PHILCO . . . . . Model 38-C3—Code 121

SERVICE BULLETIN No. 277 for members of RADIO MANUFACTURERS SERVICE

A PHILCO Service Plan

Electrical Specifications

TYPE CIRCUIT: Superheterodyne, with such features as: magnetic tuning control on the broadcast range; automatic volume control; Iron core adjusted first I. F. transformer; push-pull Pentode audio output, using screen phase inversion; Bass compensation in the Volume Control circuit, and the Philco Automatic Tuning Mechanism.

POWER SUPPLY:

Voltage	Frequency	Consumption
115	50 to 60 cycles	110 watts
115	25 to 40 cycles	110 watts

Different Transformers are required for operation on the frequencies listed above. These are shown on the parts list.

INTERMEDIATE FREQUENCY: 470 K. C.

UNDISTORTED OUTPUT: 5 watts.

TUBES USED: Nine. One 6U7G RF, one 6K7G I. F. amplifier; one 6A8G, Det. Osc.; one 6N7G, osc. control; one 6H6G, discriminator; one 6Q7G, 2nd det. 1st audio; two 6F6G output, and one 5Y4G rectifier.

TUNING RANGE: Three. Range one—530 to 1720 K. C. Range two—2.3 to 7.4 M. C. Range three—7.35 to 22 M. C.

TONE CONTROL: Four positions.

SPEAKER: H29.

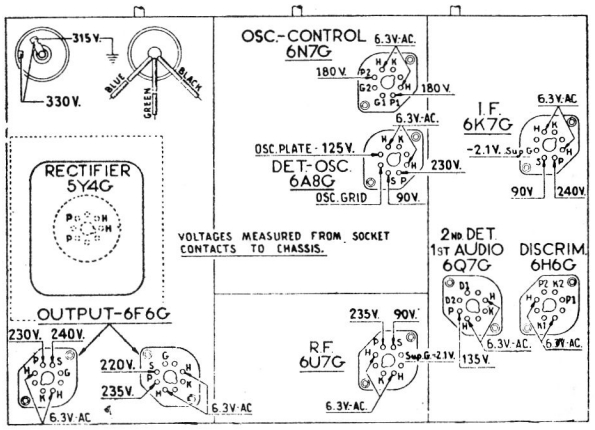


Fig. 1. Socket Voltages, Underside of Chassis—The voltages indicated by arrows were measured with a **Philco 025A Circuit Tester** which contains an accurate voltmeter. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator; Philco Model 088 signal generator, using fundamental frequency from 110 to 20,000 K. C. is the correct instrument for the purpose; (2) Output meter; Philco Model 025A circuit tester incorporates a sensitive output meter and is recommended; (3) Philco fibre handle screwdriver, part No. 27-7059, and fibre wrench part No. 3164.

OUTPUT METER: The 025A 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 and advance volume control of receiver until a readable indication is noted after signal generator is connected in the following adjustments.

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 entered 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.

INTERMEDIATE FREQUENCY CIRCUIT

With signal generator output lead connected through a .1 mfd. condenser to the grid of the 6A8G det-osc. tube; and controls set as follows, adjust I. F. compensators for maximum output.

a. Magnetic Tuning Knob (34) off
b. Tone Control (93) normal
c. Volume Control (68) maximum
d. Receiver dial 580 K. C.
e. Signal generator 470 K. C.
f. Range Switch position (Broadcast)
g. Compensators in order (53), (51A), (45A), (45B).

RADIO FREQUENCY CIRCUIT

Tuning Range 530 to 1720 K. C.

