



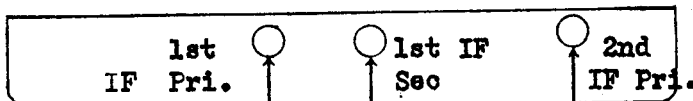
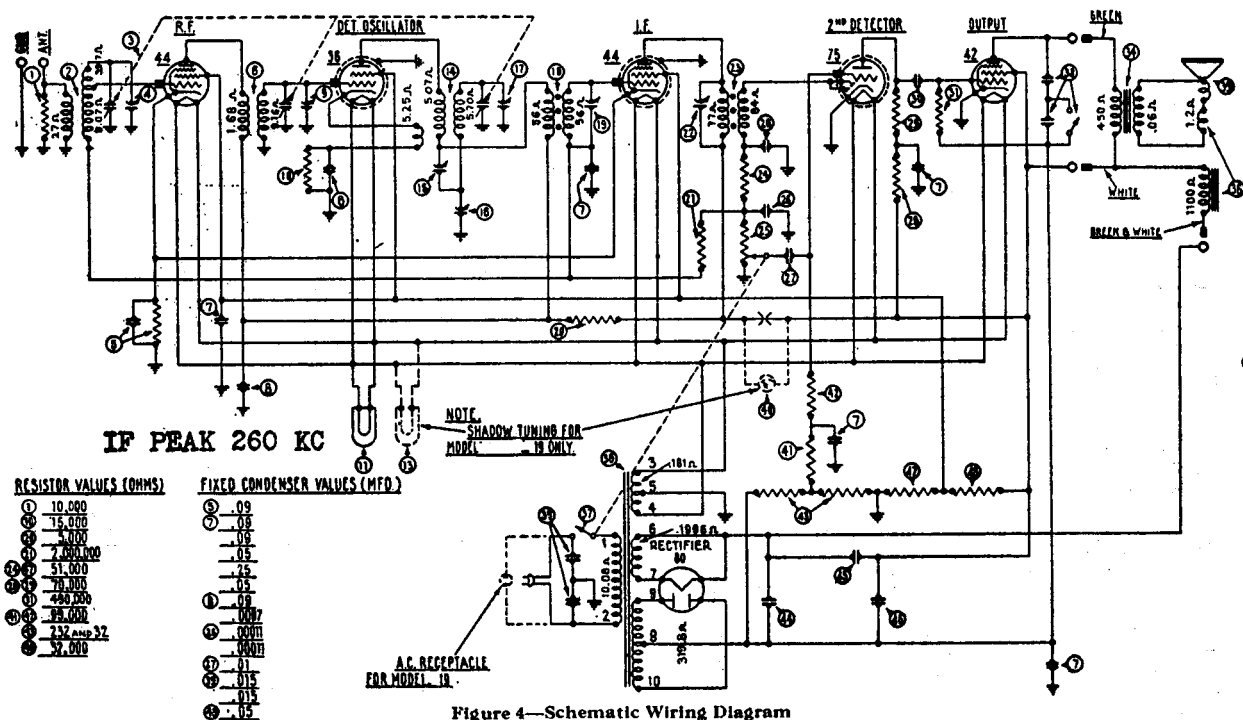
Philco Radio & Television Corp.

	Model: 19	Chassis:	Year: Pre October 1934
	Power:	Circuit:	IF:
	Tubes:		
	Bands:		
Resources			
Riders 3 (III) PHILCO 3-33			
Riders 3 (III) PHILCO 3-34			
Riders 4 (IV) PHILCO 4-18			
Riders 4 (IV) PHILCO 4-19			
Riders 4 (IV) PHILCO 4-20			
Riders 4 (IV) PHILCO 4-43			
Riders 5 (V) PHILCO 5-16			

PHILCO RADIO & TELEVISION CORP.

MODEL 89,19
Schematic
Alignment
Changes

Models 89 and 19



In run number 5; the antenna coil ③ part number 06619 was changed to new coil part number 32-1062. The interstage coil ④ part number 06662 was changed to new coil part number 32-1063. The volume control and A. C. switch ⑤ 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 ③ condenser, lug No. 3 to lug No. 5 on the condenser mounted between ② 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 ⑨ 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 ⑩ power transformer part number 8047. Change ⑪ electrolytic condenser (6 mfd.) part number 8165 to new condenser (8 mfd.) part number 7558. Change ⑫ electrolytic condenser (6 mfd.) part number 8166 to new condenser (8 mfd.) part number 7558.

