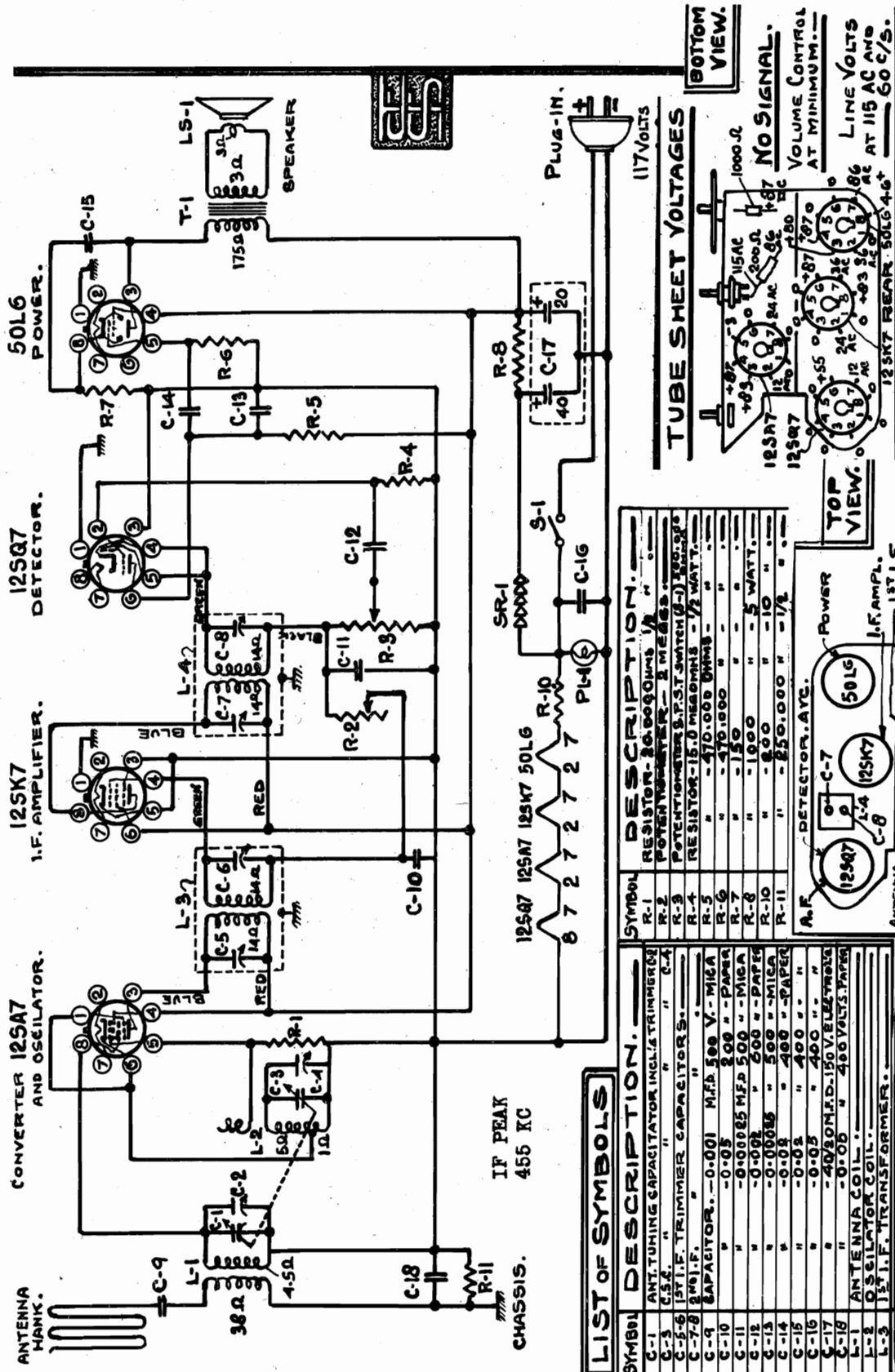
"Vistac" has been applied to the following parts of the clock movement:

1. Time set shaft before assembling, and time set shaft spacers where they touch front plate and base plate.
 2. Base plate stud where the switch lever touches it.
 3. Both ends of the shaft for the intermediate gear and shaft assembly.
 4. Switch lever assembly where it touches the front plate.
- If it is necessary to replace any of the above parts, a very small amount of "Vistac" should be applied.



H21 Movement Assembly

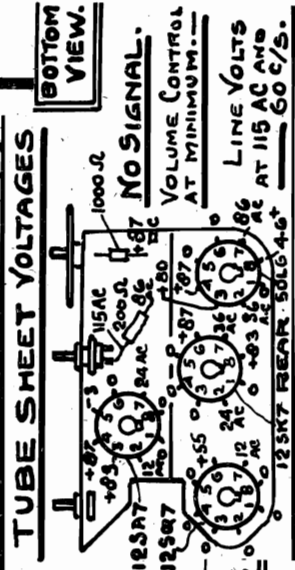
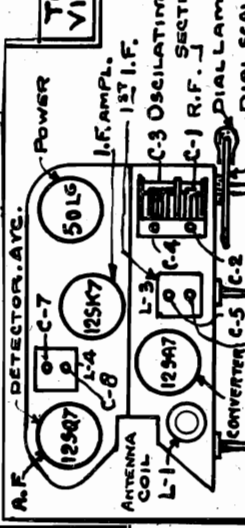
TELECOIN CORP.



LIST OF SYMBOLS

SYMBOL	DESCRIPTION
C-1	ANT. TUNING CAPACITOR INCL. TRIMMER
C-2	"
C-3	"
C-4	"
C-5	1ST I.F. TRIMMER CAPACITOR
C-6	"
C-7	"
C-8	"
C-9	500 V. MICA
C-10	"
C-11	"
C-12	"
C-13	"
C-14	"
C-15	"
C-16	"
C-17	"
C-18	"
L-1	ANTENNA COIL
L-2	OSCILLATOR COIL
L-3	1ST I.F. TRANSFORMER
L-4	2ND I.F. TRANSFORMER
LS-1	LOUDSPEAKER - 4" P.M.
PL-1	PILOT LAMP - 115 VOLTS - 6 WATT.
SR-1	POWER SWITCH - S.P.S.T. (PART OF R-3)
T-1	SELENIUM RECTIFIER - 100 MILLI A. 5 PIV. OUTPUT TRANSFORMER

SYMBOL	DESCRIPTION
R-1	RESISTOR - 20,000 OHMS 1/2 W.
R-2	POTENTIOMETER - 2 MEGS.
R-3	POTENTIOMETER S.P.S.T. SWITCH (PART OF R-3)
R-4	RESISTOR - 15.0 MEGS. 1/2 WATT.
R-5	" - 470,000 OHMS - "
R-6	" - 470,000 " - "
R-7	" - 150 " - "
R-8	" - 1000 " - 5 WATT.
R-9	" - 500 " - 10 " - "
R-10	" - 250,000 " - 1/2 W.
R-11	" - 10 " - "



TUBE SHEET VOLTAGES

117 VOLTS

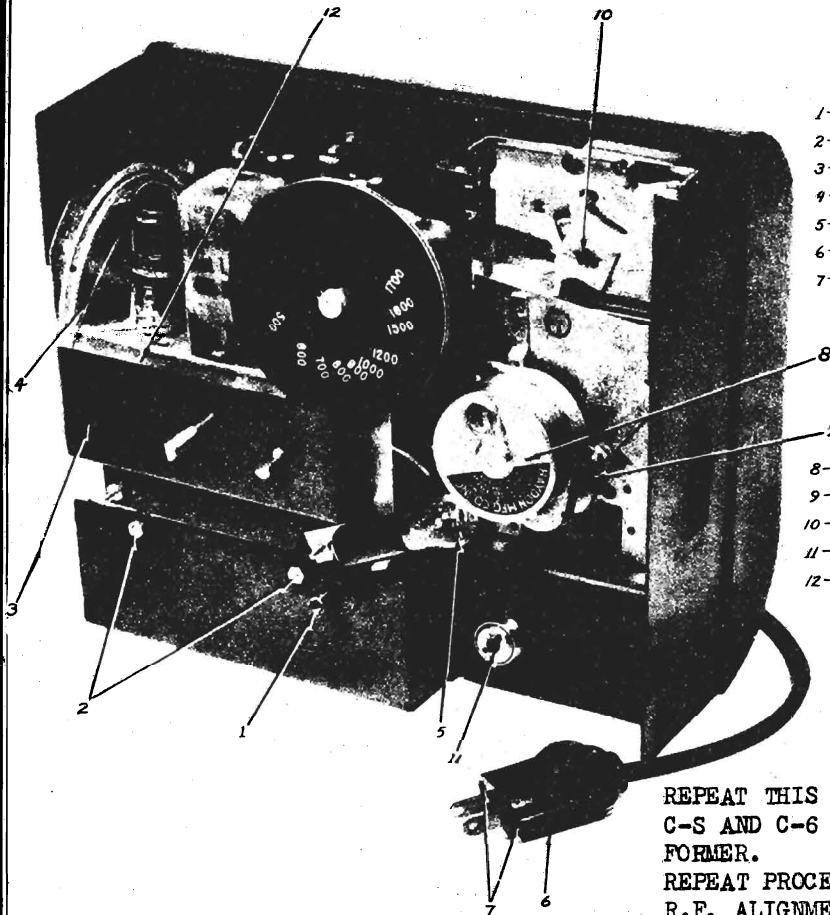
NO SIGNAL

VOLUME CONTROL AT MINIMUM

LINE VOLTS AT 115 AC AND 60 C/S.

MODEL M5TS4

TELECOIN CORP.



- 1-NUT FOR CABINET STUD-TYPE LOCK.
- 2-HEX NUTS SECURING CHASSIS TO CABINET BACK.
- 3-CONTROL KNOB PANEL.
- 4-ANTENNA WIRE.
- 5-110 VOLT 6 WATT DIAL LAMP.
- 6-FUSE PLUG AND CORD.
- 7-2-110VOLT FUSES 2 OR 3 AMPS. EJECT BY PUSHING OUT WITH PENCIL OR SCREWDRIVER FROM REAR.
- 8-110 VOLT 60 CYCLE TIMER MOTOR.
- 9-TIMER ON-OFF SWITCH.
- 10-SLUG REFLECTOR ASSEMBLY.
- 11-COIN BOX LOCK.
- 12-ADJUSTABLE MAXIMUM VOLUME CONTROL UNDER PANEL. (R-2 ON SCHEMATIC)

ELECTRICAL SPECIFICATIONS

POWER SUPPLY. 105-125 V.-50/60 CYCL. AC
 POWER CONSUMPTION - 30 WATTS
 FREQUENCY RANGE 500-1700 KCS.
 INTERMEDIATE FREQUENCY 455 KCS.
 AUDIO OUTPUT 1.5 WATTS
 TIMER.--60 CYCLES. 110 VOLTS - AC.

LOUD SPEAKER

PERMANENT MAGNET...4" DIAMETER.

ALIGNMENT PROCEDURE

ALIGNMENT FREQUENCIES:

I.F. 455 KCS. R.F. 1700 KCS.

I.F. ALIGNMENT:

CONNECT OUTPUT METER ACROSS THE VOICE COIL.--TURN THE RECEIVER VOLUME CONTROL TO MAXIMUM.

CONNECT HIGH SIDE OF ALIGNMENT OSCILLATOR, THROUGH A.05 MFD CAPACITOR, TO THE CONVERTER GRID.

SET ALIGNMENT OSCILLATOR AT 455 KCS AND ADJUST OUTPUT TO GIVE THE LOWEST CONVENIENTLY READABLE INDICATION ON THE OUTPUT METER .

ADJUST TRIMMERS C-7 AND C-8 IN 2ND I.F. TRANSFORMER TO GIVE MAXIMUM INDICATION ON OUTPUT METER.--

REPEAT THIS PROCEDURE FOR TRIMMERS C-5 AND C-6 IN THE 1ST I.F. TRANSFORMER.

REPEAT PROCEDURE TO CHECK ACCURACY.--

R.F. ALIGNMENT :

RETAIN OUTPUT METER CONNECTED AS ABOVE AND RECEIVER VOLUME CONTROL SET AT MAXIMUM.--

CONNECT ALIGNMENT OSCILLATOR TO ANTENNA.--

SET ALIGNMENT OSCILLATOR AT 1700 KCS. AND PLACE IN OPERATION.

ROTATE RECEIVER TUNING CAPACITOR (C-1 AND C-3 TO GIVE MAXIMUM SIGNAL INDICATION ON OUTPUT METER.

ADJUST OUTPUT OF ALIGNMENT OSCILLATOR TO GIVE THE LOWEST CONVENIENTLY READABLE INDICATION ON THE OUTPUT METER.

ADJUST OSCILLATOR TRIMMER C-4 TO PEAK THE SIGNAL INDICATION ON OUTPUT METER.--

THEN ADJUST ANTENNA TRIMMER C-2 TO FURTHER PEAK THE SIGNAL.--

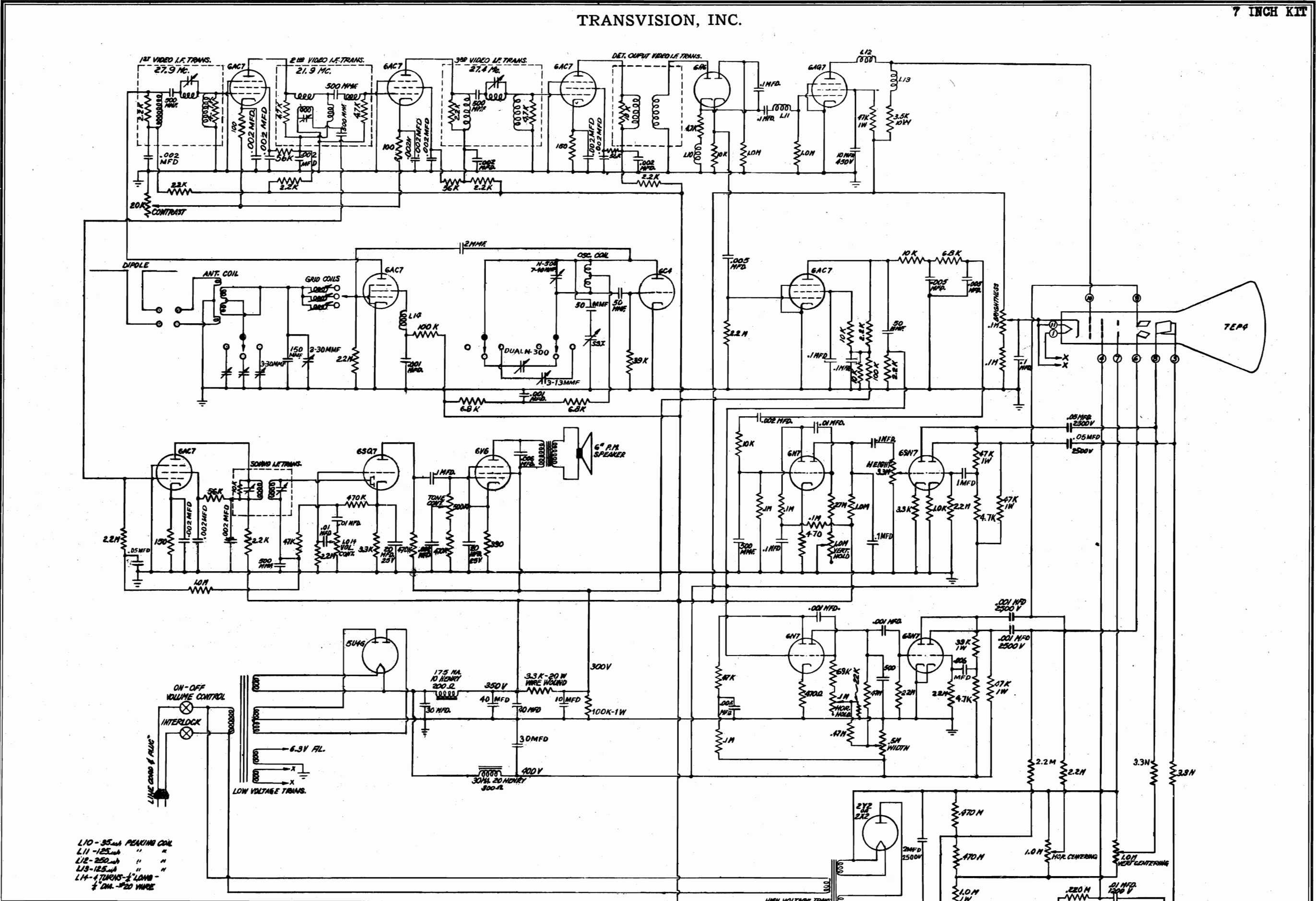
REPEAT PROCEDURE TO CHECK ACCURACY-- TRIMMER LOCATIONS ARE SHOWN IN

NOTES

AN ELECTRONIC VOLTMETER MAY BE CONNECTED TO THE AVC BUS AND USED FOR ALIGNMENT INDICATION IN LIEU OF THE OUTPUT METER ACROSS THE VOICE COIL.

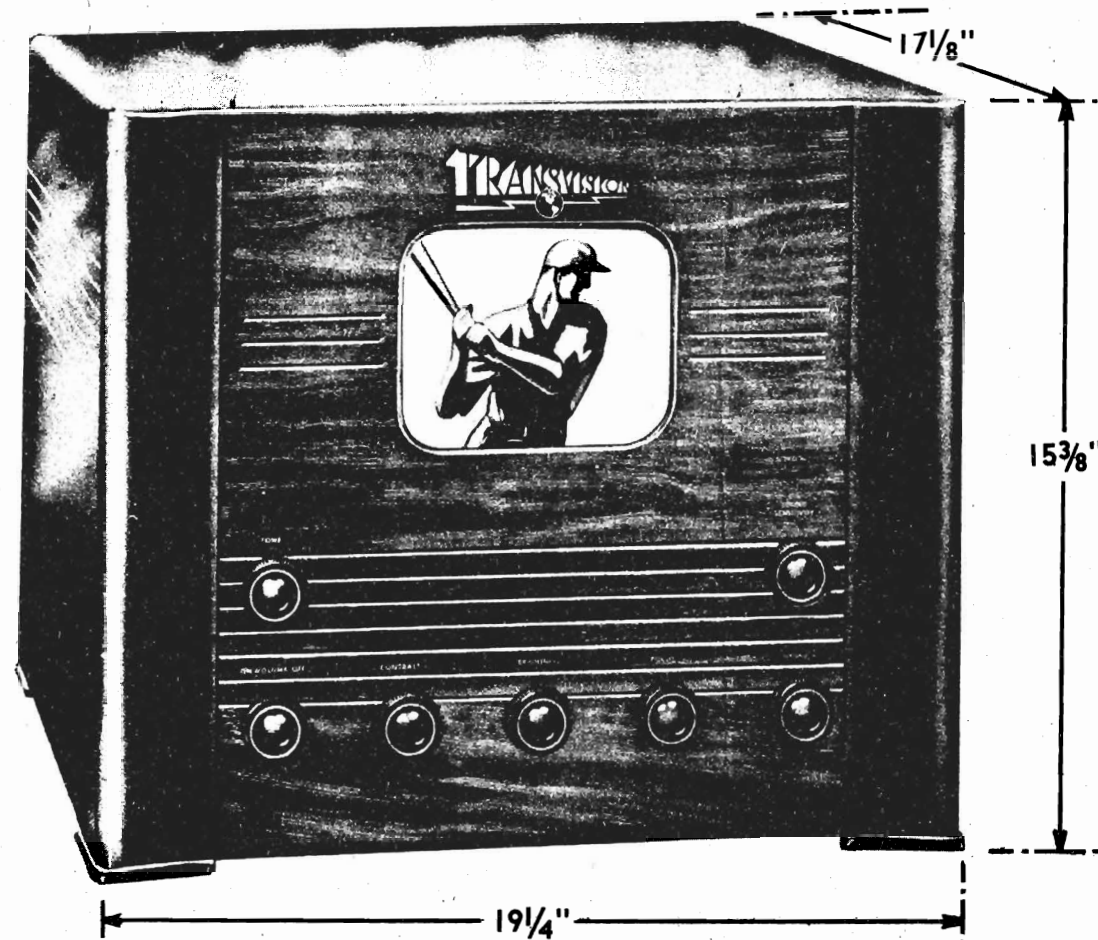
AN ELECTRONIC VOLTMETER OR A VOLTMETER WITH A MINIMUM RESISTANCE OF 20,000 OHMS PER VOLT SHOULD BE USED FOR VOLTAGE MEASUREMENTS.

TRANVISION, INC.



TRANSVISION, INC.

7 INCH KIT



The tube lineup in the RF section is a 6AC7 mixer and a 6C4 local oscillator. This stage has been carefully designed for flat response to the entire 6.5 megacycles of all channels and, despite compactness is also capable of surprising gain.

In the video IF section there are three stages, each using a 6AC7. The Audio Intelligence is picked off of the second IF transformer by a trap tuned to 21.9 megacycles and fed into a sound IF stage that uses another 6AC7. A 6SQ7 demodulator-amplifier and a 6V6 power amplifier comprise the audio section, while the video detection and amplification are achieved by a 6H6 and 6AG7 respectively.

The sync separator is still another 6AC7 and it fires 6N7 multivibrators in both the vertical and horizontal sweep circuits. The 6SN7's that follow are push-pull amplifiers. Low voltage rectification employs a 5A4G while a 2X2 (or 2Y2) rectifies the high voltages. The picture tube is the type 7EP4.

Perhaps the most striking feature of the IF section is the system of fixed, double-tuned trap coupling. This method not only obviates the need for a signal generator, but, in spite of the high IF frequency, it simultaneously affords satisfactory gain over a 3.5 megacycle bandpass that is obtained by heavy damping. The only tuning imposed upon the constructor at all involves trimmers in the trap circuits. In the second IF can, for example, the 21.9 megacycle trap is simply adjusted for maximum output (audio), while the two remaining trimmers are set for greatest brightness.

7 INCH KIT

TRANSVISION, INC.

The selection of a relatively high intermediate frequency was dictated by image considerations. This choice fixes the various image frequencies in channels that for the present are inactive, thereby evading this problem despite the inherently poor image rejection power of television receivers in general. Measurements have indicated that at these high image frequencies conventional tubes like the 6AC7 became inoperative and in this curious manner introduce acceptable rejection properties.

A noteworthy wiring precaution that preserves IF gain at its highest possible level concerns the use of a single ground for each IF stage. This common ground is a lug securely fastened to the appropriate socket under the #1 pin. In this manner, spurious voltages that frequently reduce gain are effectively eliminated. Excellent response in the video circuit is derived through the use of low resistance in the detector circuits and through a carefully designed series-shunt peaking arrangement in both the input and output of the section.

In the audio section, demodulation is accomplished by means of slope detection, while ample volume is provided by the two stages of amplification that follow. A tone control is also included. The salient feature of the sync separator is the exceedingly low voltages employed, a provision that affords maximum limiting.

Because of the latitude present in sweep design, it is always of interest to discuss what considerations have guided final circuit decisions. The primary one, of course, pertains to the selection of impulse generator. Greater flexibility is naturally permitted in the vertical section because of its lower frequency and, consequently, the advantages of a multivibrator can be utilized here without further ado.

The problem of stability, however, must be considered more cautiously in horizontal design. Initial plans, therefore, tentatively called for another multivibrator in the horizontal section. Surprisingly enough, the instability that actually materialized appeared to be closely connected with the interference problem, such as ignition disturbances, for example. Investigation soon focused attention upon the long time constant of the capacity grid leak arrangement originally coupling the differentiating network to the 6N7 multivibrator. At any rate, a direct connection from differentiator to grid, together with a further lowering of the differentiator time constant, succeeded in reducing the problem to such negligible proportions that the multivibrator proved completely acceptable.

A common expedient used in the rectifier circuits to provide the kinescope with an extra 350 volts deserves a word of comment. Generally, the low side of the high voltage rectifier is returned directly to ground. But since this procedure has the disadvantage of losing the potential available in the low voltage section, it appeared sensible to connect the two rectifier circuits in series. As a precaution against noise pickup, the low side of the high voltage supply was tied to a 350 volt terminal point safely distant from the RF unit. No ill effects developed and, because of the additional voltage, the kinescope performance was materially improved.

A final consideration that demands special attention in the kit field concerns adequate protection against the high voltages present. For the under surface of the chassis, an interlock switch and a bottom plate are provided, while for the top surface a ceramic cap insulates the connection to the anode of the 2X2. The last protective measure is the use of bakelite shafts, attached, of course, to all controls possessing high voltage connections.

Despite the simplicity of design employed to make the TRANSVISION TELEVISION KIT the ideal set for the inexperienced assembler to construct, no modern television technique was omitted. As a result, we have a television kit easy to construct into a set which, when complete, provides the user with a quality television receiver.

TRAVLER RADIO & TELEV.

MODELS 5003, 5004,
5005, 5006

ALIGNMENT AND SERVICE DATA

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker.

The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

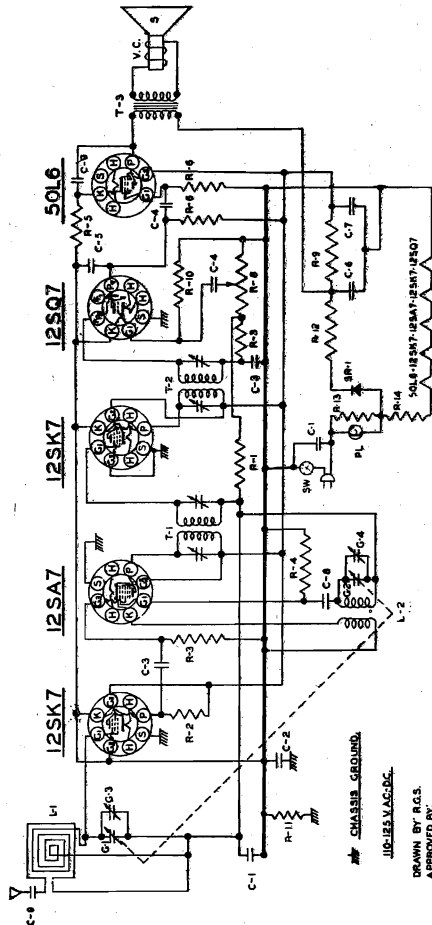
SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

CAUTION: Always predetermine voltage of power source. Never try to plug this receiver into a 220 volt line, as this will cause serious damage.

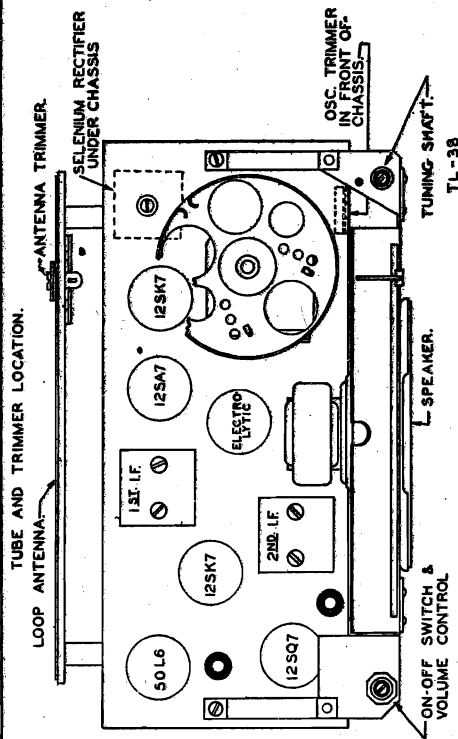
INSTALLATION: Unwind the power cord and plug into a convenient outlet. This receiver is equipped with a sensitive loop antenna and under ordinary conditions no external antenna would be required.

Due to the directional qualities of the loop antenna the reception of some stations may be improved by placing the receiver in different positions.



PART NO.	DESCRIPTION.	PART NO.	DESCRIPTION.
IR-23	R-1 15MΩ RESISTOR 1/2 W 20	GC-2	GANG CONDENSER
IR-9	R-2 15MΩ RESISTOR 1/2 W 20	CC-3	ANT. TRIMMER CONDENSER
IR-6	R-3 15MΩ RESISTOR 1/2 W 20	TC-7	ANT. TRIMMER CONDENSER
IR-11	R-4 15MΩ RESISTOR 1/2 W 20	TC-8	SW. SWITCH ON VOLUME CONTROL
VC-4	R-5 15MΩ RESISTOR 1/2 W 20	TU-25	5/8" ANT.-12SA7-12SQ7 50L6
IR-24	R-6 1MΩ VOLUME CONTROL	VR-4	VR-4 TR
IR-20	R-7 200Ω RESISTOR 1/2 W 10	SR-1	SELENIUM RECTIFIER
IR-33	R-8 200Ω RESISTOR 1/2 W 10		
PC-8	R-9 200Ω RESISTOR 1/2 W 10		
PC-9	R-10 200Ω RESISTOR 1/2 W 10		
PC-10	R-11 200Ω RESISTOR 1/2 W 10		
	R-12 200Ω RESISTOR 1/2 W 10		
	R-13 200Ω RESISTOR 1/2 W 10		
	R-14 200Ω RESISTOR 1/2 W 10		
	C-1 100μF CONDENSER 400V		
	C-2 100μF CONDENSER 400V		
	C-3 100μF MCA CONDENSER		
	C-4 100μF MCA CONDENSER		
	C-5 100μF MCA CONDENSER		
	C-6 100μF MCA CONDENSER		
	C-7 100μF MCA CONDENSER		
	C-8 100μF MCA CONDENSER		
	C-9 100μF MCA CONDENSER		
	L-1 100μH INDUCTOR		
	L-2 100μH INDUCTOR		
	L-3 100μH INDUCTOR		
	L-4 100μH INDUCTOR		
	L-5 100μH INDUCTOR		
	L-6 100μH INDUCTOR		
	L-7 100μH INDUCTOR		
	L-8 100μH INDUCTOR		
	L-9 100μH INDUCTOR		
	L-10 100μH INDUCTOR		
	L-11 100μH INDUCTOR		
	L-12 100μH INDUCTOR		
	L-13 100μH INDUCTOR		
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	L-34 100μH INDUCTOR		
	L-35 100μH INDUCTOR		
	L-36 100μH INDUCTOR		
	L-37 100μH INDUCTOR		
	L-38 100μH INDUCTOR		
	L-39 100μH INDUCTOR		
	L-40 100μH INDUCTOR		

100-125V AC, 60 Hz.
DRAWN BY R.G.S.
APPROVED BY
DATE 12-17-46

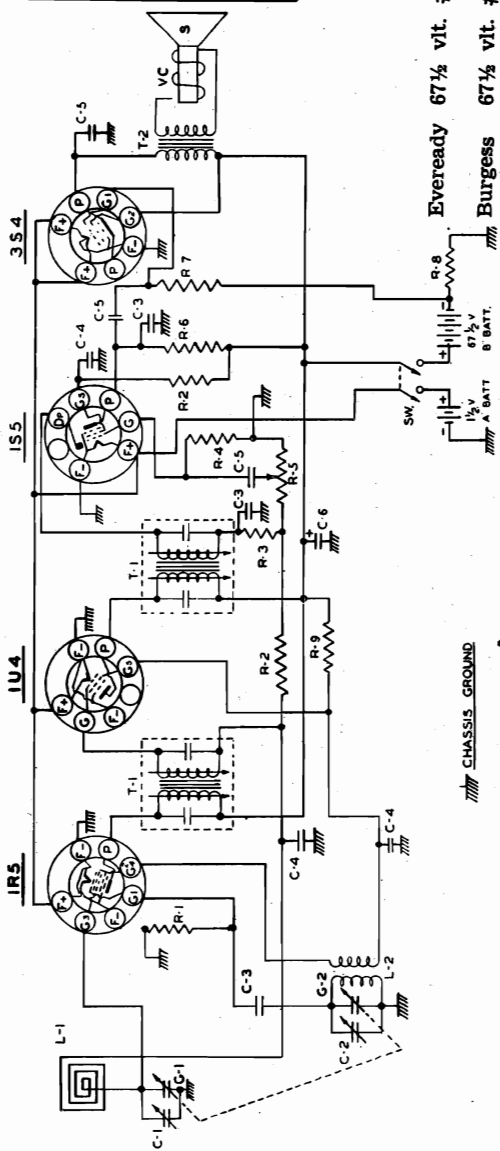
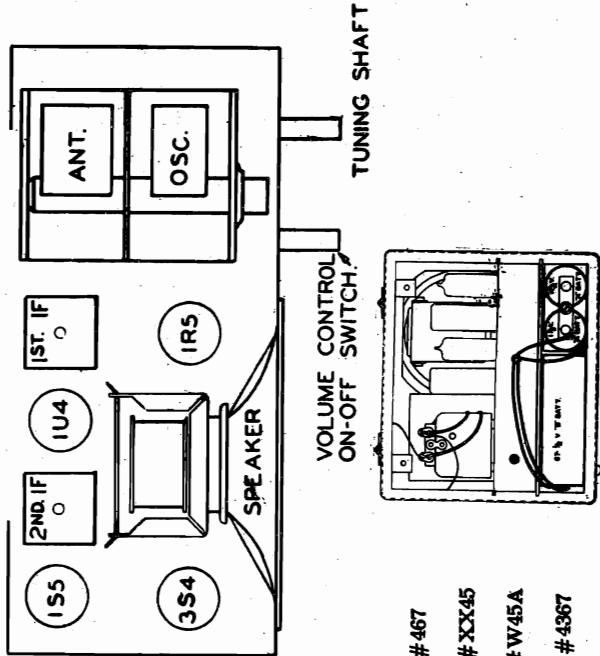


POWER SOURCES: This receiver may be operated on alternating current (AC) of 110 to 125 volts at 60 cycles or on direct current (DC) of 110 to 125 volts. When used on DC, if the tubes light up but set does not play, reverse the cord plug in the power outlet.

MODEL 5019

TRAV-LER RADIO & TELEV.

TUBE AND TRIMMER LOCATION.



- Eveready 67½ vlt. # 467
- Burgess 67½ vlt. # XX45
- General 67½ vlt. # W45A
- Ray-O-Vac 67½ vlt. # 4367

ALIGNMENT AND SERVICE DATA

Remove chassis from cabinet for alignment. A signal generator is required having the following frequencies: 455 KC and 1400 KC. An output meter should be connected across the speaker.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD. condenser. The ground lead from the generator may be connected to any spot on the metal chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the movable iron cores in the IF cans. These IF adjustments are made in the top and in the bottom of the can under the speaker.

The volume control of the receiver should be turned to maximum during the IF and all subsequent alignment and the generator output as low as possible to prevent the AVC from working and giving false readings.

SECOND STEP: With the leads from the generator still connected as in IF alignment, adjust the generator to 1400 KC. Set the dial pointer to 1400 KC on the dial scale. Adjust the oscillator trimmer until the signal is tuned in.

THIRD STEP: Remove the generator leads from the gang condenser.

Replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn over the outside of the cabinet. With the receiver and the generator still set at 1400 KC increase the generator output. Adjust the Antenna trimmer through the back of the chassis until a maximum signal is noted on the output meter.

No further adjustment should be necessary as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

NOTE: When the antenna trimmer is adjusted at 1400 KC., the chassis as well as the "A" and "B" batteries must be in normal position in the cabinet to reflect the proper loop impedance.

FART NO	DESCRIPTION	PART NO	DESCRIPTION
IR-20	220MΩ RESISTOR 1/2W	G-1	GANG CONDENSER
IR-23	23MΩ RESISTOR 1/2W	G-2	LOOP ANTENNA
IR-31	10MΩ RESISTOR 1/2W	L-1	OSC. COIL
IR-3	10MΩ RESISTOR 1/2W	L-2	IF COIL
VC-6	1MΩC VOLUME CONTROL	SW	DPST. SWITCH ON VOLUME CONTROL
IR-13	25MΩ RESISTOR 1/2W	T-2	SPEAKER TRANSFORMER
IR-15	220 Ω RESISTOR 1/2W	VC	VOICE COIL
IR-37	10M Ω RESISTOR 1/2W	S	PM SPEAKER
TC-7	ANT. TRIMMER ON GANG	IR5-1U4-1S5-3S4	
MC-2	OSC TRIMMER ON GANG	TU-29	
PC-7	100MΩ 400 V. CONDENSER		
PC-6	.005MFD 450 V.		
EC-7	20MFD. 30WV.		

BATTERY SERVICING

To replace the batteries in this receiver loosen and remove the screw in the back of the cabinet. Remove the back.

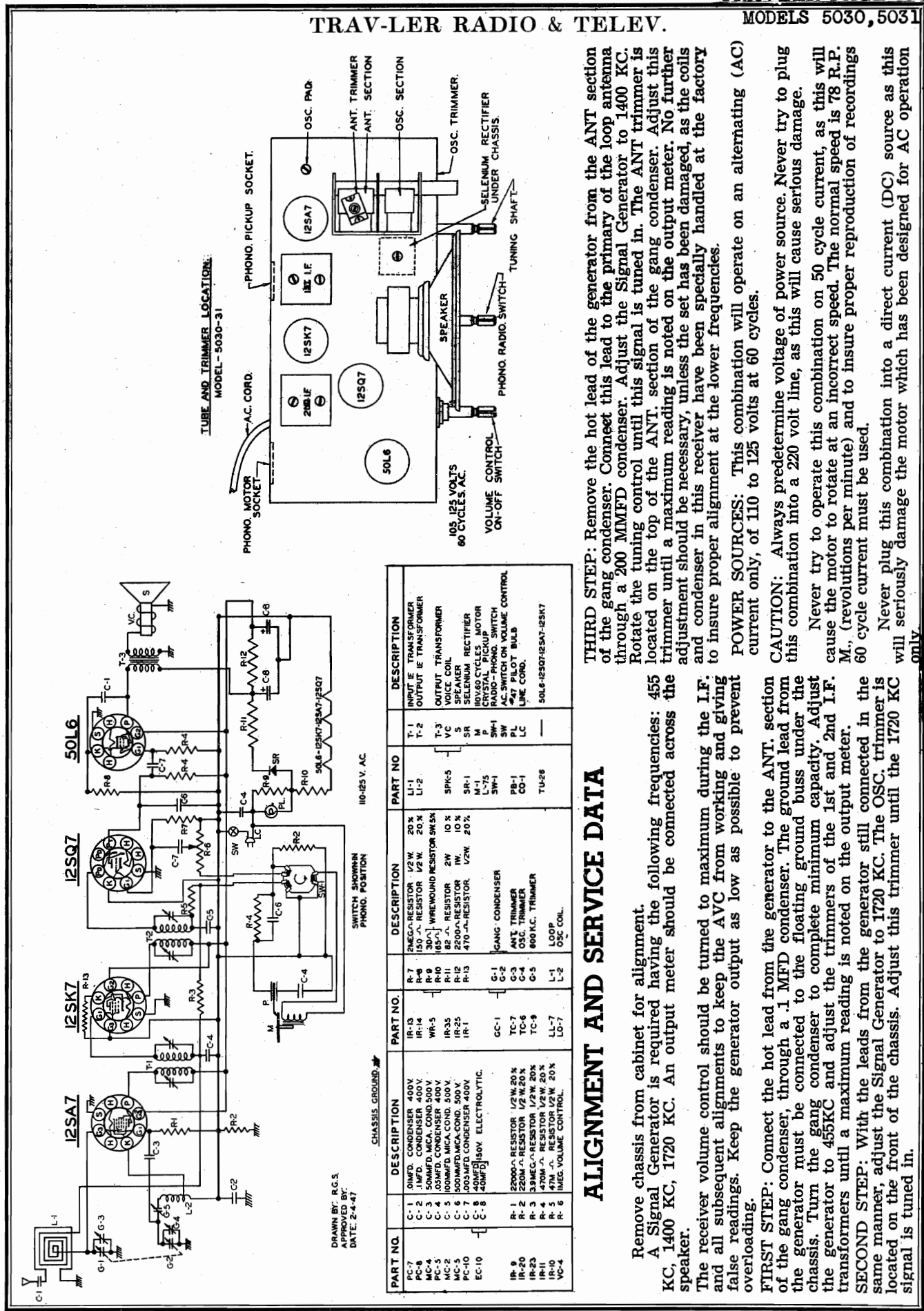
To the right looking at the rear of the cabinet is the "A" or flashlight battery assembly. Remove the battery assembly from the cabinet. Loosen the screw in the cross arm assembly until the batteries may be removed. Replace with fresh batteries and retighten the screw making sure that the battery center caps fit into the small recesses in the ends of the cross arm.

To replace the "B" battery, remove it from the cabinet. Disconnect the fasteners from the battery. Replace with a fresh battery and reconnect the fasteners. When replacing the "B" battery in the cabinet, make sure that the terminal end of the battery faces the end of the cabinet.

After the batteries have been installed, replace the back, making sure that the two washers in the bottom of the back fit into the slot near the bottom edge of the cabinet. Replace and tighten the screw.

CAUTION: If the batteries in the receiver wear out from use and the receiver refuses to operate make sure that the volume control is turned all the way to the left in "OFF" position, until the batteries can be replaced. If the switch is left in the "ON" position this will cause the battery cells to burst and they will leak into the receiver which may ruin the component parts.

TRAVLER RADIO & TELEVISION



TUBE AND TRIMMER LOCATION MODEL - 5030-31

DRAWN BY: R.G.S.
APPROVED BY:
DATE: 2-4-47

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
PC-7	0.1MFD CONDENSER 400V	R-7	2MEGA-RESISTOR 1/2W 20%	T-1	INPUT I.F. TRANSFORMER
PC-8	1MFD CONDENSER 400V	R-8	150 Ω-RESISTOR 1/2W 20%	T-2	OUTPUT I.F. TRANSFORMER
MC-4	50MMFD. MICA COND. 500V	R-9	30Ω-RESISTOR 1/2W 20%	T-3	VOICE COIL
PC-5	0.001MFD. MICA COND. 500V	R-10	165Ω-RESISTOR 1/2W 20%	VC	SPEAKER
MC-2	100MMFD. MICA COND. 500V	R-11	82 Ω-RESISTOR 2W 10%	SR	SELENIUM RECTIFIER
MC-3	500MMFD. MICA COND. 500V	R-12	2200Ω-RESISTOR 1W 10%	P	CRYSTAL PICKUP MOTOR
MC-5	500MMFD. MICA COND. 500V	R-13	470 Ω-RESISTOR 1/2W 20%	SW-1	RADIO-PHONO SWITCH
EC-10	40MMFD 500V ELECTROLYTIC	GC-1	GANG CONDENSER	SW	AC SWITCH ON VOLUME CONTROL
IR-9	22000Ω-RESISTOR 1/2W 20%	TC-7	ANT. TRIMMER	PL	#47 PILOT BULB
IR-20	2200Ω-RESISTOR 1/2W 20%	TC-8	OSC. TRIMMER	LC	LINE COND.
IR-1	500Ω-RESISTOR 1/2W 20%	G-3	600Ω-RESISTOR 1/2W 20%		
IR-2	470Ω-RESISTOR 1/2W 20%	G-5	47M Ω-RESISTOR 1/2W 20%		
IR-10	47M Ω-RESISTOR 1/2W 20%	LL-7	LOOP OSC. COIL		
VC-4	1MEG. VOLUME CONTROL	L-2	OSC. COIL		

ALIGNMENT AND SERVICE DATA

Remove chassis from cabinet for alignment. A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1720 KC. An output meter should be connected across the speaker. The receiver volume control should be turned to maximum during the I.F. and all subsequent alignments to keep the AVC from working and giving false readings. Keep the generator output as low as possible to prevent overloading.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a 1 MFD condenser. The ground lead from the generator must be connected to the floating ground buss under the chassis. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

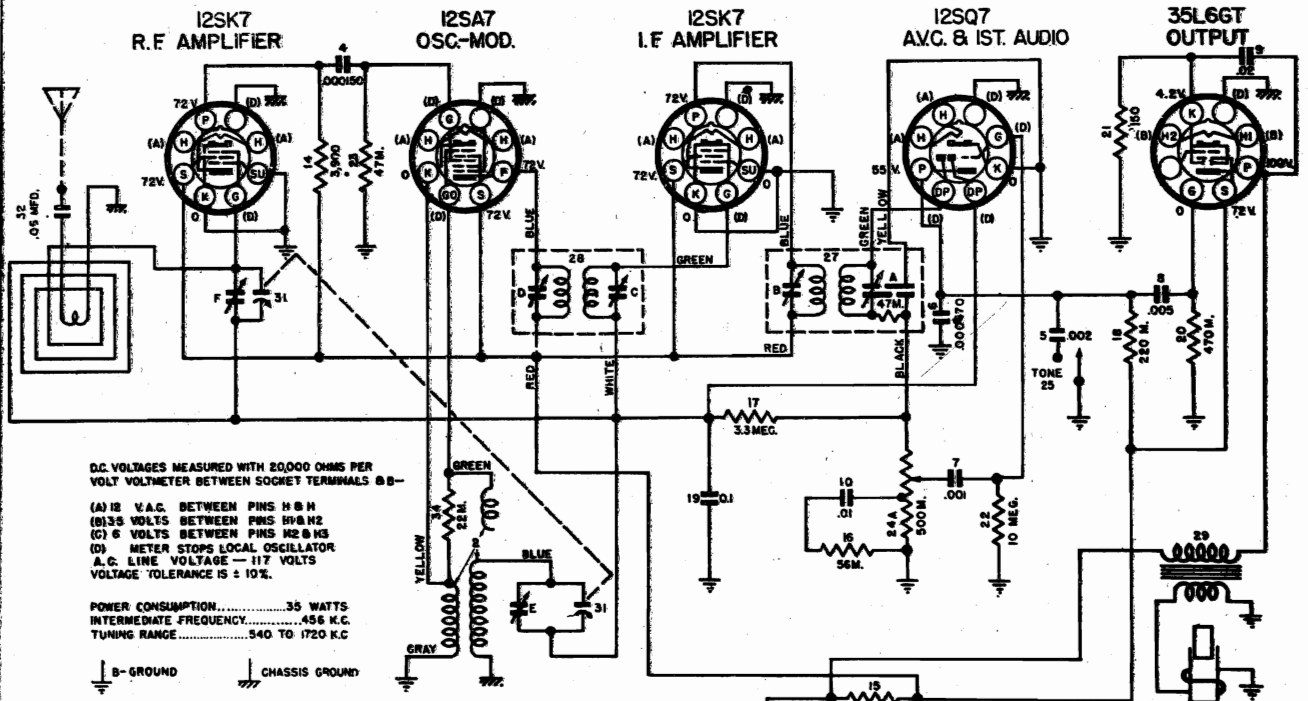
SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1720 KC. The OSC. trimmer is located on the front of the chassis. Adjust this trimmer until the 1720 KC signal is tuned in.

THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Connect this lead to the primary of the loop antenna through a 200 MMFD condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the top of the ANT. section of the gang condenser. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

POWER SOURCES: This combination will operate on an alternating (AC) current only, of 110 to 125 volts at 60 cycles.

CAUTION: Always predetermine voltage of power source. Never try to plug this combination into a 220 volt line, as this will cause serious damage. Never try to operate this combination on 50 cycle current, as this will cause the motor to rotate at an incorrect speed. The normal speed is 78 R.P.M., (revolutions per minute) and to insure proper reproduction of recordings 60 cycle current must be used. Never plug this combination into a direct current (DC) source as this will seriously damage the motor which has been designed for AC operation only.

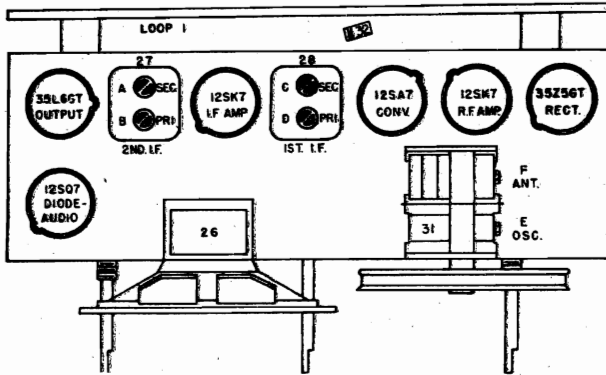
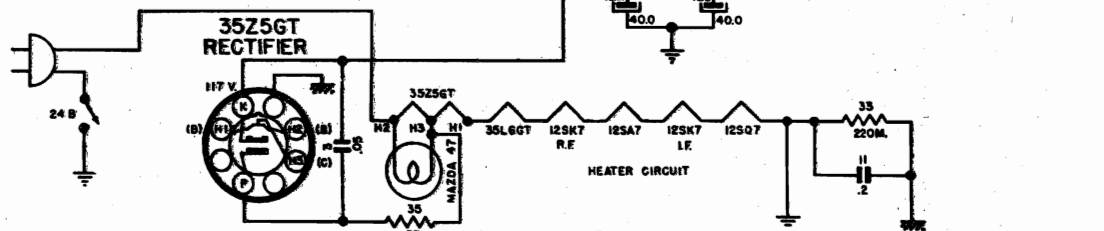
UNITED MOTORS SERVICE CORP. MODELS R-1227, R-1228, R-1229
(DIV. OF GEN. MOTORS)



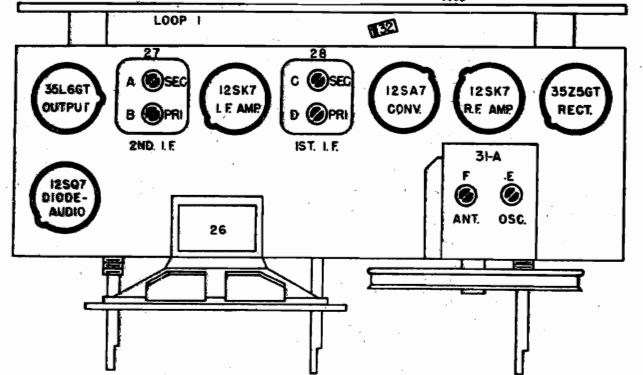
D.C. VOLTAGES MEASURED WITH 20,000 OHMS PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS B-B—
 (A) 12 V.A.C. BETWEEN PINS H & H
 (B) 35 VOLTS BETWEEN PINS H & H2
 (C) 6 VOLTS BETWEEN PINS M2 & M3
 (D) METER STOPS LOCAL OSCILLATOR
 A.C. LINE VOLTAGE — 117 VOLTS
 VOLTAGE TOLERANCE IS ± 10%.

POWER CONSUMPTION.....35 WATTS
 INTERMEDIATE FREQUENCY.....456 K.C.
 TUNING RANGE.....540 TO 1720 K.C.

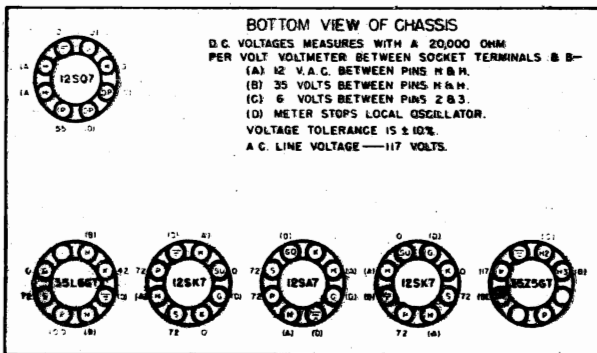
B-GROUND CHASSIS GROUND



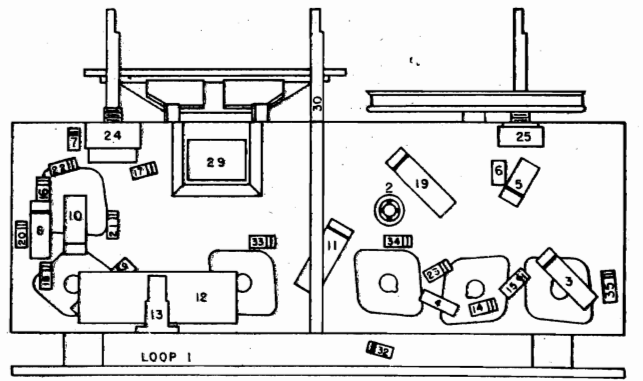
PARTS LAYOUT — TUBE VIEW
TRIMMERS ON SIDE OF TUNING CONDENSER



PARTS LAYOUT — TUBE VIEW
TRIMMERS ON TOP OF TUNING CONDENSER



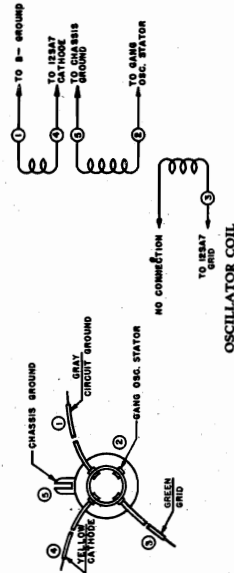
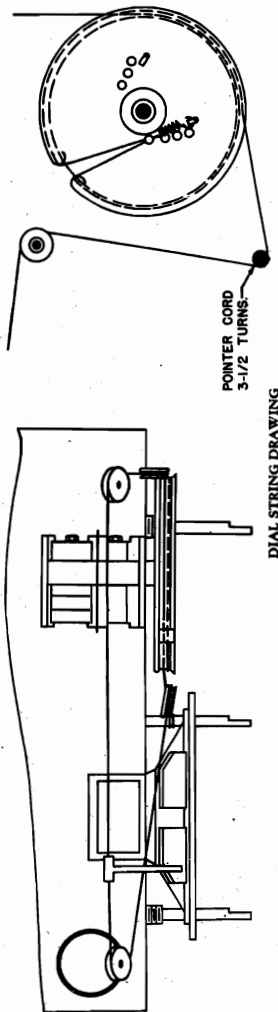
TUBE SOCKET VOLTAGE CHART



PARTS LAYOUT — CHASSIS VIEW

MODELS R-1227, R-1228, UNITED MOTORS SERVICE CORP.
R-1229 (DIV. OF GEN. MOTORS)

Some receivers are made using a gang condenser having the trimmers on the side of the condenser and some with the trimmers on the top of the condenser. Two Parts Layout drawings are used to illustrate this difference.



ALIGNMENT PROCEDURE

Output Meter Connections Across Voice Coil Winding
Generator Ground To Chassis through .01 MFD
Dummy Antenna In Series with generator
Volume Control Position Fully on

Steps	Series Condenser or Dummy Antenna	Connect Signal Generator To	Adjust Signal Generator To	Turn Radio Dial To	Adjust Trimmers
1	.02 Mfd.	12SA7 Grid (Pin #8)	456 KC	Quiet Point near H. F. end	A-B (2nd IF Trans) C-D (1st IF Trans)
2	.000200 Mfd.	Ant. lead	1720 KC	1720 KC	E (Osc.)
3	.000200 Mfd.	Ant. lead	1400 KC	1400 KC	F (Ant.)

Illus. No.	Service Part No.	Description
1	1217138	Antenna Assy. — Loop and Back Cover — Models R-1227 and R-1228, (Includes Condensers #31, #32, #33, #34, #35, #36, #37, #38, #39, #40, #41, #42, #43, #44, #45, #46, #47, #48, #49, #50, #51, #52, #53, #54, #55, #56, #57, #58, #59, #60, #61, #62, #63, #64, #65, #66, #67, #68, #69, #70, #71, #72, #73, #74, #75, #76, #77, #78, #79, #80, #81, #82, #83, #84, #85, #86, #87, #88, #89, #90, #91, #92, #93, #94, #95, #96, #97, #98, #99, #100, #101, #102, #103, #104, #105, #106, #107, #108, #109, #110, #111, #112, #113, #114, #115, #116, #117, #118, #119, #120, #121, #122, #123, #124, #125, #126, #127, #128, #129, #130, #131, #132, #133, #134, #135, #136, #137, #138, #139, #140, #141, #142, #143, #144, #145, #146, #147, #148, #149, #150, #151, #152, #153, #154, #155, #156, #157, #158, #159, #160, #161, #162, #163, #164, #165, #166, #167, #168, #169, #170, #171, #172, #173, #174, #175, #176, #177, #178, #179, #180, #181, #182, #183, #184, #185, #186, #187, #188, #189, #190, #191, #192, 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Illus. No.	Service Part No.	Description
13	1216519	Control — Volume Control and Switch
24	1216519	Control — Tone
25	1216519	Lamp — Dial Light (Mazda #47)
26	1216519	Transformer — Output
28	1216519	Pointer — Dial
29	1216519	Shaft — Drive
19	7241702	Cord — Dial Drive (72" Length)
20	1216519	Socket — Dial Light Assy. (Less Lamp)
21	1216519	Washer — (Use With Drive Shaft)
22	1217323	Control — Tone
23	1217323	Lamp — Dial Light (Mazda #47)
24	1216519	Transformer — Output
25	1216519	Pointer — Dial
26	1216519	Shaft — Drive
27	1217323	Control — Tone
28	1217323	Lamp — Dial Light (Mazda #47)
29	1216519	Transformer — Output
30	1216519	Pointer — Dial
31	1216519	Shaft — Drive
32	1217323	Control — Tone
33	1217323	Lamp — Dial Light (Mazda #47)
34	1216519	Transformer — Output
35	1216519	Pointer — Dial
36	1216519	Shaft — Drive
37	1217323	Control — Tone
38	1217323	Lamp — Dial Light (Mazda #47)
39	1216519	Transformer — Output
40	1216519	Pointer — Dial
41	1216519	Shaft — Drive
42	1217323	Control — Tone
43	1217323	Lamp — Dial Light (Mazda #47)
44	1216519	Transformer — Output
45	1216519	Pointer — Dial
46	1216519	Shaft — Drive
47	1217323	Control — Tone
48	1217323	Lamp — Dial Light (Mazda #47)
49	1216519	Transformer — Output
50	1216519	Pointer — Dial
51	1216519	Shaft — Drive
52	1217323	Control — Tone
53	1217323	Lamp — Dial Light (Mazda #47)
54	1216519	Transformer — Output
55	1216519	Pointer — Dial
56	1216519	Shaft — Drive
57	1217323	Control — Tone
58	1217323	Lamp — Dial Light (Mazda #47)
59	1216519	Transformer — Output
60	1216519	Pointer — Dial
61	1216519	Shaft — Drive
62	1217323	Control — Tone
63	1217323	Lamp — Dial Light (Mazda #47)
64	1216519	Transformer — Output
65	1216519	Pointer — Dial
66	1216519	Shaft — Drive
67	1217323	Control — Tone
68	1217323	Lamp — Dial Light (Mazda #47)
69	1216519	Transformer — Output
70	1216519	Pointer — Dial
71	1216519	Shaft — Drive
72	1217323	Control — Tone
73	1217323	Lamp — Dial Light (Mazda #47)
74	1216519	Transformer — Output
75	1216519	Pointer — Dial
76	1216519	Shaft — Drive
77	1217323	Control — Tone
78	1217323	Lamp — Dial Light (Mazda #47)
79	1216519	Transformer — Output
80	1216519	Pointer — Dial
81	1216519	Shaft — Drive
82	1217323	Control — Tone
83	1217323	Lamp — Dial Light (Mazda #47)
84	1216519	Transformer — Output
85	1216519	Pointer — Dial
86	1216519	Shaft — Drive
87	1217323	Control — Tone
88	1217323	Lamp — Dial Light (Mazda #47)
89	1216519	Transformer — Output
90	1216519	Pointer — Dial
91	1216519	Shaft — Drive
92	1217323	Control — Tone
93	1217323	Lamp — Dial Light (Mazda #47)
94	1216519	Transformer — Output
95	1216519	Pointer — Dial
96	1216519	Shaft — Drive
97	1217323	Control — Tone
98	1217323	Lamp — Dial Light (Mazda #47)
99	1216519	Transformer — Output
100	1216519	Pointer — Dial

Power Supply 105 / 125 volts AC-DC

Power Consumption 35 Watts

Model R-1227 Brown Plastic Cabinet

Model R-1228 White Plastic Cabinet

Model R-1229 Wood Cabinet

Model R-1227

Model R-1228

Model R-1229

MODELS R-1408, R-1409 UNITED MOTORS SERVICE CORP. (DIV. OF GEN. MOTORS) ALIGNMENT PROCEDURE

Output Meter Connections Across Voice Coil Winding
 Generator Ground To Ground Terminal
 Dummy Antenna In Series with generator
 Volume Control Position Fully on
 Adjust Signal Generator Output to a Minimum for Satisfactory Output Indication.

Steps	Series Condenser Or Dummy Antenna	Connect Signal Generator To	Adjust Signal Generator To	Turn Radio Dial To	Adjust Trimmers
1	0.1 Mfd.	1A7 Grid Cap.***	456 KC	Quiet Point near H. F. end	A-B (2nd IF Trans) C-D (1st IF Trans)
2	.000200 Mfd.	Ant. Terminal	1720 KC	1720 KC	E (Osc.)
3	.000200 Mfd.	Ant. Terminal	1400 KC	1400 KC	F (Ant.)
4*	.000200 Mfd.	Ant. Terminal	600 KC	600 KC	H

*Rock in Oscillator Core "H" with Signal Generator until maximum output is secured.

Repeat steps 2, 3 and 4 for most accurate alignment.

NOTE: If hum is encountered in output when an AC operated signal generator is used for Step 1, short out the 0.2 mfd condenser (#15) which is connected between B- and the chassis until work is completed. Shorting wire must be removed for normal operation in order to reduce shock hazard.

