PHILCO

REG. U.S. PAT. OFF

Service Bulletin—No. 174

MODEL 14

PHILCO RADIO MODEL 14 is a nine-tube superheterodyne receiver, designed for operation upon alternating current. The intermediate frequency of the superheterodyne circuit is 175 kilocycles. The frequency range of the receiver is 520-4000 kilocycles, which includes standard broadcast, police, aircraft, and amateur radiophone reception. The tube sequence is: Type 78 tube for radio frequency amplifier, Type 6A7 tube as combination first detector and oscillator, Type 78 for intermediate frequency, Type 37 for automatic volume control—second detector, Type 77 as first audio frequency, Type 42 as Driver—2nd A. F.; two Type 42's as triodes form the class "A" amplifier, and a Type 80 is the rectifier. The power consumption of the Model 14 is 110 watts. The Receiver incorporates automatic volume control, four-point bass-compensating tone control, shadow-tuning, and a waveband switch which permits reception over a wide frequency band with the same superheterodyne circuit.

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

CIRCUIT	R. F.	Det. Osc.	I. F.	A.V.C.-2nd, Det.	1st, A. F.	Driver (2nd A. F.)	Output (Class "A")		Rectifier
TYPE TUBE	78	6A7	78	37	77	42	42	42	80
Filament Volts—F to F..	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	5.0
Plate Volts—P to K.....	210	210	220	..	80	205	275	275	340
Screen Grid Volts—SG to K (Type 6A7—G3-5 to K).....	90	90	90	..	40	205	280	280	..
Control Grid Volts—CG to K (Type 6A7—G4 to K).....	.4	.1	3.2	.4	.5	.4	28	28	..
Cathode Volts—K to F...	2.7	2.7	3.2	..	..	..	..	..	..
Type 6A7—G1 to K.....	..	30	..	..	..	..	..	..	..
Type 6A7—G2 to K.....	..	170	..	..	..	..	..	..	..

*All the above values were obtained from the underside of the 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. The PHILCO MODEL 048 ALL-PURPOSE SET TESTER IS RECOMMENDED FOR THIS. Volume Control at maximum; station selector at 520 K. C. Readings which are obtained with a plug-in adaptor will NOT be satisfactory.

Table 2—Power Transformer Data

Terminal	A. C. Volts	Circuit	Color
1-2	105-125	Primary	White
3-5	6.3	Filament	Black
6-7	5.0	Filament of 80	Blue
8-10	760	Plates of 80	Yellow
4	...	Center Tap of 3-5	Black—Yellow Tracer
9	...	Center Tap of 8-10	Yellow—Green Tracer