PHILCO RADIO & TELEVISION CORP.

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.

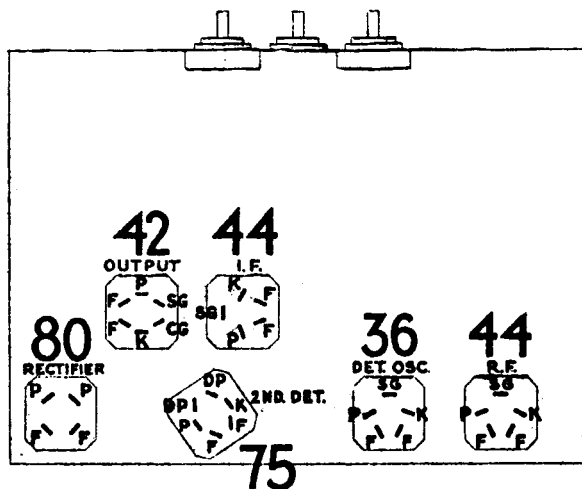
Table 1—Tube Socket Data*—A. C. Line
Voltage 115 Volts

Circuit	RF	Det. Osc.	IF	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	245	
Control Grid Volts—CG to K	.3	7.5	.3	.3	.15	
Cathode Volts—K to F	3.5	7.8	3.5		11	
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 voltages 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	105-125	Primary	White
3-4	6.3	Filaments	Black
5-7	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.

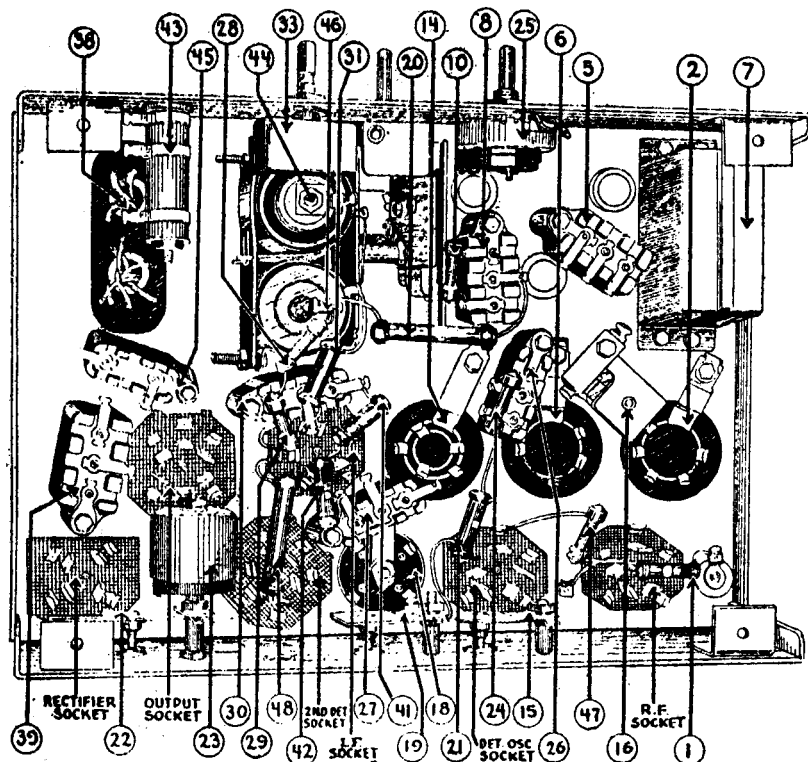


Figure 2—Bottom View of Chassis, Showing Parts

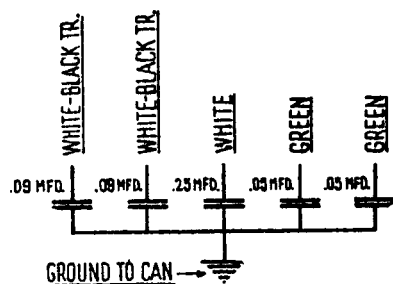


Figure 3—Internal Connections Filter Condenser.

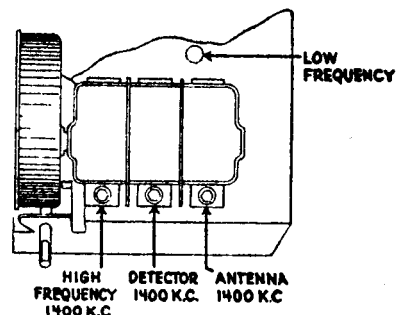


Fig. 4—Top View of Chassis showing Tuning Condensers, Models 89 and 19, also additional Compensating Condensers

MODEL 19 - 128Socket layout
Voltage, Data

PHILCO RADIO & TELEVISION CORP.

