Philco Radio & Television Corp.

	Model: 37-620	**Chassis:**	**Year:** Pre October 1936
	Power:	**Circuit:**	**IF:**
	Tubes:		
	Bands:		

Resources
Riders 7 (VII) PHILCO 7-50
Riders 7 (VII) PHILCO 7-51
Riders 7 (VII) PHILCO 7-52
Riders 7 (VII) PHILCO 7-53

PHILCO RADIO & TELEV. CORP.

MODEL 37-620
Schematic
Coil Data

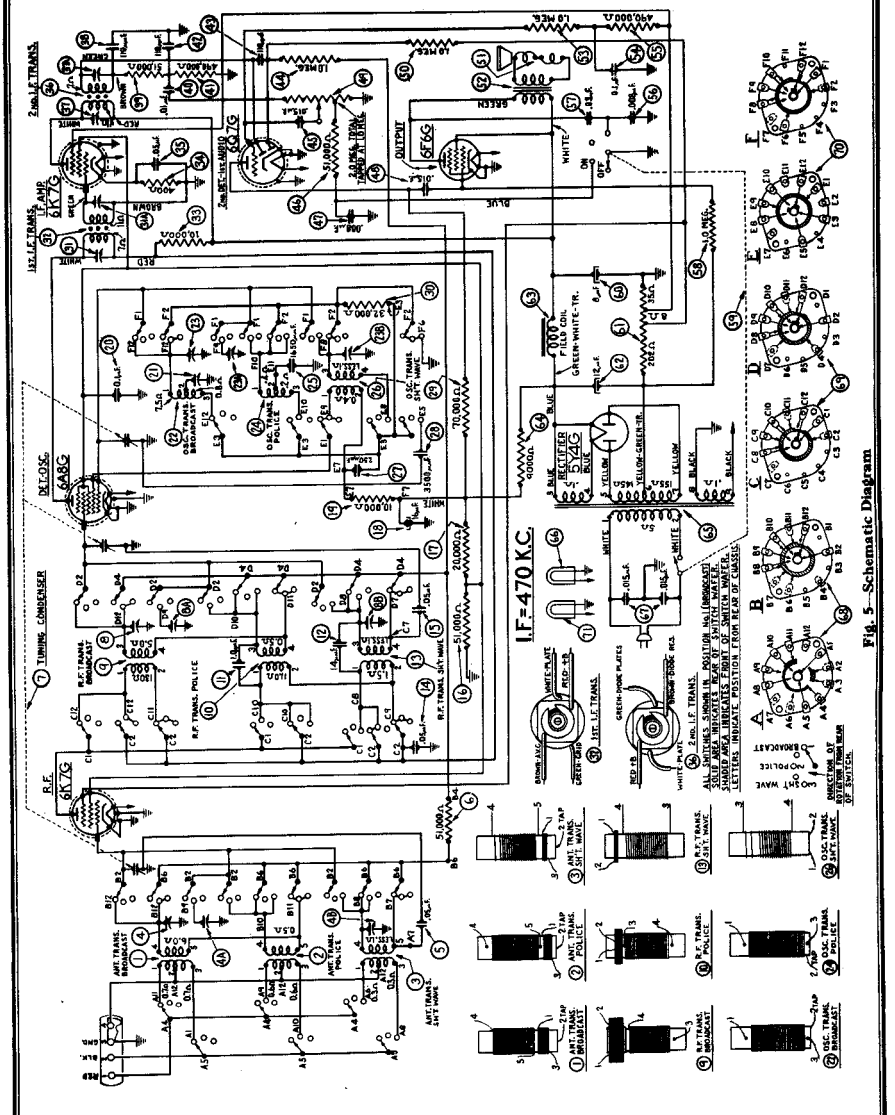


Fig. 5—Schematic Diagram

General Description

Model 37-620 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, 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.

CONSTRUCTION

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

(1) 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.

(2) 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 tube 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 on this unit.

(3) 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. The socket for the 5Y4G tube is mounted on the power transformer.

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 lettered and numbered 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 sockets 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 B and J. These instructions, however, will cover both types.

