Philco Radio & Television Corp.

	Model: 37-60	**Chassis:**	**Year:** Pre October 1937
	Power:	**Circuit:**	**IF:**
	Tubes:		
	Bands:		

Resources
Riders 7 (VII) PHILCO 7-19
Riders 7 (VII) PHILCO 7-20
Riders 7 (VII) PHILCO 7-21
Riders 7 (VII) PHILCO 7-22
Riders 8 (VIII) CHANGES 8-3

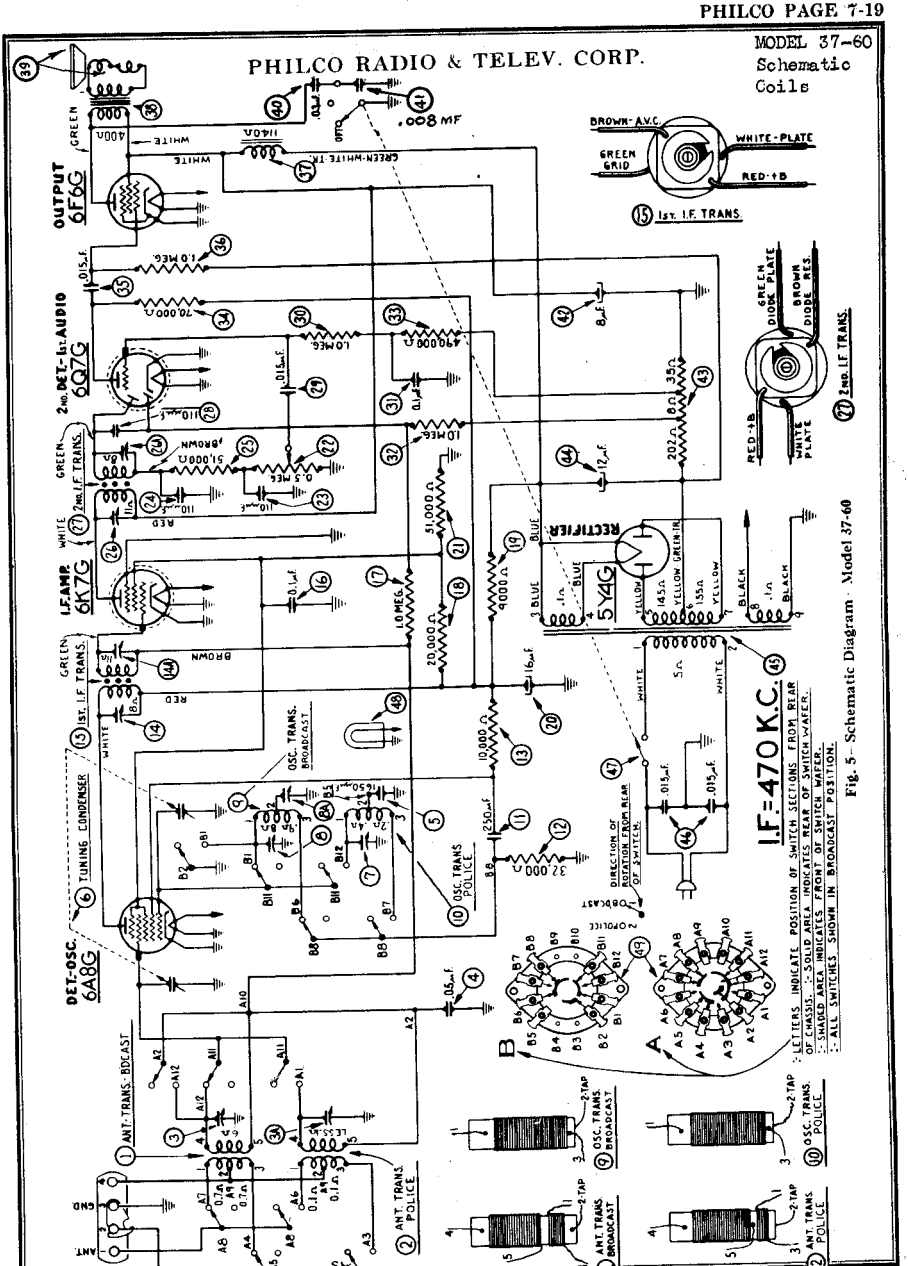

Fig. 5- Schematic Diagram - Model 37-60

MODEL 37-60
Voltage, Socket
Circuit Data,
Transformer Data

PHILCO RADIO & TELEV. CORP.

