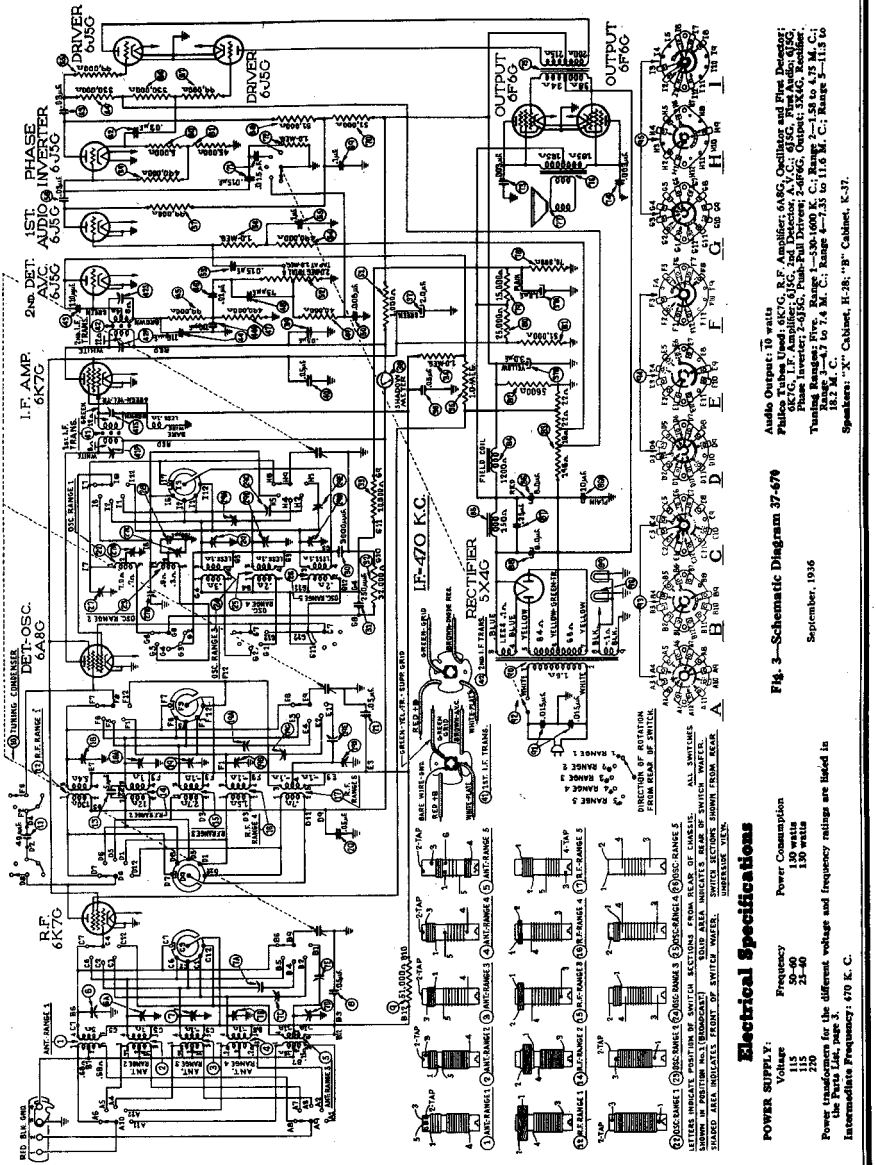
Philco Radio & Television Corp.

	Model: 37-670	**Chassis:**	**Year:** Pre October 1936
	Power:	**Circuit:**	**IF:**
	Tubes:		
	Bands:		

Resources
Riders 7 (VII) PHILCO 7-73
Riders 7 (VII) PHILCO 7-74
Riders 7 (VII) PHILCO 7-75
Riders 7 (VII) PHILCO 7-76

PHILCO RADIO & TELEV. CORP.

MODEL 37-670
Schematic
Coil Data



Electrical Specifications

POWER SUPPLY:

Voltage	Frequency	Power Consumption
105	50-60	130 watts
115	50-60	130 watts
210	25-40	130 watts

Power transformers for the different voltage and frequency ratings are listed in the Parts List, page 3.

Intermediate Frequency: 470 K. C.

