

MODEL 40-780, Codes 121-251

SPECIFICATIONS

TYPE CIRCUIT: Model 40-780, Code 121, is an Eleven (11) Tube A. C. operated Superheterodyne receiver. The features of design included in this model are three (3) tuning ranges for reception of standard, police and short-wave broadcast stations; connections for attaching a high impedance electric phonograph pick-up; automatic volume control; continuously variable tone control; bass compensation and a degenerated push-pull audio output circuit.

POWER SUPPLY: 118 or 236 Volt, 50 to 60 Cycle A. C.
118 or 236 Volt, 25 to 40 Cycle A. C.

The receiver is adjusted for operation on either of the above operating voltages by inserting the plug as indicated on top of the power transformer.

TUNING RANGES:
530 to 1720 K. C. 2.3 to 7.4 M. C. 7.4 to 22 M. C.

I. F. FREQUENCY: 455 K. C.

PHILCO TUBES: 7C7E, R. F. Amplifier; 6J8EG, Detector Oscillator; 6K7EG, 1st I. F. Amplifier; 7C7, 2nd I. F. Amplifier; 7A6, 2nd Detector, A. V. C.; 6R7G, 1st Audio; two 6J5G, Phase Inverter; two 6V6EG, Audio Output; and 80, Rectifier.

AUDIO OUTPUT: 8 Watts.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370, or Farm Radio Aerial, Part No. 40-6383, should be used. In addition a good ground connection is required to the nearest water pipe or any other ground source that is available.

CABINET DIMENSIONS:
Height, 38". Width, 30". Depth, 15 3/4".

ALIGNING COMPENSATING CONDENSERS EQUIPMENT REQUIRED

Signal Generator: In order to properly adjust the various R. F. and I. F. padders of this receiver, a calibrated signal generator such as Philco Model 077 A. C. operated or Model 177 battery operated is required. These signal generators cover a frequency range of 540 to 36000 K. C.

Aligning Indicating Device: A Vacuum Tube Voltmeter or Audio Output Meter, such as Philco Models 027 and 028, is required. Procedures for connecting these instruments are listed below.

Aligning Tools: Fiber handle screwdriver, Philco Part No. 45-2610 and Aligning Wrench, Part No. 7696.

CONNECTING ALIGNING INSTRUMENTS

Signal Generator: The signal generator is connected to the receiver as indicated in the tabulations below under "output connections to receiver". A Dummy Antenna is also required. This is listed under column, "Dummy Antenna, Note A".

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the Det-Osc. tube grid (6J8EG). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the other end of the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of one of the 6V6EG tubes. Adjust the meter of the 0 to 30 volt A. C. scale.

After connecting the aligning meters, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in the schematic diagram. If the aligning meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

| Operations in Order | SIGNAL GENERATOR | | | RECEIVER | | | SPECIAL INSTRUCTIONS |
|---------------------|--------------------------------|----------------------|--------------|--------------|--|-------------------------|----------------------|
| | Output Connections to Receiver | Dummy Antenna Note A | Dial Setting | Dial Setting | Control Settings | Adjust Compensators | |
| 1 | 6J8G Grid and Ground | .1 mfd. | 455 K. C. | 580 K. C. | Vol. Max. Tone Treble | 38A, 37A, 37B, 36A, 36C | Note D |
| 2 | Antenna and Ground | 200 mmfd. | 1500 K. C. | 1500 K. C. | Vol. Max. Range Switch "Brdcat" | 27, 26B, 26A | Note B |
| 3 | Antenna and Ground | 200 mmfd. | 580 K. C. | 580 K. C. | Vol. Max. | 31 | Roll Gang |
| 4 | Antenna and Ground | 200 mmfd. | 1500 K. C. | 1500 K. C. | Vol. Max. | 27, 26B, 26A | |
| 5 | Antenna and Ground | 400 ohms | 6.0 M. C. | 6.0 M. C. | Vol. Max. Tone Treble Range Switch "S.W.1" | 27A | Roll Gang |
| 6 | Antenna and Ground | 400 ohms | 20 M. C. | 20 M. C. | Vol. Max. Tone Treble Range Switch "S.W.2" | 33, 18, 5 | Note C |

