



FOR MEMBERS OF RADIO MANUFACTURERS SERVICE A PHILCO SERVICE PLAN

SERVICE BULLETIN
No. 268

Models 37-310 and 37-311—Code 121

Electrical Specifications

TYPE CIRCUIT: Superheterodyne, with Automatic (Dial) Tuning and Magnetic Tuning control on the broadcast range.

Both receivers use a push-pull pentode audio output circuit. The 37-311 receiver, however, uses a 6J5G, second detector and 6K5G 1st audio tube.

DIAL MECHANISM; Philco Automatic Dial Tuning System.

POWER SUPPLY;

Voltage	Frequency Cycles	Consumption	
		37-310	37-311
115	50 to 60	120 watts	125 watts
115	25 to 40	125 watts	130 watts

INTERMEDIATE FREQUENCY; 470 K. C.

UNDISTORTED OUTPUT: 37-310, 5 watts. 37-311, 7 watts

PHILCO TUBES USED; 37-310—Nine. Two 6K7G, one 6A8G, one 6N7G; one 6H6G; one 6Q7G; two 6F6G, and one 5Y4G.
37-311—Ten. Two 6K7G, one 6A8G, one 6N7G; one 6H6G; one 6K5G; one 6J5G; two 6F6G, and one 5Y4G.

TUNING RANGES:

- Range 1—530 to 1720 K.C.
- Range 2—2.3 to 7.4 M.C.
- Range 3—7.35 to 22 M.C.

TOPE CONTROL: 37-310—3 Positions, 37-311—4 Positions,

SPEAKER: H-30

Aerial Connections

To obtain the full advantage of the sensitivity of this receiver, the Philco High Efficiency Aerial must be used. The connections for the aerial are as follows:

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.

Dial Calibration

In order to adjust this receiver correctly the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

1. Loosen the shaft coupling set screws. Then turn the tuning condenser fully closed and the dial to the first index line. Now tighten the shaft coupling set screws, and rotate the dial until the 520 K.C. mark is midway between the index line and the glowing beam indicator.

2. With condenser in this position loosen the set screws of the shaft coupling on the tuning condenser..

3. Then turn the tuning dial until the glowing beam indicator is centered on the index line.

NOTE: Be careful when turning the dial that the position of the tuning condenser is not disturbed.

4. Now tighten the shaft coupling set screws.

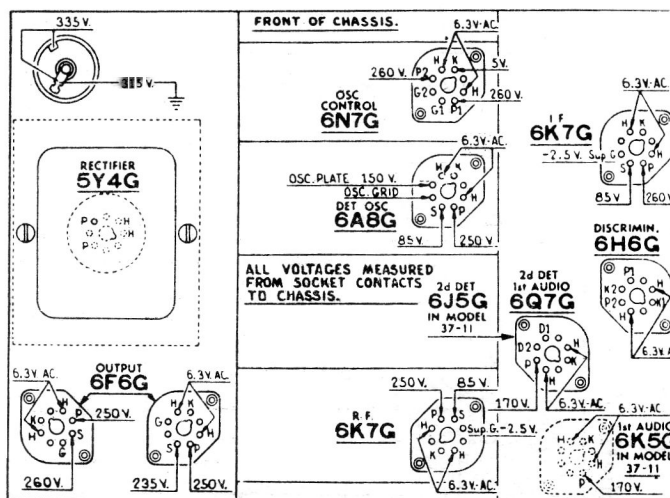


Fig. 1 Socket Voltages 37-310 and 37-311

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.

NOTE

Model 37-310 and 37-311 are similar in circuit design, with the exception that the 6Q7G tube, 2nd. Det. 1st Audio in the 37-310 is replaced with a 6J5G as a diode detector and a 6K5G tube for 1st audio stage in the Model 37-311. The schematic diagram Fig. 3 shows the complete circuit of the 37-311 receiver, also the 6Q7G, 2nd Det 1st Audio circuit of the 37-310. The parts of these two chassis are the same with the exception of condenser (81A) in the tone control circuit and the tone controls. In Model 37 310 the condenser is Part No. 3615-SU .05 mfd., and in the 37-311 it is Part No. 3615-YU .05 mfd., .03 mfd.

Resistor locations in both receiver power units are slightly different as will be noted in Figs. 5 and 7.

