

# PHILCO . . . . . Model 37-630



## FOR MEMBERS OF RADIO MANUFACTURERS SERVICE

## SERVICE BULLETIN No. 251

### General Description

Model 37-630 is a 6 tube superheterodyne receiver for operation on alternating current, having three tuning ranges, covering standard broadcast and short-wave frequencies, and using the new Philco High-Efficiency self-centering glass tubes.

The circuit includes the Philco "Foreign Tuning System" controlled by the tuning range switch which provides maximum sensitivity and noise reduction, when used with the **Philco High Efficiency Aerial** supplied with the receiver. One stage of Radio Frequency amplification which greatly increases the signal to noise ratio, automatic bass compensation in the volume control circuit, shadow tuning and a separate diode circuit for automatic volume control are also incorporated in this receiver.

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 at 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 to terminal 3.

A good ground connection is desirable in all installations. Make the ground connection from the nearest water or radiator pipe to terminal 3 on the terminal panel.

The chassis is constructed in three basic assembly units, concentrating each circuit in a single unit.

The Radio Frequency unit, located in the center of the chassis, contains a 6K7G tube which functions as a Radio Frequency Amplifier; a 6A8G tube, for the Detector-Oscillator circuit; individual Antenna, R. F. Amplifier and Oscillator coils for each tuning range; selector switch; compensating condensers for all coils; and other parts necessary for the associated circuits. The

unit is separately mounted on rubber grommets, cushioning it from the main chassis.

The Intermediate Frequency unit, mounted on the right hand side of the chassis (facing front of set) consists of the Intermediate Frequency transformers, compensating condensers, a 6K7G for the I. F. Amplifier stage, and a 6Q7G tube as the second detector —automatic volume control and first audio stage. All voltages supplied to the I. F. and R. F. units are furnished from a terminal strip mounted in this unit.

The Power Pack and Audio Output circuits, together with the required voltage dividers and filter condensers are mounted in the power unit. This unit contains a 6F6G tube and a 5Y4G tube for the Power Output and Rectifier Circuits respectively, and the combined tone control and power switch.

Schematic Diagram, Fig. 5, is numbered, indicating all important parts. These numbers correspond with the parts layout shown in Fig. 6. In addition, the range switch wafers are shown on the schematic diagram. The contacts on each wafer are numbered and lettered to indicate their connection points in the schematic diagram, which are also lettered and numbered. The physical drawings of each coil used in the receiver are also shown on schematic diagram Fig. 5. The connections of these coils are numbered on the coil drawing and on the schematic diagram.

Fig. 1 shows the Voltage measurements taken from the bottom of the socket at each contact. In Fig. 2, the correct position of the dial indicator, for proper adjustment of the compensator condenser is shown. Fig. 3 and 4 are the locations of the I. F. and R. F. compensators respectively.

This receiver is used in cabinets type X code 121 and type T code 122. These instructions, however, will cover both types.

### Electrical Specifications

**Voltage Rating:** 115 Volts A.C.

**Frequency Rating:** 50 to 60 cycles.

For 25 to 40 cycle operation the Power Transformer marked with asterisk in parts list is used.

**Power Consumption:** 65 Watts.

**Types and Number of Tubes:** 2 type 6K7G, R. F. and I. F. Amplifiers; 1 type 6A8G, Detector-Oscillator; 1 type 6Q7G, 2nd

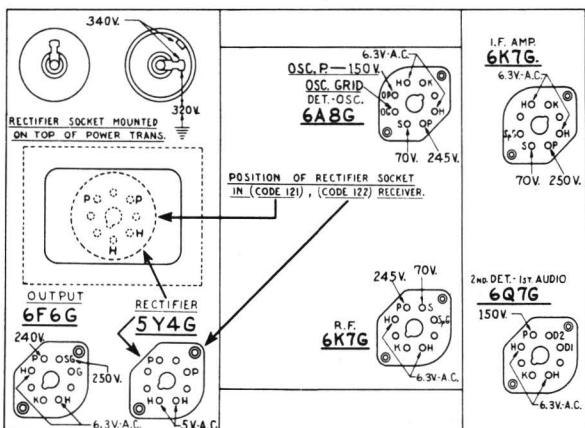
Detector, Automatic Volume Control and 1st Audio; 1 type 6F6G, Output; and 1 type 5Y4G Rectifier.