Fig. 3—Schematic Diagram 37-670

September, 1936

Audio Output: 10 watts

Philco Tubes Used: 6K7G, R.F. Amplifier; 6A8G, Oscillator and First Detector; 6K7G, I.F. Amplifier; 6J5G, 2nd Detector, A.V.C. and 1st Audio; 6J5G, Phase Inverter; 6F6G, 6F6G, Class B Output; 5X4G, Rectifier.

Tuning Ranges: Five. Range 1—530-1600 K. C.; Range 2—1.58 to 4.75 M. C.; Range 3—2.7 to 7.4 M. C.; Range 4—7.35 to 11.6 M. C.; Range 5—11.5 to 18.2 M. C.

Speakers: "A" Cabinet, H-28; "B" Cabinet, K-37.

Alignment of Compensators

The locations of the various compensators are shown in Figs. 6 and 7.

The following procedure must be observed in adjusting the compensators:

DIAL CALIBRATION—In order to adjust this receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this rotate the tuning control to the extreme counter-clockwise position (maximum capacity). Loosen the set screw of the dial hub, then turn dial until the glowing indicator is centered on second index line of dial scale (see Fig. 5). Now tighten the dial hub set screw in this position.

SHADOW METER ADJUSTMENT—Remove aerial and allow tubes to warm up. Then adjust the shadow meter as follows:

1. Move the shadow meter coil backwards and forwards, until the opposite edges of the shadow are ⅛ of an inch from each end of the shadow screen, measuring along the bottom edge of the screen. Adjustment of the shadow meter light bracket may be necessary for perfect centering.
2. Remove the 5X4G rectifier tube from its socket and rotate coil until shadow reaches minimum width. This width must not exceed 1/16 of an inch.
3. Replace the 5X4G rectifier tube in its socket. The shadow should then widen until it is not more than 1/16 inch or less than 1/16 inch from each side of the screen, measuring along the bottom edge. If these limits are not obtained readjust the shadow meter as given in paragraphs 1 and 2 until they are reached.

OUTPUT METER—The 025 Output Meter is connected between the plate and cathode prongs of one of the (6F6G) tubes. The meter is adjusted to use the (0-30) volt scale.

INTERMEDIATE FREQUENCY CIRCUIT

Frequency 470 K. C.

1. Connect the 068 Signal Generator output lead through a .1 mfd. condenser to the control grid of the 6A8G tube, and the ground connection of the output lead to the chassis. Turn the Volume Control to maximum volume position.
2. Set the range switch in position No. 1 (Broadcast), then rotate the tuning condenser of the receiver to approximately 580 K. C. and adjust the signal generator for 470 K. C.
3. Adjust compensators (42S) 2nd I.F. Sec., (42P) 2nd I.F. Pri., (41S) 1st I.F. Sec., and (41P) 1st I.F. Pri. for maximum reading on the output meter.

RADIO FREQUENCY CIRCUIT

Tuning Range (11.5) to (18.2) M. C.

1. Remove the signal generator output lead from the grid of the 6A8G tube and connect it through the .1 mfd. condenser to terminal No. 1 on aerial input panel and the generator ground lead to terminal No. 3, rear of chassis. Terminals 2 and 3 must be connected by the shorting link provided on the panel.
2. Set the range switch in position No. 5. Turn the receiver and signal generator dials to 18 M. C. Now adjust compensator (29D) by turning the screw (clockwise) to the maximum capacity position, then slowly turning it (counter-clockwise) until a second peak signal is reached on the output meter. The first peak from maximum capacity is the image signal and must not be used. NOTE—In adjusting some receivers only one peak will be observed, therefore, tune the compensator to maximum on this peak. If the above procedure is correctly performed, the image signal will be found at 17.06 M. C. by advancing the signal generator attenuator and turning the receiver dial to this frequency mark on the dial.
3. The antenna and R.F. compensators (7D) and (19D) are now adjusted by connecting a variable condenser of approximately 350 mmfd.—Philco Part No. 45-2325 across the oscillator compensator (29D) (First contact from left side of the receiver facing rear underside of chassis) and ground. Leaving the signal generator and receiver dials at 18 M. C., tune the added condenser from the maximum capacity point until the second harmonic of the receiver oscillator beats against the signal from the generator thereby bringing in the signal. The antenna and R. F. compensators (7D) and (19D) are then adjusted for maximum output. Now remove the external condenser and readjust compensator (29D) as given in paragraph 2 above.
4. Turn signal generator and receiver dials to 12 M. C. and adjust compensator (29E) for maximum output. Then adjust compensators (19E) and (7E) for maximum output.
5. Now turn the signal generator and receiver dials to 18 M. C. and readjust compensators (29D) Osc., (7D) Ant. and (19D) R.F. as given in paragraphs 2 and 3 above.