1. Connect the signal generator output lead through a .1 mfd. condenser to "RED" terminal of the aerial panel and the generator ground to the chassis of the receiver.
2. Other controls set as given under intermediate frequency circuit, with the exception of those as follows: Adjust compensators for maximum output as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
1	1600 K. C.	1600 K. C.	(27) (7B) (7A)
1	580 K. C.	580 K. C.	(28) Roll gang through signal when padding this compensator. (See Note B.)
1	1600 K. C.	1600 K. C.	(27)
1	1500 K. C.	1500 K. C.	(7B) (7A)

Tuning Range 2.3 to 7.4 M. C. Adjust compensators for maximum output as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
2	6 M. C.	6 M. C.	(27A)

Tuning Range 7.35 to 22 M. C. Adjust compensators for maximum output as follows:

Range Switch	Signal Generator	Receiver Dial	Compensators in Order
3	18 M. C.	18 M. C.	(27B) check image at 17.06 M. C. (See Note A.) (11) (4) Use shunt condenser on (27B) or rock gang through signal when padding compensator No. 11 (See Note C.)
3	18 M. C.	18 M. C.	(27B)

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 (51B) of the magnetic tuning transformer is now adjusted for maximum ouput.

The above adjustment is now checked for accuracy, by turning the magnetic tuning control "off" and "on." In either position, there should be no change in the tone of the signal. If a change of tone or hiss develops, it indicates a shift in frequency and the adjustment must be repeated.

NOTE A—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). Then slowly turn compensator counter-clockwise until a second maximum peak is obtained on the output meter. This second peak is the fundamental signal, and the compensator must be adjusted for maximum output with it. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting this compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) 940 K. C. below the frequency being used on any high frequency range.

NOTE B—First tune compensator (28) for maximum output, then vary the tuning condenser of the receiver for maximum output about the 580 K. C. dial mark. Now turn compensator (28) slightly to the right or left and vary the receiver tuning condenser for maximum output. If the output reading increases, turn compensator (28) 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.

NOTE C—To eliminate the effect of the R. F. compensator detuning the Osc. circuit, a variable tuning condenser of approximately 350 mmfd. is connected from the oscillator compensator to ground when designated in the padding instruction 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.

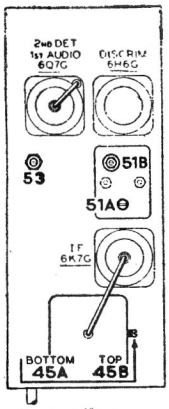


Fig. 2. I. F. Compensators Top of Chassis

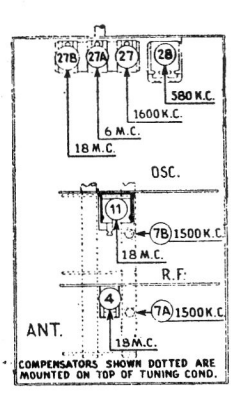
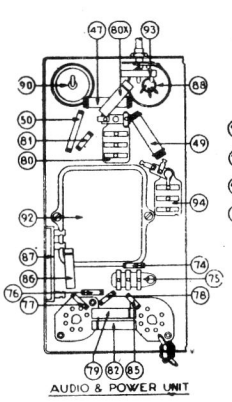
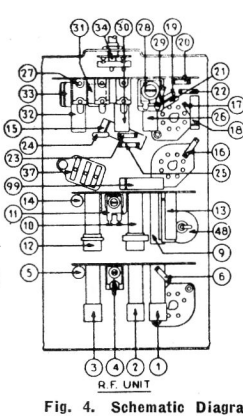