***Connect generator ground to chassis ground.

NOTE: On all sets above Serial No. 5000 the 47 ohm resistors, Illustration No. 27 and 28, have been replaced by 22 ohm resistors to prevent possible overheating if the line voltage is above 120 volts. If replacement becomes necessary, install either a 22 ohm resistor or two 47 ohm resistors in parallel in both locations (Illus. No. 27 and 28).

MISCELLANEOUS ELECTRICAL PARTS

- 8760 Battery — "A" 7.4 V, "B" 90 V
- 1217105 Fastener — Coil Form
- 1217124 Iron Core Assembly
- 47 Lamp — Dial
- 1217239 Lamp — Neon Glow
- 30 Speaker — 5" PM
- 1216956 Transfer Switch
- 1217582 Transformer Output
- 1216945 Volume Control and Switch

CABINET PARTS

- Cabinet — Model R-1409 — Brown Leather
- Cabinet — Model R-1408 — Cream Leather
- Front Cover Assy. — Complete — Model R-1409
- Front Cover Assy. — Complete — Model R-1408
- Front Cover
- Grille and Baffle Cloth
- Mounting Brackets and Screws
- Dial Crystal
- Handle Assy. Complete
- Knob — Power Volume and Tuning Control — Model R-1409
- Knob — Power Volume and Tuning Control — Model R-1408
- Knob and Spring — Transfer Switch — Model R-1409
- Knob and Spring — Transfer Switch — Model R-1408

ELECTRICAL PARTS

COILS

- 73 1217535 Antenna Assy. — Loop and Back Cover — Model R-1409 (Includes Condenser #2)
- 73 1217569 Antenna Assy. — Loop and Back Cover — Model R-1408 (Includes Condenser #2)
- 54 1217019 Oscillator
- 52 1216952 1st I. F.
- 51 1216953 2nd I. F.

CONDENSERS

- 1 1216904 2 Gang Variable Antenna Section
- 1A Oscillator Section
- 1B
- 2 1217250 Antenna Trimmer (Included in #1217535 and 1217569)
- 3 G101 .000100 Mfd. Moided
- 4 E102 .001 Mfd. 600 V. Tubular
- 5 E102 .005 Mfd. 600 V. Tubular
- 6 E103 .01 Mfd. 600 V. Tubular
- 7 E103 .01 Mfd. 600 V. Tubular
- 8 E103 .01 Mfd. 600 V. Tubular
- 9 E103 .01 Mfd. 600 V. Tubular
- 10 E103 .05 Mfd. 600 V. Tubular
- 11 E104 .01 Mfd. 600 V. Tubular
- 12 E204 .02 Mfd. 400 V. Tubular
- 13 E204 .02 Mfd. 400 V. Tubular
- 14 E204 .02 Mfd. 400 V. Tubular
- 15 E204 .02 Mfd. 400 V. Tubular
- 16 J500 40 Mfd. 25 V. Electrolytic
- 17 1217139 4 Section Electrolytic
- 17A 40 Mfd. 150 V.
- 17B 40 Mfd. 150 V.
- 17C 40 Mfd. 150 V.
- 17D 160 Mfd. 25 V.

RESISTORS

- 26 A220 22 Ohms 1/2 W. Insulated
- 27 B470 47 Ohms 1/2 W. Insulated
- 28 B470 47 Ohms 1/2 W. Insulated
- 29 B151 150 Ohms 1/2 W. Insulated
- 30 A331 330 Ohms 1/2 W. Insulated
- 31 A331 330 Ohms 1/2 W. Insulated
- 32 1216958 330 Ohms 10 W. Candohm
- 33 A471 470 Ohms 1/2 W. Insulated
- 34 B102 1,000 Ohms 1 W. Insulated
- 35 1216959 1,500 Ohms 10 W. Candohm
- 36 1216960 2,000 Ohms 10 W. Candohm
- 37 B472 4,700 Ohms 1 W. Insulated
- 38 A153 15,000 Ohms 1/2 W. Insulated
- 39 A473 47,000 Ohms 1/2 W. Insulated
- 41 A224 220,000 Ohms 1/2 W. Insulated
- 42 A105 1 Megohm 1/2 W. Insulated
- 43 A395 3.9 Megohm 1/2 W. Insulated
- 44 A395 3.9 Megohm 1/2 W. Insulated
- 45 A395 3.9 Megohm 1/2 W. Insulated
- 46 A395 3.9 Megohm 1/2 W. Insulated
- 47 A395 3.9 Megohm 1/2 W. Insulated

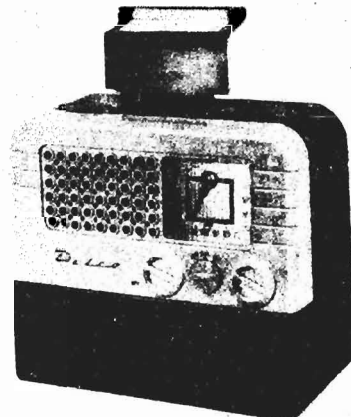
MECHANICAL PARTS

CHASSIS PARTS

- 72 1836870 Bushing — Selector Switch
- 1217103 Cable Assy. — Battery
- 66 1212233 Cord — Universal Dial Drive — 48" Length
- 65 1217501 Dial and Dial Plate Assy.
- 7232123 Grommet — Neon Lamp Mtg.
- 70 7231480 Nut — Hex
- 1217533 Plug — Mole Chassis
- 1217225 Pointer — Dial
- 74 1217548 Power Cord and Socket
- 68 1217238 Pulley Assy.
- 69 1216951 Shaft — Manual Drive
- 59 1217839 Socket — Dial Light Assy., Less Lamp
- 7238279 Socket — Octal Base Tube.
- 1217323 Spring — Cord Tension
- 67 7245333 Washer — "C" (Use With #1216951)

- Charging Rate (Battery Charging) "A" 15 Mils.
- Charging Rate (Battery Charging) "B" 4 Mils.
- Battery Supply, "A" 7.5 Volts
- Battery Supply, "B" 90 Volts
- Power Supply 105/125 volts AC-DC
- Power Consumption 38 Watts

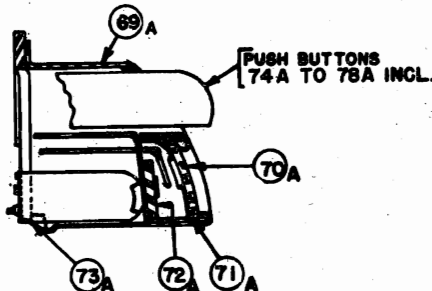
The only difference between the R-1408 and R-1409 is in cabinet colors. The R-1408 is cream leather and the R-1409 is brown leather.



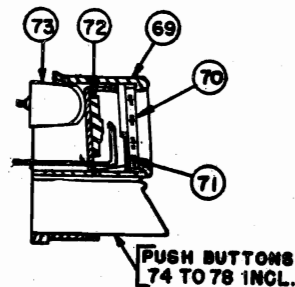
UNITED MOTORS SERVICE CORP. MODELS 980690, Revised,
(DIV. OF GEN. MOTORS) 980733, Buick

PUSH BUTTON SET-UP

Release holding spring in bottom of button, pull button off. Loosen re-set screw and push in until it bottoms. Tune in desired station while holding in re-set screw. Release and tighten screw. Replace button.



MODEL 980733



MODEL 980690

ALIGNMENT PROCEDURE

Volume control maximum. Signal Generator output minimum for satisfactory output indication (preferably below one watt output).

ESCUTCHEON CROSS SECTION

Series Condenser or Dummy Antenna	Connect to	Signal Generator Frequency	Adjust Screws In Order
0.1 Mfd.	Grid side of R. F. Sec. of Gang. Cond.	262 K. C.	A B C D
0.1 Mfd.	Grid side of R. F. Sec. of Gang. Cond.	1615 K. C.	E
.000060 Mfd.	Antenna Connector	1430 K. C.	F G
.000060 Mfd.	Antenna Connector	600 K. C.	H J

Adjust trimmer G to match car antenna (1430 KC) when radio is installed.

SPECIAL INSTRUCTIONS

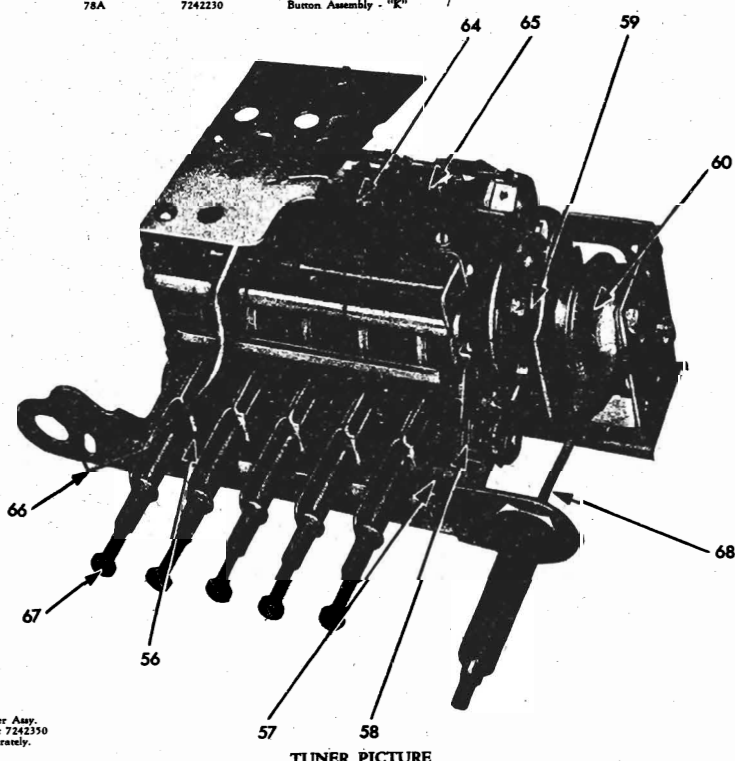
Rock gang condenser back and forth through signal during 600 K. C. adjustment of screws H and J. Repeat Alignment adjustment of trimmers F and G at 1430 K. C. and of cores H and J at 600 K. C.

SERVICE PARTS LIST

1946 BUICK MODELS 980690 (CONTROLS AT BOTTOM) AND 980733 (CONTROLS AT TOP)				
Illus. No.	Service Part No.	Description	Part No.	Description
CONDENSERS				
1	7244039	Oscillator Air Trimmer (Included in Osc. Coil Assembly, Part #7244111)	64	7242167 Cord and Spring Assembly
2	7242450	.000012 Mfd. Compensating	65	7242168 Cord and Link Assembly
3	7233113	.000047 Mfd. Molded	66	7240460 Pointer and Tip Assembly
4	7240577	.000120 Mfd. Molded	67	7240368 Reser Screw Assembly
5	7236105	.000220 Mfd. Molded	68	7241981 Tuning Shaft Assembly
6	7240566	.000560 Mfd. Mica	69	7241966 Escutcheon
7	7240566	.000560 Mfd. Mica	70	7242173 Dial - Glass
8	7240566	.000560 Mfd. Mica	71	7240508 Dial Clamp
9	7235665	.000560 Mfd. Mica - Molded (Aic. for 7240566)	72	7240909 Backplane Assembly
10	7236134	.0015 Mfd. 800 V. Tubular	73	7238515 Dial Shield
11	7240578	.0025 Mfd. 400 V. Tubular	74	7242221 Button Assembly - "B"
12	7230912	.0025 Mfd. 600 V. Tubular	75	7242222 Button Assembly - "U"
13	1208600	.01 Mfd. 600 V. Tubular	76	7242223 Button Assembly - "T"
14	7236075	.015 x .015 Mfd. 1500 V. Dual-Tubular	77	7242224 Button Assembly - "C"
15	1211009	.025 Mfd. 400 V. Tubular	78	7242225 Button Assembly - "K"
16	1211232	.025 Mfd. 400 V. Tubular	64A	7242005 Cord and Spring Assembly
17	1207908	0.1 Mfd. 400 V. Tubular	65A	7242006 Cord and Link Assembly
18	1207908	0.1 Mfd. 400 V. Tubular	66A	7241997 Pointer and Tip Assembly
19	1207908	0.1 Mfd. 400 V. Tubular	67A	7241982 Reser Screw Assembly
20	7240579	0.2 Mfd. 400 V. Tubular	68A	7241980 Tuning Shaft Assembly
21	7240612	Electrolytic - 2 Section 20-20 Mfd. 400 V.	69A	7242039 Escutcheon Assembly
22	7238553	Electrolytic - 3 Section 20-20-20 Mfd. 25 V.	70A	7241991 Dial Glass
RESISTORS				
23	1213217	100 Ohms 1/2 W. Insulated	71A	7241992 Dial Shield
24	1213217	100 Ohms 1/2 W. Insulated	72A	7241987 Backplane Assembly
25	1213224	330 Ohms 1/2 W. Insulated	73A	7242093 Dial Clamp
26	1214572	330 Ohms 2 W. Insulated	74A	7242226 Button Assembly - "B"
27	1213482	390 Ohms 1/2 W. Insulated	75A	7242227 Button Assembly - "U"
28	1214543	580 Ohms 1/2 W. Insulated	76A	7242228 Button Assembly - "T"
29	1214544	820 Ohms 1/2 W. Insulated	77A	7242229 Button Assembly - "C"
30	1213237	1,500 Ohms 1/2 W. Insulated	78A	7242230 Button Assembly - "K"
31	1214573	18,000 Ohms 2 W. Insulated		
32	1214550	22,000 Ohms 1/2 W. Insulated		
33	7240590	22,000 Ohms 2 W. Insulated		
34	1213342	27,000 Ohms 1 W. Insulated		
35	1213844	68,000 Ohms 1/2 W. Insulated		
36	1214555	220,000 Ohms 1/2 W. Insulated		
37	1218555	220,000 Ohms 1/2 W. Insulated		
38	1213282	1 Megohm 1/2 W. Insulated		
39	1213282	1 Megohm 1/2 W. Insulated		
MISCELLANEOUS ELECTRICAL PARTS				
40	7240469	Speaker - 8" Electrodynamic		
41	7240519	Power Transformer Assembly		
42	7240464	Audio Pack - Driver and Output Transformer		
43	7238546	First I. F. Transformer Assembly		
44	7240467	Second I. F. Transformer Assembly		
45	7242238	Antenna Coil and Shield Assembly		
46	7242238	R. F. Coil Assembly		
47	7244111	Oscillator Coil Assembly		
48	7241708	"A" Filter Choke		
49	7240251	Antenna Choke Coil		
50	8630	Vibrator - Synchronous		
51	7241967	Volume, Tone Control and Switch (Model 980690)		
	7241928	Volume, Tone Control and Switch (Model 980733)		
MISCELLANEOUS CHASSIS PARTS				
	7242034	"A" Lead Connector Assembly		
	7242035	Antenna Lead Connector Assembly		
	7238539	Vibrator Socket		
	7236279	Octal Base Tube Socket		
	7240408	Dial Light Assembly (Includes Dial Lamp)		
	125988	Bulb - Dial Lamp		
	1241177	"A" Lead Cable Assembly - Model 980690		
	1321178	"A" Lead Cable Assembly - Model 980733		
	120151	Fuse		
	1208579	Static Collector Assembly		
	1880659	Generator Condenser		
	1207820	Distributor Suppressor		
	1853686	Suppressor Adapter		
	1324056	Bracket - R. H. - Model 980690		
	1324057	Bracket - L. H. - Model 980690		
	1323926	Bracket - R. H. - Model 980733		
	1323927	Bracket - L. H. - Model 980733		
	1320624	Washer		
	120380	Lockwasher		
	120375	Hex. Nut		
	123291	Screw		
TUNER UNIT AND PARTS				
	7242170	Tuner Assembly Complete (Model 980690)		
	7242350	Tuner Assembly Complete (Model 980733)		
56	7240287	Shaft - Declutching Switch Lever		
57	7238110	Declutching Switch Lever Assembly		
	7255698	Retainer Spring		
	7240292	Spring - Declutching Switch Lever		
	7238197	Switch Assembly - Declutching		
58	7240396	Drive Drum Assembly		
	7240471	Clutch Assembly Complete		
	7237124	Universal Joint Spring		

Parts included in Part #7242170 which are serviced separately.

Parts included in Part #7242350 which are serviced separately.

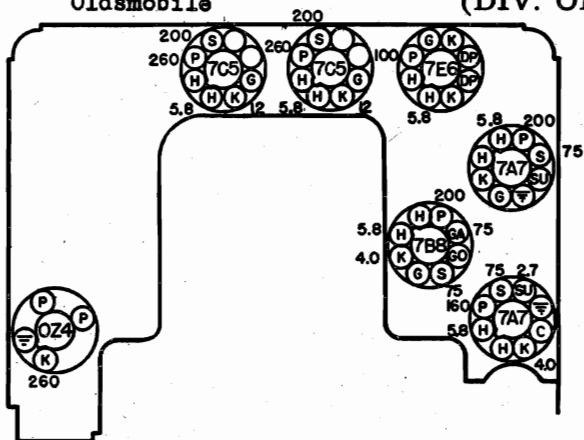


TUNER PICTURE

Parts Included in Tuner Assy. Part 7242170 and Part 7242350 which are serviced separately.

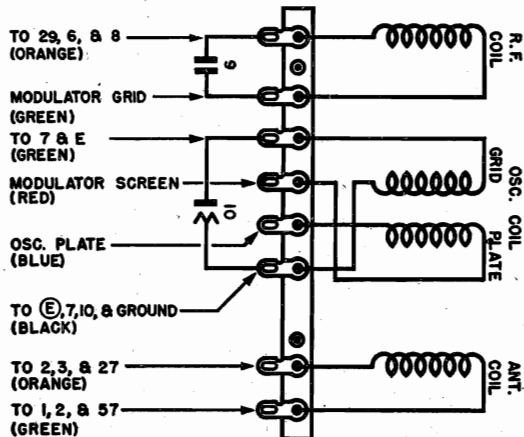
MODEL 982399,
Oldsmobile

UNITED MOTORS SERVICE CORP.
(DIV. OF GEN. MOTORS)



VOLTAGE READINGS BETWEEN SOCKET TERMINALS AND GROUND WITH D.C. VOLTMETER HAVING RESISTANCE OF 20,000 OHMS PER VOLT. ALL READINGS TAKEN WITH 6.0 VOLTS AT SPARK PLATE. CURRENT DRAIN WITH SPEAKER AND DIAL LIGHT 7.7 AMPS. "B" SUPPLY DRAIN 62 MA. TOLERANCES ON VOLTAGES ±10%

TUBE SOCKET VOLTAGE CHART



TUNER COILS

ALIGNMENT PROCEDURE

Volume Control Maximum — Tone Control on treble.

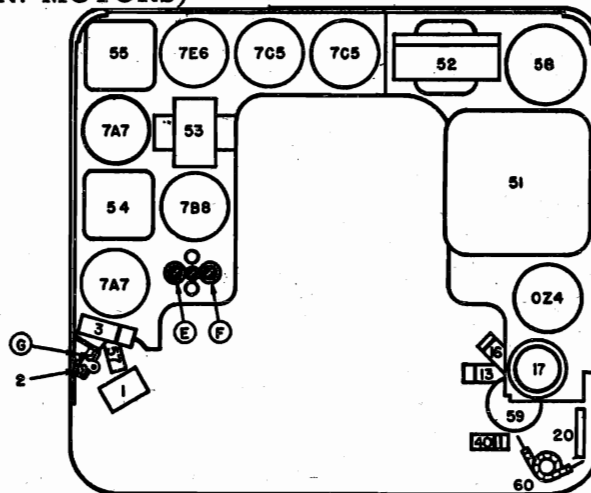
Signal Generator minimum for satisfactory output indication.

Series Condenser Or Dummy Antenna	Connect To	Signal Generator Frequency	Adjust Screws In Order
0.1 MFD	Grid side of Trimmer F	262 KC	A B C D
.000070 MFD	Antenna Terminal	1615 KC	E
.000070 MFD	Antenna Terminal	1430 KC	F G

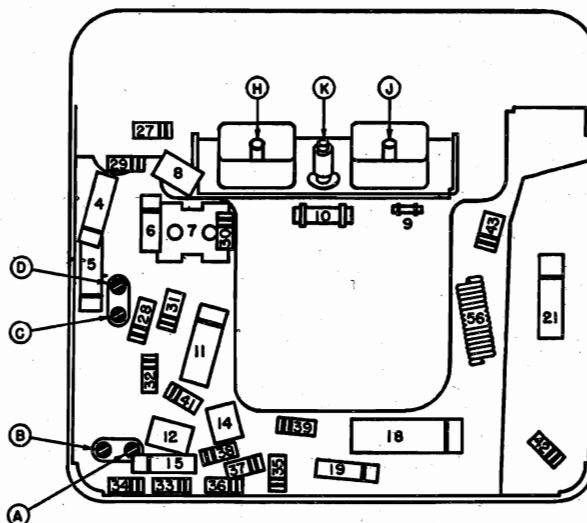
Adjust trimmer G to match car antenna (1430 KC) when radio is installed.

SPECIAL INSTRUCTIONS

Mechanical alignment of iron cores. Tune to stop at H.F. end of dial. Adjust cores H, J, and K to extend 1 3/2" from end of coil form. Adjust trimmers E, F, and G, (1615 KC). Adjust cores H and J for maximum output at 1430 KC. Repeat alignment of trimmers E, F, and G at 1615 KC. Repeat alignment of cores H and J at 1430 KC. Align trimmers F and G at 1430 KC.

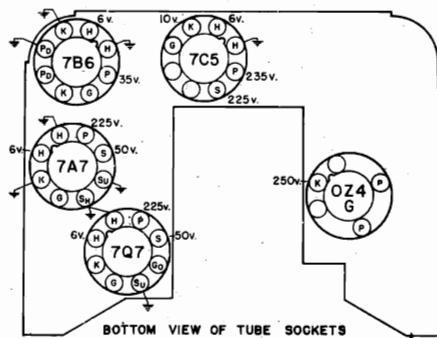


PARTS LAYOUT—TUBE VIEW

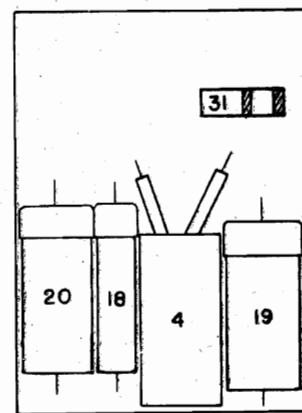
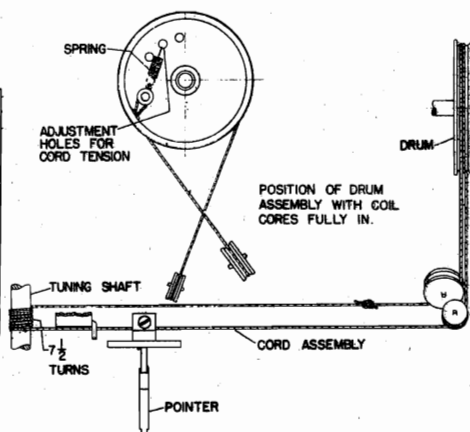


PARTS LAYOUT—CHASSIS VIEW

MODEL 984170, Pontiac UNITED MOTORS SERVICE CORP.
(DIV. OF GEN. MOTORS)



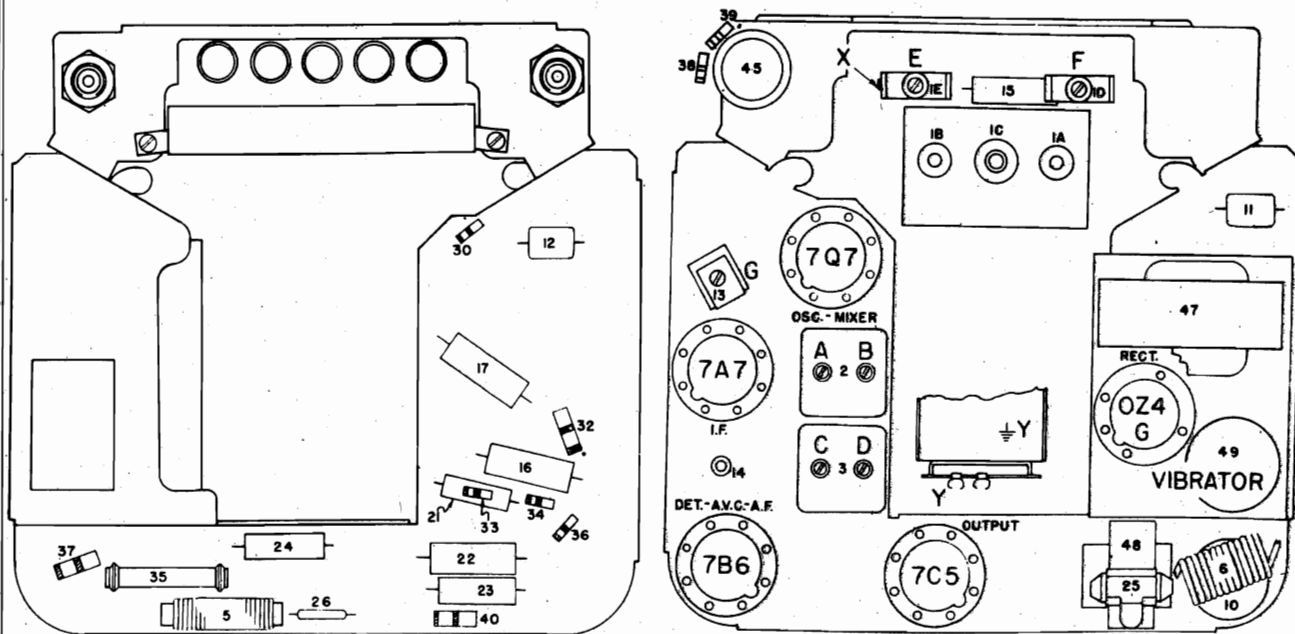
READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT; "A" BATTERY 6.0 VOLTS. CURRENT DRAIN 6.0 AMPERES; "B" SUPPLY DRAIN APPROXIMATELY 50 M.A. ALL READINGS ± 10%.



SOCKET VOLTAGES

DIAL CORD HOOKUP

POWER PACK LAYOUT



PARTS LAYOUT

ALIGNMENT PROCEDURE

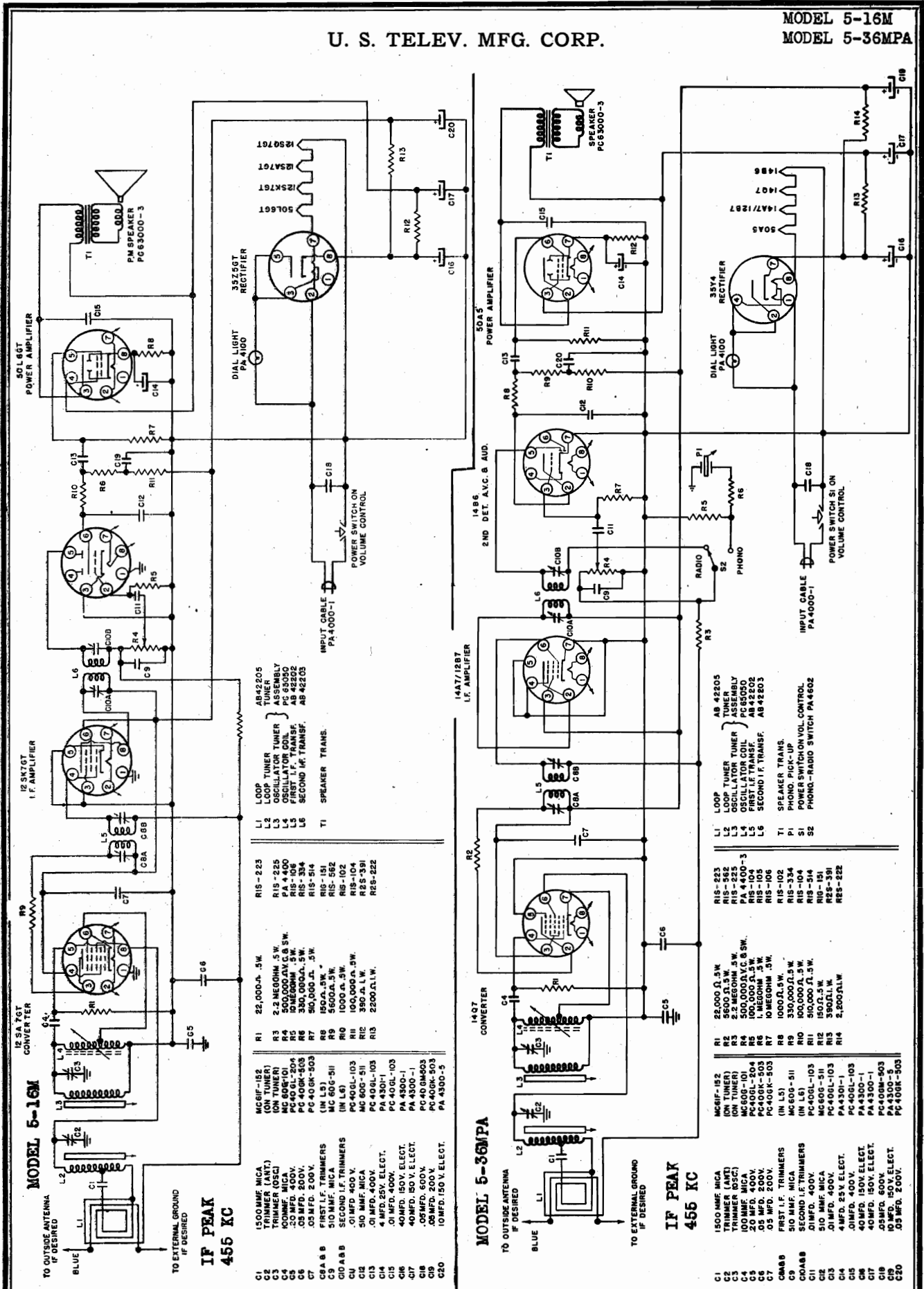
Volume Control maximum.
Tone Control on high position.
Signal Generator Output minimum for satisfactory output indication.

Series Capacitor Or Dummy Antenna	Connect To	Signal Generator Frequency	Adjust Screws In Order
0.1 mfd.	Terminal X (See Parts Layout)	260 KC	A, B, C, D
.000060 mfd.	Antenna Terminal	1610 KC	G
.000060 mfd.	Antenna Terminal	1400 KC	E, F

Low frequency alignment not required.
Adjust Trimmer F to match car antenna (1400 KC) when radio is installed.

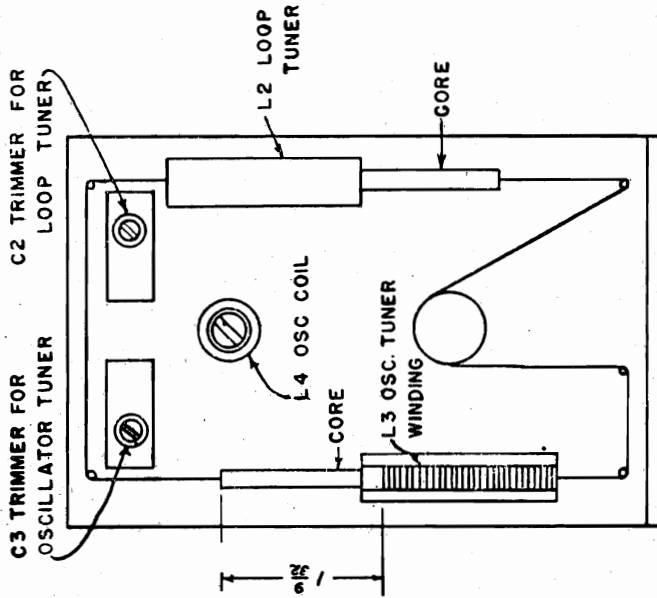
U. S. TELEV. MFG. CORP.

MODEL 5-16M
MODEL 5-36MPA

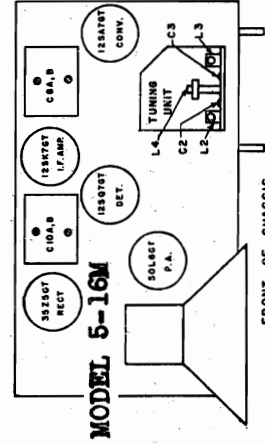
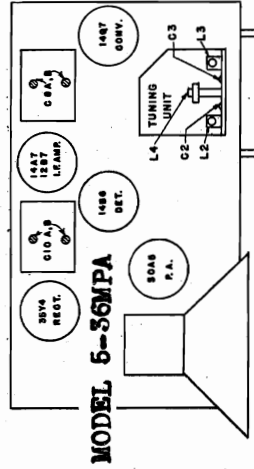


MODEL 5-16M
MODEL 5-36MPA

U. S. TELEV. MFG. CORP.



BACK VIEW OF TUNING UNIT
MODEL 5-16M, 5-36MPA



VOLTAGE CHART MODEL 5-36MPA

TUBE	FUNCTION	VOLUME CONTROL ON FULL WITH NO SIGNAL							
		Voltage of Each Socket Prong to Switch on Volume Control							
No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 8	
14Q7	Converter	24*	67	85	-5.5	0	-4	0	13*
14A7/12B7	I. F. Amp.	37*	84	84	0	0	-5	0	24*
14B6	2nd Det. - AVG - AF	0	55	-5	0	-5	-6	0	13*
50A5	Power Amp.	37*	76	83	—	—	0	5.6	84*
35Y4	Rectifier	117*	112*	—	112*	—	—	114.	84*

Voltage readings are for schematic diagram shown on back of sheet. Allow 15%+ or — on all measurements. Measurements were made with Simpson Model 260 Meter.
* AC volts.

VOLTAGE CHART MODEL 5-16M

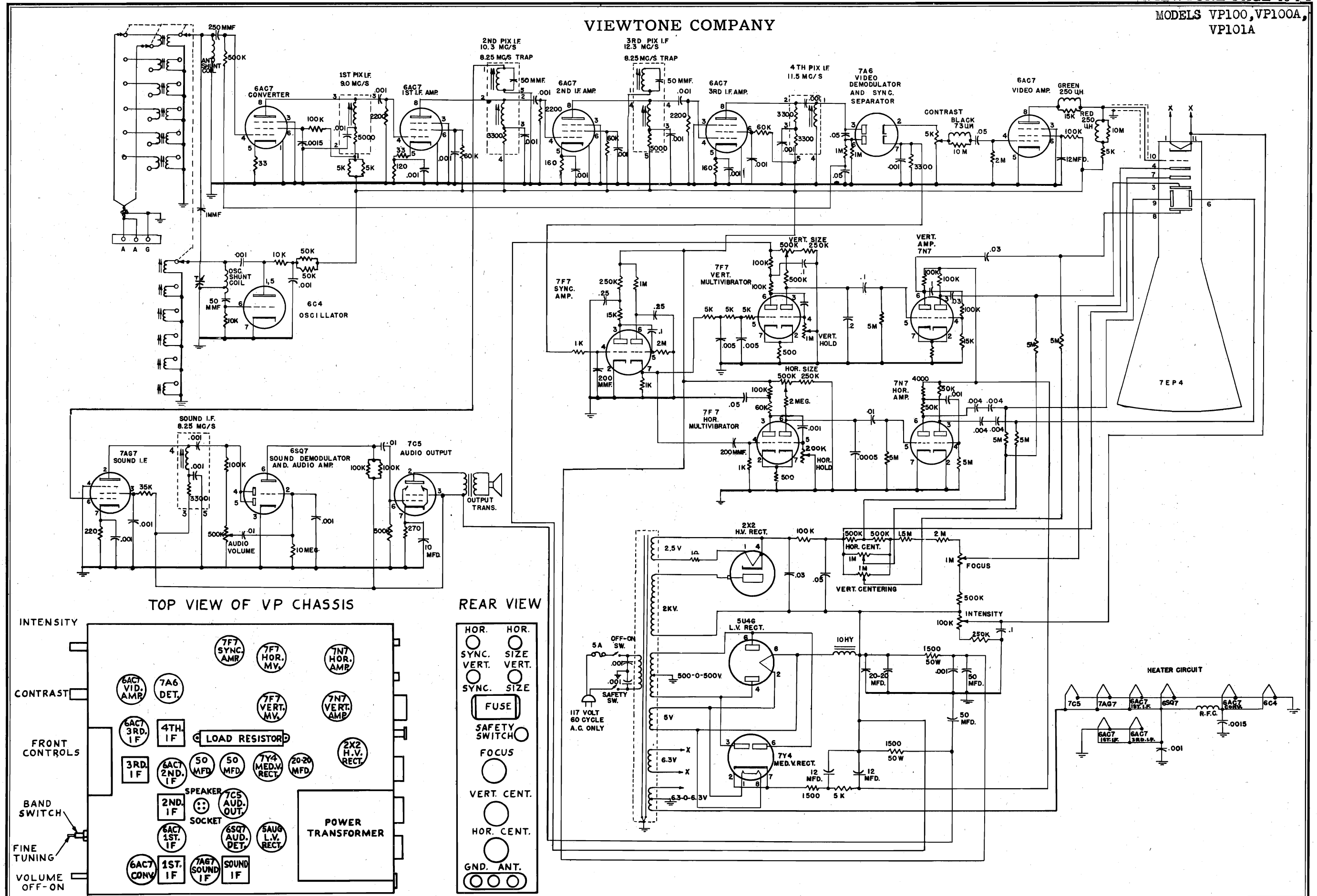
TUBE	FUNCTION	VOLUME CONTROL ON FULL WITH NO SIGNAL							
		Voltage of Each Socket Prong to Switch on Volume Control							
No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 8	
12SA7GT	Converter	0	24*	65	72	-6	0	12*	-4
12SK7GT	I. F. Amp.	0	36*	0	-4	0	72	24*	72
12SQ7GT	2nd Det. - AVG - AF	0	-4	0	0	-25	49	12*	0
50L6LGT	Power Amp.	0	36*	92	99	0	—	86*	6.5
35Z5GT	Rectifier	0	117*	112*	—	112*	—	86	115

Voltage readings are for schematic diagram shown on back of sheet. Allow 15%+ or — on all measurements. Measurements were made with Simpson Model 230 Meter.
* AC volts.

ALIGNMENT CHART FOR MODEL 5-16M 5-36MPA

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNER SETTING	TRIMMER	REMARKS
1	I.F.	Converter Pin No. 8	.01 mfd.	455 KC	High Freq. End	C10 A&B C 8 A&B	2nd I.F. 1st I.F.
2	Osc. Tuner Core	When tuner is against stop at high frequency end, the end of winding L3, oscillator tuner					When tuner is against stop at high frequency end, the end of core should be 1-9/32" away from end of winding L3, oscillator tuner
3	Pointer	Set pointer to coincide with the first horizontal line below 160 on dial					
4	Trimmers	Blue Ant. Lead	200 mmf.	1400 KC	1400 KC	C3 Osc. Tuner Trim. C2 Loop Tuner Trim.	Peak at max. Peak at max.
5	Oscillator	Blue Ant. Lead	200 mmf.	600 KC	Rock Tuner Control	Adjust Iron Core in L4 Osc. Coil	Use short non-metallic screw driver to fit slot of core from back of tuner
6	Repeat operations 4 and 5						
7	Check operations 1 to 6 inclusive						

VIEWTONE COMPANY



VIEWTONE COMPANY

MODELS VP100, VP100A, VP101A

THE INTENSITY CONTROL SHOULD BE TURNED COMPLETELY COUNTER-CLOCKWISE BEFORE TURNING THE SET ON. THIS WILL REDUCE THE ILLUMINATION OF THE INTENSE SPOT THAT APPEARS ON THE CATHODE RAY TUBE BEFORE THE SWEEP CIRCUITS START FUNCTIONING. BY TURNING THE CONTROL CLOCKWISE THE AVERAGE ILLUMINATION, OR BRIGHTNESS OF THE PICTURE IS INCREASED.

ON THE REAR OF THE CHASSIS ARE SEVEN CONTROLS, WHICH ONCE SET, NEED ONLY OCCASIONAL ADJUSTMENT.

THE HORIZONTAL SYNC. CONTROLS THE PICTURE STABILITY. IT SHOULD BE ADJUSTED TO THE ONE POINT WHERE THE PICTURE "LOOKS IN" HORIZONTALLY.

THE HORIZONTAL AMPLITUDE CONTROLS THE SIZE OF THE PICTURE ONCE IT HAS BEEN LOCKED IN.

THE VERTICAL SYNC. SHOULD BE ADJUSTED TO THE POINT WHERE ONLY ONE PICTURE LOOKS IN VERTICALLY.

THE VERTICAL AMPLITUDE CONTROLS THE VERTICAL SIZE OF THE PICTURE.

THESE CONTROLS WHEN ONCE SET REQUIRE ONLY OCCASIONAL ADJUSTMENT, THIS DUE TO THE AGING OR CHANGING OF TUBES.

THE FOCUS CONTROL SHOULD BE ADJUSTED TO THE POINT OF THE GREATEST SHARPNESS OF THE PICTURE

THE HORIZONTAL CENTERING CONTROL ENABLES THE COMPLETE PICTURE TO BE MOVED HORIZONTALLY IN ORDER TO CENTER IT ON THE TUBE.

THE VERTICAL CENTERING CONTROL ENABLES THE COMPLETE PICTURE TO BE MOVED VERTICALLY IN ORDER TO CENTER IT ON THE TUBE.

IMPORTANT SAFETY PRECAUTIONS

USE EXTREME CAUTION AT ALL TIMES WHEN SERVICING RECEIVER.

THIS RECEIVER CONTAINS HIGH VOLTAGE (3,000 volts). AN INTERLOCK SWITCH IS PROVIDED AT THE REAR OF THE CHASSIS FOR THE PROTECTION OF THE INDIVIDUAL. IT IS RECOMMENDED THAT ONLY QUALIFIED PERSONNEL BE ALLOWED TO SERVICE THIS RECEIVER.

THE MOST DANGEROUS PORTION OF THE H.V. SUPPLY IS THE PLATE LEAD OF THE 2X2/879 RECTIFIER TUBE.

VIEWTONE TELEPHONE RECEIVER

ADVENTURER - CONSOLE WITH RADIO AND TELEVISION
FUTURA - TABLE MODEL

GENERAL DESCRIPTION

THESE MODELS CONSIST OF A 19-TUBE, DIRECT VIEWING TELEVISION RECEIVER. FEATURES OF THE TELEVISION RECEIVER INCLUDE:

SEVEN INCH CATHODE RAY TUBE, SINGLE-STATION, SELECTOR SWITCH WITH FINE TUNING CONTROL; DOUBLE SAFETY PROTECTION WHICH INCLUDES FUSE AND INTERLOCK SWITCH; SAFETY PLEXITE VIEWING WINDOW AND AUTOMATIC GAIN CONTROL.

OPERATION OF THE VIEWTONE TELEVISION RECEIVER

ON THE FRONT OF THE CHASSIS THERE ARE FOUR CONTROLS:

1. VOLUME, OFF-ON.
2. STATION SELECTOR AND FINE TUNING.
3. CONTRAST
4. INTENSITY

THE POWER-VOLUME CONTROL TURNS ON THE POWER FOR THE COMPLETE SET AND ALSO CONTROLS THE VOLUME OF THE SOUND ACCOMPANYING THE PICTURE

THE STATION SELECTOR AND FINE TUNING IS A COAXIAL DUAL CONTROL WHOSE OUTER KNOB SELECTS THE CHANNEL OF THE STATION WHICH IT IS DESIRED TO RECEIVE, THAT IS IN NEW YORK:

CHANNEL	FREQUENCY	STATION
2	54-60	WCBS - TV (C.B.S.)
4	66-72	WNET (N.B.C.)
5	76-82	WABD (Dumont)

SET THE LARGE KNOB TO THE CORRESPONDING NUMERALS ON THE FRONT OF THE CABINET. THE INNER SECTION OF THIS KNOB IS THEN USED FOR FINE TUNING, AND MAY ELIMINATE RIPPLES AND DISTORTION FROM THE PICTURE. BY TURNING THIS KNOB, BOTH PICTURE AND SOUND ARE TUNED IN SIMULTANEOUSLY.

THE CONTRAST CONTROL VARIES THE BLACK AND WHITE TONES OF THE PICTURE BEING RECEIVED. TURNING THIS CONTROL CLOCKWISE INCREASES THE CONTRAST FROM GRAYS, TO BLACK AND WHITE.

MODELS VP100, VP100A, VP101A

VIEWTONE COMPANY

I. F. ALIGNMENT PROCEDURE

1. REQUIRED: SIGNAL GENERATOR, 8-15 MC
OUTPUT INDICATOR (OSCILLOSCOPE, V.T.V.M.)
REMOVE OSCILLATOR TUBE
TYPE VP100 CHASSIS DISTINGUISHED BY BLACK SERIAL NO.
TYPE VP100A " " " RED " "
2. ALIGNMENT OF 4TH I.F. TRANSFORMER.
APPLY OUTPUT OF SIG. GEN. TO GRID OF THIRD I.F. TUBE.
TUNE IN SLUG OF TRANS. FOR MAXIMUM DEFLECTION IN INDICATOR CONNECTED TO C.R.T. VIDEO LEAD.
FREQUENCY: VP100 12.6 Mc
VP100A 11.5 Mc

3. ALIGNMENT OF 3RD I.F. TRANSFORMER.
APPLY OUTPUT OF SIG. GEN. TO GRID OF SECOND I.F. TUBE.
TUNE BOTTOM SLUG OF I.F. TRANS. FOR MAXIMUM DEFLECTION IN OUTPUT INDICATOR CONNECTED TO C.R.T. VIDEO LEAD.
FREQUENCY: VP100 12.0 Mc
VP100A 12.0 Mc
TUNE TOP IRON SLUG OF IF TRANS. FOR MINIMUM DEFLECTION OF OUTPUT INDICATOR CONNECTED TO C.R.T. VIDEO LEAST
TRAP FREQUENCY: VP100 8.25 Mc
VP100A 10.3 Mc

4. ALIGNMENT OF 2ND I.F. TRANSFORMER.
APPLY OUTPUT OF SIG. GEN. TO GRID OF 1ST IF AMPLIFIER TUBE. TUNE BOTTOM SLUG OF IF FOR MAXIMUM DEFLECTION OF OUTPUT INDICATOR CONNECTED TO VIDEO LEAD OF C.R.T.
FREQUENCY: VP100 11.5 Mc
VP100A 10.3 Mc
TUNE TOP SLUG OF IF TRANS. FOR MINIMUM DEFLECTION OF OUTPUT INDICATOR CONNECTED TO C.R.T. VIDEO LEAD. THIS WILL CORRESPOND TO MAXIMUM AUDIO OUTPUT.
TRAP FREQUENCY: VP100 8.25 Mc
VP100A 8.25 Mc

5. ALIGNMENT OF 1ST IF TRANSFORMER.
APPLY OUTPUT OF SIG. GEN. TO GRID OR CATHODE OF CONVERTER TUBE. TUNE BOTTOM IRON SLUG FOR MAXIMUM DEFLECTION IN OUTPUT.
FREQUENCY: VP100 10.3 Mc
VP100A 9.0 Mc
IN THE MODEL VP100 THERE IS A 14.25 Mc TRAP WHICH IS TUNED FOR MINIMUM DEFLECTION.

6. ALIGNMENT OF SOUND IF TRANSFORMER.
APPLY OUTPUT OF SIG. GEN. TO GRID OR CATHODE OF CONVERTER TUBE. TUNE TOP SLUG FOR MAXIMUM SOUND OUTPUT. MAXIMUM SOUND CAN BE DETERMINED BY EAR OR BY APPLYING V.T.V.M. OR OSCILLOSC. TO GRID OF 7C5 AUDIO OUTPUT.
FREQUENCY: VP100 8.25 Mc
VP100A 8.25 Mc

ANTENNA INSTALLATION

THE IMPORTANCE OF A GOOD ANTENNA INSTALLATION CANNOT BE OVEREMPHASIZED. A PROPERLY INSTALLED ANTENNA IS THE DIFFERENCE BETWEEN GOOD OR POOR RECEPTION. AN ANTENNA SHOULD NOT BE INSTALLED PERMANENTLY ON AN APARTMENT OR RESIDENCE ROOF UNTIL THE QUALITY OF PICTURE RECEPTION IS AT ITS BEST. ENOUGH SLACK SHOULD BE ALLOWED IN THE LEAD IN TO FACILITATE MOVEMENT OF THE ANTENNA. A SHIFT OF ONLY A FEW FEET IN ANTENNA POSITION MAY RESULT IN AN ENORMOUS DIFFERENCE IN PICTURE RECEPTION. THE ANTENNA SHOULD BE POSITIONED BROADSIDE TOWARD THE TRANSMITTER. IF A RECEPTOR AND REFLECTOR ARRANGEMENT IS USED, THE RECEPTOR IS PLACED IN FRONT OF THE REFLECTOR BROADSIDE TOWARD THE STATION.

FOR BEST POSSIBLE RESULTS THE ANTENNA SHOULD BE REMOVED AS FAR AS POSSIBLE FROM HIGHWAYS, HOSPITALS, AND OTHER SOURCES OF INTERFERENCE. AUTOMOBILE IGNITION NOISES AND DIATHERMY MACHINES MAY CAUSE "HERRINGBONES" WHICH DISTORT THE PICTURE BEING RECEIVED.

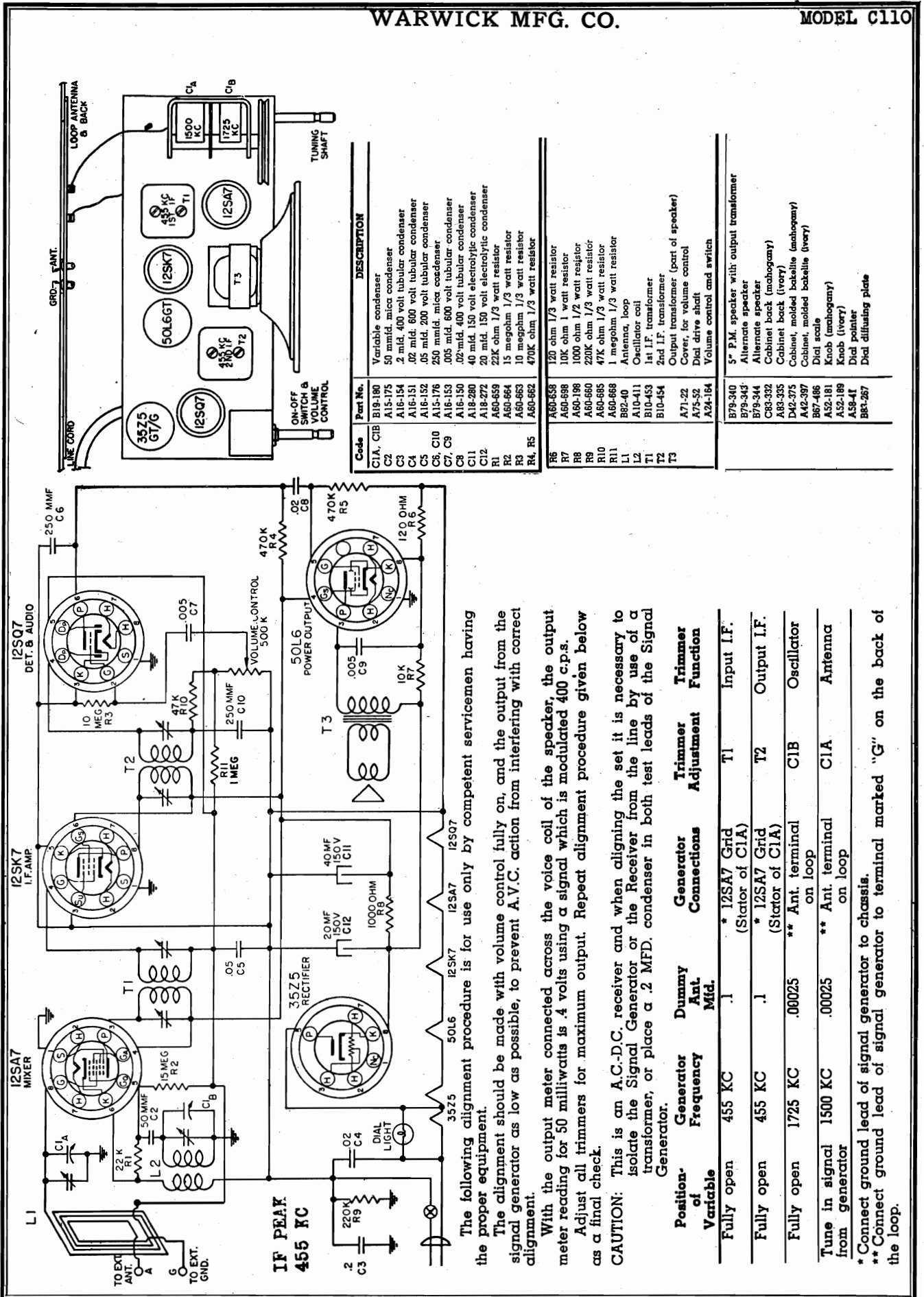
R. F. ALIGNMENT PROCEDURE

1. REPLACE 6C4 OSCILLATOR TUBE. APPLY OUTPUT OF SIG. GEN. TO ANTENNA TERMINAL OF CHASSIS. CONNECT OUTPUT INDICATING DEVICE TO VIDEO LEAD OF C.R.T. SET OSCILLATOR CONDENSER HALF WAY OPEN.
2. ADJUST OSC. COIL SLUGS SO THAT SOUND OUTPUT IS HEARD AS THE SIG. GEN. IS SET ON THE SOUND CARRIER FREQUENCY OF THE TELEVISION CHANNEL.

CHANNEL	SOUND CARRIER
1	49.75 Mc
2	59.75 Mc
3	65.75 Mc
4	71.75 Mc
5	81.75 Mc
6	87.75 Mc

3. ADJUST ANTENNA COIL SLUGS SO THAT THE OUTPUT INDICATING DEVICE INDICATES MAXIMUM AS THE SIG. GEN. IS SET ON THE FREQUENCIES LISTED BELOW. THESE FREQUENCIES ARE BETWEEN THE SOUND AND THE PICTURE CARRIERS TO GIVE RESPONSE TO BOTH.

CHANNEL	SET ANT. COIL TO
1	47 Mc
2	58 Mc
3	63 Mc
4	70 Mc
5	78 Mc
6	85 Mc



Code	Part No.	DESCRIPTION
C1A, C1B	B10-180	Variable condenser
C2	A18-175	50 mmfd. mica condenser
C3	A18-154	2 mid. 400 volt tubular condenser
C4	A18-151	.02 mid. 600 volt tubular condenser
C5	A18-152	.05 mid. 200 volt tubular condenser
C6, C10	A18-176	250 mmfd. mica condenser
C7, C9	A18-153	.005 mid. 600 volt tubular condenser
C8	A18-150	.02 mid. 400 volt tubular condenser
C11	A18-280	40 mid. 150 volt electrolytic condenser
C12	A18-272	20 mid. 150 volt electrolytic condenser
R1	A60-659	22K ohm 1/3 watt resistor
R2	A60-664	15 megohm 1/3 watt resistor
R3	A60-663	10 megohm 1/3 watt resistor
R4, R5	A60-662	470K ohm 1/3 watt resistor
R6	A60-658	120 ohm 1/3 watt resistor
R7	A60-698	10K ohm 1 watt resistor
R8	A60-198	100 ohm 1/2 watt resistor
R9	A60-960	220K ohm 1/3 watt resistor
R10	A60-965	47K ohm 1/3 watt resistor
R11	A60-668	1 megohm 1/3 watt resistor
L1	B82-40	Antenna, loop
L2	A10-411	Oscillator coil
T1	B10-453	1st I.F. transformer
T2	B10-454	2nd I.F. transformer
T3	A71-22	Output transformer (part of speaker)
	A75-32	Cover, for volume control
	A74-52	Dial drive shaft
	A24-154	Volume control and switch

Part No.	DESCRIPTION
B78-340	5" P.M. speaker with output transformer
B78-343	Alternate speaker
B78-344	Alternate speaker
C88-332	Cabinet back (mahogany)
A88-335	Cabinet back (ivory)
D42-375	Cabinet, molded bakelite (mahogany)
A42-397	Cabinet, molded bakelite (ivory)
B67-466	Dial scale
A52-181	Knob (mahogany)
A52-189	Knob (ivory)
A58-41	Dial pointer
B85-267	Dial diffusing plate

IF PEAK
455 KC

The following alignment procedure is for use only by competent servicemen having the proper equipment.
The alignment should be made with volume control fully on, and the output from the signal generator as low as possible, to prevent A.V.C. action from interfering with correct alignment.

With the output meter connected across the voice coil of the speaker, the output meter reading for 50 milliwatts is 4 volts using a signal which is modulated 400 c.p.s. Adjust all trimmers for maximum output. Repeat alignment procedure given below as a final check.

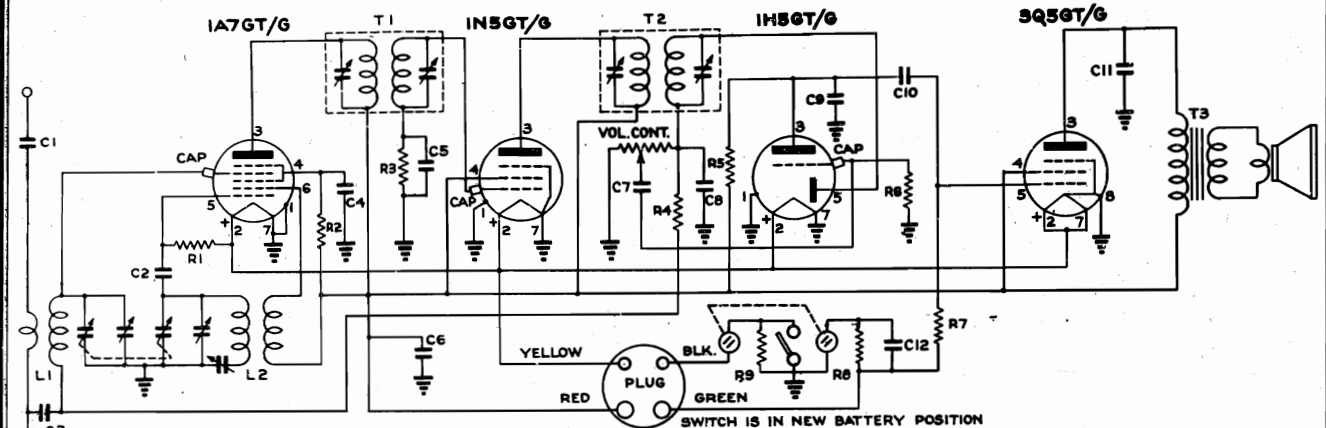
CAUTION: This is an A.C.-D.C. receiver and when aligning the set it is necessary to isolate the Signal Generator or the Receiver from the line by use of a transformer, or place a .2 MFD. condenser in both test leads of the Signal Generator.

Position of Variable	Generator Frequency	Dummy Ant. Mfd.	Generator Connections	Trimmer Adjustment	Trimmer Function
Fully open	455 KC	.1	* 12SA7 Grid (Stator of C1A)	T1	Input I.F.
Fully open	455 KC	.1	* 12SA7 Grid (Stator of C1A)	T2	Output I.F.
Fully open	1725 KC	.00025	** Ant. terminal on loop	C1B	Oscillator
Tune in signal from generator	1500 KC	.00025	** Ant. terminal on loop	C1A	Antenna

* Connect ground lead of signal generator to chassis.
** Connect ground lead of signal generator to terminal marked "G" on the back of the loop.

WATTERSON RADIO MFG. CORP.

MODEL 4782



IF = 455 KC.

CODE	PART NO.	DESCRIPTION
C1	6W4	.00005 MICA CONDENSER
C2	6W3	.0005 MICA CONDENSER
C3	5W13	.1 MFD. 400 V. TUBULAR
C4	5W13	.1 MFD. 400 V. TUBULAR
C5	5W7	.02 MFD. 400 V. TUBULAR
C6	5W14	.25 MFD. 400 V. TUBULAR
C7	5W2	.005 MFD. 400 V. TUBULAR
C8	6W2	.00025 MFD. MICA CONDENSER
C9	6W1	.0001 MFD. MICA CONDENSER
C10	5W6	.01 MFD. 400 V. TUBULAR
C11	5W18	.002 MFD. 600 V. TUBULAR
C12	19W11	10 MFD. 50 V. TUBULAR

R1	9W47	220,000 Ω - 1/2 WATT
R2	9W6	22,000 Ω - 1/2 WATT
R3	3W55	1 MEGOHM - 1/4 WATT
R4	3W55	1 MEGOHM - 1/4 WATT
R5	3W55	1 MEGOHM - 1/4 WATT
R6	3W55	10 MEGOHM - 1/2 WATT
R7	9W56	2.2 MEGOHM 1/2 WATT
R8	9W32	380 Ω - 1/4 WATT
R9	9W12	75 Ω 1/4 WATT

T1	3W24	1ST. I.F. TRANSFORMER
T2	3W25	2ND. I.F. TRANSFORMER
T3	12W2	OUTPUT TRANSFORMER
L1	3W46	ANTENNA COIL
L2	3W45	OSCILLATOR COIL
SP.	22W10B	P.M. SPEAKER
VOL.	13W2	VOLUME CONTROL - 500M Ω

BATTERY—This receiver has been designed to operate from a battery that has the "B" supply (90 volts) and the "A" supply (1 1/2 volts) incorporated into a single pack. The batteries recommended to be used with this set are the following:

1. Ray-O-Vac—their No. "AB" 82 Power Pack.
2. Eveready—their No. 748 Power Pack.
3. Burgess—their No. 17G-D50 Power Pack.
4. General—their No. 60DL11L Power Pack.

