

# PHILCO

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## Service Bulletin—No. 205

### Model 16—Codes 125 and 126

Model 16 (codes 125 and 126) is an eleven tube all-wave superheterodyne receiver covering a continuous frequency range from 550 to 22500 kilocycles. This range is divided into 4 sections or bands any of which may be brought into use by means of a four-position wave-band switch. As each position of the switch is reached the scale on the dial corresponding to that position is illuminated, this being accomplished by the use of four pilot lamps connected to the switch.

Model 16 has automatic volume control, and four point tone control with fixed bass compensation. The bass compensation can be eliminated (when desired on certain types of programs or stations) by means of a toggle switch located on the side of the cabinet.

The intermediate frequency of the Model 16 is 460 kilocycles. The power consumption of the code 125 set is 120 watts; of the code 126 is 130 watts. This set is designed for use on alternating current only, of the voltage and frequency specified on the chassis nameplate. It employs the following tubes:

RF..... Type 78  
 1st Detector..... Type 77  
 Oscillator..... Type 76  
 1st I. F..... Type 78  
 2nd I. F..... Type 78

2nd Detector..... Type 37  
 1st A. F..... Type 77  
 Driver..... Type 42 as triode  
 Output Tubes (2)..... Type 42 as triodes  
 Rectifier (code 125)..... Type 80  
 Rectifier (code 126)..... Type 5Z3

#### Power Transformer Data Line Voltage 120

Terminals	A.C. Volts	Circuit	Color of Leads
1-2	120	Primary	White
3-5	*720	Plates of Rectifier	Yellow
6-7	5.0	Filament of Rectifier	Blue
8-9	6.3	Filaments	Black
4	...	Center Tap of 3-5	Yellow—Green Tracer

\*780 in code 126

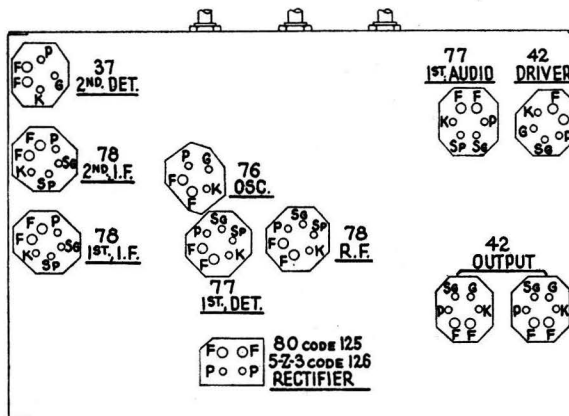


Fig. 1—Tube Sockets (Underside of Chassis)

#### Socket Voltages (Code 125) Line Voltage 115

Tube Function	78 R.F.	77 1st Det.	76 Osc.	78 1st I.F.	78 2d I.F.	37 2d Det.	77 1st Aud.	42 Driver	42 Output	80 Rect.
Circuit										
F to F.....	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	5.0
P to K.....	175	185	70	180	180	0	60	190	275 ea.	...
SG to K.....	65	62	...	65	65	...	48	190	275 ea.	...
K to Gnd.....	2.4	4.8	5.4	2.3	2.5	0	0	0	0	...

#### Socket Voltages (Code 126) Line Voltage 115

Tube Function	78 R.F.	77 1st Det.	76 Osc.	78 1st I.F.	78 2d I.F.	37 2d Det.	77 1st Aud.	42 Driver	42 Output	80 Rect.
Circuit										
F to F.....	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	5.0
P to K.....	210	220	75	215	215	0	70	215	330	...
SG to K.....	75	70	...	75	80	...	56	215	330	...
K to Gnd.....	2.8	5.8	6.1	2.8	3.3	0	0	0	0	...

The above voltages were obtained from sockets under chassis by using a high resistance D.C. voltmeter for all plate, grid and cathode voltages and an A.C. voltmeter or filament voltages. (Refer to Fig. 1 when testing voltages.) Volume control was full "on", wave band switch in standard broadcast position and dial at 55. Philco 025 Circuit Tester is recommended for making the above tests.