Model 37-60

General Description

Model 37-60 is a 5 tube superheterodyne receiver for operation on alternating current and has two tuning ranges, covering Standard Broadcast and American short-wave reception up to 7 megacycles. The new Philco High Efficiency self-centering glass tubes are used.

The circuit incorporates the Philco Aerial Tuning System—controlled by the range switch—which provides maximum sensitivity and noise reduction when used with the Philco All Wave Aerial.

The red and black leads of the All Wave 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 of the terminal panel across terminals 3 and 4.

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

CONSTRUCTION

The chassis is constructed in three basic assembly units.

The Radio Frequency unit contains a 6A8G tube which functions as a Detector-Oscillator, tuning condenser, antenna 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 the front) consists of the Intermediate Frequency coils compensating condensers, a 6K7G tube for 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. All high Voltage A. C. Wiring is housed in the power transformer assembly which includes the rectifier socket.

Although unit construction has changed the appearance of this model, the service bulletin will be of great assistance in checking through all stages of the receiver. The Wiring Diagram, as usual, 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 itself 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 compensators is shown. Figs. 3 and 4, are the location of the I. F. and R. F. compensators respectively.

This Receiver is supplied in two models, type B and type F. These instructions, however, are used for both types.

Electrical Specifications

Voltage Rating: 115 Volts. A. C.
Frequency Rating: 50-60 Cycle.
For 25-40 cycle operation use Power Transformer, marked with asterisks in Parts List.
Power Consumption: 60 Watts.
Type and Number of Philco Tubes: 1 type 6A8G First Detector-oscillator; 1 type 6K7G I. F. Amplifier; 1 type 6Q7G 2nd Detector, A. V. C., and 1st Audio; 1 type 6F6G Pentode Output and 1 type 5Y4G, Rectifier.
Speaker: S7.
Type of Circuit: Superheterodyne with Pentode Power Output.
Intermediate Frequency: 470 K. C.
Undistorted Power Output: 3 Watts.
Tuning Ranges: Two—(1): 530 to 1720 K.C., (2): 2.3 to 7.4 M.C.

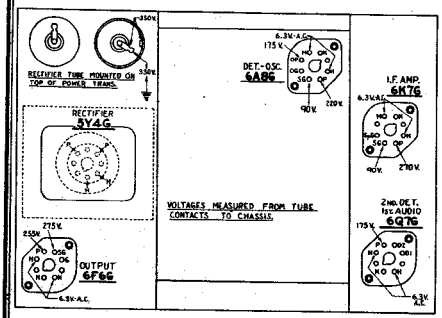

Fig. 1—Socket Voltages Viewed from Underside of Chassis
Measurements taken with Philco Model 025 Circuit Tester which contains a 1000 ohm per volt voltmeter. Line voltage, 115—Wave Switch in Broadcast Position. Dial turned to 600 KC.

POWER TRANSFORMER DATA

Lead No. Shown on Schematic	A. C. Volts	Current	Circuit	Color	Resistance
1-2	120	—	Primary	White	50 ohms
5-7	670	70 M. A.	High Voltage Sec.	Yellow	145 ohms 155 ohms
3-4	5.0	2.0 A	Fil. Rect.	Blue	.1 ohms
8-9	6.7	2.1 A	Fil.	Black	.1 ohms
6	—	—	Center Tap of 5-7	Yellow Green Tr	—

PHILCO RADIO & TELEV. CORP.

MODEL 37-60
Trimmers
Alignment

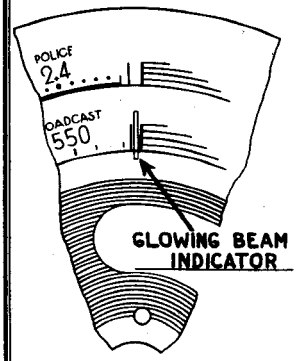

Fig. 2—Dial Calibration

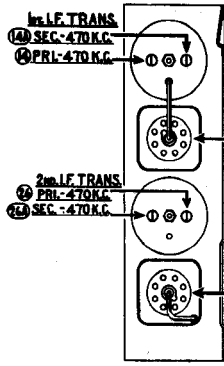

Fig. 3—Locations of I. F. Compensators Top of Chassis

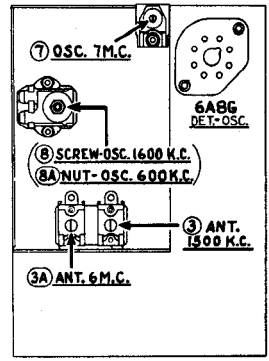

Fig. 4—Locations of R. F. Compensators Underside of Chassis

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, three in the Oscillator Circuit, and two 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 to adjust 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 very sensitive output meter and is recommended for these adjustments.