Either of the above battery packs may be used in conjunction with this receiver, and is to be placed inside and to the rear of the cabinet and the 4 prong plug provided plugged into the socket of the battery pack.

ANTENNA—To obtain the excellent performance of which your Watterson Receiver is capable, a good outside antenna must be provided. For best results the antenna should be approximately 75 to 100 feet long, including the lead in, and should be connected to the colored wire coming out of the back of the cabinet. It should be erected as high as possible and as far from surrounding objects as practical.

GROUND—A ground connection must be used. A satisfactory ground can be made by connecting the black wire to a nearby cold water pipe by means of an approved clamp, or to a pipe or ground rod driven into the ground.

BATTERY AND TUBE SAVING SWITCH—Located on the back of the chassis is a slide type switch identified by the instruction tag "New Battery" and "Old Battery". When using an unused or new battery, the switch must be in the "New Battery" position. After approximately 100 hours of actual use of battery, this switch may be moved to the "Old Battery" position and increased sensitivity and performance obtained.

OPERATION—There are two adjustable controls on the front panel of the receiver. The one on the left is the volume control. Turning the volume control knob in a clockwise direction turns the receiver on, and is also a means of adjusting the volume output of the receiver.

CAUTION—When not using the receiver, make certain that it is shut off by turning the volume control knob completely to the left until the on-off switch has been thrown. Failure to do this will cause the battery pack to run down.

The knob on the right is the tuning knob and is used to tune any desired station within the broadcast band.

I. F. Alignment

The I. F. frequency of this receiver is 455 K. C. For realignment, use the following procedure:

Open tuning condenser fully, and set volume control to maximum volume.

Couple an accurately calibrated signal generator to the grid of the 1A7 tube with a .1 mfd. condenser in series with the "high" lead of the signal generator. Connect the ground side of the signal generator to the chassis. Set the signal generator to 455 K. C. Attenuate the signal generator so that the signal is just audible in the speaker. If possible, an output meter should be used.

Adjust the 2nd I. F. transformer first. Each screw should be adjusted for maximum output. After the 2nd I. F. has been adjusted, the 1st I. F. should be adjusted for maximum output. After both transformers have been adjusted, it is necessary to recheck both transformers, making sure maximum output has been attained from both I. F.'s.

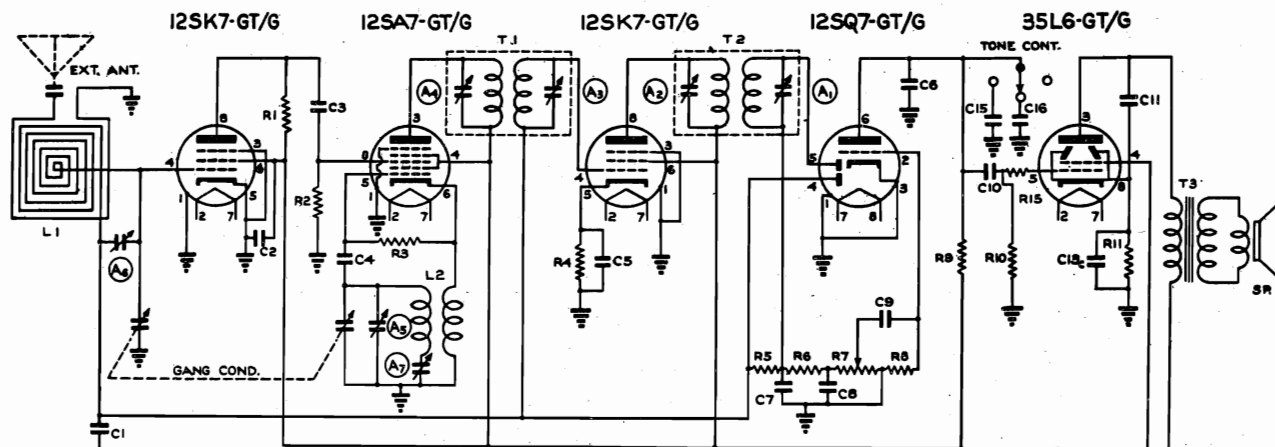
R. F. Alignment

To align the R. F. section of the receiver, proceed as follows:

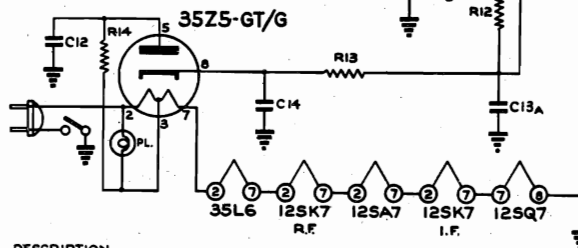
1. Connect the "high" side of the signal generator to the antenna lead and the ground lead to radio chassis.
2. Set tuning dial to 1400 K. C. and while feeding a 1400 K. C. signal into receiver adjust the oscillator trimmer (inside adjustment) and antenna trimmer (on top of chassis) for maximum output.
3. Set tuning dial to approximately 600 K. C. and while "rocking" the dial adjust the oscillator padler (nearest edge of chassis) for maximum output.
4. Repeat steps 2 and 3 above.

MODEL 4790

WATTERSON RADIO MFG. CORP.



I.F. = 455 KC.



CODE	PART NO.	DESCRIPTION
C1	5W9	.05 MFD. 400 V. TUBULAR
C2	5W9	.05 MFD. 400 V. TUBULAR
C3	6W1	.0001 MFD. MICA COND.
C4	6W1	.0001 MFD. MICA COND.
C5	5W9	.05 MFD. 400 V. TUBULAR
C6	6W2	.00025 MFD. MICA COND.
C7	6W2	.00025 MFD. MICA COND.
C8	6W1	.0001 MFD. MICA COND.
C9	5W19	.003 MFD. 600 V. TUBULAR
C10	5W9	.05 MFD. 400 V. TUBULAR
C11	5W7	.02 MFD. 400 V. TUBULAR
C12	5W9	.05 MFD. 400 V. TUBULAR
C13A	19W7	40 MFD. 150 V. FILTER CAN
C13B	19W7	30 MFD. 150 V. FILTER CAN
C13C	19W7	20 MFD. 25 V. FILTER CAN
C14	19W5	30 MFD. 150 V. PAPER FILTER
C15	5W20	.006 MFD. 600 V. TUBULAR
C16	5W17	.001 MFD. 600 V. TUBULAR

CODE	PART NO.	DESCRIPTION
L1	3W31	LOOP - 184 μ h.
L2	3W28	OSCILLATOR COIL
T1	3W20	1ST. I.F. TRANSFORMER
T2	3W21	2ND. I.F. TRANSFORMER
T3	12W1	OUTPUT TRANSFORMER
PL	26W2	PILOT LIGHT
SP	22W22	SPEAKER
NOTE:	R15	250 Ω - 1/2 WATT (OMITTED ON SOME MODELS)

R1	9W37	2,200 Ω - 1/2 WATT RESISTOR
R2	9W28	100,000 Ω - 1/2 WATT
R3	9W64	22,000 Ω - 1/2 WATT
R4	9W72	1,000 Ω - 1/2 WATT
R5	9W56	2.2 MEGOHM - 1/2 WATT
R6	9W52	47,000 Ω - 1/2 WATT
R7	13W1	.5 MEGOHM VOL. CONT.
R8	9W63	10 MEGOHM - 1/2 WATT
R9	9W62	220,000 Ω - 1/2 WATT
R10	9W59	470,000 Ω - 1/2 WATT
R11	9W20	150 Ω - 1/2 WATT
R12	9W72	1000 Ω - 1/2 WATT
R13	9W47	220 Ω - 1 WATT
R14	9W61	22 Ω - 1/2 WATT

ANTENNA—No external antenna is required for the Model 4790 except in remote localities where reception is poor. For proper performance in such a case, an outside antenna approximately 75 feet in length, including lead in, should be connected to the colored antenna lead extending from the back of the set.

OPERATION—The three controls on the front panel of the receiver are used as follows: the extreme left control is the on-off switch and volume control; the center control is the tuning control; and the extreme right control is the tone control.

I. F. Alignment

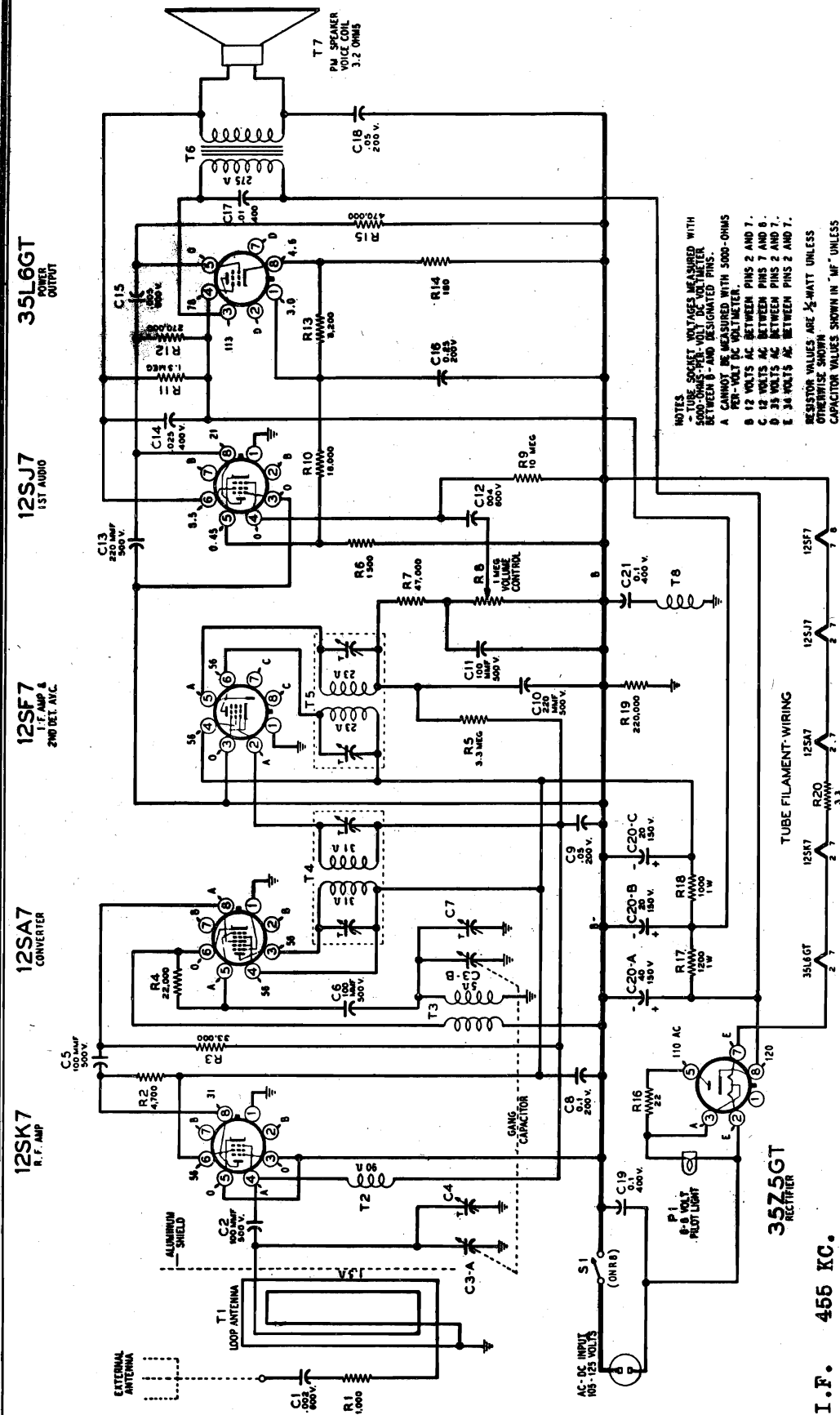
Connect the low side of an accurately calibrated signal generator through a .1 mfd condenser to the chassis of the receiver and the "high" side of the generator through a .1 mfd. condenser to the R. F. grid (pin 8) of the 12SA7 converter tube. Set the signal generator to 455 Kc. with just enough signal to be audible in the speaker with the receiver volume control full on. If possible, an output meter should be used.

Adjust the second I. F. transformer (A_1 and A_2) and then the first I. F. transformer (A_3 and A_4) for maximum output. Recheck all adjustments.

R. F. Alignment

Connect "high" side of signal generator to the antenna lead of the receiver. Set dial pointer to 1400 Kc. on the receiver dial and turn volume control full on. Set signal generator to 1400 Kc. Adjust oscillator trimmer (A_5) and then the antenna trimmer (A_6) for maximum output. Set signal generator to 600 Kc. and receiver dial to approximately 600 Kc. While "rocking" receiver dial, adjust oscillator padder (A_7) for maximum output. Recheck adjustments at 1400 Kc.

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NOTES
 - TUBE SOCKET VOLTAGES MEASURED WITH 5000-OHMS-PER-VOLT DC VOLTMETER BETWEEN 8- AND DESIGNATED PINS.
 A CANNOT BE MEASURED WITH 5000-OHMS PER-VOLT AC VOLTMETER.
 B 12 VOLTS AC BETWEEN PINS 2 AND 7.
 C 12 VOLTS AC BETWEEN PINS 7 AND 9.
 D 24 VOLTS AC BETWEEN PINS 2 AND 7.
 E 36 VOLTS AC BETWEEN PINS 2 AND 7.
 RESISTOR VALUES ARE 1/2-WATT UNLESS OTHERWISE SHOWN
 CAPACITOR VALUES SHOWN IN "MF" UNLESS OTHERWISE INDICATED.

Technical Data

Tuning range	530 to 1600 kc	Sensitivity (for 0.05 watt output)	14 microvolts average
Intermediate frequency	455 kc	Power output (in voice coil)	Undistorted
Power consumption	30 watts	Maximum	0.84 watts
Selectivity	65 kc broad at 1000 x signal at 1000 kc		1.5 watts

I. F. 455 KC.

MODEL D2616

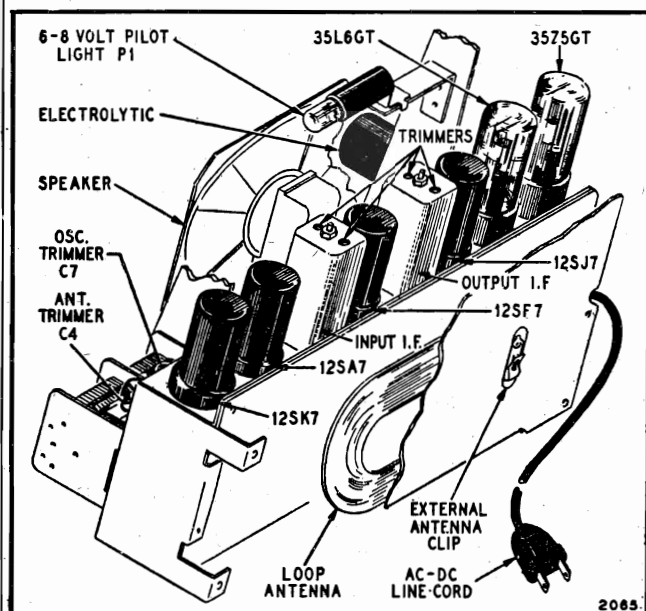
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ALIGNMENT PROCEDURE

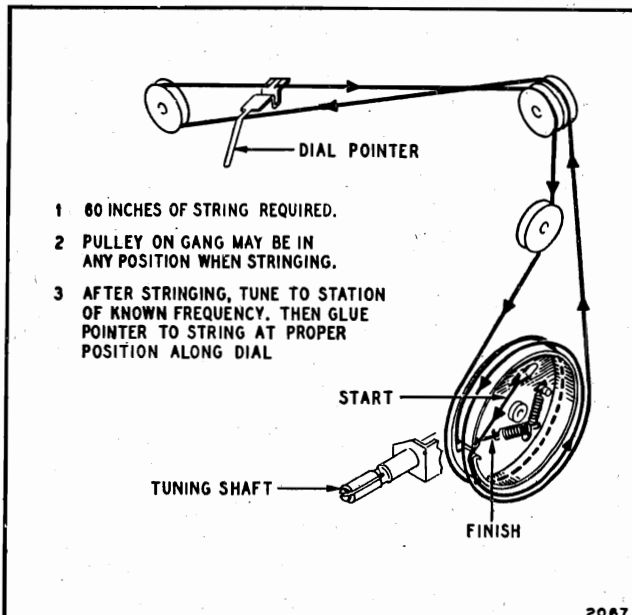
(Refer to Chassis View)

- Output meter across 3.2-ohm output load.
- Volume control at maximum.
- Connect ground post of signal generator to B— of radio.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

SIGNAL GENERATOR			TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT (in order shown)
Frequency	Dummy Antenna	Connection to Radio		
455 kc	0.1 mf	Stator of antenna section of gang	Rotor full open (plates out of mesh)	Trimmers on output and input I.F. cans
1600 kc	0.1 mf	Stator of antenna section of gang	Rotor full open (plates out of mesh)	Oscillator trimmer C7
1400 kc	200 mmf	External antenna clip	1400 kc	Antenna trimmer C4



Chassis View



Replacing Dial Pointer Drive Cord

SETTING THE PUSHBUTTONS

The pushbuttons may be used, after proper adjustment, for the automatic tuning of any six stations which you select.

1. Turn on the radio.
2. Push out the call letters of the desired stations from the call-letter sheets supplied with this manual.
3. Insert one call letter tab in each of the pushbuttons, preferably but not necessarily in order of frequency (as obtained from your newspaper). Press an acetate tab (supplied in small envelope) into each of the buttons.
4. Rotate the tuning knob to the left (counterclockwise) as far as it will go.
5. On the bottom of the set is a hole through which the pushbutton locking screw can be adjusted. With a screwdriver, check to see if the screw is loose. If it is not, turn it several turns to the left. Then return the set to an upright position.

6. Press the first pushbutton down all the way. With one hand hold the button down firmly and with the other carefully tune in the desired station. Release the pushbutton.

7. Follow this procedure for each of the five other buttons, adjusting each one for a different station.

8. Rotate the tuning knob as far to the left as it will go. Now tighten the locking screw on the bottom of the radio. **IT IS IMPORTANT THAT THIS SCREW BE TIGHTENED VERY FIRMLY.**

9. The pushbuttons are now properly set for automatic tuning. Any of the six stations may now be tuned in simply by pressing the proper button down as far as it will go. If it is desired to reset any of the buttons for a new station, loosen the locking screw, set the pushbutton as described above, and re-tighten the locking screw.

MODEL D 2616 WESTERN AUTO SUPPLY CO.

Ref. No.	Part No.	Description
CAPACITORS *		
C1	C-8D-10778	.002 mf, 600 volts, +40% -15%
C2, C5 C6, C11	C-8F3-8	100 mmf, 500 volts, 20%, mica
C-3A, B C4, C7	B-8A-10827	Two-gang condenser assembly, including antenna and oscillator trimmers. Range of gang: 15-452 mmf (ant.), 10-162 mmf (osc.).
C8	C-8D-10771	.1 mf, 200 volts, +20% -10%
C9, C18	C-8D-10770	.05 mf, 200 volts, 20%
C10, C13	C-8F3-10	220 mmf, 500 volts, 20%, mica
C12	C-8D-10788	.004 mf, 600 volts, 20%
C14	C-8D-10987	.025 mf, 400 volts, 10%
C15	C-8D-10935	.005 mf, 600 volts, +40% -15%
C16	C-8D-10775	.25 mf, 200 volts, +20% -10%
C17	C-8D-10761	.01 mf, 400 volts, 20%
C19, C21	C-8D-10760	.1 mf, 400 volts, +20% -10%
C20-A, B, C	A-8C-10077	Electrolytic, for 60-cycles; 40 mf x 150 volts, 20 mf x 150 volts, 20 mf x 150 volts
C20-A, B, C	A-8C-10946	Electrolytic, for 25 cycles; 60 mf x 150 volts, 40 mf x 150 volts, 40 mf x 150 volts
RESISTORS *		
R1	C-9B1-62	1000 ohms, 1/2 watt, 10%
R2	C-9B1-70	4700 ohms, 1/2 watt, 10%
R3	C-9B1-80	33,000 ohms, 1/2 watt, 10%
R4	C-9B1-78	22,000 ohms, 1/2 watt, 10%
R5	C-9B1-34	3.3 megohms, 1/2 watt, 20%
R6	C-9B1-64	1500 ohms, 1/2 watt, 10%
R7	C-9B1-82	47,000 ohms, 1/2 watt, 10%
R8, S1	A-10A-10642	Volume control (1 megohm) and on-off switch
R9	C-9B1-37	10 megohms, 1/2 watt, 20%
R10	C-9B1-77	18,000 ohms, 1/2 watt, 10%
R11	C-9B1-32	1.5 megohms, 1/2 watt, 20%
R12	C-9B1-91	270,000 ohms, 1/2 watt, 10%
R13	C-9B1-73	8200 ohms, 1/2 watt, 10%
R14	C-9B1-53	180 ohms, 1/2 watt, 10%
R15	C-9B1-94	470,000 ohms, 1/2 watt, 10%
R16	C-9B1-3	22 ohms, 1/2 watt, 20%
R17	C-9B2-63	1200 ohms, 1 watt, 10%
R18	C-9B2-62	1000 ohms, 1 watt, 10%
R19	C-9B1-90	220,000 ohms, 1/2 watt, 10%
R20	C-9B2-44	33 ohms, 1 watt, 10%
COILS AND TRANSFORMERS		
T1	C-201-10908	Loop antenna assembly (includes cabinet back, capacitor C1 and resistor R1)
T2	A-16A-12161	R.F. choke coil
T3	A-13D-10661	Oscillator coil
T4	B-13B-10091-1	Input I.F. transformer complete in can. Range of trimmers: 45-85 mmf each.
T5	B-13B-10794	Output I.F. transformer complete in can. Range of trimmers: 43-79 mmf each.
T6	B-12C-10623	Output transformer for speaker
T8	A-16A-10792	I.F. choke coil

*The values of the resistors and mica capacitors listed above are based on RMA standards. Due to conditions beyond our control some receivers have been shipped with components of pre-standardized values. This receiver will operate equally well with components of either group. An illustration of the differ-

NOTE ON TUBE REPLACEMENT

Replace a defective metal 12SK7 tube with another metal tube. Replace a glass 12SK7 tube with a metal tube or with an exact duplicate of the tube now in the set.

Ref. No.	Part No.	Description
DIAL AND TUNING PARTS		
P1	B-6D-10650	Dial scale
	A-6A-10609	Diffuser
	B-2M-7758	Snap-in rivet, for diffuser (2 used)
	A-2G-10639	Dial pointer
	B-53A-10989	String for dial pointer (60")
	A-49A-10887	Spring for dial pointer string
	A-55A-10093	Socket assembly, for dial light
	A-46A-10793	Dial light bulb, 6-8 volts, T-47
	A-3C-10641	Spacer, brass (on extreme left)
	A-3C-10640	Spacer, brass (5 used)
	A-2C-10658	Cam
	A-2C-10611	Washer, D-D, on sides of cams
	29E-1812	Spring washer, on cam shaft
	A-3F-10656	Locking screw for cams
	A-2C-10654	Retainer yoke
	A-2C-10655	Cam yoke
	A-2L-10610	Stop arm
	200-10653	Lever assembly (arm and roller)
	A-2C-10607	Gear segment
	A-3B-10643	Gear bushing
A-3C-10636	Coupling pin, on gear segment	
A-49A-10646	Drum spring, on gear coupling pin	
A-3A-10651	Tuning shaft	
A-3L-7192	Pinion gear on tuning shaft	
A-49A-10628	Lever spring	
MISCELLANEOUS		
T7	B-18A-10647	P.M., 6" x 4" oval
	A-15B-10440	Socket, octal (for all tubes but 12SK7)
	A-15C-11201	Socket, octal, laminated (for 12SK7)
	B-15B-10076	Mounting plate, for electrolytic
	B-14M-10038	Line cord and plug
	B-2M-11205	Snap-in rivets, for mounting back (5 used)
	A-2M-10096	Split tee-pins, for mounting back (2 used)
	5C-10010-9	Cabinet
	B-5B-10016-B	Knob, volume and tuning
	B-5A-10648-8	Pushbutton
	A-26B-10736	Rubber feet for cabinet
	A-23L-10934	Station call letters, one set
A-6C-10819	Acetate tabs, for pushbuttons	
A-2H-10715	Tube shield (used with metal-base 12SA7GT tube)	
A-2H-11271	Tube shield (used with bakelite-base 12SA7GT tube)	

ences in both resistors and capacitors follows:
 Pre-standardized value—50,000 ohms, 1/3 watt, 10%
 RMA value—47,000 ohms, 1/2 watt, 10%
 Pre-standardized value—200 mmf, 500 volts, 20%
 RMA value—220 mmf, 500 volts, 20%

NOTICE: There is a power rating label on the cabinet. This label specifies the power supply on which the radio may be used, and identifies it as to stock number and model. When ordering parts or writing, give ALL information appearing on label.

- H-244A Speaker 5" PM
- S-608A Tube Socket Octal (8 prong)
- E-164A Knob-tuning and volume
- A-2131 Line Cord and plug

COILS

- A-2154B Antenna & Back Cover Assembly
- T-1361A 1st I.F. Transformer 456 KC
- T-1362A 2nd I.F. Transformer 456 KC
- T-1365A R. F. Choke Coil 1.4 MH
- T-1368A Audio Transformer
- T-1372A R.F. Choke Coil 3.0 MH

CAPACITORS

- C-471A 0.1 mfd, 400 V Tubular
- C-493A 1000 mmf, 350 V Ceramic
- C-494A 250 mmf, 350 V Ceramic
- C-495A 50 mmf, 500 V Ceramic
- C-480A 0.005 mfd, 400 V Tubular
- C-466A 40-40 mfd, 150 V Electrolytic
- C-483A 10-160 mmf Trimmer
- C-496A 0.02 mfd, 200 V Tubular
- C-460A 0.1 mfd, 200 V Tubular
- C-497A 0.2 mfd, 400 V Tubular
- C-500A 0.01 mfd, 400 V Molded

MODEL D2619

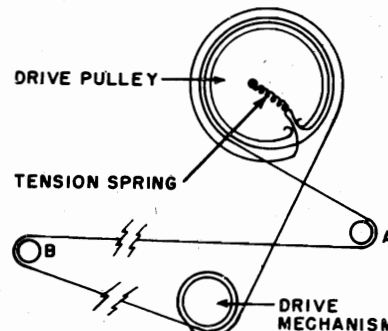
- W-43A 50 ohm, 10 Watt Wire wound
- W-415A 150 ohm, 0.5 Watt Carbon
- W-452A 4700 ohm, 0.5 Watt Carbon
- W-433A 1000 ohm, 1.0 Watt Carbon
- W-437A 22,000 ohm, 0.25 Watt Carbon
- W-438A 47,000 ohm, 0.25 Watt Carbon
- W-439A 100,000 ohm, 0.25 Watt Carbon
- W-440A 220,000 ohm, 0.25 Watt Carbon
- W-441A 470 ohm, 0.25 Watt Carbon
- W-442A 2.2 megohm, 0.25 Watt Carbon
- W-443A 10 megohm, 0.25 Watt Carbon
- W-444A Switch & Pot, 500,000 ohm, Carbon

TUNER & DRIVE PARTS

- A-2143E Tuner Assembly
- L-2450A Pulley-Drive
- L-2451A Pulley-Idler
- U-1442A Shoulder Rivet
- H-247B Glass Dial
- H-246A Translucent Screen
- U-1445A Snaps for Screen
- U-1461A Pointer
- U-1444A Spring
- S-599A Pilot Light Socket Assembly
- A-2155A Dial Drive Assembly

DRIVE CORD REPLACEMENT

Turn the tuner to the fully open position. Use a new cord 50" long and tie one end to the tension spring. Fasten the other end of the tension spring to the drive pulley. Pass cord through slot in pulley ring; add spring tension and continue one and one-half turns counterclockwise over top of pulley. Then pass cord around idler pulley A, starting over top and going around clockwise. Pass cord over idler pulley B, starting over top and going around counter clockwise. Wind one full turn counterclockwise around drive mechanism. Then wind one full turn counterclockwise around drive pulley, pass through slot in pulley and tie string to tension spring. Cut off excess string. Attach dial pointer to cord.

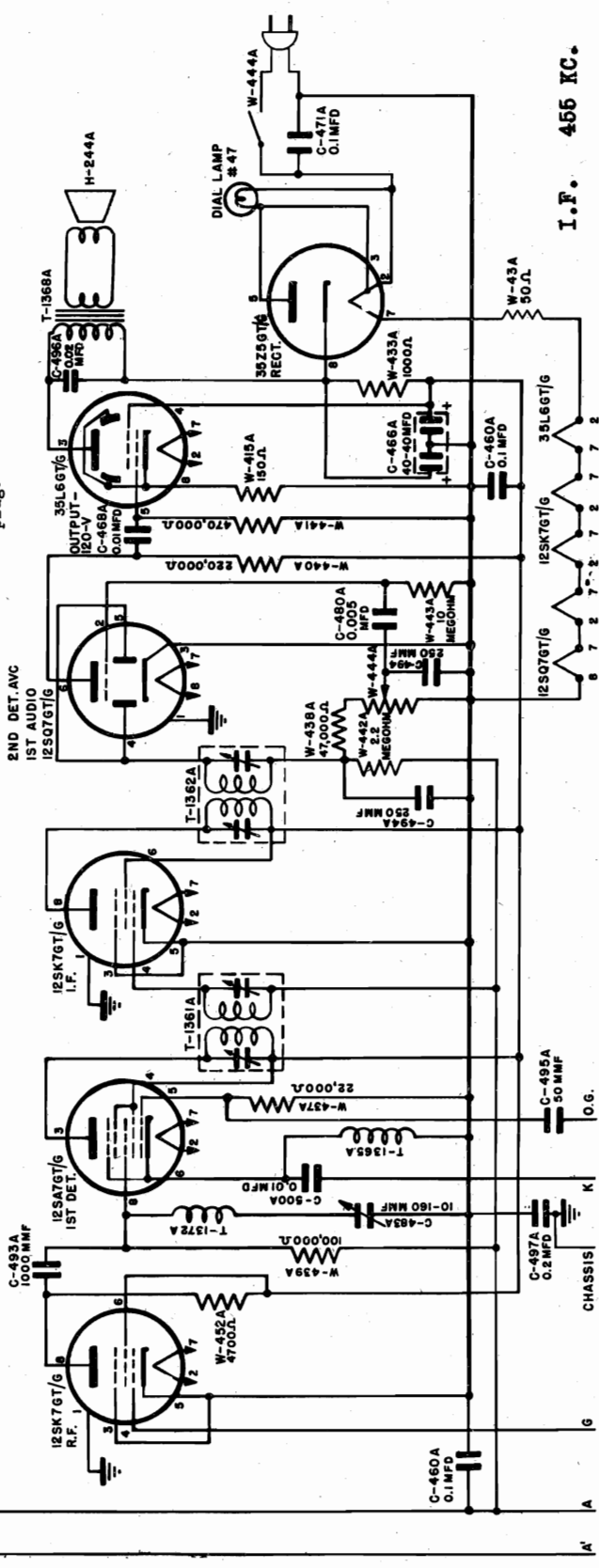


MODEL D2819

WESTERN AUTO SUPPLY CO.

using the radio on AC, reverse the plug.
 Leave the plug inserted in the position that results in the least hum.
 Radios for 25 cycle AC operation are so marked.
 DC OPERATION - Insert plug. If set does not operate after one minute - reverse plug.

Unless otherwise marked, this radio must be operated on a power supply of 105-125 volts AC, 50 to 60 cycles only or 105-125 volts DC. Do not connect the radio to the power source until certain that the power supply is correct for the receiver. If in doubt, telephone your local power company before connecting the receiver.
 If there appears to be excessive hum when



I.F. 455 KC.

12SA7GT/G
 1ST DET & OSCILLATOR
 94 VDC P
 G₁ G₂ G₃ G₄ G₅ G₆ G₇ G₈ G₉ G₁₀

12SK7GT/G
 I.F.
 94 VDC P
 SH H G₁ G₂ G₃ G₄ G₅ G₆ G₇ G₈ G₉ G₁₀

12S7GT/G
 2ND DET AVC & AUDIO
 20 VDC P
 H G₁ G₂ G₃ G₄ G₅ G₆ G₇ G₈ G₉ G₁₀

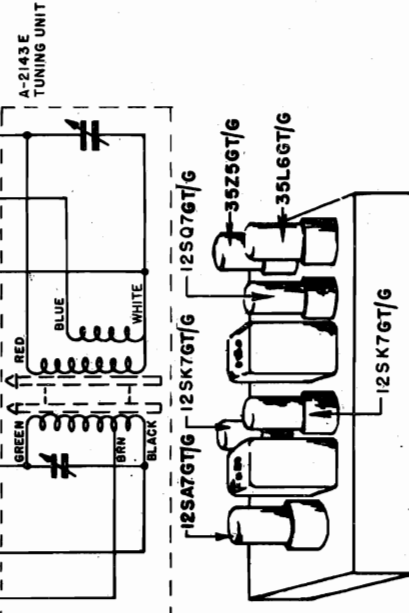
35L6GT/G
 OUTPUT
 35L6GT/G
 130 VDC RECT
 H G₁ G₂ G₃ G₄ G₅ G₆ G₇ G₈ G₉ G₁₀

35L6GT/G
 102 VAC P
 H G₁ G₂ G₃ G₄ G₅ G₆ G₇ G₈ G₉ G₁₀

STANDARD TUBE SOCKET SYMBOLS

DEF	DEFLECTOR PLATES	G ₁	GRID NO.5
D _L	DIODE PLATE-LEFT	H	HEATER TAP
D _R	DIODE PLATE-RIGHT	H _Y	HEATER TAP
G	GRID	K	CATHODE
G ₁	GRID NO.1	NC	NO CONNECTION
G ₂	GRID NO.2	P	PLATE
G ₃	GRID NO.3	SH	SHELL
G ₄	GRID NO.4		

MEASUREMENTS TAKEN WITH AC LINE VOLTAGE OF 117 VOLTS. - READINGS TAKEN WITH NO-SIGNAL INPUT. - USE 1000.0A PER VOLT METER BETWEEN INDICATED POINTS & ELECTRICAL GND. INDICATED BY "X" ON SOCKET LAYOUT. NO MEASUREMENTS MADE TO CHASSIS GROUND.



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ALIGNMENT NOTES

- A. MECHANICAL ALIGNMENT:- The following mechanical adjustments should be made before alignment;
1. Rotate shaft of tuning unit until carriage is against top stop position.
 2. Space oscillator coil slug 1-5/32" out from top of oscillator coil form.
 3. Space R.F. coil slug 1-29/64" out from top end of R.F. coil winding. (Note:-The distance 1 and 2 should be measured from mounted end of the slug)
 4. Adjust screw on trimmer of wave trap towards open position so that condenser plates are open at least 1/32".

B. I.F. ALIGNMENT PROCEDURE

1. Feed I.F. frequency from the signal generator through a 0.01 mfd condenser to the control grid of the R. F. tube.
2. No signal will be heard unless trimmer condenser under chassis is unscrewed and reduced from original setting.
3. Turn volume control full on.
4. Make preliminary I.F. adjustment with signal level approximately 50 Mv.
5. Tune I.F. trimmers for maximum signal, reducing I.F. signal input to coupling loop to keep output voltage less than 0.5 V.
6. When maximum output has been secured, adjust trimmer condenser in the I.F. trap (under chassis) by turning clockwise to the minimum signal.

C. R.F. ALIGNMENT PROCEDURE

1. Volume control full on.
2. Adjust tuning unit to top stop position.
3. Feed 1620 kc signal into external loop. Hold audio output below 0.5 V. Adjust the oscillator trimmer condenser to maximum output.
4. Move slugs in by means of tuning dial so that pointer is approximately 1" from the stop end, and a signal received from the external loop on a frequency of 1400 kc. Adjust lower trimmer (R.F. trimmer) to maximum output. Reduce R.F. input to keep signal output voltage below 0.5 V.

5. Rotate tuning shaft until pointer is approximately 1" from the other end of the scale. Feed to the external loop a test signal at 700 kc. Adjust the R.F. coil slug by rotation in the trimmer nut to maximum output.

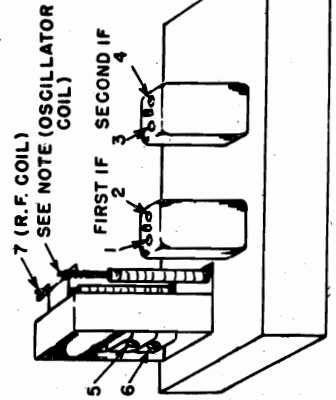
NOTE: If more than one complete turn of the slug is required to obtain maximum signal, return tuner to 1400 kc. position and repeat steps 4 and 5.

If less than one turn is required to obtain the maximum 700 kc. audio output, the R.F. alignment may be considered complete.

CAUTION: Extreme care should be taken in the 700 kc. position to make sure that the tuner carriage is not moved by the adjusting tools or hand pressure on the slug screw. Carriage should not be held against the frame, but should be allowed to assume its normal position when adjusting the R.F. coil slug.

SPECIFICATIONS

- Power consumption..... 35 Watts
(At 117 volts AC Supply)
Power Output- 1.6 Watts 10% Distortion
Selectivity----49 KC Broad at 1000 times Signal
Intermediate Frequency..... 455 KC
Speaker..... 5" PM Dynamic
Tuning Frequency Range..540 to 1620 KC
Sensitivity (For .06 Watt output-external Antenna) 20 microvolts average



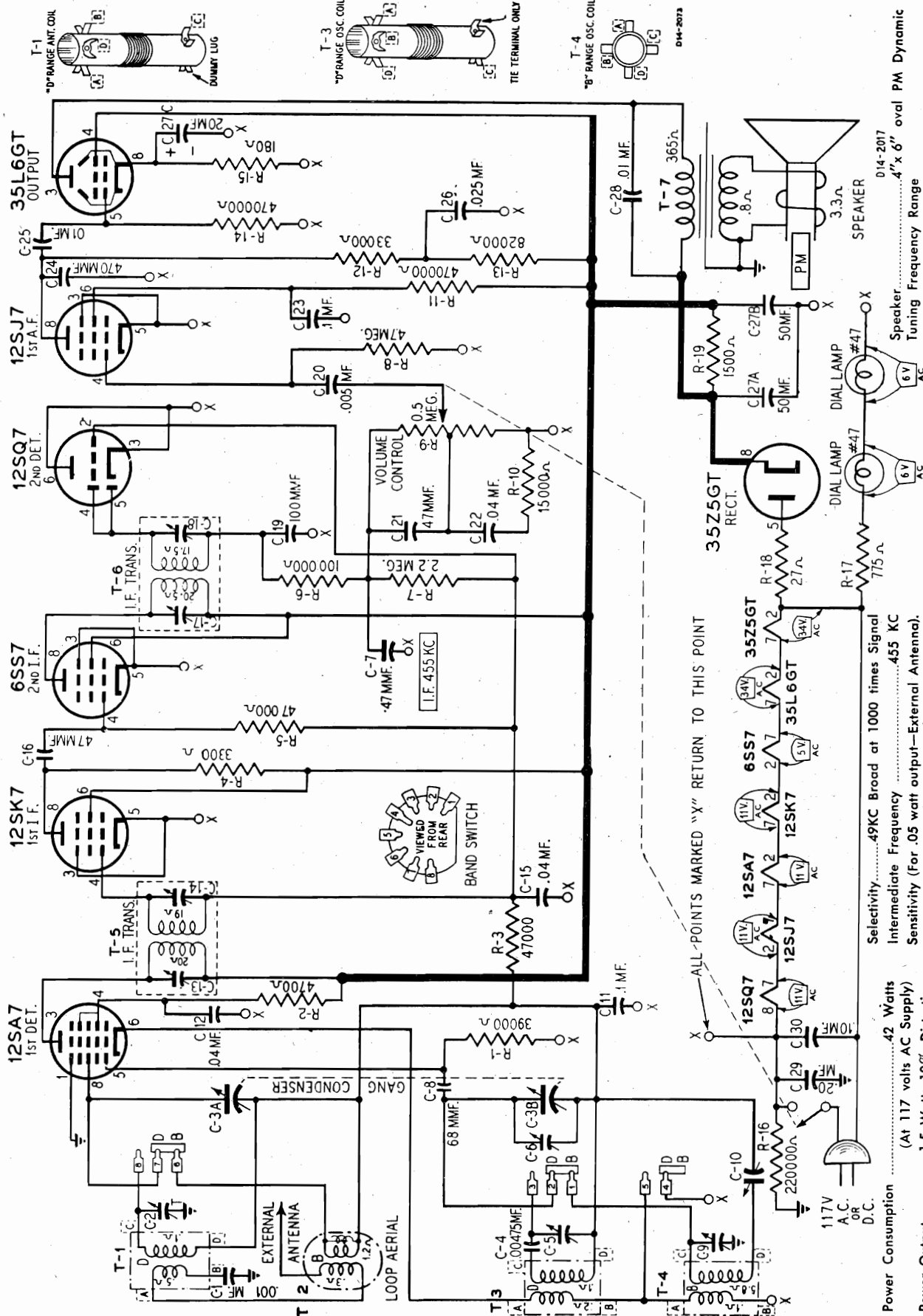
ALIGNMENT PROCEDURE

Volume Control-Maximum All Adjustments. Signal Generator which will provide an accurately calibrated signal at test frequencies as listed. Output Indicating Meter; Non-Metallic Screwdriver. Dummy Antennas-.01 mf., and 400 ohms. The equipment in column at right is required for Alignment:

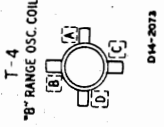
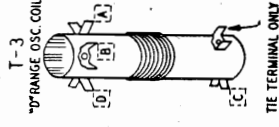
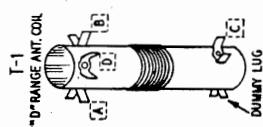
FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION	DUMMY ANTENNA	TUNER SETTING	TRIMMER ADJUSTMENT (SEE DIAGRAM)	NOTES
I.F. 455 KC	Grid of RF tube 12SK7 to chassis	0.01 mfd	Out	Adjust for Max. 1, 2, 3 and 4	No signal will be heard unless trimmer condenser under chassis is unscrewed and reduced from original setting
I.F. 455 KC	Grid of RF tube 12SK7 to chassis	0.01 mfd	Out	Trim condenser under chassis for Min. output.	If it is found that regeneration prevails when the loop antenna is put in its normal position close to the tubes, then the under chassis trimmer is incorrectly set, and should be adjusted to prevent the regenerative condition.
1620 KC	Inductive Coupling to Loop	400 ohms in series with Antenna & Gnd. leads	Out	Adjust Oso. #5 per Max. signal	
1400 KC	Inductive Coupling to Loop	400 ohms in series with Antenna & Gnd. leads	Dial set for 1400KC	Adjust RF trimmer #6 per Max. Signal.	
700 KC	Inductive Coupling to Loop	400 ohms in series with Antenna & Gnd. leads	Dial set for 700KC	Adjust RF tuning core #7 for Max. (care should be taken not to disturb carriage position of tuner)	If more than one turn is required, the trimming 1400 KC should be repeated and the 700 KC padding of the tuning core also repeated until correct alignment has been reached

MODELS D2624 Early,
D2630

WESTERN AUTO SUPPLY CO.



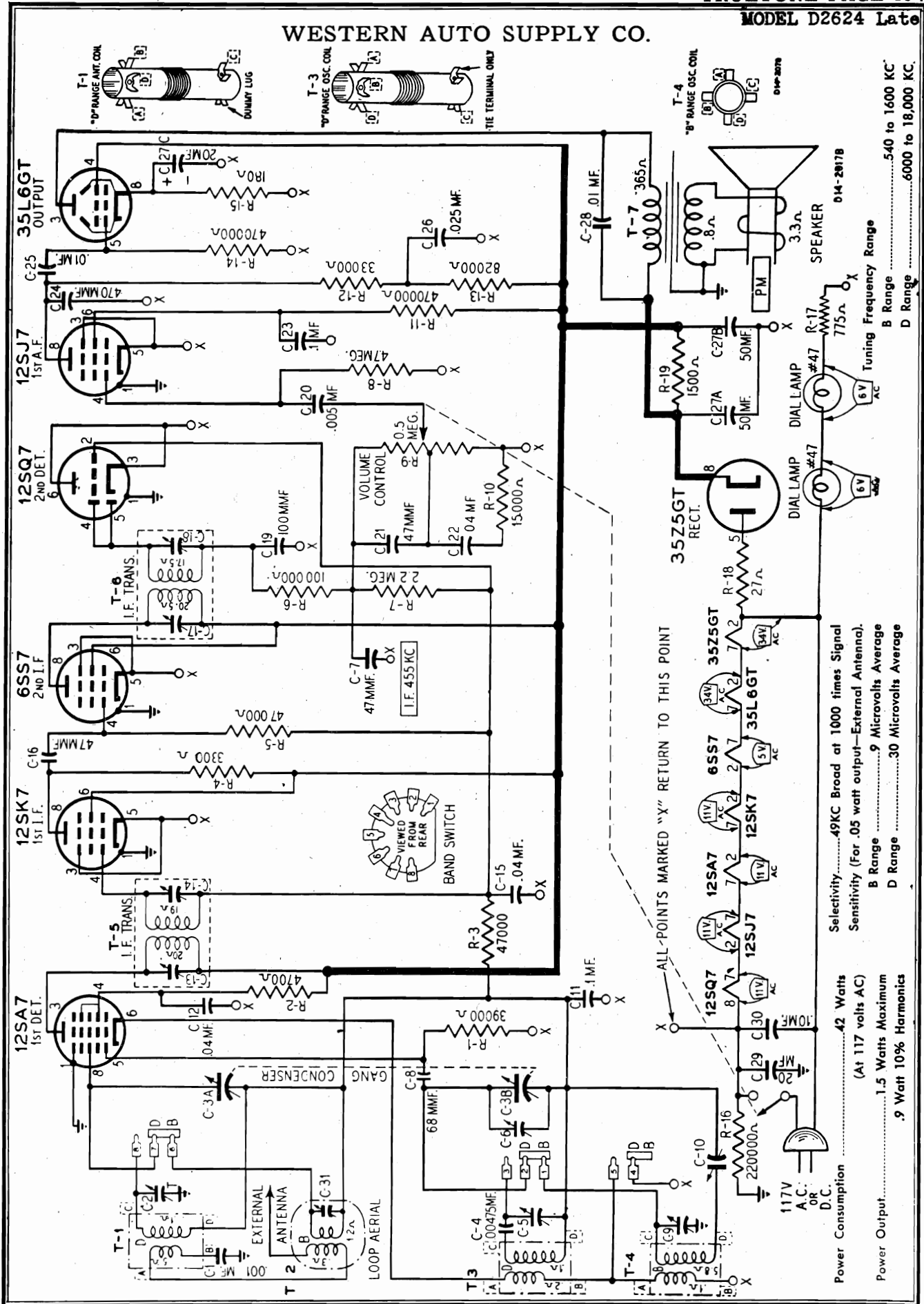
Power Consumption 42 Watts
 (At 117 volts AC Supply)
Power Output 1.5 Watts 10% Distortion
 .9 Watt Undistorted
Selectivity 49KC Broad at 1000 times Signal
Intermediate Frequency 455 KC
Sensitivity (For .05 watt output—External Antenna).
 B Range 9 Microvolts Average
 D Range 30 Microvolts Average
Speaker 4" x 6" oval PM Dynamic
Tuning Frequency Range
 B Range 528 to 1600 KC
 D Range 5750 to 18,300 KC



ALL-POINTS MARKED "X" RETURN TO THIS POINT

WESTERN AUTO SUPPLY CO.

MODEL D2624 Late



Selectivity.....49KC Broad at 1000 times Signal
 Sensitivity (For .05 watt output—External Antenna).
 B Range9 Microvolts Average
 D Range30 Microvolts Average

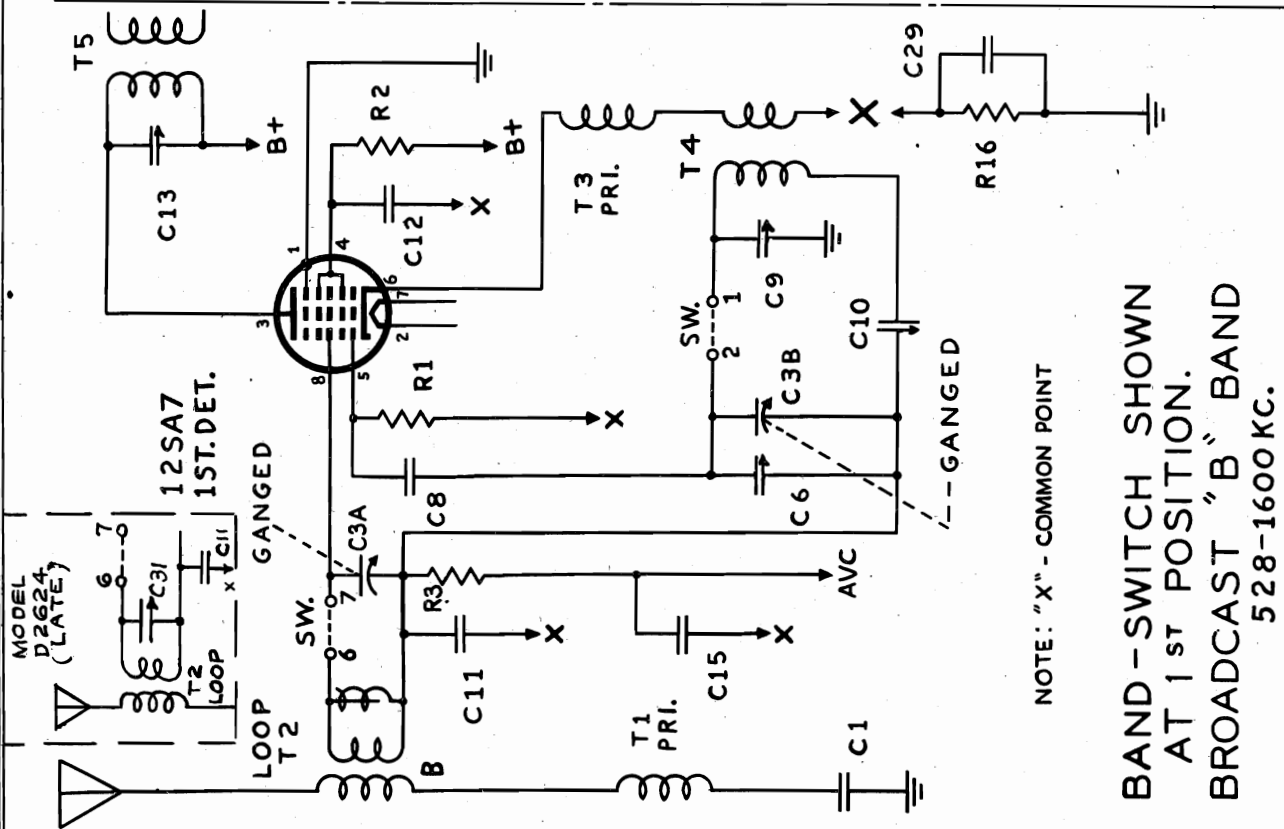
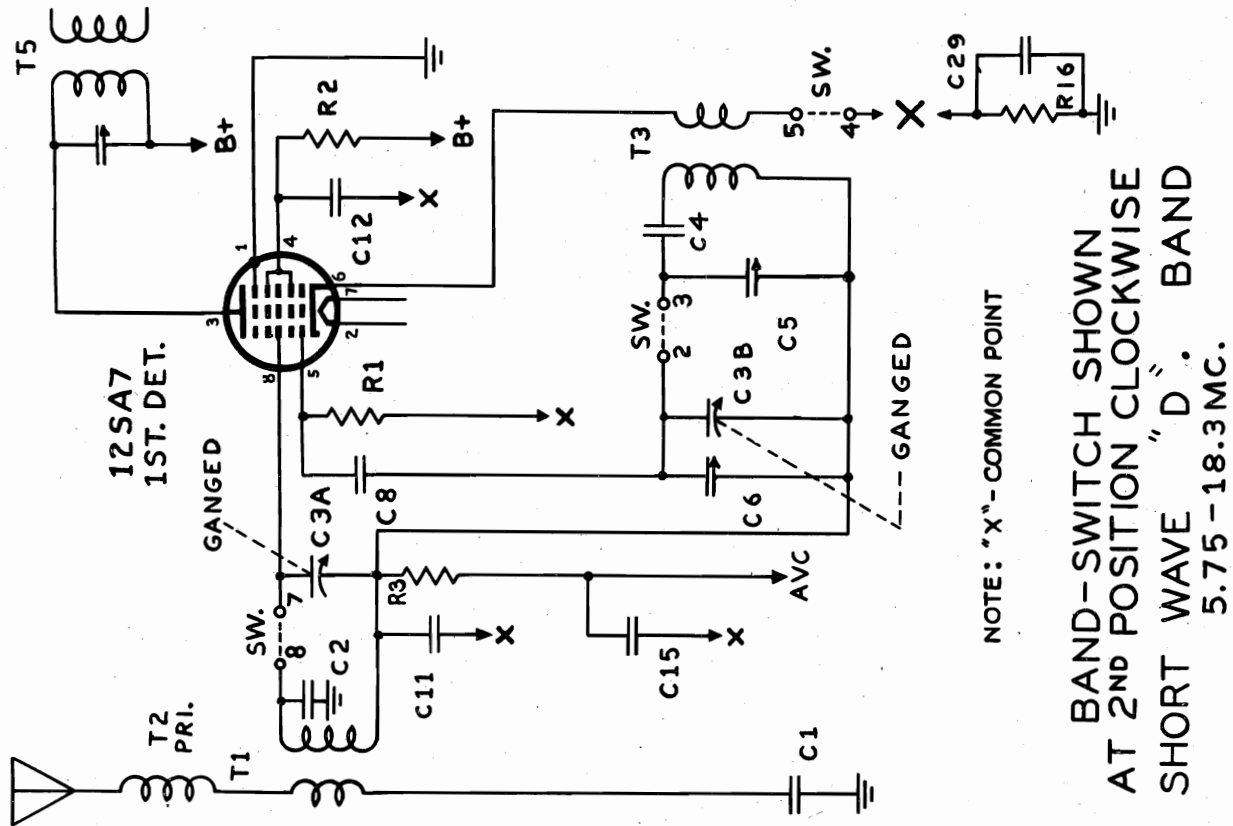
Power Consumption42 Watts
 (At 117 volts AC)
 Power Output.....1.5 Watts Maximum
 .9 Watt 10% Harmonics

Tuning Frequency Range
 B Range540 to 1600 KC
 D Range6000 to 18,000 KC

"clarified schematics"

MODELS D2624 Early,
Late, D2630

WESTERN AUTO SUPPLY CO.

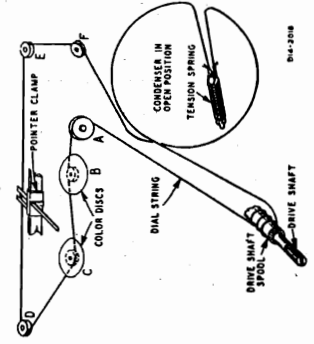


WESTERN AUTO SUPPLY CO.

Notes: In late models note D is not used in the alignment procedure. All other data is the same for both models.

BC. Band Early 528 to 1600 KC
 BC. Band Late 540 to 1600 KC
 SW. Band Early 5.75 to 18.3 MC
 SW. Band Late 6 to 18 MC

16 Meter Band ... 17.1—17.9 MC
 19 Meter Band ... 15.1—15.3 MC
 25 Meter Band ... 11.7—11.9 MC
 31 Meter Band ... 9.5—9.7 MC
 49 Meter Band ... 6—6.2 MC



ALIGNMENT PROCEDURE

Check Dial Pointer position, see DIAL CALIBRATION paragraph. Signal Generator which will provide an accurately calibrated signal at test frequencies as listed.

Volume Control—Maximum All Adjustments. Output Indicating Meter; Non-Metallic Screwdriver.

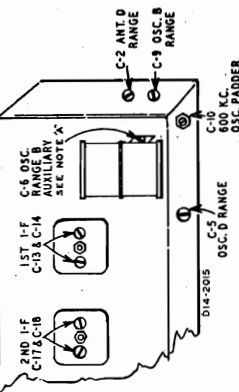
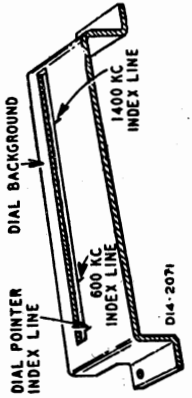
The equipment in column at right is required for Aligning: Dummy Antennas—.1 mf., 200 mmf., and 400 ohm.

SIGNAL GENERATOR		BAND SWITCH		CONDENSER SETTING		ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)	
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA SETTING	BAND SWITCH SETTING	CONDENSER SETTING		
I. F. 455 KC	Signal Grid at 1st. Det. Connect at Stator of Large Gang Section.	Point "X"	.1 mf.	B Range	Turn Rotor to Full 1st I.F. (C13) & 2nd I.F. (C17) & (C18) Open		
RANGE B 1400 KC	External Antenna Clip	Point "X"	200 mmf.	B Range	Turn Rotor to 1400 KC Index Line. See Note B	Oscillator Range B (C9) See Note A	
600 KC	External Antenna Clip	Point "X"	200 mmf.	B Range	Turn Rotor to Max. Output and Rock	600 KC Padder (C10) Rock Rotor See Note C	
1400 KC	External Antenna Clip	Point "X"	200 mmf.	B Range	Repeat above steps at 1400 and 500 KC until readjusting the oscillator. Trimmer (C9) causes no further improvement of output.	Turn Rotor to 1400 KC Index Line. See Note B	
RANGE D 16 MC	External Antenna Clip	Point "X"	400 Ohm	D Range	Turn Rotor to 1400 KC Index Line. See Note B	Oscillator Range D (C5)	
16 MC	External Antenna Clip	Point "X"	400 Ohm	D Range	Turn Rotor to 1400 KC Index Line. See Note B	Ant. Range D (C2)	

In order to align the receiver, the dial pointer must be positioned on the dial string correctly with reference to the dial. Index lines are provided on the dial background for this purpose.

To position the dial pointer, turn the gang condenser to the fully closed position. The dial pointer should be directly over the dial pointer index line. (See illustration.)

The 600 KC and 1400 KC index lines are for use when aligning the receiver.



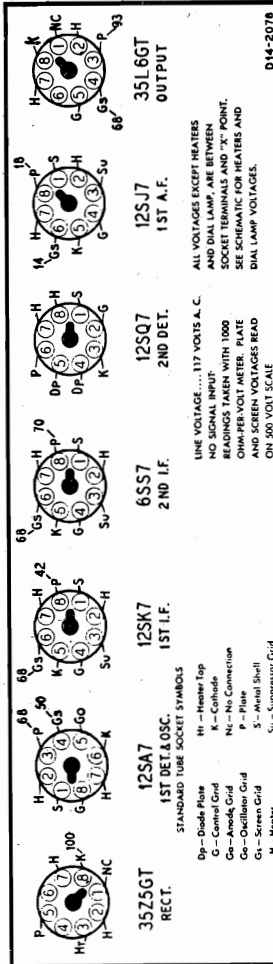
ALIGNMENT NOTES

NOTE A—Adjust Oscillator Range B (C9) trimmer on side of chassis. Oscillator Range B (C6) auxiliary trimmer on gang condenser is adjusted at factory and ordinarily need not be readjusted in the field.

NOTE B—Index line is on dial background strip. See DIAL CALIBRATION paragraph.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE D—A "gimmick" capacity is used on the loop antenna in place of a trimmer. This normally requires no adjustment. However, if a new loop antenna is installed it may be necessary to adjust the "gimmick" by increasing or decreasing the number of turns in the "gimmick." Complete the oscillator adjustment (C9) at 1400 KC, then adjust the "gimmick" at the same frequency.



DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use a new cord 60" long and tie one end to the tension spring. Fasten the other end of the tension spring to the drive pulley. Pass cord through slot in the pulley rim and continue one half turn counterclockwise, over top of pulley. Wind 3 turns clockwise around wooden drive shaft spool. Turns must progress toward chassis.

Pass cord around idler pulley A, over color disc pulley B, under color disc pulley C, and around idler pulleys D, E, and F.

Wind 3/4 turn counterclockwise around drive pulley. Pass cord through slot in rim, stretch tension spring and tie cord to it. Cut off the excess string. Attach dial pointer to cord and position the pointer directly over the Dial Pointer Index Line on the dial background.