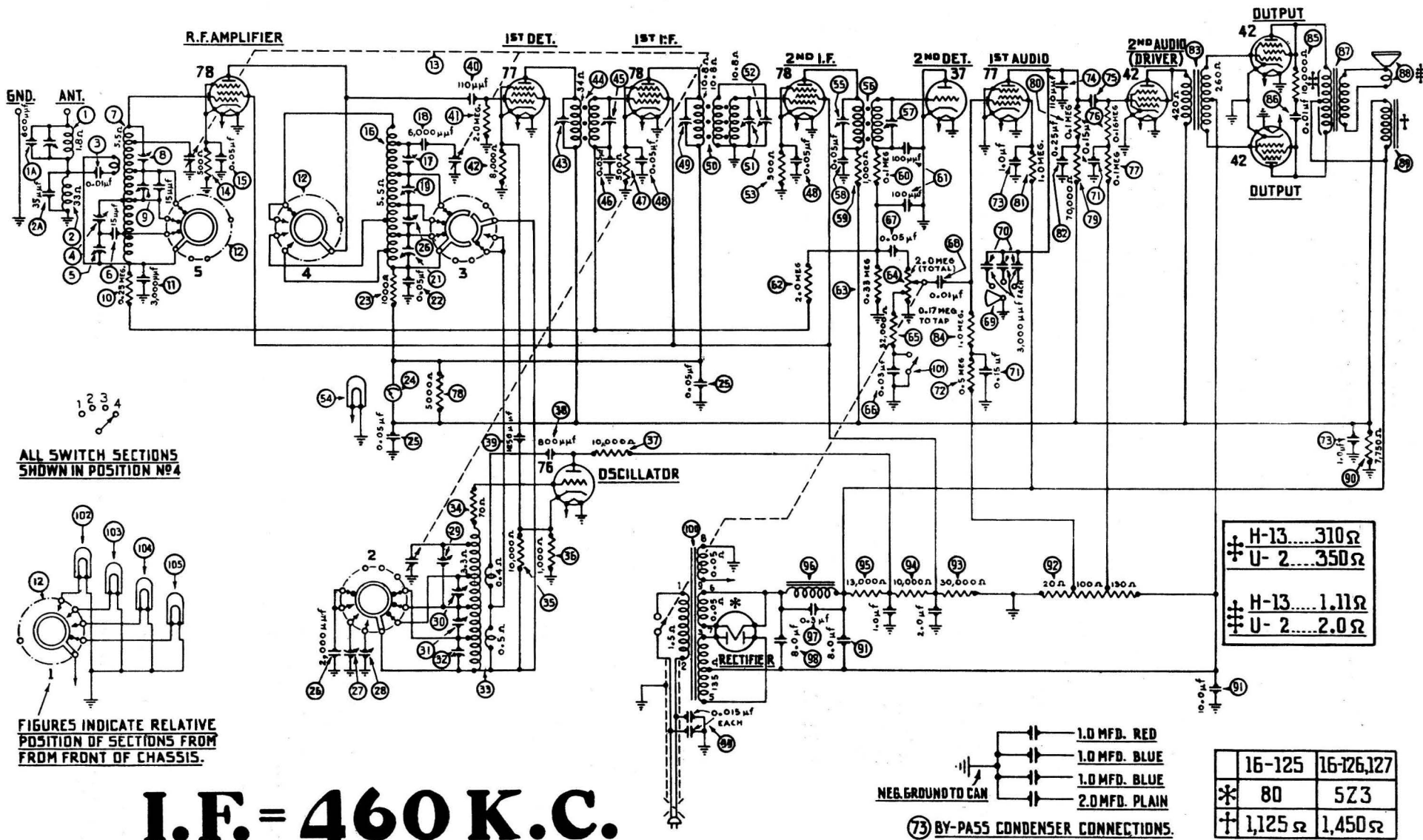


Fig. 2—Schematic Diagram

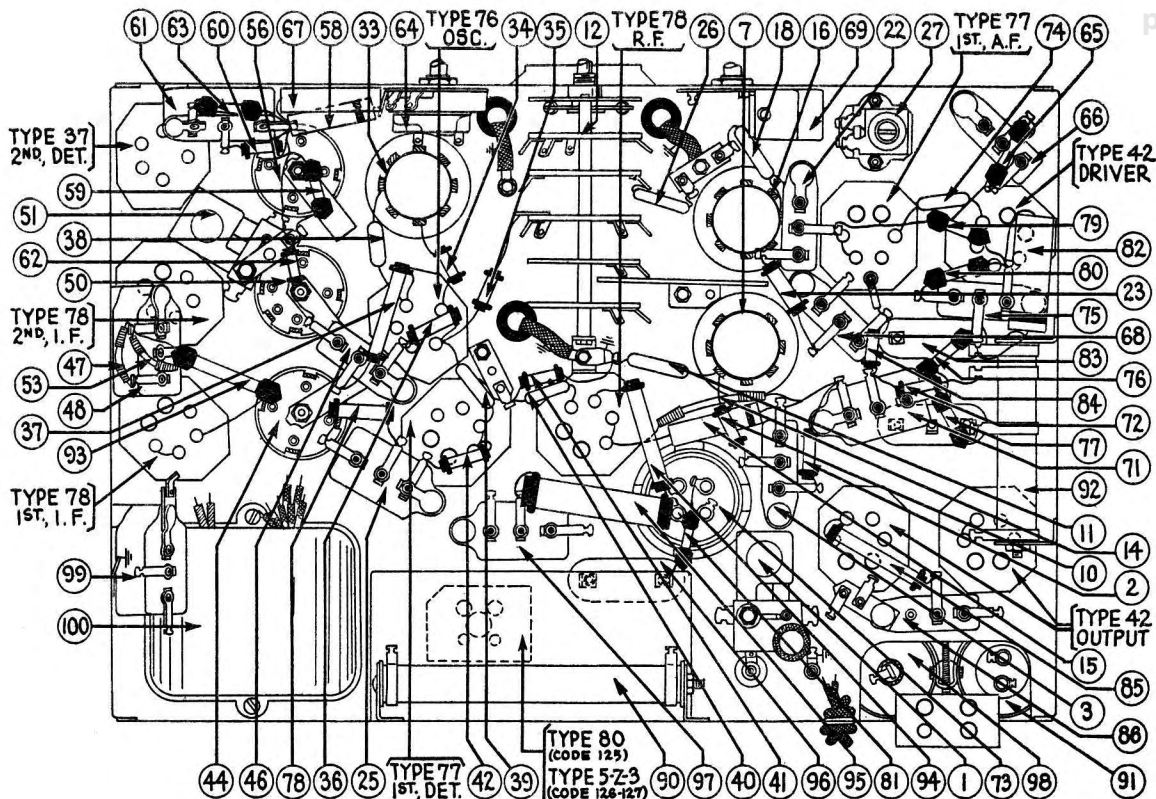


Fig. 3—Underside of Chassis, showing Parts

## REPLACEMENT PARTS—MODEL 16—CODES 125 AND 126

Nos. on Diagram	Description	Part No.	List Price	Nos. on Diagram	Description	Part No.	List Price	
①	Wave Trap	38-6049	\$0.30	⑤⑥	Condenser (.03 Mfd. Bakelite Block)	8318 F	...	
①a	Condenser (.0006 Mfd. Mica)	30-1049	.35	⑤⑦	Condenser (.05 Mfd. Tubular)	30-4020	\$0.35	
②	Antenna Choke Assembly	32-1514	.30	⑤⑧	Condenser (.01 Mfd. Bakelite Block)	3903 G	.25	
②a	Condenser (.000035 Mfd. Mica)	30-1044	.35	⑤⑨	Tone Control	30-4204	.75	
③	Condenser (.01 Mfd. Bakelite Block)	3903 N	.25	⑤⑩	Condensers (Inside Ⓞ)	Part of Ⓞ	...	
④	Compensating Condenser (Ant. Band 2)	†Part of 31-6026	...	⑤⑪	Condenser (.15 Mfd. Bakelite Block)	6287 J	.40	
④a	Compensating Condenser (Ant. Band 1)	†Part of 31-6026	...	⑤⑫	Resistor (.5 Meg. (Yellow-White-Yellow))	4517	.20	
⑤	Condenser (.00015 Mfd. Mica)	30-1030	.35	⑤⑬	Condenser (Electrolytic—1, 1, 1, 2 Mfd.)	30-2078	2.45	
⑥	Ant. Transformer	32-1487	...	⑤⑭	Condenser (.00011 Mfd. Mica)	30-1031	.35	
⑥a	Compensating Condenser (Ant. Band 4)	†Part of 31-6026	...	⑤⑮	Condenser (.05 Mfd. Bakelite Block)	3615 AD	.35	
⑥b	Compensating Condenser (Ant. Band 3)	†Part of 31-6026	...	⑤⑯	Resistor (160,000 ohms) (Brown-Blue-Yellow)	5331	.20	