Model 19 (code 128)

PHILCO RADIO MODEL 19 is a superheterodyne designed for operation upon alternating current. It uses the high-efficiency, multiple-function 6.3 volt tubes which give the performance of a set using several more than the six tubes the Model 19 actually employs. Model 19 has Automatic Volume Control, Shadow Tuning, Four-point Bass-Compensating Tone Control, and Pentode Output. The Receiver covers a frequency range from 550 to 3260 kilocycles,—which includes all standard broadcast stations, police stations, airport and aircraft, and amateur stations. The tubes, and their uses in the several circuits, are: R. F. Stage, Philco Type 44; First Detector and Oscillator, Type 36; Intermediate Frequency Stage, Type 44; Second Detector, Type 75; Output Stage, Type 42; and Rectifier, Type 80. The intermediate frequency used in adjusting the superheterodyne circuit is 260 kilocycles. The power consumption of Model 19 (Code 128) is 70 watts. The receiver has an undistorted output of 5 watts.

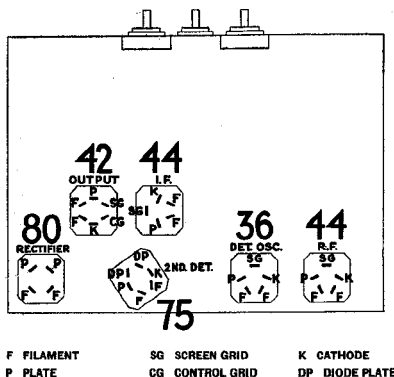
Table 1—Tube Socket Data*
A. C. Line Voltage, 115

Circuit	RF	Det. Osc.	IF	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	215	215	215	175	235	350/Plate
Screen Grid Volts—SG to K	95	90	95	245	245	245
Control Grid Volts—CG to K	.3	0.0	.3	2.2	2.2	2.2
Cathode Volts—K to F	4.4	9.5	4.4	2	2	2
Diode Plate Volts—K to DP						

*The filament voltage values in Table 1 were obtained with an A.C. voltmeter; all the other values were obtained with a high-resistance, multi-range D.C. voltmeter. The readings were taken from the underside of the chassis—with test leads and leads. The PHILCO MODEL 048 ALL-PURPOSE SET TESTER is especially useful in taking these readings, and is highly recommended for this and many other tests of Model 19. When the above values were obtained, the Station Selector was set at the low frequency (550 K.C.) end of the scale; the Volume Control was at maximum (all the way to the right).

Readings will NOT be reliable if taken with a plug-in adaptor.

CAUTION: DO NOT CONNECT THE CHASSIS TO THE POWER SUPPLY UNLESS THE SPEAKER IS CONNECTED TO THE CHASSIS AND ALL THE TUBES ARE IN PLACE.

**Fig. 1—Tube Socket Locations, from Underside of Chassis.****Table 2—Power Transformer Data**

Terminal	A.C. Volts	Circuit	Color
1-2	120	Primary	White
3-4	0.5	Filaments	Black
6-7	5.0	Filament of 80	Blue
9-10	746	Plates of 80	Yellow
5	...	Center Tap of 3-4	Black-Yellow Tracer
8	...	Center Tap of 9-10	Yellow-Green Tracer

PHILCO MODEL 048 ALL-PURPOSE SET TESTER IS HIGHLY RECOMMENDED FOR ALL TESTS OF MODEL 19.

Table 3—Resistor Data

Numbers on Figures 2 and 3	Resistance (Ohms)	Power Rating (Watts)	COLOR		
			Body	Tip	Dot
1	10,000	1/4	Brown	Black	Orange
7*	300	1/4	Violet	Black	Brown
10	15,000	1/4	Brown	Green	Orange
19	2 meg.	1/4	Red	Black	Green
23	50,000	1/4	Green	Brown	Orange
27	70,000	1/4	Violet	Black	Orange
28	70,000	1/4	Violet	Black	Orange
30	250,000	1/4	Red	Yellow	Yellow
36	2,900	1/4	Red	White	Red
39	10,000	1/4	Brown	Black	Orange
43	1 meg.	1/4	Brown	Black	Green
45	100,000	1/4	White	White	Orange
46	2,000	1	Red	Black	Red
49	1,000	1	Brown	Black	Red
50	15,000	2	Brown	Green	Orange
51	13,000	1	Brown	Orange	Orange
52†	263, 21 (tapped)	1.7, 14	—	—	—

*Wire wound flexible

†Wire wound poro. tube



44 and 36 Sockets



75 Socket



42 Socket



80 Socket

Terminal Arrangement of Tube Sockets Viewed From Under Side of Chassis

MODEL 19-128
Chassis view
Trimmer notes
Adjustment

PHILCO RADIO & TELEVISION CORP.