**Undistorted Output:** 3 watts.

**Intermediate Frequency:** 470 K. C.

**Tuning Ranges:** Three. Range 1.—530 to 1720 Kilocycles; Range 2.—2.3 to 7.4 Megacycles; Range 3.—7.35 to 22 Megacycles.

**Speakers:** X Cabinet—H24  
T Cabinet—K38

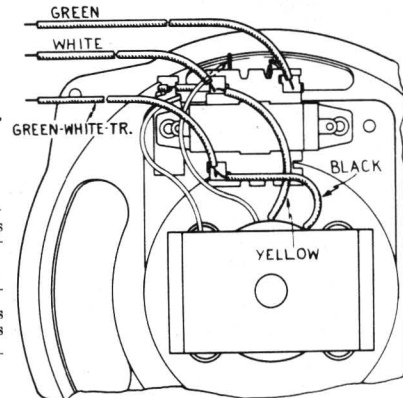


**Fig. 1. Socket Voltages Measured from Socket Contact to Ground Underside of Chassis View**

The voltages indicated by arrows were measured with a **Philco 025 Circuit Tester** which contains a voltmeter having a resistance of 1000 ohms per volt. Volume Control at minimum. Range Switch in broadcast position. Line voltage 115 A.C.

### POWER TRANSFORMER DATA

Lead No. Shown on Schematic	A.C. Volts	Current	Circuit	Color	Resistance
1-2	120	—	Pri.	White	5 ohm.s
3-4	5.0	2.0 A.	Fil. Rectifier	Blue	.1 ohm
5-7	670	70 Ma.	High Voltage Sec.	Yellow	145 ohms 155 ohms
6	—	—	Center Tap of 5-7	—	—
8-9	6.7	2.1 A.	Fil.	Black	.1 ohm



### Speaker Wiring

When replacing any part of the speaker, the hum bucking coil connections should be connected for minimum hum.

### Run 2.

While the circuit arrangement remains the same, the locations of the parts are slightly changed in this Run. Bakelite condenser Ⓢ Part No. 3793-DG is removed from front and placed in the rear of the chassis. Tubular condenser Ⓢ Part No. 30-4380 is replaced with a Part No. 8318-SU bakelite condenser placed in the position formerly held by 3793-DG.

