

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 list above. These are shown on the parts list.

INTERMEDIATE FREQUENCY: 470 K. C.

UNDISTORTED OUTPUT: 5 watts.

PHILCO TUBES USED: Nine. One 6U7GRF, one 6K7G I. F. amplifier; one 6A8G, Det. Osc.; one 6N7G, osc. control; one 6HG6, discriminator, one 6O7G, 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.

TO NE CONTROL: Four positions.

SPEAKER: H29.

Alignment of Compensators

EQUIPMENT REQUIRED: (1) Signal Generator; Philco Model 077 signal generator, using fundamental frequency from 115 to 36000 K. C. is the correct instrument for the purpose; (2) Output meter; Philco model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco fibre hand screw-driver, part No. 27-7059 and fibre wrench part No. 3164.

OUTPUT METER: The 026 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:

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

- 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.

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

RADIO FREQUENCY CIRCUIT

- 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.
- 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) |

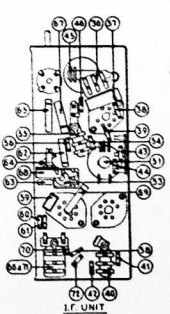
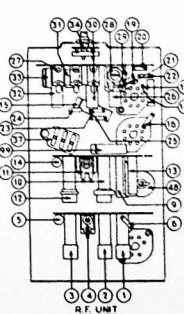
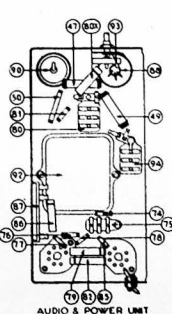
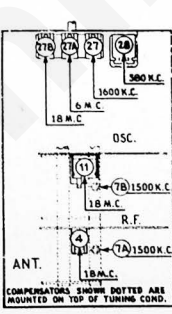
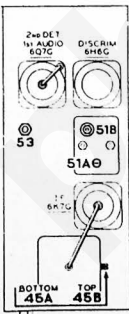


Fig. 2. I. F. Compensators Top of Chassis

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

Fig. 4. Schematic Diagram Model 38-3

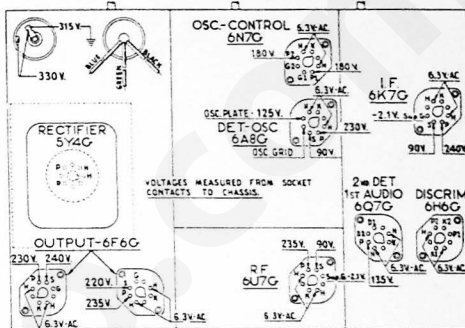


Fig. 1. Socket Voltages, Underside of Chassis—The voltages indicated by arrows were measured with a Philco 026 Circuit Tester which contains an accurate voltmeter. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

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 output.

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 compensator 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 mfd. 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.