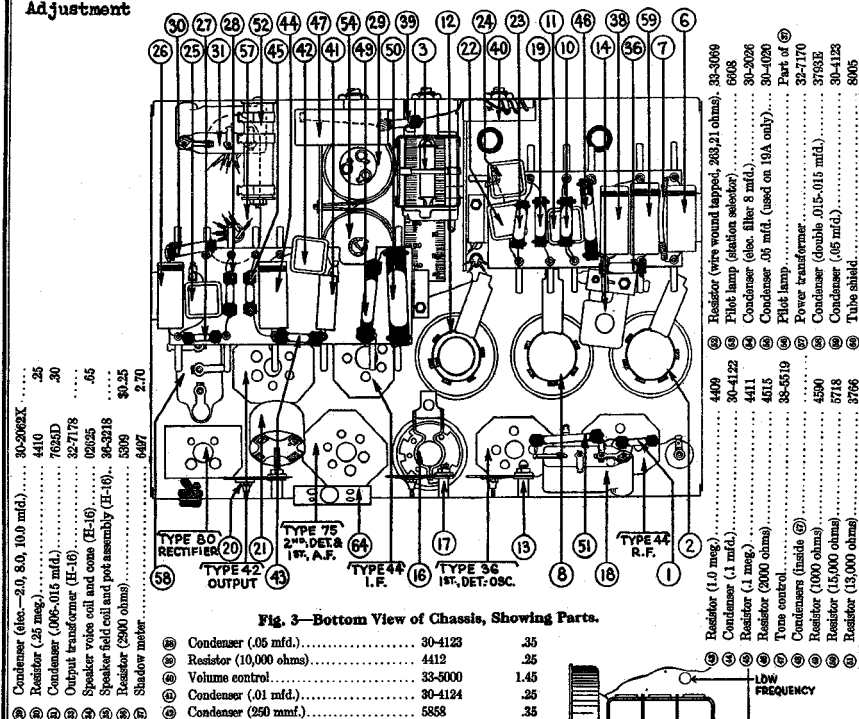


Fig. 3—Bottom View of Chassis, Showing Parts.

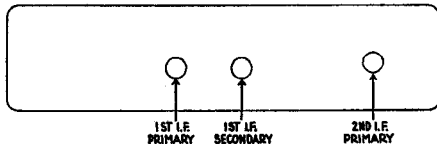


Fig. 4—Rear of Model 19 Chassis, showing location of Compensating Condensers

NOTE:—I. F. Frequency of Model 19 is 260 K.C.

ADJUSTMENT OF MODEL 19
COMPENSATING CONDENSERS

The compensating condensers of Philco Model 19 are adjusted in essentially the same manner described in Service Bulletin No. 126-C, "Adjusting Philco Superheterodynes." The method should be understood thoroughly before any adjustments are attempted.

These receivers are adjusted accurately before they are shipped from the factory. If re-adjustment is required, it is necessary usually only to re-align the intermediate frequency compensating condensers. Figures 3 and 4 show the location of these compensating condensers. The intermediate frequency is 260 kilocycles.

An accurately calibrated signal generator is required for these adjustments. The PHILCO MODEL 048 ALL-PURPOSE SET TESTER includes a precision signal generator supplying frequencies from 105 kilocycles to 5000 kilocycles. It is recommended. Your Distributor can supply the Model 048 Set Tester, and can give you complete instruction in the adjustment of Model 19.

If re-adjustment of the intermediate frequency circuit is not sufficient to restore

sensitivity, the high frequency and low frequency compensating condensers are re-aligned as described in the following paragraphs. Figure 5 shows the location of these compensating condensers.

The OSC. High Frequency compensating condenser is adjusted at 1400 kilocycles— with the signal generator of the Model 048 Set Tester set at that frequency. Next the Detector and Antenna Condensers, located on the tuning condenser assembly, should now be adjusted, with the signal generator still operating at 1400.

The last adjustment is that of the low frequency (L.F.) compensating condenser which is accessible from above through the hole in chassis housing the tuning condenser assembly. This adjustment is made with the signal generator set to give a 700 K.C. signal.