Philco Fibre Wrench No. 3164 and Fibre Handle Screw-driver No. 27-7059 complete 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 ADJUSTMENT—The Tuning condenser is set at the maximum capacity position, by turning the tuning knob counterclockwise. Loosen the set screw of dial hub and set dial, (see Fig. 2) with Glowing Indicator centered between the index lines at the low frequency end of scale.

OUTPUT METER—The Output Meter is attached to the Plate and Cathode terminals of the (6F6G tube) and adjusted to use the (0-30) volt scale. When adjusting each circuit, care should be taken to have the signal generator attenuator set to give approximately ¼ scale reading on output meter.

INTERMEDIATE FREQUENCY CIRCUIT

1 Turn wave band switch to Range 1. Rotate the tuning control to approximately 600 K. C. Connect the 088 Signal Generator output lead through a .1 mfd. condenser to the grid of the 6A8G tube, and the ground lead of Signal Generator to the chassis.

2 Set Signal Generator indicator for 470 K. C., adjust attenuator for approximately ¼ scale reading on output meter. Then adjust compensators (12)a 2nd I. F. Sec., (12) 2nd I. F. Pri., (14)a 1st I. F. Sec., (14) 1st I. F. Pri., for maximum reading on output meter.

RADIO FREQUENCY CIRCUIT—Range 2: 2.3 to 7.4 M. C.

1 Turn Range switch to Range 2. Remove signal generator output lead from the grid of 6A8G tube.

2 Attach signal generator output lead through a 0.1 mfd. condenser to the ANT. TERMINAL No. 1, on aerial panel, and the generator ground to chassis. Connect TERMINAL No. 2, to GROUND TERMINAL No. 3, with connector link provided on the panel.

3 Set Signal Generator and receiver dials for 7.0 M. C. Now adjust compensator (7) for maximum reading on output meter. Then turn Signal Generator and Receiver to 6.0 M. C., and adjust compensator (3)a for maximum output.

RANGE 1: 530 to 1720 K. C.

1 Turn range switch to Range 1. Turn the Receiver dial to 1600 K. C. Then adjust compensators (8) and (3) for maximum reading on output meter.

The 088 Signal Generator dial is set at 800 K. C. and the second harmonic of this frequency (1600 K. C.) is used in making the above adjustment.

2 The low frequency end of the band is now tuned by turning Signal Generator and Receiver dials to 600 K. C. and adjusting compensator (3)a—see note (a) below—for maximum output.

(a) When compensator (8)a osc. series is being adjusted, the Tuning Condenser must be rolled for maximum output. This is accomplished as follows: First tune compensator (3)a for maximum output. Then vary the Tuning Condenser for maximum output at 600 K. C. Now retune Compensator (8)a, and again vary the tuning condenser back and forth about 600 K. C., for maximum output. This operation of first tuning the Compensator, then the Tuning Condenser is continued until maximum output is obtained at the 600 K. C. frequency.

3 Set the Signal Generator and Receiver dials for 1600 K. C. and re-adjust Compensator (8) for maximum output. Then turn the dials to 1500 K. C. and re-adjust compensator (3) for maximum reading on output meter.

MODEL 37-60
Chassis
Parts

PHILCO RADIO & TELEV. CORP.