Tuning Range (7.35) to (11.6) M. C.

1. Set range switch in position 4. Rotate signal generator and receiver dials to 11 M. C. Now adjust compensator (29B) by turning the screw (clockwise) to the maximum capacity position, then slowly turn it (counter-clockwise) until a second peak signal is reached on the output meter. The first peak from maximum capacity is the image signal and must not be used. NOTE—In adjusting some receivers only one peak will be observed, therefore, tune the compensator to maximum on this peak. If the above procedure is correctly performed, the image signal will be found at 10.06 M. C. by advancing the signal generator attenuator and turning receiver dial to this frequency mark on the dial.
2. Using the 11 M. C. signal, compensators (19B) R.F. and (7B) Ant. are adjusted by using the procedure given in paragraph 3, under tuning range (11.5) to (18.2) M. C. with the exception that the external condenser is connected across compensator (29B) (Third contact from left side of the receiver) and ground.
3. Remove the variable condenser and readjust compensator (29B) Osc. as given in paragraph 1 above.
4. Turn the signal generator and receiver dials to 7.5 M. C. and adjust compensators (29C) Osc. series, (19C) R. F. and (7C) Ant. for maximum output.
5. Due to the slight interaction of the high and low frequency compensators of this range, compensators (29B) Osc., (19B) R.F. and (7B) Ant. must be readjusted using the procedure in paragraphs 1 and 2 above.

Tuning Range (4.7) to (7.4) M. C.

1. Set range switch in Position 3. Turn signal generator and receiver dials to 7.0 M. C. Now adjust compensator (29) Osc., (19) R.F. and (7) Ant. for maximum output.
2. Turn the signal generator and receiver dials to 5.0 M.C. and adjust compensators (29A), (19A) and (7A) for maximum output.
3. Turn the signal generator and receiver dials to 7.0 M. C. and readjust compensators (29) Osc., (19) R.F. and (7) Ant. for maximum output.

Tuning Range (1.58) to (4.75) M. C.

1. Set the range switch in position 2. Turn the signal generator and receiver dials to 4.5 M. C
2. Now adjust compensators (27B) Osc., (19A) R.F. and (6A) Ant. for maximum output.
3. Rotate the signal generator and receiver dials to 1.7 M. C. Compensator (27C) Osc. series is now adjusted for maximum output as follows:

First tune compensator (27C) for maximum output, then vary the tuning condenser of the receiver for maximum output about the 1.7 M. C. dial mark. Now turn compensator (27C) slightly to the right or left and vary the receiver tuning condenser for maximum output. If the output reading increases, turn compensator (27C) in the same direction a trifle more, and again vary the tuning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

4. Turn signal generator and receiver dials to 4.5 M. C. and readjust compensators (27B), (19A) and (6A) as given in Paragraphs 1 and 2 above.

Tuning Range (530) to (1600) K. C.

1. Set range switch in position No. 1 (Broadcast). Rotate the signal generator and receiver dials to 1500 K. C. Now adjust compensators (27) Osc., (18) R.F. and (6) Ant. for maximum output.
2. Tune signal generator and receiver dials to 580 K. C. Compensator (27A) Osc. series is then adjusted for maximum output as given in paragraph 3 under tuning range (1.58) to (4.75) M. C., the only difference in the procedure being in the frequency used.
3. Readjust compensator (27) for maximum output, by turning the signal generator and receiver dials to 1500 K. C.
4. Turn the signal generator and receiver dials to 1400 K. C. and adjust compensators (18) R.F. and (6) Ant. for maximum output.