A final re-setting may be made of the H.F. condenser (signal generator at 1400) the maximum peak of compensation is desired.

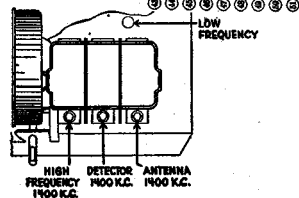


Fig. 5—Top View of Chassis showing Comp. Cond. mtd. on Tuning Condenser, Model 19, also Low Freq. Compensating Condenser.

PHILCO RADIO & TELEVISION CORP.

SEE INDEX

FOR FURTHER INFORMATION ON THESE RECEIVERS,

Models 38 and 38-A

MODEL 38, 38-A
 MODEL 71
 MODEL 89-126-126-B
 MODEL 19-122-126-126B
 MODEL 91, 14, 91-122
 MODEL 91-A, 121
 Changes

The following additional list prices should be included in the Replacement Parts list:

No. on Figs.	Description	Part No.	List Price
①	Volume Control.....	33-5017	\$0.72
①	Wave Band Switch.....	42-1030	.48
①	Antenna Transformer.....	32-1208	.48
①	Tuning Condenser Assembly.....	31-1076	2.70
①	Oscillator Transformer.....	32-1209	.78
①	1st I. F. Transformer.....	32-1251	.60
②	2nd I. F. Transformer.....	32-1252	.60
②	Voice Coil and Cone Assembly.....	36-3014	.60
②	Switch ("On-Off"; Battery).....	42-1040	.54
②	Battery Cable Assembly (including Multi-Plug).....	38-5265	.96
②	Station Selector Dial Scale.....	27-5019	.14

Note: The above list prices are effective September 15, 1933.

Model 71 Series

To correct typographical error,—

Change Part No. 02761 @, Speaker Field and Bucking Coil assembled with Pot (K-7)—(single speaker Models), to Part No. 02741.

Change Part No. 02762 @ Speaker Field and Bucking Coil assembled with Pot—(K-9)—(twin speaker Models)—to Part No. 02761.

Model 89-126-126B**Model 19-122-126-126B**

The following substitutions of electrolytic condensers are effective with current production:

Position	Code 122 (Model 19 only)	Code 126 and 126B (Models 89 and 19)
⊗	8095 (6 Mfd.), or 7464 (8 Mfd.)	30-2020, or 8166, or 4916, or 8095
⊗	8095 (6 Mfd.), or 7464 (8 Mfd.)	30-2021, or 8165, or 8095
		(These are all of 6.0 Mfd. capacity)

Effective with Run Number 5, Tuning Condenser ⊗ is superseded by Tuning Condenser, Part No. 31-1053. The complete Tuning Condenser Assembly ⊗ Part No. 06577, is superseded by Assembly, Part No. 31-1059.

The sub-base has been modified to accommodate the new condenser by change in location of mounting holes.

Effective with Run Number 6 for Model 89, and with Run Number 5 for Model 19, the red and black wires connecting Oscillator Transformer ⊗ and Compensating Condenser—(1st. I. F. Primary) ⊗ are reversed at the Compensating Condenser.

Part No. 3615BF Condenser is substituted for Part No. 3615E in ⊗.

Change Part No. 02761 @, Speaker Field and Bucking Coil assembled with Pot (K-7), to Part No. 02741.

Effective with Run Number 6 for Model 89, and with Run Number 5 for Model 19, the red and black wires connecting Oscillator Transformer ⊗ and Compensating Condenser—(1st. I. F. Primary) ⊗ are reversed at the Compensating Condenser.

Models 91 and 14 Series

Make ⊗ Oscillator Coil read Part No. 05983. This part has a list price of 65 cents.

Model 91-122

With Run number 2, Tuning Condenser Assembly ⊗ will be changed to Part No. 31-1051, immediately superseding Part No. 31-1015. In the substitution, it is necessary to remove three of Part No. W-453 mounting bolts and add three of Part No. W-729 mounting bolts; to add three Part No. 29-6060 spacers, six Part No. 3914 rubber washers, and three Part No. W-410 washers.

Model 91-A; Code 121

Effective with current production, this Model will have two Part No. 8022 (10 microfarad) Electrolytic Condensers.

MODELS 19, 38, 89

Notes

PHILCO RADIO & 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 @ 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 @ 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 @ in service bulletin 146, @ in service bulletin 146-A and @ 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.