Fig. 3. R. F. Compensators Underside of Chassis





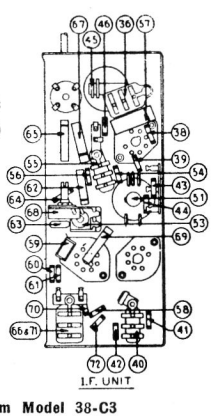


Fig. 4. Schematic Diagram Model 38-C3

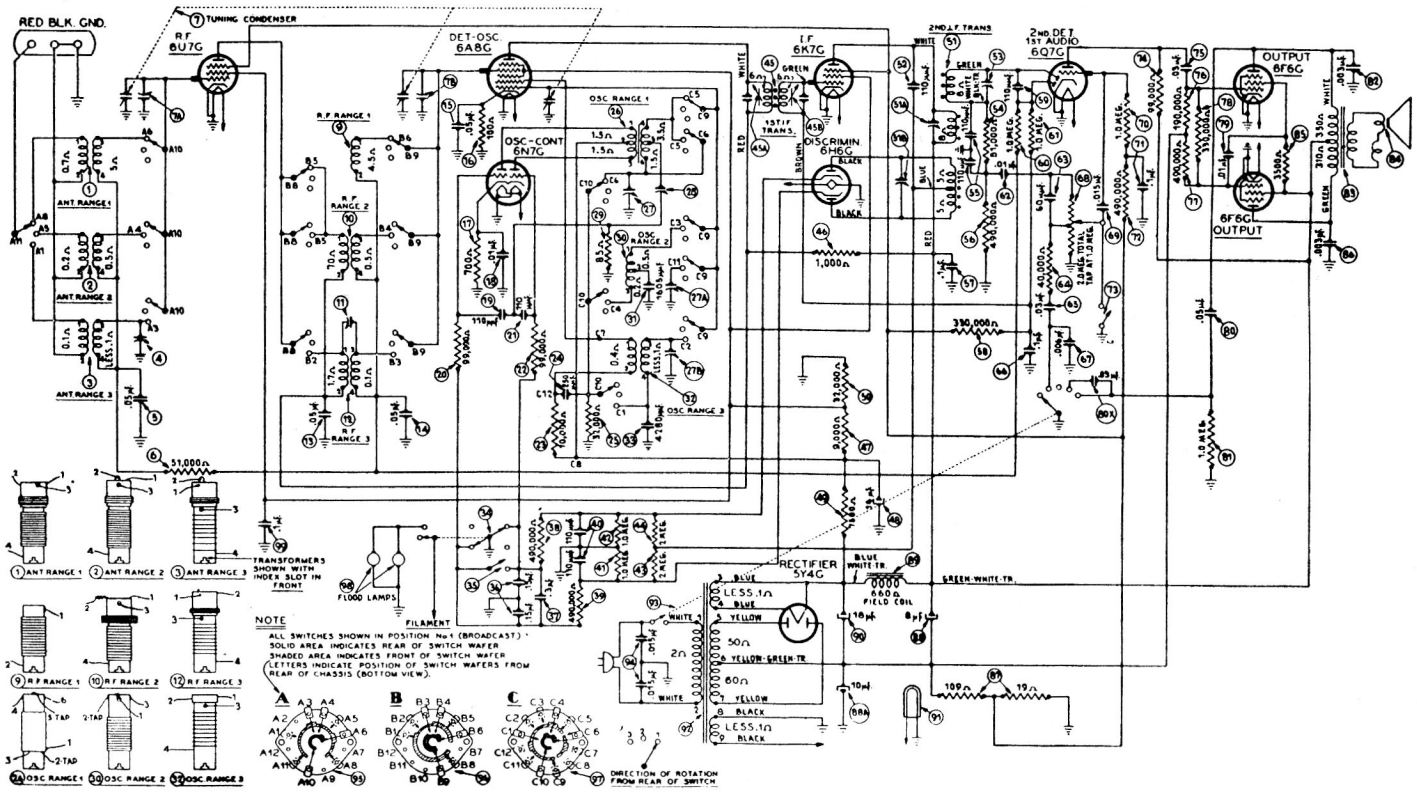


Fig. 5. Part Locations, Underside of Chassis

REPLACEMENT PARTS—Model 38-C3

Schem. No.	Description	Part No.
1	Antenna transformer (range 1)	32-2575
2	Antenna transformer (range 2)	32-2576
3	Antenna transformer (range 3)	32-2573
4	Compensator antenna, single	31-6161
5	Condenser (0.05 mf. tubular)	30-4444
6	Resistor (51,000 ohms, ½ watt)	33-351344
7	Tuning Condensor	31-1963
8	Removed prior to production	
9	R. F. transformer (range 1)	32-2379
10	R. F. transformer (range 2)	32-2382
11	Compensator (single) R. F.	31-6204
12	R. F. transformer (range 3)	32-2385
13	Condenser (0.05 mf. tubular)	30-4123
14	Condenser (0.05 mf. tubular)	30-4519
15	Condenser (0.05 mf. tubular)	30-4020
16	Resistor (100 ohms, ½ watt)	33-110344
17	Resistor (700 ohms, ½ watt)	33-170344
18	Condenser (0.01 mf. tubular)	30-4479
19	Condenser (110 mmf. mica)	30-1031
20	Resistor (99,000 ohms, ½ watt)	33-399344
21	Condenser (110 mmf. mica)	30-1031
22	Resistor (99,000 ohms, ½ watt)	33-399344
23	Resistor (10,000 ohms, ½ watt)	33-310344
24	Condenser (250 mmf. mica)	30-1032
25	Resistor (32,000 ohms, ½ watt)	33-332344
26	Osc. transformer (range 1)	32-2373
27	Compensator (osc. series)	31-6151
28	Compensator osc.	31-6170
29	Resistor (85 ohms, ½ watt)	33-085344
30	Osc. transformer (range 2)	32-2383
31	Condenser (1605 mmf. tracking)	31-6155
32	Osc. transformer (range 3)	32-2386
33	Condenser (4280 mmf. tracking)	31-6156
34	Switch (magnetic tuning, manual)	42-1269
35	Switch (magnetic tuning, automatic dial)	45-2330
36	Condensers (0.15 mf. dual bakelite)	6287 DG
37	Condenser (0.3 mf. double bakelite)	6287 DU
38	Resistor (490,000 ohms, ½ watt)	33-449344
39	Resistor (490,000 ohms, ½ watt)	33-449344
40	Condenser (110 mmf. dual bakelite)	8035 DG
41	Resistor (1.0 meg., ½ watt)	33-510344
42	Resistor (1.0 meg., ½ watt)	33-510344
43	Resistor (2.0 meg., ½ watt)	33-520344
44	Resistor (2.0 meg., ½ watt)	33-520344
45	1st I. F. transformer	32-2604
46	Resistor (1000 ohms, ½ watt)	33-210344
47	Resistor (9000 ohms, 2 watts)	33-290534
48	Condenser (16 mf. electrolytic)	30-2194