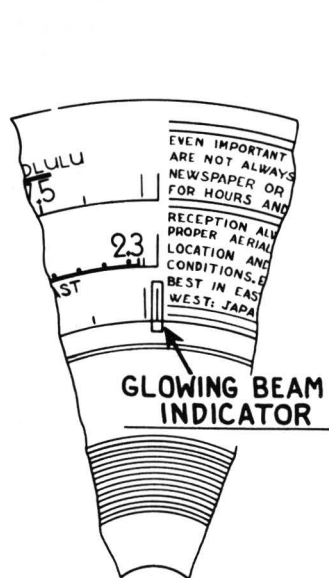


Fig. 2—Dial Calibration

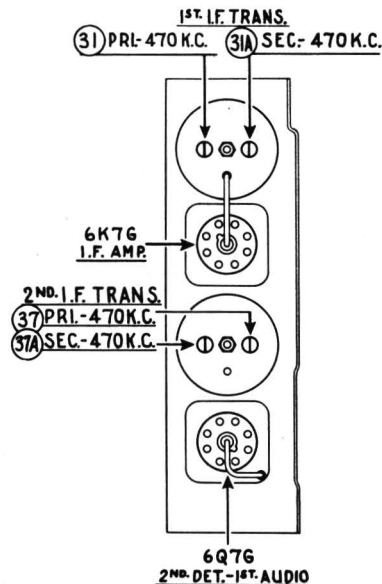


Fig. 3—Locations of I. F. Compensators

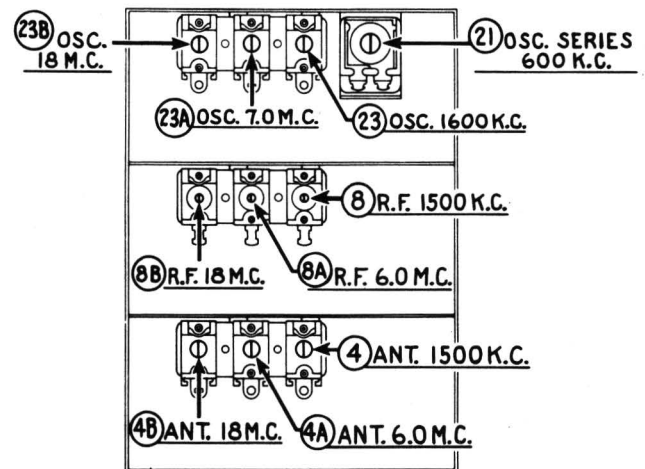


Fig. 4—Locations of R. F. Compensators

## Alignment of the Compensators

The accurate adjustment of the various compensating condensers is vital to the proper functioning of this receiver. There are four compensating condensers in the I. F. Circuit, four in the Oscillator Circuit, three in the R. F. Amplifier Circuit and three in the Antenna Circuit. Incorrect adjustment will cause loss of sensitivity, unsatisfactory tone, and poor selectivity.

To accurately adjust this receiver, precision test equipment is necessary. A signal generator such as the PHILCO MODEL 088 SIGNAL GENERATOR, covering from 110 to 20,000 K. C. is recommended for adjusting the compensators at the various frequencies specified. A visual indication of the receiver output is also necessary to obtain correct adjustment of the compensators. PHILCO MODEL 025 CIRCUIT TESTER contains a sensitive output meter and is recommended for these adjustments.

Philco Fibre Handle Screw-driver No. 27-7059 completes the necessary equipment for these adjustments. The locations of the various compensators are shown in Figs. 3 and 4.

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 condenser control to the extreme counter-clockwise position (maximum capacity). Loosen the screw of dial hub, then turn dial until the glowing indicator is centered on the first index line of dial scale (see Fig. 2). Now tighten the dial hub set screw in this position.

**Shadow Meter Adjustment**—Remove aerial and allow tubes to warm up. Then adjust shadow meter as follows:

- 1 Move the Shadow meter coil backwards and forwards, until the shadow is within one-eighth of an inch of each side of the screen.
- 2 Remove the Rectifier tube from its socket, and rotate the shadow meter coil for minimum shadow width.
- 3 Replace the Rectifier tube. The shadow should then return to maximum width or within one-eighth of an inch of each side of the screen. If the shadow does not return to maximum width, operations 1 and 2 should be continued until it does.

**Output Meter**—The 025 Output Meter is connected to the plate and cathode terminals of the (6F6G) tube. Adjust the meter to use the (0-30) Volt Scale.

During the I. F. and R. F. adjustments, the signal generator\* output should be maintained at the lowest possible level that will give an indication on the output meter.

### INTERMEDIATE FREQUENCY CIRCUIT

#### Frequency 470 K. C.

- 1 Connect the 088 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.
- 2 Set the range switch in position No. 1 (Broadcast), then rotate the tuning condenser of the receiver to the maximum capacity position (counter-clockwise), and adjust the signal generator for 470 K. C.
- 3 Adjust compensators 37a 2nd I. F. Sec., 37 2nd I. F. Pri., 31a 1st I. F. Sec., and 31 1st I. F. Pri. for maximum reading on output meter.

### RADIO FREQUENCY CIRCUIT

#### Tuning Range—7.3 to 22.0 M. C.

- 1 Remove the signal generator output lead from the grid of 6A8G tube, and connect it through a .1 mfd. condenser to terminal No. 1 on aerial input panel, and the generator ground lead to terminal No. 3, rear of chassis.

(a) Terminals 2 and 3 of aerial input panel must be connected with connector link provided on the panel, during these adjustments.

- 2 Set the tuning range switch in position No. 3 (Short Wave). Turn the signal generator and receiver dials to 18 M. C. and adjust compensators 23b Osc., 8b R. F. and 4b Ant. for maximum output. (See Note (a) below).