NOTE A—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

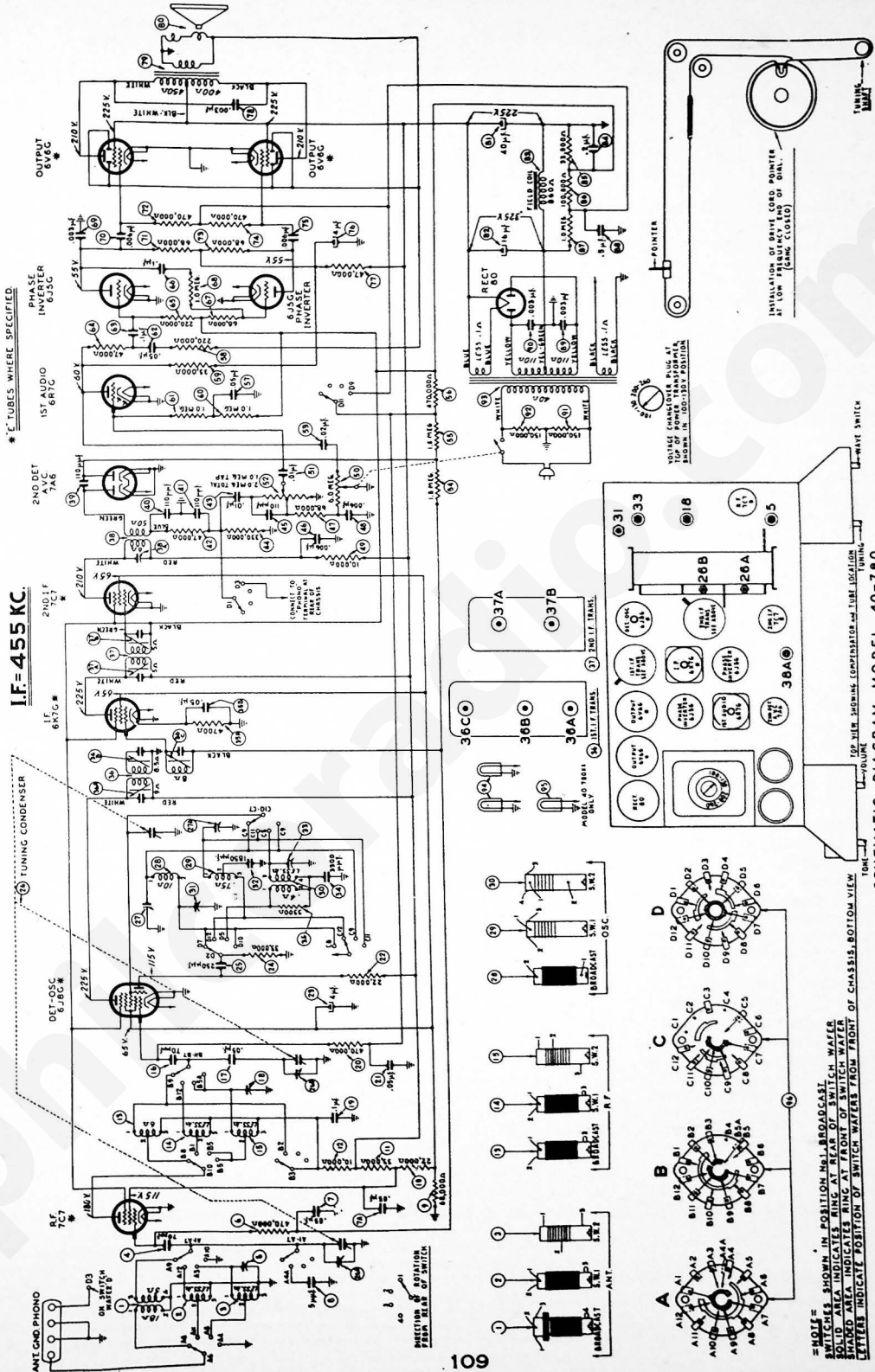
NOTE B—**DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C—When adjusting compensator (33) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 19,090 M. C.