MODELS D2624 Early,
Late, D2630
MODEL D2644

WESTERN AUTO SUPPLY CO.
REPLACEMENT PARTS LIST

NOTICE: There is a Model Number label on the chassis. This label identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

- 12A430 4" x 6" P.M. speaker—with mounting bracket Cone and voice coil assembly for speaker (specify part number and letters stamped on speaker)
- 3A303 Tube Socket—octal (8 prong) molded
- 10A520 Knob, tuning for IVORY cabinet
- 10A521 Knob, volume for IVORY cabinet
- 10A522 Knob, band for WALNUT cabinet
- 10A467 Knob, tuning
- 10A468 Knob, volume
- 10A469 Knob, band
- 13X546 Line cord and plug
- 2A206 Band change switch
- 28X292 Snap button (mounting antenna to cabinet)

No. 6x3/8" P.K. Type "Z" screws (mounting antenna to chassis)

TRANSFORMERS AND COILS

- 9A1443 T-1 "D" Range Antenna Coil Assembly
- 26A386 T-2 "B" Band Loop Antenna Assembly with Trimmer (for Walnut Cabinet)
- 26A387 T-2 "B" Band Loop Antenna Assembly with Trimmer (for Ivory Cabinet)
- 9A1444 T-3 "D" Range Oscillator Coil Assembly
- 9A1442 T-4 "B" Band Oscillator Coil Assembly
- 9A1793 T-5 1st I-F coil assembly
- 9A1794 T-6 2nd I-F coil assembly
- 51X118 T-7 Output transformer

- CAPACITORS**
- B67102 C-1 .001 mf 200 V Tubular
 - 17A152 C-2 2-25 mmf Ant. Range "D" Trimmer
 - C-9 2-25 mmf. Osc. Range "B"
 - 14A148 C-3A Gang capacitor and pulley
 - C-3B
 - 46X289 C-4 .00475 mf 180 V Tubular
 - 17A174 C-5 2-25 mmf Osc. Range "D" Trimmer
 - C-6 Part of C-3
 - 47X463 C-7 47 mmf Molded
 - 47X466 C-8 68 mmf Molded
 - 17A234 C-10 250-325 mmf 600 K.C. Padder
 - B66104 C-11 .1 mf 200 V Tubular
 - C-12
 - B66403 C-15 .04 mf 200 V Tubular
 - C-22
 - 47X446 C-13, C-14 Part of T-5 (1st I-F coil assembly)
 - C-16, C-21 47 mmf Molded
 - C-17, C-18 Part of T-6 (2nd I-F coil assembly)
 - 47X476 C-19 100 mmf Molded
 - B66502 C-20 .005 mf 200 V Tubular
 - 47X467 C-24 470 mmf Molded
 - B66101 C-25 .01 mf 200 V Tubular
 - C-28
 - B67253 C-26 .025 mf 200 V Tubular
 - C-27A 50 mf 150 V Dry electrolytic
 - C-27B 50 mf 150 V
 - C-27C 20 mf 25 V
 - D67204 C-29 .20 mf 400 V Tubular
 - D66104 C-30 .10 mf 400 V Tubular
 - 17A123 C-31 1-12 mmf Antenna Range B Trimmer

- B85104 R-6 100,000 0.5 Carbon
- B85225 R-7 2.2 meg 0.5 Carbon
- B85475 R-8 4.7 meg 0.5 Carbon
- 36X309 R-9 Volume control and switch 0.5 megohms
- B84153 R-10 15,000 0.5 Carbon
- B85474 R-11, R-14 470,000 0.5 Carbon
- B84333 R-12 33,000 0.5 Carbon
- B34823 R-13 82,000 0.5 Carbon
- B84181 R-15 180 0.5 Carbon
- B85224 R-16 220,000 0.5 Carbon
- 43X214 R-17 775 28 Wire wound
- B84270 R-18 27 0.5 Carbon
- C85152 R-19 1500 1.0 Carbon

DIAL AND DRIVE ASSEMBLY

- 6X21 Rubber grommet } Mounting gang {
- 20X329 Cond. cushion stud } capacitor {
- 15A128 Color disc assembly
- 58X588 Dial scale
- 58X587 Dial background
- 26A384 Pointer bracket assembly complete with leys and studs
- 15X220 Pointer 5 ft. Drive cord
- 28X113 Drive cord tension spring
- 25X580 Drive shaft bracket
- 26X465 Drive shaft
- 19X192 "C" Washer (for drive shaft)
- 24X564 Drive shaft spool
- 7A193 Pilot light socket assembly
- No. 47 Pilot light

RESISTORS

- | | Ohms | Watts | | |
|------------|------------|-------|--------|--|
| B84393 R-1 | 39,000 | 0.5 | Carbon | |
| B84472 R-2 | 4700 | 0.5 | Carbon | |
| B85473 R-3 | R-5 47,000 | 0.5 | Carbon | |
| B84332 R-4 | 3300 | 0.5 | Carbon | |

Model D2644

ALIGNMENT PROCEDURE

Volume control—Maximum: all adjustments.

Connect ground lead of signal generator to radio chassis.

Connect dummy antenna in series with output lead of signal generator.

Connect output meter across voice coil of speaker.

The following equipment is necessary for proper alignment:

Signal generator that will provide the test frequencies as listed, 30% modulated, 400 c.p.s. Output meter.

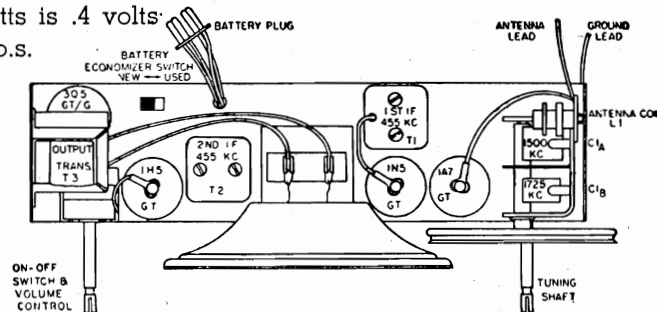
Non metallic screwdriver.

Dummy antennas... .1 mfd., 00025 mfd.

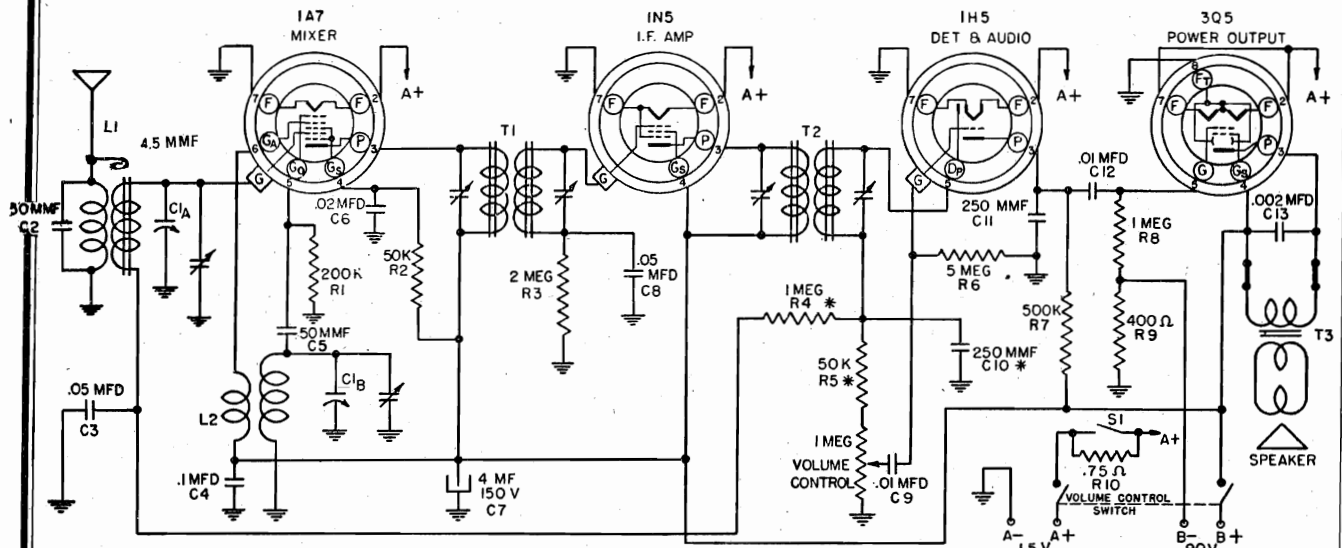
Variable Condenser Setting	Generator Frequency	Dummy Antenna Mfd.	Connection to Radio	Trimmer Adjustment	Trimmer Function
Minimum Capacity (Fully Opened)	455 K.C.	.1	Grid of 1A7GT Tube	Two Trimmers on Top of T2	Output I.F.
Minimum Capacity (Fully Opened)	455 K.C.	.1	Grid of 1A7GT Tube	Two Trimmers on Top of T1	Input I.F.
Minimum Capacity (Fully Opened)	1725 K.C.	.00025	Antenna Lead	C1B	Oscillator Trimmer
Tune in signal From Generator	1500 K.C.	.00025	Antenna Lead	C1A	Antenna Trimmer

With an output meter connected across the voice coil of the speaker, the output meter reading for 50 milliwatts is .4 volts using a signal which is modulated 30% at 400 c.p.s.

Frequency Range
540 to 1725 K.C.
I.F. Frequency 455 K.C.



WESTERN AUTO SUPPLY CO.



* Note: R4, R5, and C10 are part of 2nd I.F. Transformer (T2) and can not be replaced separately.

IF PEAK 455 KC

PARTS LIST

CONDENSERS

Circuit Diagram Reference	Part No.	Description
C1A, C1B	B19-185	Variable condenser with Drum
C3, C8	A16-152	.05 mfd. 200 volt tubular condenser
C4	A16-157	.1 mfd. 200 volt tubular condenser
C5	A15-175	50 mmfd mica condenser
C6	A16-150	.02 mfd. 400 volt tubular condenser
C7	A18-273	4 mfd. 150 volt electrolytic condenser
C9, C12	A16-156	.01 mfd. 400 volt tubular condenser
C11	A15-176	250 mmfd mica condenser
C13	A16-155	.002 mfd. 600 volt tubular condenser

RESISTORS

R1	A60-667	200 K Ohm 1/3 watt resistor—20%
R2	A60-685	50 K Ohm 1/3 watt resistor—20%
R3	A60-684	2 Megohm 1/3 watt resistor—20%
R6	A60-669	5 Megohm 1/3 watt resistor—20%
R7	A60-662	500 K Ohm 1/3 watt resistor—20%
R8	A60-668	1 Megohm 1/3 watt resistor—20%
R9	A60-665	400 Ohm 1/3 watt resistor—10%
R10	A60-691	.75 Ohm 1 watt resistor

COILS

L1	A10-414	Antenna Coil
L2	A10-415	Oscillator coil
T1	B10-416	1st I.F. Transformer
T2	B10-417	2nd I.F. Transformer

MISCELLANEOUS

T3	A80-218	Speaker output transformer
S1	A69-164	Battery Economizer switch
	A24-165	Volume control and switch
	B79-335	6¼ inch P.M. Speaker
	D42-382	Wood cabinet
	B67-484	Dial scale
	A52-182	Knobs, Walnut Bakelite
	B58-59	Dial pointer
	A84-35	Dial drive shaft and pulley assembly
	A45-118	Battery plug, 4 prong

VOLTAGE CHART

All voltages measured with a 1000 ohm per volt meter on the 150 volt scale. For the following voltages the "B" battery section of the power pack should read 90 volts under load. Where no voltages are shown the voltage is 0 or is too low to be read with this type of voltmeter.

1A7GT TUBE	PIN NO.	VOLTS
Plate-P—to ground	3	85
Screen-G3 & G5—to ground	4	37
Grid-G2—to ground	6	85
1N5GT TUBE		
Plate-P—to ground	3	85
Screen-G2—to ground	4	85
1H5GT TUBE		
Plate-P—to ground	3	17
3Q5GT TUBE		
Plate-P—to ground	3	83
Screen-G2—to ground	4	85

SERVICE NOTES

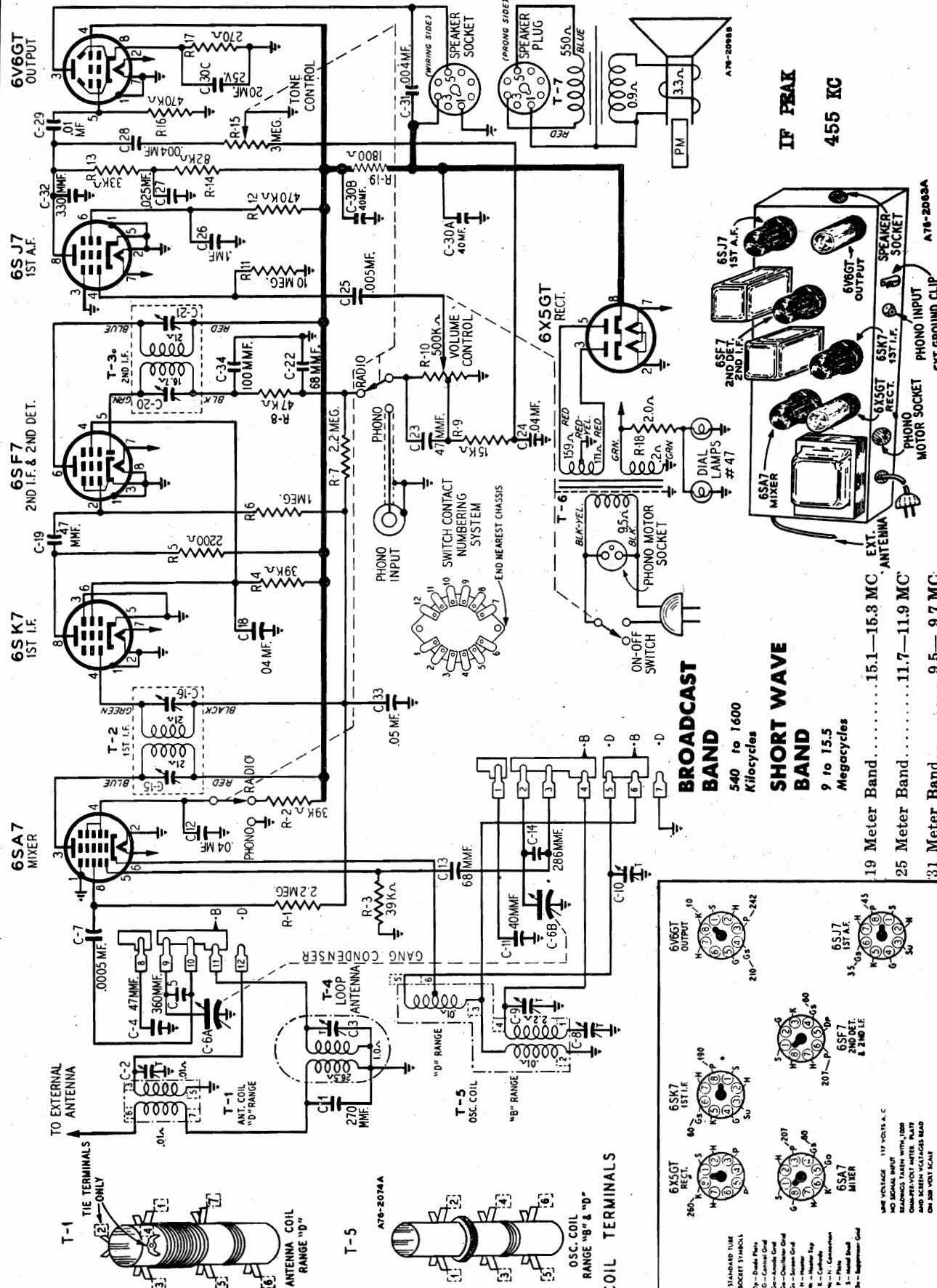
Voltages taken from the different points of the circuit to the chassis are measured with volume control in maximum position, all tubes in their sockets and with a volt meter having a resistance of 1000 ohms per volt, using the 150 volt scale. These voltages are clearly indicated on the voltage chart.

All voltages should be measured with a new battery or one that gives 90 volts under load.

To check for open by-pass condensers, shunt each condenser with another one having the same capacity and voltage rating which is known to be good until the defective unit is located.

MODEL D2645

WESTERN AUTO SUPPLY CO.



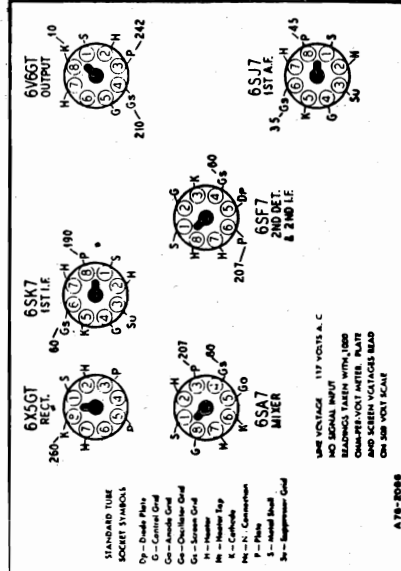
BROADCAST BAND
540 to 1600 Kilocycles

SHORT WAVE BAND
9 to 15.5 Megacycles

19 Meter Band.....15.1—15.8 MC. EXT. ANTENNA

25 Meter Band.....11.7—11.9 MC

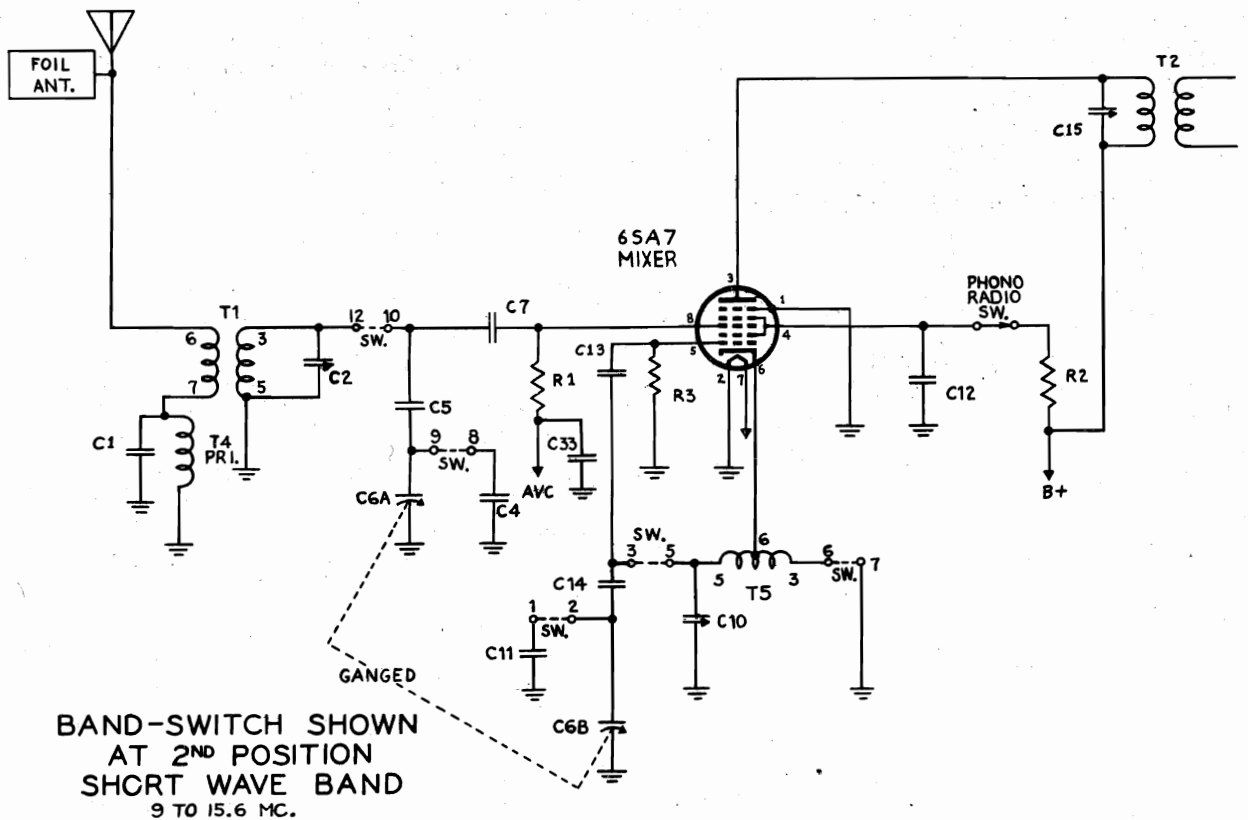
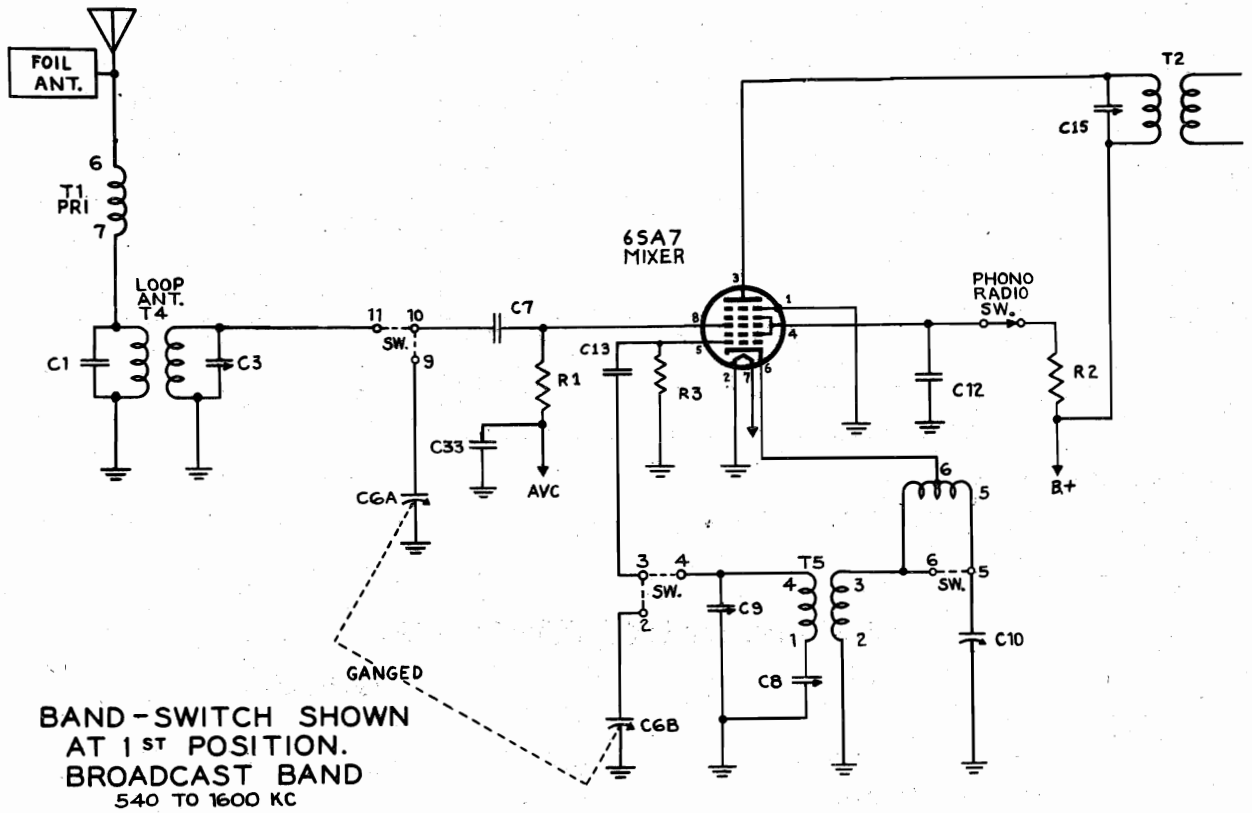
31 Meter Band.....9.5—9.7 MC



STANDARD TUBE SOCKET SYMBOLS
G—Grid
H—Heater
P—Plate
S—Screen
A—Anode

NOTE: VOLTAGE 117 VOLTS A.C.
NO SMALL PARTS
REARINGS TAKEN WITH 1000
OHM-RESISTANCE METER. PLATE
AND SCREEN VOLTAGES READ
ON 500 VOLTS SCALE

WESTERN AUTO SUPPLY CO.



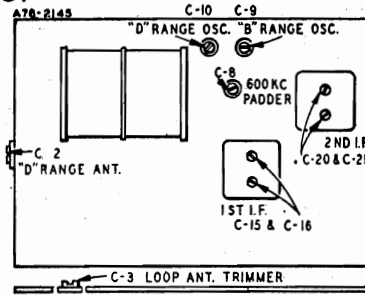
WESTERN AUTO SUPPLY CO.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments. Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead. Allow Chassis and Signal Generator to "Heat Up" for several minutes.

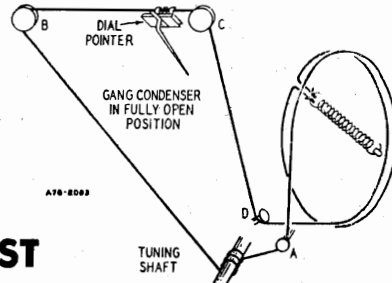
The following equipment is required for aligning: An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed. Output Indicating Meter—Non-Metallic Screwdriver. Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

SIGNAL GENERATOR		BAND SWITCH		CONDENSER SETTING		ADJUST TRIMMERS TO MAXIMUM	
FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM		
I.F.	455 KC	Grid of 6SA7 Pin 8	.1 mf.	B Range	Turn Rotor to Full Open	2nd I.F. (C20) & (C21) 1st I.F. (C15) & (C16)	
RANGE B	1620 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)	
	1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output Set Pointer to 1400 KC (See Note A)	Ant. Range B (C3)	
	600 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Oscillator (C8) Rock Rotor—See Note B	
Repeat above steps at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C9) causes no further improvement of output.							
RANGE D	15,600 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)	
	14,000 KC	Antenna Lead	400 Ohm	D Range	Tune Rotor to Max. Output	Ant. Range D (C2) Rock Rotor—See Note B	
LOOP RANGE B	1400 KC	Antenna Lead	100 mmf.	B Range	Tune Rotor to Max. Output	Ant. Range B (C3)	



NOTE A—Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn Rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.



DRIVE CORD REPLACEMENT

The drive cord should be replaced as shown on the accompanying illustration using a 46" drive cord for the purpose. Three turns are to be wound clockwise around the

tuning shaft with the turns progressing away from the chassis. After the cord has been installed, stretch the tension spring and hook the free end to the tab on the drive pulley. Cut off any excess string that may remain.

REPLACEMENT PARTS LIST

NOTICE: There is a power rating label on the chassis. This label specifies the power supply on which the radio may be used, and identifies the radio as to chassis, dial and issue letter. When ordering parts or writing, give ALL information appearing on this label.

MISCELLANEOUS

- 12A442 6" P.M. Speaker Complete with Output Transformer.....
- Cone and Voice Coil Assembly (Specify part number and letters stamped on speaker)
- Output Transformer (Specify part number and letters stamped on speaker)
- 3A303 Tube socket—(8 prong) moulded
- 3A304 Phono motor socket
- 3A305 Phono socket—single pin tip
- 10A578 Knob (Tuning)
- 10A579 Knob (Off-On, Volume)
- 10A581 Knob (Tone, Radio-Phono)
- 10A580 Knob (SW-BC)
- 2A359 Band Change Switch
- 13X328 Line cord and plug assembly

TRANSFORMERS AND COILS

- T-1 9A1812 "D" Range Antenna Coil Assembly
- T-2 9A1814 1st I.F. Coil Assembly
- T-3 9A1815 2nd I.F. Coil Assembly
- T-4 9A1831 "B" Range Loop Antenna
- T-5 9A1813 "B" Range and "D" Range Oscillator Coil Assembly
- T-6 53X282 117 Volt 60 Cycle Standard Power Transformer
- T-7 Output Transformer (See Miscellaneous)

CAPACITORS

- C-1 47X445 270 mmf Moulded
- C-2 17A164 5-50 mmf Trimmer
- C-3 17A123 1-12 mmf Trimmer
- C-4 47X473 47 mmf Silvered mica
- C-5 47X474 360 mmf Silvered mica
- C-6A, C-6B 14A178 Gang Capacitor with drive pulley
- C-7 B66511 .0005 mf 200 V Tubular
- C-8 17A155 350-430 mmf Trimmer
- C-9, C-10 17A109 2.5-35 mmf Dual Trimmer
- C-11 47X472 40 mmf Silvered mica
- C-12, C-18 D66403 .04 mf 400 V Tubular
- C-13 47X466 68 mmf Moulded
- C-14 47X481 286 mmf Silvered mica
- C-15, C-16 Part of T-2 (1st I.F. Coil Assem.)
- C-19, C-23 47X463 47 mmf Moulded
- C-20, C-21 Part of T-3 (2nd I.F. Coil Assem.)
- C-22 47X471 68 mmf Moulded
- C-24 D-4403 .04 mf 400 V Tubular
- C-25 D66502 .005 mf 400 V Tubular
- C-26 D66104 .10 mf 400 V Tubular
- C-27 D54253 .025 mf 400 V Tubular
- C-28, C-31 D66402 .004 mf 400 V Tubular
- C-29 D56103 .01 mf 400 V Tubular
- C-30A } 40 mf 450 V } Moulded
- C-30B } 45X346 40 mf 450 V } 3 Section Electrolytic
- C-30C } 20 mf 25 V }
- C-32 47X470 330 mmf Moulded
- C-33 B66303 .05 mf 200 V Tubular
- C-34 47X476 100 mmf Moulded

RESISTORS

- B85225 R-1, R-7 2.2 megohms 0.5 W Carbon
- C84393 R-2, R-4 39 K ohms 1.0 W Carbon
- B84393 R-3 39 K ohms 0.5 W Carbon
- B84222 R-5 2200 ohms 0.5 W Carbon
- B85105 R-6 1 megohm 0.5 W Carbon
- B85473 R-8 47 K ohms 0.5 W Carbon
- B84153 R-9 1.5 K ohms 0.5 W Carbon
- 36X358 R-10 .5 megohm Volume control and line switch
- B85106 R-11 10 megohms 0.5 W Carbon
- B85474 R-12, R-16 470 K ohms 0.5 W Carbon
- B84333 R-13 33 K ohms 0.5 W Carbon
- B84823 R-14 82 K ohms 0.5 W Carbon
- *40X276 R-15 3.0 megohms Tone control & Radio-Phono switch
- C84271 R-17 270 ohms 1.0 W Carbon
- 43X213 R-18 2.0 ohms 0.5 W Wire wound
- D84182 R-19 1800 ohms 2.0 W Carbon

DIAL AND DRIVE ASSEMBLY

- 26A400 Dial bracket assembly complete with dial glass, background, diffusers, etc.
- 7A202 Pilot light socket assembly
- No. 47 Pilot light
- Drive cord tension spring
- 46" Drive cord (18 lb. test)
- Pointer
- Drive Shaft
- 19X192 "C" Washer (for drive shaft)
- 6X21 Rubber Grommet } Mfg. Gang Capacitor }
- 20X329 Cond. Cushion Stud }

Speaker 6" PM Dynamic

Selectivity 40 KC Broad at 1000 Times Signal

Sensitivity (For 0.5 Watt Output, with External Antenna)

B Range 9 Microvolts Average

D Range 20 Microvolts Average

Power Consumption (at 117 Volts AC) 40 Watts (normal) 60 Watts (phono operating)

Power Output 4 Watts Maximum 2.3 Watts, 10% Harmonics

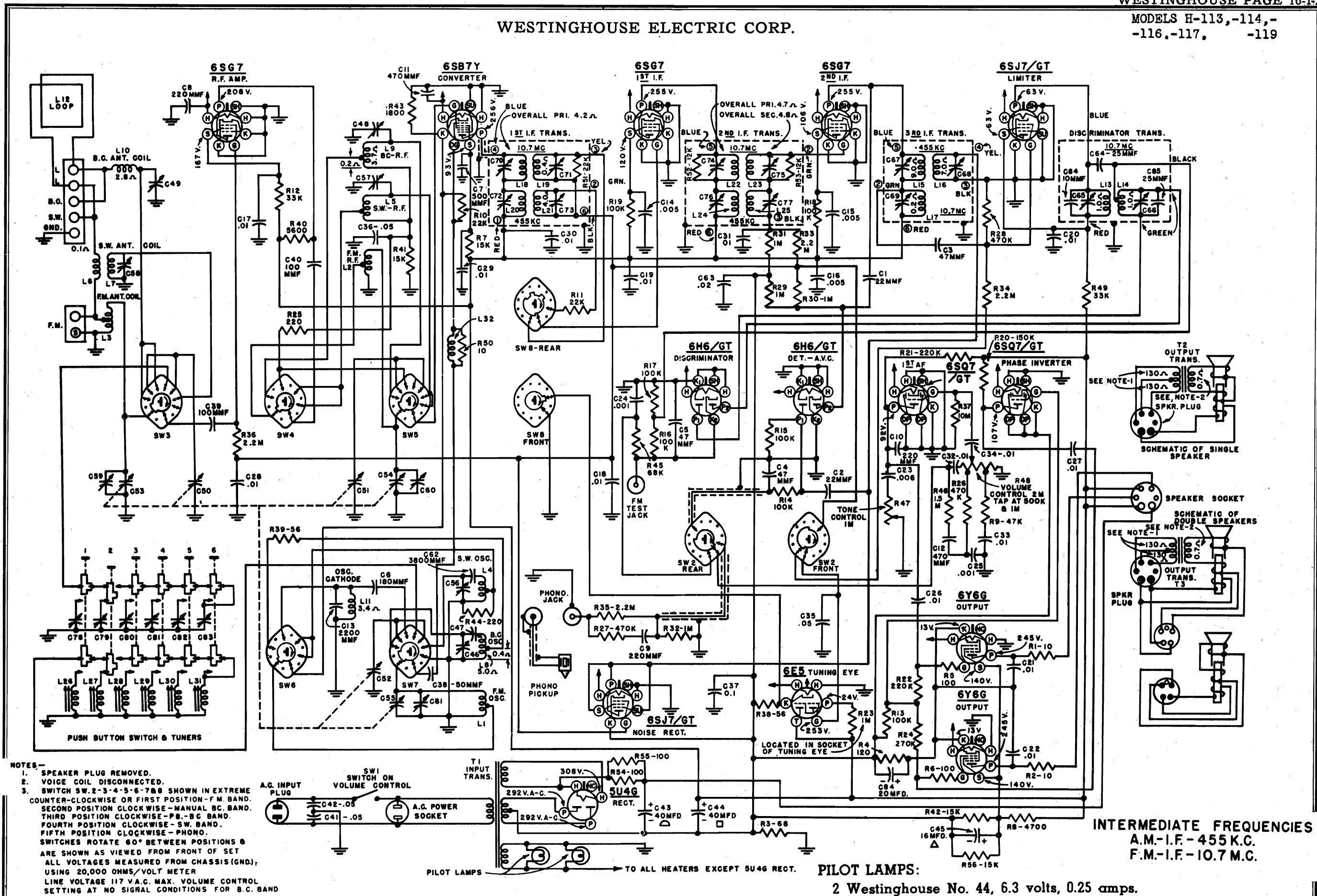
Tuning Frequency Range

B Range 540-1600 Kilocycles

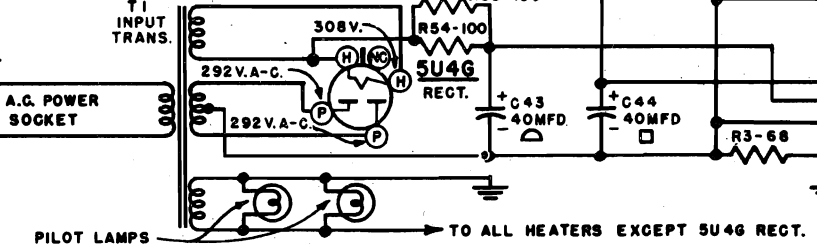
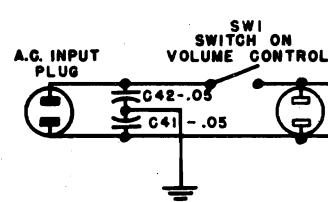
D Range 9-15.5 Megacycles

WESTINGHOUSE ELECTRIC CORP.

MODELS H-113,-114,-116,-117,-119



NOTES—
 1. SPEAKER PLUG REMOVED.
 2. VOICE COIL DISCONNECTED.
 3. SWITCH SW. 2-3-4-5-6-7-8 SHOWN IN EXTREME COUNTER-CLOCKWISE OR FIRST POSITION—F.M. BAND. SECOND POSITION CLOCKWISE—MANUAL B.C. BAND. THIRD POSITION CLOCKWISE—P.B.—B.C. BAND. FOURTH POSITION CLOCKWISE—S.W. BAND. FIFTH POSITION CLOCKWISE—PHONO. SWITCHES ROTATE 60° BETWEEN POSITIONS & ARE SHOWN AS VIEWED FROM FRONT OF SET ALL VOLTAGES MEASURED FROM CHASSIS (GND), USING 20,000 OHMS/VOLT METER LINE VOLTAGE 117 V.A.C. MAX. VOLUME CONTROL SETTING AT NO SIGNAL CONDITIONS FOR B.C. BAND

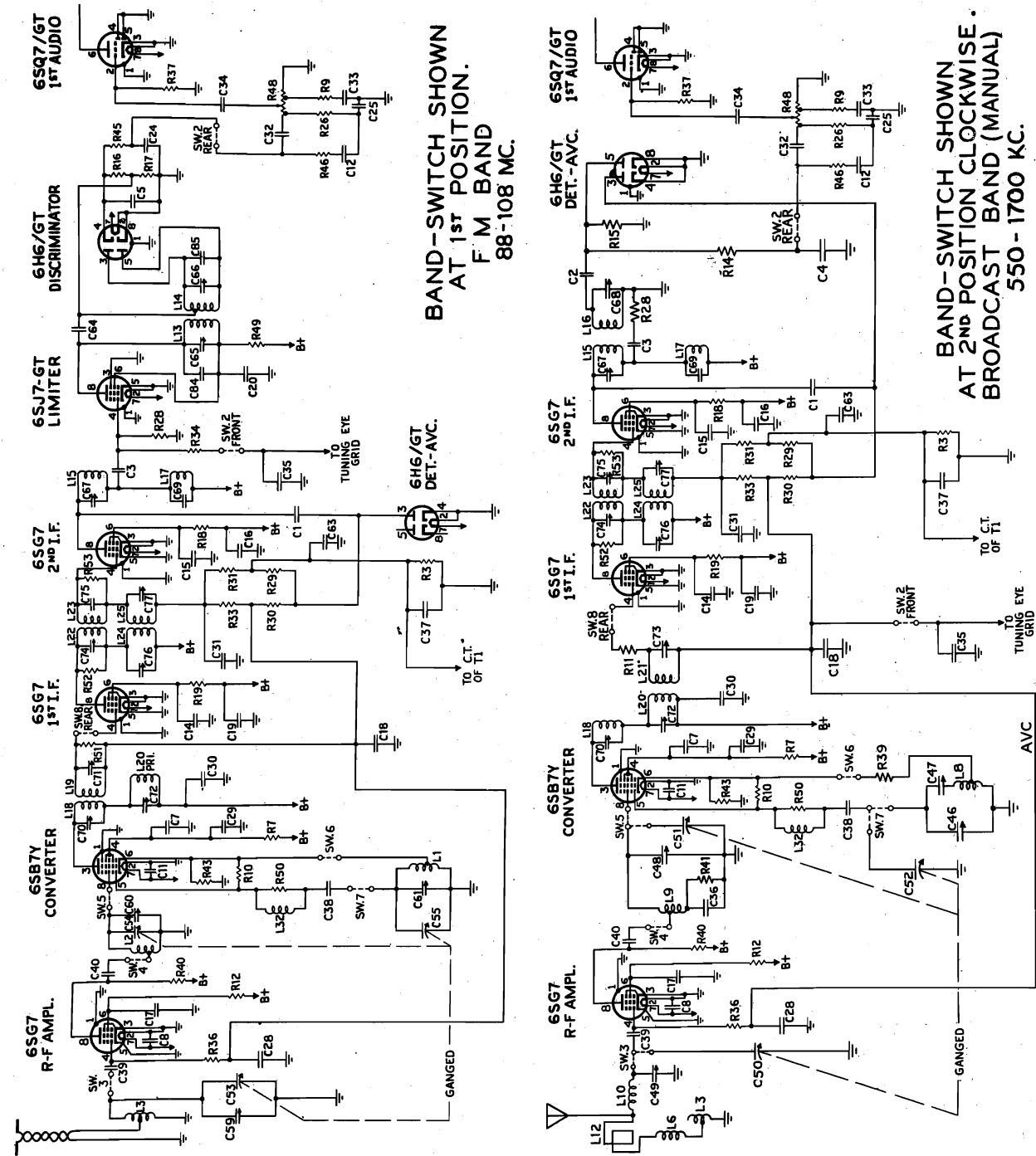


PILOT LAMPS:
 2 Westinghouse No. 44, 6.3 volts, 0.25 amps.

INTERMEDIATE FREQUENCIES
 A.M.—I.F.—455 K.C.
 F.M.—I.F.—10.7 M.C.

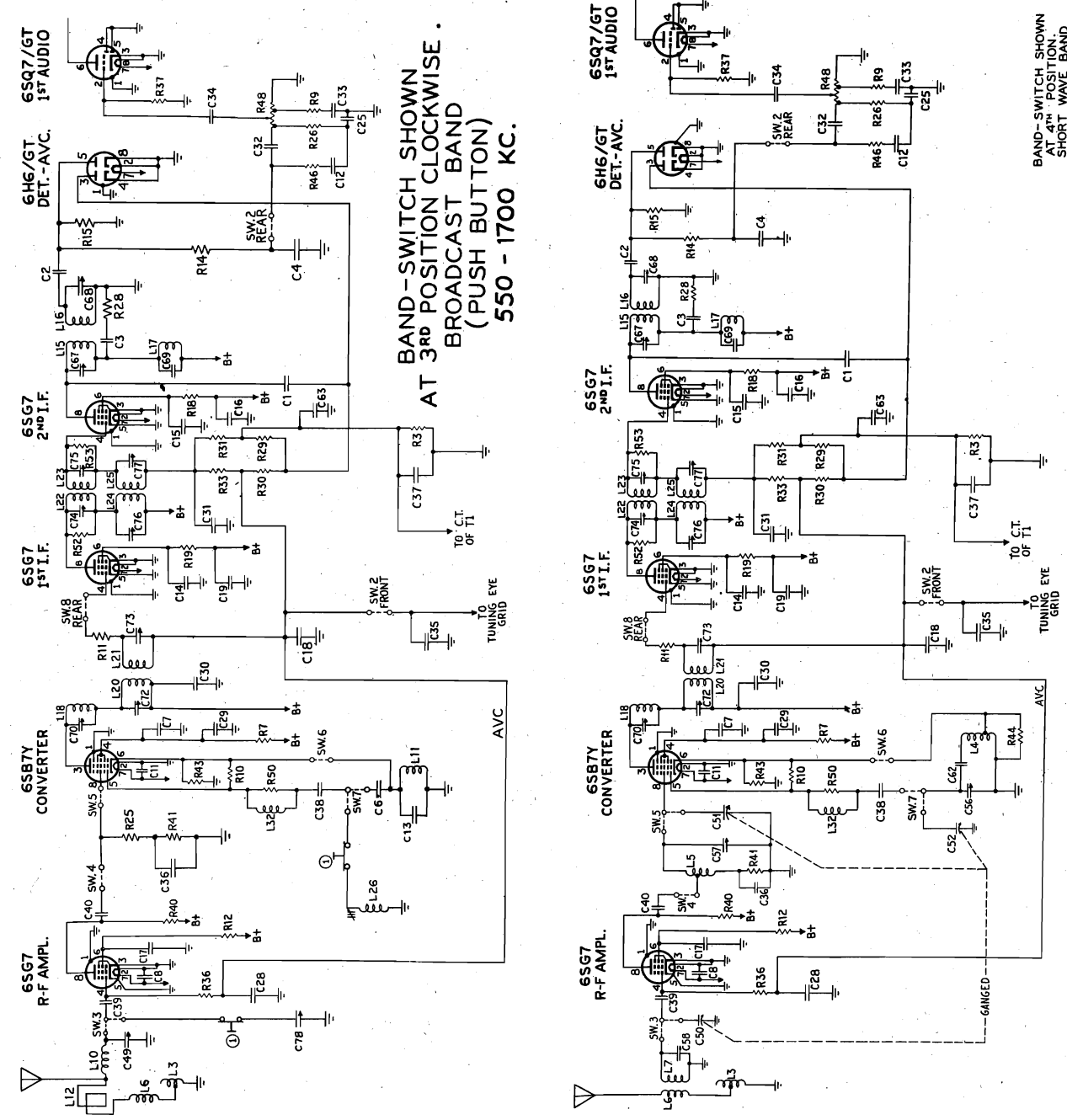
WESTINGHOUSE ELECTRIC CORP.

MODELS H-113, -114, -116, -117, -119

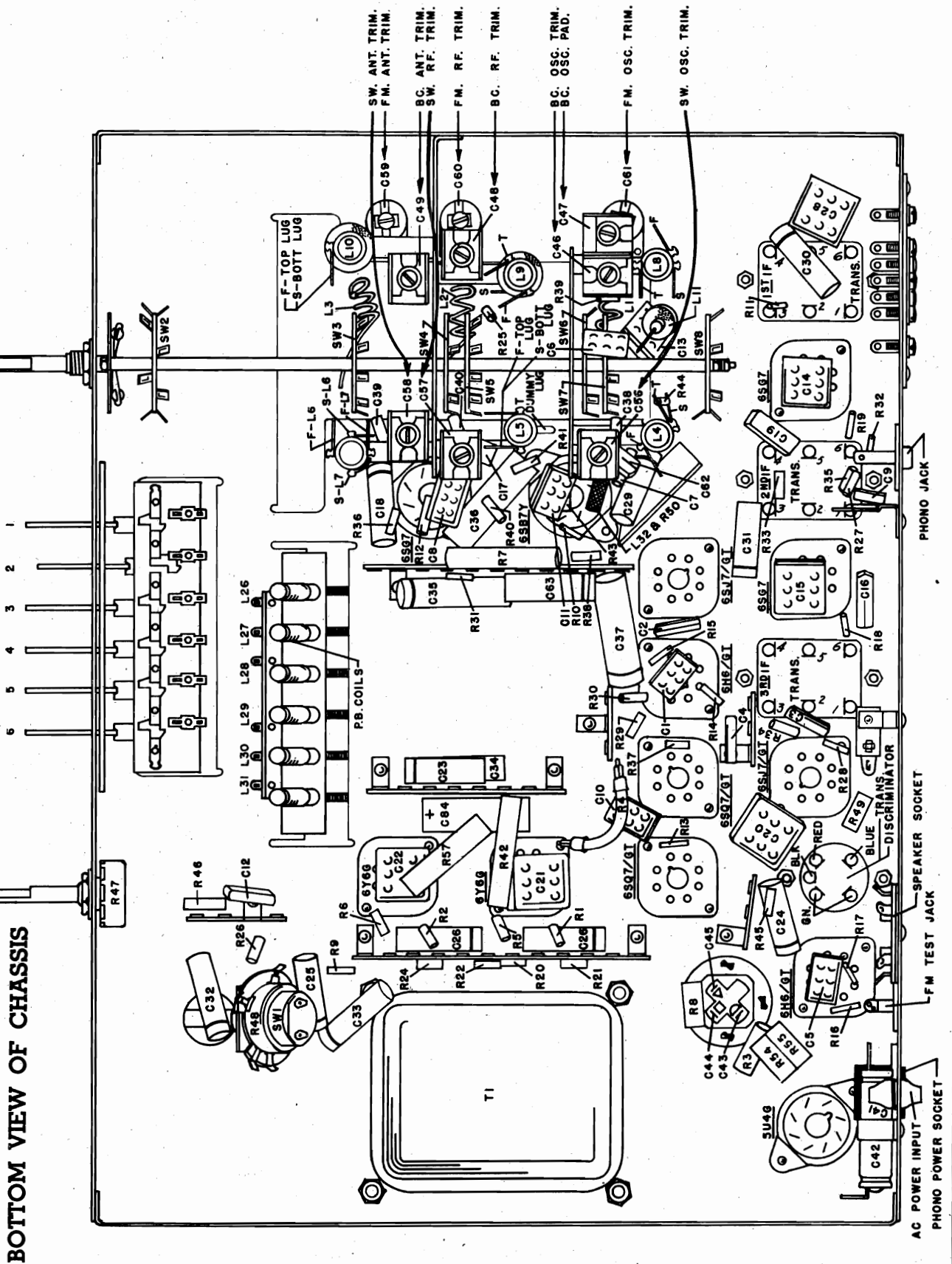


WESTINGHOUSE ELECTRIC CORP.

MODELS H-113, -114, -116, -117, -119

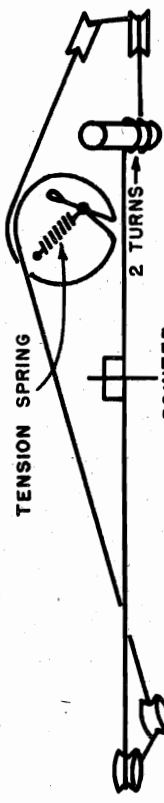
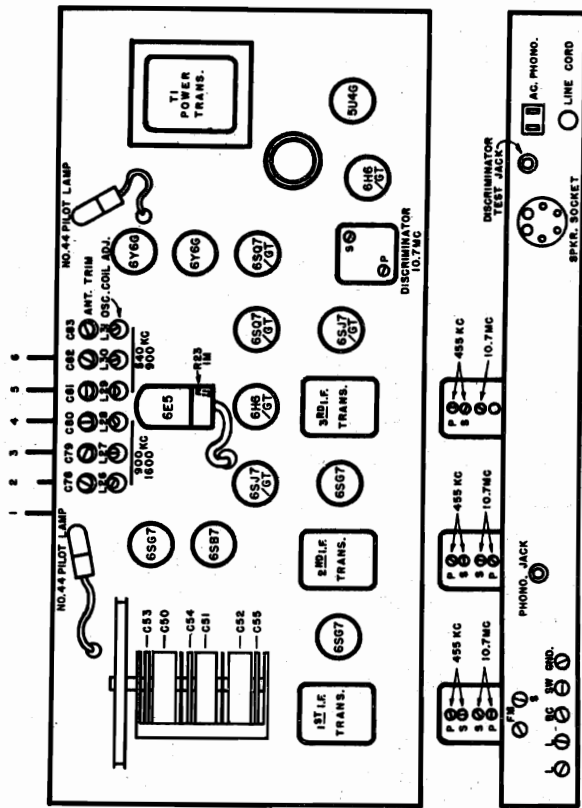


WESTINGHOUSE ELECTRIC CORP. MODELS H-113, -114, -116, -117, -119



BOTTOM VIEW OF CHASSIS

CHASSIS LAYOUT



ALIGNMENT
BROADCAST AND SHORT WAVE BANDS
AMPLITUDE MODULATION

Connect an output meter across the speaker voice coil. With the volume control set for maximum output and the signal from the generator attenuated to avoid A.V.C. action, proceed as follows:

Step	Connect Signal Generator to—	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set Phono-Band switch to "BC"			
2	Set Phono-Band switch to "BC"	455 kc	550 kc	455 kc secondary and primary trimmers of 3rd I.F. transformer for maximum output.
3	6S07, 2nd I.F. control grid through a .01 mid capacitor	455 kc	550 kc	455 kc secondary and primary trimmers of 2nd I.F. transformer for maximum output.
4	6S07, 1st I.F. control grid through a .01 mid capacitor	455 kc	550 kc	455 kc secondary and primary trimmers of 1st I.F. transformer for maximum output.
5	6S87Y, converter, control grid through a .01 mid capacitor	455 kc	550 kc	carefully "peak" all 455 kc I.F. transformer trimmers for maximum output.
6	BC antenna terminal through a 200 mmf capacitor	600 kc	800 kc	BC oscillator paddler for maximum output.
7	BC antenna terminal through a 200 mmf capacitor	1600 kc	1600 kc	BC oscillator trimmer for maximum output.
8	Re-check steps 6 and 7			
9	Radiated signal (no connection)	1400 kc	1400 kc	BC R-F and ANT trimmers for maximum output.
10	Set Phono-Band switch to "S.W."			
11	SW antenna terminal through a 400 ohm resistor	18.0 mc	18.0 mc	SW oscillator trimmer for maximum output. NOTE: If the signal is heard at two different trimmer settings, the one nearest minimum capacity is correct—the other is the image. SW R-F and ANT trimmers for maximum output.
12	Radiated signal (no connection)	16.0 mc	16.0 mc	

F. M. BAND

FREQUENCY MODULATION

Connect a 20,000 ohms-per-volt or Vacuum Tube Voltmeter between the Discriminator Test Jack and the chassis. With the volume control set for maximum output and the signal from the generator attenuated to avoid A.V.C. action, proceed as follows:

Step	Connect Signal Generator to—	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set Phono-Band switch to "F.M."			
2	Set Phono-Band switch to "F.M."			
3	6S07, 2nd I.F. control grid through a .01 mid mica capacitor	UNMODULATED 10.7 mc	88 mc	10.7 mc primary trimmer of 3rd I.F. trans. for maximum voltage.
4	6S07, 1st I.F. control grid through a .01 mid mica capacitor	UNMODULATED 10.7 mc	88 mc	10.7 mc secondary and primary trimmers of 2nd I.F. trans. for maximum voltage.
5	Fixed plates of the FM converter tuning capacitor through a .01 mid mica capacitor	UNMODULATED 10.7 mc	88 mc	10.7 mc secondary and primary trimmers of 1st I.F. transformer for maximum voltage.
6	Fixed plates of the FM converter tuning capacitor through a .01 mid mica capacitor	UNMODULATED 10.7 mc	88 mc	carefully "peak" all 10.7 mc I.F. trimmers for maximum voltage.
7	FM antenna terminal through a non-inductive 300 ohm resistor	UNMODULATED 105 mc	105 mc	FM oscillator trimmer for maximum voltage.
8	FM antenna terminal through a non-inductive 300 ohm resistor	UNMODULATED 105 mc	105 mc	FM R-F and ANT trimmers for maximum voltage.
9	Fixed plates of the FM converter tuning capacitor through a .01 mid mica capacitor	UNMODULATED 10.7 mc	88 mc	Primary trimmer of discriminator transformer for maximum voltage.
10	Fixed plates of the FM converter tuning capacitor through a .01 mid mica capacitor	UNMODULATED 10.7 mc	88 mc	Secondary trimmer of discriminator transformer for zero voltage. The voltage will change polarity as the trimmer is tuned through resonance. Tune carefully for zero voltage.
11	Re-check steps 9 and 10.			

- LOUDSPEAKER:**
H-113, H-114, H-119:
Size and Type (1) 12" Electro-Dynamic
Field Resistance 250 ohms
Voice Coil Impedance 8 ohms
- H-116, H-117:
Size and Type (2) 8" Electro-Dynamic
Field Resistance 500 ohms
Voice Coil Impedance 3.2 ohms
- SPECIAL PROVISIONS:**
H-113, H-114:
Phonograph, playback of wire recording and television sound input connection, A-C outlet for phonograph motor at rear of chassis.
H-116, H-117, H-119:
Playback of wire recording and television sound input connection at rear of chassis.
- POWER OUTPUT**
Undistorted 14 watts
Maximum 25 watts
- FREQUENCY RANGES:**
Standard Broadcast 550 to 1700 kc.
International Short Wave 5.0 to 18.0 mc.
Frequency Modulation 88 to 108 mc.
- POWER SUPPLY RATING:** 105-120 volts, 50-60 cycles A-C
- POWER CONSUMPTION (radio sect. only):** 175 watts

INTERMEDIATE FREQUENCY
455 KC.

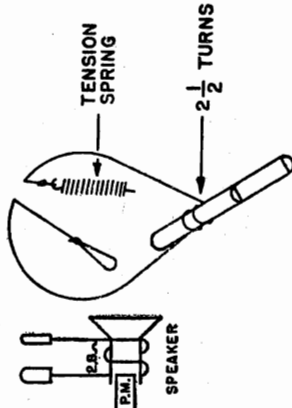
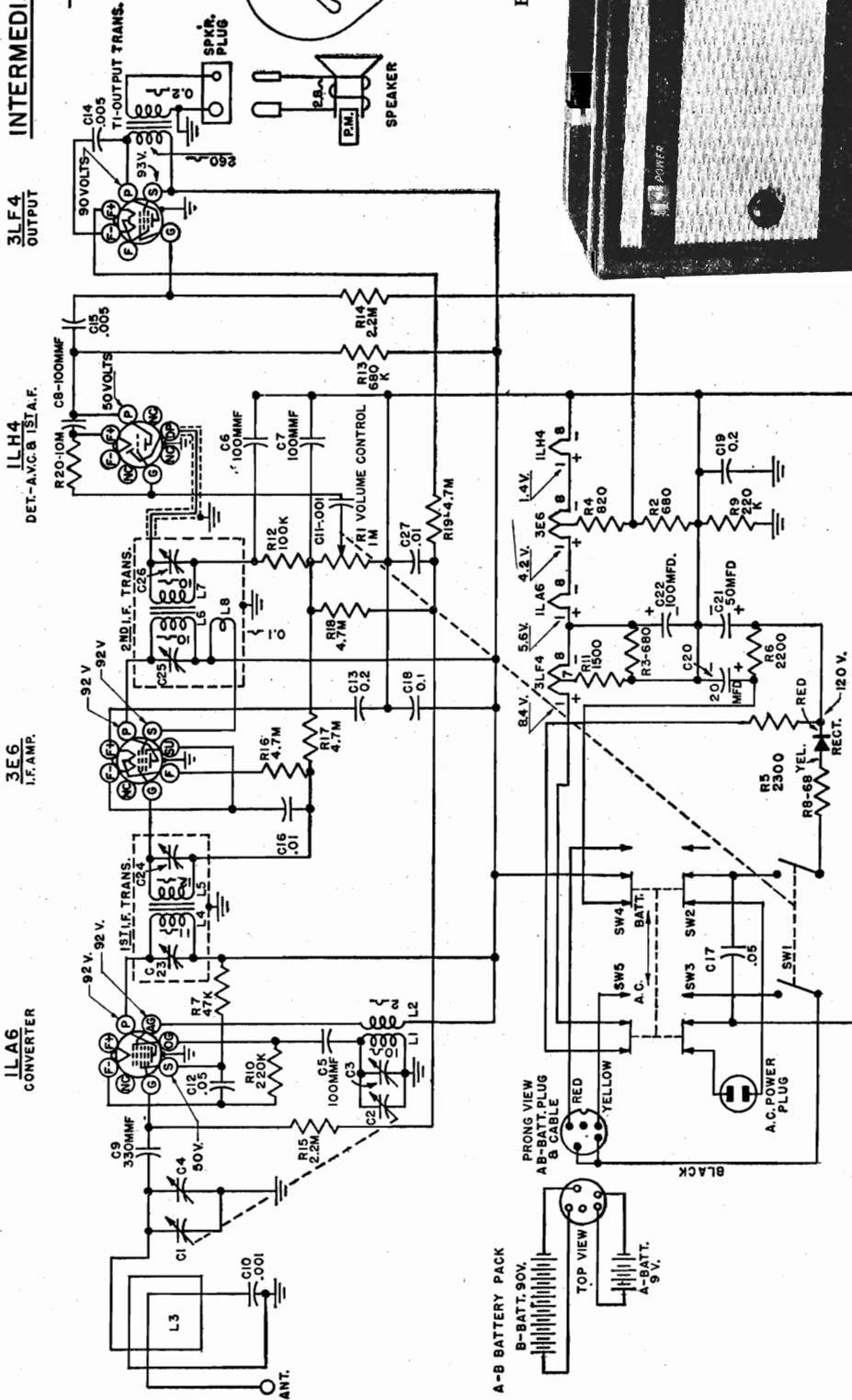
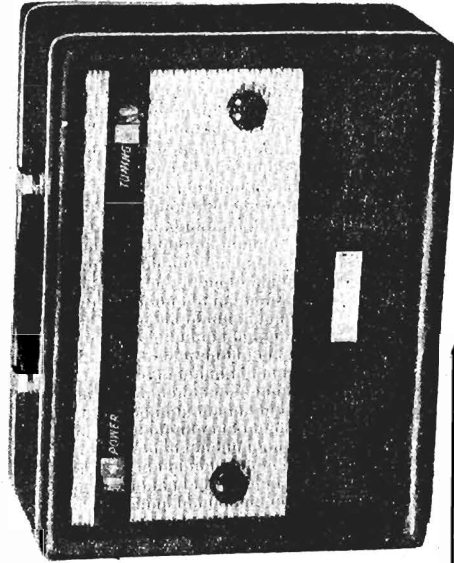


Fig. 3 -- DIAL DRIVE MECHANISM

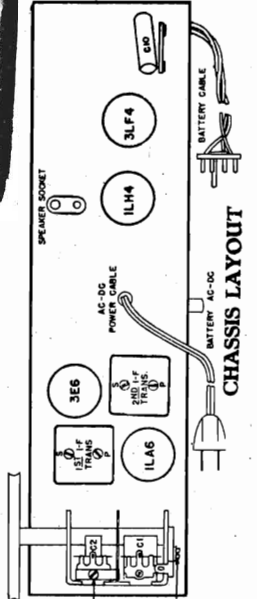


POWER OUTPUT:
Undistorted 200 milliwatts
Maximum 400 milliwatts

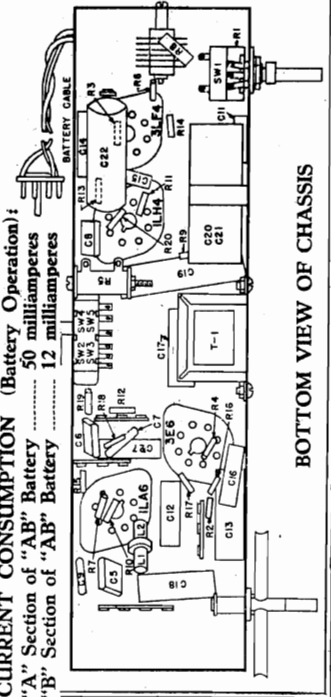
LOUDSPEAKER:
Size and Type 4" P. M
Voice Coil Impedance 3.2 ohms

NOTES:
1. SWITCHES "SW 2-3-4-5" ARE SHOWN IN A.C. POSITION.
2. VOLTAGES MEASURED FROM COMMON NEGATIVE USING A 20,000 OHM/VOLT METER. (A.C. OPERATION - 115 V. LINE.)

