

## Philco Radio & Television Corp.

**Model:** 89

**Chassis:**

**Year:** Pre October 1934

**Power:**

**Circuit:**

**IF:**

**Tubes:**

**Bands:**

### Resources

[Riders Volume 5 - PHILCO 5-16](#)

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MODELS 19, 38, 89

Notes

PHILCO RADIO &amp; TELEV. CORP.

## Correcting Intermittent Operation

On some of the earlier models of the 89, 19 and 38, difficulty may occasionally be experienced with intermittent operation. This condition usually occurs during periods of humid weather, and is caused by stopping of the oscillator. In some cases, the radio may be completely dead and at other times this in-operative condition may exist over a portion of the dial only.

There are a number of possible causes for the difficulty and the necessary steps have been taken in later production to correct the condition. On a few of the earlier sets, however, it may be necessary to make one or more of the changes outlined below:

1. **OSCILLATOR TUBE:** In most cases, partial or complete failure of the oscillator circuit can be corrected by replacing the oscillator tube.
2. **BATTERY VOLTAGE:** In the Model 38, low voltage of the "A" or "B" battery may cause failure in oscillation.
3. **CATHODE RESISTOR:** In the Models 89 and 19, correct performance can usually be restored by changing the cathode resistor  $\textcircled{C}$  in the wiring diagrams of service bulletins 146 and 146A from 15,000 ohms to 10,000 ohms (Philco Part No. 4412). In the Model 38, the cathode resistor  $\textcircled{C}$  in the wiring diagram of service bulletin 106 is changed from 6,000 ohms to 4,000 ohms (Philco Part No. 33-1040).
4. **COMPENSATING CONDENSERS:** The first I. F. compensating condensers in Models 89 and 19  $\textcircled{C}$  in service bulletin 146,  $\textcircled{C}$  in service bulletin 146-A and  $\textcircled{C}$  in service bulletin 166 have been changed from Part No. 04000-M to Part No. 31-6016. The new condenser has a larger insulating surface between the plates of the condenser and the mounting holes. The possibility of moisture absorption is thus eliminated. It is necessary to re-drill a hole in the chassis so that the condenser can be mounted correctly with respect to the opening in the chassis for the compensating condenser wrench.
5. **BAKELITE WASHERS:** In order to prevent moisture absorption with resulting drifting in the compensating condenser adjustment, a bakelite washer and a metal washer are now being used on top of the compensating condenser, in place of the fibre washers previously used. The part number of the bakelite washer is 27-4109 and the metal washer (placed on top of the bakelite) is W-1331. These two replace the old fibre washer Part No. 3500.
6. **MICA INSULATION:** It was found on some sets that the mica which separates the leaves of the high frequency oscillator compensating condensers was extremely thin and would crack easily. Moisture absorption in the cracks was sufficient to stop oscillation. This condition was corrected by replacing the mica.
7. **WIRE INSULATION:** The wire which connects from the oscillator tuning condenser to the oscillator coil should be rubber-covered. Possible moisture absorption in the insulation of the cotton-covered wire may be sufficient to produce leakage to ground.
8. **OSCILLATOR COIL IMPREGNATION:** In some cases, it may be desirable to re-impregnate the oscillator coils in accordance with the present methods of production. The coil is dipped in hot paraffine for twenty seconds. The entire coil, including the terminals, is submerged; the only part which is out of the paraffine is a portion of the mounting lug, thus assuring a good ground connection. The coil and the paraffine both are allowed to cool until the paraffine becomes a considerably heavier consistency, at which time the coil is again dipped, thus allowing a fairly heavy covering over the entire coil. The coil is now entirely sealed and will not be affected by any moisture changes.
9. **TUNING CONDENSER:** A few tuning condensers of the 89 and 38 Models went out of the factory with a sanded surface on the bakelite between the stator and rotor plates. Moisture absorption at this point was sufficient to stop oscillation. Changing the tuning condenser to the type with smooth bakelite insulation will correct the trouble. In present production, these bakelite pieces are dipped in insulating varnish to seal all possible openings which might absorb moisture.
10. **OSCILLATOR SOCKETS:** In extreme cases it may be necessary to change the detector-oscillator tube socket. Moisture absorption occasionally takes place around the rough edges of the socket.