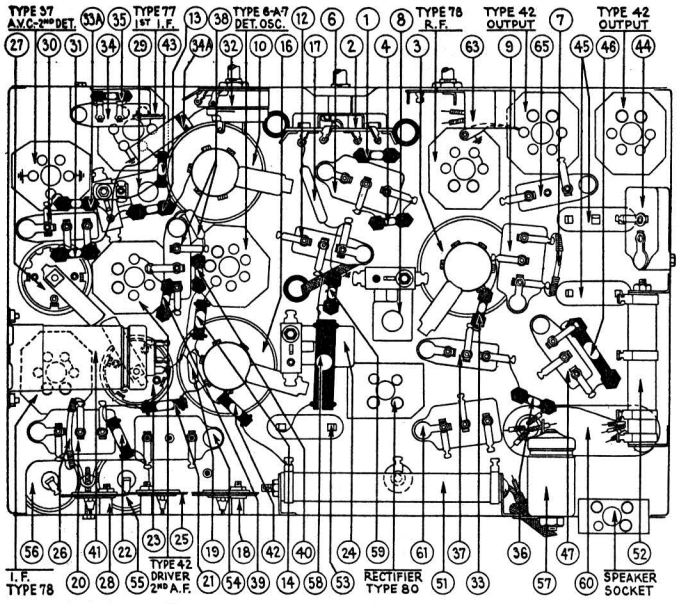


Fig. 2—Bottom View of Chassis Showing Parts

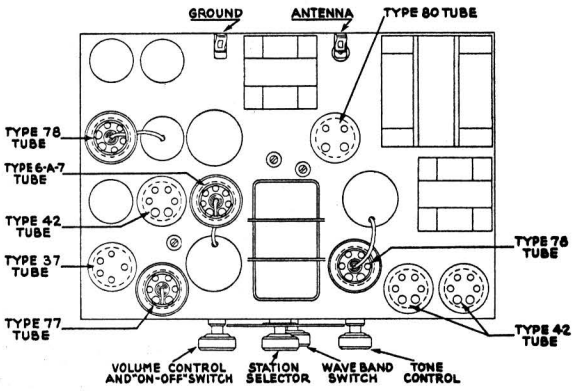


Fig. 1—Top View of Chassis

Adjustment of Model 14

The accurate adjustment of receivers is completed before shipment from the factory. Subsequent adjustments should not be undertaken unless complete instruction has been obtained in the adjustment of the compensating condensers. An accurately calibrated signal generator is necessary, and the PHILCO MODEL 048 ALL-PURPOSE SET TESTER, which contains a precision signal generator, is thoroughly recommended. Philco Service Bulletin No. 120-C, "Adjusting Philco Superheterodynes", outlines the general procedure. The following specifically supplements for Model 14:

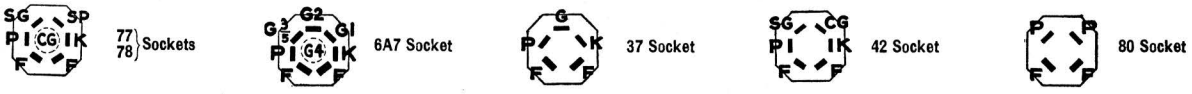
Figure 3 of the present Bulletin shows the electrical position of the several compensating condensers; Figure 2, the physical location of those compensating condensers which are mounted upon the underside of the chassis, and at the rear of the chassis sub-base.

The intermediate frequency compensating condensers should be adjusted first. The intermediate frequency is 175 kilocycles. The location of these compensating condensers is: (a) 1st, I. F. PRIMARY—㉔,—underneath the chassis. May be reached through hole in chassis sub-base to rear, *left*, of Tuning Condenser Assembly ⑤. See Figure 1. (b) 1st, I. F. SECONDARY—㉕,—at rear of chassis, and accessible therefrom. Mounted near ㊺ and ㊻ electrolytic condensers. (c) 2nd, I. F. PRIMARY—㉘,—at rear of chassis. Accessible from rear. Mounted next to ㉕. (d) 2nd, I. F. SECONDARY—㉙,—underneath the chassis. Accessible through hole in sub-base, located between Type 42 (Driver) and Type 77 (1st, A. F.). See Figure 1.

Next, the "OSC.; H. F." ⑮, "DETECTOR" ⑪, and "ANT.; H. F." ⑧ compensating condensers should be adjusted in the order given. ⑮ and ⑪ are mounted upon the Tuning Condenser Assembly ⑤. ⑧ is located *underneath* the chassis, accessible through hole in sub-base at rear of Tuning Condenser Assembly ⑤,—between Tuning Condenser and Type 80 (Rectifier). See Figure 1. The signal generator is adjusted to a frequency of 1500 K. C. for ⑮, to 1400 K. C. for ⑪ and ⑧.

The "OSC.; L. F." ⑱ compensating condenser is next adjusted. It is located at rear of chassis, beside ㉕, and toward "GND " terminal of Receiver. The signal generator is set at 600 K. C. for this adjustment. The Tuning Condenser should be "rocked" during this adjustment.

The "Push-on Button" shields covering the holes through which these adjustments are made, must be replaced upon completion of the adjustments.



Terminal Arrangement of Tube Sockets Viewed from Under Side of Chassis.

