

PHILCO

REG. U.S. PAT. OFF

Service Bulletin — No. 194

Model 118

Philco Model 118 is an eight tube superheterodyne radio receiver operating on alternating current (A. C.) and designed for reception on either the standard broadcast band (including police bands up to 1720 K. C.), or a major section of the short wave band. A two-position switch changes reception from broadcast to short-wave. The frequency ranges are 540 to 1720 K. C. and 4.2 to 12 megacycles.

Model 118 is equipped with shadow-tuning, four point tone control with fixed bass compensation, and automatic volume control. The power consumption is 110 watts and the undistorted output of the Super Class "A" Amplifier is 10 watts. The intermediate frequency (I. F.) is 260 K. C.

Model 118 is equipped with the following tubes:

- R. F.....Type 78
- Detector-Oscillator.....Type 6A7
- I. F.....Type 78
- 2d Det. 1st A. F.....Type 75
- Driver.....Type 42
- Output tubes (2) (Connected as triodes).....Type 42
- Rectifier.....Type 80

Tube Socket Voltages—Line Voltage 115

Function	R.F.	Det.-Osc.	I.F.	A.F.	Driver	Output		Rect.
Type	78	6A7	78	75	42	42	42	80
Filament (F-F).....	6.3	6.3	6.3	6.3	6.3	6.3	6.3	5.0
Plate (P-K).....	180	180	200	125	195	280	280	315
Screen (SG-K).....	80	175	80	...	195	290	290	...
Cathode (K to F)....	2.5	2.6	3.2	0	0	0	0	...
6A7: G ¹ to K.....	26							
6A7: G ² to K.....	150							

Power Transformer Voltages

Terminals	A.C. Volts	Circuit	Color of Leads
1-2	120	Primary	White
3-5	6.3	Filaments	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

The above tests were made with an A. C. voltmeter for filament voltages and a high resistance D. C. voltmeter for all others. Dial at 550 K. C., wave band switch to left, volume control at maximum. Tests made with test prods applied to sockets underneath chassis. Philco Model 048 All-purpose Tester or Model 025 Circuit Tester are recommended for these tests. Use Fig. 1 in making tests given in left hand table above.