CURRENT CONSUMPTION (Battery Operation):
"A" Section of "AB" Battery 50 milliamperes
"B" Section of "AB" Battery 12 milliamperes



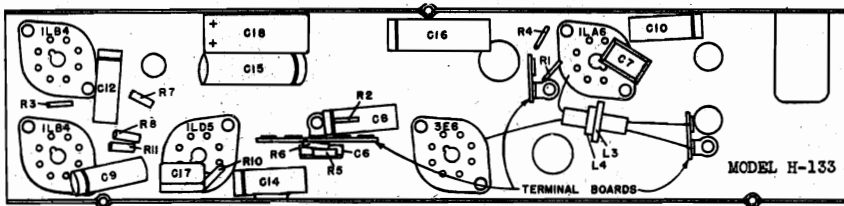
CHASSIS LAYOUT



BOTTOM VIEW OF CHASSIS

MODEL H-133
MODEL H-148

WESTINGHOUSE ELECTRIC CORP.



MODEL H-133 ALIGNMENT MODEL H-148

Before beginning alignment, make certain that the dial pointer aligns with the dot on the extreme high-frequency end of the dial when the tuning capacitor is set for minimum capacity.

Connect an output meter across the speaker voice coil.

While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid A.V.C. action.

Step	Connect Signal Generator to—	Signal Generator Frequency	Radio Dial Setting	Adjust
1	3E6 control grid through 0.1 mfd capacitor	455 kc	550 kc	Secondary and Primary trimmers of 2nd I-F trans. for max. output.
2	1LA6 control grid through 0.1 mfd capacitor	455 kc	550 kc	Secondary and Primary trimmers of 1st I-F trans. for max. output.
3	Antenna terminal through 200 mmf capacitor	455 kc	550 kc	"Peak" all I-F trimmers.
4	Antenna terminal through 200 mmf capacitor	*1700 kc	*1700 kc	Oscillator trimmer for max. output.
5	Antenna terminal through 200 mmf capacitor	1400 kc	1400 kc	Antenna trimmer for max. output.

*1600 KC for Model H-148; rest of alignment the same

When ordering parts specify model number of set in addition to part number and description of part.

- Part Number Description
- V-3603 Background, dial
- V-4521 Baffle and Grille Cloth Assy.
- V-3594 Battery, "A-B" (1½ v. & 90 v.)
- V-3395 Battery, "C" (4½ v.)
- V-3590 Bracket var. cap. mtg.
- V-1112-2 Cabinet
- V-3589 Capacitor, variable, 2 gang (C1, C2, C3, C4)
- RCP10W2503A Capacitor, 0.05 mfd, 200 v. (C5)
- RCP10W2503A Capacitor, 47 mmf. (C6, C7)
- RCP10W4103A Capacitor, 0.01 mfd, 400 v. (C8, C9, C10)
- RCP10W4103K Capacitor, 0.001 mfd, 600 v. (C11, C12)
- RCP10W4103K Capacitor, 470 mmf. (C13)
- RCP10W3204A Capacitor, 0.02 mfd, 600 v. (C14)
- RCP10W3204A Capacitor, 0.1 mfd, 200 v. (C15, C16)
- RCM20A101M Capacitor, 100 mmf. (C17)
- V-0581 Capacitor, electrolytic, 10 mfd, 150 v. (C18)
- V-4783 Capacitor, 4.7 mmf. (C18—not used on all chassis)
- V-3582 Clamp, dial mtg.
- V-3567 Coil, antenna (L1, L2)
- V-3582 Coil, oscillator (L3, L4)
- V-3584 Control, volume, 1 meg. (R12) with switch (SW1)
- V-4157S-66 Cord, dial drive
- V-3586 Decal, OFF
- V-3680 Decal, TONE
- V-3862 Decal, STATIONS
- V-3865 Decal, WESTINGHOUSE
- V-3989 Decal, glass

- Part Number Description MODEL H-133
- V-3489 Foot, felt
- V-3628 Grommet, variable cap. mtg.
- V-3622 Jumper, "C" battery
- V-3331-1 Knob, volume (including spring)
- V-3331-2 Knob, tuning (including spring)
- V-3331-3 Knob, tone (including spring)
- Form B3466 Operating Instructions
- V-4896 Plug, battery cable
- V-4897 Plug and Cable Assy., battery
- V-3559 Pointer Assy.
- V-3188S Pulley, 7/16" dia.
- RC10AE224M Resistor, 220K ¼ w. (R1)
- RC10AE105M Resistor, 1.0 meg. ¼ w. (R2, R3)
- RC10AE583M Resistor, 58K ¼ w. (R4)
- RC10AE235M Resistor, 2.2 meg. ¼ w. (R5, R6, R7, R8)
- RC10AE101M Resistor, 100 ohms ¼ w. (R9)
- RC10AE105M Resistor, 10 meg. ¼ w. (R10)
- RC10AE334M Resistor, 330K ¼ w. (R11)
- V-3755S-10 Screw, chassis mtg.
- V-3573 Socket, loctal tube
- V-3601 Speaker, 5¼" P.M.
- V-3248S Spring, dial drive
- V-3551 Stud and Bracket Assy., pulley
- V-3583 Switch, tone control (SW2)
- V-3674 Terminal Board, 2 lugs
- V-3675 Terminal Board, 5 lugs
- V-3676 Transformer, output (T1)
- V-3577 Transformer, 1st I-F.
- V-3578 Transformer, 2nd I-F.
- V-3227 Washer, cap. var. cap. mtg.
- V-3752S Washer, felt
- V-3675-4 Washer, chassis mtg.

- V-3900 Strip, plastic, loop mtg.
- V-3872 Switch, battery AC-DC (SW2, SW3, SW4, SW5)
- V-4116S Terminal Board, 1 lug
- V-3664 Terminal Board, 2 lugs
- V-3642 Terminal Board, 3 lugs
- V-3665 Terminal Board, 4 lugs
- V-3877 Transformer, 1st I-F (L4, L5, C23, C24)
- V-3876 Transformer, 2nd I-F (L6, L7, C25, C26)
- V-3668 Transformer, output
- V-3667 Washer, phenolic (resistor mtg.)
- V-3752S Washer, felt
- V-3919 Washer, flat (chassis mtg.)
- V-3900 Strip, decorative power and tuning

MODEL H-148

- PART NO. DESCRIPTION
- V-3881 Baffle and Grille Cloth Assy.
- V-3920 Battery Pack, "AB" (9 v. and 90 v.)
- V-3323 Bearing, tuning shaft
- V-3944 Bracket Assy. (OFF-ON)
- V-3857 Bracket, variable capacitor mtg.
- V-1114 Cabinet
- V-3558 Capacitor, variable 2 gang (C1, C2, C3)
- V-4542 Capacitor, Antenna trimmer (C4)
- RCM20A101M Capacitor, 100 mfd mica (C5, C6, C7, C8)
- RCM20A331M Capacitor, 330 mfd mica (C9)
- RCP10W6102A Capacitor, .001 mfd 600 v. (C10, C11)
- RCP10W2503A Capacitor, .05 mfd 200 v. (C12)
- RCP10W2204A Capacitor, 0.2 mfd 200 v. (C13)
- RCP10W6502A Capacitor, .005 mfd 600 v. (C14, C15)
- RCP10W4103A Capacitor, .01 mfd 400 v. (C16, C17)
- RCP10W4503A Capacitor, .05 mfd 400 v. (C17)
- RCP10W4104A Capacitor, 0.1 mfd 400 v. (C18)
- RCP10W4204K Capacitor, 0.2 mfd 400 v. (C19)
- V-3861 Capacitor, electrolytic, 20 mfd 150 v. (C20) 50 mfd 150 v. (C21)
- V-3866 Capacitor, electrolytic cartridge 100 mfd 25 v. (C22)
- V-3697 Channel, decorative strip mtg.
- V-3337 Clamp, cable
- V-3886 Clamp, handle
- V-3862 Clamp, spring (electrolytic cap. mtg.)
- V-3645 Coil, oscillator (L1, L2)
- V-3852 Control, volume (R1) with switch (SW1)
- V-4349-1 Cord, A-C power
- V-4157S-15 Cord, dial drive
- V-3878 Decal, OFF-ON
- V-3859 Dial
- V-3885 Foot, felt
- V-3698 Grille
- V-3766 Grommet, fiber
- V-3880 Grommet, rubber, square
- V-3901 Handle
- V-3912 Knob, tuning and volume
- V-3914 Label, tube layout
- V-6265 Latch Assy., back cover
- V-3915 Loop, antenna (L3)
- V-3894 Name Plate
- V-3904 Panel, metal
- V-3874 Plug and Cable, Assy., battery
- V-4115 Rectifier, selenium
- RC10AE681K Resistor, 680 ohms ¼ w. (R2, R3)
- RC10AE321K Resistor, 320 ohms ¼ w. (R4)
- V-3869 Resistor, ballast, 2300 ohms 5 w. (R5)
- RC10AE222K Resistor, 2200 ohms ¼ w. (R6)
- RC10AE473K Resistor, 47K ¼ w. (R7)
- RC40AE650M Resistor, 65 ohms 2 w. (R8)
- RC40AE224M Resistor, 220K ¼ w. (R9, R10)
- RC10AE192K Resistor, 1900 ohms ¼ w. (R11)
- RC10AE104K Resistor, 100K ¼ w. (R12)
- RC10AE694K Resistor, 690K ¼ w. (R13)
- RC10AE225M Resistor, 2.2M ¼ w. (R14, R15)
- RC10AE475K Resistor, 4.7M ¼ w. (R16, R17, R18, R19)
- RC10AE106M Resistor, 10M ¼ w. (R20)
- V-3960 Shaft, tuning
- V-3899 Shield, plastic front
- V-3871 Shield, spiral
- V-3870-1 Socket, lock in
- V-3299 Socket, speaker
- V-4114 Spacer, sleeve
- V-3917 Speaker, 4" P.M.
- V-3650 Spring, OFF-ON
- V-3655 Spring, coil, for OFF-ON switch
- V-3248S Spring, dial drive
- V-3900 Strip, decorative power and tuning

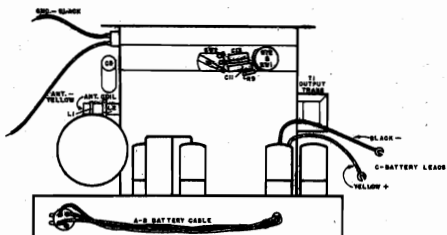
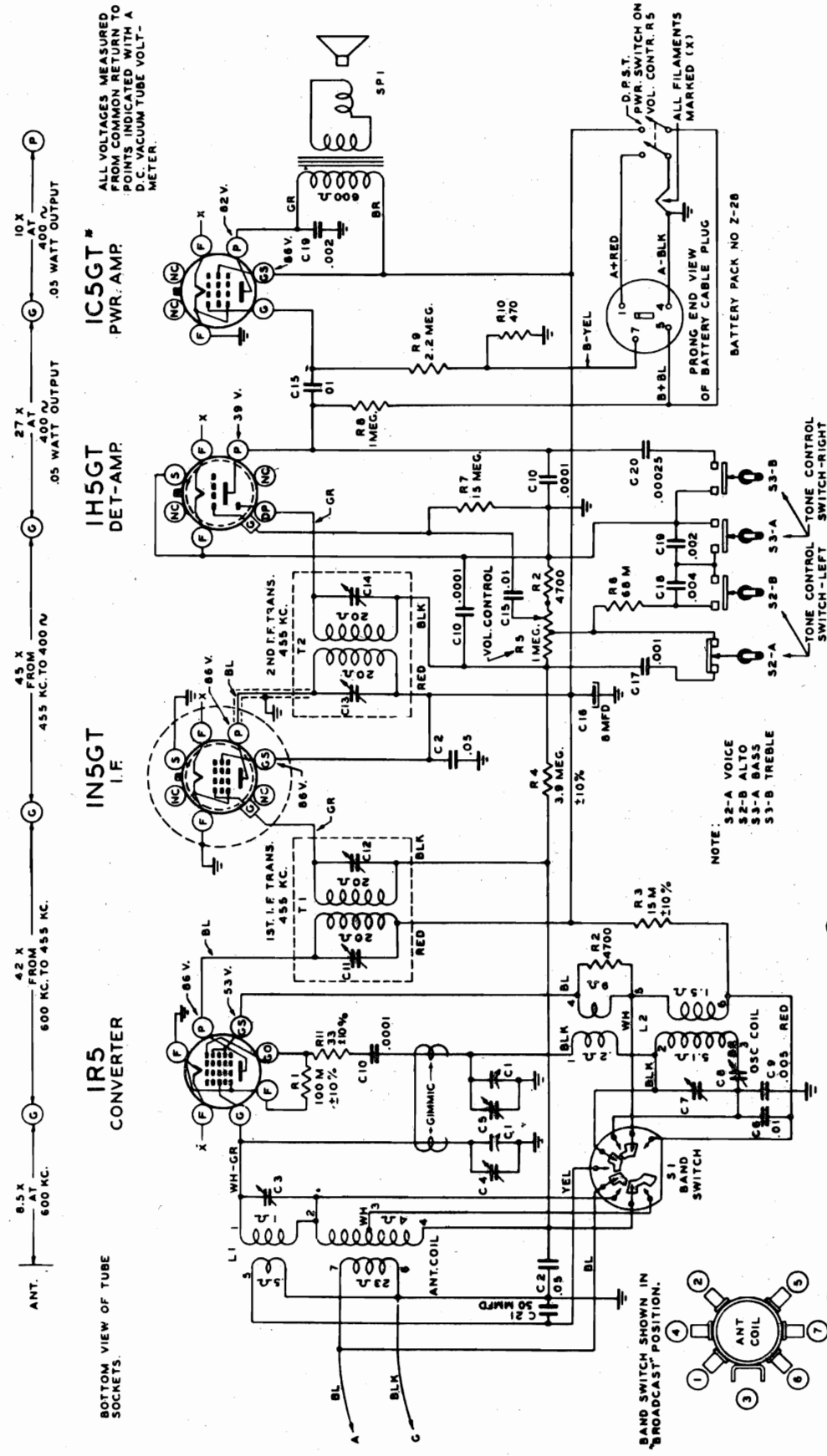


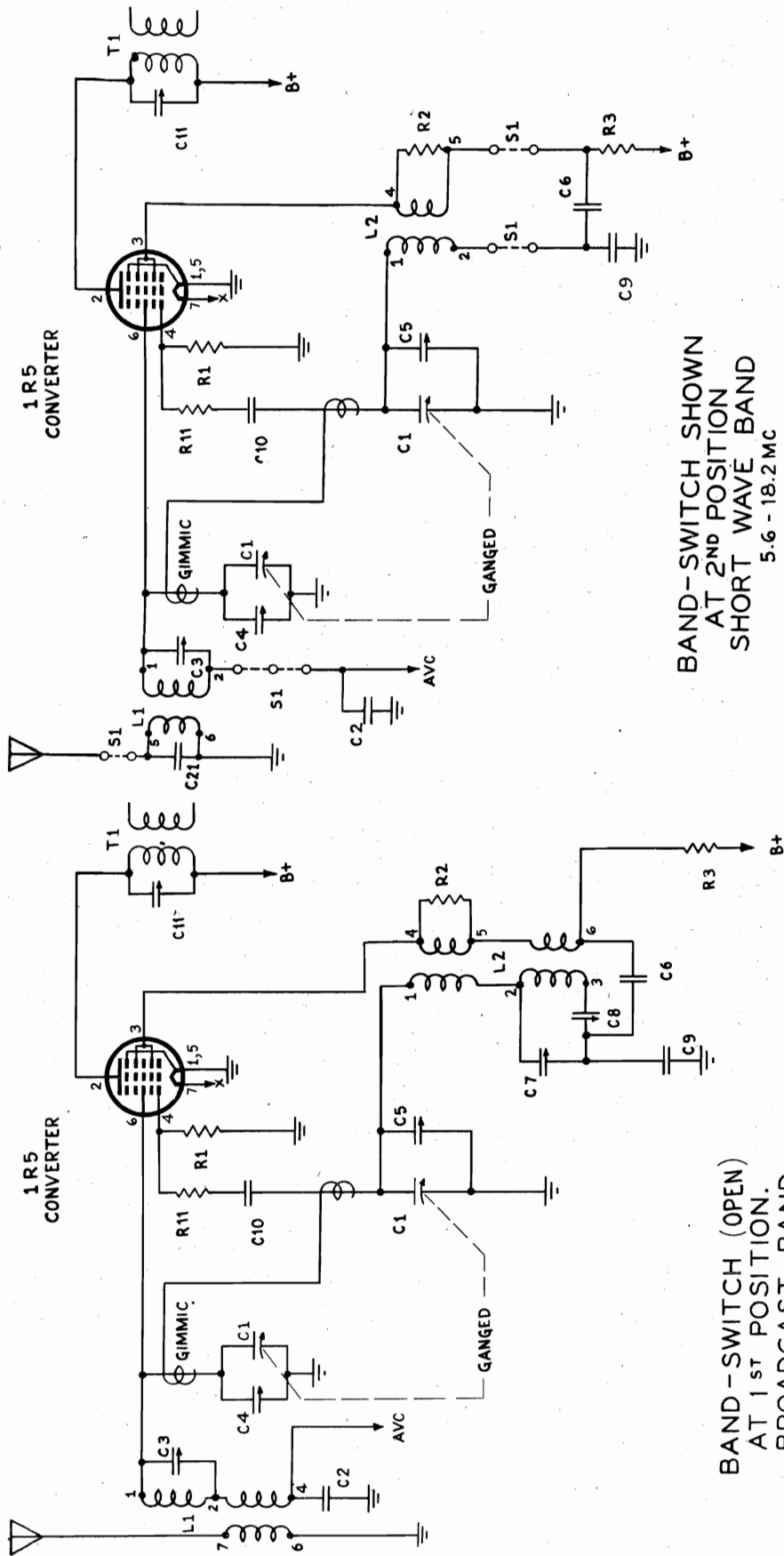
FIG. 3—REAR VIEW OF CHASSIS



IF FREQUENCY 455 KC.
 TUNING RANGE 540 KC.-1620 KC.
 TUNING RANGE 5600 KC.-18200 KC.

ALL RESISTORS ±20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

"clarified schematics"



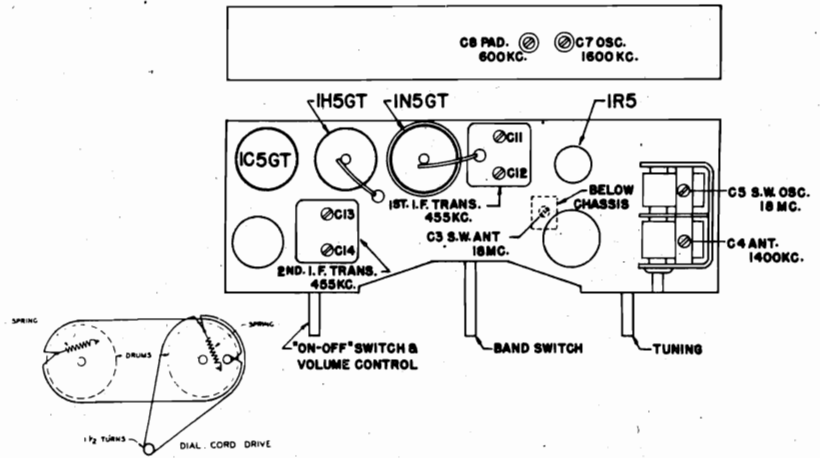
BAND-SWITCH SHOWN
AT 2ND POSITION
SHORT WAVE BAND
5.6 - 18.2 MC

BAND-SWITCH (OPEN)
AT 1ST POSITION.
BROADCAST BAND
540 - 1620 KC

TO THE SERVICE MAN:

The alignment of this receiver is conventional. An output meter, connected across the voice coil of the speaker, is very helpful in making correct adjustments.

The Guardian Reminder Circuit consist of a 4700 ohm resistor (R2) in series with the low side of the volume control. With this circuit, it is impossible to turn the volume completely off and leave the power on. In some cases where the minimum volume is too high even at the lowest setting of the volume control, R2 may be changed to a lower value or shorted out completely.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	BAND	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	BC	600 Kc.	C-11, C-12, C-13, C-14	Align I.F.
2	Ant.-Gnd.	400 ohms	18 Mc.	SW	18 Mc.	C-5	Set Osc. to Scale
3	Ant.-Gnd.	400 ohms	400 ohms	SW	Rock Gang 18 Mc.	C-3	Align Antenna
4	Ant.-Gnd.	200 Mmf.	1600 Kc.	BC	1600 Kc.	C-7	Set Osc. to Scale
5	Ant.-Gnd.	200 Mmf.	1400 Kc.	BC	1400 Kc.	C-4	Align Antenna
6	Ant.-Gnd.	200 Mmf.	600 Kc.	BC	Rock Gang 600 Kc.	C-8	Adjust Padder

DIAL ASSEMBLY

26-342	Dial Scale.....	.32
46-443	Radiogram Knob (Voice).....	.07
46-444	" " (Treble).....	.07
46-445	" " (Alto).....	.07
46-446	" " (Bass).....	.07
59-122	Off & ON Indicator.....	.12
59-160	Dial Pointer.....	1.14
76-335	Tuning Control Shaft.....	.07
80-183	Indicator Spring.....	.024
80-209	Dial Cord Tension Spring.....	.024
80-471	Tuning Shaft Spring.....	1.31C
93-690	Felt Washer (S-11362).....	.60C
192-90	Dial Crystal.....	.50
196-64	Dial Crystal Gasket.....	.08
39588	Indicator Cam Assem.....	.07
39610	Dial Cord & Eyelet (Pointer).....	.12
39733	Dial Cord & Eyelet (Gang Cond.).....	.07
39751	Pulley & Rivet Assem. (Gang Cond.).....	.12
311362	Pulley & Bushing Assem. (Pointer).....	.11
311558	Vol. & Tuning Knob Assem. (2 used) [46-520].....	.28
312305	Band Switch Knob Assem. (46-598).....	.32

COILS & CHOKES

95-838	1st I.F. Transformer (T1).....	1.77
95-839	2nd I.F. Transformer (T2).....	1.77
39829	Osc. Coil Assem. (L2).....	1.39
39832	Ant. Coil Assem. (L1).....	1.39

CONDENSERS

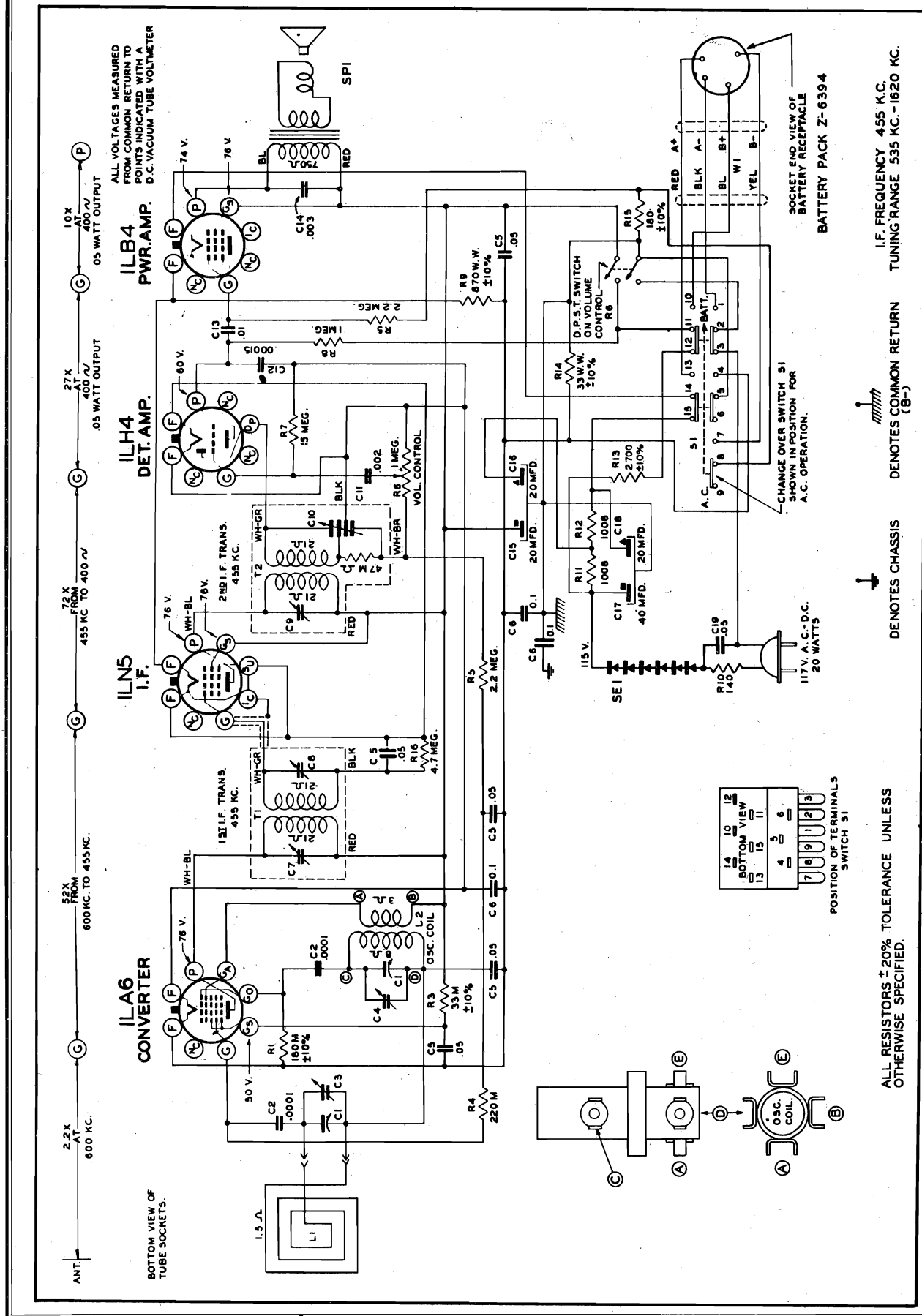
22-162	.0001 Mfd. (C10).....	600 V. .20
22-182	.00025 Mfd. (C20).....	600 V. .26
22-196	.01 Mfd. (C15).....	600 V. .20
22-448	.004 Mfd. (C18).....	600 V. .20
22-492	.002 Mfd. (C19).....	600 V. .20
22-684	Dry Electrolytic 8 Mfd. (C16).....	150 V. .45
22-826	.01 Mfd. (C6).....	200 V. .20
22-829	.05 Mfd. (C2).....	200 V. .20
22-887	.001 Mfd. (C17).....	600 V. .20
22-1022	.005 Mfd. (C9).....	600 V. .38
22-1206	Two Section Gang (C1).....	2.56
22-1239	Two Section Trimmer (C7 & C8).....	.58
22-1240	Single Section Ceramic Trimmer (C3).....	.20
22-1532	50 Mmf. (C21).....	500 V. .20

RESISTORS

63-260	100M Ohm (R1).....	1/4 Watt .09
63-271	1 Megohm (R8).....	1/4 " .09
63-311	15M Ohm (R3).....	1/4 " .09
63-581	470 Ohm (R10).....	1/4 " .09
63-587	4700 Ohm (R2).....	1/4 " .09
63-594	68M Ohm (R6).....	1/4 " .09
63-600	2.2 Megohm (R9).....	1/4 " .09
63-620	33 Ohm (R11).....	1/4 " .09
63-669	3.9 Megohm (R4).....	1/4 " .09
63-976	15 Megohm (R7).....	1/4 " .09
63-1236	Volume Control & Switch (R5).....	1.81

MISCELLANEOUS

49-522	6 1/2" P.M. Speaker.....	10.00
	206-522 Output Transformer.....	2.21
	208-522 Cone & Voice Coil.....	2.09
	Speaker Cable.....	.19
52-190	#6-32 x 1/4 x 3/32 Hex Nut.....	.31C
54-34	Antenna Marker.....	.024
57-11A	Ground Marker.....	.024
57-900	Dial Mtg. Plate.....	.35
57-1159	Radiogram Escutcheon Plate (2 used).....	.18
58-74	Battery Cable Plug.....	.12
70-124	#2 x 3/8 Phillips Hd. Wood Screw - Brass Plated (57-1159).....	1.70C
78-436	Miniature Tube Socket.....	.19
78-611	Octal Base Tube Socket.....	.12
95-279	Band Selector Switch.....	.72
85-284	Radiogram Switch L.H. (Voice & Alto).....	.55
85-288	Radiogram Switch R.H. (Treble & Bass).....	.55
93-125	#6 Internal Shakeproof Lockwasher.....	.31C
93-258	Brown Felt Washer (Knobs).....	.78C
94-29F	Steel Bushing (Radiogram) (4 used).....	.036
112-56	#6-1/4 Hex Hd. Self Tapping Screw.....	.55C
114-67	#6-32 x 7/16 Hex Acorn Hd. M.S. Steel N.P. (Radiogram) (4 used).....	.43C
114-162	#8 x 7/8 Hex Acorn Hd. Self Tapping Screw (Chassis Mtg.).....	1.20C
125-17	Rubber Grommets (85-284 & 288).....	.03
125-39	Rubber Grommets.....	.02
126-379	Tube Shield.....	.07
159-14	Plug Buttons (Dial Scale).....	.78C
188-32	Retainer Ring (76-335).....	1.03C
188-34	Retainer Ring (S-11362).....	1.20C
188-48	Control Knob Decorative Ring.....	.035
202-384	Instruction Book.....	.15



MODEL 5G003ZZ CHASSIS No. 5C40ZZ

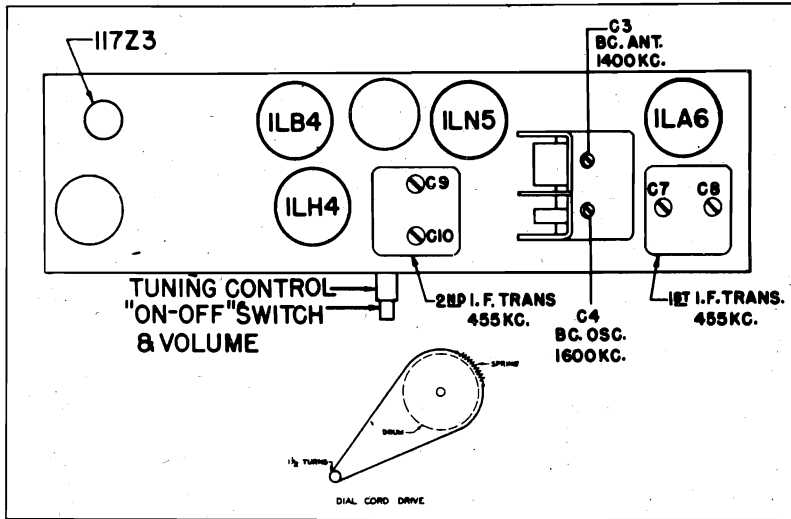
MODELS 5G003, 5G003Z
MODEL 5G003ZZ

ZENITH RADIO CORP.

TO THE SERVICEMAN:

The alignment of chassis 5C40 is conventional and the most accurate alignment will be accomplished if the procedure is followed exactly. The IF frequency is 455 KC and all measurements, voltage, and resistance have been taken with an electronic volt-ohm meter.

Stage by stage gain measurements are for reference purposes only. Gain measurements can seldom be duplicated, and are used only for comparison purposes.



TUBE TRIMMER LOCATION AND DIAL CABLE DRAWING

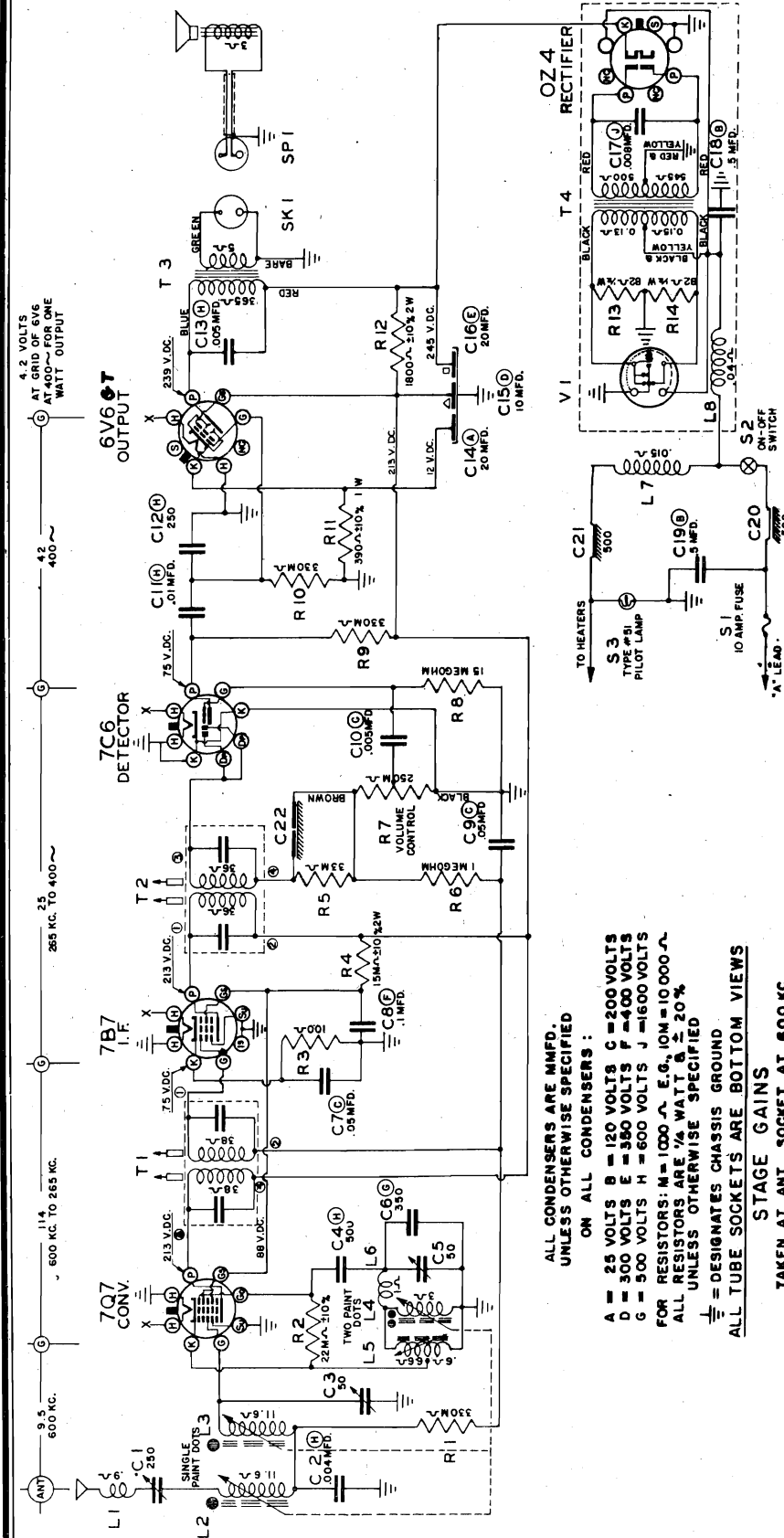
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSC. TO	DUMMY ANT.	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455	600	C7, C8, C9 C10	I.F. Alignment
2	Single Turn Loop	--	1600	1600	C4	Set Osc. to scale
3	Coupled Loosely to Wavemagnet	--	1400	1400	C3	Alignment of Antenna

PARTS LIST

PART NO.	REF. NO.	DESCRIPTION	PRICE	PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY							
26-366		Dial Scale	.12	63-1097	R9	870 Ohm W. W. Insl.	1 Watt. .24
46-530		Volume Control Knob (Small)	.17	63-1099	R14	33 Ohm W. W. Insl.	1/2 Watt. .21
46-587		Tuning Control Knob (Large)	.11	63-1363	R11-R12	Two Section Candohm (63-1132)	.60
57-1120		Escutcheon Plate	1.00	63-1366	R10	Zipohm	.60
57-1187		Dial Pointer	.60	63-1549	R6	Vol. Control & Switch D P S T.	1.81
59-164		Tuning Control Shaft	.28	MISCELLANEOUS			
76-488		Tuning Shaft Tension Spring (63-1459)	.03	11-70		A. C. Line Cord & Plug (Alt 11-90)	.60
80-365		Dial Cord Tension Spring	.04	12-1322		Reinforcing Brkt. (2 used Handle)	.15
80-508		Rubber Grommets (22-1450)	.03	14-903		Polystyrene Cabinet Front Less Accessories (Use S-13209)	.24
125-17		Dial Plate Spacer	.02			Battery Socket Cap	.09
147-148		Plug Button (26-366-192-95)	.01			Cabinet Rear Cover Less Accessories (Use S-11999)	.20
159-50		Tuning Shaft Retainer Ring	.01	45-51		Cabinet Hinge	.65
188-53		Dial Glass	.20	24-371		Handle End Pieces (Die Cast)	7.25
192-99		Dial Glass Gasket	.06	40-28		4" P M Speaker (Complete)	1.67
196-88		Pulley & Bushing Assembly	.33	43-111		206-540 Output Transformer	1.73
S-11098		Dial Cord & Eyelet Assembly	.09	49-540		208-540 Cone & Voice Coil Assen.	.02
S-11137						Speed Nut (2 used S-11999)	.24
CHOKES AND COILS							
95-937	T1	First I.F. Transformer	1.85	54-224		Chassis Bottom Plate	.02
95-938	T2	Second I.F. Transformer	1.85	57-1119		Brass Eyelet (S-11999)	.02
S-11830	L2	Osc. Coil Assen. 5C40-40Z	.95	64-98		Brass Eyelet (S-11999)	.01
S-13765	L2	Osc. Coil Assen. 5C40ZZ	.95	78-229		Electrolytic Socket	.03
CONDENSERS							
22-162	C2	.0001 Mfd.	500 Volt. .20	78-275		Loktal Base Tube Socket	.19
22-196	C13	.01 Mfd.	600 Volt. .20	78-400		Miniature Base Tube Socket	.12
22-326	C14	.003 Mfd.	400 Volt. .20	78-446		Loktal Base Tube Socket (3 used)	.19
22-470	C12	.00015 Mfd.	200 Volt. .20	78-637		Battery Cable Socket	.23
22-492	C11	.002 Mfd.	600 Volt. .20	80-436		Tube Retaining Spring (117Z3)	.15
22-827	C6	.1 Mfd.	200 Volt. .23	83-1393		Instruction Book	.25
22-829	C5	.05 Mfd.	200 Volt. .20	85-267-S1		Rubber Strip (Handle)	.30
22-1014	C15 & C16	Dry Electrolytic 20 x 20 Mfd.	150 Volt. .95	86-66		Power Change Over Switch	.82
22-1017	C19	.05 Mfd.	200 Volt. .20	86-142		Pin Jack Terminal (Gang)	.02
22-1081	C17 & C18	Dry Electrolytic 40 x 20 Mfd. 150 Volt-25	112-468	89-743		Pin Jack Terminal (Gang)	.02
22-1450	C1	Two Section Gang 5C40-40Z	4.15	110-119		Bakelite Spacer Washer (S-11999)	.03
22-1653	C1	Two Section Gang 5C40ZZ	4.15	112-468		Grille Cloth	.15
RESISTORS							
63-271	R8	1 Megohm	1/4 Watt. .09	112-533		#6 x 5/16 Phillips B H Self Tapping Screw (82-20)	1.83C
63-296	R4	220 M Ohm	1/4 Watt. .09	112-604		#6 x 1/4 Phillips R.H. Self Tapping Screw (40-28)	.02
63-439	R13	2700 Ohm	1/4 Watt. .09	126-482		#6 x 5/16 Phillips Stove Hd. Self Tapping Screw (Chassis Mtg.)	.03
63-579	R2	220 Ohm	1/4 Watt. .09	139-61		Spiral Shield	.05
63-600	R5	2.2 Megohm	1/4 Watt. .09	156-27		Baffle Board (or 139-66)	.08
63-602	R16	4.7 Megohm	1/4 Watt. .09	159-53		Cover Catch (2 used)	.09
63-627	R15	180 Ohm	1/4 Watt. .09	189-53		Flexible Handle Sleeve	.40
63-646	R3	33 M Ohm	1/4 Watt. .09	202-429		Instruction Book	.40
63-654	R1	180 M Ohm	1/4 Watt. .09	212-2		Selenium Rectifier	.03
63-976	R7	15 Megohm	1/4 Watt. .09	S-11999 L1		Cabinet Back & Wavemagnet Assen. Complete (24-371)	4.75
						SC40-SC40Z	
						Cabinet Back & Wavemagnet Assen. ZZ Model	
						Front Cabinet & Hinge Assen. (14-903)	6.25
						Strap & Rivet Assen. (Handles)	.20

Prices subject to change without notice.



SENSITIVITY:..... 10 microvolts at one watt output.

UNDISTORTED POWER OUTPUT:..... 2 watts measured at the voice coil.

MAXIMUM POWER OUTPUT:..... 4.25 watts measured at the voice coil.

SPEAKER:..... 6" x 9" oval, instrument panel mounting.

CURRENT CONSUMPTION:..... 5. amperes

ALL CONDENSERS ARE MMFD. UNLESS OTHERWISE SPECIFIED ON ALL CONDENSERS:

A = 25 VOLTS B = 120 VOLTS C = 200 VOLTS D = 300 VOLTS E = 350 VOLTS F = 400 VOLTS G = 500 VOLTS H = 600 VOLTS J = 1600 VOLTS

FOR RESISTORS: M = 1000 Ω, E.g., 10M = 10,000 Ω. ALL RESISTORS ARE 1/4 WATT & ± 20%.

⊥ = DESIGNATES CHASSIS GROUND

ALL TUBE SOCKETS ARE BOTTOM VIEWS

STAGE GAINS
 TAKEN AT ANT. SOCKET AT 600 KC. AND AT CONVERTER GRID AT 265 KC.

DUMMY ANTENNA
 30 MMFD SERIES & 30 MMFD. SHUNT AT ANT. SOCKET & 0.1 MMFD. SERIES TO CONVERTER GRID

BATTERY CONDITIONS
 6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUND

TEST CONDITIONS
 VOLUME CONTROL SET AT MAXIMUM WITH NO INCOMING SIGNAL
 VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

SCHEMATIC DIAGRAM FOR 5 TUBE
CROSLLEY 5MX080
 I.F. 265 KC.
 TUNING RANGE 540 KC. TO 1600 KC.

CORE OR COIL REPLACEMENT ONLY

WARNING: The following adjustments are to be made ONLY if a core or coil is replaced.

- 1—Replace coil or core.
- 2—Set signal generator to 1675 Kc.
- 3—Connect signal generator leads through dummy, illustrated in Figure 9, to antenna receptacle on the receiver. This is important.
- 4—Set receiver dial to 1600 Kc. (maximum high frequency end of dial)
- 5—Break cement loose on all cores and, using the special tuning wrench part No. S-13064, screw the core completely out of the antenna coil, the converter coil, and the oscillator coil.
- 6—Adjust oscillator trimmer C-5 (Fig. 8) at 1675 Kc.
- 7—Adjust converter trimmer C-3 and antenna trimmer C-1 (Fig. 7 and 8) for maximum output reading.
- 8—Replace cores to their approximate original position.
- 9—Set generator and receiver dial to 1200 Kc.
- 10—Adjust oscillator core L-4 (Fig. 8) to scale at 1200 Kc.
- 11—Adjust the two antenna cores L2 and L3 (Fig. 7) for maximum output reading. Do not adjust trimmers.
- 12—Set signal generator to 600 Kc.
- 13—If necessary, "rock in" shunt oscillator core L-5 (Fig. 8) for maximum output reading. This should be done only as a last resort, as the core has been set and sealed and should not require adjustment.
- 14—Check receiver at 1200 Kc. for calibration and gain. If the receiver is off scale or weak, repeat operations 9, 10 and 11.
- 15—After alignment is complete, the maximum high frequency tuning range should be checked. If the range is greater or less than 1605 Kc, the mechanical stop for the tuner cross arm should be bent to limit the frequency coverage to 1605 Kc.

After all adjustments have been made, glue core screws with speaker cement.

IMPORTANT: After reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature. Extend antenna to maximum. Check the antenna trimmer alignment on a weak station near 1200 Kc.

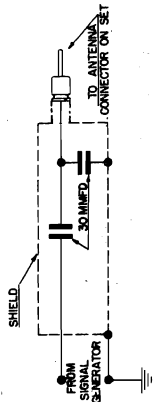


Fig. 9. Dummy Antenna
Fig. 9 shows the schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver.

ALIGNMENT

Maximum performance depends on accurate alignment of the receiver; therefore follow these instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control set at maximum. Reduce the signal intensity as much as possible at the signal generator. Connect the output meter across the voice coil.

I. F. ALIGNMENT PROCEDURE

- 1—Remove top and bottom covers from receiver.
- 2—Set signal generator to 265 Kc.
- 3—Apply signal from generator through a .1 Mfd. dummy to 7Q7 converter grid. (Pin No. 6 on socket.)
- 4—Adjust I.F. slugs A, B, C and D (Figs. 7 and 8), in the order named for maximum output. Repeat the operation to assure accurate alignment.

R. F. AND OSCILLATOR ALIGNMENT

- 1—Connect signal generator leads through dummy, illustrated in Fig. 9, to antenna lead in socket on receiver. This is important.
- 2—Set signal generator to 535 Kc.
- 3—Set dial to 535 Kc. (End of travel, against the stop.)
- 4—Adjust oscillator trimmer C-5 (Fig. 8) for maximum response.
- 5—Set signal generator to 1200 Kc.
- 6—Tune set to 1200 Kc.
- 7—Adjust converter trimmer C-3 (Fig. 7) and Ant. trimmer C-1 (Fig. 8) for maximum response.
- 8—If dial calibration is off after making above adjustments, a correction can be made by turning eccentric screw at fulcrum of dial pointer. (Fig. 7).

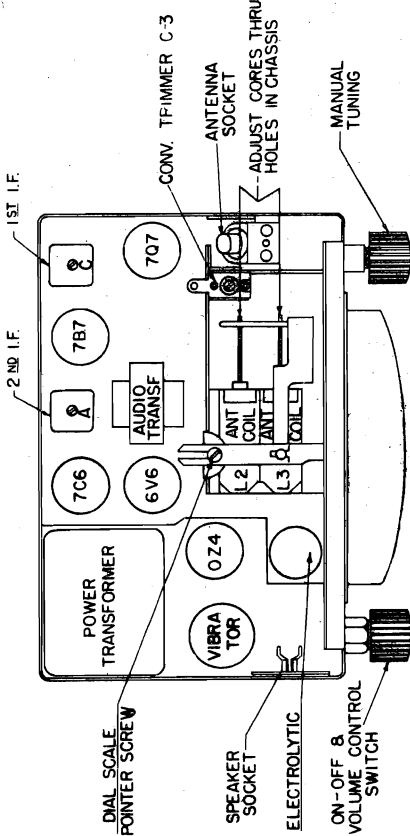


Fig. 7. Top View of Chassis

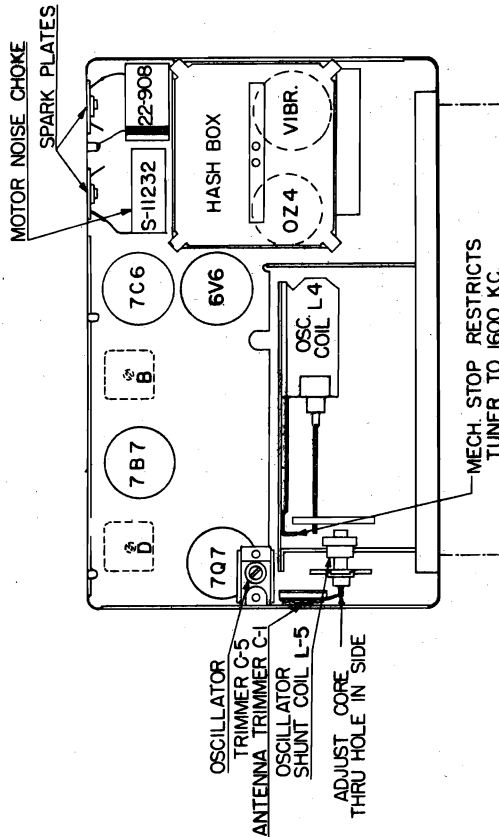


Fig. 8. Bottom View of Chassis

The generator condenser No. 22-920 should be installed as shown below in figure 5.

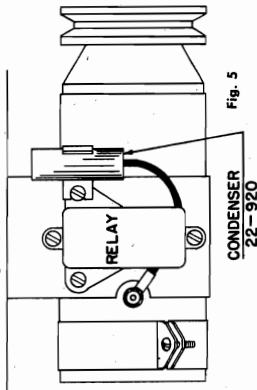


Fig. 5
CONDENSER 22-920

The motor hood band spring No. 80-145 should be installed as shown in figure 6. Note that the sharp extrusions are facing down toward the front of the car before the hood grounding strip is bent back.

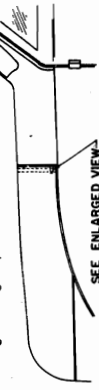


Fig. 6
HOOD SEAL
COWL PANEL
SEE ENLARGED VIEW

The fuel gauge condenser No. 22-919 should be installed as shown in figure 4.

The generator condenser No. 22-920 should be installed as shown below in figure 5.

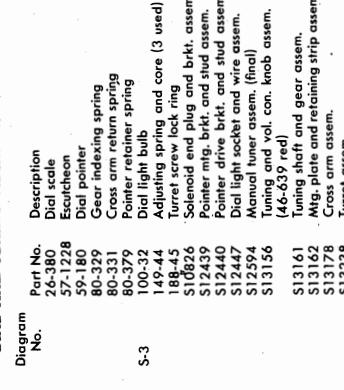


Fig. 4
CONNECT TO THIS TERMINAL (TANK)
CONNECT TO THIS TERMINAL (TANK)

INTERFERENCE ELIMINATION

There should be no interference from the ignition system if the receiver has been installed according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations.

IMPORTANT: Be sure that good contacts are made between the car frame, or body, and the interference condensers. If necessary, clean away paint or dirt with emery paper. Be sure all nuts and bolts are tightened securely.

The distributor suppressor No. 63-1046 and the flexible ground strap No. 83-1335 should be connected as shown in figure 3.

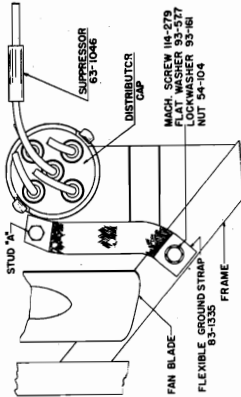


Fig. 3

The fuel gauge condenser No. 22-919 should be installed as shown in figure 4.

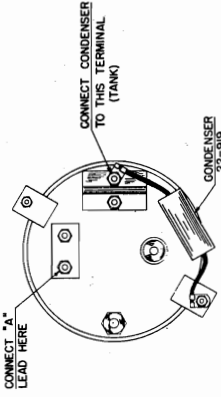


Fig. 4

MISCELLANEOUS

- 52-294 Vol. con. cable
- 52-397 Speaker cable and plug
- 52-417 Battery cable (fuse to ammeter)
- 52-418 Ser. spacer nut (used on 63-1513)
- 54-184 Vibrator socket
- 78-281 Local base tube socket (8 contact)
- 78-286 Local base tube socket (moulded)
- 78-287 Speaker tube socket
- 78-288 Local base tube socket
- 78-289 Vibrator cushion washer
- 78-288 Local base tube socket
- 95-915 Output transformer
- 95-1002 Power transformer
- 136-15 10 amp. fuse (3AG)
- 190-20 Vibrator
- 202-486 Instruction book
- S-11391 Ant. con. socket and brkt. assem.

Fig. 1. Installation
SPEAKER ASSEMBLY S-13173

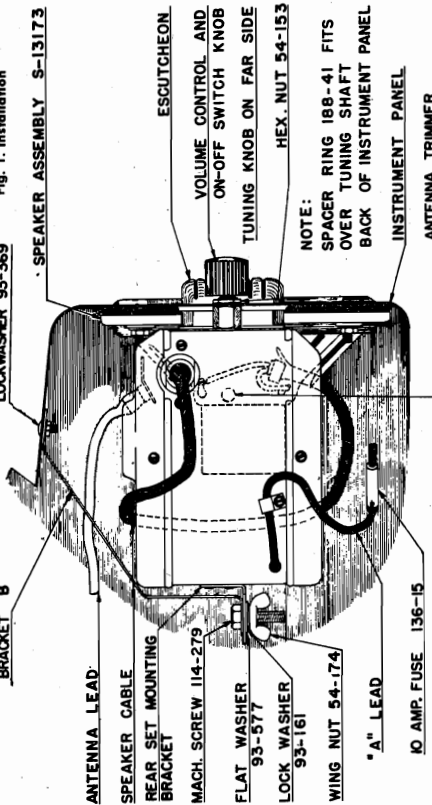


Fig. 2. Front View
RESISTORS

Turn the tuning knob (Fig. 1) to tune in the desired station. Tune to the exact frequency to prevent distortion. The pointer in front of the illuminated dial scale indicates the frequency to which the receiver is tuned. (Fig. 2)



- R-4 63-942 15M ohm 2 watt insl.
- R-12 63-1368 1800 ohm W.W. 2 watt insl.
- R-11 63-1372 390 ohm W.W. 1 watt insl.
- R-6 63-1390 1 megohm 1/4 watt insl.
- R-5 63-1391 33M ohm 1/4 watt insl.
- R-1 63-1392 330M ohm 1/4 watt insl.
- R-9 63-1395 22M ohm 1/4 watt insl.
- R-2 63-1399 82 ohm 1/4 watt insl.
- R-10 63-1400 1.5 megohm 1/4 watt insl.
- R-8 63-1414 100 ohm 1/4 watt insl.
- R-3 63-1513 Vol. con. and sv.
- R-7

SPEAKER AND GASKET ASSEMBLY

- S-13173 Speaker and gasket assem. (comp.)
- 49-576 6" x 9" P.M. speaker
- 196-91 Speaker gasket and screen
- 208-576 Cone and voice coil assem.

RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to assist in the removal and reinstallation of this receiver when service is necessary.

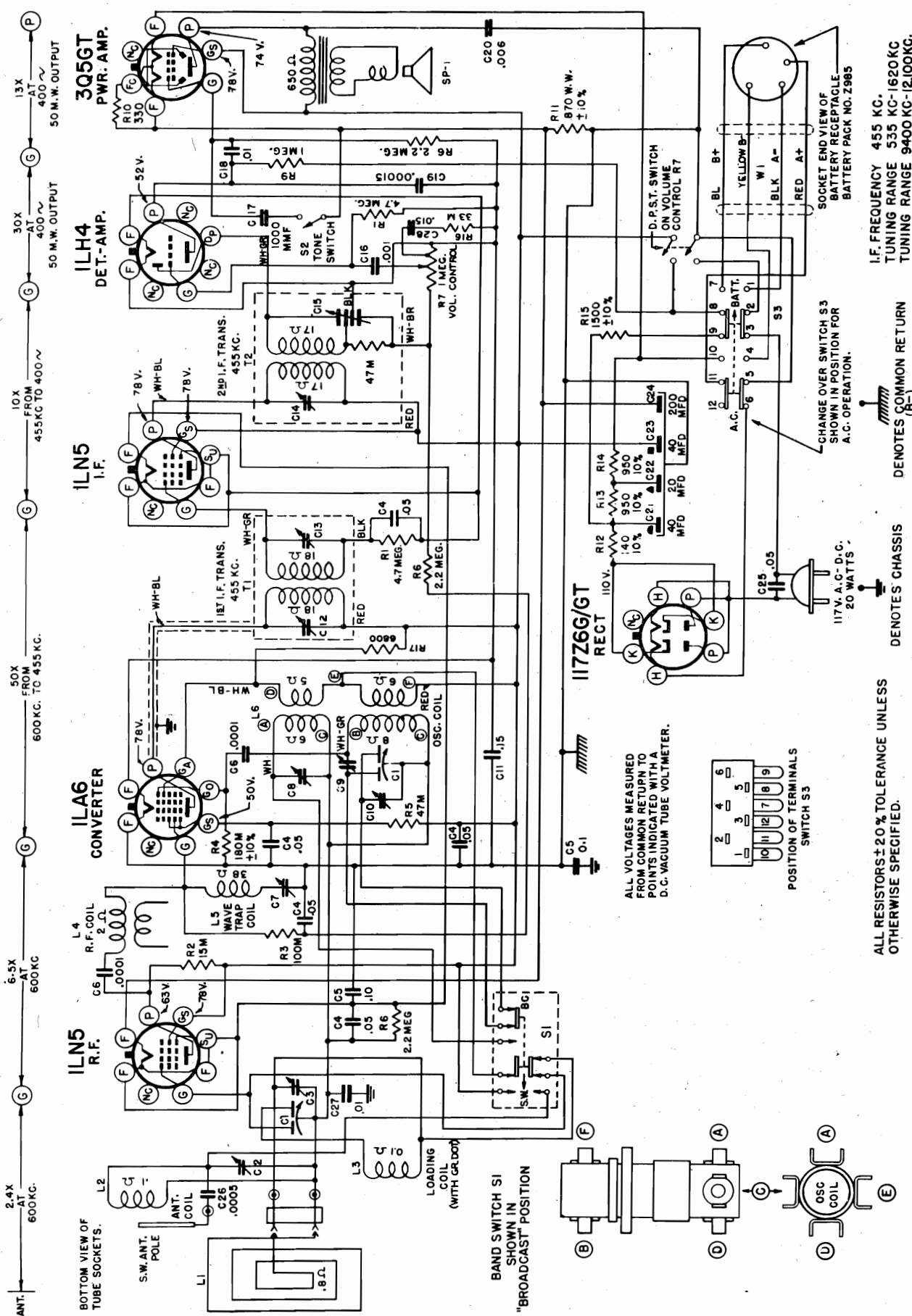
To take the receiver from the car, remove the control knobs and mounting nuts from the front panel, and remove the wing-nut, 54-174, lock washer 93-161, flat washer 93-577, and machine screw 114-279 from the set mounting bracket "B."

The speaker is held to the rear of the panel by four hex. nuts.

OFF-ON SWITCH AND VOLUME CONTROL

To turn the receiver on, turn the volume control knob to the right until it clicks and the dial is illuminated. Allow the receiver to reach operating temperature. (Approximately 20 seconds.) To increase the volume, continue to rotate this knob to the right. To turn the receiver off turn the volume control knob to the left until it clicks. (Fig. 2)

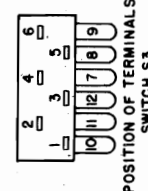
- CONDENSERS**
- C-8 22-170 .1 mfd.
 - C-12 22-182 250 mfd.
 - C-9 22-250 .05 mfd.
 - C-4 22-716 500 mfd.
 - C-13 22-838 .005 mfd.
 - C-10 22-906 .005 mfd.
 - C-18 22-908 .5 mfd.
 - C-19 .01 mfd.
 - C-22 22-1076 Dual 250 mfd.
 - C-7 22-250 .05 mfd.
 - C-1 22-1244 Detector trimmer
 - C-3 22-1376 Oscillator trimmer
 - C-14 22-1387 Dry dielectric 20 mfd., .25 v. x 350 ohm—300 v. x 20 mfd.—
 - C-15 22-1420 Antenna trimmer
 - C-17 22-1448 500 mfd.
 - C-6 22-1641 350 mfd.



ANT. 2-4X AT 600KC. 6-5X AT 600KC. 50X FROM 600KC. TO 455KC. 10X FROM 455KC TO 400~ 30X AT 400~ 13X AT 400~ 50 M.W. OUTPUT 50 M.W. OUTPUT

I.F. FREQUENCY 455 KC.
TUNING RANGE 535 KC-1620KC
TUNING RANGE 9400 KC-12,100KC.

ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.



CHANGE OVER SWITCH S3 SHOWN IN POSITION FOR A.C. OPERATION.