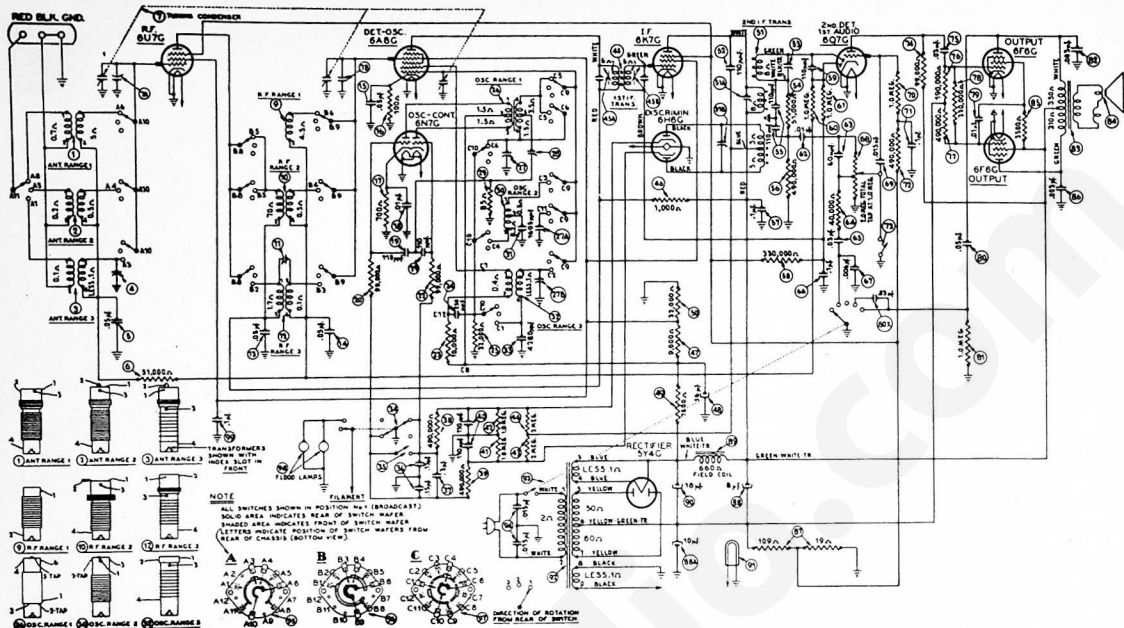


Fig. 5 Part Locations, Underside of Chassis

Replacement Parts—Model 38-3

| Schem. No. | Description | Part No. | List Price | Schem. No. | Description | Part No. | List Price | Schem. No. | Description | Part No. | List Price |
|------------|--|-----------|------------|------------|--|-----------|------------|--------------------------------|--|----------|------------|
| 1 | Antenna transformer (range 1) | 32-2875 | | 50 | Resistor (32,000 ohms, 1 watt) | 33-332439 | \$0.20 | 93 | Power transformer (110/220 volts, 50 to 60 cycles) | 32-7608 | \$8.00 |
| 2 | Antenna transformer (range 2) | 32-2876 | | 51 | 2nd I. F. transformer (discriminator) | 32-2376 | 3.30 | 94 | Condensers (0.015 mf. dual bakelite) | 3793 DG | 40 |
| 3 | Antenna transformer (range 3) | 32-2873 | | 52 | Condenser (110 mmf. mica) mounted in 51 | 30-1031 | 20 | 95 | Range Switch (antenna) | 42-1268 | 75 |
| 4 | Compensator antenna, single | 31-6161 | \$0.30 | 53 | Compensator | 31-6147 | 40 | 96 | Range Switch (R. F.) | 42-1314 | 75 |
| 5 | Condenser (0.05 mf. tubular) | 30-4444 | 20 | 54 | Resistor (51,000 ohms, 1/2 watt) | 33-351339 | 20 | 97 | Range Switch (osc.) | 42-1284 | 75 |
| 6 | Resistor (51,000 ohms, 1/2 watt) | 33-351339 | 4.00 | 55 | Resistor (110 mmf. dual bakelite) | 8035 DG | 25 | 98 | Flood Lamps | 34-2039 | 07 |
| 7 | Tuning Condenser | 31-1963 | 4.00 | 56 | Resistor (490,000 ohms, 1/2 watt) | 33-349339 | 20 | 99 | Condenser (0.1 mf. tubular) | 30-4455 | 25 |
| 8 | Remove prior to production | | | 57 | Condenser (0.1 mf. tubular) | 30-4455 | 25 | 38-3 Code 121 | | | |
| 9 | R. F. transformer (range 1) | 32-2379 | 4.00 | 58 | Resistor (330,000 ohms, 1/2 watt) | 33-333339 | 20 | | | | |
| 10 | R. F. transformer (range 2) | 32-2382 | 1.00 | 59 | Condenser (110 mmf. mica) | 30-1031 | 20 | Brace | 28-4119 | 05 | |
| 11 | Compensator (single) R. F. | 31-6160 | 30 | 60 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 20 | Cable A. C. | 1-2778 | | |
| 12 | R. F. Transformer (range 3) | 32-2385 | 1.20 | 61 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 20 | Cable Speaker | 41-3258 | 50 | |
| 13 | Condenser (0.05 mf. tubular) | 30-4123 | 20 | 62 | Condenser (0.01 mf. tubular) | 30-4479 | 20 | Coupling (Tuning Condenser) | 31-1961 | 80 | |
| 14 | Condenser (0.05 mf. tubular) | 30-4020 | 20 | 63 | Condenser (0.01 mf. tubular) | 30-4479 | 20 | Coupling (Range Switch) | 28-7198 | 15 | |