NOTE D—Before adjusting padders 38A, 37A, 37B, 36A, 36C, turn padder 36B all the way out. After the padders are adjusted to maximum, then adjust padder 36B for maximum.

IF=455 KC.

* C-TUBES WHERE SPECIFIED



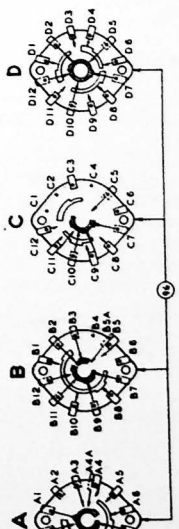
SCHEMATIC DIAGRAM MODEL 40-780

SCHEMATIC DIAGRAM AND COMPENSATOR LOCATIONS — MODEL 40-780

D. C. VOLTAGES INDICATED AT THE TUBE ELEMENTS IN THE ABOVE DIAGRAM WERE MEASURED WITH A 1000 OHMS PER VOLTMMETER. PHILCO MODEL 027

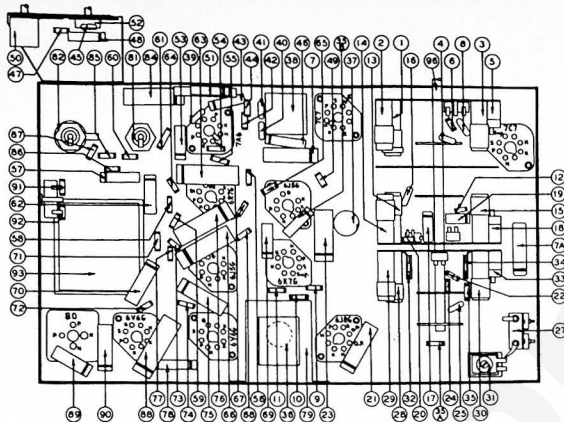
LINE VOLTAGE 115 VOLTS A. C. NO SIGNAL BEING RECEIVED — RANGE SWITCH BROADCAST.

SWITCHES SHOWN IN POSITION #1. BROADCAST
 SOLID AREA INDICATES WING AT FRONT OF SWITCH WATER
 SHADDED AREA INDICATES WING AT REAR OF SWITCH WATER
 LETTERS INDICATE POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS, BOTTOM VIEW



