

PHILCO

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Service Bulletin—No. 188

Models 34 and 34A

Philco models 34 and 34A are superheterodyne "all wave" receivers designed for reception of both broadcast and short wave stations; they operate from batteries as a source of power. Model 34 is intended for use with a 2-volt storage battery and a dry B-and-C battery unit; model 34A uses a dry A battery in connection with the dry B-and-C unit.

Model 34 uses seven tubes; model 34A has in addition a ballast tube (type 1-C-1). The chassis of the two sets are identical, but the model 34 when shipped has a jumper wire across the filament contacts of the ballast tube (1-C-1), socket. This wire should be left in place as long as the set is operated on the storage battery. In model 34A the jumper wire is removed and the ballast tube (1-C-1) must be in place at all times.

Model 34 uses the following Philco low-current-drain 2-volt tubes:

Detector Oscillator.....	1C6
Intermediate Frequency (2).....	34
2nd Detector.....	30
1st A.F.....	32
Driver.....	30
Output.....	19
Ballast (34A only).....	1-C-1

Model 34 is intended for use with the Philco type 172-R 2-volt storage A battery, model 34A uses Philco type 896 dry A battery. Both sets use the Philco type P968 combination B & C battery unit.

The current drain is: A battery—750 milliamperes; B battery—16 to 19 milliamperes. The ballast tube used in the model 34A keeps the voltage delivered by the dry A battery to the filament at nearly two volts at all times.

The Intermediate Frequency of the set is 460 Kilocycles. The range of receivable frequencies is 520 to 22,000 K.C.

Table 1—Tube Socket Data*

CIRCUIT	Det.-Osc.	1st I. F.	2nd I. F.	2nd Det.	1st A. F.	Driver	Output
TYPE TUBES	1C6	34	34	30	32	30	19
Filament Volts.....	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Plate Volts.....	P-135 G2-120	135	135	..	40	135	135
Screen Grid Volts.....	67½	67½	67½	..	35	..	..

*The above values were obtained from the underside of the chassis, using test prods and leads, with a high-resistance multi-range D. C. voltmeter. The Philco Model 048 All Purpose Set Tester is highly recommended for all tests of this character. Receiver volume control at maximum; station selector at 520 kilocycles. Readings taken with a plug-in adapter will not be satisfactory.

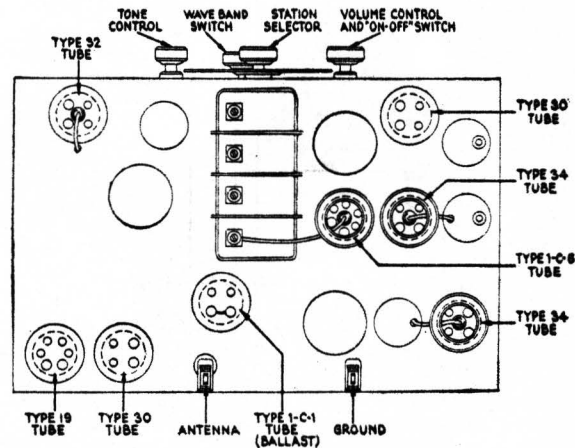


FIG. 1—Top View of Chassis

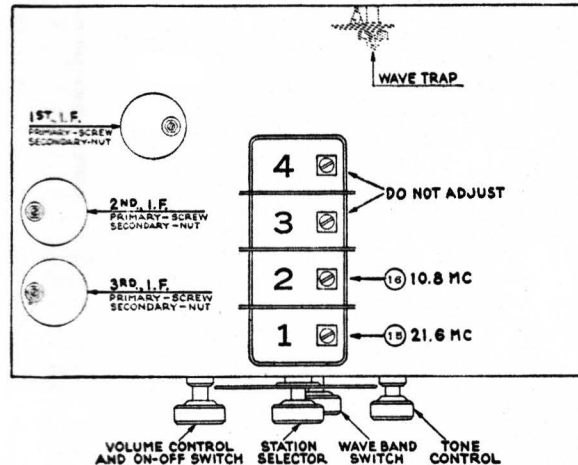


FIG. 2—Position of Compensating Condensers Reached from Above Chassis

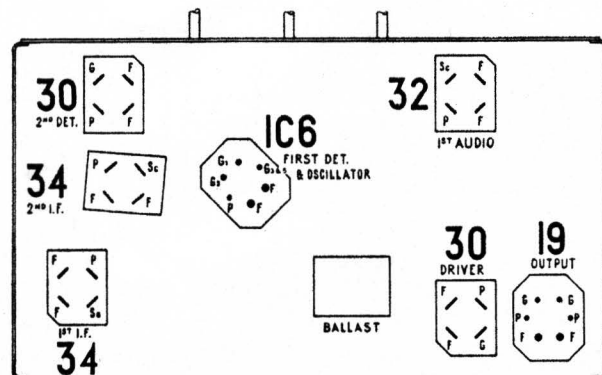


FIG. 3—Tube Socket Layout (View of Underside)