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MODEL 89,19  
Schematic  
Alignment  
Changes

Models 89 and 19

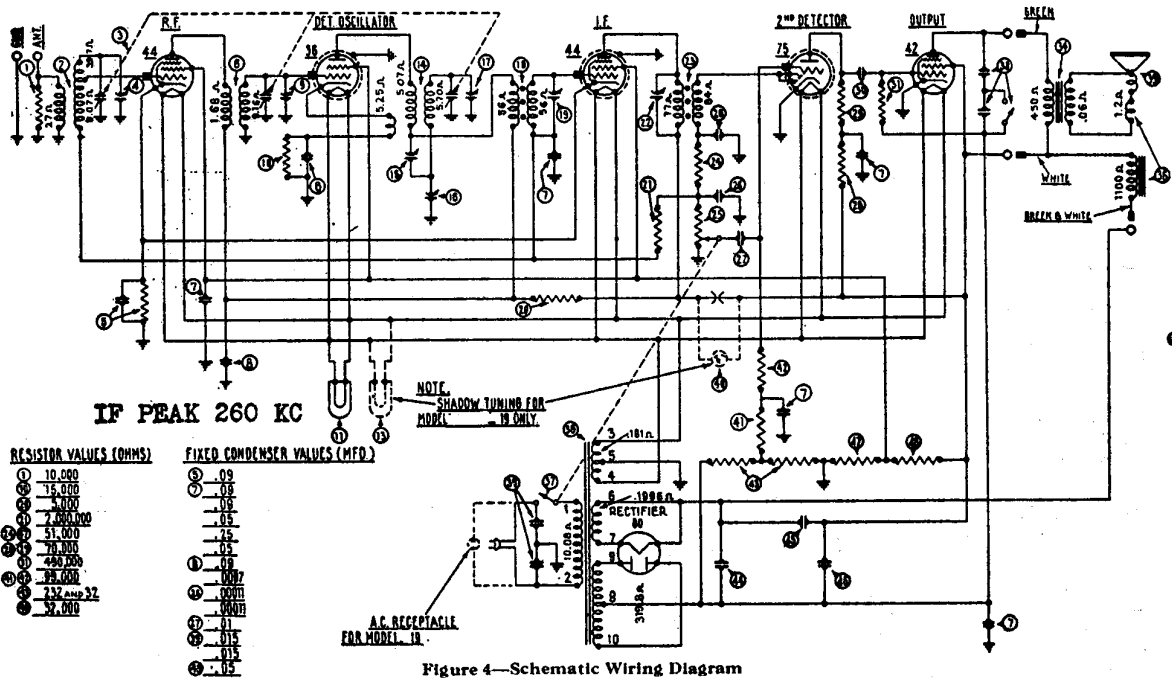


Figure 4—Schematic Wiring Diagram

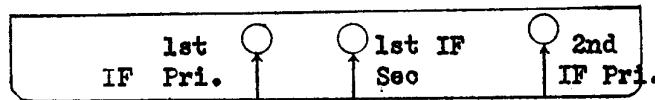


Fig. 3—Back of Model 89 and 19 Chassis, showing location of Compensating Condensers

In run number 5; the antenna coil ⓐ part number 06619 was changed to new coil part number 32-1062. The interstage coil ⓑ part number 06662 was changed to new coil part number 32-1063. The volume control and A. C. switch ⓓ part number 33-5004 was changed to new Volume Control (only) part number 33-5007. A combined "On-Off" and frequency change switch was added, part number 42-1002. The above changes permits the police and airplane broadcast reception.

In run number 2, Model 19-121; run number 3, Model 19-122; a (2900 ohms) resistor, part number 5309 was added. This resistor was connected between ⓐ condenser, lug No. 3 to lug No. 5 on the condenser mounted between ⓑ antenna transformer and the R. F. socket.

The following changes were made in 19-122 to make 19-123 under run No. 1:

The sub base part number 8136 was changed to new sub base part number 29-1051. The tuning condenser assembly part number 06702 was changed to new condenser assembly part number 31-1004. The dial scale 8111 was changed to new dial scale 7882. The A. C. Socket part number 5962 was removed. The bottom shield part number 8057 was removed. The two side brackets part numbers 8133 and 8134 were removed. Four new mounting feet part number 4222 were added. The two electrolytic condensers part number 8095 were changed to part numbers 8165 and 8166.

Below run number 4 on 89-121; run number 1 on 19-121; run number 2 on 19-122, the wiring on the compensating condenser ⓐ was reversed and the fibre nut, part number 7505 was changed to part number 3151 (brass nut); part number W-775 hole cover was added.

Notes for 25 cycle Model 89-A.