⑦	Condenser (.00015 Mfd. Mica)	30-1030	.35	⑤⑰	Resistor (.1 Meg.) (White-White-Orange)	4411	.20	
⑧	Resistor (.25 Meg.) (Red-Yellow-Yellow)	4410	.20	⑤⑱	Resistor (5000 ohms) (Green-Black-Red)	5310	.20	
⑧a	Condenser (.003 Mfd. Mica)	7301	.45	⑤⑲	Resistor (7000 ohms) (Violet-Black-Orange)	5385	.20	
⑨	Wave Band Switch	42-1079	3.50	⑤⑳	Resistor (.1 Meg.) (White-White-Orange)	4411	.20	
⑩	Tuning Condenser Assembly	31-1350	6.50	⑤㉑	Resistor (1 Meg.) (Brown-Black-Green)	4409	.20	
⑪	Resistor (500 ohms Flexible Wirewound)	6977	.20	⑤㉒	Condenser (.25 Mfd. Tubular)	30-4146	.40	
⑪a	Condenser (.05 Mfd. Tubular)	30-4020	.35	⑤㉓	Audio Transformer	32-7057	2.75	
⑪b	R.F. Transformer	32-1468	2.30	⑤㉔	Resistor (1 Meg.) (Brown-Black-Green)	33-1096	.20	
⑫	Compensating Condenser (R.F.; Band 4)	†Part of 31-6026	...	⑤㉕	Resistor (10000 ohms)	3524	.20	
⑫a	Condenser (.006 Mfd. Mica)	30-1043	.60	⑤㉖	Condenser (.01 Mfd. Bakelite Block)	3903 F	.25	
⑫b	Compensating Condenser (R.F.; Band 3)	†Part of 31-6026	...	⑤㉗	Output Transformer	(U-2)	32-7052	2.00
⑫c	Compensating Condenser (R.F.; Band 2)	†Part of 31-6026	...	⑤㉘	(H-13)	32-7078	1.40	
⑫d	Compensating Condenser (R.F.; Band 1)	†Part of 31-6026	...	⑤㉙	Voice Coil and Cone Assembly	(U-2)	36-3061	1.40
⑬	Condenser (.05 Mfd. Bakelite Block)	3615 BL	.35	⑤㉚	(H-13)	02625	1.20	
⑬a	Resistor (1000 ohms) (Brown-Black-Red)	5837	.20	⑤㉛	Field Coil and Pot Assembly	(U-2)	36-3088	8.00