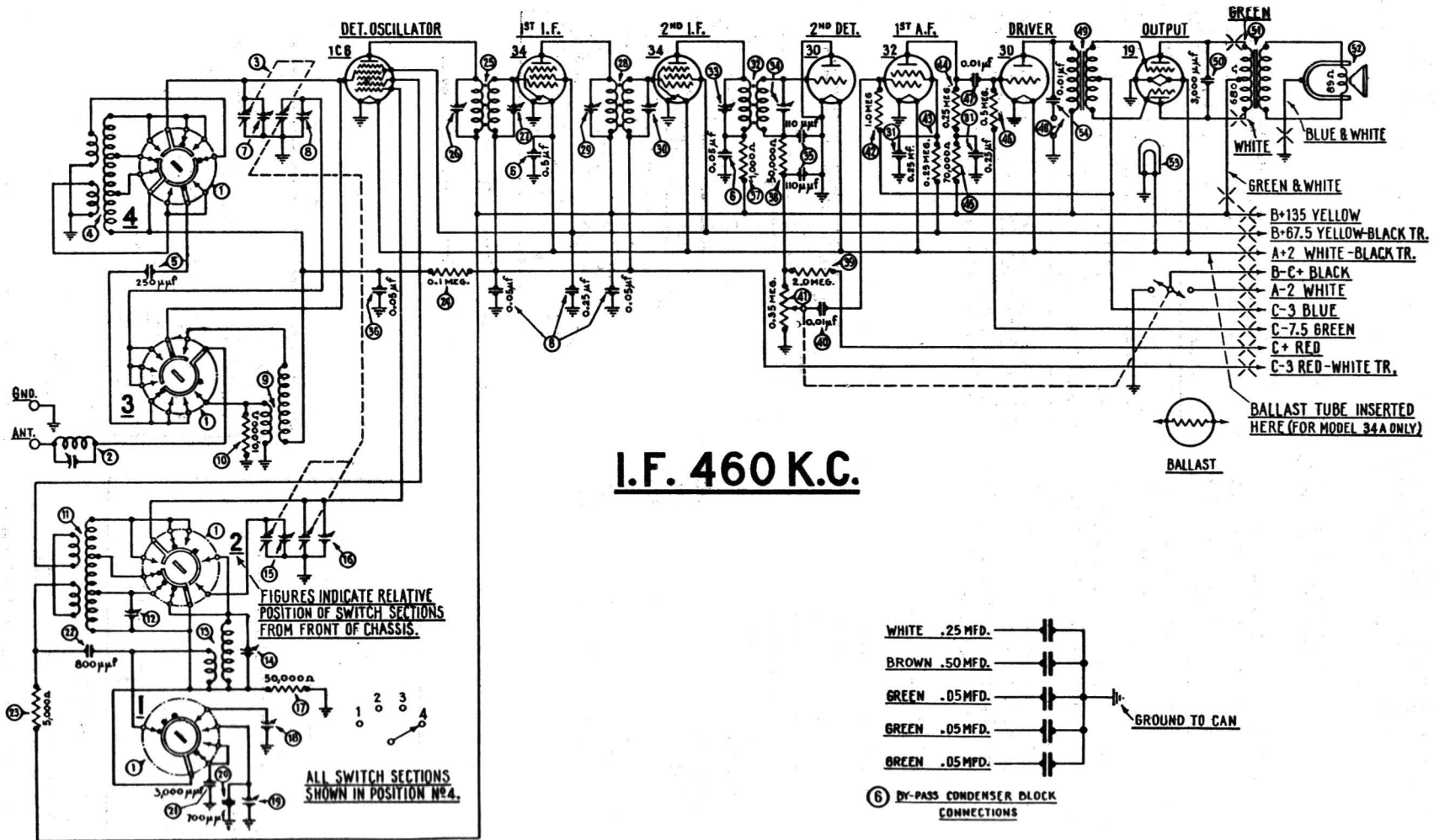


FIG. 4—Schematic Wiring Diagram

NOTE: Output transformer is mounted on receiver (under chassis) instead of on speaker as indicated in diagram. Also speaker magnet is not grounded.