Use ⓐ power transformer part number 8047. Change ⓑ electrolytic condenser (6 mfd.) part number 8165 to new condenser (8 mfd.) part number 7558. Change ⓓ electrolytic condenser (6 mfd.) part number 8166 to new condenser (8 mfd.) part number 7558.

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MODEL 89,19  
Chassis  
Socket  
Voltage

Models 89 and 19

The Philco Radio of the 89 and 19 Series is a 6 tube super-heterodyne, employing the high efficiency 6.3 volt filament tubes, automatic volume control and pentode output. The intermediate frequency used in adjusting the super-heterodyne circuit is 260 kilocycles. The power consumption of the models 89 and 19 is 60 watts.

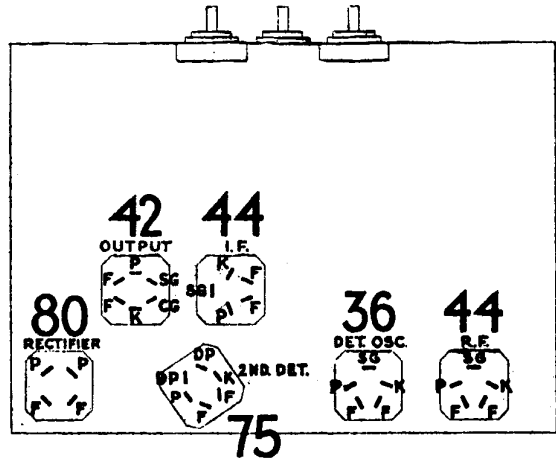
Table 1—Tube Socket Data\*—A. C. Line Voltage 115 Volts

Circuit	RF	Det. Osc.	1F	2nd Det.	Out-put	Rectifier
Type Tube	44	36	44	75	42	80
Filament Volts—F to F.	6.3	6.3	6.3	6.3	6.3	5.0
Plate Volts—P to K.	235	230	240	175	235	350/Plate
Screen Grid Volts—SG to K.	90	90	90		245	
Control Grid Volts—CG to K.	3	7.5	3	3	15	
Cathode Volts—K to F.	3.5	7.8	3.5		14	
Diode Plate Volts—K to DP.				2		

\*All of the readings above in Table 1 were taken from the under side of chassis, using test prods and leads with a suitable A. C. voltmeter for filament voltage and a high resistance, multi-range D. C. voltmeter for all other readings. Volume control at maximum and switch and station selector set for 550 KC. Readings taken with a radio set tester and plug-in adapter will not be satisfactory.

Table 2—Power Transformer Data

Terminal	A. C. Volts	Circuit	Color
1-2	106-125	Primary	White
3-4	6.3	Filaments	Black
6-7	5.0	Filament of 80	Blue
9-10	670	Plates of 80	Yellow
6	....	Center Tap of 3-4	Black-Yellow Tracer
8	....	Center Tap of 9-10	Yellow-Green Tracer



F Filament      SG Screen Grid      K Cathode  
P Plate          CG Control Grid      DP Diode Plate

Figure 1—Tube Socket, Under Side of Chassis

Caution: Never connect the chassis to the power supply unless the speaker is connected and all tubes are in place.