SOCKET END VIEW OF BATTERY RECEPTACLE BATTERY PACK NO. 2895

117V. A.C.-D.C. 20 WATTS

ALL RESISTORS ± 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

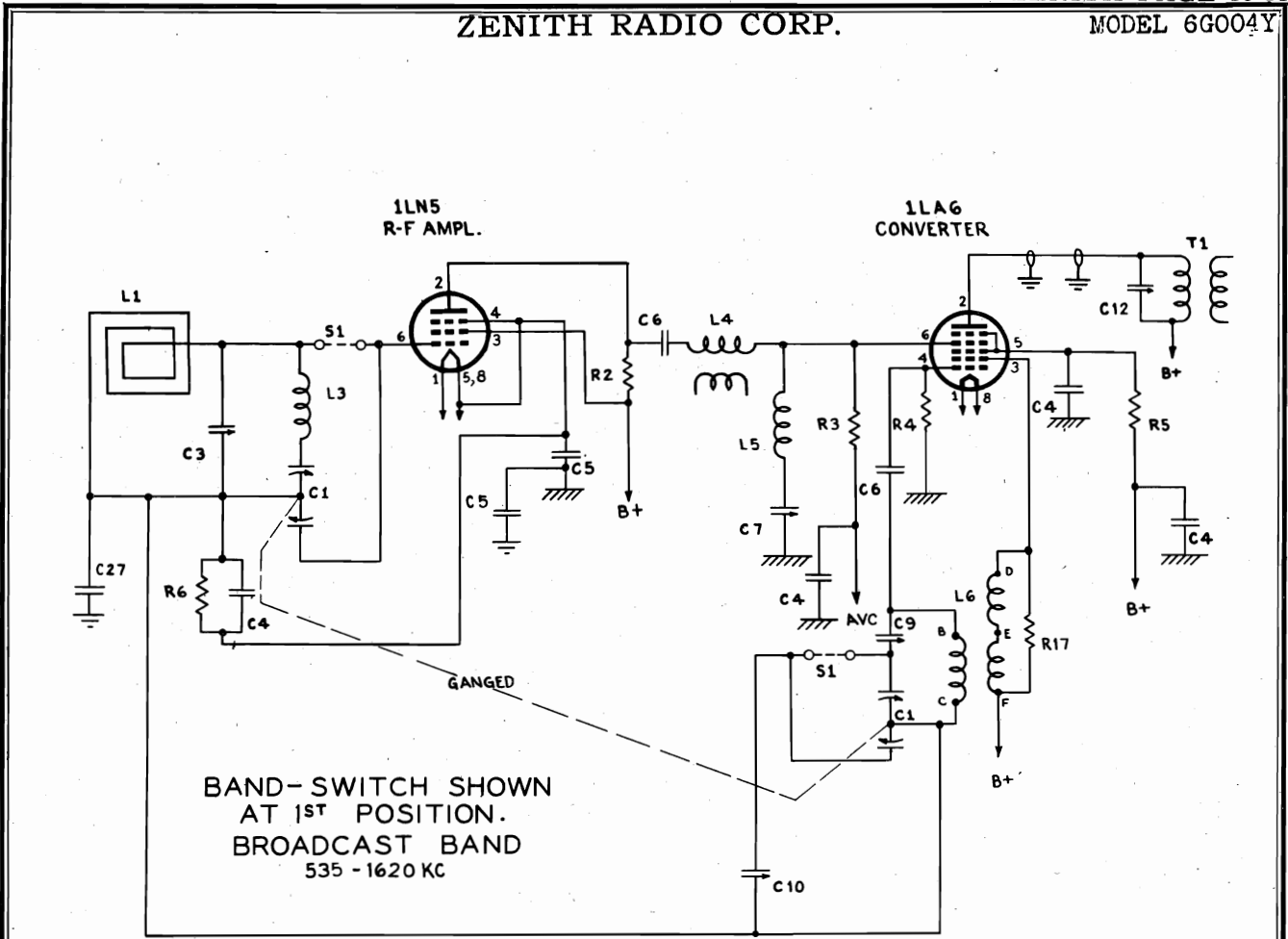
DENOTES CHASSIS

DENOTES COMMON RETURN (B-)

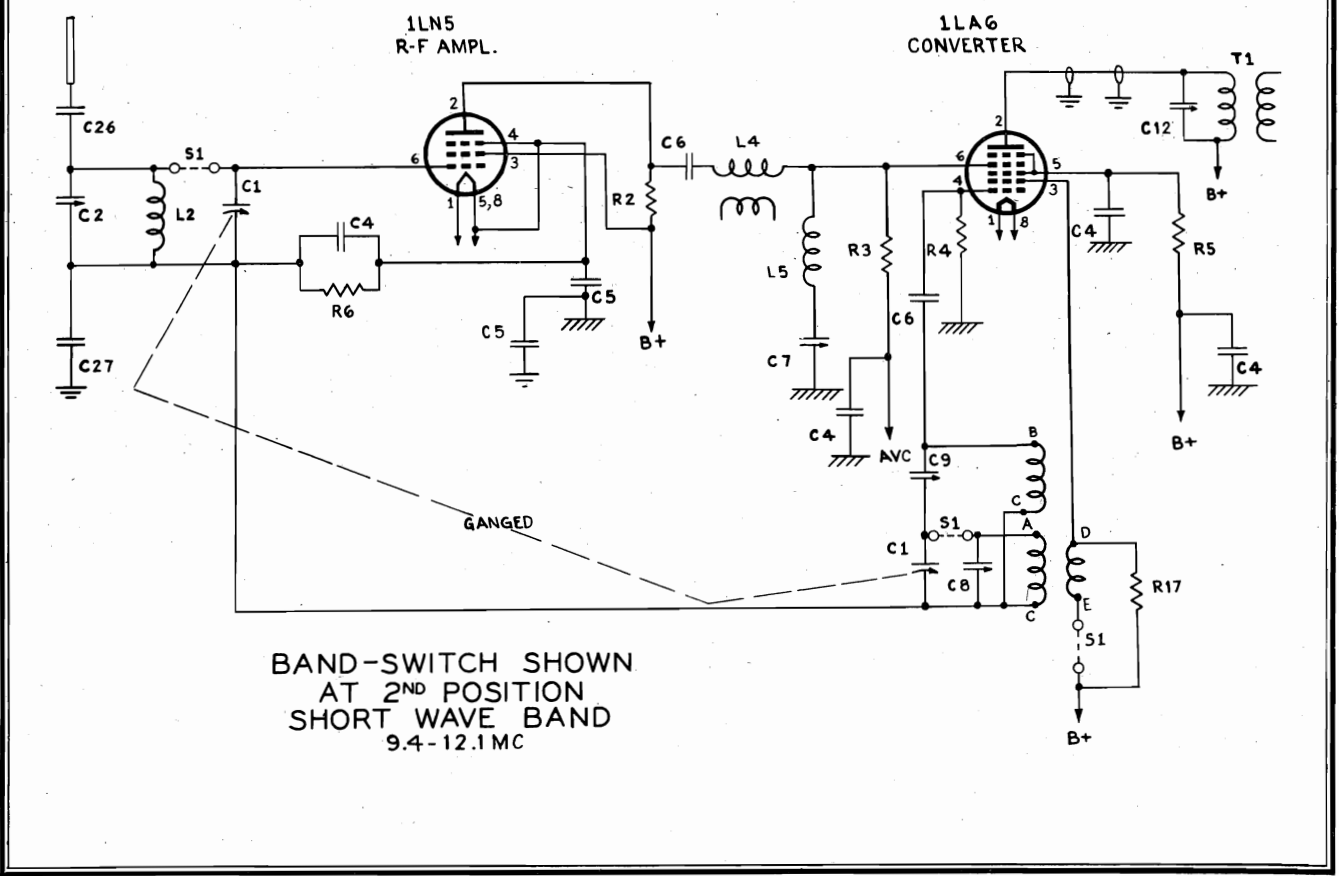
"clarified schematics"

ZENITH RADIO CORP.

MODEL 6G004Y



BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND 535 - 1620 KC

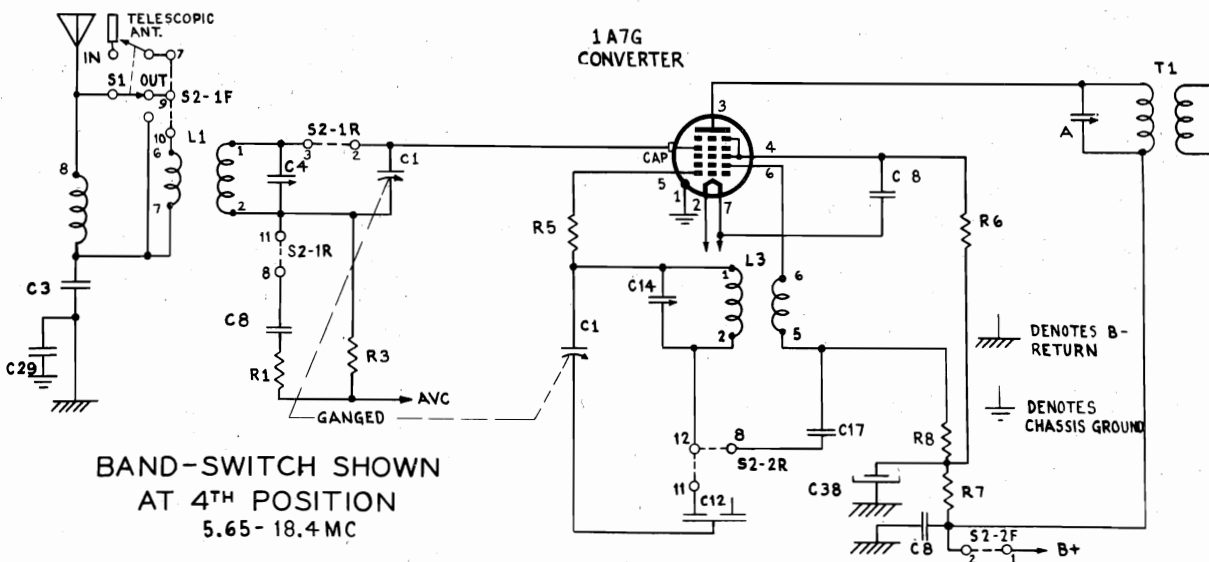
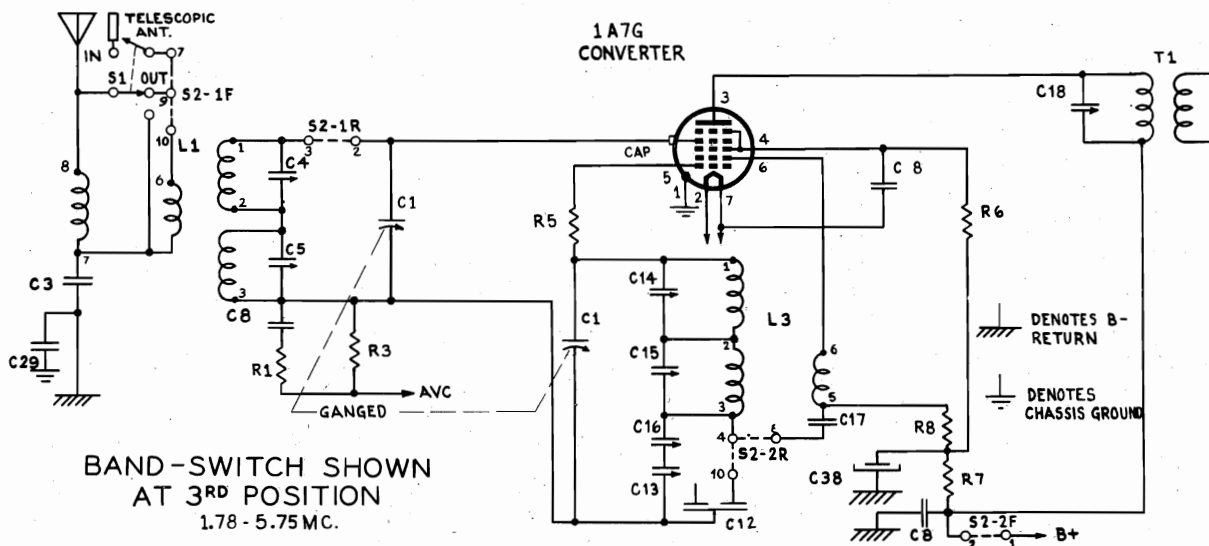
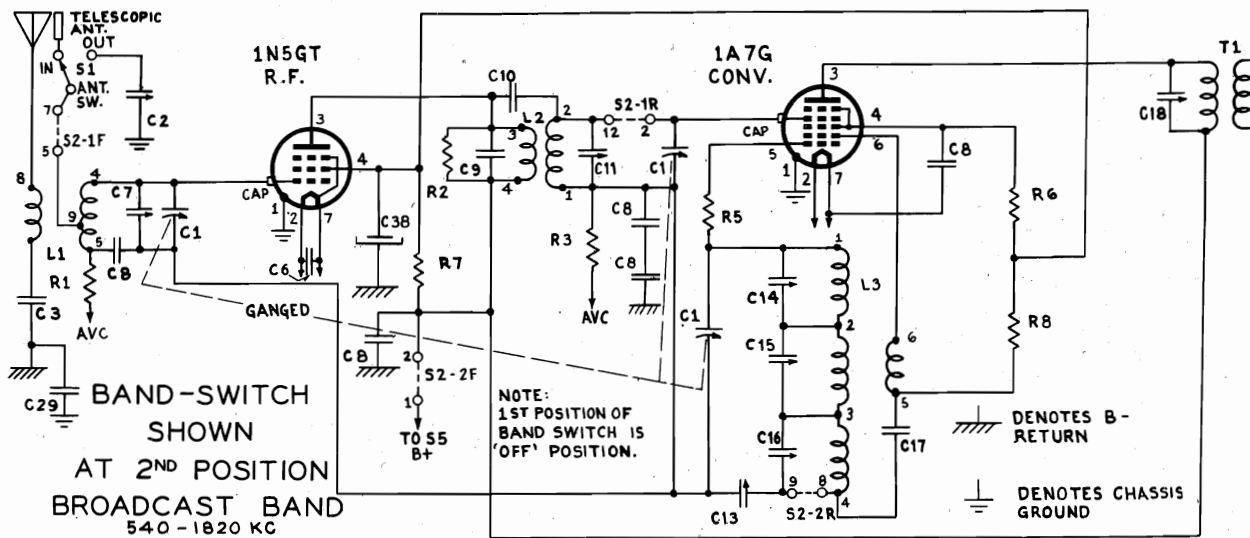


BAND-SWITCH SHOWN AT 2ND POSITION. SHORT WAVE BAND 9.4-12.1 MC

"clarified schematics"

PAGE 16-14 ZENITH
MODEL 6G038

ZENITH RADIO CORP.

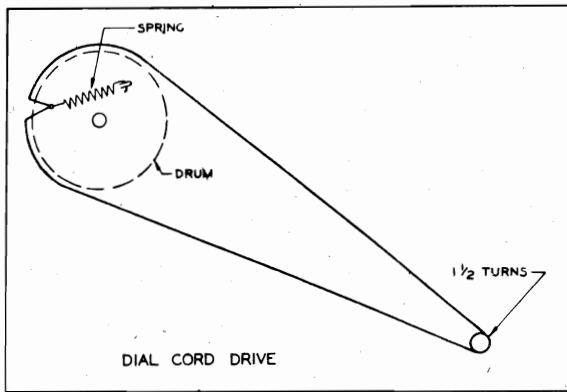


ZENITH RADIO CORP.

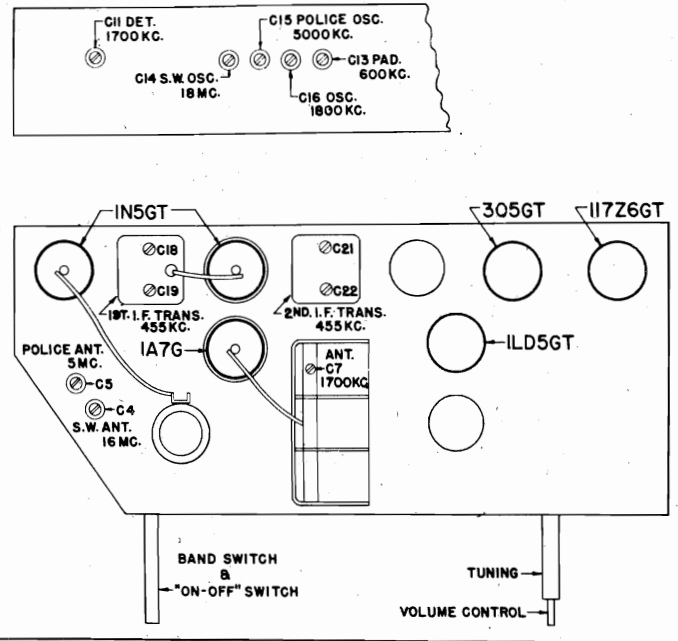
MODEL 6G038

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter grid	.5 mfd	455 Kc	600 Kc	C18,C19,C21,C22	Align I.F.
2	One turn		18 Mc	18 Mc	C14	Adjust oscillator to scale
3			16 Mc	16 Mc	C4	Adjust for max.
4	Loosely		5 Mc	5 Mc	C15	Adjust oscillator to scale
5	Coupled		5 Mc	5 Mc	C5	Adjust for max.
6	To		1800 Kc	1800 Kc	C16	Adjust oscillator to scale
7	Waverod		1700 Kc	1700 Kc	C11 & C7	Adjust for max.
8			600 Kc	600 Kc	C13	Rock gang and adjust for max.



DIAL CABLE DRAWING

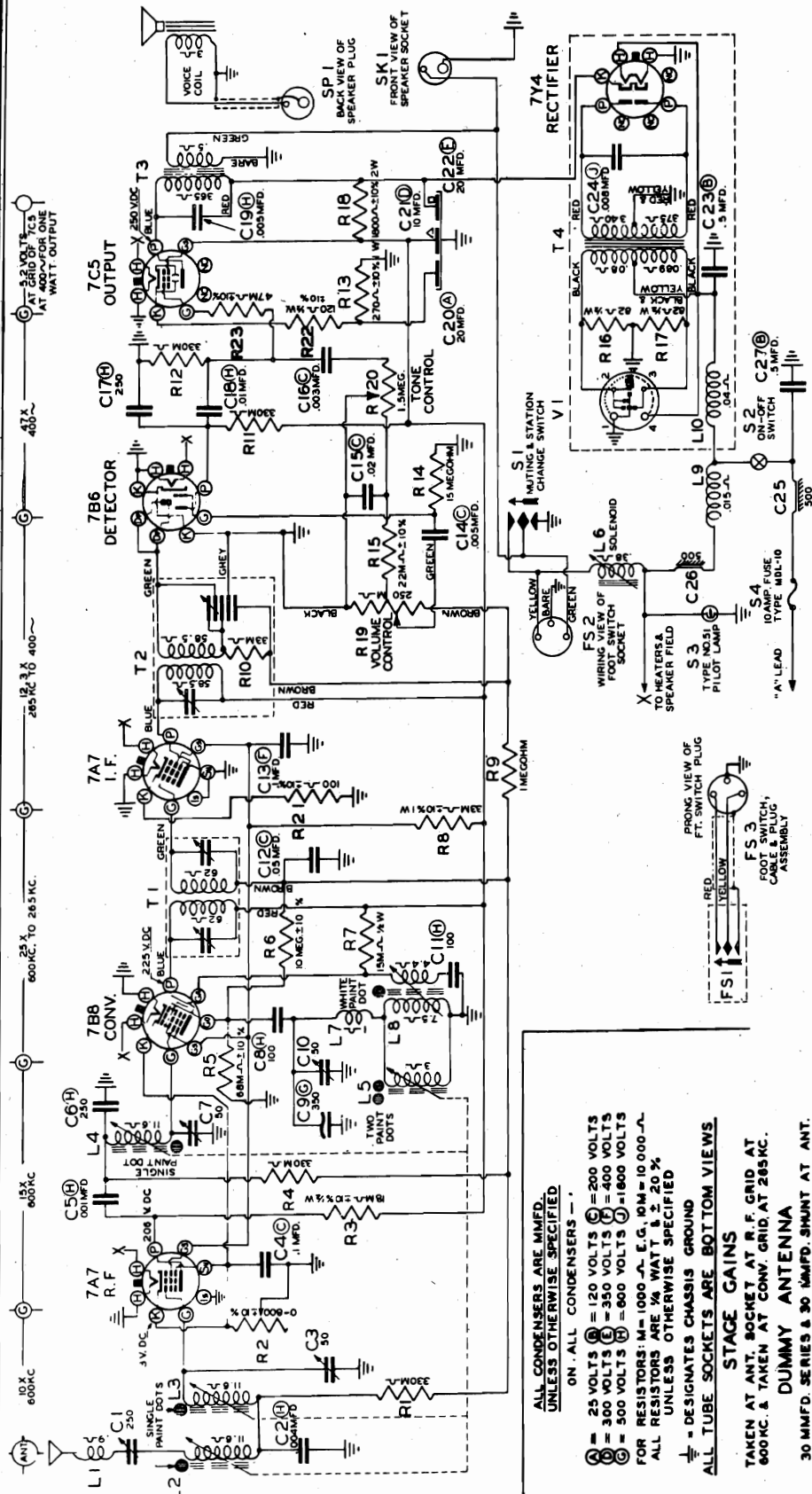


TUBE TRIMMER LOCATION

PARTS LIST			
PART NO.	REF. NO.	DESCRIPTION	PRICE
DIAL ASSEMBLY			
59-121		Dial pointer	.19
76-305		Tuning Control shaft	.12
80-69		Dial Cord Tension Spring	.02
80-227		Tuning Shaft Tension Spring	.02
93-482		Black Bakelite Washer (used with 59-121)	.72C
188-27		Retaining Ring (76-305)	1.20C
S-9643		Dial Scale & Indicator Assembly (26-293)	1.20
S-9758		Dial Cord Assembly	.07
MS-586		Pulley & Fracket Assembly	.12
COILS & CHOKES			
95-821	T1	1st I.F. Transformer	1.77
95-822	T2	2nd I.F. Transformer	1.77
S-9689	L3	Oscillator Coil & Wire Assembly	1.26
S-9690	L2	Detector Coil Assembly	1.04
S-11815	L1	Antenna Coil Assembly	1.65
CONDENSERS			
22-162	C23	.0001 Mfd	.20
22-196	C24	.01 Mfd	.20
22-229	C33	.005 Mfd	.20
22-289	C9	50 Mfd	.20
22-303	C10	5 Mfd	.20
22-326	C25	.003 Mfd	.20
22-327	C6	.02 Mfd	.20
22-358	C17	.002 Mfd	.36
22-448	C26	.004 Mfd	.20
22-470	C35	.0015 Mfd	.20
22-492	C20	.002 Mfd	.20
22-827	C29	.1 Mfd	.23
22-829	C8	.05 Mfd	.20
22-830	C32	.02 Mfd	.20
22-887	C31	.001 Mfd	.20
22-900	C12	Dual unit paper	.83
22-954	C34	.00035 Mfd	.16
22-1017	C20	.05 Mfd	.20
22-1047	C36,37,38	10-20-30 Mfd. Dry Electrolytic	1.63
22-1144	C13,14,15,16	Four Section Ceramic Trimmer	.83
22-1183	C3	.01 Mfd	.40
22-1217	C1	Three Gang Variable	4.48
22-1230	C4,C5	Two Section Ceramic Trimmer	.38
22-1234	C27,28	200 Mfd. 10 V. x 40 Mc. 150 V. Dry Electrolytic	1.92
22-1421	C2,C11	Trimmer Capacitor	.40
RESISTORS			
63-271	R15	1 Megohm	.09
63-577	R5	100 Ohm	.09
63-580	R18	330 Ohm	.09
63-589	R2	10,000 Ohm	.09
63-591	R6	22,000 Ohm	.09
63-593	R10	47,000 Ohm	.09
63-594	R11	68,000 Ohm	.09
63-597	R20	470,000 Ohm	.09
63-600	R3	2.2 Megohm	.09
63-602	R1	4.7 Megohm	.09
63-604	R16	10 Megohm	.09
63-605	R21	1000 Ohm	.10
63-635	R7	3300 Ohm	.09
63-640	R8	8200 Ohm	.09
63-654	R4	180,000 Ohm	.09
63-975	R19	15 Megohm	.09
63-1087	R1	870 Ohm	.04
63-1244	R9	Volume Control	1.20
63-1259	R13,14	Candohm (2 section)	.43
63-1366	R12	140 Ohm Zipcon	.24

RADIO ESQUTCHEON PARTS			
PART NO.	REF. NO.	DESCRIPTION	PRICE
S-9995		Radiorgan Escutcheon & Knob Assen. L.H. (Complete)	1.20
S-9996		Radiorgan Escutcheon & Knob Assen. R.H. (Complete)	1.20
MS-660		Fracket Assembly	.25
S-9590		Knob & Eyelet Assen. (3 used on L.H., 1 on R.H.)	.12
S-9591		Knob & Eyelet Assembly (2 used on R.H. only)	.12
S-9591		Tenite Escutcheon (Flack) (1 used on L.H. only)	.36
S-9591		Tenite Escutcheon (Flack) (1 used on R.H. only)	.36
76-337		Latch Shaft	.03
76-338		Latch Spring	.04
80-264		#6 x 1/4" Hex. Hd. Self Tapping Screw (2 used)	.72C
114-159		Latch	.36C
156-10		Latch	.36C
MISCELLANEOUS			
11-68		Line Cord & Plug (8 ft. long)	.65
12-782		Volume Control Mounting Bracket	.05
12-787		Tuning Sleeve Support Bracket	.04
12-1082		Antenna Rod Mounting Bracket	.06
15-34		Socket Cap (or 15-67) (Battery Cable)	.07
17-67		Antenna Rod Retaining Clamp	.08
19-77		Cable Retaining Clamp	.01
48-579		Fand Selector Switch Knob	.20
49-464	SP1	8" P.M. Speaker	10.52
208-464		208-464 Output Transformer	1.97
208-464		208-464 Cone & Voice Coil	2.63
		Antenna Lead Marker	.03
57-11A		Ground Lead Marker	.03
57-11G		Dial Escutcheon (or 57-1112) (Part of S-9580 or S-11777)	2.41
57-905		Antenna Knob Escutcheon	.70
57-1103		#2 x 3/8" Oval Hd. Wood Screw (Ant. Esc. Mtg.)	1.70C
70-124		#2 x 3/8" Flat Hd. Wood Screw (Dial Esc. Mtg.)	.02
72-58		Speaker Plug Socket	.12
78-190		Electrolytic Capacitor Socket	.03
78-229		Four Contact Socket (Battery Cable)	.12
78-396		Loktal Base Tube Socket (7 contact)	.19
78-446		Octal Base Tube Socket (8 contact)	.12
78-611		Octal Base Tube Socket	.12
78-671		Power Switch	.31
85-171	S5	Antenna Switch	.35
85-303	S1	Bona Selector Switch	2.00
85-366	S2	Rubber Washer (Chassis Mtg.)	.07
93-215		#6 x 1/4" Hex. Hd. Self Tapping Screw (Radiogram Switch Mtg.)	.55C
112-56		#10-32 x 7/8" Hex Washer Hd. M.S. Steel (Chassis Mtg.) (3 used)	.72C
114-128		#10 x 1-1/16" Hex Washer Hd Self Tapping Screw (Chassis Mtg.) (1 used)	1.81C
125-17		Rubber Grommet	.03
126-379		Tube Shield (for GT type)	.07
126-382		Tube Shield	.08
192-68		Dial Escutcheon Glass (Part of S-11777 or S-9580)	.43
196-47		Dial Escutcheon Gasket	.19
202-398		Instruction Book	.25
S-8540		Dummy Knob & Set Screw Assembly (46-350)	.24
S-9580		Dial Escutcheon Assembly (or S-11777)	3.01
S-9595	S3.4	Radiogram Strip & Contact Assembly (2 used)	.31
S-9816		Tuning Control Knob & Set Screw Assembly	.30
S-11251		Telescopic Antenna Assembly	7.85
S-11899		Volume Control Knob Assembly (46-578)	.26

Willy's



SCHEMATIC DIAGRAM FOR 6 TUBE
WILLY'S 6MW083
WITH FOOT CONTROL

I. F. 265 KC.
TUNING RANGE 540KC. TO 1600 KC.

SENSITIVITY: 4 microvolts at one watt output.

POWER OUTPUT: 5.5 watts measured at the voice coil.

SPEAKER: 8" round, mounted on firewall.

CURRENT CONSUMPTION: 7.5 amperes

INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE: 20 amperes

- ALL CONDENSERS ARE MIMFD. UNLESS OTHERWISE SPECIFIED. ON ALL CONDENSERS -
- ⊖ = 25 VOLTS ⊕ = 120 VOLTS ⊙ = 200 VOLTS ⊚ = 300 VOLTS ⊛ = 350 VOLTS ⊜ = 400 VOLTS ⊝ = 500 VOLTS ⊞ = 600 VOLTS ⊟ = 1600 VOLTS
- FOR RESISTORS: M = 1000 Ω E.G. 10M = 10 000 Ω. ALL RESISTORS ARE 1/4 WATT ± 20% UNLESS OTHERWISE SPECIFIED
- ⊥ = DESIGNATES CHASSIS GROUND
- ALL TUBE SOCKETS ARE BOTTOM VIEWS
- STAGE GAINS**
- TAKEN AT ANT. SOCKET AT R.F. GRID AT 600KC. & TAKEN AT CONV. GRID AT 265KC.
- DUMMY ANTENNA**
- 30 MMFD. SERIES & 30 MMFD. SHUNT AT ANT. SOCKET & 0.1MFD. SERIES TO CONVERTER GRID
- BATTERY CONDITIONS**
- 6.3 VOLTS AT STORAGE BATTERY TERMINALS WITH POSITIVE GROUNDING
- TEST CONDITIONS**
- VOL. CONTROL SET AT "MAX." TONE CONTROL SET ON "HIGH"; WITH NO INCOMING SIGNAL VOLTAGES READ FROM POINT SHOWN TO CHASSIS WITH 1000 OHM PER VOLT METER

Sold only as an accessory.

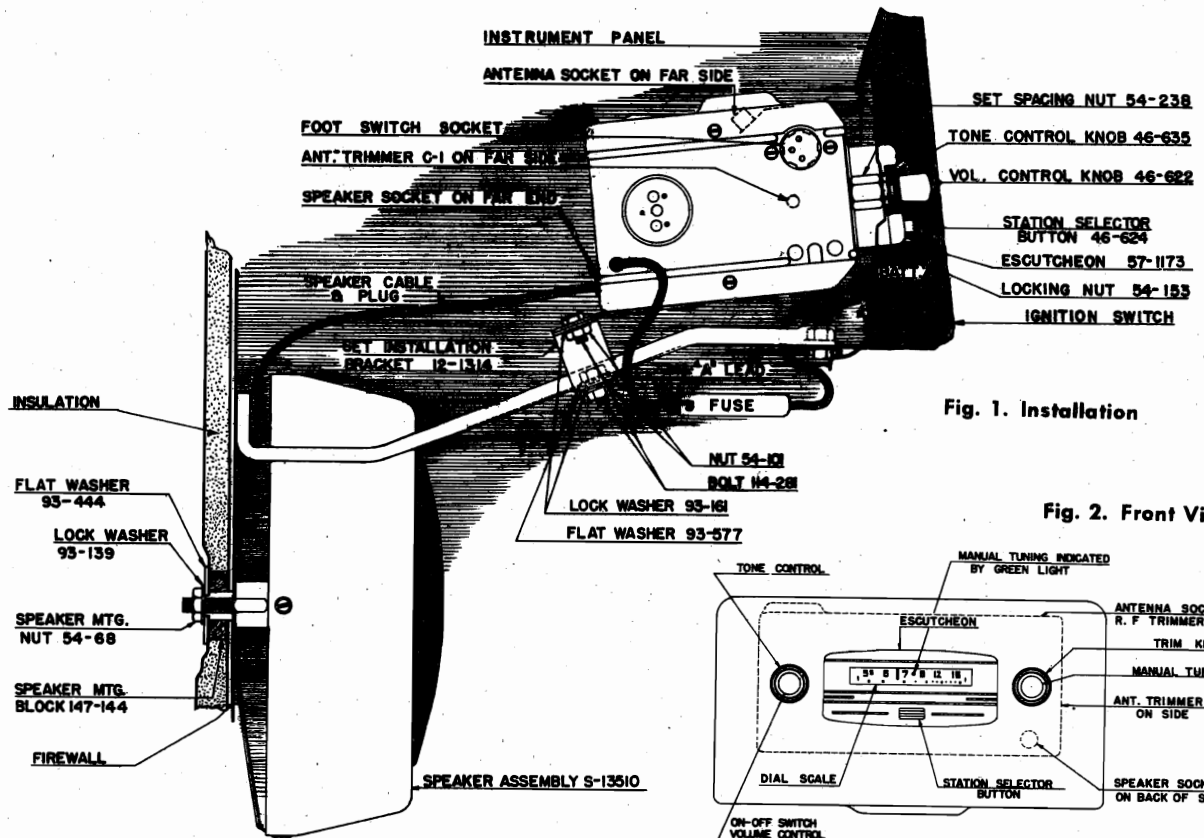
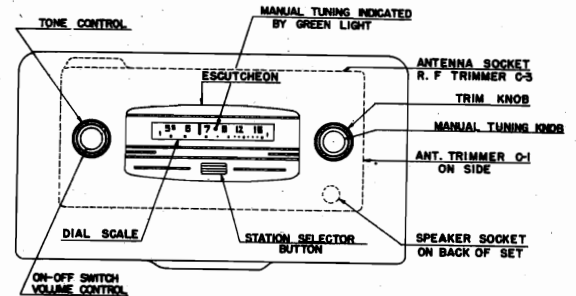


Fig. 1. Installation

Fig. 2. Front View



RECEIVER INSTALLATION

Figures 1 and 2, illustrating the installed receiver, the escutcheon plate, and the control knobs, are given here to facilitate removal and reinstallation of this receiver when service or repair is necessary.

To take the receiver from the car, remove the control knobs and mounting nuts from the front panel, and remove the set installation Bracket No. 12-1314 from the rear set mounting bracket.

MANUAL TUNING

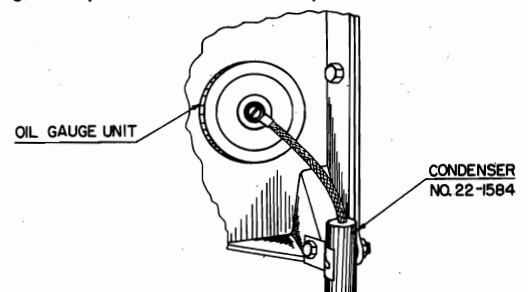
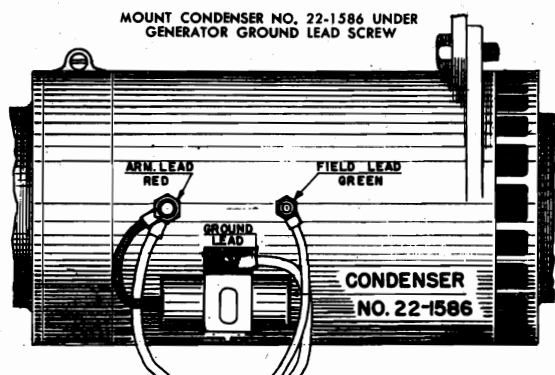
1. Press the Station Selector push button (Fig. 2) several times or until the green dot in the dial scale is illuminated.
2. Pull the Manual Tuning control knob (right hand) outward and turn to tune in desired station. Be sure to tune to exact frequency to assure the best tone quality.

AUTOMATIC TUNING

There are five automatic tuning positions which may be adjusted to five desired stations. If these positions have not been previously adjusted proceed as follows:

1. Press the station selector push button repeatedly until the green dot in the dial scale is illuminated.
2. Press the button once more to move the mechanism to the No. 1 Position.
3. Pull manual tuning knob outward to engage the automatic mechanism.
4. Select the station desired and tune to its frequency by turning the tuning knob. Tune very carefully for clearest reception.
5. Press the station selector push button, pull the manual tuning knob outward, and tune in the station desired for No. 2 position. Use same procedure for positions No. 3, 4 and 5.

When the five automatic positions have been adjusted to the five desired stations as instructed, it is only necessary to press the station selector push button to return to dial tuning, or any one of the stations adjusted on the Automatic.



PARTS LIST MODEL 6MW083 (CHASSIS 6CB3)
1946 WILLYS OVERLAND LONG DISTANCE RADIO

COILS AND CHOKES

Diagram No.	Part No.	Description	Diagram No.	Part No.	Description
L 9	20-213	Main Hash Choke	R 1	80-331	Cross Arm Return Spring
T 1	95-916	1st I.F. Transformer	R 4	80-332	Cam Lever Spring
T 2	95-942	2nd I.F. Transformer	R 11	80-336	Ratchet Gear Return Spring
L 1	S8819	Ant. Motor Noise Choke Assem.	R 12	80-340	Lever Spring
L 2	S11040	Ant. & R.F. Coil Assem. (Right Hand)	R 5	80-341	Kick-off Spring
L 3			R 8	80-342	Tuning Shaft Spring
L 4			R 15	80-379	Pointer Retainer Spring
L 5			R 8	80-445	Flag Spring
L 7			R 16	83-1030	Return Spring Retainer Strip
L 8			R 17	83-1039	Solenoid Insulating Strip
L 10			R 14	86-30	#6 Shakeproof Terminal
			R 7	93-125	#6 Internal Shakeproof Lockwasher
			R 22	93-501	#4 Internal Shakeproof Lockwasher
			R 3	93-631	Retainer Washer
			R 6	93-650	Brass Washer (.010 x 3/8 x 3/8)
			R 21	93-706	Neoprene Washer (.020 x 3/8 x 3/8)
			R 23	93-822	Brass Washer (.008 x .125 x 3/8)
			R 19	93-849	Shim Washer
			R 20	94-438	Spacing Bushing
				97-193	Lever Stud
				97-236	Flag Stud
				100-32	Dial Light Bulb
				114-63	#6-32 x 3/8 Hex Acorn Hd. M.S.
				114-69	#4-40 x 1/4 Hex Acorn Hd. M.S.
				114-150	#6-32 x 3/8 Hex Acorn Hd. M.S.
				117-83	Tuning Shaft Locking Lever
				128-26	Dial Indicator Cam
				147-126	Gear & Disc Spacer
				149-44	Adjusting Spring & Core
				S10826	Solenoid End Plug & Bracket Assem.
				S10829	Solenoid & Terminal Assem.
				S10381	Ratchet & Bracket Assem.
				S10836	Cross Arm Assem.
				S11056	Tuning Shaft & Gear Assem.
				S11076	Push-Full Tuner Assem. (complete)
				S11082	Turret Assem.
				S11271	Solenoid Sw. Assem. (Hand Selector & Muting)
				S11391	Antenna Connector Socket & Bracket Assembly
				S12438	Mounting Plate & Lever Assem.
				S12439	Pointer Mounting Bracket & Stud Assem.
				S12440	Pointer Drive Bracket & Stud Assem.
				S12447	Dial Light Socket & Wire Assem.
				S12909	Indicator Flag & Bracket Assem. (59-186)
				S12911	Front Plate & Bushing Assem.

CONDENSERS

Diagram No.	Part No.	Description	Diagram No.	Part No.	Description
C 8	22-162	100 Mmfd.	FS 2	78-646	Foot Sw. Cable Socket (or 78-406)
C 11	22-170	.1 Mfd.	SK 1	78-728	Speaker Cable Socket
C 13	22-182	250 Mmfd.		80-232	Vol. Con. Knob Retaining Spring
C 17	22-190	.1 Mfd.		80-454	Selector Knob Spring
C 4	22-250	.05 Mfd.		95-914	Power Transformer (Alt. for 95-1013)
C 12	22-250	.05 Mfd.		95-915	Output Transformer
C 19	22-838	.005 Mfd.		95-1013	Power Transformer
C 14	22-906	.005 Mfd.		112-310	Foot Sw. Mtg. Screw
C 23	22-908	.5 Mfd.		136-14	Fuse—10 Amp.—Type MDL—10
C 6	22-1136	250 Mmfd.		190-20	Vibrator
C 5	22-1169	.001 Mfd.		S12042	Instruction Book
C 18	22-1170	.01 Mfd.		S12043	Foot Sw. Cable & Plug Assem.
C 16	22-1180	.003 Mfd.		S-9458	Foot Switch & Plate Assembly
C 2	22-1244	.004 Mfd.			*Note: Not used in production. Sold only as an accessory.
C 15	22-1270	.02 Mfd.			
C 3	22-1376	R.F. Trimmer			
C 7	22-1377	Det. Trimmer			
C 10	22-1378	Osc. Trimmer			
C 20	22-1387	Dry Electrolytic—20 Mfd. 25 V. x 10 Mfd.—300 V. x 20 Mfd. 350 V.			
C 21	22-1420	Ant. Trimmer			
C 24	22-1448	.008 Mfd.			
C 9	22-1478	350 Mmfd. Compensator			
	22-1553*	Dry Electrolytic—20 Mfd.—25 V. x 20 Mfd.—300 V.			
	22-1554*	Dry Electrolytic—10 Mfd.—350 V.			
C 25	27-87	Spark Plate			
C 26	27-87	Spark Plate			

*Note: It is necessary to use one each 22-1553 and 22-1554 to replace one 22-1387.

RESISTORS

Diagram No.	Part No.	Description	Diagram No.	Part No.	Description
R 2	63-1267	Sensitivity Control (Sub. for 63-1379)	R 2	63-1368	1800 Ohm, 2 Watt Insl. W.W.
R 18	63-1368	1800 Ohm, 2 Watt Insl. W.W.	R 13	63-1369	270 Ohm, 1 Watt Insl. W.W.
R 13	63-1369	270 Ohm, 1 Watt Insl. W.W.	R 2	63-1379	Sensitivity Control
R 2	63-1379	Sensitivity Control	R 9	63-1390	1 Megohm 1/4 Watt.

DIAL AND TUNING MECHANISM ASSEMBLY (Continued)

Diagram No.	Part No.	Description	Diagram No.	Part No.	Description
	80-331	Cross Arm Return Spring		80-331	Cross Arm Return Spring
	80-332	Cam Lever Spring		80-332	Cam Lever Spring
	80-336	Ratchet Gear Return Spring		80-336	Ratchet Gear Return Spring
	80-340	Lever Spring		80-340	Lever Spring
	80-341	Kick-off Spring		80-341	Kick-off Spring
	80-342	Tuning Shaft Spring		80-342	Tuning Shaft Spring
	80-379	Pointer Retainer Spring		80-379	Pointer Retainer Spring
	80-445	Flag Spring		80-445	Flag Spring
	83-1030	Return Spring Retainer Strip		83-1030	Return Spring Retainer Strip
	83-1039	Solenoid Insulating Strip		83-1039	Solenoid Insulating Strip
	86-30	#6 Shakeproof Terminal		86-30	#6 Shakeproof Terminal
	93-125	#6 Internal Shakeproof Lockwasher		93-125	#6 Internal Shakeproof Lockwasher
	93-501	#4 Internal Shakeproof Lockwasher		93-501	#4 Internal Shakeproof Lockwasher
	93-631	Retainer Washer		93-631	Retainer Washer
	93-650	Brass Washer (.010 x 3/8 x 3/8)		93-650	Brass Washer (.010 x 3/8 x 3/8)
	93-706	Neoprene Washer (.020 x 3/8 x 3/8)		93-706	Neoprene Washer (.020 x 3/8 x 3/8)
	93-822	Brass Washer (.008 x .125 x 3/8)		93-822	Brass Washer (.008 x .125 x 3/8)
	93-849	Shim Washer		93-849	Shim Washer
	94-438	Spacing Bushing		94-438	Spacing Bushing
	97-193	Lever Stud		97-193	Lever Stud
	97-236	Flag Stud		97-236	Flag Stud
	100-32	Dial Light Bulb		100-32	Dial Light Bulb
	114-63	#6-32 x 3/8 Hex Acorn Hd. M.S.		114-63	#6-32 x 3/8 Hex Acorn Hd. M.S.
	114-69	#4-40 x 1/4 Hex Acorn Hd. M.S.		114-69	#4-40 x 1/4 Hex Acorn Hd. M.S.
	114-150	#6-32 x 3/8 Hex Acorn Hd. M.S.		114-150	#6-32 x 3/8 Hex Acorn Hd. M.S.
	117-83	Tuning Shaft Locking Lever		117-83	Tuning Shaft Locking Lever
	128-26	Dial Indicator Cam		128-26	Dial Indicator Cam
	147-126	Gear & Disc Spacer		147-126	Gear & Disc Spacer
	149-44	Adjusting Spring & Core		149-44	Adjusting Spring & Core
	S10826	Solenoid End Plug & Bracket Assem.		S10826	Solenoid End Plug & Bracket Assem.
	S10829	Solenoid & Terminal Assem.		S10829	Solenoid & Terminal Assem.
	S10381	Ratchet & Bracket Assem.		S10381	Ratchet & Bracket Assem.
	S10836	Cross Arm Assem.		S10836	Cross Arm Assem.
	S11056	Tuning Shaft & Gear Assem.		S11056	Tuning Shaft & Gear Assem.
	S11076	Push-Full Tuner Assem. (complete)		S11076	Push-Full Tuner Assem. (complete)
	S11082	Turret Assem.		S11082	Turret Assem.
	S11271	Solenoid Sw. Assem. (Hand Selector & Muting)		S11271	Solenoid Sw. Assem. (Hand Selector & Muting)
	S11391	Antenna Connector Socket & Bracket Assembly		S11391	Antenna Connector Socket & Bracket Assembly
	S12438	Mounting Plate & Lever Assem.		S12438	Mounting Plate & Lever Assem.
	S12439	Pointer Mounting Bracket & Stud Assem.		S12439	Pointer Mounting Bracket & Stud Assem.
	S12440	Pointer Drive Bracket & Stud Assem.		S12440	Pointer Drive Bracket & Stud Assem.
	S12447	Dial Light Socket & Wire Assem.		S12447	Dial Light Socket & Wire Assem.
	S12909	Indicator Flag & Bracket Assem. (59-186)		S12909	Indicator Flag & Bracket Assem. (59-186)
	S12911	Front Plate & Bushing Assem.		S12911	Front Plate & Bushing Assem.

SET INSTALLATION AND SUPPRESSION KIT

Diagram Part No.	Description
S13597	Set Installation & Suppression Kit (complete)
12-1314	Set Installation Bracket
22-1584	Oil Gauge Cond. (.5 Mfd.—200 V.)
22-1585	Temp. Gauge Cond. (.5 Mfd.—200 V.)
22-1586	Generator Cond. (1 Mfd.—200 V.)
54-68	3/8 x 3/4 x 3/8 Hex Nut
54-104	1/4-20 x 1/2 x 3/8 Hex Nut
54-153	3/8-28 x 1/2 x 1/20 Hex Nut
63-1512	Distributor Suppressor
80-145	Motor Hood Bond Spring
93-139	3/8 External Shakeproof Lockwasher
93-161	1/4 External Shakeproof Lockwasher
93-444	1/8 x 3/8 x 1 3/8 Steel Washer
93-577	.062 x 1/4 x 3/8 Steel Washer
112-365	#8 x 1/4 B.H. Sheet Metal Screw
114-281	1/4-20 x 3/8 Hex Hd. M.S.
147-144	Speaker Mounting Spacer
188-41	Spacer Ring

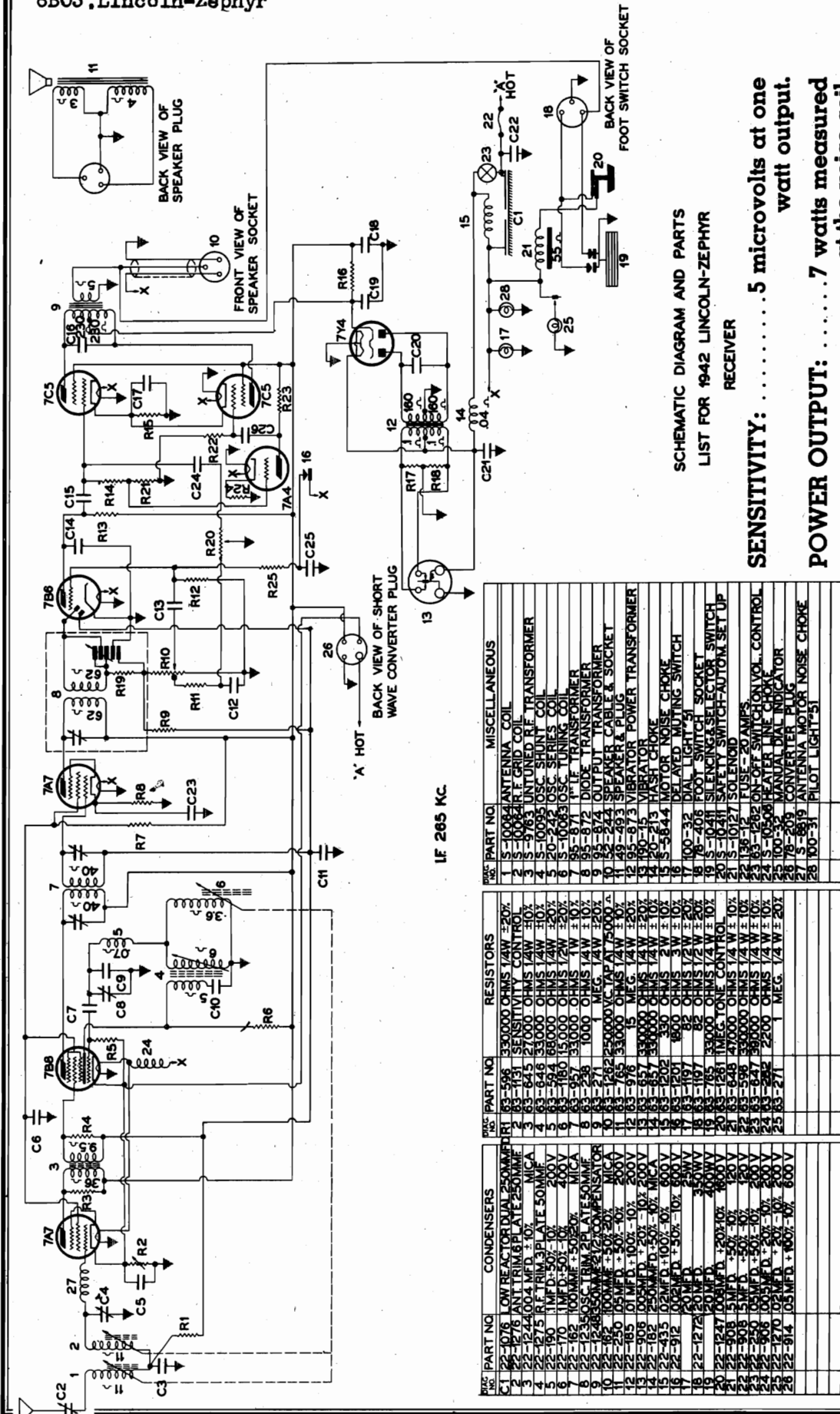
KNOB KIT

S13174	Knob Kit (complete)
S12910	Tuning & Trim Knob Assem.
S13-239	Vol. Con. Knob & Spring Assem.
46-635	Tone Con. Knob

SPEAKER AND SPEAKER MOUNTING PARTS

Diagram Part No.	Description
43-131	Speaker Housing
49-566	7.6" PM Speaker & Cable
54-30	208-566 Cone & Voice Coil
74-41	3/8 x 3/4 x 3/8 Hex Nut
93-126	Speaker Screen
93-783	#8 Internal Shakeproof Lockwasher
112-248	Stat. Bronze Steel Washer (1/2 x 3/8 x 3/8)
147-85	-8-32 x 3/8 Oval B.H.M.S.
S13066	Speaker Mounting Bracket & Stud Assem.
S13510	Complete Speaker & Housing Assem.

Note: When ordering cone and voice coil marked * be sure to add manufacturers' code letter that follows base part number.



SCHEMATIC DIAGRAM AND PARTS LIST FOR 1942 LINCOLN-ZEPHYR RECEIVER

SENSITIVITY:5 microvolts at one watt output.
POWER OUTPUT:7 watts measured at the voice coil.
SPEAKER:6" x 9" oval, instrument panel mounting.
CURRENT CONSUMPTION: ..9.2 amperes INSTANTANEOUS CURRENT CONSUMPTION DURING AUTOMATIC CHANGE CYCLE:18.2 amperes

CONDENSERS		RESISTORS		MISCELLANEOUS	
PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
1	27-0000	1	5000	1	5-1004
2	100MFD	2	100MFD	2	1004
3	100MFD	3	100MFD	3	1004
4	100MFD	4	100MFD	4	1004
5	100MFD	5	100MFD	5	1004
6	100MFD	6	100MFD	6	1004
7	100MFD	7	100MFD	7	1004
8	100MFD	8	100MFD	8	1004
9	100MFD	9	100MFD	9	1004
10	100MFD	10	100MFD	10	1004
11	100MFD	11	100MFD	11	1004
12	100MFD	12	100MFD	12	1004
13	100MFD	13	100MFD	13	1004
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67	100MFD	67	100MFD	67	1004
68	100MFD	68	100MFD	68	1004
69	100MFD	69	100MFD	69	1004
70	100MFD	70	100MFD	70	1004
71	100MFD	71	100MFD	71	1004
72	100MFD	72	100MFD	72	1004
73	100MFD	73	100MFD	73	1004
74	100MFD	74	100MFD	74	1004
75	100MFD	75	100MFD	75	1004
76	100MFD	76	100MFD	76	1004
77	100MFD	77	100MFD	77	1004
78	100MFD	78	100MFD	78	1004
79	100MFD	79	100MFD	79	1004
80	100MFD	80	100MFD	80	1004
81	100MFD	81	100MFD	81	1004
82	100MFD	82	100MFD	82	1004
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92	100MFD	92	100MFD	92	1004
93	100MFD	93	100MFD	93	1004
94	100MFD	94	100MFD	94	1004
95	100MFD	95	100MFD	95	1004
96	100MFD	96	100MFD	96	1004
97	100MFD	97	100MFD	97	1004
98	100MFD	98	100MFD	98	1004
99	100MFD	99	100MFD	99	1004
100	100MFD	100	100MFD	100	1004

TUBE COMPLEMENT:7A7 R.F., 7B6 converter, 7A7 I.F., 7B6 Detector and 1st Audio, 7A4 Phase Inverter, 2-7C5 Push pull power output. 7Y4 Rectifier.

RECEIVER INSTALLATIONS:

Figures 1-1A-2 and 2A, illustrating the escutcheon plate, control knobs and the installed receivers, are given here to facilitate removal and reinstallation of the receivers when service or repairs are necessary.

Remove the tuning and volume control knobs to expose the 8/32 flat head screws that support the receiver at the top. Remove the lower support brackets "D" next and finally loosen the hook bolts "A" to remove the receiver from the car.

NOTE: To set up a station on any automatic position pull the tuning knob out and tune the receiver as in manual tuning. Press the tuning knob in to its original position after the station has been accurately tuned in.

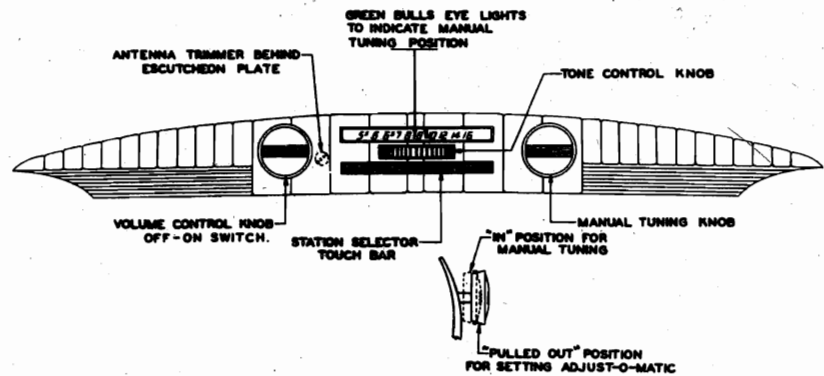


FIG. 1—Zephyr

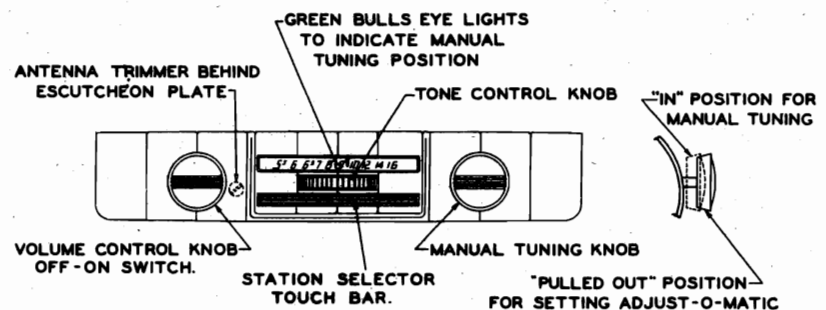


FIG. 1A—Continental

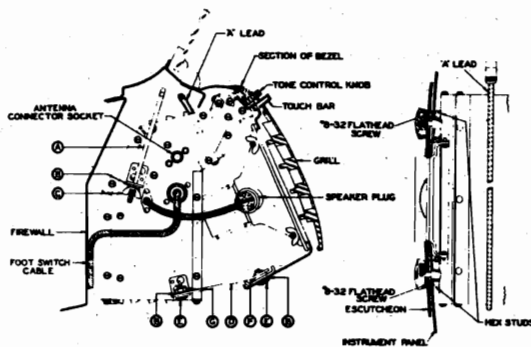


FIG. 2—Zephyr

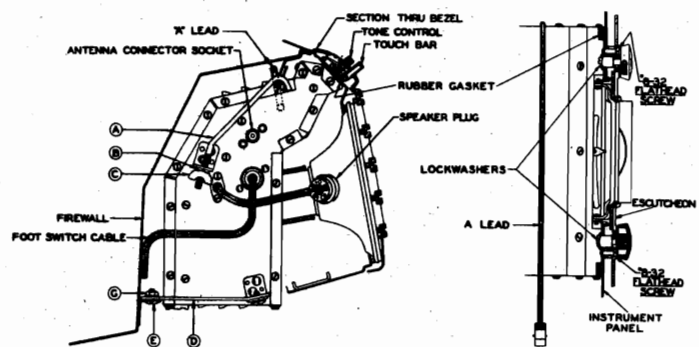


FIG. 2A—Continental

DELAYED AUTOMATIC MUTING CIRCUIT

Pressing either the Touch-bar or the foot control switch automatically mutes the receiver for the duration of the change cycle. This action is accomplished by applying 6 volts negative to the 7B6 first audio grid through the 1 megohm resistor R-25. (See schematic diagram). This negative voltage blocks the grid of the 7B6 until the voltage bleeds off through the 15 megohm resistor R-12, when the receiver will again operate normally. **NOTE:** The storage battery in the car must be properly polarized to apply the negative muting voltage to the receiver. If the battery polarity is reversed the receiver will not mute and it may become distorted during the change cycle. Always connect the positive (+) terminal of the storage battery or power supply to the receiver case when checking the receiver.

INTERFERENCE SUPPRESSION

There should be no motornoise or interference from the ignition circuit, if the receiver has been installed in the car according to the instructions furnished with it. The interference suppression equipment may be checked for proper installation by referring to the following illustrations:

The two distributor condensers No. 22-1147 should be installed as shown in Figure 3 below.

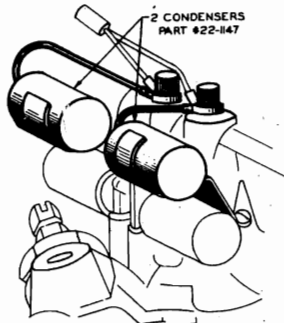


FIG. 3

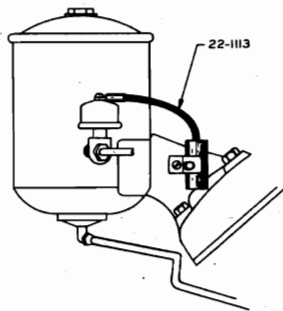


FIG. 4

The oil gauge condenser No. 22-1113 should be installed as shown in Figure 4 above.

The temperature gauge condenser No. 22-1113 should be installed with its bracket fastened under one of the cylinder head bolts as shown in Figure 5 below.

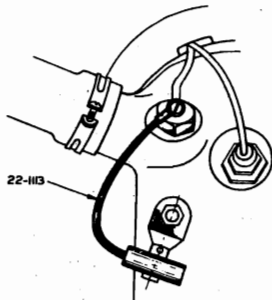


FIG. 5

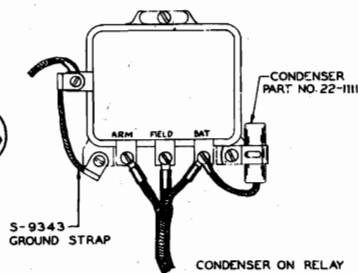


FIG. 6

The No. S-9343 ground strap and the voltage regulator condenser No. 22-1111 should be installed as shown in Figure 6 above. The condenser lead should be connected to the "Batt" terminal.