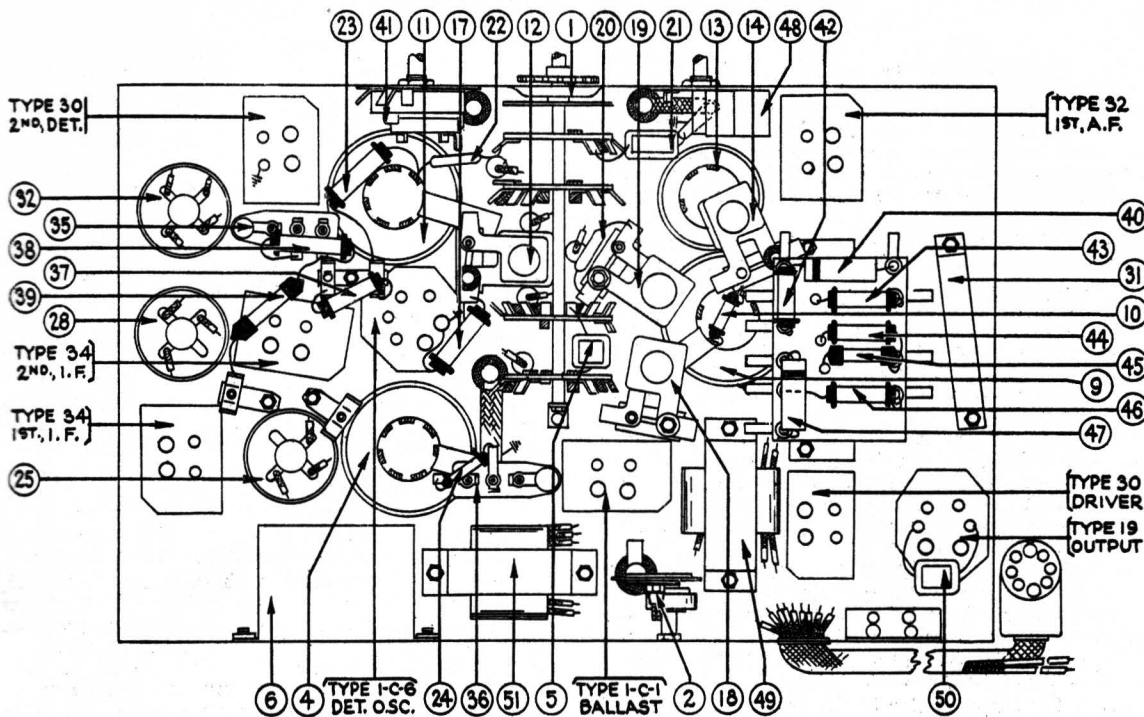


FIG. 5—Bottom View of Chassis, Showing Parts, and Position of Compensating Condensers Reached from Below Chassis