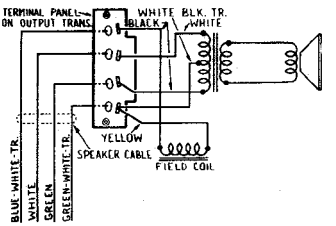


Fig. 1—Speaker Wiring for Types K-37 and H-28

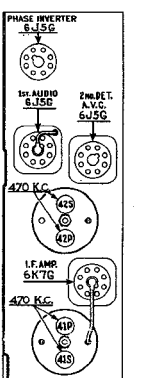


Fig. 6—I.F. Compensators Top of Chassis

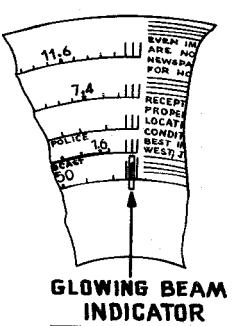


Fig. 5—Dial Calibration

PHILCO RADIO & TELEV. CORP.

MODEL 37-670
Trimmers, Voltage
Socket, Data

SERVICE DATA

Model 37-670 is an 11 tube superheterodyne receiver designed for operation on alternating current. It has five tuning ranges, covering standard broadcast and short-wave frequencies. The chassis is constructed in four basic assembly units, concentrating the R.F., I.F., Audio and Power circuits in individual units.

The circuit includes the PHILCO Foreign Tuning System—controlled by the range switch—providing maximum sensitivity and noise-reduction, when used with the Philco High-Efficiency Aerial; automatic bass compensation in the volume control circuit; shadow tuning; automatic volume control, and a push-pull class "A" output circuit.

AERIAL CONNECTIONS

The red and black leads of the High-Efficiency Aerial "transmission line" are connected to terminals 1 and 2 respectively, of the terminal panel provided on the rear of the chassis. Connect the jumper on the terminal panel across terminals 3 and 4.

If a temporary aerial is used, the jumper should be across terminals 2 and 3. The aerial connects to terminal 1 and the ground lead to terminal 3. A good ground connection is desirable in all installations.

REPLACING DIAL

To replace the dial, remove the clamp holding the dial to the hub, by turning clamp counter-clockwise, using the two holes provided on the clamp for this purpose.

REMOVING MASK ARM & LINK ASSEMBLY

First remove dial, then loosen set screw of dial hub and remove the hub and felt washer from the shaft. Now loosen screws holding indicator bracket and lens assembly, and move bracket forward about ½ inch. The assembly may now be removed by loosening set screw of range switch arm, then pulling arm off of range switch shaft.

REMOVING SWITCH & COIL ASSEMBLIES OF R.F. UNIT

To replace any part in the switch and coil assemblies of the R.F. Unit, each assembly can be removed separately as follows:

First remove the tuning dial, mask and arm assembly. Remove the center mounting screw on the rear of the R.F. Unit. Then lift the rear of the unit and push forward until the rubber mounting grommets, on each side of the unit, clear the mounting slots. The unit is then lifted far enough from the chassis for removal of the two screws holding the selector switch indexing plate and shaft (front of unit). Then pull shaft straight out from the unit. Also, remove the volume control shaft by releasing the retaining clip, inside the chassis, from the shaft.

IMPORTANT—When selector switch shaft is replaced, care should be taken to have all wafer rotors in the same position, so that the key on the switch shaft will slide freely into the notched hole in each wafer rotor. **NEVER** force shaft into rotors.

Servicing Stages—It is necessary to unsolder some connecting leads in order to release the stage for servicing. If all the following connections are unfastened the stage will be entirely released. Ordinarily only one or two leads need be loosened in order to change coils, replace coupling condensers, or replace switch sections.

ANTENNA ASSEMBLY—Rear Section

1. Unsolder the wires which connect the antenna panel and I.F. Unit to the range switch, also the assembly shield ground leads.
2. Unsolder the two leads from the gang condenser terminal panel which connect to the range switch. Also the lead of tubular condenser (**40**) at the ground lug on the R.F. Unit.
3. Remove the screw holding the shield plate to the unit base. This screw is located in the right hand corner of the shield plate, facing the rear underside of the chassis. The assembly can then be removed.

R.F. ASSEMBLY—Middle Section

1. Unsolder the wires from the I.F. Unit and the 6K7G plate contact in R.F. Unit which connect to the range switch. Then remove ground leads of shield plate.
2. Unsolder the leads from the gang condenser terminal panels and the lead connecting D2 on the range switch to the 6K7G Plate Contact.
3. Remove the screw holding the shield plate to the unit base. This screw is located in the right hand corner of the shield plate facing the rear underside of the chassis. Then pull the assembly straight out.