⑬b	Shadowmeter	45-2028	2.50	⑤㉜	(H-13)	36-3104	2.70	
⑬c	Condenser (.05 Mfd. Twin Bakelite Block)	3615 BS	.40	⑤㉝	Resistor (B.C. Wirewound 7750 ohms)	33-3020	.35	
⑬d	Condenser (.002 Mfd. Mica)	30-1042	.40	⑤㉞	Condenser (Electrolytic—8 & 10 Mfd.)	{30-2045 (code 125) {30-2046 (code 126)	1.80 1.85	
⑬e	Compensating Condenser (Osc. L.F.; Range 2)	31-6028	.85	⑤㉟	Resistor (Voltage Divider—20 ohms, 100 ohms, 130 ohms)	33-3021	.20	
⑬f	Compensating Condenser (Osc. L.F.; Range 1)	31-6028	.85	⑤㊱	Resistor (30000 ohms) (Orange-Black-Orange)	7836	.20	
⑬g	Compensating Condenser (Osc. H.F.; Range 4)	31-6026	.85	⑤㊲	Resistor (10000 ohms) (Brown-Black-Orange)	3524	.20	
⑬h	Compensating Condenser (Osc. H.F.; Range 3)	31-6026	.85	⑤㊳	Resistor (13000 ohms) (Brown-Orange-Orange) (3-watt)	6450	.40	
⑬i	Compensating Condenser (Osc. H.F.; Range 2)	31-6026	.85	⑤㊴	Filter Choke	32-7056	2.20	
⑬j	Compensating Condenser (Osc. H.F.; Range 1)	31-6028	.85	⑤㊵	Condenser (.3 Mfd. Bakelite Block)	6287 F	.40	
⑭	Oscillator Transformer	32-1469	2.40	⑤㊶	Condenser (Electrolytic—8 Mfd.)	{30-2023* (code 125) {30-2011 (code 126)	1.10 1.40	
⑭a	Resistor (70 ohms) (Violet-Black-Black)	33-1129	.20	⑤㊷	Condenser (.015 Mfd. Twin)	3793 E	.40	
⑭b	Resistor (10000 ohms) (Brown-Black-Orange)	33-1000	.20	⑤㊸	Power Transformer 60 Cycle 115 Volts (code 125)	32-7291	7.00	