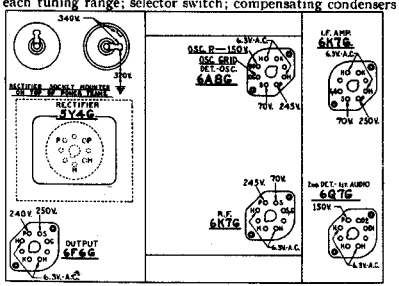


Fig. 1—Socket Voltages
Measured from Socket Contact to Ground
Underside of Chassis View

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 ohms
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

Run 2.

While the circuit arrangement remains the same, the position of the parts is slightly changed in this Run. Bakelite condenser ⑬ Part No. 3793-DG is removed from front and placed in the rear of the chassis. Tubular condenser ⑭ Part No. 30-4380 is replaced with a Part No. 8318-SU bakelite condenser, placed in the position formerly held by 3793-DG.

Electrical Specifications

Voltage Rating: 115 Volts AC.

Frequency Rating: 50 to 60 cycles.
For 25 to 40 cycle operation, the Power Transformer marked with asterisk in the 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: B Cabinet—S-7; J Cabinet—HS.

PHILCO RADIO & TELEV. CORP.

MODEL 37-620
Trimmers
Alignment

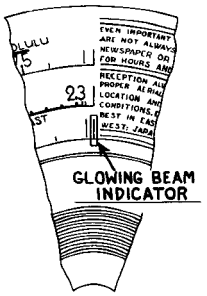


Fig. 2—Dial Calibration

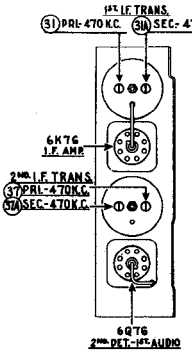


Fig. 3—Locations of I. F. Compensators

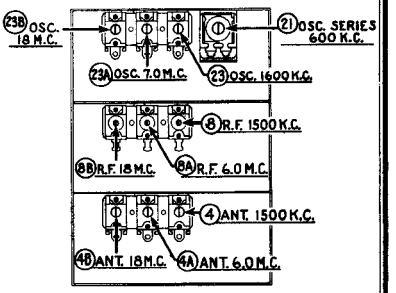


Fig. 3—Locations of R. F. Compensators

Adjustment of 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.

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 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 (37)a 2nd I. F. Sec., (37) 2nd I. F. Pri., (31)a 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 (23)b Osc., (8)b R. F. and (4)b 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. compensator (4)b and (8)b should then be adjusted to give maximum output. Now remove the external condenser and turn compensator (23)b to maximum capacity (clockwise) then without moving signal generator or receiver tuning condenser, back off compensator (23)b (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 (23)a for maximum output. Now turn the signal generator and receiver dials to 6.0 M. C. and adjust compensators (8)a R. F. and (4)a 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 (23) 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.

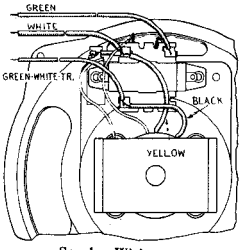
(a) While compensator (21) is being adjusted, the tuning condenser must be rolled for maximum output. This is accomplished as follows:—First tune compensator (21) for maximum output. Then vary the tuning condenser for maximum output at 600 K. C. Now retune compensator (21), and again vary the tuning 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.

MODEL 37-620
Chassis
Speaker Data
Parts List

PHILCO RADIO & TELEV. CORP.