| 15 | Condenser (0.05 mf. tubular) | 30-4020 | 20 | 64 | Resistor (40,000 ohms, 1/2 watt) | 33-340339 | 20 | Clip (volume shaft) | 28-4394 | 01 | |
| 16 | Resistor (100 ohms, 1/2 watt) | 33-110339 | 20 | 65 | Condenser (0.02 mf. tubular) | 30-4449 | 20 | Control Switch (station index) | 31-1898 | 15 | |
| 17 | Resistor (700 ohms, 1/2 watt) | 33-170339 | 20 | 66 | Condenser (0.1 mf. dual bakelite) | 4989 DG | 40 | Control (handle) | 28-5092 | 90 | |
| 18 | Condenser (0.01 mf. tubular) | 30-4179 | 20 | 67 | Condenser (0.006 mf. tubular) | 30-4445 | 20 | Dial | 45-2472 | | |
| 19 | Condenser (110 mmf. mica) | 30-1031 | 20 | 68 | Volume Control | 33-5158 | 1.00 | Dial & Station Tab Escutcheon | 38-8802 | 60 | |
| 20 | Resistor (99,000 ohms, 1/2 watt) | 33-399339 | 20 | 69 | Condenser (0.015 mf. tubular) | 30-4358 | 20 | Floodlight Socket Assembly | 45-2348 | 60 | |
| 21 | Condenser (110 mmf. mica) | 30-1031 | 20 | 70 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 20 | Gear, Dial Assembly (small) | 45-2347 | 60 | |
| 22 | Resistor (99,000 ohms, 1/2 watt) | 33-399339 | 20 | 71 | Part of 69 | | | Gear, Dial Assembly (large) | 45-2349 | 60 | |
| 23 | Resistor (10,000 ohms, 1/2 watt) | 33-103339 | 20 | 72 | Resistor (490,000 ohms, 1/2 watt) | 33-449339 | 20 | Gear, Hub Assembly (large) | 45-2329 | 75 | |
| 24 | Condenser (250 mmf. mica) | 30-1032 | 25 | 73 | Audio shorting switch (stationary insulated section) | 28-4110 | 15 | Handle (Dial) | 45-2344 | 50 | |
| 25 | Resistor (32,000 ohms, 1/2 watt) | 33-27239 | 20 | 74 | Audio shorting switch (movable section) | 45-2350 | 15 | Hub Assembly (Handle) | 45-2344 | 50 | |
| 26 | Osc. transformer (range 1) | 32-2373 | 1.60 | 75 | Resistor (99,000 ohms, 1/2 watt) | 33-399339 | 20 | Housing (Control Screws) | 28-7196 | 2.00 | |
| 27 | Compensator (osc. series) | 31-6151 | 40 | 76 | Condenser (0.03 mf. bakelite) | 8318 SU | 35 | Knob Tuning | 27-4330 | 10 | |
| 28 | Compensator osc. | 31-6170 | 75 | 77 | Resistor (190,000 ohms, 1/2 watt) | 33-318339 | 20 | Knob Vernier | 27-4331 | 10 | |
| 29 | Resistor (85 ohms, 1/2 watt) | 33-085339 | 20 | 78 | Resistor (490,000 ohms, 1/2 watt) | 33-349339 | 20 | Knob Tone & Volume | 27-4332 | 10 | |
| 30 | Osc. transformer (range 2) | 32-2383 | 70 | 79 | Resistor (330,000 ohms, 1/2 watt) | 33-343339 | 20 | Mask Guide | 28-4118 | 25 | |
| 31 | Condenser (1605 mmf. tracking) | 31-6155 | 40 | 80 | Condenser (0.01 mf. tubular) | 30-4169 | 20 | Mask Tone | 27-4326 | 10 | |