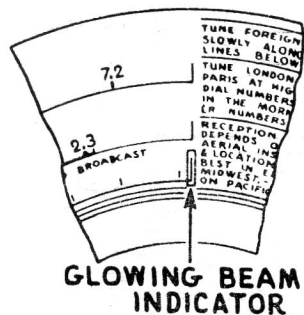


Fig. 2. Dial Calibration

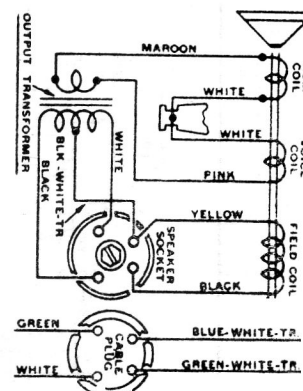


Fig. 3. Speaker

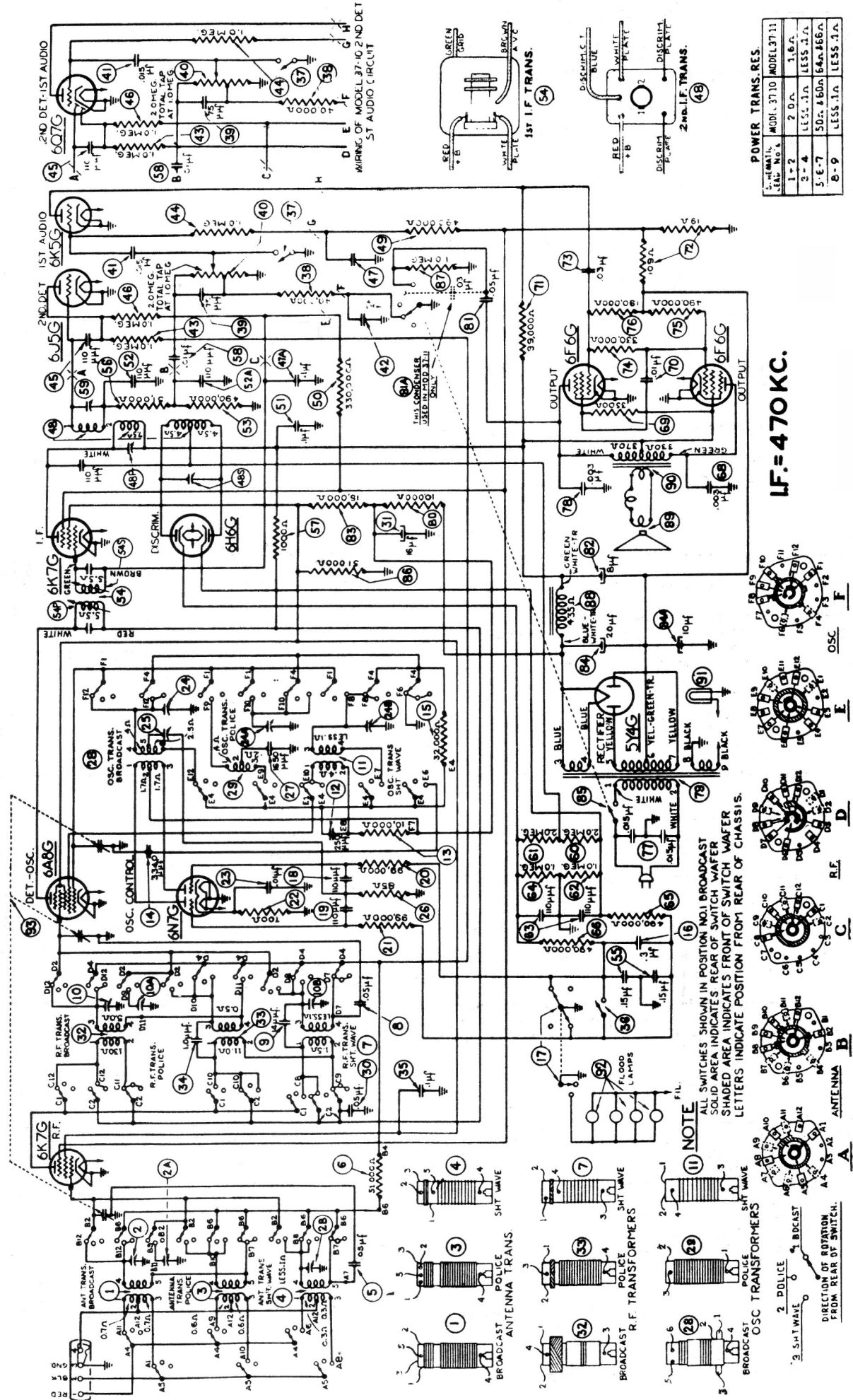
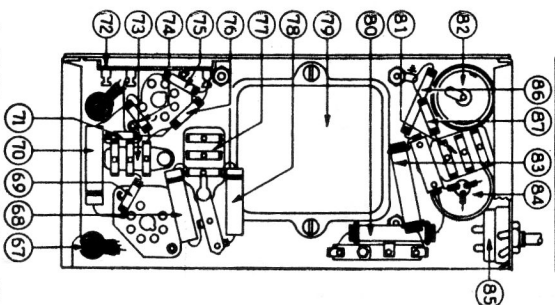
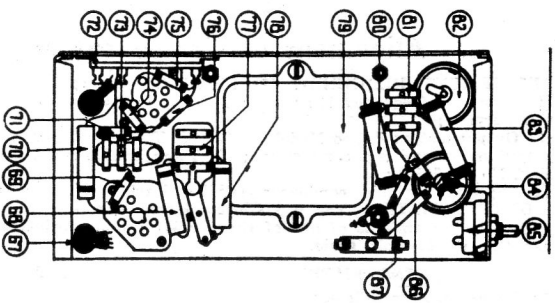