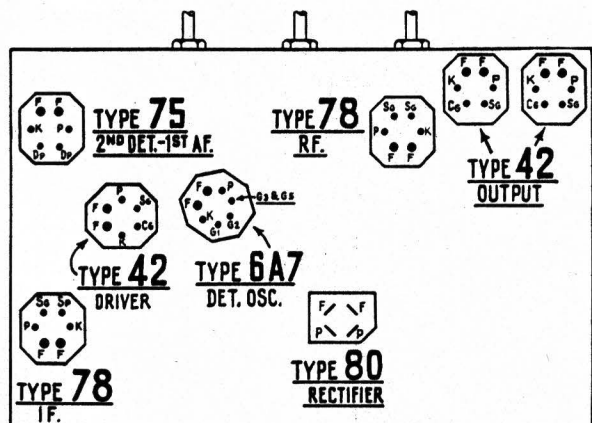


Fig. 1. Tube Socket Layout

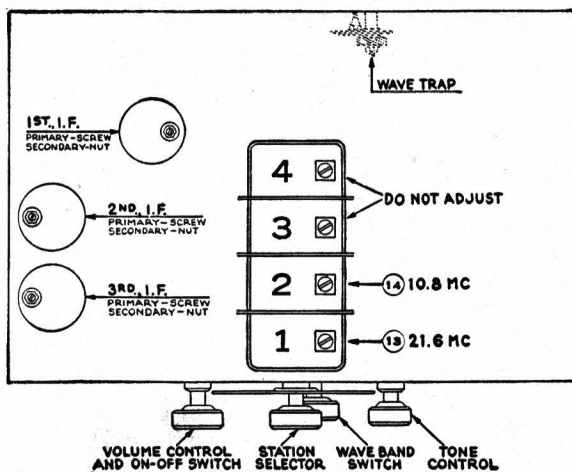


Fig. 2. Top View

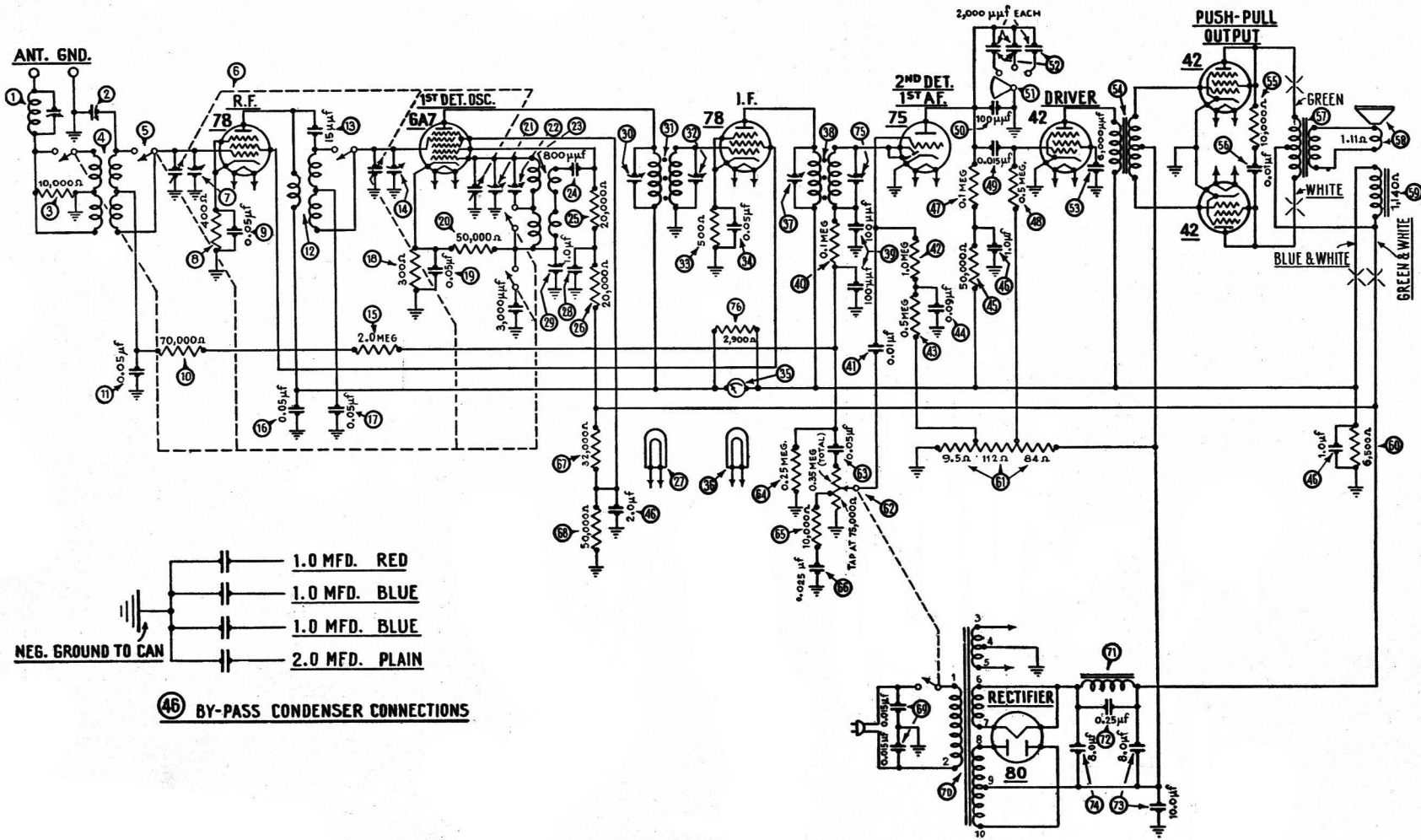


Fig. 3. Schematic Diagram

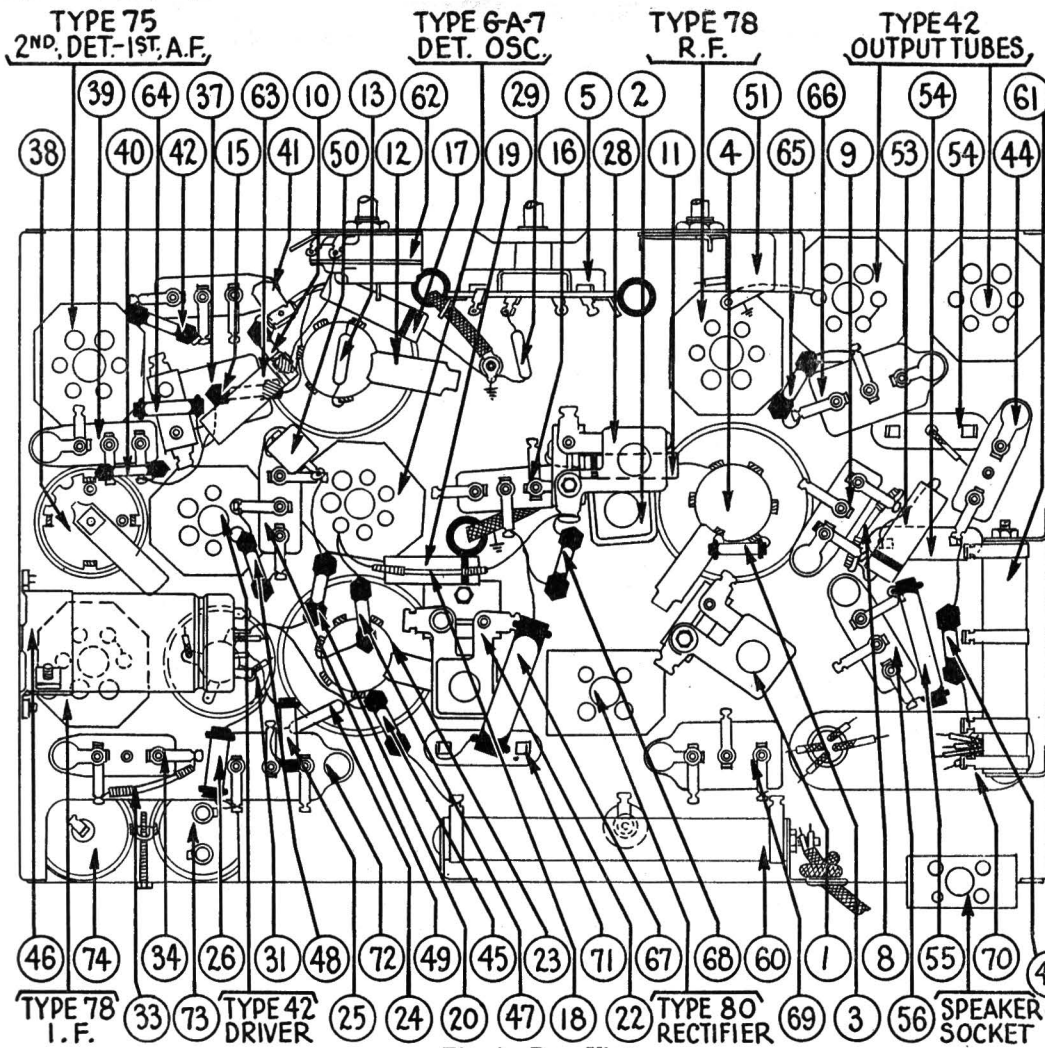


Fig. 4. Base View

Replacement Parts for Model 118

No. on Diagram	Description	Part No.	List Price	No. on Diagram	Description	Part No.	List Price
1	Wave Trap.....	38-5740	.45	46	Resistor (50,000 ohms) (Green-Brown-Orange).....	4518	\$0.25
2	Compensating Condenser (Ant.-H. F.).....	04000D	\$0.15	46	Condenser (Electrolytic 1, 1, and 2 Mfd.).....	33-2078	2.45
3	Resistor (10,000 ohms) (Brown-Black-Orange).....	33-1000	.25	47	Resistor (1 Meg.) (White-White-Orange).....	4411	.25
4	Antenna Transformer.....	32-1378	1.00	48	Resistor (.5 Meg.) (Yellow-White-Yellow).....	4517	.25
5	Wave Band Switch.....	42-1046	.80	49	Condenser (.015 Mfd. Bakelite Block).....	3793F	.35
6	Tuning Condenser Assembly.....	31-1173	6.25	50	Condenser (.0001 Mfd. Mica).....	4519	.35
7	Compensating Condenser (Ant.-Broadcast).....	Part of 6	....	61	Tone Control.....	30-4186	.75
8	Resistor (400 ohms Flexible Wire-Wound).....	33-3016	.20	62	Condensers (In Tone Control).....	Part of 61	....
9	Condenser (.05 Mfd.) (Bakelite Block).....	3615BK	.35	63	Condenser (.006 Mfd. Tubular).....	30-4024	.40
10	Resistor (70,000 ohms) (Violet-Black-Orange).....	5385	.25	64	Input Transformer.....	32-7114	2.00
11	Condenser (.05 Mfd.) (Tubular).....	30-4020	.35	65	Resistor (10,000 ohms) (Brown-Black-Orange).....	3524	.25
12	Detector Transformer.....	32-1379	.70	66	Condenser (.01 Mfd. Bakelite Block).....	3903P	.25