| 32 | Osc. transformer (range 3) | 32-2386 | 70 | 80A | Condenser (0.05 mf. bakelite) | 8326 SU | 25 | Mask & Link Assembly | 45-2401 | 70 | |
| 33 | Condenser (428 mmf. tracking) | 31-6156 | 60 | 81 | Resistor (0.03 mf. tubular) | 30-4447 | 20 | Mtg. Feet-Rubber-(Chassis) | 27-4564 | 10 | |
| 34 | Switch (magnetic tuning, manual) | 42-1269 | 75 | 82 | Condenser (0.003 mf. tubular) | 30-4469 | 20 | Pilot Lamp Assembly | 38-7706 | 35 | |
| 35 | Switch (magnetic tuning, automatic dial) | 45-2330 | 1.20 | 83 | Output transformer | 32-7754 | 1.50 | Ring Retaining Mask Assembly | 28-7195 | 20 | |
| 36 | Condensers (0.15 mf. dual bakelite) | 6287 DU | 40 | 84 | Cone and voice coil assembly | 36-3801 | 1.40 | Screen Holder Assembly | 31-2053 | 35 | |
| 37 | Condenser (0.3 mf. double bakelite) | 6287 DU | 40 | 85 | Resistor (3500 ohms, 1/2 watt) | 33-235339 | 20 | Shaft (Vol. Cont.) | 38-8285 | 12 | |
| 38 | Resistor (490,000 ohms, 1/2 watt) | 33-449339 | 20 | 86 | Condenser (0.003 mf. tubular) | 30-4469 | 20 | Shaft & Plate (Range Switch) | 42-1287 | 50 | |
| 39 | Resistor (490,000 ohms, 1/2 watt) | 33-449339 | 20 | 87 | Resistor (bias 128 ohms) | 33-3280 | 30 | Socket (7 prong) | 27-6087 | 10 | |
| 40 | Condensers (110 mmf. dual bakelite) | 8035 DG | 25 | 88 | Condenser (electrolytic 8 mf., 10 m.f.) | 30-2201 | 1.75 | Socket (6 prong) | 27-6086 | 10 | |
| 41 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 20 | 89 | Field Coil Assembly | 36-3218 | 4.25 | Speaker H-29 | 30-1293 | | |
| 42 | Resistor (2.0 meg., 1/2 watt) | 33-520339 | 20 | 90 | Condenser (electrolytic 18 mf.) | 30-2200 | 1.40 | Vernier Drive Assembly | 45-2342 | 2.40 | |
| 43 | Resistor (2.0 meg., 1/2 watt) | 33-520339 | 20 | 91 | Pilot Lamp | 34-2039 | 07 | | | | |
| 44 | Resistor (2.0 meg., 1/2 watt) | 33-520339 | 20 | 92 | Power transformer (115 volts, 50 to 60 cycles) | 32-7605 | 6.25 | | | | |
| 45 | 1st I. F. transformer | 32-2604 | 1.60 | | Power transformer (115 volts, 25 cycle) | 32-7607 | 9.00 | | | | |
| 46 | Resistor (1000 ohms, 1/2 watt) | 33-210339 | 20 | | | | | | | | |
| 47 | Resistor (9000 ohms, 2 watts) | 33-290639 | 30 | | | | | | | | |
| 48 | Condenser (16 mf. electrolytic) | 30-2194 | 1.60 | | | | | | | | |
| 49 | Resistor (7500 ohms, 3 watts) | 33-275639 | 30 | | | | | | | | |

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 RADIO AND TELEVISION CORPORATION

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