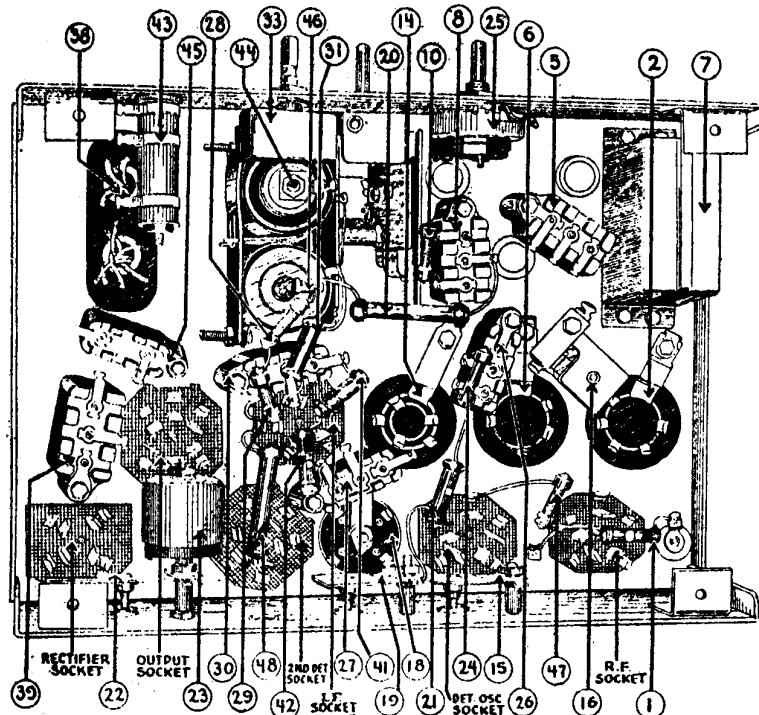


Figure 2—Bottom View of Chassis, Showing Parts

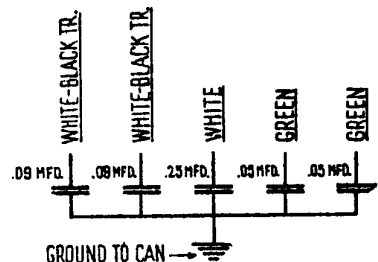


Figure 3—Internal Connections Filter Condenser.

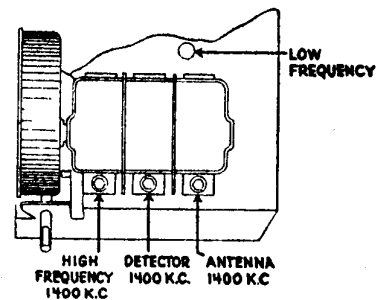


Figure 4—Top View of Chassis showing Tuning Capacitors, Models 89 and 19, also additional Compensating Capacitors

**MODELS 60, 89, 144**  
Changes

**PHILCO RADIO & TELEV. CORP.**

**Model 60**

Effective August 1st, resistors ⑩ and ⑪ in wiring diagram of Model 60, Bulletin No. 164 will be changed from Part No. 4518 (½ watt) to Part No. 6098 (⅓ watt). These changes are made to facilitate wiring in assembly.

Starting with Run No. 7, the following changes will be made. Note that a Wave Trap is added, necessitating several changes; other changes are to improve sensitivity.

Part No. (Fig. 3)	Remove	Add	Location
		38-6073 Wave Trap	In series with antenna post
③	4989-Z Condenser		
④	7217 Resistor	33-8010 (Bias Resistor, 300 Ohms, flex.)	Refer to Schematic Diagram
		33-8016 (Bias Resistor, 400 Ohms)	From 78 Cathode to Ground
		30-4020 (Condenser .05 Mfd. Tubular)	From 78 Cathode to Ground
⑫	3656 (25,000 Ohms)	33-1027 (39,000 Ohms)	Refer to Schematic Diagram
⑬	4412		
⑭	4518 (5,000 Ohms) ½ Watt	6099 (99,000 Ohms) ⅓ Watt	Refer to Schematic Diagram
⑮	4517	6097	Refer to Schematic Diagram
⑯	04000M	04000J	Refer to Schematic Diagram
⑰	30-4063 (.05-.09-.09-.5-2) (.2 section not used)	30-4217 (.05-.09-.09-.5)	(Filter block)

**Model 89**

Effective with Run No. 13 compensating condenser ⑩ on diagram (1st I. F. primary) will be a Part No. 31-6024 instead of 04000M previously used.

The new condenser is of an improved construction which eliminates possibility of "frequency drift" or breakdown.

Starting with Run No. 14, Model 89 will use a type 77 tube as detector-oscillator instead of the type 36 tube previously used. This change results in more stable performance of the oscillator.

In addition to requiring the use of a six-hole socket for the detector oscillator tube instead of the 5-hole previously used, the following changes are required:

Part ⑩, No. 6208 resistor (15,000 ohms) is replaced by No. 33-1114 (8,000 ohms).

Part ④, No. 8174-B condenser (.09 and .0007 Mfd.) is replaced by No. 8322-B (.09 and .0014).

**Model 144**

Effective with Run No. 6, electrolytic condenser ⑩ (see Bulletin No. 193) will be changed from part No. 30-2020 to 30-2026. Same capacity (6 mfd.), higher working voltage.

Starting with Run No. 7, Part ⑰ filter choke in Model 144 will be a 32-7018 instead of No. 5930 which has been used. This change is to adjust factory material lists and does not affect value of choke or performance of set.

The part number of the Shadowmeter to be used on the Model 144 will be 45-1106 instead of 6497 as listed on Bulletin 193. Change to identify in production.

On Fig. 3 (Schematic) fixed condenser ⑳ used in the bass compensation circuit, should be marked .02 Mfd. (Part No. 30-4113). The list of parts on Page 3 of Service Bulletin 193 gives this part number and value, which is correct.