(a) The adjustment of the Radio Frequency compensator on the high frequency range causes a slight detuning of the oscillator circuit. In order to overcome this detuning effect, connect a variable condenser of approximately 350 mmfd., having a good vernier drive, across the oscillator section of the tuning condenser. Leaving the signal generator and receiver dials at 18 M. C., tune the added condenser so that the second harmonic of the receiver oscillator will beat against the signal from the 088 signal generator bringing in the signal. The antenna and R. F. compensators 4b and 8b should then be adjusted to give maximum output. Now remove the external condenser and turn compensator 23b to maximum capacity (clockwise) then without moving signal generator or receiver tuning condenser, back off compensator 23b (counter-clockwise) until a second peak is reached on the output meter. The first peak is caused by tuning to the image frequency signal and must not be used.

#### Tuning Range 2.3 to 7.4 M. C.

- 1 Turn the range switch to position No. 2 (police). Rotate the signal generator and receiver dials to 7.0 M. C. Then adjust compensator 23a for maximum output. Now turn the signal generator and receiver dials to 6.0 M. C. and adjust compensators 8a R. F. and 4a Ant. for maximum reading on the output meter.

#### Tuning Range 530 to 1720 K. C.

- 1 Set the range switch in position No. 1 (Broadcast). Set the 088 Signal Generator indicator at 800 K. C. and the receiver dial at 1600 K. C.

(a) In adjusting the receiver at 1600 K. C. the second harmonic of 800 K. C., to which the signal generator is tuned, is used. The second harmonic of 800 K. C. is 1600 K. C. Now adjust compensators 21 Osc., 8 R. F. and 4 Ant. for maximum reading on output meter.

- 2 The low frequency end of the range is now tuned by turning the signal generator and receiver dials to 600 K. C. and adjusting compensator 21 Osc. Series—(see Note (a) below)—for maximum reading on output meter.

(a) While compensator 21 is being adjusted, the tuning condenser must be rolled for maximum output. This is accomplished as follows:—First tune compensator 21 for maximum output. Then vary the tuning condenser for maximum output at 600 K. C. Now retune compensator 21, and again vary the tuning condenser back and forth at 600 K. C. for maximum output. This operation of first turning the compensator then the tuning condenser is continued until maximum output is obtained at the 600 K. C. frequency.

- 3 After the low frequency (600 K. C.) end of the range is adjusted, the 1600 K. C. end is readjusted, as given in Paragraph (1) above, to correct any variation that the low frequency series compensator may have caused in the alignment of the high frequency end.

- 4 Now turn the signal generator and receiver dials to 1500 K. C. and readjust compensators 4 Ant., and 8 R. F., for maximum output.