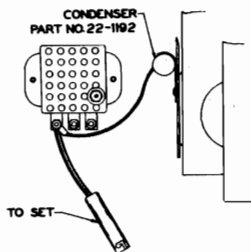
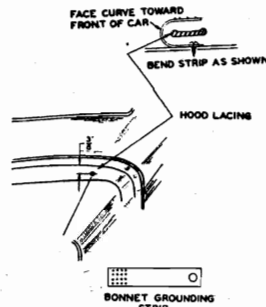


FIG. 7

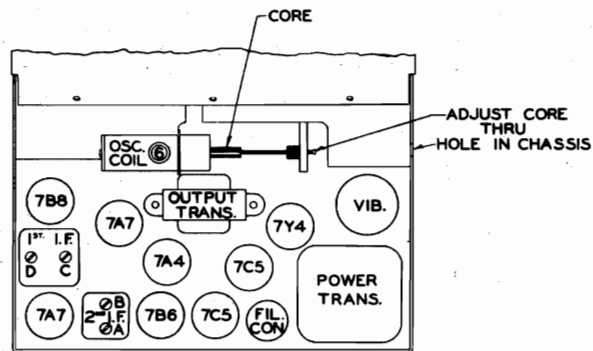
The No. 22-1192 condenser and the "A" lead should be connected together at the terminal strip inside the car above the steering column as shown in Figure 7.

Check the antenna connector and the instrument panel bolts so they make a good ground contact with the car body.



Install the No. 80-145 bonnet grounding strip as illustrated in figure 8.

FIG. 8



TUBE & TRIMMER LAYOUT MOD. 8ML692

FIG. 9

ALIGNMENT

Maximum performance is dependent upon the accurate alignment of the receiver, so follow the alignment instructions carefully.

CAUTION: Make all alignment adjustments to the receiver with the volume control turned full on. Reduce the signal intensity, if necessary, at the signal generator. Connect the output meter across the voice coil.

I.F. ALIGNMENT PROCEDURE

- 1—Remove the top and bottom covers from the receiver.
- 2—Place the receiver in the Manual tuning position and set the pointer at the low frequency end of the dial. (540 Kc.)
- 3—Set the signal generator at 265 Kc.
- 4—Apply the signal from the generator through a .1 mfd. dummy to the 7B8 converter grid.
- 5—Adjust trimmers A-B-C and D (Fig. 9) for maximum output. Repeat the operation to assure accurate alignment.

R. F. AND OSCILLATOR ALIGNMENT

- 1—Set the signal generator at 1640 Kc.
- 2—Connect the signal generator leads, through the dummy as illustrated in Figure 12, to the antenna receptacle on the receiver.
- 3—Set the receiver dial at 1640 Kc. (Maximum high frequency end of dial.)
- 4—Screw the cores completely out of the antenna, R.F. and oscillator coils.
- 5—Set the oscillator trimmer (F—Fig. 10) at 1640 Kc.
- 6—Peak R.F. and antenna trimmers (G—Fig. 10 and H—Fig. 11) for maximum output reading.
- 7—Replace the cores to their approximate original positions in the antenna, R.F. and oscillator coils.
- 8—Set the generator and the receiver dial at 1200 Kc.
- 9—Adjust the oscillator core (No. 6—Fig. 9) to scale at 1200 Kc.
- 10—Adjust the antenna and R.F. cores (No. 1 and No. 2—Fig. 10) for maximum output reading.
- 11—Set the signal generator at 600 Kc.
- 12—"Rock in" the Shunt oscillator core (No. 4—Fig. 10) for maximum output reading. (Same as rocking in the padder condenser on a ganged condenser receiver.)
- 13—Check receiver at 1200 Kc. for calibration and gain. If receiver is off scale or weak, repeat operation 9, and 10.

IMPORTANT: When reinstalling the receiver in the car, allow it to operate for approximately 15 minutes to reach normal operating temperature before checking the antenna trimmer alignment on a weak station at approximately 1200 Kc.

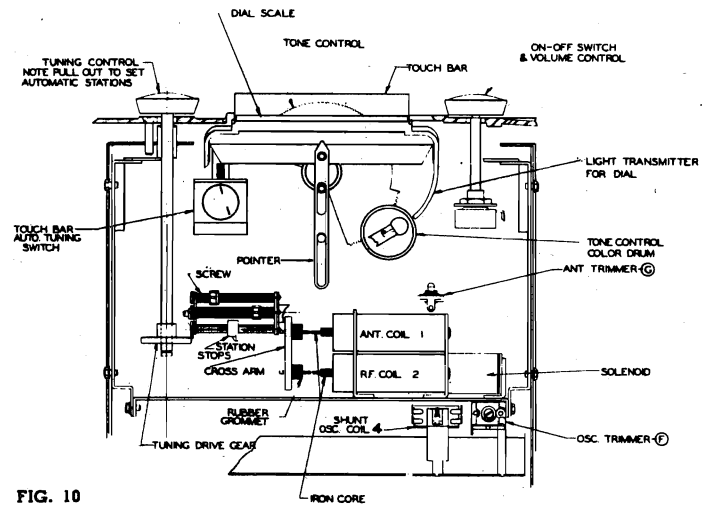
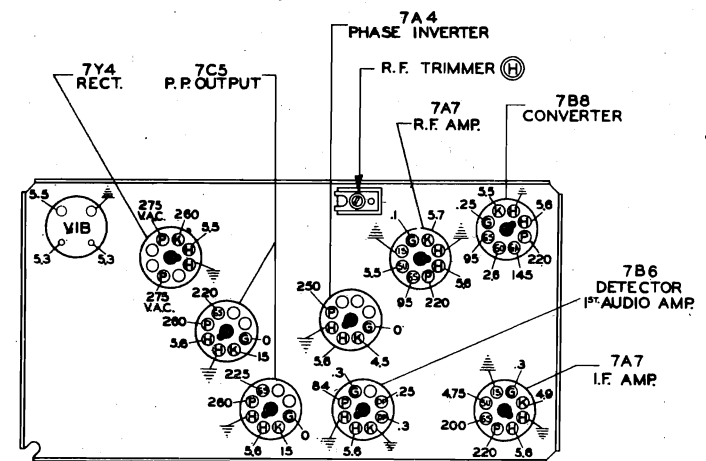


FIG. 10



BOTTOM VIEW OF CHASSIS

FIG. 11

Figure 11 shows the approximate voltages as measured with a 1000 ohm per volt meter measured between the socket terminals and the chassis. Volume control set at maximum with no signal. Battery Voltage—6.3.

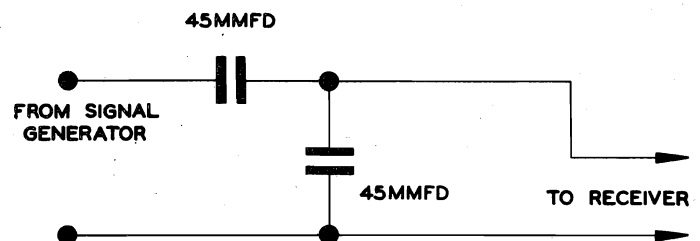


FIG. 12

Schematic of a recommended dummy antenna, closely resembling actual antenna capacity, to be used in series with signal generator leads when aligning the R.F. section of the receiver Fig. 12.

PARTS PRICE LIST

MODEL 8ML692 (CHASSIS 8B 03)

LINCOLN

1942 ADJUST-O-MATIC RADIO

26H-18805

DIAL AND TUNING MECHANISM

12-894	Rear magnet mounting bracket	.15
26-314	Dial scale	1.00
34-108	Ratchet	.25
34-122	Tone control gear	.03
35-5	Tone control color drum	.15
46-478	Volume control knob	.20
57-963	Dial scale background plate	.60
80-272	Ratchet lever spring	.02
80-274	Tuning coil return spring	.05
80-300	Gear indexing spring	.03
85-308	Station selector switch	.60
93-558	Brass washer	.01
97-156	Tone control knob retaining stud	.30
100-32	Dial light bulb	.07
126-437	Dial light shield	.01
126-438	Dial scale light shield	.005
126-439	Color organ light shield	.02
147-118	Manual automatic bakelite breaker collar	.04
187-5	Indicator light rod (lucite)	.20
188-34	Retaining ring (tuning shaft)	.01
188-39	Turret screw lock ring	.02
188-45	Retaining ring	.01
S10108	Ratchet drive lever & spring assembly	.35
S10110	Front magnet mounting bracket & detent lever spring assembly	.20
S10117	Tuning adjustment screw & grommet assembly	.20
S10127	Magnet coil & terminal assembly	.40
S10232	Tuning shaft & gear assembly	1.00
S10411	Manual automatic selector switch assembly	.35
S10415	Turret shaft, screw & stop assembly	.25
S10514	Magnet core, cross arm, pointer drive bracket & stud assembly	2.00
S10517	Tone control knob assembly (46-478)	.90
S10518	Dial pointer, stud & bushing assy. (59-136)	.45
S10321	Manual dial light socket, switch, bracket and stud assembly	.30
S10522	Color organ light socket & wire assembly	.75
S10323	Dial light socket & wire assembly	.40

CONDENSERS

22-162	.0001 mid.	600 volt.	.15
22-170	.1 mid.	400 volt.	.20
22-182	.00025 mid.	600 volt.	.20
22-185	.1 mid.	200 volt.	.15
22-190	.05 mid.	200 volt.	.15
22-250	.05 mid.	200 volt.	.15
22-435	.02 mid.	600 volt.	.15
22-906	.005 mid.	200 volt.	.15
22-908	.5 mid.	120 volt.	.25
22-912	.002 mid.	600 volt.	.15
22-914	.05 mid.	600 volt.	.20
22-1076	Dual spark plate condenser	600 volt.	.20
22-1111	Generator condenser	600 volt.	.45
22-1113	Oil & water gauge condenser	600 volt.	.35
11-1147	Distributor condenser	600 volt.	.35
22-1192	"A" lead condenser	600 volt.	.50
22-1235	Single section ceramic trimmer	600 volt.	.15
22-1244	.004 mid.	600 volt.	.20
22-1247	.008 mid.	1600 volt.	.40
22-1248	350 mmfd. compensator	200 volt.	.40
22-1270	.02 mid.	200 volt.	.15
22-1272	20 mid. 25 volt x 20 mid. 400 volt x 20 mid. 350 volt dry electrolytic	400 volt x 20 mid. 350 volt dry electrolytic	1.25
22-1275	Single section ceramic trimmer	400 volt x 20 mid. 350 volt dry electrolytic	95-973
22-1276	Antenna trimmer	400 volt x 20 mid. 350 volt dry electrolytic	25

MISCELLANEOUS

207-483	Field coil (not replaceable)	5.00
208-493	Cone & voice coil assembly	2.00
52-200	Battery cable—fuse to ammeter	.20
52-244	Speaker cable and plug	.45
52-253	Battery cable—set to fuse	.20
52-266	Antenna cable	1.70
76-209	Socket—short wave adaptor	.10
76-251	Socket—antenna connector	.10
76-408	Socket—foot switch	.15
76-454	Socket—lokal tube (8 contact)	.15
76-455	Socket—lokal tube (6 contact)	.15
76-467	Socket—lokal tube (5 contact)	.15
76-477	Socket—vibrator	.10
80-246	Power transformer ground spring	.07
80-291	Muting switch spring	.03
85-961	Muting switch insulating strip	.35C
85-962	Muting switch insulating strip	.30C
89-125	No. 6 internal shockproof lockwasher	.28C
92-123	Muting switch fibre washer	.03
95-573	Power transformer	3.00
95-874	Output transformer	1.50
114-63	No. 6/32 x 3/16" Hex acorn Hd. M.S.-N.P.	.25C

RESISTORS

63-238	1M ohm	1/4 watt	.07
63-271	1 megohm	1/4 watt	.07
63-282	2200 ohm	1/4 watt	.07
63-594	68M ohm	1/4 watt	.07
63-596	330M ohm	1/4 watt	.07
63-645	27M ohm	1/4 watt	.07
63-646	33M ohm	1/4 watt	.07
63-647	39 M ohm	1/4 watt	.07
63-648	47M ohm	1/4 watt	.07
63-657	330M ohm	1/4 watt	.07
63-765	33M ohm	1/4 watt insulated.	.15
63-957	33M ohm	1/4 watt insulated.	.20
63-976	15 megohm	1/4 watt	.07
65-1131	Sensitivity control		.50
65-1180	15M ohm	1/4 watt insulated.	.17
65-1197	82 ohm	1/4 watt	.08
65-1201	1800 ohm W.W.	3 watt insulated.	.30
65-1202	330 ohm W.W.	2 watt insulated.	.30
65-1261	Tone control		1.00
65-1262	Volume control & switch		1.50

COILS AND CHOKES

20-213	Main hash choke	.25
20-242	Oscillator series coil	.20
95-871	1st I. F. transformer	1.25
95-872	2nd I. F. transformer	1.50
S5844	Motor noise choke assembly	.15
S8819	Antenna motor noise choke assembly	.20
S9762	Untuned R. F. coil & core assembly	.50
S10063	Oscillator coil & shield assembly	1.10
S10064	R. F. coil & shield assembly	1.40
S10095	Oscillator alum. coil assembly	.60
S10508	Heter line choke assembly	.30

MOTOR NOISE SUPPRESSION KIT ASSEMBLY

S10574	Motor noise suppression kit complete	2.60
S9343	Regulator ground lead assembly	.05
22-1111	Suppressor condenser bracket	1.50C
22-1113	Generator condenser	.45
22-1119	Water & oil gauge condenser	.35
22-1192	Distributor condenser	.35
83-916	"A" lead condenser	.50
114-39	Bonding strip	.04
	No. 8 x 1/4" Hex Hd. slotted S.T. screw	.50C

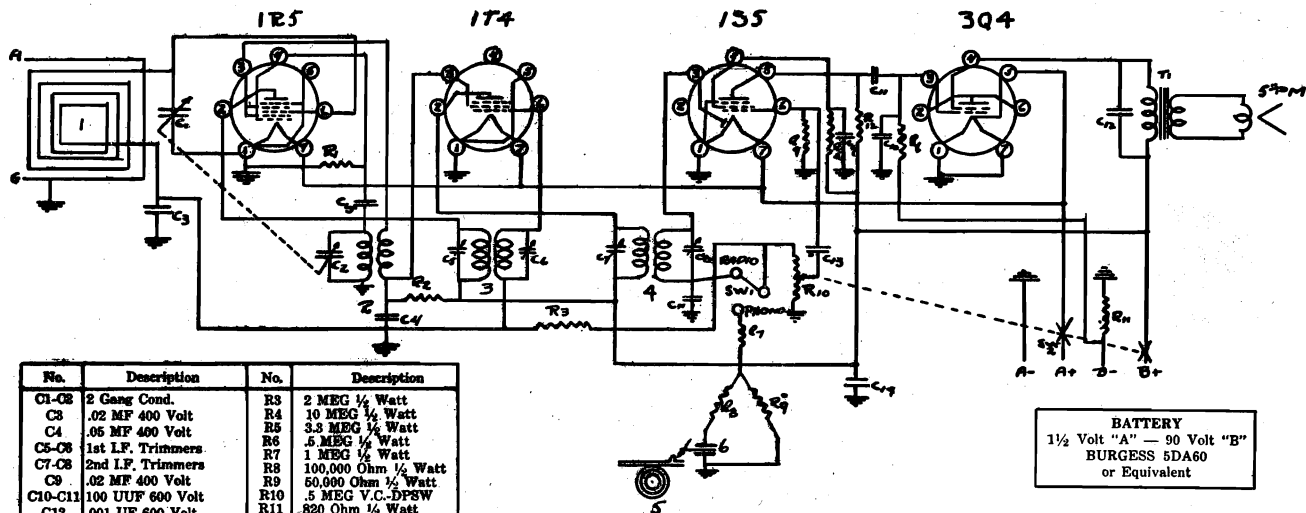
TUNING KNOB KIT ASSEMBLY

S10577	Tuning knob kit complete	.55
S10568	Tuning control knob assembly (46-477)	.35
46-478	Volume control knob	.20

All Prices List—Subject to Regular Discount and Change Without Notice—9/15/41.

ALAMO ELECTRONICS CORP.

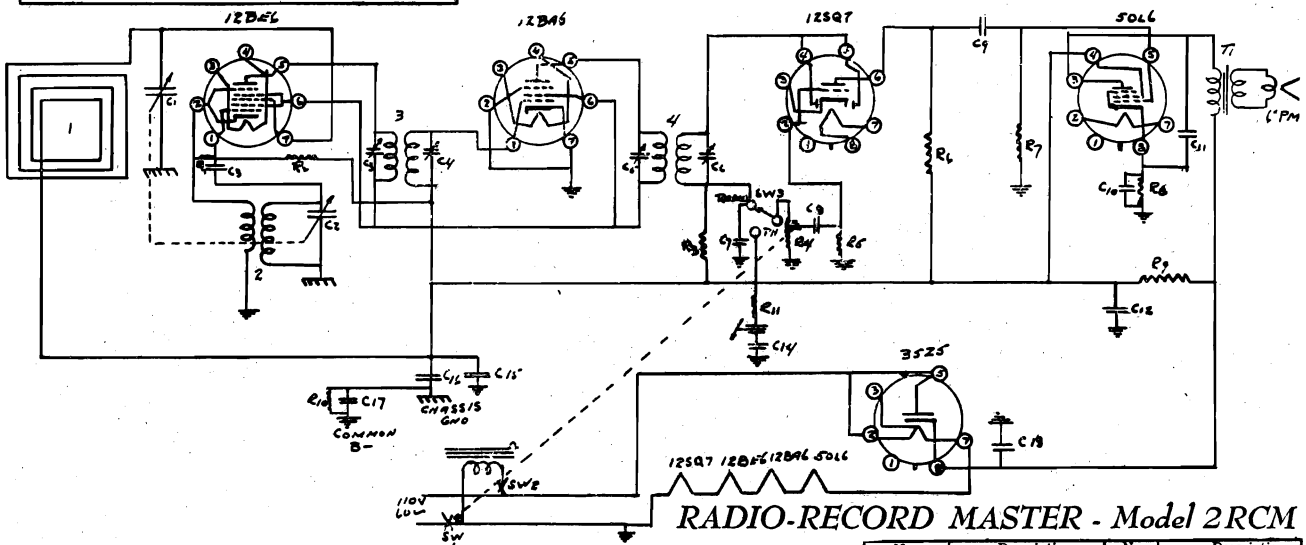
MODEL AEC-3RCMB
MODEL 2RCM



No.	Description	No.	Description
C1-C2	2 Gang Cond.	R3	2 MEG 1/2 Watt
C3	.02 MF 400 Volt	R4	10 MEG 1/2 Watt
C4	.05 MF 400 Volt	R5	3.5 MEG 1/2 Watt
C5-C6	1st I.F. Trimmers	R6	.5 MEG 1/2 Watt
C7-C8	2nd I.F. Trimmers	R7	1 MEG 1/2 Watt
C9	.02 MF 400 Volt	R8	100,000 Ohm 1/2 Watt
C10-C11	100 UUF 600 Volt	R9	50,000 Ohm 1/2 Watt
C12	.001 UF 600 Volt	R10	.5 MEG V.C.-DPSW
C13	.005 UF 600 Volt	R11	820 Ohm 1/2 Watt
C14	10 MFD 90 Volt	R12	1 MEG 1/2 Watt
C15	50 UUF 600 Volt	1	Loop
R1	100,000 Ohm 1/2 Watt	2	Osc. Coil
R2	18,000 Ohm 1/2 Watt	3	1st I.F.
		4	2nd I.F.
		5	Spring Meter
		6	Crystal Pickup

BATTERY
1 1/2 Volt "A" - 90 Volt "B"
BURGESS 5DA60
or Equivalent

MODEL AEC-3RCMB



RADIO-RECORD MASTER - Model 2RCM

No.	Description	No.	Description
C1 & C2	2 Gang Cond.	1	Loop
C3	50 UUF 600V	2	Osc. Coil
C3 & C4	1st I.F.	4	1st I.F. 456 Kc
C5 & C6	2nd I.F.	3	2nd I.F. 456 Kc
C7	100 UUF 600V	T1	Output Trans.
C8 & C9	.005 MF 600V	SW2	T. T. Power
C10	10 MFD 25V	SW3	Radio-Phone.
C11	.03 MF 400V		
C12 & C13	40 MFD 150V		
C14 & C15	.45 MFD 400V		
C16 & C17			
R1	20,000 1/2 Watt		
R2	10 MEG 1/2 Watt		
R3	2 MEG 1/2 Watt		
R4	.5 MEG V.C. & SW1		
R5	4.7 MEG 1/2 Watt		
R6 & R7	470,000 1/2 Watt		
R10	15052 1/2 Watt		
R9	15052 1/2 Watt		
R11	1 MEG 1/2 Watt		

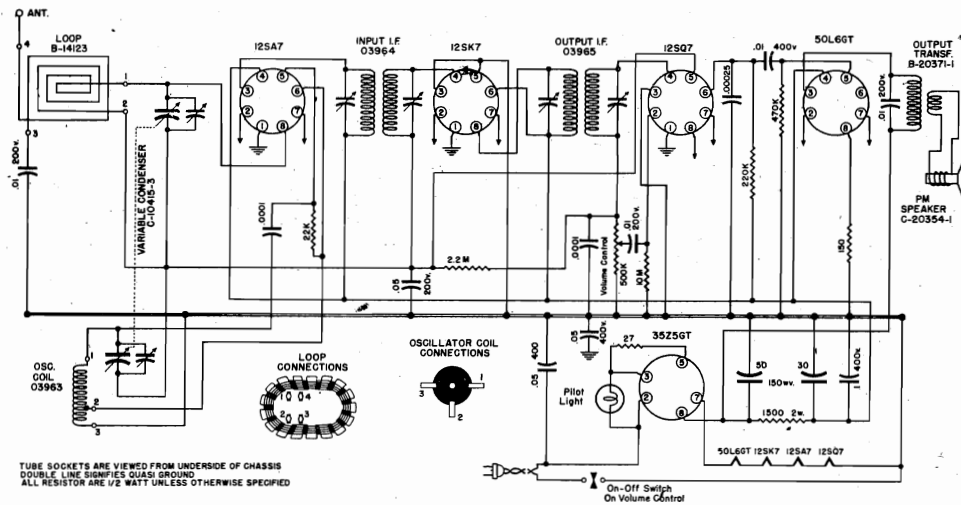
I.F. ALIGNMENT. Remove the chassis and loop antenna from the cabinet and set them up on the bench. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench. With the gang condenser set at minimum, adjust the test oscillator to 455 KC and connect the output to the grid of the first detector tube (12BE6) through a .05 to .1 mfd condenser. The ground on the test oscillator should be connected to the ground buss, indicated on the circuit diagram. Align all four I.F. trimmers to peak or maximum reading on the output meter. Each I.F. has two adjustments at the top of the can.

LOOP ALIGNMENT. Connect the test oscillator to a dummy loop which can be made by coiling 2 turns of hookup wire about 6" in diameter. Place this dummy loop about a foot from the loop on the receiver and in the same plane

GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 455, 600, 1400 and 1620 KC and an output meter to be connected across the primary or secondary of the output transformer. If possible, all alignments should be made with the volume control on maximum and the test oscillator output as low as possible to prevent the AVC from operating and giving false readings.

CORRECT ALIGNMENT PROCEDURE. The intermediate frequency (I.F.) stages should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the oscillator and loop should be adjusted.

as the receiver loop. With the gang condenser set at minimum capacity, set the test oscillator at 1620 KC, and adjust the oscillator (or 1620 KC trimmer) on gang condenser. Next—set the test oscillator at 1400 KC, and tune in the signal on the gang condenser. Adjust the antenna trimmer (or 1400 KC trimmer) for maximum signal. Next set the test oscillator at 600 KC, and tune in signal on condenser to check alignment of coils.



When using D.C. power supply, and after allowing sufficient time for tubes to warm up, if the receiver does not operate, remove the line cord plug from the socket and reverse. Replace the plug in the reverse position and allow tubes to warm up, at which time the receiver will operate

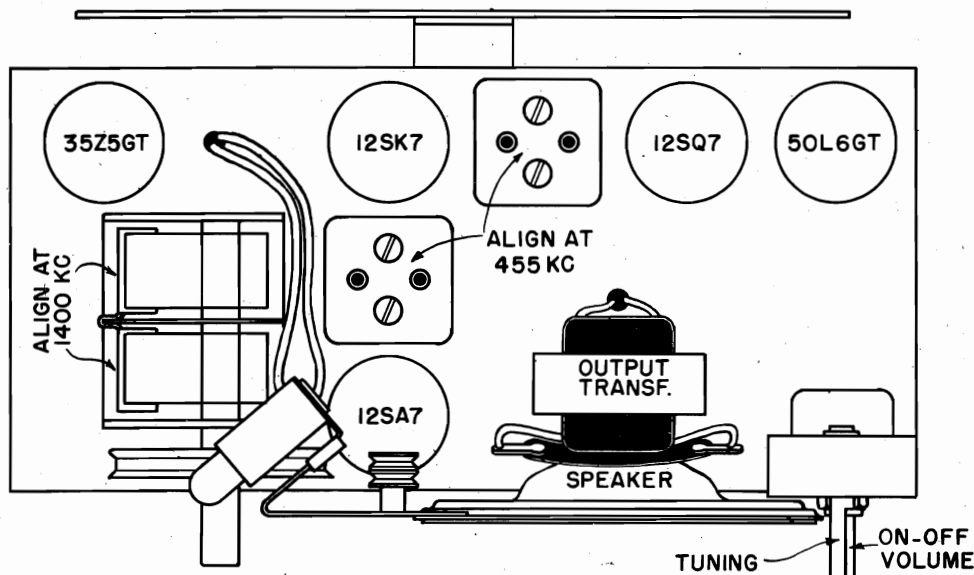
When using A.C. power supply, it will be found that there will be less hum when the line cord plug is in the best position. Try both positions, leaving the plug in the position that produces the least hum.

For the reception of local stations no antenna is necessary, the built-in loop providing sufficient volume. If it is desired to listen to more distant stations, an antenna 50 to 100 feet long should be connected to the flexible lead protruding from rear of the cabinet. Do not use a ground with this receiver.

If the receiver fails to operate, remove the back plate to see that all tubes are pushed down in their respective sockets as illustrated in the tube layout diagram below. Always disconnect line cord plug before making any adjustments inside of cabinet.

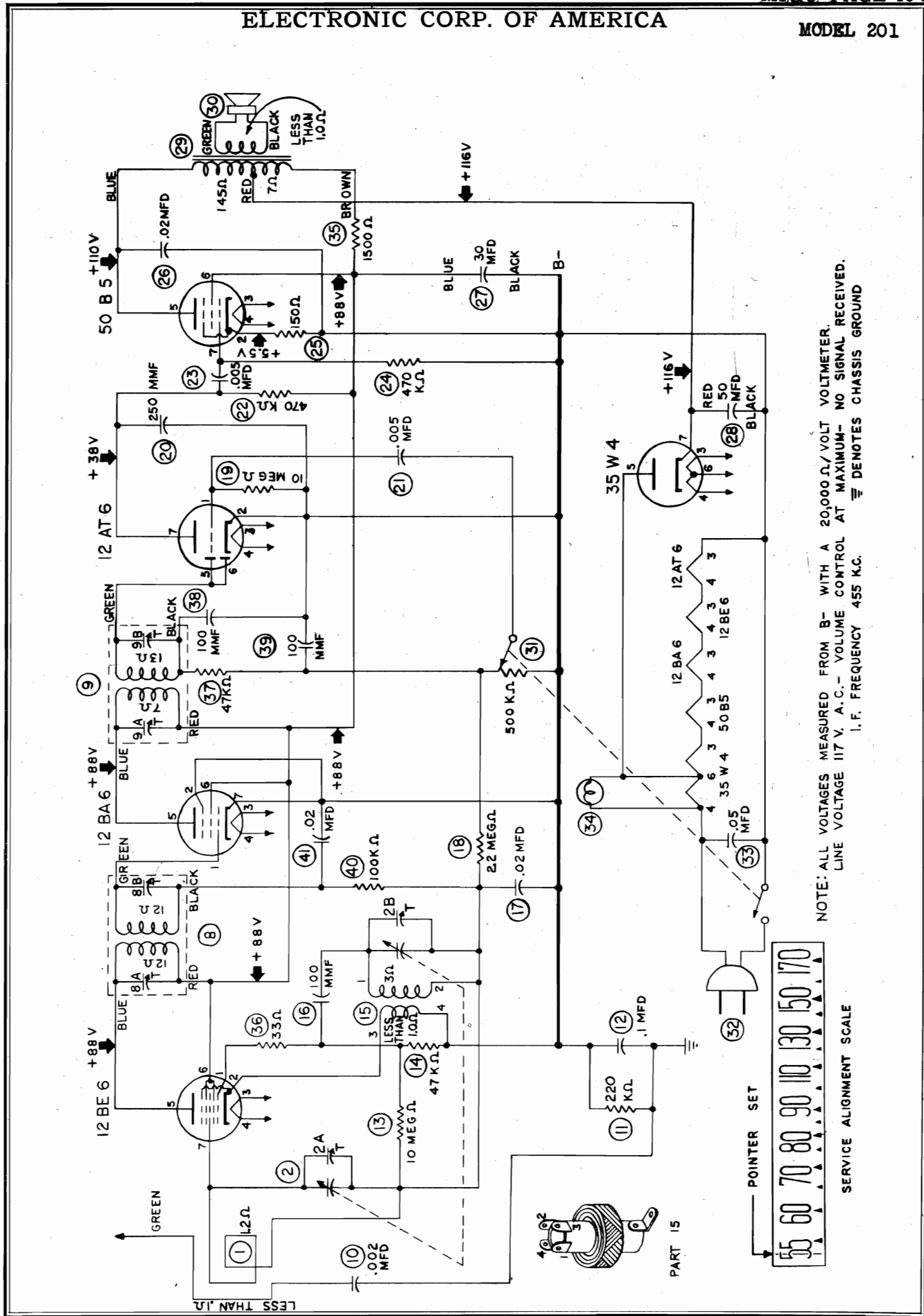
Sometimes, when operating this receiver in buildings having steel in their construction, it will be necessary to use an external antenna to provide sufficient volume for satisfactory operation.

TUBE LAYOUT

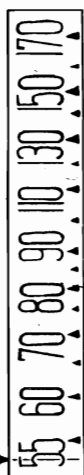


ELECTRONIC CORP. OF AMERICA

MODEL 201



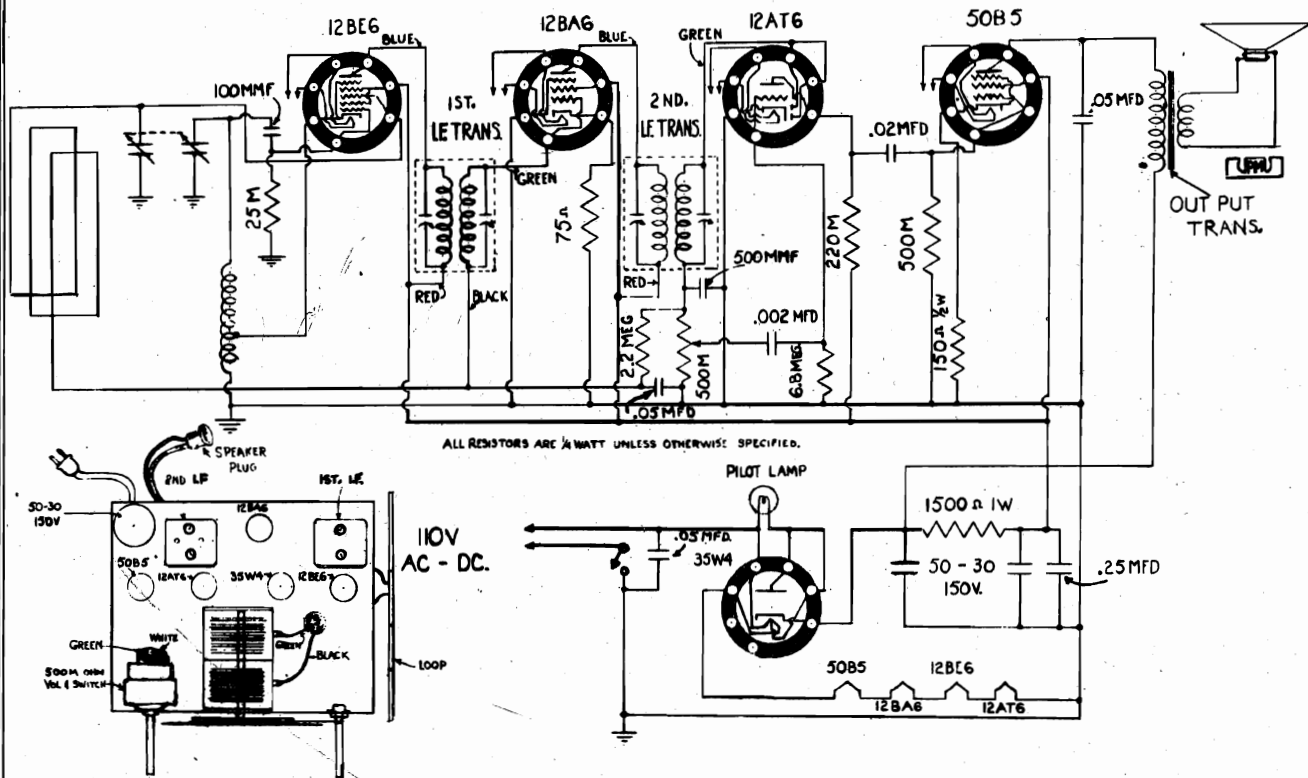
NOTE: ALL VOLTAGES MEASURED FROM B- WITH A 20,000 Ω/VOLT VOLTMETER.
 LINE VOLTAGE 117 V. A.C.- VOLUME CONTROL AT MAXIMUM- NO SIGNAL RECEIVED.
 I.F. FREQUENCY 455 K.C.



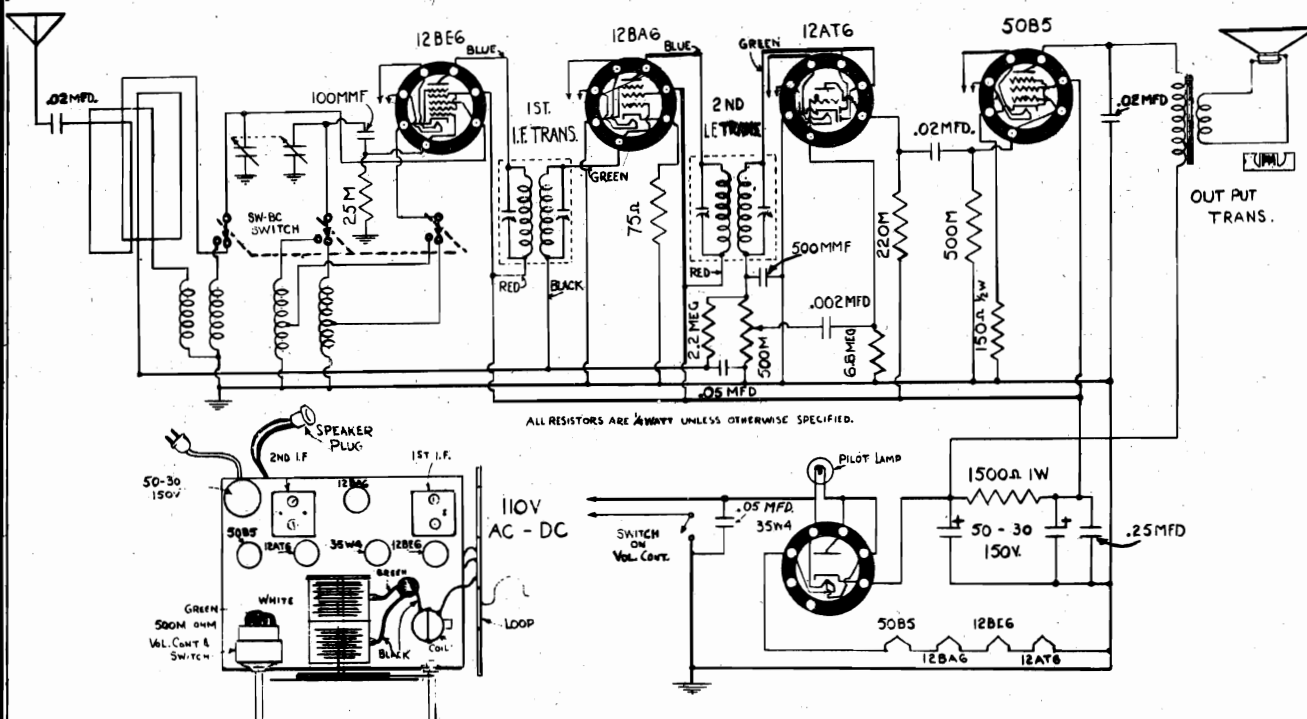
POINTER SET

EMPIRE DESIGNING CORP.

MODEL 55
MODEL 56



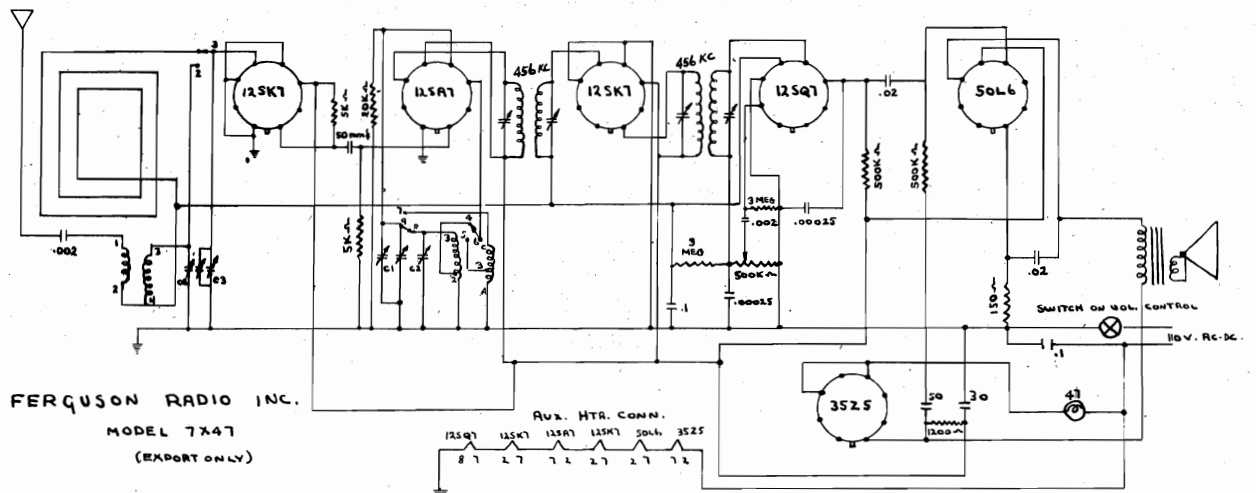
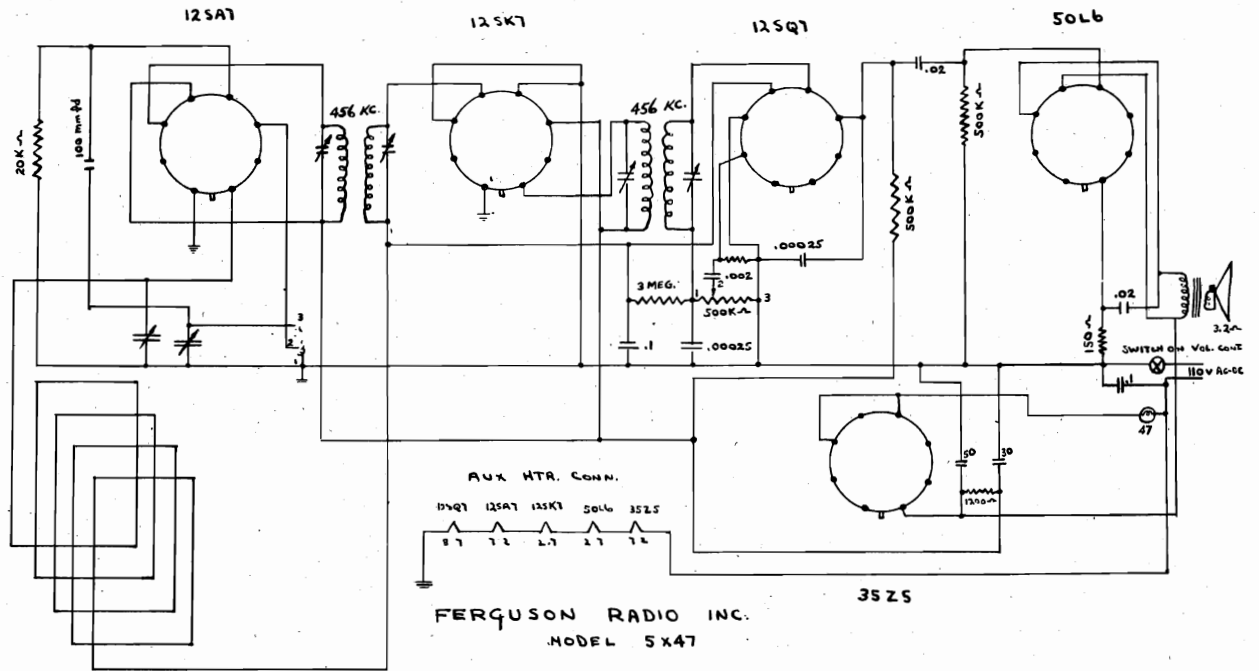
MODEL 55 IF PEAK 455 KC

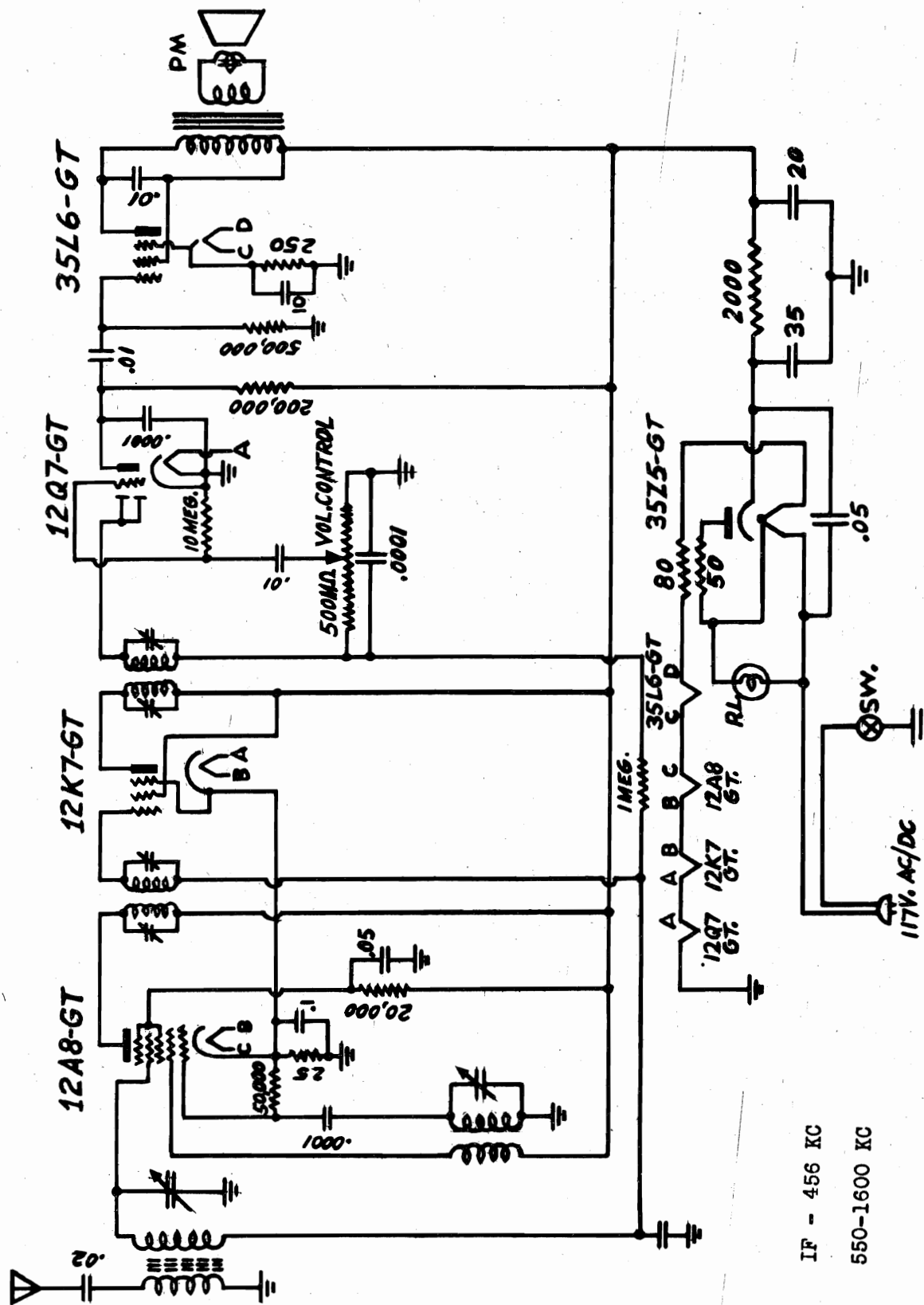


MODEL 56 IF PEAK 455 KC

FERGUSON RADIO CORP.

MODEL 5X47
MODEL 7X47





IF - 456 KC
550-1600 KC

NATIONAL ACOUSTIC PRODUCTS

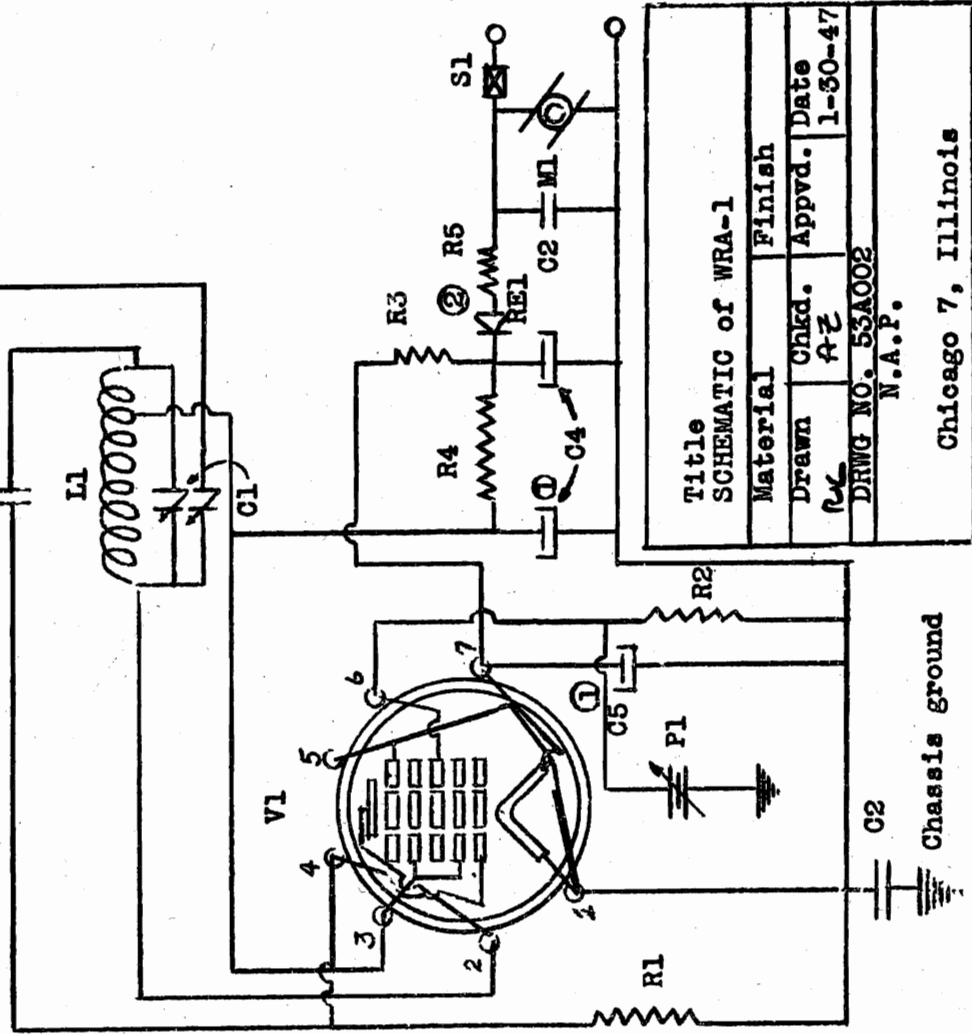
MODEL WRA-1

CHANGE	
Issue No. 1	
Ⓛ C5 added, C4 change 5-8-47	ck
Ⓜ R5 added change 6-24-47	ck
U.g.	

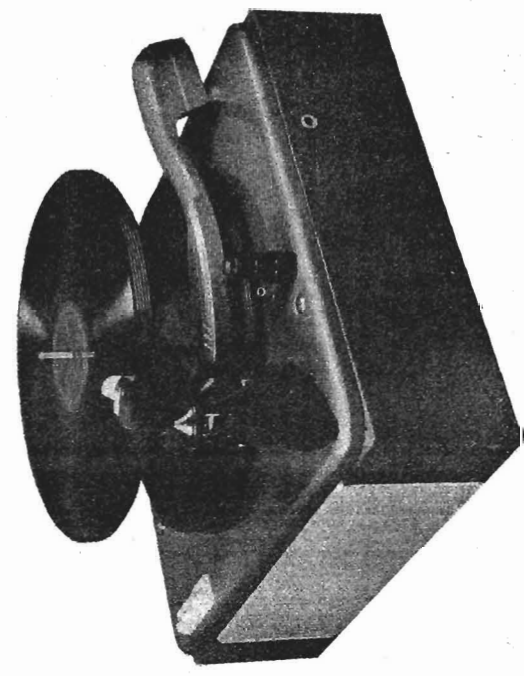
Sym.No.	Part No.	Part Value
C 1	44S001	Trimmer Cond.
C 2	19S007	.05 MFD 400 W.V. (2)
C 3	19S015	100 MMFD Mica
C 4	18S020	20-20 MFD 150 W.V.
C 5	19S011	100 MFD 10 W.V.
L 1	49S001	Osc. Coil
M 1	24S042	Changer Motor
P 1	24S042	Crystal Pickup
R 1	16S011	27000 ohm $\frac{1}{2}$ W.
R 2	16S020	500000 ohm $\frac{1}{2}$ W.
R 3	16S028	2500 ohm 10 W.
R 4	16S029	5000 ohm $\frac{1}{2}$ W.
R 5	16S029	110 ohm 2 W $\frac{1}{2}$ 10%
RE 1	48S001	Selenium Rect.
S 1	24S042	SPST Switch
V 1	24S025	1R5 Tube

CAUTION: Remove AC plug before removing or installing V1

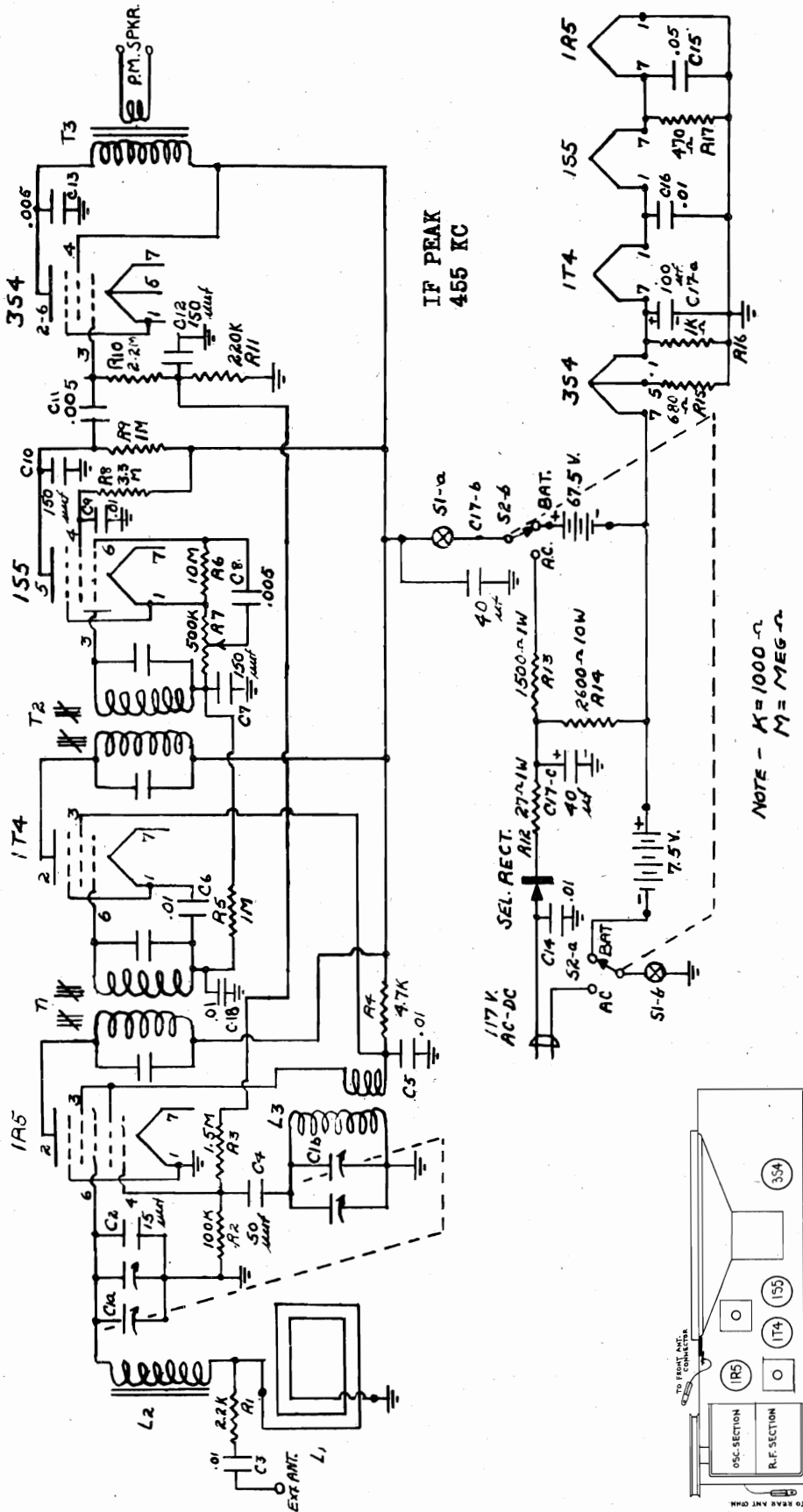
NOTE: C4 must be two separate 20 MFD. capacitors



Title SCHEMATIC of WRA-1			
Material	Chkd.	Finish	Appvd.
ck	A-Z		1-30-47
DRWG NO. 53A002			
N.A.P.			
Chicago 7, Illinois			



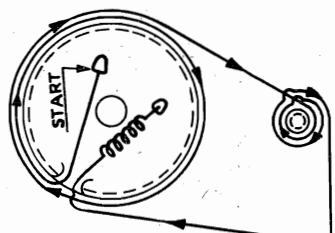
MODEL 341T



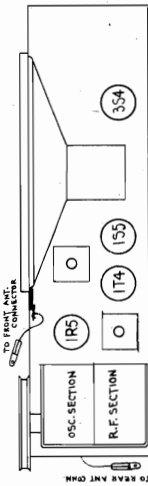
IF PEAK
455 KC

NOTE - K = 1000 Ω
M = MEG Ω

WARNING:— Turn dial to 55 before removing Chassis.
NOTE:— To remove chassis—remove three screws at bottom of cabinet—remove battery & antenna plugs—remove batteries—pull chassis towards rear & tilt forward.
ALIGNMENT INSTRUCTIONS:— Couple signal generator through a .1 M.F.D. capacitor to high side of R.F. section of variable Set generator at 455 K.C. and adjust 2nd I.F. transformer, then 1st I.F. transformer for maximum output. Couple generator to external antenna lead through 200 M.M.F. capacitor. Set receiver dial so that variable is completely unmeshed. Set generator at 1620 K.C. Adjust oscillator trimmer for maximum output. Set generator at 1400 K.C.
 Tune Receiver to 1400 K.C. Place chassis into cabinet and tip forward so that R.F. trimmer is accessible. Adjust R.F. trimmer for maximum output.

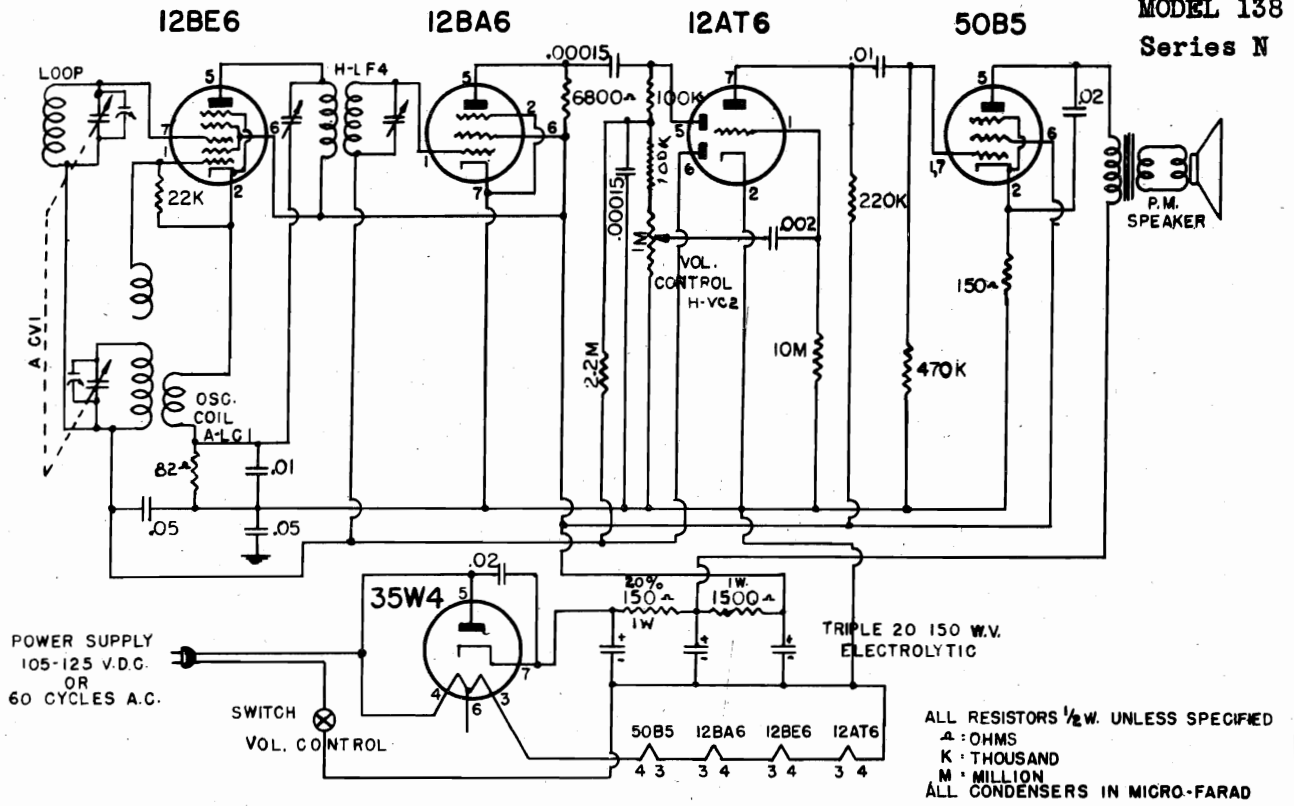


DIAL CORD DRIVE



TELEPHONE RADIO CORP.

MODEL 135, Dynamite Series H
MODEL 138 Series N

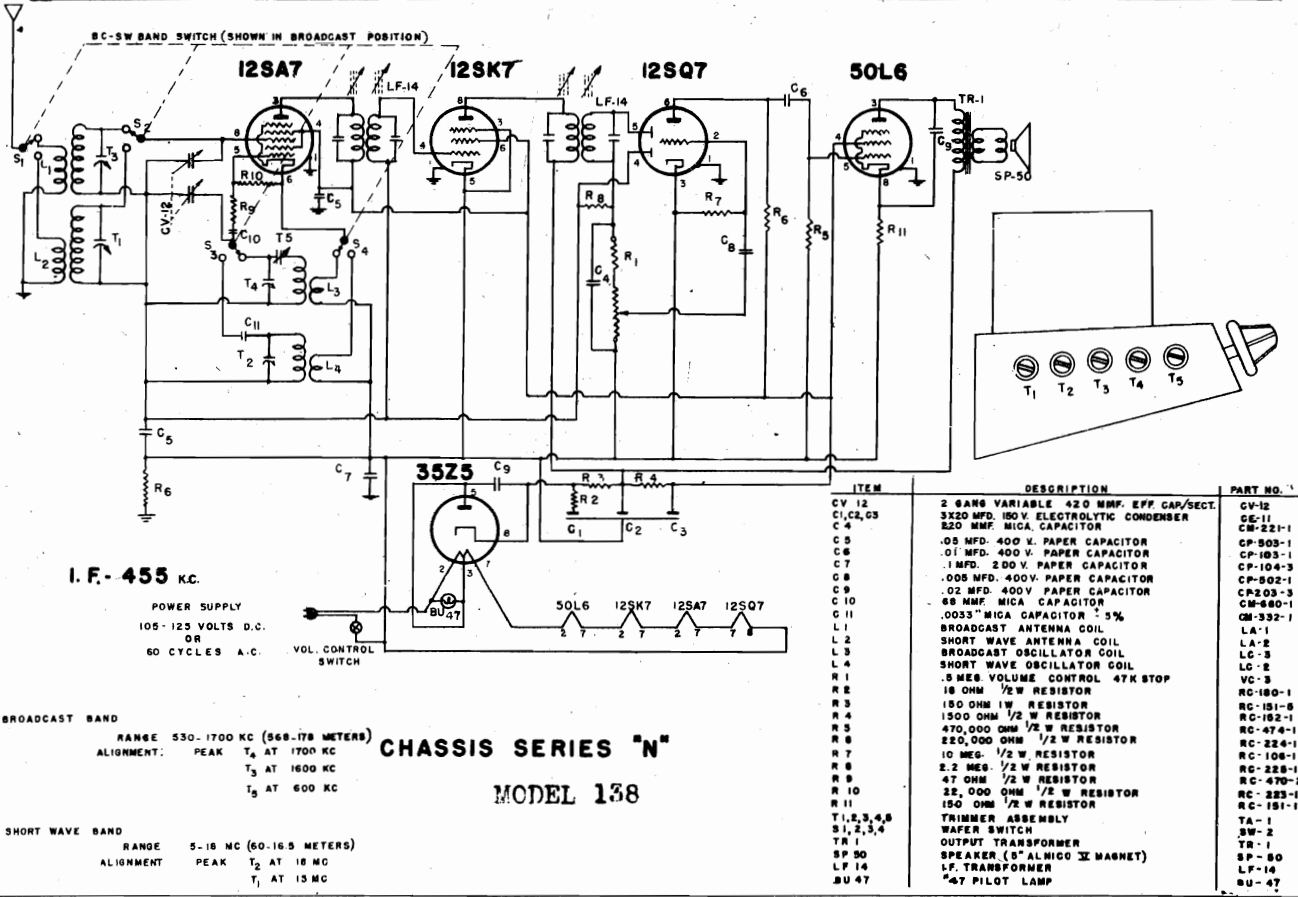


POWER SUPPLY
105-125 V.D.C.
OR
60 CYCLES A.C.