Fig. 4. Schematic Diagram
Models 37-310, 37-311

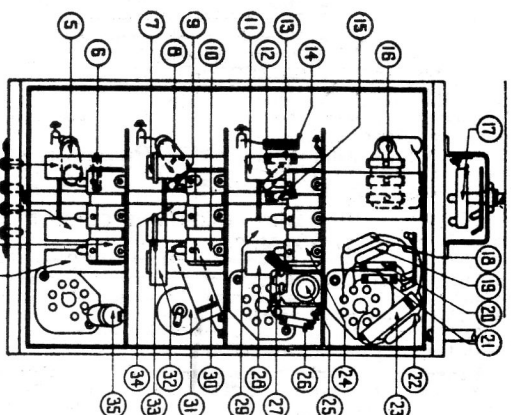
POWER UNIT 37-311



POWER UNIT 37-310



R.F. UNIT 37-310 & 37-311



I.F. UNIT 37-310 & 37-311

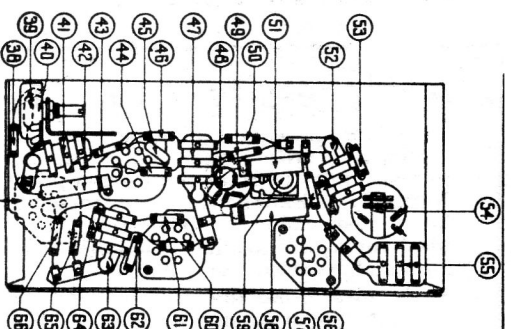


FIG. 5. 37-311 Power Unit Base View

FIG. 6. 37-310-311 R.F., I.F. Base View and 37-310 Power Unit Base View

Replacement Parts—Models 37-310-311

Schem.	No.	Description	Part No.	Schem.	No.	Description	Part No.	Schem.	No.	Description	Part No.	Schem.	No.	Description	Part No.
1	Antenna Transformer (Range 1)	32-2108	42	Condenser (.006 mfd. tubular)	30-4445	79	37-311 { Power Transformer (115 V, 50 to 60 cycles)	32-7640	Mask Guide	28-4148	37-310	37-310	Mask & Link Assembly	27-5272	
2	Compensator (Three section)	31-6092	43	Resistor (1.0 megohm, 1/2 watt)	33-510339	80	37-310 Resistor (10,000 ohms, 2 watt)	32-7642	Pilot Lamp Assembly (Auto Dial)	38-8706	37-310	37-310	Pilot Lamp Assembly (Auto Dial)	38-8706	
3	Antenna Transformer (Range 2)	32-2119	44	Resistor (1.0 megohm, 1/2 watt)	33-510339	81	Condenser (.05 mfd. bakelite)	3615-SU	Ring (Retaining Handle Hub)	28-8630	37-310	37-310	Ring (Retaining Handle Hub)	28-8630	
4	Antenna Transformer (Range 3)	32-2109	45	Condenser (.110 mfd. mica)	30-1081	82	Electrolytic Condenser (8 mfd.)	30-2024	Reflector Ring	28-7195	37-310	37-310	Reflector Ring	28-7195	
5	Condenser (.05 mfd. tubular)	30-4020	46	Resistor (1.0 megohm, 1/2 watt)	33-510339	83	Resistor (15,000 ohms, 3 watt)	33-815639	Range Switch Ant.	42-1200	37-310	37-310	Range Switch Ant.	42-1200	
6	Resistor (51,000 ohms, 1/2 watt)	33-351339	47	Condenser (.1 mfd. dual bakelite)	4989-DG	84	Electrolytic Condenser (10,20 mfd.)	30-2183	Range Switch R.F.	42-1245	37-310	37-310	Range Switch R.F.	42-1245	
7	R. F. Transformer (Range 3)	32-2126	48	2nd I. F. & Discriminator Trans.	32-2362	85	Base Comp. Control & A.C. switch (37-311)	42-1297	Range Switch Index Plate & Shaft	42-1265	37-310	37-310	Range Switch Index Plate & Shaft	42-1265	
8	Resistor (.05 mfd. tubular)	30-4020	49	Resistor (490,000 ohms, 1/2 watt)	33-433339	86	Base Comp. Control & A.C. switch (37-311)	42-1297	Set Screw	27-4057	37-310	37-310	Set Screw	27-4057	
9	Condenser (.14 mfd. mica)	30-1072	50	Resistor (330,000 ohms, 1/2 watt)	33-433339	87	Resistor (51,000 ohms, 1 watt)	33-561439	Socket (7 Prong)	27-6057	37-310	37-310	Socket (7 Prong)	27-6057	
10	Compensator (Three section)	31-6092	51	Condenser (.1 mfd. tubular)	30-4455	88	Speaker Field Assembly (H30)	33-433339	Socket (Rectifier)	27-6058	37-310	37-310	Socket (Rectifier)	27-6058	
11	Oscillator Transformer (Range 3)	32-2110	52	Cond. (.110 mfd. dual bakelite)	8085-DG	89	Cone Voice Coil (H30)	33-8687	Shield (Tube) (Square)	27-2726	37-310	37-310	Shield (Tube) (Square)	27-2726	
12	Condenser (.250 mfd. mica)	30-1032	53	Resistor (490,000 ohms, 1/2 watt)	33-433339	90	Output Transformer (H30)	33-8687	Shield (Tube) (Round)	27-2726	37-310	37-310	Shield (Tube) (Round)	27-2726	
13	Resistor (10,000 ohms, 1/2 watt)	33-310339	54	1st I.F. Transformer	32-2233	91	Pilot Lamp	33-8687	Shield (Tube) (Round)	27-2726	37-310	37-310	Shield (Tube) (Round)	27-2726	
14	Condenser (3340 mfd. semi-fixed)	31-6152	55	Cond. (.15 mfd. dual bakelite)	6287-DG	92	Floodlight Assembly	33-8687	Spring (Vol. Shaft)	27-8300	37-310	37-310	Spring (Vol. Shaft)	27-8300	