REPLACEMENT PARTS Model 40-780

| SCHE. No. | DESCRIPTION | PART No. |
|-----------|--|-----------|
| 1 | Antenna Trans. (Brdcst) | 32-2588 |
| 2 | Antenna Trans. (S.W.1) | 32-3191 |
| 3 | Antenna Trans. (S.W.2) | 32-3196 |
| 4 | Mica Cond. (70 mmfd.) | 30-1117 |
| 5 | Compensator | 31-6288 |
| 6 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 7 | Tubular Cond. (.05 mfd.) | 30-4609 |
| 7A | Tubular Cond. (.05 mfd.) | 30-4518 |
| 8 | Mica Cond. (5 mmfd.) | 30-1120 |
| 9 | Resistor (68,000 ohms, 1/2 watt) | 33-368339 |
| 10 | Resistor (22,000 ohms, 1/2 watt) | 33-322339 |
| 11 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 12 | Resistor (10,000 ohms, 1 watt) | 33-310439 |
| 13 | R. F. Trans. (Broadcast) | 32-3189 |
| 14 | R. F. Trans. (S.W.1) | 32-3190 |
| 15 | R. F. Trans. (S.W.2) | 32-3197 |
| 16 | Mica Cond (70 mmfd.) | 30-1117 |
| 17 | Tubular Cond. (.05 mfd.) | 30-4519 |
| 18 | Compensator | 31-6288 |
| 19 | Tubular Cond. (.1 mfd.) | 30-4611 |
| 20 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 |
| 21 | Tubular Cond. (.05 mfd.) | 30-4609 |
| 22 | Resistor (22,000 ohms, 1/2 watt) | 33-322339 |
| 23 | Electrolytic Condenser (4 mfd., 300 V.) | 30-2415 |
| 24 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 25 | Mica Cond. (250 mmfd.) | 30-1119 |
| 26 | Tuning Cond. Assy. | 31-2386 |
| 27 | Compensator (2 section) | 31-6287 |
| 28 | Oscillator Trans. (Brdct) | 32-3254 |
| 29 | Oscillator Trans. (S.W.1) | 32-3094 |
| 30 | Oscillator Trans. (S.W.2) | 32-3102 |
| 31 | Compensator | 31-6289 |
| 32 | Tracking Condenser (1850 mmfd.) | 31-6310 |
| 33 | Compensator | 31-6288 |
| 34 | Tracking Condenser (3300 mmfd.) | 31-6311 |
| 35 | Resistor (3300 ohms, 1/2 watt) | 33-233339 |
| 35A | Resistor (4700 ohms, 1/2 watt) | 33-247339 |
| 35B | Tubular Cond. (.05 mfd.) | 30-4519 |
| 36 | 1st I. F. Trans. Assy. | 32-3284 |
| 37 | 2nd I. F. Trans. Assy. | 32-3285 |
| 38 | 3rd I. F. Trans. Assy. | 32-3286 |
| 39 | Mica Cond. (110 mmfd.) | 30-1118 |
| 40 | Mica Cond. (110 mmfd.) | 30-1118 |
| 41 | Mica Cond. (110 mmfd.) | 30-1118 |
| 42 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 |
| 43 | Tubular Cond. (.01 mfd.) | 30-4581 |
| 44 | Resistor (330,000 ohms, 1/2 watt) | 33-433339 |
| 45 | Mica Cond. (110 mmfd.) | 30-1118 |
| 46 | Tubular Con. (.006 mfd.) | 30-4591 |
| 47 | Resistor (68,000 ohms, 1/2 watt) | 33-368339 |
| 48 | Tubular Con. (.006 mfd.) | 30-4583 |
| 49 | Resistor (10,000 ohms, 1/2 watt) | 33-310339 |
| 50 | Tone Control and On-Off Switch | 33-5335 |