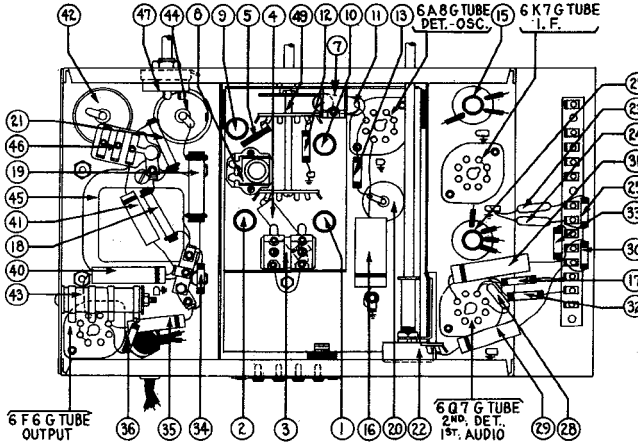

Fig. 6—Base View of Chassis

Replacement Parts—Model 37-60

Schem. No.	Description	Part No.	Price List
①	Antenna Transformer (Broadcast)	32-2108	$0.80
②	Antenna Transformer (Police)	32-2119	.65
③	Compensator ANT 1600 K.C.	31-6093	.40
③A	ANT. Compensator 6 meg.	Part of ③	
④	Condenser (.05 mfd. Tubular)	30-4444	.20
⑤	Condenser (1650 mfd. Semi-fixed)	31-6096	.40
⑥	Tuning Condenser	31-1826	3.00
⑦	Oscillator Compensator (Police 7 M.C.)	31-6101	.20
⑧	Oscillator Compensator (Broadcast) 1600 K.C. Screw	31-6100	.40
⑧A	Compensator (600 K.C. Nut)	Part of ⑧	
⑨	Oscillator Transformer (Broadcast)	32-2120	.65
⑩	Oscillator Transformer (Police)	32-2121	.40
⑪	Condenser (.250 mmfd. Mica)	30-1032	.25
⑫	Resistor (32000 ohms ½ watt)	33-332339	.20
⑬	Resistor (10000 ½ watt)	33-310339	.20
⑭	Compensator (Pri. 1st I.F.)	Part of ⑭	
⑭A	Compensator (Sec. 1st I.F.)	Part of ⑭	
⑭	1st I.F. Transformer	32-2100	1.50
⑮	Condenser (.1 mfd. Tubular)	30-4170	.25
⑯	Resistor (1 meg. ½ watt)	33-510344	.20
⑰	Resistor (20000 ohms 1 watt)	33-320439	.20
⑱	Resistor (9000 ohms 2 watts)	33-290539	.30
⑲	Electrolytic Condenser (16 mf.)	30-2118	1.65
⑳	Resistor (51000 ohms 1 watt)	33-351439	.20
㉑	Volume Control	33-5157	1.00
㉒	Condenser (mica 110 mmfd.)	30-1031	.20
㉓	Condenser (mica 110 mmfd.)	30-1031	.20
㉔	Resistor (51000 ohms ½ watt)	33-351339	.20
㉕	Compensator 2nd I.F. Pri.	Part of ㉖	
㉕A	Compensator 2nd I.F. Sec.	Part of ㉖	
㉖	2nd I.F. Transformer Unit	32-2102	1.50
㉗	Condenser (mica 110 mmfd.)	30-1031	.20
㉘	Condenser (Tubular .015 mfd.)	30-4558	.20
㉙	Resistor (1 meg. ½ watt)	33-510339	.20
㉚	Condenser (Tubular .1 mfd.)	30-4122	.20
㉛	Resistor (1 megohm ½ watt)	33-510339	.20
㉜	Resistor (490000 ohm ½ watt)	33-449339	.20
㉝	Resistor (70000 ohm ½ watt)	33-370339	.20
㉞	Condenser (Tubular .015 mfd.)	30-4226	.20
㉟	Resistor (1 meg. ½ watt)	33-510339	.20
㊱	Field Coil Assembly	36-3039	2.75
㊲	Output Transformer	32-7019	
㊳	Cone & Voice Coil Assembly	36-3157	.80
㊴	Condenser (Tubular .03 mfd.)	30-4380	.20
㊵	Condenser (Tubular .008 mfd.)	30-4112	.20
㊶	Electrolytic Condenser (8 mfd.)	30-2024	1.10
㊷	Bias Resistor	33-3277	.20
㊸	Electrolytic Condenser (12 mfd.)	30-2117	1.20
㊹	Power Transformer (50-60 cycle, 115 volts)	32-7583	4.25
	*Power Transformer (25-40 cycle, 115 volts)	32-7584	
㊺	Condenser (Bakelite Twin .015 mfd.)	3793 DG	.40
㊻	Tone Control & Power Switch	42-1180	$0.75
㊼	Pilot Lamp	34-2039	.15
㊽	Wave Switch	42-1195	1.50
	Dial	27-5190	.30
	Dial Hub	28-7182 FA-3	.10
	Dial Hub Clamp	28-2837 FA-3	.10
	Set Screw	N-1506	Per C 2.00
	Screen Bracket & Screen Assembly	31-1878	.25
	Pilot Lamp Socket Assembly	38-7706	.35
	Tube Socket 7 Prong	27-5057	.11
	Tube Socket 8 Prong	27-5058	.11
	Tube Shield	38-2726	.10
	Tube Shield Base	38-3906	.05
	I. F. Coil Shield	38-7763	.20
	R.F. Trans. Mtg. Plate	38-3908	.02
	R.F. Trans. Mtg. Spacer	27-3228	.01
	R.F. Trans. Mtg. Screw	W-1635	Per C .30
	R.F. Mtg. Grommet	27-4317	.04
	R.F. Mtg. Sleeve	38-2257 FA-3	.01
	R.F. Mtg. Bushing	27-3230	Per C .45
	Screw	W-729	
	Vernier Drive Assem.	31-1879	
	B.C. Resistor Mtg. Screw	W-512	Per C .90
	B.C. Resistor Mtg. Nut	W-317A	Per C .40
	Volume Control Shaft	28-6408	
	Volume Control Shaft Spring	28-4117	Per C .40
	Washer Volume Control Shaft	28-4186	
	Washer Volume Control Shaft	4436	Per C 1.50
	Volume Control Shaft Retaining Clip	28-8610	.02
	Volume Control Mtg. Nut	W-684 FA-3	Per C 1.25
	Tone Control Mtg. Nut	W-684 FA-3	Per C 1.25
	Inst la or	27-5320	Per C .40
	I.F. Terminal Panel	38-7703	.25
	I.F. Terminal Spacer	4122	.01
	Knob Tuning	27-4321	.10
	Knob Volume, Tone	27-4332	.10
	Knob Selector Switch	27-4332	.10
	Chassis Mtg. Screw		
	Tuning Condenser Grommet	27-4325	.02
	Screw	W-650 FA-3	Per C .40
	Baffle Assembly B Cabinet	40-5935	
	A.C. Cord	L-2183	.40
	Speaker Cable	L-2181	.25
	Clamp Electrolytic Condenser	6440	.05
	Insulator Electrolytic Condenser	27-7194	.01
	Grid Cap	38-3888	.01
	Spacer, (Compensating Condenser)	29-6032	.04
	Screw	W-1653 FA-3	Per C .30
	†B Speaker S-7	35-1009	5.75
	Nut Mtg. Speaker	W-124 A	Per C 1.35
	Baffle Assem. F Cabinet	40-5933	