ALL RESISTORS 1/2 W. UNLESS SPECIFIED
Δ : OHMS
K : THOUSAND
M : MILLION
ALL CONDENSERS IN MICRO-FARAD

MODEL 135
"DYNAMITE" CHASSIS SERIES "H"

I.F. - 455 KC.
FREQ. RANGE - 530-1700 KC.
ALIGN AT - 1500 KC.
TRACK AT - 600 KC.



I.F. - 455 KC.
POWER SUPPLY
105-125 VOLTS D.C.
OR
60 CYCLES A.C.

BROADCAST BAND
RANGE 530-1700 KC (568-178 METERS)
ALIGNMENT: PEAK T₄ AT 1700 KC
T₃ AT 1600 KC
T₂ AT 600 KC

SHORT WAVE BAND
RANGE 5-18 MC (60-16.5 METERS)
ALIGNMENT PEAK T₂ AT 18 MC
T₁ AT 15 MC

CHASSIS SERIES "N"
MODEL 138

ITEM	DESCRIPTION	PART NO.
CV-12	2 GANG VARIABLE .420 MMF. EFF. CAP/SECT.	CV-12
C1, C2, C5	3520 MFD. 150 V. ELECTROLYTIC CONDENSER	CE-11
C4	500 MFD. MICA CAPACITOR	CM-221-1
C5	.05 MFD. 400 V. PAPER CAPACITOR	CP-503-1
C6	.01 MFD. 400 V. PAPER CAPACITOR	CP-103-1
C7	.1 MFD. 200 V. PAPER CAPACITOR	CP-104-3
C8	.005 MFD. 400V. PAPER CAPACITOR	CP-502-1
C9	.02 MFD. 400V. PAPER CAPACITOR	CP-203-3
C10	68 MMF. MICA CAPACITOR	CM-680-1
C11	.0033" MICA CAPACITOR 5%	CM-332-1
L1	BROADCAST ANTENNA COIL	LA-1
L2	SHORT WAVE ANTENNA COIL	LA-2
L3	BROADCAST OSCILLATOR COIL	LO-3
L4	SHORT WAVE OSCILLATOR COIL	LC-2
R1	.5 MEG. VOLUME CONTROL 47K STOP	VC-3
R2	18 OHM 1/2 W RESISTOR	RC-180-1
R3	150 OHM 1/2 W RESISTOR	RC-151-6
R4	1500 OHM 1/2 W RESISTOR	RC-152-1
R5	470,000 OHM 1/2 W RESISTOR	RC-474-1
R6	220,000 OHM 1/2 W RESISTOR	RC-224-1
R7	10 MEG. 1/2 W RESISTOR	RC-10M-1
R8	2.2 MEG. 1/2 W RESISTOR	RC-223-1
R9	47 OHM 1/2 W RESISTOR	RC-470-3
R10	22,000 OHM 1/2 W RESISTOR	RC-223-1
R11	150 OHM 1/2 W RESISTOR	RC-151-1
T1, 2, 3, 4, 5	TRIMMER SWITCH	TS-2
TR-1	TRIMMER ASSEMBLY	TA-1
SP-50	WAFER SWITCH	SW-2
LF-14	OUTPUT TRANSFORMER	TR-1
BU-47	SPEAKER (8" ALNICO II MAGNET)	SP-80
	PILOT LAMP	LP-14
		BU-47

ADMIRAL CORPORATION

MODEL RC 170, RC 170 A.

OPERATING INSTRUCTIONS

1. SETTING FOR SIZE OF RECORD

The size of record for which the record changer is set to play is indicated by the position of the size-change knob (96). The record size is stamped on the housing (94) of the head assembly.

To change the setting, slide the size-change knob backward or forward to the numeral corresponding to the size of records to be played. Slide the knob to "M" for manual play.

If the size-change knob does not slide back freely, the setting may be changed by pushing against the front of the record clip (83) when it is in the downward position as shown in Figure 1.

2. STARTING THE RECORD CHANGER

To load the Record Changer, lift the record clip (83) to its upright position and place the records on the center post (27). The bottom record is supported by the shoulder of the center post and the push plate (79A).

Lower the record clip gently, using care not to let it snap onto the records or damage may result.

THE CHANGE CYCLE

6. DESCRIPTION OF CHANGE CYCLE (See Figures 7 and 8)

If at all possible, we recommend that you carefully observe the operation of a changer that is in normal operating condition. It is a good idea to rotate the turntable by hand and repeat the changing cycle until you understand the function of each part.

The changer operates as follows: The changer mechanism is driven during its change cycle by the knurled hub of the turntable rotating the rubber-tired drive wheel (28). During normal playing, the drive wheel is held in a neutral position as illustrated in Fig. 8 so that the indentation prevents the tire from contacting the knurled hub. The drive wheel (28) is held in this position by the trip lever (63) and the stop stud (65) on the main cam (66).

When a record has finished playing and the needle has reached the trip point, the arm control lever roller (48C, Fig. 7) makes contact with reject link (43A), moving the trip arm (43) which releases trip lever (63). The trip lever spring (62) moves trip lever (63) freeing cam stop stud (65) and allows spring (69) to pull the main cam clockwise (bottom view). Since the main cam (66) and the drive wheel (28, Fig. 8) are on the same shaft, the drive wheel is thus turned so its rubber tire is against the knurled hub of the turntable. The turntable now rotates the drive wheel (28) which in turn rotates the main cam (66). Roller (68), Fig. 7) riding on the main cam, moves arm control slide (52), and the raised portion (52A) of this slide raises arm lift shaft (This shaft is 19 on the RC170 and 103 on the RC170A.) which lifts pickup arm from the record. Stud (52C) moving with slide (52) pushes arm control lever (48A) causing the pickup arm to move to the right, clearing the record. The movement of roller (68) also causes trip lever (63) to re-engage in the recess of trip arm (43). Trip spring (61) holds the trip arm (43) and trip lever (63) together.

Roller (70), also riding against main cam (66), moves push-off arm (71). This movement is transmitted through the linkage of 79F, 79D (Fig. 7) to the

Turn the Phono-Motor switch (33) to the ON position. Move the switch button to the left (REJECT) momentarily and release. The bottom record will drop to the turntable and the Record Changer will play the entire stack of records automatically.

3. REJECTING A RECORD

To reject a record at any time, move the Phono-Motor switch button (33) to the left (REJECT).

4. STOPPING AND UNLOADING

It is advisable to stop the Record Changer when the Changer mechanism is out of cycle (playing a record). To remove the records, lift the record clip to its upright position and move the pickup arm to the right so that it clears the records. Lift the records straight up by supporting the bottom one. Do not tilt or squeeze the records when lifting.

5. REPLACING CARTRIDGE AND NEEDLE

Before replacing, see cartridge service data on page 5.

Remove the old cartridge (3) by getting your finger nails or a small screwdriver under it as shown in Figure 2 and pull down on the back edge. Press new cartridge into place again, making sure to push near its back edge where its pins go into the socket.

push-off plate 79A, Fig. 8. (Note that the record stack rests on plate 79A.) The shape of the main cam (66) is such that the push-off plate (79A) first moves back, allowing the bottom record to drop onto the record support plate (79B). Then the push-off plate (79A) slides forward and drops the next record to be played but only after the pickup arm has cleared the record stack. The little slide in the top end of the center post holds back all records other than the bottom one.

As the main cam continues its rotation, the arm control slide (52) moves back following the cam since it is kept in contact with it by slide spring (76). Stud (52C) moving with the arm control slide (52) allows arm control lever (48A) to move back. The tension of the set-down spring (55) moves the arm control lever through set-down lever (54B) and roller (48D). This moves the pickup arm to the set-down point for the record to be played. This set-down point is governed by the set-down adjustment screw (25) for 12-inch records and screw (26) for 10-inch records.

When the record changer is set to play 10-inch records, the arm control lever roller (48D) moving along the edge of the set-down lever (54B) and on reaching the shoulder of the set-down lever, moves this lever and the set-down arm (54) until they are stopped by the set-down adjustment screw (26) making contact with the rear flange of the record changer pan (24). At this point the pick-up arm is above the starting groove and is lowered by the action of the arm control slide as explained above.

When the record changer is set to play 12-inch records, the size change link (75) removes the tension from the change link spring (74) allowing the set-down arm (54) to move so that the set-down adjustment screw (25) makes contact with the rear flange, instead of screw (26). This movement of the set-down arm is caused by spring (55) when the arm is in its change cycle. This changes the set-down of the pick-up arm for 12-inch records.

While the needle is held in position above the starting groove, the safety arm (52B) pushes stud (54A)

MODEL RC 170, RC 170 A. ADMIRAL CORPORATION

IMPORTANT

These two models are very similar. The differences are illustrated in Figures 3 and 4. To be certain which model changer you are servicing, look for the changer model number which appears on the underside of the changer mechanism.

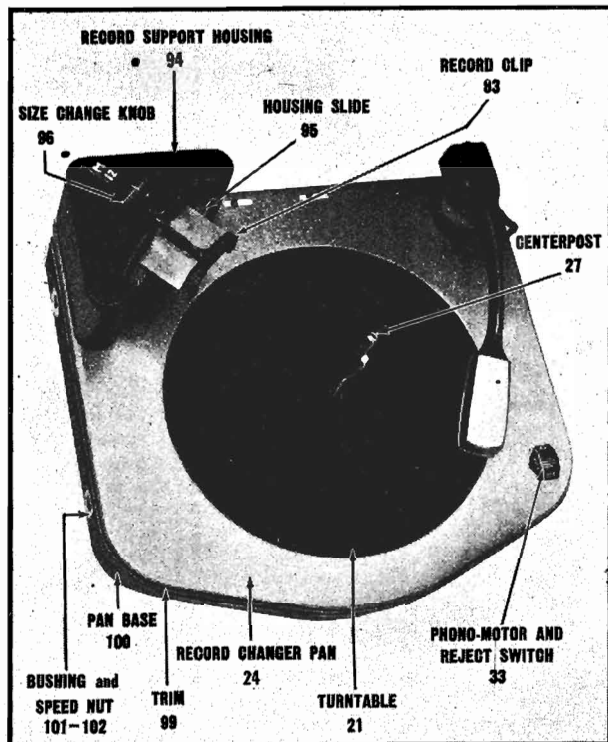


Figure 1. Record Changer, Top View

Figures 3 and 4 show major differences between models RC170 and RC170A. In addition, differences occur in parts carrying reference numbers 49, 50 and 52 (see parts list).

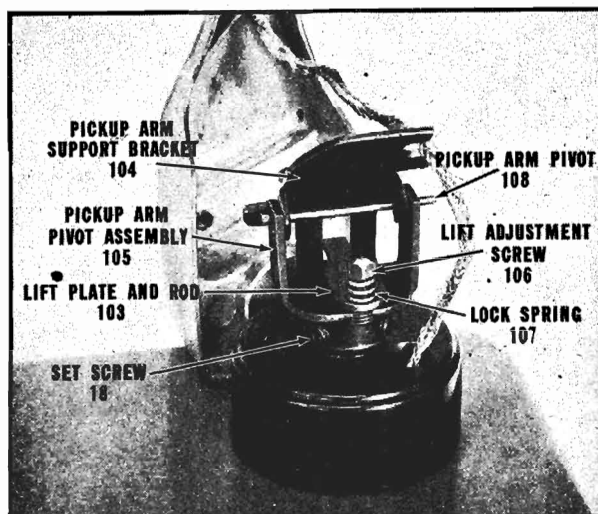


Figure 4. Pickup Arm Hinge Assembly for RC170A

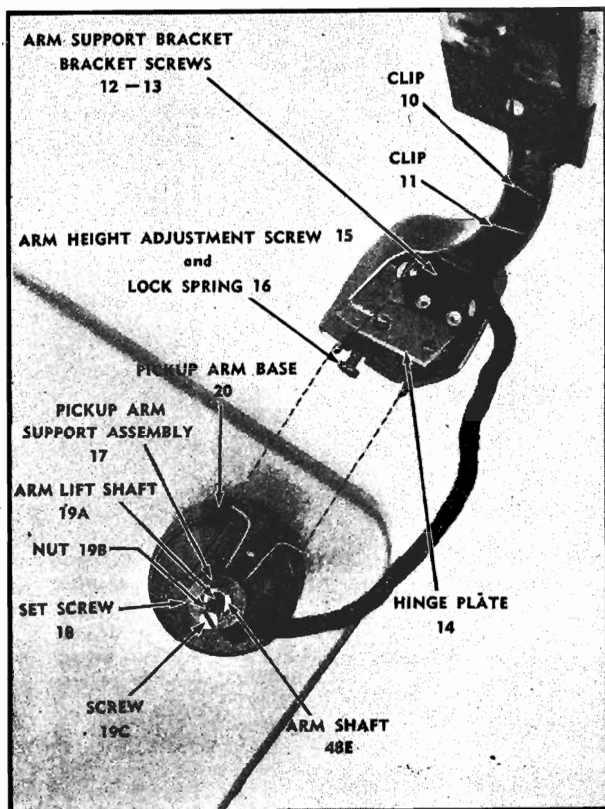


Figure 3. Pickup Arm Hinge Assembly for RC170

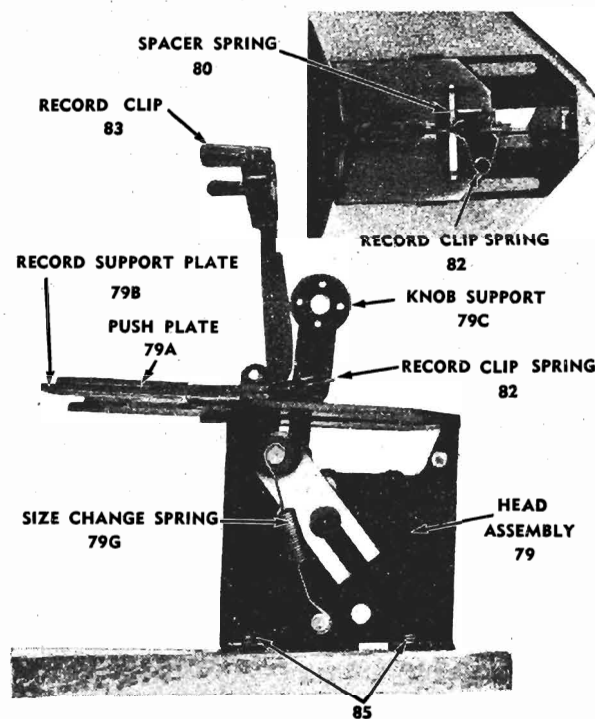


Figure 5. Head Assembly

ADMIRAL CORPORATION

MODEL RC 170, RC 170 A.

releasing the pickup arm so that it has a free sideward movement to follow the record groove. About one revolution of the turntable after the releasing of the pickup arm, the arm is lowered by the downward movement of arm lift shaft (19).

When the reject is used, the movement of the reject knob (33) forces stud (39A) against the reject link (43A) moving trip arm (43) which releases trip lever (63) and the cycle of record change proceeds in the same manner as for automatic changing.

ADJUSTMENTS

TOOLS REQUIRED { **No. 8 Allen Set Screw Wrench (Part No. P-5825. List price \$0.10)**
3/16 inch Open End Wrench (Part No. P-5807. Net price \$0.39)

7. ADJUSTMENT OF SET-DOWN POINT (See Figures 1 and 8)

Adjustments for 10-inch records are made by the screw (26) which can be seen through the right hand slot at the top rear of the record changer. Turning this screw in moves the set-down point of the pickup arm closer to the center post and turning the screw out moves it further away. The proper set-down point is between $4\frac{5}{8}$ " and $4\frac{11}{16}$ " from the needle to the near side of the center post.

Adjust the 12-inch set-down with screw (25), Fig. 8. Turning screw (25) in (as seen through the left hand slot) moves the set-down point for 12-inch records further from the center post and turning the screw out moves it closer to the center post. The proper set-down point is between $5\frac{5}{8}$ " and $5\frac{11}{16}$ " from the needle to the near side of the center post.

If either adjusting screw has reached the end of its travel so that it is not possible to get a proper setdown, it will be necessary to re-set the assembly (17) or (105) as follows:

7A. SETTING PICKUP ARM SUPPORT ASSEMBLY (17) IN RC170 OR (105) IN RC170A

- Set adjusting screws (25) and (26) half-way in.
- With the set screws (18) loose, move the pickup arm so that the pickup arm cap (2) rests against the top portion (above the shelf) of center post.
- Holding the pickup arm in this position, move the arm control lever (48B) so that it is $\frac{3}{8}$ " from the rear flange of the pan (24); always keep this spacing less than $\frac{1}{16}$ " but more than $\frac{1}{32}$ " (between .04 and .06" is correct).
- Press the arm control lever assembly (48) up into the pickup arm base (20). Press the pickup arm support assembly (17) or (105) down against the pickup arm base (20), leaving a .006 to .008 inch clearance between them. This clearance is necessary to prevent binding. The spring washer (part number 405A27) should be slightly compressed between the top of the pickup arm base and the bottom of the collar.
- Tighten the two set screws (18).
- Make final set-down adjustments with adjustment screws (25) and (26). (See page 2)

8. ADJUSTMENT OF PICKUP POINT (See Fig. 7)

The pick-up or tripping point adjustment is made by screw (45). Turning the screw in brings the pick-up point closer to the center post and turning the screw out moves it further away. The proper pick-up point is between $1\frac{11}{16}$ " and $1\frac{3}{4}$ " from the needle to the near edge of the center post.

On the late production of the record changer used with the console radios, a hole has been made in the bottom cover so that this adjustment can be made without removing the bottom cover from the changer. As the table models do not use the bottom cover, this adjustment is easily made.

In adjusting the pick-up point it will be found that an occasional record does not have the groove run in far enough so that the pick-up arm will be carried close enough to the center post to actuate the reject link. If adjustments are made to accommodate these few records, it will be found that the changer starts its change cycle with some normal records before they are finished playing. In adjusting for this type complaint, it is wise to let the customer decide for which side the adjustment should be made.

9. ADJUSTMENT OF PICKUP ARM HEIGHT (See Figures 3 and 4)

Before adjusting arm height, be sure needle is properly adjusted (see paragraph 18).

With the record changer out of cycle and the pick-up arm clear of the turntable, adjust screw (This adjustment screw is 15 on the RC170 and 106 on the RC170A.) so that the tone arm needle is approximately $\frac{1}{8}$ " above the top of the pan. Turning the screw in raises the arm and turning it out lowers the arm.

The model RC170 also has an adjustment screw (19C) to adjust the maximum height that the pickup arm should reach. The maximum height of the pick-up arm during the change cycle should be from $1\frac{3}{8}$ " and $1\frac{1}{2}$ " between the needle and turntable. After making this adjustment tighten locking nut (19B) and again check the adjustment.

10. ADJUSTING DISTANCE BETWEEN HEAD ASSEMBLY (79) AND CENTERPOST (See Figs. 7, 8)

Do not bend the centerpost to make this adjustment; adjust as described below.

The adjustment of the head assembly (79) is made by loosening the three screws, 85. (underneath the changer) and moving the assembly closer or further away from the center post as the case may be. The head assembly is in proper relationship to the center post when it is set with a dimension of $4\frac{7}{8}$ " from the front edge of the record support plate (79B, Fig. 8) to the rear of the center post (side nearest the record support plate) and at a point on the center post of the same height as the record support plate. This dimension is taken with the changer set to play 10-inch records.

After adjusting, check as follows:

- Place a 10-inch record (with a true center hole) on the centerpost to a point in line with the record support plate (79B). Holding the record horizontal and exerting force on it toward the head assembly, the record should just clear the record support plate (79B). Exerting force away from the head assembly should give a small gap between the record support plate (79B) and the record. **Repeat with a 12-inch record.**
- Load the changer with a stack of records; push record stack toward head assembly. Start the changer mechanism, and check push-off for several 10-inch records. **Repeat for 12-inch records.**

MODEL RC 170. RC 170 A. ADMIRAL CORPORATION

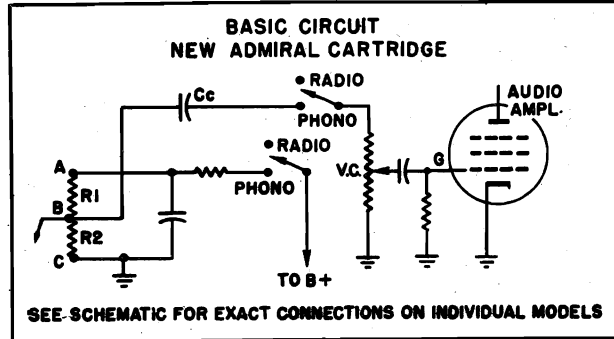
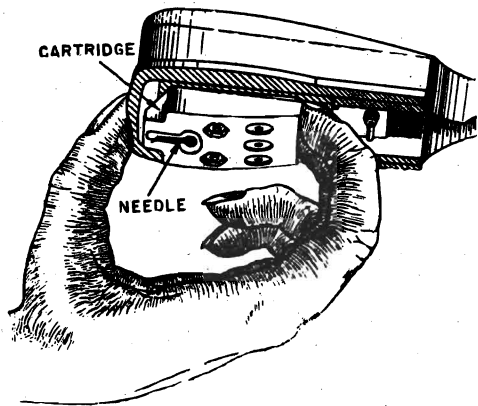


Figure 6. Basic Circuit for New Admiral Cartridge

Figure 2: Removing Cartridge by Pulling Down on Back Edge

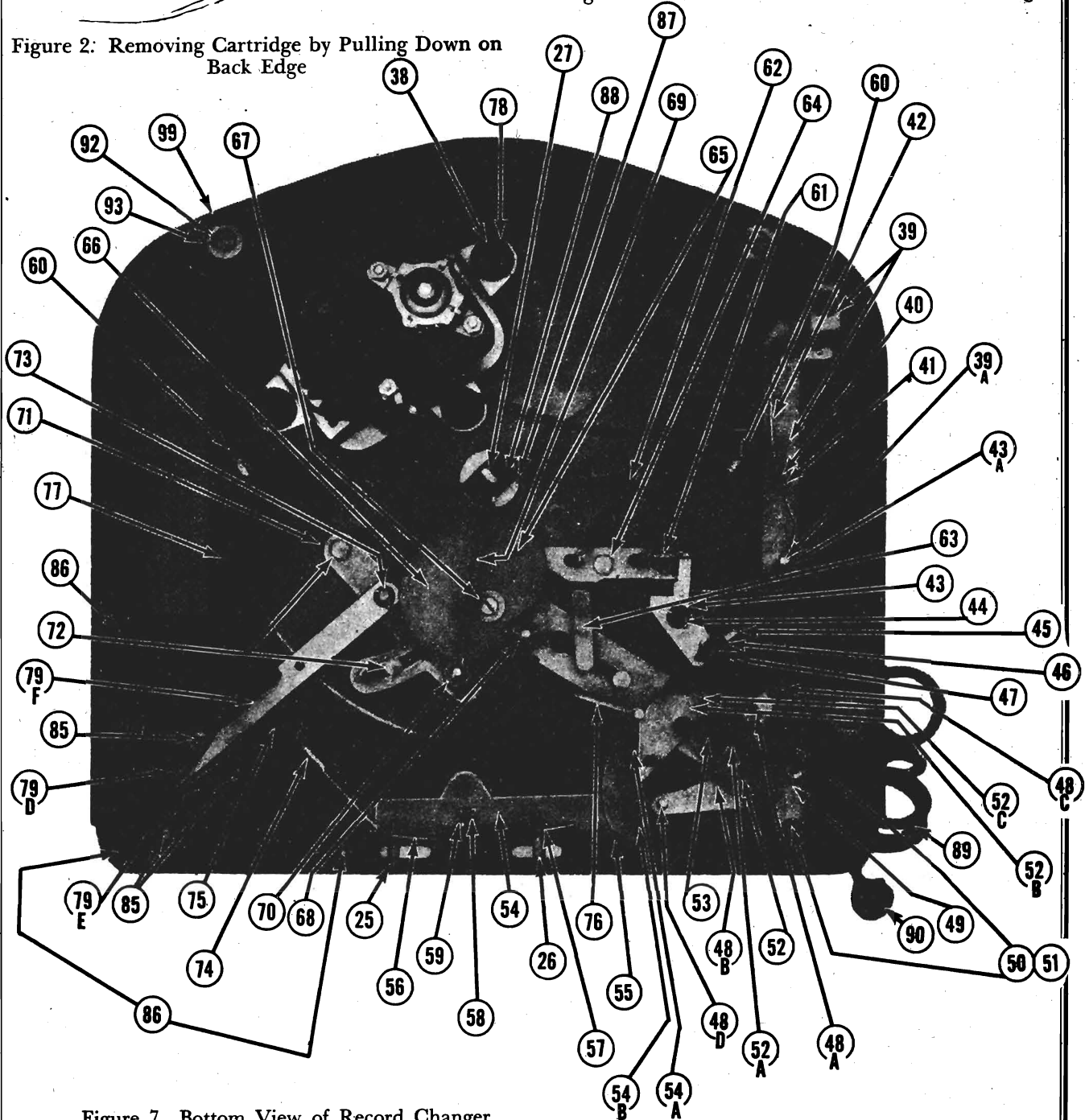


Figure 7. Bottom View of Record Changer

ADMIRAL CORPORATION

MODEL RC 170, RC 170 A.

Reference numbers 12, 14, 17, and 19 apply to RC 170 only; see Figs. 3 and 4 and note marked † in parts list.

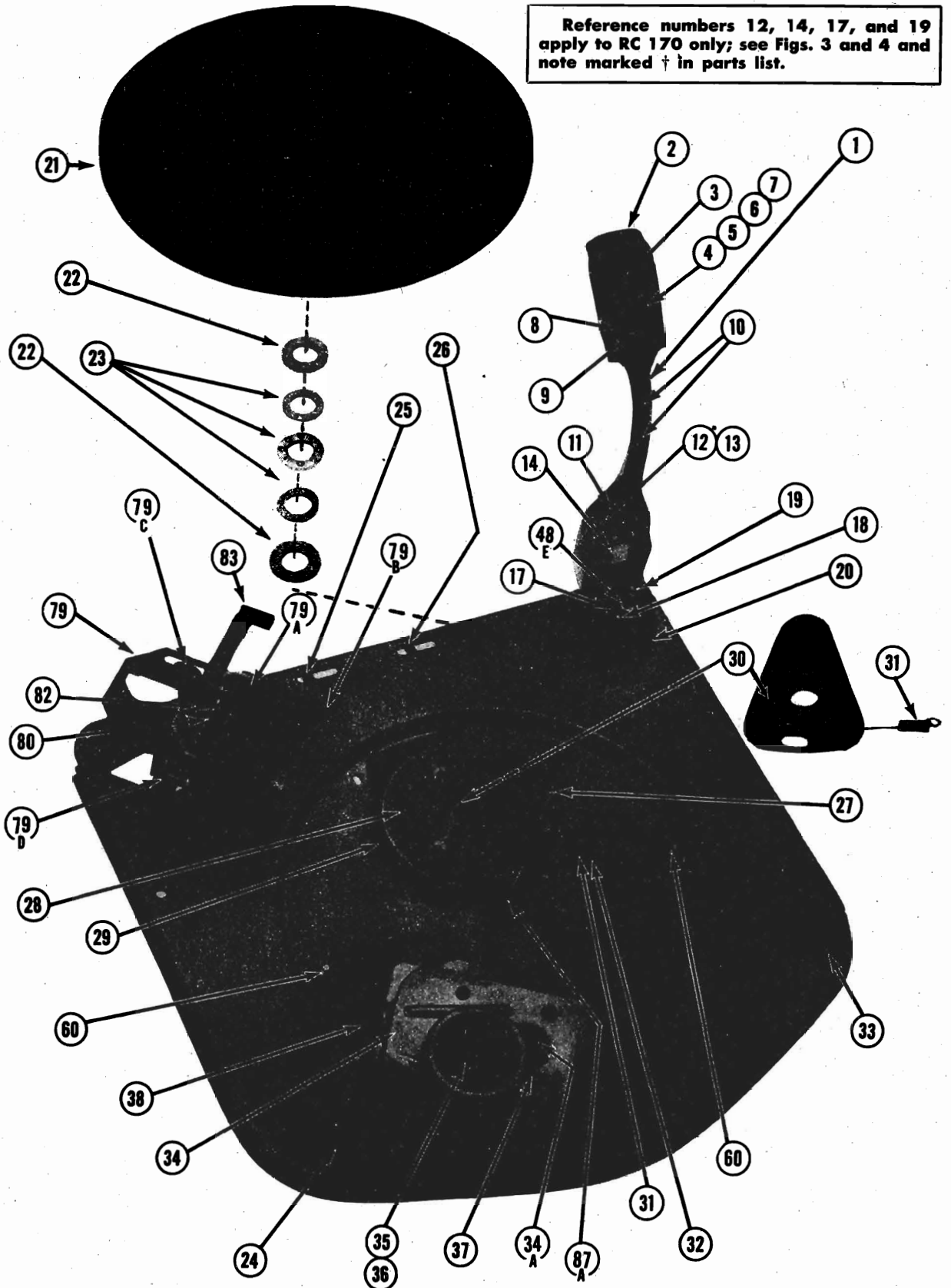


Figure 8. Top View of Record Changer

SERVICE PARTS LIST FOR RC170 & 170A RECORD CHANGER

Ref. No.	Part Number	Description	Ref. No.	Part Number	Description
1	G400A177	Pickup Arm Casting Only (painted)	52A		Inclined (raised) Portion of Arm Control Slide (part of 52)
2	403B16-1	Pickup Arm Cap (clear plastic)	52B		Safety Arm (part of 52)
3	A1372	Cartridge and Needle	52C		Stud (part of 52)
4	G400A198	Cartridge Holder (socket with contacts)	53	405A58	Relief Spring
5	401A152	Plate (For mounting cartridge holder to pickup arm)	54	G400A152	Set Down Arm Assembly
6	20-312-C2-6	Screw #2-56x5/16" R.H.M.S. (4 required)	54A		Stud (part of 54)
7	2A1-1-6	Nut #2-56 (4 required)	54B		Set Down Lever (part of 54)
8	401A115	Cap Clamp	55	405A56	Set Down Spring
9	20-312-C2-6	Screw for Cap Clamp #2-56x3/8" R.H.M.S.	56	405A44	Lock Spring
10	414A17	Pickup Arm Wire Clip (.359"x.047"; 3 required)	57	405A44	Lock Spring
11	414A17-1	Pickup Arm Wire Clip (.506"x.047"; 1 required)	58	405A22	Spring Washer
12	†401A134	Arm Support Bracket (see note †)	59	405A78	Hairpin Spring
13	65-250-C2-39	Arm Support Bracket Screw #6-32x1/4" B.H.M.S.	60	1A80-5	Mounting Screws
14	†G400A165	Pickup Arm Hinge Plate (see note †)	61	405A68	Trip Spring
15	†65-625-C2-47	Pickup Arm Adjustment Screw #6-32x5/8" (see note †)	62	405A75	Trip Lever Spring
16	†405A70	Lock Spring for Pickup Arm Adjustment Screw (see note †)	63	401A153-1	Trip Lever (includes shoulder rivet #64)
17	†G400A168	Pickup Arm Support Assembly (see note †)	64	402A97	Shoulder Rivet (See Note A)
18	1A43-14	Allen Set Screw #8-32x3/16" Cone Point (2 required)	65		Cam Stop Stud (part of 66)
19	†G400A172	Arm Lift Shaft (includes screw and lock nut) (see note †)	66	G400A163	Main Cam
19A		Arm Lift Shaft	67	85-375-C2-39	Main Cam Screw #8-32x3/8" B.H.M.S.
19B		Nut #6-32	68	415A9	Roller
19C		Screw #6-32x3/8" Fil. H.M.S.	69	405A79	Push Off Arm Spring
20	G400A173	Pickup Arm Base	70	415A9	Roller
21	G400A167	Turntable	71	G400A154-1	Push Off Arm (includes 2 shoulder rivets, #72)
22	412A1	Cork Washer (2 required)	72	402A97	Shoulder Rivet
23	415A2	Thrust Bearing Assembly (replace as a unit)	73	405A78	Hairpin Spring
24	G400A195	Record Changer Pan with Studs and Welded Parts	74	405A54	Change Link Spring
25	402A87	Set Down Adjustment Screw	75	401A159	Size Change Link
26	402A87	Set Down Adjustment Screw	76	405A60	Slide Spring
27	G400B137-1	Center Post (includes 405A62 speed nut)	77	88A8-1	Motor Plug (male)
28	G400A179	Drive Wheel (includes tire)	78	G400A196	Rubber Mounting Grommet and 401A106 fastener (for 407B3-2 and 407B4-2 motor) (3 required)
29	406A13	Drive Wheel Tire Only	78	G400A203	Rubber Mounting Grommet, spacer, and fastener (for 407B1-2 motor)
30	G400A149-1	Drive Wheel Support Assembly	79	G400A186-1	Head Assembly (includes 79A to 79G; does not include #80, 82 or 83)
31	405A54	Drive Wheel Spring	79A		Push Plate
32	402A76	Spring Stud	79B		Record Support Plate
33	403A23	Reject Knob	79C		Knob Support
33A	405A80	Reject Knob Retaining Spring	79D		Push Off Lever
34	*407B3-2 or **407B1-2 *407B4-2	Motor with Idler Wheel and fasteners; 105-125 V, 60 Cycle	79E	405A69	Size Change Lever Spring
		Motor with Idler Wheel and fasteners; 105-125 V, 50 Cycle	79F		Push Off Link (See Note B)
			79G	405A57	Size Change Spring
34A	401A48	Drive Pulley (Part of 34. For motors 407B3, 407B4. In addition, motor 407B4 includes a coil spring, part number 405A32.)	80	405A74	Spacer Spring
	405A32	50 Cycle Conversion Spring (this spring used to convert 407B3 motor)	82	405A73	Record Clip Spring
	G400A23	Idler Wheel Assembly (used with either 407B3 or 407B4 motor)	83	G400A190	Record Clip (does not include #405A73, 405A74 springs or 406A16 rubber bumpers)
35	G400A57	Idler Wheel Assembly (for 407B1 motor)	84	406A16	Rubber Bumpers for Record Clip
36	405A15	Hairpin Spring for Idler Wheel	85	62-375-C2-39	Screw #6-32x3/8" Fil. H.M.S. (3 required)
37	†405A14	Spring, Idler Wheel (for 407B3 or 407B4 motor)	86	62-375-C2-39	Screw #6-32x3/8" Fil. H.M.S. (3 required)
38	†405A67	Spring, Idler Wheel (for 407B1 motor)	87	G400A146-1	Center Post Bracket Assembly (includes 1-#405A-62 speed nut)
39	401A106	Shakeproof Motor Fastener	88	405A62	Speed Nut for Fastening Center Post
39	G400A162	Switch and Lever (ON-OFF-REJECT)	89		See Radio Service Manual for Proper Cable and Part Number
39A		Spring Stud (Part of 39)	90	{ 98A19	Plug, 3 contact
40	405A78	Hairpin Spring	90	{ 88A8-5	Plug, 4 contact
41	405A22	Spring Washer	92	G400A197	Mounting Screw (for mounting bottom cover to pan)
42	405A77	Switch Lever Spring	93	19A10-3	Mounting Spring (for mounting bottom cover to pan)
43	G400A181	Trip Arm Assembly	94	403C14	Record Support Housing Plastic (does not include #99)
43A		Reject Link (part of 43)	95	403B15	Housing Slide, Blastic
44	405A78	Hairpin Spring	96	403A20	Size Change Knob (2 required)
45	402A96	Trip Adjustment Screw	97	402A81	Knob Spacer
46	4B1-34-37	Washer (2 required)	98	443-312-C2-34	Screw (size change knob) #4-40x5/16" Philips
47	405A76	Adjustment Lock Spring	99	403A24	Trim
48	G400A175	Arm Control Lever Assembly	100	G400A143	Bottom Cover (consoles only)
48A		Arm Control Lever	100A	413A7	Grommet (1") for bottom cover
48B		Arm Control Lever	101	27A24	Bushing in Bottom Cover (consoles only; 4 required)
48C		Arm Control Lever Roller	102	2A10-10-59	Speed Nut for Bushing (consoles only) (4 required)
48D		Arm Control Lever Roller	103	††G400A201	Lift Plate and Rod (See Note ††)
48E		Pickup Arm Shaft	104	††401A162	Arm Support Bracket (See Note ††)
			105	††G400A200	Arm Pivot Assembly (See Note ††)
49	{ 401A143	Slide Support (RC170 only)	106	††402A104	Lift Adjusting Screw, #6-32x3/8" cap screw (See Note ††)
	{ 401A143-1	Slide Support (RC170A only)			
50	{ 402A85-1	Slide Spacer (RC170 only; See Note C)	107	††405A81	Lock Spring (See Note ††)
	{ 402A85-2	Slide Spacer (RC170A only)	108	††414A18	Pickup Arm Pivot (See Note ††)
51	C2-1000-C2-39	Spacer Screw #6-32x1" Fil. H.M.S. (2 required)	109	405A27	Washer, spring
52	{ G400A159	Arm Control Slide Assembly (RC170 only)			
	{ G400A159-1	Arm Control Slide Assembly (RC170A only)			

*407B3-2 and 407B4-2 are the same as #407B3 and 407B4 respectively except that 3 #401A106 fasteners are included.

**407B1-2 is the same as #407B1 except that three spacer washers and three #401A106 fasteners are included.

† Parts marked † are used in the RC170 only. See Figure 3. See Ref. numbers 103, 104, 105, 106, 107, 108 for RC170A parts.

†† Parts marked †† are used in the RC170A only. See Figure 4. See Ref. numbers 12, 14, 15, 16, 17, 19 for RC170 parts.

NOTE A: The rivet (64) has been replaced on the late RC170 and all of the RC170A by a stud the same as spring stud #32. A spring washer (41) and a hairpin spring (40) is used to hold the trip lever (63) in place. The trip lever (63) remains the same in either case.

NOTE B: Three different type push off links (79F) have been used. The one shown in figure 7 is the latest but is now installed with its offset to the rear of the changer. In other words it is turned over on its axis 180°. This latest type can be used on all earlier changers.

NOTE C: The model RC170 uses two different type spacers (50). However, 402A85-1 can be used to replace either type. In re-assembly be sure that the spacer with the cut down section is used near the spring mounting bushing (front).

ADMIRAL CORPORATION

MODEL RC 170, RC 170 A.

If the setting of the head assembly does not give proper push-off for both 10-inch and 12-inch records, vary the spacing slightly and re-check.

It should be noted that the records do not rest on the record support plate (79B) during normal playing of the changer; but rest on top of the push off plate

(79A). During record change the push off moves back and allows the records to drop to the record support plate (79B). The push off plate now moves forward pushing the bottom record off. The remaining records are being supported by the push off plate itself. This is done to reduce any tendency for two records to drop to the turntable at the same time.

SERVICE AND REPAIR

CAUTION

See that the rubber tires on both the drive wheel (28) and the idler wheel (35) are kept clean and free from oil, grease, dirt, or any foreign material. Carbona or carbon tetrachloride may be used for cleaning these parts.

11. REMOVING PLASTIC HOUSING FROM HEAD ASSEMBLY (See Figures 1 and 7)

The housing (94) of the head assembly can be taken off by removing the two size change knobs (96) and the three screws (86). With the record clip (83) in the down position, the housing can be lifted from the assembly. The housing slide (95) will drop out as the housing is removed.

12. REPLACING A PICKUP ARM BASE (See Figures 3, 4 and 7)

When installing a pick-up arm base (20) and before tightening the two screws (51), exert pressure on the base towards the front of the changer and at the same time rotate it in a clockwise (bottom view) direction. Tighten the screws while holding the base in this position. If this is not done properly, the arm control slide (52) may bind between the two slide spacers (50).

After replacing the pickup arm base, re-set the pickup arm support assembly as in paragraph 7A.

13. REPLACING SIZE CHANGE SPRING (See Figure 5)

Whenever it is necessary to remove or replace the size change spring (79G) care must be taken to re-install it in its proper position. See Figure 5 for its mounting position.

14. REPLACING HEAD ASSEMBLY

Remove the assembly housing as explained in No. 11. Release the push-off link (79F) from the push-off arm (71) by removing the hairpin clip (73) and washer. Remove three screws and washers (85) and the assembly is free from the pan.

When re-installing the head assembly, replace the three screws and washers but do not tighten them. Reconnect the push-off link and arm. Adjust the head assembly as explained in paragraph 10.

15. REMOVING TURNTABLE AND BEARING ASSEMBLY

To remove the turntable it is only necessary to grasp the table by its edges and lift up. **Before replacing the turntable, make sure that the recessed part of the drive wheel (28) is towards the centerpost. If necessary, turn drive wheel counter clockwise about a turn so it locks in this position.** The pickup arm should be positioned away from the turntable to avoid the possibility of accidentally tripping the changer mechanism. In replacing the turntable **force**

is not needed to seat it. Make sure, however, that the drive wheel of the motor has been pushed in towards the centerpost and that the wheel is making contact with the inner side of the turntable flange. In some cases it may be found that the two cork washers, after considerable use, are compressed so the turntable will rub. To build the stack up, an extra cork washer should be used. This third cork washer may be placed at the top or bottom of the stack.

The washers (22) and thrust bearing assembly (23) are removed by sliding them off of the centerpost. In replacing, have them in the order shown in Figure 8.

16. REMOVING BOTTOM COVER (100)

To remove the bottom cover (100) from the record changer, remove the two rear screws (92) through the bottom. Then press on the front edge of the bottom cover; this frees the changer from the slotted mounting brackets at the front of the bottom cover. To replace bottom cover, reverse above operations.

The changer must float on the springs (93) to prevent microphonic feedback, thus the springs (93) must be re-installed properly. The wider end fits around and hugs the extrusion in the mounting brackets in the bottom cover. The narrow end of the spring fits over the threaded bushing on the changer pan (24). In some changers it has been necessary to add spacer washers beneath the narrow portion of the spring (93) to assure "free floating" of the changer.

17. MOUNTING 407B1 MOTOR TO CHANGER

The model 407B1 motor may be used with this record changer but it is necessary that a fibre or felt washer be used as a spacer between the motor mounting grommet and the changer pan. The No. 401A106 shakeproof motor fastener can be used to then mount the motor.

18. CARTRIDGE (See Figure 6)

The new Admiral pick-up cartridge uses an entirely new principle since it is not a crystal, magnetic, or capacitive device. The pick-up element is made of special rubber which is a high resistance electrical conductor (R-1 & R-2). The resistance varies as the length of the rubber is changed. A Monel metal needle, osmium tipped, is clamped to the center of the resistive rubber as shown at B. As the needle moves back and forth in the record groove, it alternately lengthens the rubber on one side and shortens the rubber on the other side.

A DC voltage is applied at A. The voltage drop from B to C varies as the resistance changes due to the "back and forth" movement of the needle. The varying voltage drop is in reality an alternating voltage of audio frequency. This voltage is applied through the coupling condenser (Cc) to the grid (G) of the audio amplifier tube.

Trouble Shooting: If you suspect the cartridge or needle and have a replacement cartridge available, the quickest test is to try the other cartridge. This is very simple since the Admiral cartridge plugs in. Remove

the old cartridge as described on page 1 and plug in the replacement cartridge. If replacing cartridge does not correct the trouble or if no replacement is available, proceed as follows:

1. Make sure radio operates satisfactorily on radio stations.
2. Turn switch to Phono and turn volume control up high. Touch the needle with finger. If a loud hum is heard, circuit from B to G is not open or shorted. If hum is not heard, check circuit from B to G.
3. If hum is heard, check voltage across outer terminals on bottom of cartridge. Generally it should measure from 80 to 100 volts DC. See circuit diagram for individual chassis. If voltage is correct, cartridge should be replaced.
4. If voltage is not correct, check circuit for fault. In case of distortion, check coupling condensers.
5. If the needle is bent, it can be straightened by bending it down so that it projects $\frac{1}{16}$ " from cartridge. It should then be pressed back several times with a flat object.

Do not attempt to repair cartridges or remove the cap on the cartridge assembly as this will void the warranty.

19. LUBRICATION

Under normal operating conditions, the motor

should never require oiling. The rest of the changer, however, should be lubricated with grease whenever it comes into the shop for repairs or adjustment. A good grade automobile chassis grease may be used for this purpose.

The oilite bearings, used in the turntable hub and pick-up arm base, may be lubricated with SAE No. 20 motor oil.

Care should be taken to prevent any of the lubricant from coming into contact with the drive or idler wheel tires. Also be careful, when using oil, that an excess does not seep into the felt of the turntable.

Use grease sparingly on stud (64) of trip lever (63); excessive lubricant may cause suction binding and subsequent failure of the trip mechanism.

20. REPLACEMENT PARTS

In some cases replacement parts from the factory may be a different type than those being replaced. These parts will be of a later production but may be used as replacement parts. In cases where rivets or adapting parts are needed, they will be included with the replacement part.

Note that when replacements involve loosening or removing set screws (18) in assemblies (17) or (105), it will be necessary to re-set the assembly as described in paragraph 7A.

OPERATING AND SERVICE INSTRUCTIONS FOR RECORD CHANGER

MODEL 46-A

General Specifications

MOTOR VOLTAGE—115 Volts—60-cycles A.C. (**DO NOT USE D.C.**)

MAXIMUM NUMBER OF RECORDS PLAYED AUTOMATICALLY:

Fourteen (14) 10" records

Twelve (12) 12" records

TURNTABLE SPEED - - - 78 to 80 R.P.M.

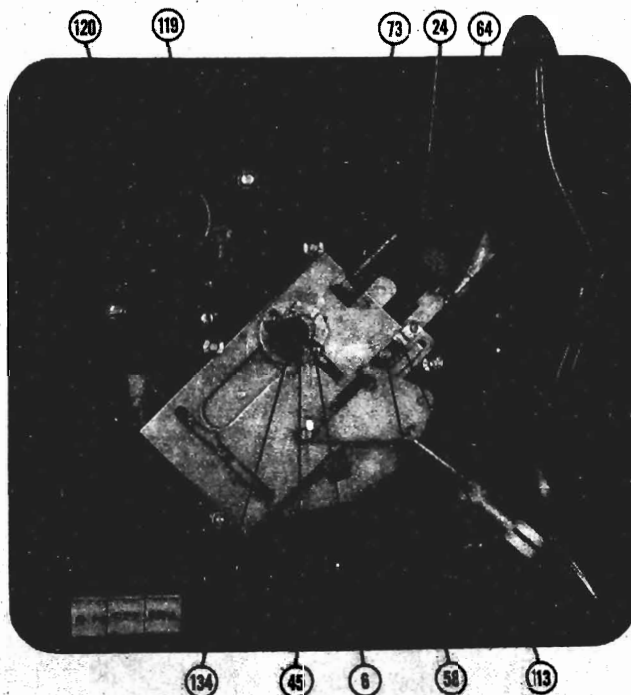


FIGURE I

CAUTION

Twelve only 12" or fourteen 10" records may be played, **DO NOT INTERMIX** 12" and 10" records.

DO NOT CHANGE CAP playing position unless Changer is out of cycle.

DO NOT USE FORCE at any time to either start or stop the Changer mechanism.

DO NOT LEAVE RECORDS ON SUPPORTS when Changer is not in use as this will cause the records to warp and hinder the efficiency of the Changer.

For more enjoyable listening and operating performance, always keep records in albums.

The last record in the stack will keep repeating until the Changer is stopped.

DO NOT OPERATE the Changer on **D.C. Current.**

Make certain that the center post slide cap is down before loading.

If a record does not have the eccentric inside groove, it will be necessary to use the **REJECT PUSH BUTTON** to play the next record.

With normal use, the needle should not require replacement. **DO NOT DROP** the needle or damage its precision point. **DO NOT REMOVE** and then replace the same needle. Make certain that the needle is securely held in cartridge case.

LOADING

The plastic cap can be moved either forward or backward, from the 10-inch to 12-inch position, or from the 12-inch to the 10-inch position.

The records are placed over the center post, resting on the ledge in the center and on the cap ledge on the outside edge.

Snap pressure clamp down on top record stack.

To place Changer in either 10" or 12" playing position, use the following procedures:

For 10" playing position, lift up the cap at an angle and push the cap forward until the maximum forward motion is reached, then release cap to allow it to fall into place. The Changer is now ready to play 10" records. For 12" playing position, lift up the cap at an angle and pull backwards until the maximum backward position is reached, then release cap to allow it to fall into place. The Changer is now ready to play 12" records.

NOTE: The 10" cap position is always in the maximum **FORWARD** position, and the 12" cap position is always in the maximum **BACKWARD** position.

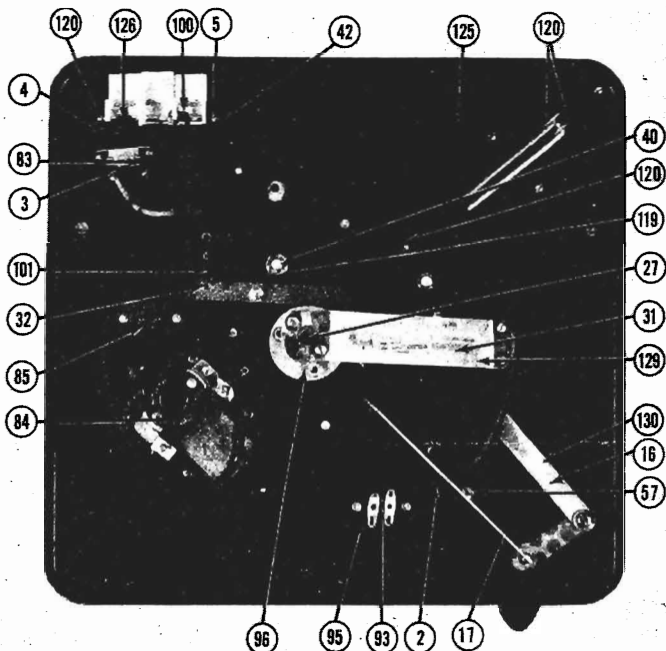


FIGURE 2

STARTING

Press down on the push button marked "ON." After the turntable has attained speed, press down on the push button marked "REJ." Hold finger pressure for a few seconds and then release.

The bottom record will fall on the turntable and the Changer will automatically play through the entire stack of records.

REJECTING

Press down on the push button marked "REJ." Hold finger pressure for a few seconds and release. A record may be rejected at any time during playing by this simple operation.

UNLOADING

Press down on the push button marked "OFF." Set the tone arm on the tone arm rest post. Set the record pressure clamp in an upright position. The played records may now be easily removed by lifting the entire stack of records upward and in a horizontal plane.

OPERATING CYCLE

1—Records are placed on offset portion of center post. Tone arm plays through the first record and follows on to the eccentric groove. When needle feeds into a position of $1\frac{1}{8}$ inches away from center post, the trip which is attached to tone arm link (16) engages and moves pawl lever (23). Clutch arm which is attached to pinion, gear is now released thus engaging turntable clutch. Changing mechanism is now powered.

2—Lift lever roller (73) travels over lift lever (17) raising tone arm off record.

3—End of elongated slot in main slide (21) engages stud (58) on tone arm link (16). The backward motion causes the tone arm to swing clear, allowing record to drop.

4—Push-off stud (68) on slide plate (10) engages push-off arm (10) which in turn retards record cap (89). Record drops from upper shelf to lower shelf. At this point the slide reverses its motion.

5—Stud (68) on slide plate (10) reverses its motion thereby causing record cap to advance. This action pushes the record forward, allowing it to drop off spindle shelf.

6—Spring on return slide (113) engages stud (58) on tone arm link (16). It then moves forward until the stud engages position stop (8) in either 10" or 12" position.

7—Tone arm is now in set down position and is allowed to rest on record when lift lever roller (73) is disengaged from lift lever (17).

8—Tone arm is now resting on record and remains locked for the next half turn.

9—Roller (70) on bottom of large gear (18) pushes position stop (8) until it is clear of stud (58) on tone arm link (16).

10—Pawl lever (23) engages clutch arm thus cutting off power for changing mechanism. Changer will now proceed through playing cycle.

OPERATION OF PUSH-OFF HEAD

When record cap (89) is in 12" position the push-off lever (9) is in the forward hole. The 12"-10" lever (11) is free. When record cap (89) is in 10" position the push-off lever (9) is in the rear hole and the 12"-10" lever (11) is pushed forward. This in turn pulls

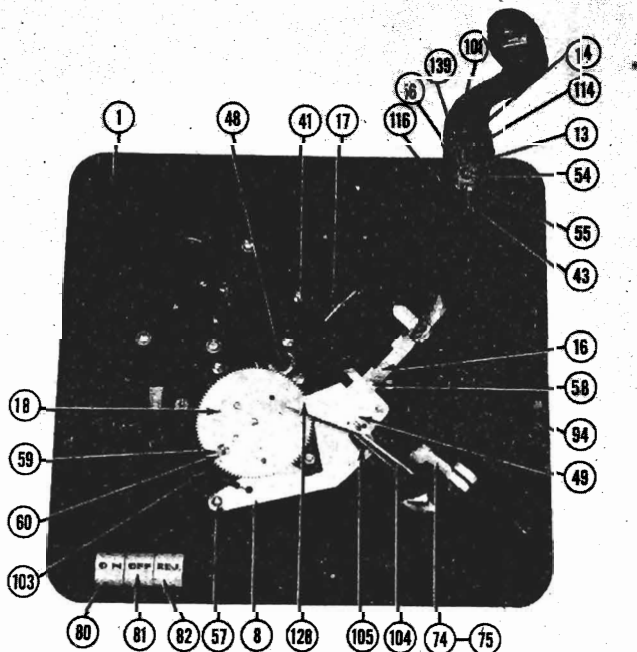


FIGURE 3

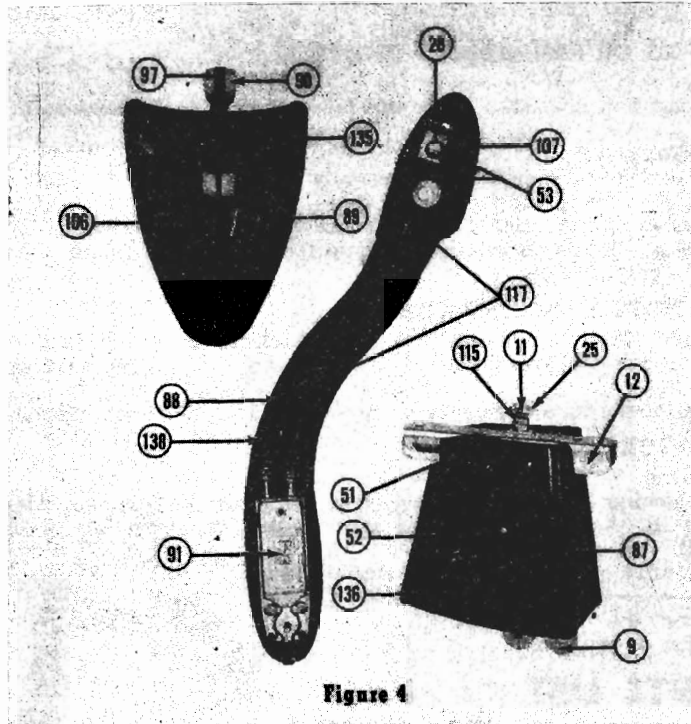


Figure 4

the position stop (8) into the 10" position through the action of the connecting link (16).

OPERATION OF REJECT LEVER

When reject button (82) is pushed down it moves reject arm (32) through the action of connecting link (100). The reject arm (32) engages tab on bottom of pawl lever ((23) thereby engaging the clutch.

TONE ARM ADJUSTMENT

(Vertical)

Tighten screw (77) clockwise to raise tone arm. Counter-clockwise to lower.

(Horizontal)

Operate mechanism by hand, through change cycle, until tone arm rests on turntable. For slight adjustment—turn screw in hole in rear of tone arm clockwise for outward adjustment, counter-clockwise for inward adjustment. For greater adjustment turn hexagon head screw. Place in proper position for set down and tighten screw.

ADJUSTMENT OF PUSH-OFF HEAD

Be sure center post (45) has not been bent. It should be at right angles to turntable before proceeding with adjustment. To adjust, loosen three screws holding base (87) to base plate (11). Place 10" record on center post (45) so that it rests on shoulder of record cap (89). Be sure the hole in record is directly on top of center post (45). With edge of record lying on top shelf, move base (87) back or forward until edge of record has 1/32" clearance from back edge of top step. When proper adjustment is made tighten screws in base (87), being certain position is not changed.

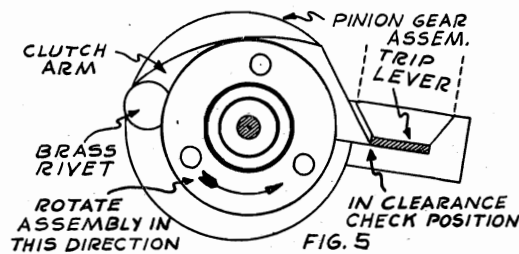


FIG. 5

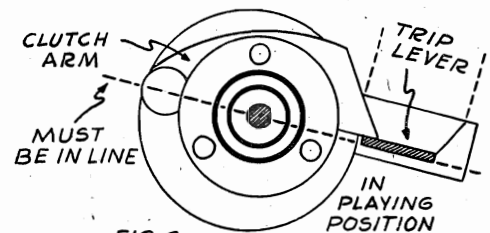


FIG. 6

TIMING OF GEARS AND CLUTCH ADJUSTMENT TO ADJUST REMOVE TURNTABLE

1—Normal position of large gear, while in playing cycle should be with roller (60) centered in slot at end of slide plate (21). In this position the gear will snap into the index position. (As shown in Figure 1), and clutch will be disengaged.

2—The small pinion gear is indexed correctly when the turntable shaft and clutch assembly is rotated in a counter clockwise direction, with clutch engaged. The end of the clutch arm will be in line with the edge of the trip lever as shown in Figure 5.

3—If pinion gear has been removed from changer proceed as follows. Place large gear in index position. Insert pinion gear with brass rivet opposite trip lever as shown in Figure 6. Clutch arm will be resting on trip lever. If properly timed you will be able to spin turntable and clutch assembly freely. If motion is not free remove assembly and rotate pinion gear one tooth (clockwise direction).

4—For a finer adjustment bend end of trip lever forward or backward. Clutch arm should have smallest clearance possible between turntable and clutch assembly.

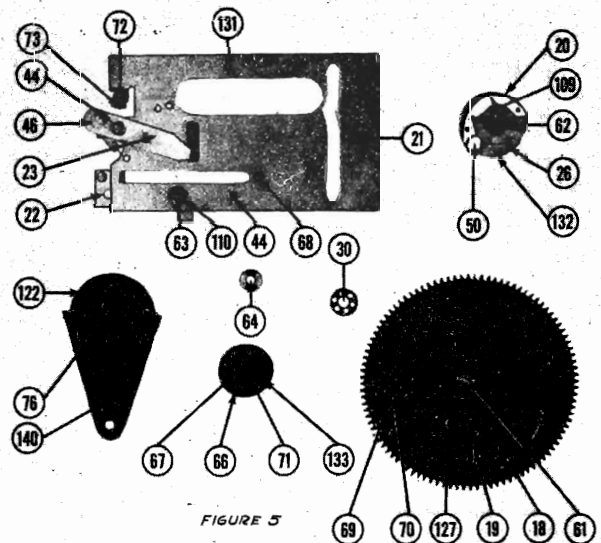


FIGURE 5