13	Condenser (.000015 Mfd.) (Mica).....	30-1030	.35	67	Output Transformer.....	32-7078	1.40
14	Compensating Condenser (Det.).....	Part of 6	....	68	Voice Coil and Cone Assembly.....	H-13-02625	.80
15	Resistor (2 Meg.) (Red-Black-Green).....	5872	.25			K-17-36-3020	.60
16	Condenser (.05 Mfd.) (Bakelite Block).....	3615D	.35	69	Field Coil and Pot Assembly.....	36-3104	2.70
17	Condenser (.05 Mfd.) (Tubular).....	30-4020	.35	69	Resistor (Wire-Wound) (6500 ohms).....	33-3033	.30
18	Resistor (300 ohms Flexible Wire-Wound).....	33-3010	.20	61	Resistor (Wire-Wound) (9.5, 112, 84 ohms).....	33-3034	.20
19	Condenser (.05 Mfd.) (Tubular).....	30-4020	.35	62	Volume Control and On-Off Switch.....	33-5024	1.45
20	Resistor (50,000 ohms) (Green-Brown-Orange).....	4518	.25	63	Condenser (.05 Mfd. Tubular).....	30-4020	.35
21	Compensating Condenser (Osc. H. F. Bdest.).....	Part of 6	....	64	Resistor (240,000 ohms) (Red-Yellow-Yellow).....	4410	.25
22	Compensating Condenser (Osc. H. F. Shortwave).....	31-6016	.30	65	Resistor (10,000 ohms) (Brown-Black-Orange).....	4412	.25
23	Oscillator Transformer.....	32-1380	.70	66	Condenser (.025 Mfd. Bakelite Block).....	7653D	.35
24	Condenser (.0008 Mfd. Mica).....	5878	.35	67	Resistor (32,000 ohms) (Orange-Red-Orange).....	33-1026	.35
25	Resistor (20,000 ohms) (Red-Black-Orange).....	6650	.25	68	Resistor (50,000 ohms) (Green-Brown-Orange).....	4518	.25
26	Resistor (20,000 ohms) (Red-Black-Orange).....	6650	.25	69	Condenser (.015 Mfd. Twin) (Bakelite Block).....	3793R	.40
27	Pilot Lamp (Station Selector).....	6608	.11	70	Power Transformer.....	32-7111	5.75
28	Compensating Condenser (Osc. L. F.).....	04000R	.45	71	Filter Choke.....	32-7115	1.80