15	Resistor (32,000 ohms, 1/2 watt)	33-332339	56	Resistor (51,000 ohms, 1/2 watt)	33-332339	93	Tuning Condenser	33-8687	Retaining Clip (Vol. Shaft)	28-4117	37-310	37-310	Retaining Clip (Vol. Shaft)	28-4117	
16	Condenser (.15 mfd. dual)	42-1289	57	Resistor (1000 ohms, 1/2 watt)	33-210339	94	Antenna Terminal Panel	31-1948	Spring (Mask retaining ring)	28-5629	37-310	37-310	Spring (Mask retaining ring)	28-5629	
17	Magnetic Tuning Switch	42-1289	58	Cond. (.01 mfd. tubular)	30-4479	95	Automatic Dial Assembly	31-1948	Washer (Dial ring contact)	27-8398	37-310	37-310	Washer (Dial ring contact)	27-8398	
18	Condenser (.10 mfd. mica)	30-1031	59	Compensator	31-6147	96	Resistor (1 megohm, 1/2 watt)	33-561439	Washer (Dial scale)	27-8398	37-310	37-310	Washer (Dial scale)	27-8398	
19	Condenser (110 mfd. mica)	30-1031	60	Resistor (2 megohms, 1/2 watt)	33-561439	97	Resistor (1 megohm, 1/2 watt)	33-561439							
20	Resistor (99,000 ohms, 1/2 watt)	33-399339	61	Resistor (2 megohms, 1/2 watt)	33-561439	98	Speaker Field Assembly (H30)	33-8687							
21	Resistor (99,000 ohms, 1/2 watt)	33-399339	62	Resistor (1 megohm, 1/2 watt)	33-510339	99	Output Transformer (H30)	33-8687							
22	Resistor (700 ohms)	33-1220	63	Cond. (.110 mfd. dual bakelite)	8085-DG	100	Pilot Lamp	33-8687							
23	Condenser (.01 mfd. tubular)	30-4169	64	Resistor (490,000 ohms, 1/2 watt)	33-433339	101	Floodlight Assembly	33-8687							
24	Compensator (Three section)	31-6149	65	Resistor (490,000 ohms, 1/2 watt)	33-433339	102	Tuning Condenser	33-8687							
25	Compensator (Broadcast series)	31-6151	66	Resistor (490,000 ohms, 1/2 watt)	33-433339	103	Antenna Terminal Panel	31-1948							
26	Resistor (85 ohm, 1/2 watt)	33-085339	67	Speaker Cord	41-3359	104	Automatic Dial Assembly	31-1948							
27	Condenser (1650 mfd. semi-fixed)	31-6096	68	Condenser (.003 mfd. tubular)	30-4469	105	Bracket (Drive Mgr. Assembly)	31-1901							
28	Oscillator Transformer (Range 1)	32-2336	69	Resistor (3500 ohms, 1/2 watt)	33-255339	106	Cable & Plug (Pilot lamps)	41-8254							
29	Oscillator Transformer (Range 2)	32-2121	70	Condenser (.01 mfd. tubular)	30-4169	107	Cable & Plug (Speaker)	41-8254							
30	Electrolytic Condenser (16 mfd.)	32-2118	71	Resistor (99,000 ohms, 1/2 watt)	33-399339	108	Coupling Assembly (Tuning Shaft)	31-1961							
31	R. F. Transformer (Range 1)	32-2105	72	Resistor (Bias)	33-3280	109	Set Screws Assembly	W-650							
32	R. F. Transformer (Range 2)	32-2106	73	Condenser (.08 mfd. bakelite)	8318-SU	110	Control Screws (Station Index)	27-5271							
33	Condenser (Lug & Wire Twisted)	32-7278	74	Resistor (330,000 ohms, 1/2 watt)	33-433339	111	Dial Guide	31-1908							
34	Condenser (.1 mfd. tubular)	30-4455	75	Resistor (490,000 ohms, 1/2 watt)	33-433339	112	Dial Screen Holder	45-2347							
35	Magnetic Tuning Switch (Auto-matic Dial)	45-2330	76	Resistor (190,000 ohms, 1/2 watt)	33-419339	113	Dial Screen Holder	45-2347							
36	Washer Insulator for above switch	27-8361	77	Condenser (.015 mfd. dual bakelite)	3793-DG	114	Gear No. 1 Front (Dial Assembly)	45-2347							
37	Washer Insulator for above switch	27-8361	78	Condenser (.003 mfd. tubular)	30-4469	115	Gear No. 2 Rear (Dial Assembly)	45-2347							
38	Resistor (40,000 ohms, 1/2 watt)	33-340339				116	Handle (Dial)	45-2339							
39	Condenser (75 mfd. mica)	30-1053				117	Handle (Hub Assembly)	45-2344							
40	Volume Control	33-5158				118	Housing (Control Screw)	28-7196							
41	Condenser (.015 mfd. bakelite)	3793-SU				119									