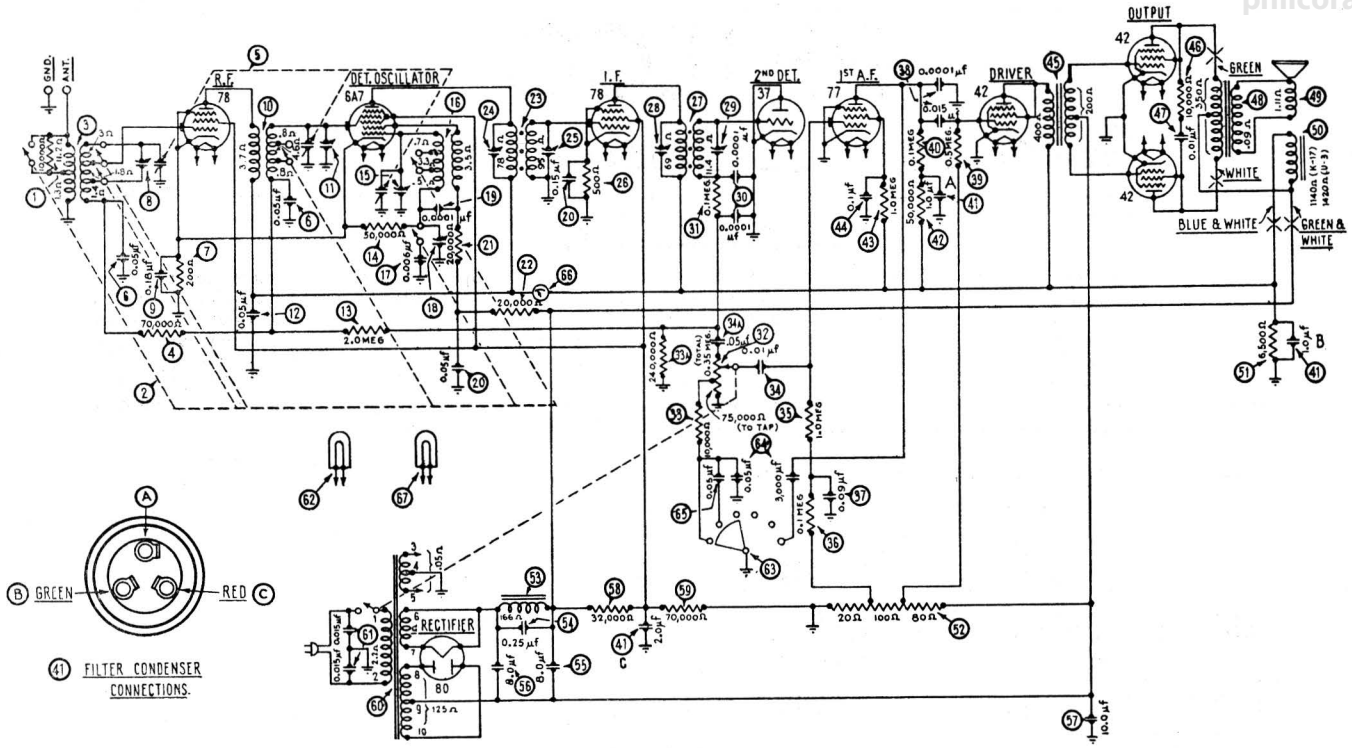


Fig. 3—Schematic Wiring Diagram

Replacement Parts for Model 14

(THESE PRICES ARE EFFECTIVE SEPTEMBER 15 1933).

No. on Figs.	Description	Part No.	List Price
(1)	Resistor (10,000) (Brown-Black-Orange)	4412	$0.24
(2)	Wave Band Switch	42-1035	.78
(3)	Antenna Transformer	32-1261	.60
(4)	Resistor (70,000) (Violet-Black-Orange)	5385	.24
(5)	Tuning Condenser Assembly (Code 122)	31-1099	4.35
	Tuning Condenser Assembly (Code 123)	31-1100	4.35
(6)	Condenser (Double) (.05-.05)	3615-AM	.24
(7)	Resistor (Flexible Wire Wound); (200) (Red-Black-Brown)	7217	.18
(8)	Compensating Condenser (Ant.; H. F.)	04000-A	.14
(9)	Condenser (.18)	4989-AC	.24
(10)	Detector Transformer	32-1256	.45
(11)	Compensating Condenser (Det.; Part of (5))	.....	....
(12)	Condenser (.05)	3615-AA	.24
(13)	Resistor (2.0 meg.) (Red-Black-Green)	5872	.24
(14)	Resistor (50,000) (Green-Brown-Orange)	4518	.24
(15)	Compensating Condenser (Osc.; H. F.; Part of (5))	.....	....
(16)	Oscillator Transformer	32-1262	.55
(17)	Condenser (.006)	6359	.48
(18)	Compensating Condenser (Osc.; L. F.)	04000-R	.42
(19)	Condenser (.0001)	4519	.22
(20)	Condenser (Double); (.05-.15)	6287-M	.25
(21)	Resistor (20,000) (Red-Black-Orange)	6650	.30
(22)	Resistor (20,000) (Red-Black-Orange)	6650	.30
(23)	1st, I. F. Transformer	32-1263	.55
(24)	Compensating Condenser (1st, I. F. Pri.)	04000-J	.24
(25)	Compensating Condenser (1st, I. F. Sec.)	04000-H	.22
(26)	Resistor (Flexible Wire Wound) (500) (Green-Black-Brown)	6977	.24
(27)	2nd, I. F. Transformer	32-1264	.55
(28)	Compensating Condenser (2nd, I. F. Pri.)	04000-J	.24
(29)	Compensating Condenser (2nd, I. F. Sec.)	04000-T	.19
(30)	Condenser (Double); (.0001-.0001)	8035-K	.25
(31)	Resistor (.1 meg.) (White-White-Orange)	4411	.24
(32)	Volume Control & "On-Off" Switch	33-5024	1.00
(33)	Resistor (10,000) (Brown-Black-Orange)	4412	.24
(33)a	Resistor (240,000) (Red-Yellow-Yellow)	4410	.24
(34)	Condenser (.01)	3903-Z	.17
(34)a	Condenser (.05)	30-4020	.14
(35)	Resistor (1.0 meg.) (Brown-Black-Green)	4409	.24
(36)	Resistor (.1 meg.) (White-White-Orange)	4411	.24
(37)	Condenser (.09)	4989-N	.24
(38)	Condenser (.00011)	4519	.22
	Condenser (.015)	3793-AB	.20
(39)	Resistor (.5 meg.) (Yellow-White-Yellow)	4517	.24
(40)	Resistor (.1 meg.) (White-White-Orange)	4411	.24
(41)	Electrolytic Condenser ("A"=1.0 mfd.; "B"=1.0 mfd.; "C"=2.0 mfd.)	30-2029	1.00