⑭c	Resistor (10000 ohms) (Brown-Black-Red)	5837	.20	⑤㊹	Power Transformer 25 Cycle 115 Volts (code 125)	32-7292	9.25	
⑭d	Resistor (10000 ohms) (Brown-Black-Orange)	3524	.20	⑤㊺	Power Transformer 60 Cycle 115 Volts (code 126)	32-7283	7.00	
⑭e	Condenser (.0008 Mfd. Mica)	5878	.35	⑤㊻	Power Transformer 25 Cycle 115 Volts (code 126)	32-7284	...	
⑭f	Condenser (.00125 Mfd. Mica)	5886	.35	⑤㊼	Bass Compensation Switch (Toggle Type)	3253	.45	
⑭g	Condenser (.00011 Mfd. Mica)	4519	.35	⑤㊽	Pilot Lamp (Dial Section)	34-2031	.45	
⑭h	Resistor (2 Meg.) (Red-Black-Green)	33-1025	.20	⑤㊾	Pilot Lamp (Dial Section)	34-2031	.12	
⑭i	Resistor (8000 ohms) (Gray-Black-Red)	33-1157	.20	⑤㊿	Pilot Lamp (Dial Section)	34-2031	.12	
⑭j	Compensating Condenser (1st I.F. Pri.)	Part of ④	...	⑤㉀	Pilot Lamp (Dial Section)	34-2031	.12	
⑭k	1st I.F. Transformer	32-1188	.65	⑤㉁	Tube Socket (4 Prong)	7544	.12	
⑭l	Compensating Condenser (1st I.F. Sec.)	Part of ④	...	⑤㉂	Tube Socket (5 Prong)	27-6013	.11	
⑭m	Condenser (.05 Mfd. Bakelite Block)	3615 AA	.35	⑤㉃	Tube Socket (6 Prong)	7547	.11	
⑭n	Resistor (500 ohms Flexible Wirewound)	6977	.20	⑤㉄	Speaker Socket	7828	.10	
⑭o	Condenser (.05 Mfd. Twin Bakelite Block)	3615 AJ	.40	⑤㉅	Tube Shield (Short Type)	28-1107	.10	
⑭p	Compensating Condenser (2nd I.F. Pri.)	Part of ⑤	...	⑤㉆	Tube Shield (Tall Type)	28-1820	.06	