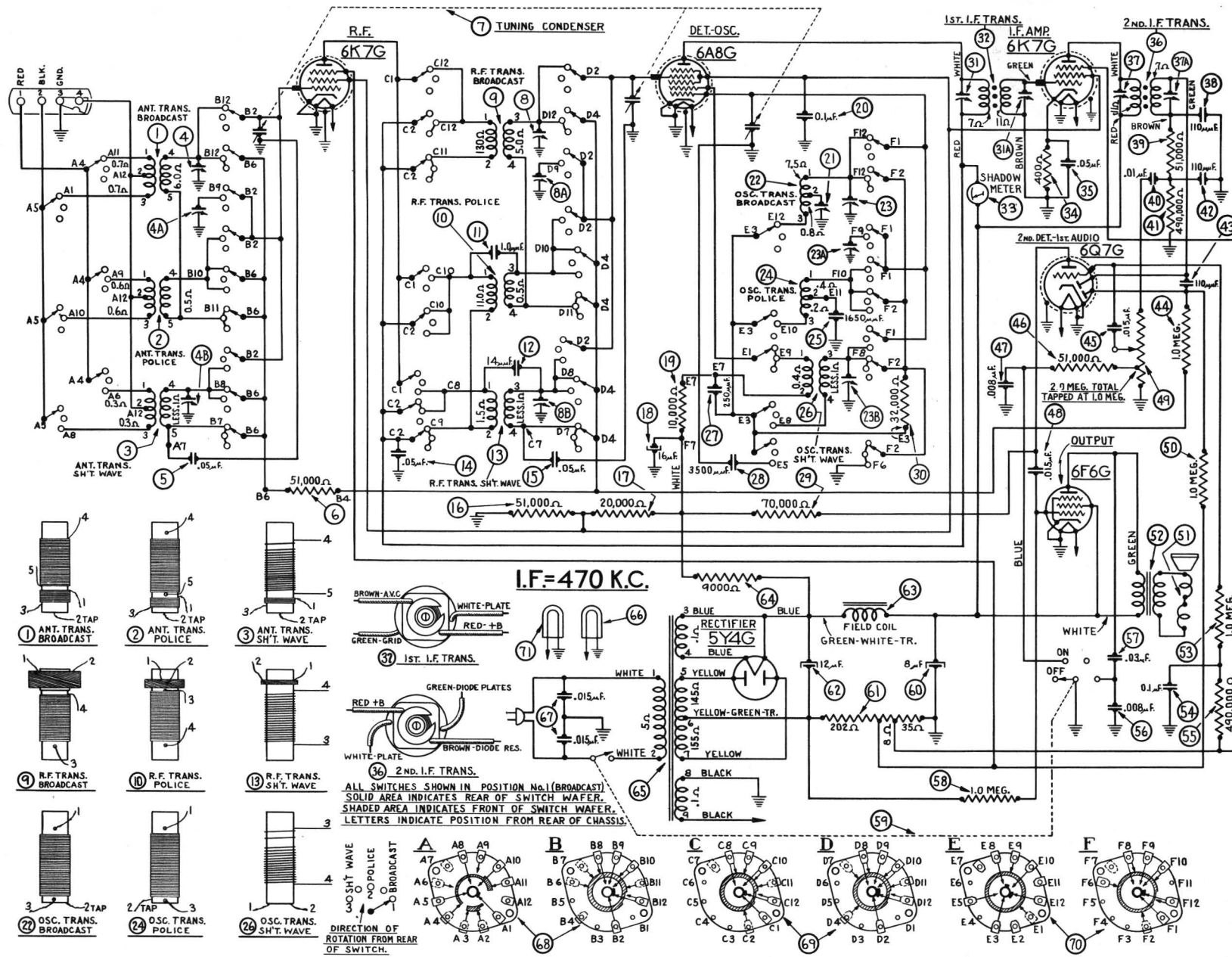


Fig. 5—Schematic Diagram Model 37-630



Use . . .

# PHILCO MODEL 088 SIGNAL GENERATOR

The Instrument Designed  
and Specified by Philco  
Engineers for Adjusting  
Philco Radios