Speaker Wiring

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

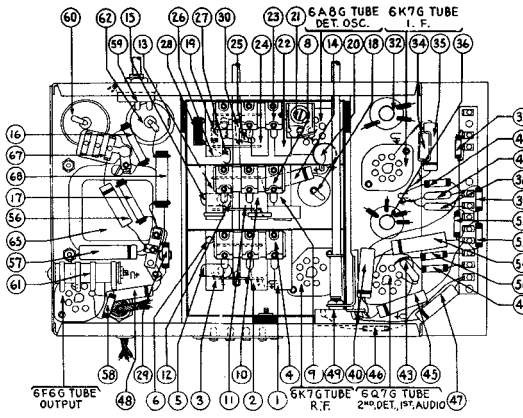


Fig. 6—Base View

Replacement Parts—Model 37-620

Schem. No.	Description	Part No.	Price List
1	Antenna Transformer (Broadcast)	32-2108	$0.80
2	Antenna Transformer (Police)	32-2119	.55
3	Antenna Transformer (S. W.)	32-2109	.75
4	Compensator Ant. 1500 K.C.	31-6092	.60
5	Condenser (.05 mfd. Tubular)	30-4020	.20
6	Resistor (51000 ohms ½ watt)	33-351339	.20
7	Tuning Condenser	31-1818	4.50
8	Compensator (R. F. 1500 K.C.)	31-6092	.60
9	R. F. Transformer (Broadcast)	32-2105	.75
10	R. F. Transformer (Police)	32-2106	.65
11	Condenser (1.0 mmfd.)		
12	Condenser (14 mmfd. Mica)	30-1073	.20
13	R. F. Transformer (S. W.)	32-2126	.55
14	Condenser (.05 mfd. Tubular)	30-4123	.20
15	Condenser (.05 mfd. Tubular)	30-4020	.20
16	Resistor (51000 ohms 1 watt)	33-351439	.20
17	Resistor (20000 ohms 1 watt)	33-320439	.20
18	Electrolytic Condenser (15 mfd.)	30-2118	1.95
19	Resistor (10000 ohms ½ watt)	33-310339	.20
20	Condenser (.1 mfd. Tubular)	30-4170	.25
21	Compensator (Osc. Series 600 K.C.)	31-6056	.55
22	Osc. Transformer (Broadcast)	32-2120	.65
23	Compensator (Osc. 1500 K.C.)	31-6092	.60
24	Osc. Transformer (Police)	32-2121	.60
25	Condenser (1650 mmfd. Semi-fixed)	31-6096	.40
26	Osc. Transformer (S.W.)	32-2110	.75
27	Condenser (250 mmfd. Mica)	30-1032	.25
28	Condenser (3500 mmfd. Semi-fixed)	31-6097	.50
29	Resistor (70000 ohms ½ watt)	33-370339	.20
30	Resistor (32000 ohms ½ watt)	33-332339	.20
31	Compensator (1st I. F. Pri. 470 K.C.)	Part of 39	
32	1st I. F. Transformer	32-2100	1.50
33	Resistor (1000 ohms ½ watt)	33-310239	.20
34	Resistor (400 ohm Bakelite)	33-1211	.20
35	Condenser (.05 mfd. Tubular)	30-4020	.20
36	2nd I. F. Transformer	32-2102	1.50
37	Compensator (2nd I. F. Pri. 470 K.C.)	Part of 42	
38	Condenser (110 mmfd. Mica)	30-1031	.20
39	Resistor (51000 ohms ½ watt)	33-351339	.20
40	Condenser (.01 mfd. Tubular)	30-4124	.25
41	Resistor (490000 ohms ½ watt)	33-449339	.20
42	Condenser (110 mmfd. Mica)	30-1031	.20
43	Condenser (110 mmfd. Mica)	30-1031	.20
44	Resistor (1 megohm ½ watt)	33-510339	.20
45	Condenser (.015 mfd. Tubular)	30-4358	.20
46	Resistor (51000 ohms ½ watt)	33-351339	.20
47	Condenser (.006 mfd. Tubular)	30-4112	.20
48	Condenser (.015 mfd. Tubular)	30-4226	.20
49	Volume Control	33-5158	1.00
50	Resistor (1 megohm ½ watt)	33-510339	.20
51	Voice Coil and Cone, S7 Speaker	36-3014	.80
	Voice Coil & Cone, HS Speaker	36-3627	
52	Output Transformer, S7 & HS Speaker	32-7019	.85
53	Resistor (1 megohm ½ watt)	33-510339	.20
54	Condenser (.01 mfd. Tubular)	30-4122	.20
55	Resistor (490000 ohms ½ watt) *	33-449339	.20
56	Condenser (.006 mfd. Tubular)	30-4112	.20