*25 cycle Transformer 32-7584 used in Model 37-60A.
†Speaker used in F & B Cabinet.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Philco 37-600

To prevent reduction in sensitivity at the low-frequency end of the band, the 200-ohm resistor, No. 7, has been changed to 300 ohms, starting with Run No. 3. This change has been noted in the Parts List on *page 7-37 of Rider's Volume VII*, but it still shows as 200 ohms on the schematic, which will be found on the same page.

The lead connecting the suppressor grid to the cathode of the 6J7G i-f tube has been changed. It now runs from the suppressor grid to the junction of the sensitivity control, No. 23, and the secondary of the i-f transformer, No. 19.

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Philco 37-116

Up to Run No. 4, a condenser was connected between the heater contact and ground of the 6K7G r-f tube. This condenser was removed starting with Run No. 4 to prevent hum modulation on Range 5. It is not shown on the schematic appearing on *page 7-31, 7-32 of Rider's Volume VII.*

Electrolytic condensers, Nos. 126 and 127, 8 mf., have been changed to 4 mf. Part No. 30-2174, starting with Run. No. 5.

Starting with Run No. 6, the two 25,000-ohm resistors, Nos. 110 and 111, have been removed from the audio unit and relocated in the power unit near the 6B4G sockets.

To obtain the proper selectivity curve in the expanded position of the i-f expanding unit and to avoid regeneration, dress the plate lead (white) of the 6L7G tube as follows: The plate lead should lay across the 6L7G socket, then pass into the oscillator section close to the base; from here the wire must pass through the second aperture from the front of the r-f unit into the i-f unit.