| SCHE. No. | DESCRIPTION | PART No. | SCHE. No. | DESCRIPTION | PART No. |
|-----------|---|-----------|-----------|--|-----------|
| 51 | Tubular Cond. (.01 mfd.) | 30-4581 | 85 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 |
| 52 | Vol. Control (2.0 meg.) | 33-5334 | 86 | Resistor (100,000 ohms, 1/2 watt) | 33-410339 |
| 53 | Tubular Cond. (.02 mfd.) | 30-4516 | 87 | Resistor (1.0 meg., 1/2 watt) | 33-510339 |
| 54 | Resistor (1.5 meg., 1/2 watt) | 33-515339 | 88 | Tubular Cond. (.5 mfd.) | 30-4590 |
| 55 | Resistor (1.5 meg., 1/2 watt) | 33-515339 | 89 | Tubular Con. (.003 mfd.) | 30-4608 |
| 56 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 | 90 | Tubular Con. (.003 mfd.) | 30-4608 |
| 57 | Tubular Cond. (.05 mfd.) | 30-4519 | 91 | Resistor (150,000 ohms, 1/2 watt) | 33-415339 |
| 58 | Resistor (220,000 ohms, 1/2 watt) | 33-422339 | 92 | Resistor (150,000 ohms, 1/2 watt) | 33-415339 |
| 59 | Resistor (33,000 ohms, 1/2 watt) | 33-333339 | 93 | Power Trans. (100-130 V., 200-260 V., 50-60 cycles) | 32-8007 |
| 60 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 94 | Pilot Lamps (Dial) | 34-2064E |
| 61 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | 95 | Pilot Lamp (XX Cabinet only) | 34-2210E |
| 62 | Tubular Cond. (.05 mfd.) | 30-4518 | 96 | Wave Switch | 42-1525 |
| 63 | Tubular Cond. (.1 mfd.) | 30-4611 | | Bezel | 56-1222 |
| 64 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 | | Cable and Plug (Power Supply) | L-3238 |
| 65 | Resistor (220,000 ohms, 1/2 watt) | 33-422339 | | Spec. Export A.C. Plug | L-1367 |
| 66 | Tubular Cond. (.1 mfd.) | 30-4611 | | Cabinet (40-780T) | 10419A |
| 67 | Resistor (68,000 ohms, 1/2 watt) | 33-368339 | | Cabinet (40-780XX) | 10421A |
| 68 | Resistor (1.0 meg., 1/2 watt) | 33-510339 | | Dial | 27-5544 |
| 69 | Tubular Con. (.003 mfd.) | 30-4582 | | Drive Cord Assy. (Dial) | 31-2407 |
| 70 | Tubular Con. (.006 mfd.) | 30-4610 | | Felt Strip (Bezel Mtg.) | 27-8225 |
| 71 | Resistor (68,000 ohms, 1/2 watt) | 33-368339 | | Gasket (Dial Mtg.) | 27-9258 |
| 72 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 | | Knob (Tuning) | 27-4330 |
| 73 | Resistor (68,000 ohms, 1/2 watt) | 33-368339 | | Knob (Tuning) | 27-4862 |
| 74 | Resistor (470,000 ohms, 1/2 watt) | 33-447339 | | Knob (Volume and Wave Switch) | 27-4332 |
| 75 | Tubular Con. (.006 mfd.) | 30-4610 | | Knob (Tone Control) | 27-4872 |
| 76 | Electrolytic Condenser (4 mfd., 300 V.) | 30-2415 | | Pointer | 56-1276 |
| 77 | Resistor (47,000 ohms, 1/2 watt) | 33-347339 | | Socket (4 prong, type 80 tube) | 27-6044 |
| 78 | Tubular Con. (.003 mfd.) | 30-4582 | | Socket (6 prong, type 6J5G, 6K7G, 6R7G tubes) | 27-6086 |
| 79 | Output Transformer | 32-8058 | | Socket (8 prong, type 6J8G, 6V6G tubes) | 27-6058 |
| 80 | Cone and Voice Coil Assy. (Spr. Pt. No. 36-1459-2) | 36-4106 | | Socket (Loktal type) | 27-6131 |
| | (Spr. Pt. No. 36-1460-3) | 36-4105 | | Speaker (Model 40-780T) | 36-1459 |
| 81 | Electrolytic Condenser (40 mfd., 300 V.) | 30-2366 | | Spkr. (Model 40-780XX) | 36-1460 |
| 82 | Electrolytic Condenser (15 mfd., 400 V.) | 30-2364 | | Spring Clip (Coil Mtg.) | 28-5002 |
| 83 | Field Coil (Replace Spkr.) | | | Spring (Drive Cord) | 28-8913 |
| 84 | Tubular Cond. (.2 mfd.) | 30-4587 | | Station Card Holder | 56-1273 |
| | | | | Tube Shield | 28-2726 |
| | | | | Tube Shield Base | 28-2725 |
| | | | | Tuning Drum and Coupling Assy. | 31-2327 |
| | | | | Vernier Drive (Tuning) | 31-2406 |
| | | | | Washer ("C" type, Shaft Mtg.) | 28-2043 |