MODEL 34 PARTS

No. on Figs.	Description	Part No.	List Price Each	No. on Figs.	Description	Part No.	List Price Each
1	Wave-Band Switch.....	42-1045	\$3.60	38	Condenser (.00011 mfd. twin).....	8035-C	\$0.25
2	Wave Trap.....	38-5199	.30	39	Condenser (.05 mfd.).....	3615-J	.35
3	Tuning Condenser Assembly.....	31-1153	6.25	37	Resistor (1,000 ohms—Brown-Black-Red).....	5837	.25
4	Antenna Transformer (H. F. Bands).....	32-1271	.70	38	Resistor (50,000 ohms—Green-Brown-Orange).....	4518	.25
5	Condenser (.00025 mfd.).....	3082	.35	39	Resistor (2 meg.—Red-Black-Green).....	5872	.25
6	By-pass Condenser Block (.25-.5-.05-.05 mfd.).....	30-4151	1.00	40	Condenser (.01 mfd.).....	30-4124	.25
7	Compensating Condenser (Ant. H. F.).....	Part of 3	....	41	Volume Control and On-Off Switch.....	33-5064	1.45
8	Compensating Condenser (Ant. B'cst).....	Part of 3	....	42	Resistor (1.0 meg.—Brown-Black-Green).....	4409	.25
9	Antenna Transformer (Broadcast).....	32-1270	.55	43	Resistor (330,000 ohms—Orange-Orange-Yellow).....	4410	.25
10	Resistor (10,000 ohms—Brown-Black-Orange).....	33-1000	.25	44	Resistor (.25 meg.—Red-Yellow-Yellow).....	6046	.25
11	Oscillator Transformer (H. F. Bands).....	32-1273	.35	45	Resistor (70,000 ohms—Violet-Black-Orange).....	5385	.25
12	Compensating Condenser (Range 2).....	04000-C	.15	46	Resistor (.5 meg.—Yellow-White-Yellow).....	4517	.25
13	Oscillator Transformer (Broadcast).....	32-1272	.70	47	Condenser (.01 mfd.).....	30-4124	.25
14	Compensating Condenser (Osc. Range 1).....	04000-A	.15	48	Tone Control.....	30-4152	.50
15	Compensating Condenser (Osc. Range 4).....	Part of 3	....	49	Audio (Input) Transformer.....	7233	1.80
16	Compensating Condenser (Osc. Range 3).....	Part of 3	....	50	Condenser (.003 mfd.).....	7301	.45
17	Resistor (50,000 ohms—Green-Brown-Orange).....	4518	.25	51	Output Transformer.....	32-7223	1.50
18	Compensating Condenser (Broadcast; Series).....	04000-S	.35	52	Voice Coil & Cone Assembly (KR-6).....	36-3157	.50
19	Compensating Condenser (Range 2; Series).....	04000-R	.45	53	Pilot Lamp.....	5316	.35
20	Condenser (.0007 mfd.).....	5833	.35	54	Condenser (.01 mfd.).....	Part of 48	....
21	Condenser (.003 mfd.).....	6009	.60		Pilot Lamp Bracket.....	38-5633	.55
22	Condenser (.0008 mfd.).....	6021	.35		Battery Cable.....	41-3083	2.00
23	Resistor (5,000 ohms—Green-Black-Red).....	5310	.25		Tube Shield (1).....	28-1107	.10
24	Resistor (100,000 ohms—White-White-Orange).....	6099	.25		Tube Shield (2).....	8005	.06 ea.
25	First I. F. Transformer.....	32-1341	1.35		Six Prong Socket.....	7547	.11
26	Compensating Condenser (1st I. F. Pri.).....	31-6007,	....		Four Prong Socket.....	7544	.10
		Inc. as	....		Speaker Socket.....	4957	.10
27	Compensating Condenser (1st I. F. Sec.).....	part of 25	....		Knob (Medium).....	03063	.10
28	Second I. F. Transformer.....	32-1341	1.35		Knob (Small).....	03064	.10
29	Compensating Condenser (2nd I. F. Pri.).....	31-6007,	....		Knob (Large).....	27-4025	.10
		Inc. as	....		Dial Assembly.....	31-1162	1.25
30	Compensating Condenser (2nd I. F. Sec.).....	part of 28	....		Dial Scale.....	27-5089	.60
31	Condenser (.25-.25 mfd.) (By-pass).....	30-4150	.70		Idle Shaft Assembly.....	31-1056	.25
32	3rd I. F. Transformer.....	32-1342	1.35		Gear (Wave-Band Switch).....	28-7012	.20
33	Compensating Condenser (3rd I. F. Pri.).....	31-6007,	....		Mounting Bolt.....	W-587	3.00 per C.
		Inc. as	....		Mounting Washer (Rubber).....	5189	.04
34	Compensating Condenser (3rd I. F. Sec.).....	part of 32	....		Mounting Washer (Steel).....	5058	.85 per C.

ADJUSTING MODEL 34

The compensating condensers of Model 34 have been adjusted accurately before shipment. If later adjustment is required, in most cases only the intermediate frequency and low frequency compensating condensers should be done. Extreme care must be given the adjustment of the high frequency circuits, and the adjustment should NOT be undertaken unless the receiver is seriously out of alignment.

DO NOT ATTEMPT TO ADJUST the compensating condensers mounted upon sections numbered 3 and 4 of the Tuning Condenser Assembly. These have been adjusted, and sealed, at the factory.

Philco Model 048 All-Purpose Set Tester, which incorporates a signal generator covering broadcast and police band frequencies, is recommended for the adjustment of the intermediate frequency and low frequency compensating condensers.