OSCILLATOR ASSEMBLY—Front Section

1. Unscrew the two screws located on each side of the R.F. Unit.
2. Unsolder the wires connecting the range switch to resistors (**81**) and (**78**) in the power unit, electrolytic condenser (**77**) in the R.F. Unit and Osc. plate and grid contacts on the 6A8G socket.
3. Remove the leads from the gang condenser terminal panels and the lead of Mica condenser (**30**) at the ground lug on R.F. Unit base. With these leads disconnected lift oscillator section from unit.

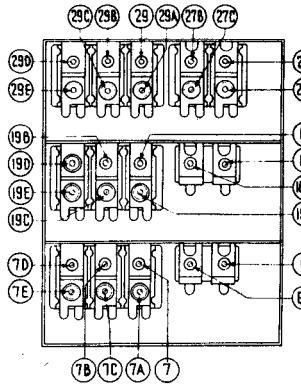


Fig. 7—R.F. Compensators Underside of Chassis

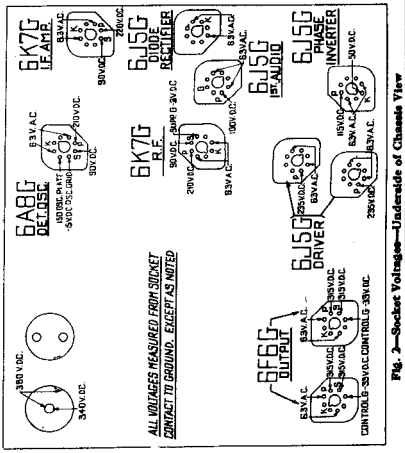


Fig. 8—Socket Voltages—Underside of Chassis View

The voltages indicated by arrows were measured with a voltmeter having a resistance of 1000 ohms per volt. Volume Control at minimum, range switch in broadcast position, line voltage 115 A.C.

MODEL 37-670
Chassis Views
Parts List

PHILCO RADIO & TELEV. CORP.