LOCATION OF 6K5G USED IN 37-311

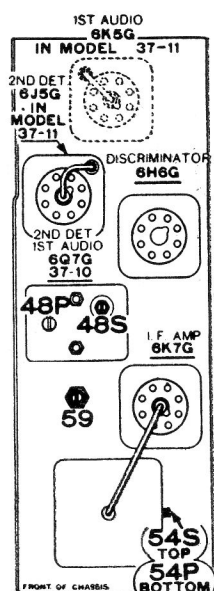


Fig. 7

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator; Philco Model 088 (fundamental frequency 110 to 20,000 K. C.) is the correct instrument for this purpose;

(2) Output meter; Philco Model 025 Circuit Tester incorporates a sensitive output meter and is recommended; (3) Fibre handle screw-driver (Philco Part No. 27-7059);

(4) Special variable condenser (Philco Part No. 45-2325).

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

INTERMEDIATE FREQUENCY CIRCUIT

1: Set controls as follows:

- Magnetic Tuning 'off'
- Bass compensation minimum
- Volume control maximum
- Receiver Dial 580 K. C
- Signal Generator 470 K. C

2. Adjust the I. F. compensators for maximum with signal generator output lead connected through a .1 mfd. condenser to the grid of the tubes as follows:

Input Point	Compensators in Order
6K7G—1st I. F.	(59) (48P)
6A8G—1st Det.	(54S) (54P)

RADIO FREQUENCY CIRCUIT

Tuning Range 7.35 to 22 M. C.