To prevent clicks when tuning the bass compensation control on a very strong carrier, a 2-megohm resistor, Part No. 33-520339, was connected from the lug on which the 70,000-ohm resistor, No. 103, and the .008-mf. condenser, No. 104, are connected in the audio unit, to ground.

It will be noticed in the schematic on *page 7-31, 7-32 of Rider's Volume VII*, that two parts carry the same number: No. 135. One is the pilot light and this is the correct number for this part; the second is a switch, located on the schematic just below and to the left of the 6J5G AVC tube. The number of this switch should be 137. This number does not appear in the list of parts on *page 7-36*, but the switch is used on the automatic dial mechanism and appears in the parts list under "Code 122" as "Plunger Stop and Switch Assembly, Part No. 45-2330."

Another switch located betwen Nos. 100 and 103 on the schematic with the wording "used in code 122 only," is used to short the audio system when using the automatic dial. This switch is located on the vernier drive assembly. The part numbers of the removable sections which contain the riveted contacts, are 45-2350 and 28-4110.

The magnetic tuning transformer has been changed. Its old part number was 32-2217 and its new number is 32-2361.

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Philco 37-38

Starting with Run No. 4, the filament wiring of the 1D5G i-f. tube was reversed to improve the operation of the set. In Fig. 1 on *page 7-18 of Rider's Volume VII*, the "F+" of the 1D5G socket becomes "F—" and is grounded to the lug near the socket.

The 32,000-ohm resistor, No. 8 (see schematic on *page 7-17 of Rider's Volume VII*) has been replaced with one having a value of 51,000 ohms, Part No. 33-351339. The resistor is removed from the range switch assembly and is connected directly to the oscillator grid of the 1C7G tube and ground. This change was made to improve the sensitivity in the center of the broadcast band.

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Philco 37-60

Run No. 2. The 1000-mf. condenser, No. 11, was changed to 250 mmf., Part No. 30-1032, and resistor No. 12 was changed from Part No. 33-351339 to No. 33-332339. This change was made to prevent relaxation oscillation.

Run No. 5. Refer to the Base View of the chassis on *page 7-22 of Rider's Volume VII*. The condenser No. 46 has been moved from the location shown—near the front—to the rear of the power unit. The tubular condenser No. 40 has been replaced with Part No. 8318-SU Bakelite condenser and mounted in the location from which No. 46 was removed.

Run No. 6. The suppressor grid of the 6K7G, i-f tube, is removed from ground and connected to the —2.5 negative tap of the bias resistor, No. 43. See schematic on *page 7-19 of Rider's Volume VII.*

Beginning with Run No. 9, the i-f transformers were changed. The first i-f transformer No. 15 now is Part No. 32-2274 and the second, No. 27, is Part No. 32-2276. The first i-f transformer has a stabilizing winding which is placed in series with the suppressor grid of the 6K7G i-f tube. The short or yellow lead is connected to the ground lug and the long lead to the suppressor grid.

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Philco 37-61

The changes applying to Philco Model 37-60 also apply to Model 37-61 with the exception of the first paragraph. The schematic diagram appears on *page 7-23 in Rider's Volume VII.*

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Philco 90, 90A

Please make a note on *page 84 of Aligning Philco Receivers* that the i-f. peak of both chassis used in these models (with two 45s and one 47) is 175 kc. Note 1 on this page should read "175 kc. for both chassis." The correct i-f. peak is indicated on the schematics in Rider's Manuals.

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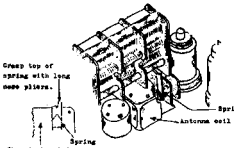
Wells-Gardner 6K Series

If noise (not motor or vibrator) is encountered in this model, it may be due to the fact that the antenna transformer shield can is not grounding satisfactorily. The noise brought about by this condition is a popping or scratching, and will be heard only when the chassis is bumped or shaken.



By inserting a spring as shown above in the Wells-Gardner 6K series chassis, a good ground is assured for the antenna transformer shield.

This condition can easily be remedied without removing the chassis from the case by inserting a phosphor-bronze spring between the antenna coil can and the chassis bracket. This spring is inserted with a pair of long-nose pliers and the position after insertion is shown in the illustration.

For other data, see *pages 7-20 and 7-21 in Rider's Volume VII.*

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