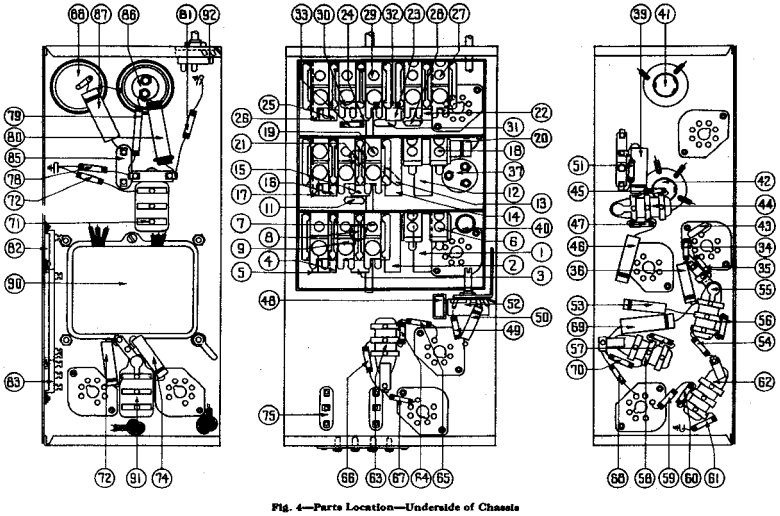


Fig. 4—Parts Location—Underside of Chassis

Replacement Parts — Model 37-670

Schem. No.	Description	Part No.	List Price
1	Antenna Transformer (530 to 1600 K.C.)	32-2108	$0.80
2	Antenna Transformer (1.58 to 4.75 M.C.)	32-2146	.80
3	Antenna Transformer (4.7 to 7.4 M.C.)	32-2183	.60
4	Antenna Transformer (7.35 to 11.6 M.C.)	32-2185	.70
5	Antenna Transformer (11.5 to 18.2 M.C.)	32-2175	.80
6	Compensator (two section)	31-6063	.40
7	Compensator (six section)	31-6112	1.40
8	Condenser (.05 mfd. tubular)	30-4020	.20
9	Resistor (51000 ohms)	33-351339	.20
10	Tuning Condenser	31-1855	4.50
11	Condenser (40 mmfd. mica)	30-1076	.20
12	R. F. Transformer (530 to 1600 K.C.)	32-2105	.75
13	Condenser (5 mmfd. mica)	30-1077	.20
14	R. F. Transformer (1.58 to 4.75 M.C.)	32-2147	.60
15	R. F. Transformer (4.7 to 7.4 M.C.)	32-2177	.60
16	R. F. Transformer (7.3 to 11.6 M.C.)	32-2178	.60
17	R. F. Transformer (11.5 to 18.2 M.C.)	32-2176	.70
18	Compensator (two section)	31-6063	.40
19	Compensator (six section)	31-6112	1.40
20	Condenser (.05 mfd. tubular)	30-4020	.20
21	Condenser (.05 mfd. tubular)	30-4020	.20
22	Oscillator Transformer (550 to 1600 K.C.)	32-2120	.65
23	Oscillator Transformer (1.58 to 4.75 M.C.)	32-2149	.60
24	Oscillator Transformer (4.7 to 7.4 M.C.)	32-2184	.60
25	Oscillator Transformer (7.3 to 11.6 M.C.)	32-2186	.70
26	Oscillator Transformer (11.6 to 18.2 M.C.)	32-2182	.70
27	Compensator (four section)	31-6108	
29	Condenser (700 mmf.)	5863	.35
29	Compensator (six section)	31-6112	
30	Condenser (3000 mmfd. mica)	30-1022	.45
31	Condenser (250 mmfd. mica)	30-1032	.25
32	Resistor (32000 ohms)	33-332339	.20
33	Resistor (10000 ohms)	33-310339	.20
34	Resistor (1.0 megohm)	33-510339	.20
35	Resistor (1.0 megohm)	33-510339	.20
36	Condenser (.05 mfd. tubular)	30-4444	.20
37	Electrolytic Condenser (2, 1, 3 mfd.)	30-2122	1.85
38	Shadowmeter	45-2189	2.50
39	Condenser (.05 mfd. tubular)	30-4012	.25
40	Condenser (.05 mfd. tubular)	30-4123	.20
41	1st I. F. Transformer	32-2170	2.00
42	2nd I. F. Transformer	32-2172	2.00
43	Condenser (110 mmfd. mica)	30-1031	.20
44	Condenser (110 mmfd. dual bakelite)	9035-DG	.25
45	Resistor (99000 ohms)	33-399339	.20
46	Condenser (.01 mfd. tubular)	30-4124	.25
47	Resistor (490000 ohms)	33-449339	.20
48	Condenser (75 mmfd. mica)	30-1053	.20
49	Resistor (40000 ohms)	33-340339	$0.20
50	Condenser (.006 mfd. tubular)	30-4125	
51	Resistor (1000 ohms)	33-310339	.20
52	Volume Control	33-5158	1.00
53	Condenser (.015 mfd. tubular)	30-4558	.20
54	Resistor (490000 ohms)	33-449339	.20
55	Condenser (.1 mfd. bakelite)	4069-SG	.35
56	Resistor (1 megohm)	33-510339	.20
57	Resistor (99000 ohms)	33-399339	.20
58	Condenser (.03 mfd. bakelite)	8318-SU	.35
59	Resistor (490000 ohms)	33-449339	.20
60	Resistor (5000 ohms)	33-350339	.20
61	Resistor (45000 ohms)	33-345339	.20
62	Condenser (.05 mfd. bakelite)	8315-SU	.20
63	Condenser (.03 mfd. bakelite)	8318-SU	.20
64	Resistor (330000 ohms)	33-433339	.20
65	Resistor (99000 ohms)	33-399339	.20
66	Resistor (330000 ohms)	33-433339	.20