Philco Model 091 crystal-controlled Signal Generator is recommended for the high frequency adjustments. It gives an accurate and constant 3600 kilocycle (3.6 megacycle) signal, the harmonics of which include the necessary high frequencies for adjusting the compensating condensers in the high frequency circuits.

1—ADJUSTMENT OF THE INTERMEDIATE FREQUENCY—Remove the grid clip from the type 1C6 tube and connect the "ANT" output terminal of the signal generator to the grid cap of the tube. Connect the "GND" terminal of the signal generator to the "GND" terminal of the receiver chassis.

Connect the output meter to the primary terminals of the output transformer. Set the signal generator at 460 K.C. (the intermediate frequency of Model 34) and adjust each of the I.F. compensating condensers in turn, to give maximum response in the output of the receiver. The location of the I.F. compensating condensers is shown in Figure 2. Each of these transformers has a dual compensating condenser mounted at its top, and accessible thru a hole in the top of the coil shield. In the dual compensators, the Primary circuit is adjusted by turning the screw; the Secondary circuit is adjusted by turning the hex-head nut.

2—ADJUSTMENT OF THE WAVE TRAP—Replace the grid clip upon the Detector-Oscillator tube (Type 1C6). Connect the output leads from the signal generator directly to the antenna and ground terminals of the receiver. Set the Wave-Band Switch of the receiver to the standard broadcast band (Range 1) and the Station Selector at the low frequency (520 K.C.) end. Adjust the Wave Trap ② condenser to give MINIMUM response to a 460 K.C. signal from the signal generator. The Wave Trap ② is located at rear and underneath the chassis, and is shown in Figures 2 and 5. It is reached from the rear of the chassis.

3—ADJUSTMENT OF THE DIAL FREQUENCIES—Model 34 has four separate frequency bands or ranges, each obtained by one of the four positions of the wave-band switch. There is a compensating condenser for each

range, which must now be adjusted. In the following procedure, the frequency ranges referred to, and obtained by the different positions of the switch are:

Range 1.....520 K.C.—1500 K.C.

Range 2.....1.5 M.C.—4.0 M.C.

Range 3.....4.0 M.C.—11.0 M.C.

Range 4.....11.0 M.C.—23.0 M.C.

Connect the output terminals of the Model 091 or equivalent Signal Generator, to the "ANT" and "GND" terminals of the receiver chassis. Connect an output meter to the primary terminals of the Output Transformer of the receiver. Set the Wave-Band Switch to Range 4, and the Station Selector at 21.6 M.C. The sixth harmonic of the 3.6 M.C. crystal in the Model 091 Signal Generator is picked up at this point. Adjust the compensating condenser ⑮ on Section 1 of Tuning Condenser for maximum response in the output of the receiver.

Turn the Wave-Band Switch to Range 3, and the Station Selector to 10.8 M.C. Here, the third harmonic of the 3.6 M.C. crystal will be heard. Adjust the compensating condenser ⑯ on Section 2 of Tuning Condenser for maximum response in the output of the receiver.

Turn the Wave-Band Switch to Range 2, and adjust the Station Selector to 3.6 M.C. The "Antenna" connection between the Signal Generator and the receiver chassis must be removed for this adjustment, otherwise the output of the Signal Generator will be too great. Adjust the compensating condenser ⑰ to give maximum response in the output circuit. This compensating condenser is located underneath the chassis and is not accessible from above. See Figure 5.

This concludes adjustments requiring the Model 091 (or equivalent) high frequency signal generator.

The Model 048 or its equivalent is now used again. Turn the Wave-Band Switch of the set to Range 2 and the Station Selector to 1.5 M.C. Set the Signal Generator at 1500 K.C. Make sure the "Antenna" connection between the Signal Generator and the Chassis has been restored. Adjust compensating condenser ⑱ located underneath the chassis, (Figure 5). Adjustment is made from the underside of the chassis.

Tune the Wave-Band Switch to Range 1 and the Station Selector to 1400 K.C. Set the Signal Generator at 1400 K.C. Adjust compensating condenser ⑲, which is located underneath the chassis. (See Figure 5). This adjustment is made from the underside of chassis.

Finally, with Wave-Band Switch at Range 1, and Station Selector at 520 K.C., set the Signal Generator at 520 K.C. and adjust compensating condenser ⑳ (Figure 5). This compensating condenser is also mounted underneath the chassis, and reached from below.

For proper and accurate adjustment of Model 34, the procedure must be followed exactly in the order given. The adjustment should not be undertaken without proper equipment as mentioned above.

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