No. on Figs.	Description	Part No.	List Price
(42)	Resistor (50,000) (Green-Brown-Orange)	4518	.24
(43)	Resistor (1.0 meg.) (Brown-Black-Green)	4409	.24
(44)	Condenser (.1)	3615-BM	.25
(45)	Input Transformer	32-7057	2.70
(46)	Resistor (10,000 ohms) (Brown-Black-Orange)	3524	.24
(47)	Condenser (.01)	3903-P	.24
(48)	Output Transformer	32-7078	1.25
(49)	Voice Coil and Cone Assembly	36-3061	.90
(50)	Speaker Field Coil and Pot Assembly (U-3)	36-3162	6.75
(51)	Resistor (Wire Wound); (6,500)	33-3033	.25
(52)	Voltage Divider Resistor (Wire Wound)	33-3032	.20
(53)	Filter Choke	32-7115	1.50
(54)	Condenser (.25 mfd.)	6287-N	.20
(55)	Condenser (Electrolytic), (8.0 mfd.) (Code122)	30-2022	1.00
	Condenser (Electrolytic), (8.0 mfd.) (Code123)	7464	1.50
(56)	Condenser (Electrolytic), (8.0 mfd.) (Code122)	30-2025	1.15
	Condenser (Electrolytic), (8.0 mfd.) (Code123)	7464	1.50
(57)	Condenser (Electrolytic), (10.0 mfd.)	30-2003	.84
(58)	Resistor (32,000) (Orange-Red-Orange)	33-1026	.30
(59)	Resistor (70,000) (Violet-Black-Orange)	5385	.24
(60)	Power Transformer (50-60 cycles)	32-7111	5.75
(61)	Condenser (Double); (.015-.015)	3793-R	.30
(62)	Pilot Lamp (Station Selector)	6608	.14
(63)	Tone Control	30-4073	.55
(64)	Condensers, (Internal to (63))	.....	....
(65)	Condenser, (External to (63))	3615-G	.19
(66)	Shadow Tuning Meter	6497	2.70
(67)	Pilot Lamp; (Part of (66) Shadow Tuning Meter)	.....	....
	Shield ("Push-on" Button)	W-775 per C	1.50
	Tube Shield	28-1107	.12
	Four-Prong Tube Socket	7544	.07
	Five-Prong Tube Socket	7546	.12
	Six-Prong Tube Socket	7547	.12
	Seven-Prong Tube Socket	27-6005	.12
	Speaker Socket	4957	.10
	Dial Scale (Station Selector)	27-5013	.20
	Mounting Bolt (Chassis)	W-567 per C	2.88
	Mounting Washer (Chassis)	5189	.04
	Mounting Washer (Chassis)	5058 per C	.82
	Knob (large)	03063	.10
	Knob (small)	03064	.07
	Knob Spring	5262 per C	.42
	Bezel	6418	.24
	Bezel Mounting Screw	W-452 per M	4.20
	Bezel Felt	6732 per C	.25
	Speaker (K-17) (Baby Grand Only) Output Transformer	32-7078	1.25
	Speaker (K-17) (Baby Grand Only) Voice Coil & Cone Assembly	36-3020	.48
	Speaker (K-17) (Baby Grand Only) Speaker Field & Pot Assembly	36-3104	2.25
	Speaker Socket *Hole Cover*	7084 per C	.90
	Speaker Cable	L-1632	.24

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