1. Connect the signal generator output lead through a .1 mfd. condenser to terminal 1, and the generator ground to terminal 3 on aerial input panel. Terminals 2 and 3 must be connected with the shorting link provided on the aerial panel.

2. Other controls set as given under intermediate frequency circuit with the exception of those as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
3	18 M. C.	18 M. C.	(24B) See Note A
3	18 M. C.	18 M. C.	(10B) (2B) Use Shunt Condenser on (24B) (Note B)
3	18 M. C.	18 M. C.	(24B) (Note A)

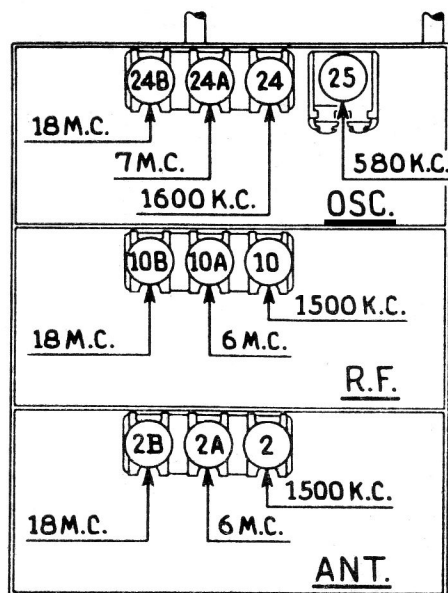


Fig. 8. R. F. Compensators, Underside of Chassis

Tuning Range 2.3 to 7.4 M.C.

Adjust compensators for maximum as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
2	7 M.C.	7 M.C.	(24A)
2	6 M.C.	6 M.C.	(10A) (2A)

Tuning Range 530 to 1720 K. C.

Adjust compensators for maximum as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
1	1600 K. C.	1600 K. C.	(24) (10) (2)
1	580 K. C.	580 K. C.	(25) Roll gang
1	1600 K. C.	1600 K. C.	(24)
1	1500 K. C.	1500 K. C.	(10) (2)

MAGNETIC TUNING ADJUSTMENT

Set the range switch in position one (530 to 1720 K. C.) and the magnetic tuning switch in the "out" position. Now turn the signal generator and receiver dial to any frequency in the Broadcast band. The receiver dial must be adjusted very accurately for maximum output.

Set the magnetic tuning control in the "on" position (clockwise). Compensator (48S) of the magnetic tuning transformer is now adjusted for maximum output.

The above adjustment is now checked for accuracy, by turning the magnetic tuning control "off" and "on". When this is done there should be no change in the tone of the received signal. If a change of tone or hiss develops, it indicates a shift in frequency and the adjustment must be made again.

NOTE "A"—To accurately adjust the compensator to the fundamental and not the image signal, turn the oscillator compensator to the maximum capacity position clockwise. Then slowly turn the compensators counter-clockwise until a second maximum peak is obtained on the output meter. The first peak is the image signal and the receiver must not be adjusted to it. If the above procedure is correctly performed, the image signal will be found 940 K. C. below the frequency being used.

NOTE "B"—To eliminate the effect of the R. F. compensator detuning the Osc. circuit, a variable tuning condenser, Philco Part No. 45-2325 is connected from the oscillator compensator to ground when designated in the padding instructions above. Tune the added condenser until the second harmonic of the receiver oscillator beats against the signal from the generator, resulting in a maximum indication on the output meter. Then adjust compensators as noted for maximum output.

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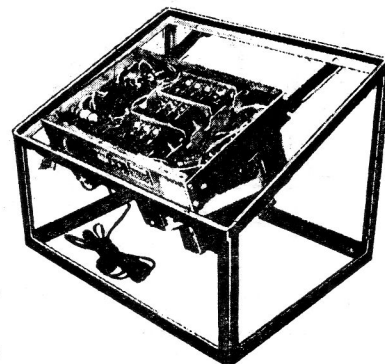
NEW
PHILCO CHASSIS-RACK
for
SHOP WORK
or DISPLAY USE

Dimensions overall:

Height 11 3/4" Depth 14" Length 17"

PART No. 45-2310

LIST PRICE \$8.00



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