⑭q	2nd I.F. Transformer	32-1470	...	⑤㉇	Dial Assembly	31-1287	...	
⑭r	Compensating Condenser (2nd I.F. Tertiary)	04000R	.45	⑤㉈	Dial Scale	27-5064	.60	
⑭s	Compensating Condenser (2nd I.F. Sec.)	Part of ⑤	...	⑤㉉	Chassis Mounting Screw (code 125)	W 1358A	2.60 C	
⑭t	Resistor (500 ohms Flexible Wirewound)	6977	.20	⑤㊰	Chassis Mounting Screw (code 126)	W 1346	.60 C	
⑭u	Pilot Lamp for Shadowmeter	Part of ⑤	...	⑤㊱	Chassis Mounting Foot	27-4116	.05	
⑭v	Compensating Condenser (3rd I.F. Pri.)	Part of ⑤	...	⑤㊲	Chassis Mounting Foot Plate	27-7497	.35 C	
⑭w	3rd I.F. Transformer	32-1188	.65	⑤㊳	Chassis Mounting Washer	29-2089	.35 C	
⑭x	Compensating Condenser (3rd I.F. Sec.)	Part of ⑤	...	⑤㊴	Knob (Waveband Switch, code 126)	27-4051	.10	
⑭y	Condenser (.05 Mfd. Tubular)	30-4123	.35	⑤㊵	Knob (Volume Control and Tone Control)	27-4052	.10	
⑭z	Resistor (1000 ohms) (Brown-Black-Red)	5837	.20	⑤㊶	Knob (Station Selector)	27-4139	.10	
⑮	Resistor (.1 Meg.) (White-White-Orange)	6099	.20	⑤㊷	Knob (Fine Tuning Control)	27-4140	.10	
⑮a	Condenser (.0001 Mfd. Twin Bakelite Block)	8085 B	.25	⑤㊸	Bass Compensation Switch Plate	28-2415	.05	
⑮b	Resistor (2 Meg.) (Red-Black-Green)	33-1025	.20					
⑮c	Resistor (330000 ohms) (Orange-Orange-Yellow)	6046	1.45					
⑮d	Volume Control (350000 ohms total) & On-Off Switch	33-5022	1.45					
⑮e	Resistor (32000 ohms) (Orange-Red-Orange)	5279	.20					