67	Resistor (99000 ohms)	33-399339	.20
68	Resistor (51000 ohms)	33-351339	.20
69	Condenser (.1 mfd. tubular)	30-4455	
70	Resistor (51000 ohms)	33-351339	.20
71	Condenser (.015 mfd. dual bakelite)	3903-LU	
72	Resistor (1 megohm)	33-510339	.20
73	Condenser (.003 mfd. tubular)	30-4499	.20
74	Condenser (.003 mfd. tubular)	30-4499	.20
75	Audio Input Transformer	32-7571	2.50
76	Output Transformer (K-37, H-28)	32-7635	
77	Cone and Voice Coil (K-37)	35-9020	
	Cone and Voice Coil (H-28)	35-9025	
78	Resistor (70000 ohms)	33-370439	.20
79	Resistor (15000 ohms)	33-315339	.20
80	Resistor (39000 ohms)	33-339339	.20
81	Resistor (51000 ohms)	33-351339	.20
82	Resistor (5000 ohms wirewound)	33-3383	.60
83	Resistor (250 ohms wirewound)	33-3281	.60
84	Field Coil Assembly (K-37, H-28)	36-3104	
85	Filter Choke	35-7115	1.80
86	Electrolytic Condenser (8, 10 mfd.)	30-2045	1.80
87	Condenser (.25 mfd.) tubular	30-4446	.25
88	Electrolytic Condenser (8 mfd.)	30-2025	1.35
89	Pilot Lamp	34-2039	.15
90	Power Transformer 115 V., 50-60 cycles	32-7640	6.50
	Power Transformer 115 V., 25-40 cycles	32-7641	
91	Condenser (.016 mfd. dual bakelite)	3793-DG	.40
92	Power and Tone Control Switch	42-1194	.75
93	Range Switch (Ant.)	42-1211	1.60
94	Range Switch (R.F.)	42-1255	1.60
95	Range Switch (Osc.)	42-1213	1.60
96	Shadowmeter Lamp	34-2064	.09
	Switch Index Plate and Shaft	42-1187	.50
	Pilot Lamp Assembly	38-7706	.35
	Dial	27-5213	.40
	Hub	28-7187	.12
	Clamp	28-2837	$0.06
	Set Screw	W-1641	.02
	Gear (Dial)	28-7185	.10
	Gear (Drive)	31-1834	.25
	Thrust Spring	25-5611	.01
	Thrust Washer	28-3976	.36 C
	"C" Washer	28-3904	.01
	Mask	27-5206	.30
	Mask Arm and Link Assembly	31-1887	.45
	Mask Washer	27-8318	.50 C
	Mask Guide and Bracket	38-7876	.25
	Screens and Lens Holder Assembly	31-1900	.30
	Volume Control Shaft	28-8060	
	Retaining Clip	26-4304	
	Spring	28-4117	.40 C
	Tube Shield	26-3726	
	Tube Shield Base	26-3806	
	Socket 7 prong	27-6057	.11
	Socket 6 prong	27-6058	.11
	Socket Rectifier	27-6062	.11
	Terminal Panel (Ant.)	38-7714	.15
	Grommet Mtg. R. F. Unit	27-4317	.04
	Sleeve Mtg. R. F. Unit	26-2257	.01
	Washer Mtg. R. F. Unit	27-7507	.50 C
	Screw Mtg. R. F. Unit	W-729	.45 C
	Rubber Mtg. (Gang Condenser)	27-4325	.02
	Spring Mtg. Shadowmeter	28-3825	.70 C
	Plate Mtg. R. F. Transformer	26-3808	
	Spacer Mtg. R. F. Transformer	27-8226	
	Screw Mtg. R. F. Transformer	W-1895	
	Screw Chassis Mtg.	W-1495	1.50 C
	Washer Chassis Mtg.	28-2089	.30 C
	Shield (Chassis Bottom)	26-3143	
	Snap Fasteners	28-4279	
	Rubber Cushion (X Cabinet)	3558	
	Rubber Bushing (two required)	27-4360	
	Rubber Washer	5189	
	Speaker Cable	41-3210	
	A. C. Cord	L-2133	.40
	Knob Tuning	27-4330	.10
	Knob Tuning Vernier	27-4331	.10
	Knob Tone & Volume	27-4332	.10
	Knob Range Switch	27-4326	.10

B & X CABINET PARTS

Bezel Frame and Plate	40-5948	.80
Glass	27-8300	.06
Ring	28-3988	.45
Gasket	27-8313	.01
Speaker K-37, "B" Cabinet	36-1235	7.25
Baffle Silk Assembly, X Cabinet	40-6015	
Speaker (H-28) "X" Cabinet	36-1242	

Figures in black type indicate circled figures in Base View. Prices Subject to Change Without Notice.