49	Resistor (7500 ohms, 3 watts)	33-275639
50	Resistor (32,000 ohms, 1 watt)	33-332434
51	2nd I. F. transformer (discriminator)	32-2376
52	Condenser (110 mmf. mica) mounted in 51	30-1031
53	Compensator	31-6147
54	Resistor (51,000 ohms, ½ watt)	33-351344
55	Condenser (110 mmf. dual bakelite)	8035 DG
56	Resistor (490,000 ohms, ½ watt)	33-449344
57	Condenser (0.1 mf. tubular)	30-4455
58	Resistor (330,000 ohms, ½ watt)	33-433344
59	Condenser (110 mmf. mica)	30-1031
60	Resistor (1.0 meg., ½ watt)	33-510344
61	Resistor (1.0 meg., ½ watt)	33-510344
62	Condenser (0.01 mf. tubular)	30-4479
63	Condenser (60 mf. mica)	30-1040
64	Resistor (40,000 ohms, ½ watt)	33-340344
65	Condenser (0.03 mf. tubular)	30-4449
66	Condenser (0.1 mf. dual bakelite)	4989 DG
67	Condenser (0.006 mf. tubular)	30-4445
68	Volume Control	33-5158
69	Condenser (0.015 mf. tubular)	30-4358
70	Resistor (1.0 meg., ½ watt)	33-510344
71	Part of 66	
72	Resistor (490,000 ohms, ½ watt)	33-449344
73	Audio shorting switch (stationary insulated section)	28-4110
	Audio shorting switch (movable section)	45-2350
74	Resistor (99,000 ohms, ½ watt)	33-399344
75	Condenser (0.03 mf. bakelite)	8318 SU
76	Resistor (190,000 ohms, ½ watt)	33-419344
77	Resistor (490,000 ohms, ½ watt)	33-449344
78	Resistor (330,000 ohms, ½ watt)	33-433344
79	Condenser (0.01 mf. tubular)	30-4469
80	Condenser (0.05 mf. bakelite)	8326 SU
80A	Condenser (0.03 mf. tubular)	30-4447
81	Resistor (1.0 meg., ½ watt)	33-510344
82	Condenser (0.003 mf. tubular)	30-4469
83	Output transformer	32-7754
84	Cone and voice coil assembly	36-3801
85	Resistor (3500 ohms, ½ watt)	33-235344
86	Condenser (0.003 mf. tubular)	30-4469
87	Resistor (bias 128 ohms)	33-3280
88	Condenser (electrolytic 8 mf., 10 mf.)	30-2201
89	Field Coil Assembly	36-3218
90	Condenser (electrolytic 18 mf.)	30-2200
91	Pilot Lamp	34-2039
92	Power transformer (115 volts, 50 to 60 cycles)	32-7606
	Power transformer (115 volts, 25 cycle)	32-7607
	Power transformer (110/220 volts, 50 to 60 cycles)	32-7608
93	Tone Control and A. C. Switch	42-1303
94	Condensers (0.015 mf. dual bakelite)	3793 DG
95	Range Switch (antenna)	42-1324
96	Range Switch (R. F.)	42-1314
97	Range Switch (osc.)	42-1284
98	Flood Lamps	34-2039
99	Condenser (0.1 mf. tubular)	30-4455