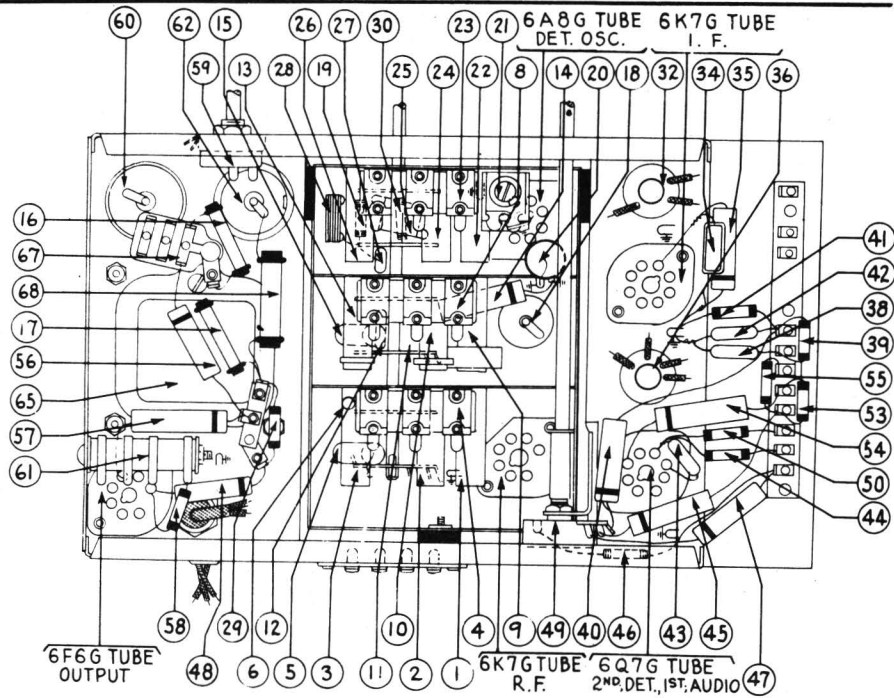


Fig. 6—Base View

## Parts List—Model 37-630

Schematic No.	Description	Part No.	List Price	Schematic No.	Description	Part No.	List Price
1	Antenna Transformer (Broadcast)	32-2108	\$0.80	66	Pilot Lamp	34-2039	\$0.15
2	Antenna Transformer (Police)	32-2119	.65	67	Condenser (015-015 mfd. Double Bakelite)	3793 DG	.40
3	Antenna Transformer (S. W.)	32-2109	.75	68	Wave Switch Antenna	42-1170	1.10
4	Compensator Ant. 1500 K. C.	31-6092	.60	69	Wave Switch R. F.	42-1171	1.00
5	Condenser (.05 mfd. Tubular)	30-4020	.20	70	Wave Switch Osc.	42-1172	1.10
6	Resistor (51000 ohms 1/2 watt)	33-351339	.20		Wave Switch Indexing Plate & Shaft	42-1173	.50
7	Tuning Condenser	31-1818	4.50		Pilot Lamp Assembly	38-7706	.35
8	Compensator (R. F. 1500 K.C.)	31-6092	.60		Dial	27-5203	.50
9	R. F. Transformer (Broadcast)	32-2105	.75		Dial Hub	28-7187	.12
10	R. F. Transformer (Police)	32-2106	.65		Dial Clamp	28-2837	.10
11	Condenser (1.0 mmfd.)				Dial Hub Set Screw	W-1641	.02
12	Condenser (14 mmfd. Mica)	30-1073	.20		Dial Gear	28-7185	.10
13	R. F. Transformer (S. W.)	32-2126	.55		Dial Guard	27-8324	.02
14	Condenser (.05 mfd. Tubular)	30-4123	.20		Thrust Spring	28-8611	.01
15	Condenser (.05 mfd. Tubular)	30-4020	.20		Thrust Washer	28-3976	Per C .30
16	Resistor (51000 ohms 1 watt)	33-351439	.20		"C" Washer	28-3904	.01
17	Resistor (20000 ohms 1 watt)	33-320439	.20		Drive Gear	31-1884	.25
18	Electrolytic Condenser (16 mfd.)	30-2118	1.65		Vernier Gear	31-1871	.75
19	Resistor (10000 ohms 1/2 watt)	33-310339	.20		Mask	27-5198	.30
20	Condenser (.1 mfd. Tubular)	30-4170	.25		Mask Arm Assembly	31-1866	.35
21	Compensator (Osc. 600 K.C.)	31-6056	.55		Mask Guide on Lamp Bracket Support	28-7844	.15
22	Osc. Transformer (Broadcast)	32-2120	.65		Mask Washer	27-8318	Per C .50
23	Compensator (Osc. 1600 K.C.)	31-6092	.60		Dial Screen Assem.	38-7912	.30
24	Osc. Transformer (Police)	32-2121	.40		Spring	28-8624	Per C .50
25	Condenser (1650 mmfd. Semi-fixed)	31-6096	.40		Lens	27-8310	.02
26	Osc. Transformer (S.W.)	32-2110	.75		Volume Control Shaft	28-6499	.10
27	Condenser (350 mmfd. Mica)	30-1032	.25		Volume Control Shaft Spring	28-4117	Per C .40
28	Condenser (3500 mmfd. Semi-fixed)	31-6097	.50		Retaining Clips	28-8610	.03
29	Resistor (70000 ohms 1/2 watt)	33-370339	.20		Washer	28-4186	Per C .75
30	Resistor (32000 ohms 1/2 watt)	33-332339	.20		Socket 8 prong	27-6058	.11
31	Compensator (1st I. F. Pri. 470 K.C.)	Part of 39			Socket 7 prong	27-6057	.11
32	1st I. F. Transformer	32-2100	1.50		Tube Shield	28-2726	.10
33	Shadowmeter	45-2189	2.50		Tube Shield Base	28-3868	.03