29	Condenser (.003 Mfd. Mica).....	7301	.45	72	Condenser (.25 Mfd.).....	6287-R	.40
30	Compensating Condenser (1st I. F. Pri.).....	Part of 31	....	73	Condenser (Elec. 8 Mfd. 10 Mfd.).....	30-2045	1.95
31	1st I. F. Transformer.....	32-1381	1.50	74	Condenser (Elec. 8 Mfd.).....	30-2025	2.00
32	Compensating Condenser (1st I. F. Sec.).....	Part of 31	....	75	Compensating Condenser (2d I. F. Secondary).....	Part of 38	....
33	Resistor (500 ohms Flexible Wire-Wound).....	6977	.20	76	Resistor (2900 ohms) (Red-White-Red).....	5309	.25
34	Condenser (.05 Mfd.) (Bakelite Block).....	3615AU	.35		Chassis Mtg. Screw.....	W-1345A	2.25C.
35	Shadowmeter.....	6497	2.50		Chassis Mtg. Washer.....	29-2089	.35C.
36	Shadowmeter Pilot Lamp.....	Part of 35	....		Chassis Mtg. Foot (Rubber).....	27-4110	.05
37	Compensating Condenser (2d I. F. Pri.).....	04000A	.15		Chassis Mtg. Foot Plate.....	27-4077	.35C.
38	2d I. F. Transformer (Early Prod. 32-1258).....	32-1424	....		Knob Assembly (Large).....	27-4051	.10
39	Condenser (.0001 Mfd. Twin) (Bakelite Block).....	8035-K	.25		Knob Assembly (Small).....	27-4052	.10
40	Resistor (.1 Meg.) (White-White-Orange).....	4411	.25		Dial Assembly.....	31-1205	.60
41	Condenser (.01 Mfd. Bakelite Block).....	3903Z	.25		Dial Scale.....	27-5046	.35C.
42	Resistor (1 Meg.) (Brown-Black-Green).....	4409	.25		Tube Shield.....	28-1107	.10
43	Resistor (.5 Meg.) (Yellow-White-Yellow).....	4517	.25		4 Prong Socket.....	7544	.10
44	Condenser (.09 Mfd. Bakelite Block).....	4989D	.35		6 Prong Socket.....	7547	.11
					7 Prong Socket.....	27-6005	.11
					Speaker Socket.....	4957	.10
					A. C. Cord and Plug.....	L-943A	.60