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Brace	28-4119
Cable A. C.	L-2839
Cable Speaker	41-3259
Coupling (Tuning Condenser)	31-1961
Coupling (Range Switch)	28-7198
Clip (volume shaft)	28-4394
Control Screw (station index)	31-1898
*Cover (handle)	28-5092
Dial	27-5283
*Dial and Station Tab Escutcheon	45-2472
Floodlight Socket Assembly	38-8802
Gear, Dial Assembly (small)	45-2348
Gear, Dial Assembly (large)	45-2347
Handle (Dial)	45-2329
Hub Assembly (Handle)	45-2344
Housing (Control Screws)	28-7196
Knob Tuning	27-4330
Knob Vernier	27-4331
Knob Tone and Volume	27-4332
Knob (Range Switch)	27-4326
Mask Guide	28-4118
Mask and Link Assembly	45-2401
Mtg. Feet-Rubber—(Chassis)	27-4564
Pilot Lamp Assembly	38-7706
Reflector Ring	28-4609
Ring Retaining Mask Assembly	28-7195
Screen Holder Assembly	31-2053
Shaft (Vol. Cont.)	38-8285
Shaft and Plate (Range Switch)	42-1287
Socket (7 prong)	27-6087
Socket (6 prong)	27-6086
Speaker H-29	36-1293
Vernier Drive Assembly	45-2342

*A complete list of the automatic tuning mechanism parts is given in Bulletin 273. Those parts shown above marked with an asterisk differ from those shown on Bulletin 273.

PHILCO PRODUCTS LIMITED

Toronto

July, 1937

Printed in Canada

MODEL 38-C3

SUPPLEMENTARY SERVICE BULLETIN
to Bulletin #277

Shown on this bulletin is a change which was made during the various production runs of this model.

Wiring panel was removed from oscillator stage and replaced by part #6287-DU condenser.

No change in wiring.

February, 1938.

PHILCO PRODUCTS LIMITED,
Service Department.