57	Condenser (.05 mfd. Tubular)	30-4380	.20
58	Resistor (1 megohm ½ watt)	33-510339	.20
59	Tone Control and A. C. Switch	42-1182	.75
60	Electrolytic Condenser (8 mfd.)	30-2024	1.10
61	Bias Resistor	33-3277	.20
62	Electrolytic Condenser (12 mfd.)	30-2117	1.20
63	Field Coil Assembly, S7 Speaker	36-3039	2.75
	Field Coil Assem. HS Speaker	36-3690	
64	Resistor (9000 ohms, 2 watt)	33-290539	$0.30
65	Power Transformer (115 Volt 50-60 cycle)	32-7583	4.90
*	Power Transformer (115V; 25-40 cycle)	38-7584	
66	Pilot Lamp	34-2039	.15
67	Condenser (.015-.015 mfd. Double Bakelite)	3783 DG	.40
68	Wave Switch Antenna	42-1170	1.10
69	Wave Switch R. F.	42-1171	1.00
70	Wave Switch Osc.	42-1172	1.10
	Wave Switch Indexing Plate & Shaft	42-1173	.50
	Pilot Lamp Assembly	38-7706	.35
	Dial	27-8303	.50
	Dial Hub	28-7187	.12
	Dial Clamp	28-2837	.10
	Dial Hub Set Screw	W-1641	.02
	Dial Gear	28-7185	.10
	Dial Guard	27-8324	.02
	Thrust Spring	28-8611	.01
	Thrust Washer	28-3976	Per C .30
	"C" Washer	28-3904	.01
	Drive Gear	31-1884	.25
	Vernier Drive	31-1871	.75
	Mask	27-5198	.30
	Mask Arm Assembly	31-1866	.35
	Mask Guide on Lamp Bracket Support	26-7844	.15
	Mask Washer	27-8318	Per C .50
	Dial Screen Assem	38-7912	.30
	Spring	28-8524	Per C .50
	Lens	27-8310	.02
	Volume Control Shaft	28-4499	.10
	Volume Control Shaft Spring	28-4117	Per C .40
	Retaining Clips	28-8610	.03
	Washer	28-4188	Per C .75
	Socket 8 prong	27-6958	.11
	Socket 7 prong	27-6057	.11
	Tube Shield	28-2726	.10
	Tube Shield Base	28-3898	.03
	I. F. Shield	38-7703	.20
	Terminal Panel I. F. Unit	38-7703	.55
	Washer I. F. Unit	28-4001	Per C .25
	Wiring Panel	38-5306	.03
	Wiring Panel Power Unit	38-5864	.02
	Grommet Mtg. Tuning Condenser	27-4325	.02
	Grommet R. F. Unit	27-4317	.02
	Sleeve Mtg. R. F. Unit	28-2257	.01
	Spacer Mtg. R. F. Unit	27-8339	Per C .40
	Screw Mtg. R. F. Unit	W-729	Per C .45
	Washer Mtg. R. F. Unit	28-3927	.01
	Insulator, Mtg. Elect. Cond	27-7194	.01
	Bracket Mtg. Elect. Cond	6449	.05
	Antenna Panel	38-7714	.15
	Speaker Cable	L-2181	.25
	A. C. Cord	L-2183	.40
	Speaker S7—B. Cabinet	36-1009	5.75
	Speaker HS—J. Cabinet	36-1220	6.25
	Knobs Tuning	27-4330	.10
	Knobs Tuning Vernier	27-4351	.10
	Knobs Wave Switch	27-4326	.10
	Knobs Tone & Volume	27-4332	.10
	Bezel Frame & Plate Assembly	40-5039	.75
	Gasket	27-8311	.01
	Glass	27-8298	.05
	Ring	28-3967	.35
	Screw Bezel Mtg.	W-1644	Per C .50
	Nut Mtg. Volume & Tone Control	W-684	Per C 1.25
	Chassis Mtg. Screw	W-1358A	Per C 2.80
	Chassis Mtg. Washer	28-2089	Per C .30

* 25-40 cycle operation.

Figures in black type indicate circled figures in Base View.

June, 1936

Prices Subject to Change Without Notice

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