34	Resistor (400 ohm Bakelite)	33-1211	.20		I. F. Shield	38-7763	.20
35	Condenser (.05 mfd. Tubular)	30-4020	.20		I. Terminal Panel I. F. Unit	38-7703	.25
36	2nd I. F. Transformer	32-2102	1.50		Washer I. F. Unit	28-4001	Per C .25
37	Compensator (2nd I. F. Pri. 470 K.C.)	Part of 42			Wiring Panel	38-6306	.03
38	Condenser (110 mmfd. Mica)	30-1031	.20		Wiring Panel Power Unit	38-5864	.02
39	Resistor (51000 ohms 1/2 watt)	33-351339	.20		Grommet Mtg. Tuning Condenser	27-4325	.04
40	Condenser (.01 mfd. Tubular)	30-4124	.25		Grommet R. F. Unit	27-4317	.02
41	Resistor (490000 ohms 1/2 watt)	33-449339	.20		Sleeve Mtg. R. F. Unit	28-2257	.01
42	Condenser (110 mmfd. Mica)	30-1031	.20		Spacer Mtg. R. F. Unit	27-8339	Per C .40
43	Condenser (110 mmfd. Mica)	30-1031	.20		Screw Mtg. R. F. Unit	W-729	Per C .45
44	Resistor (1 megohm 1/2 watt)	33-510339	.20		Washer Mtg. R. F. Unit	28-3927	.01
45	Condenser (.015 mfd. Tubular)	30-4358	.20		Insulator Mtg. Electrolytic Condenser	27-7194	.01
46	Resistor (51000 ohms 1/2 watt)	33-351339	.20		Bracket Mtg. Electrolytic Condenser	6440	.05
47	Condenser (.008 mfd. Tubular)	30-4112	.20		Antenna Panel	38-7714	.15
48	Condenser (.015 mfd. Tubular)	30-4226	.20		Speaker Cable	L-2181	.25
49	Volume Control	33-5158	1.00		A. C. Cord	L-2183	.40
50	Resistor (1 megohm 1/2 watt)	33-510339	.20		Knobs Tuning	27-4330	.10
51	Voice Coil and Cone, H24 Speaker	02625	1.20		Knobs Tuning Vernier	27-4331	.10
52	Voice Coil and Cone, K38 Speaker	36-3174	.80		Knobs Wave Switch	27-4326	.10
53	Output Transformer, H24	2580	1.00		Knobs Tone & Volume	27-4332	.10
54	Output Transformer, K38	2580	1.00		Shadowmeter Lamp Shield	28-2917	.02
55	Resistor (1 megohm 1/2 watt)	33-510339	.20		Shadowmeter Mtg. Spring	28-8623	
56	Condenser (0.1 mfd. Tubular)	30-4122	.20				
57	Resistor (490000 ohms 1/2 watt)	33-449339	.20				
58	Condenser (.008 mfd. Tubular)	30-4112	.20				
59	Resistor (1 megohm 1/2 watt)	33-510339	.20				
60	Tone Control and A. C. Switch	42-1182	.75				
61	Electrolytic Condenser (8 mfd.)	30-2024	1.10				
62	Bias Resistor	33-3277	.20				
63	Electrolytic Condenser (12 mfd.)	30-2117	1.20				
64	Field Coil Assembly, H24 Speaker	36-3665					
65	Field Coil Assembly, K38 Speaker	36-3718-01					
	Resistor (9000 ohms, 2 watt)	33-290539	.30				
	Power Transformer (115 Volt 50-60 cycle) Code 121	32-7583	4.50				
	Power Transformer (115 Volt 25-40 cycle) Code 121	32-7584	6.50				
	Power Transformer (115 Volt 50-60 cycle) Code 122	32-7626	4.25				
	Power Transformer (115 Volt 50-60 cycle) Code 122	32-7627					

Figures in black type indicate circled figures in Base View.

Prices Subject to Change Without Notice