†31-6026: list price \$0.85.

\*After Run No. 5: 30-2025, list price \$1.35.

## Adjusting Compensating Condensers

Model 16 (Codes 125, 126, 127)

### Adjustment of I. F.

1. Remove the antenna connection from the receiver, disconnect the grid clip from the first detector (type 77 tube), and connect the "ANT" output terminal of the Model 048 or 024 signal generator to the grid cap of this tube; connect the "GND" terminal of the signal generator to the "GND" terminal of the receiver.

2. Connect the 0 to 20 volt range of the output meter in the Model 048 or 025 tester to the plate prongs of the two output tubes or to the two bottom prongs of the speaker plug.

3. Adjust the signal generator to a frequency of 460 K.C. Place the receiver in operation with the dial turned to the low frequency end of the broadcast band, wave band switch to extreme left, and with the volume control adjusted near its maximum setting. Adjust the signal generator attenuator for approximately half-scale reading of the output meter.

4. Using the Philco fibre adjusting screw driver, part No. 27-7059, adjust the I. F. compensating condensers in the following order to give maximum reading in the output meter: ②, ⑤, ⑥, ④, ①, ③, ⑦. (Fig. 4).

### Adjustment of Wave-Trap

1. Connect the signal generator leads to the antenna and ground terminals of the receiver. Replace the grid clip on the first detector grid cap.

2. Set the wave-band switch of the receiver to the extreme left (broadcast position) (Range No. 1, 550-1500 K.C.), and turn the station selector to 550 K.C.

3. With the signal generator in operation at 460 K.C., adjust the wave-trap ① condenser until a minimum reading is obtained on the output meter. The Philco fibre wrench, part No. 3164, is used for this adjustment.

### Adjustment of High Frequency Padders

1. Leaving the output meter connected to the receiver connect the Philco Model 091 signal generator to the antenna and ground terminals of the chassis and place the signal generator in operation.

2. Turn the wave-band switch to Range 4 (extreme right) and adjust the station selector to 18.0 megacycles, at which point the fifth harmonic of the 3600 K.C. signal will be heard. By means of the Philco padder wrench, part No. 3164, adjust the oscillator, R.F. and antenna padders for maximum reading in the output meter and in the order mentioned. These padders

are numbered ②, ①, and ⑧, respectively in figure No. 4. To make certain that the adjustment has been correctly made check the sixth harmonic at 21.6 M.C. on the dial.

3. Turn the wave-band switch to Range 3 (4.1-10.0 M.C.) and adjust the tuning dial to 7.2 M.C. (the second harmonic of the 3600 K.C. signal). Adjust the oscillator, R.F. and antenna padders (③, ①, and ⑧, respectively) for maximum output. Check the calibration of the dial at the upper portion of the third band by tuning in the image of the 10.8 M.C. signal at approximately 9.9 on the dial. (If there is an appreciable error in calibration at this point, readjust padder ③ for maximum output. Return the dial to the 7.2 M.C. position, tuning for maximum output. Readjust padders ① and ⑧.)

4. Turn the wave-band switch to scale No. 2 (1.5-4.0 M.C.) and tune in the fundamental frequency from the signal generator at 3.6 M.C. Adjust padders ④, ② and ⑤ for maximum output.

5. At this point it will again be necessary to make use of the broadcast type signal generator Models 024, 048 or equivalent. Connect the output of this signal generator to the antenna and ground terminals of the chassis. Turn the station selector dial to 1.5 M.C. (Range 2) and adjust the signal generator to the same frequency (1500 K.C.). Adjust padder ⑦ (nut).

6. Turn the wave-band switch to Range No. 1 (broadcast band) and set the dial at 1500 K.C. Adjust the signal generator to this frequency and adjust padders ③, ② and ⑤ for maximum output.

7. Tune the receiver and the signal generator to 600 K.C. and adjust padder ② (screw) for maximum output.

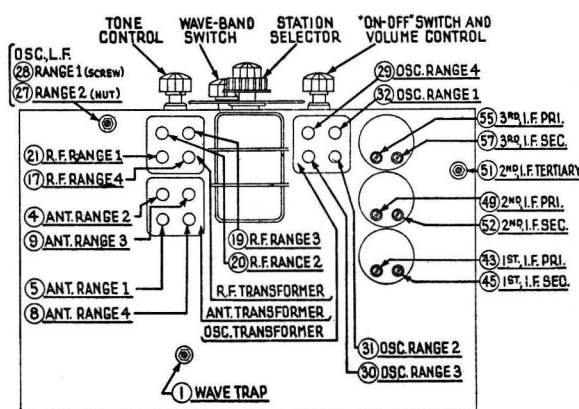


Fig. 4—Locations of Compensating Condensers

**USE PHILCO REPLACEMENT PARTS AND TUBES FOR EVERY MAKE RADIO.  
GET COMPLETE CATALOG FROM YOUR DISTRIBUTOR.**

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## Service Department