*See Note below Fig. 4.

Note: Part (37), as is shown above only in early production. In later production this part is incorporated as part of (38), not visible from below.

Adjusting Compensating Condensers

For adjusting compensating or padding condensers in Model 118, an accurately calibrated signal generator covering the broadcast range of frequencies is required and also a crystal controlled signal generator for the high frequency adjustments. For the former we suggest the Philco Model 024 Signal Generator and for the latter the Model 091, Crystal Controlled high frequency signal generator. The actual adjusting calls for a special insulated hex wrench and insulated screwdriver. Philco Part No. 3164 Fibre Wrench and No. 27-1159 Screwdriver are recommended. An output meter is also required, for connection to the receiver.

I. F. ADJUSTMENT—The I. F. (intermediate frequency) of Model 118 is 260 K. C.

Remove the grid clip from the top of the 6A7 tube and connect the shielded antenna lead from the Signal Generator to the cap of this tube. Connect the ground lead of the Signal Generator to the ground post of receiver. Connect the output meter to the primary terminals of the output transformer of receiver. Set the waveband switch at the left position (standard broadcast).

Set the wave switch on the Signal Generator at 260 K. C., and the dial of the receiver at 550. Turn on the set (volume full on), and the Signal Generator. Now adjust the 1st I. F. Primary and Secondary condensers (Nos. ⑩ and ⑪ in Fig. 3) and the 2d I. F. primary and secondary condensers (⑭ and ⑮) to give maximum reading on the output meter. The I. F. primary condenser is adjusted by turning the screw on top of the I. F. transformer and the secondary is adjusted by turning the nut. The I. F. transformers are in the smaller metal "cans". The screw and nut are reached through the hole in top. If the needle on the output meter goes off the scale, turn down the "attenuator" on the Signal Generator until a lower reading is obtained.

Note: In early production the 1st I. F. compensating condensers only are adjusted as

described above. Part ⑯ is not used. The 2d I. F. primary ⑰ is an 04000A condenser reached and adjusted through hole in top of chassis near the 42 driver tube.

WAVE TRAP—Remove antenna lead from grid cap of 6A7 tube and attach it to antenna post on set. Replace cap on 6A7 tube. With Signal Generator still operating at 260 K. C., adjust wave-trap condenser (① in Figs. 3 & 4) so as to get MINIMUM reading in output meter. This adjustment is made from underneath the chassis.

ANTENNA, DETECTOR AND OSCILLATOR H. F. (Broadcast)—These condensers Nos. ⑦, ⑧, and ⑨, are located on top of the tuning condenser gang, adjustment made by means of the fibre wrench. Set the signal generator at 1500 K. C., tune in the signal at 1500 on dial and adjust these condensers in the order given, to give maximum output reading. ⑦ is located on the section nearest the front and ⑧ on the center section.

OSCILLATOR—LOW FREQUENCY—This is condenser ⑫ (see Figs. 3 and 4) located underneath chassis and accessible from underneath. Use the fibre wrench. Set signal generator switch at 600, tune in the signal at 600 on the dial and adjust condenser to maximum.

ANT. AND OSC. H. F.—SHORTWAVE—The crystal controlled signal generator is used for these adjustments. These are condensers ② (Ant. H. F.) and ③ (Osc. H. F.) located underneath chassis, and adjusted from underneath. The fundamental frequency of the Philco Model 091 crystal controlled signal generator is 3600 K. C. or 3.6 megacycles. The third harmonic of this is 10.8 M. C. Turn the waveband switch of the set to the right and the dial to just below 11 M. C. The 10.8 harmonic should be picked up here and the two condensers should be adjusted to give maximum reading on the output meter, on this signal.

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