

PHILCO

REG. U.S. PAT. OFF

Service Bulletin—No. 176

Model 44

PHILCO MODEL 44 is a six-tube superheterodyne broadcast and short wave receiver. It operates on alternating current. The intermediate frequency is 460 kilocycles. The receiver has automatic volume control. A four-point wave-band switch covers the following ranges:

- (1) 520 K.C. to 1500 K.C.
- (2) 1.5 M.C. to 4.0 M.C.
- (3) 4.0 M.C. to 11.0 M.C.
- (4) 11.0 M.C. to 23.0 M.C.

The radio receiver uses the high-efficiency 6.3 volt tubes. A Philco Type 6A7 dual-purpose tube is used as Detector-Oscillator; a Type 78 is used for the 1st I.F. stage, a Type 78 for 2nd I.F., a Type 75 as 2nd Detector and 1st A.F., and a Type 42 as output. The Rectifier is a Type 80 tube. The power consumption of Model 44 is 65 watts.

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

CIRCUIT	Det.-Osc.	1st I.F.	2nd I.F.	2nd Det. and 1st A.F.	Output	Rectifier
TUBE TYPE	6A7	78	78	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.....	260	260	255	165	250	350
Screen Grid Volts—SG to K (Type 6A7—G-3-5 to K).....	50	85	85	...	260	...
Control Grid Volts—CG to K (Type 6A7—G-4 to K).....	.4	.4	.35	.2	.5	...
Cathode Volts—K to F.....	2.2	2.1	1.9	0	0	...
Type 6A7—G-1 to K.....	20	...	...	...	...	...
Type 6A7—G-2 to K.....	168	...	...	...	...	...

*The values in Table 1 were gotten with an A.C. voltmeter for filament voltages and a high-resistance D.C. voltmeter for all others. The values were gotten from the underside of the chassis with test prods and leads. The PHILCO MODEL 048 ALL-PURPOSE SET TESTER IS RECOMMENDED FOR THIS USE. The Volume Control was at maximum (all the way to right) and the Station Selector was adjusted to 520 K.C.—(with Wave Band Switch all the way to left),—when these readings were taken. NOTE: Values obtained with a plug-in adaptor will NOT be reliable.

DO NOT ATTEMPT TO ADJUST COMPENSATING CONDENSERS MOUNTED ON SECTIONS 3 AND 4 OF TUNING CONDENSER. (FIG. 2).

Table 2—Power Transformer Data

Terminal	A.C. Volts	Circuit	Color
1-2	105-125	Primary	White
3-5	6.3	Filaments	Black
6-7	5.0	Filament of 80	Blue
8-10	680	Plates of 80	Yellow
4	.....	Center Tap of 3-5	Black—Yellow Tracer
9	.....	Center Tap of 8-10	Yellow—Green Tracer

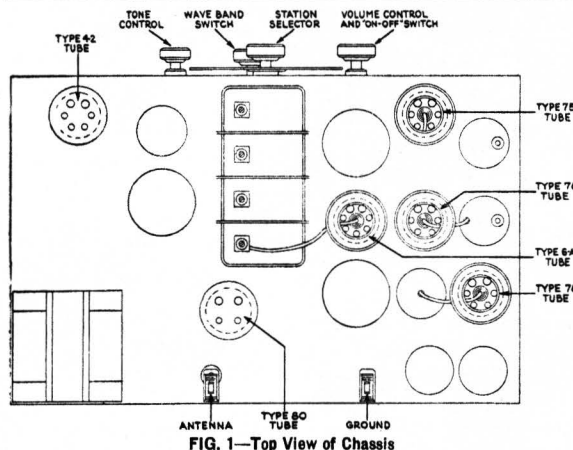


FIG. 1—Top View of Chassis

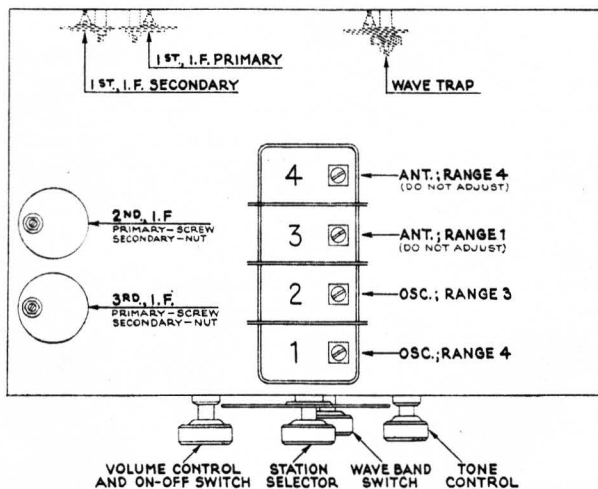
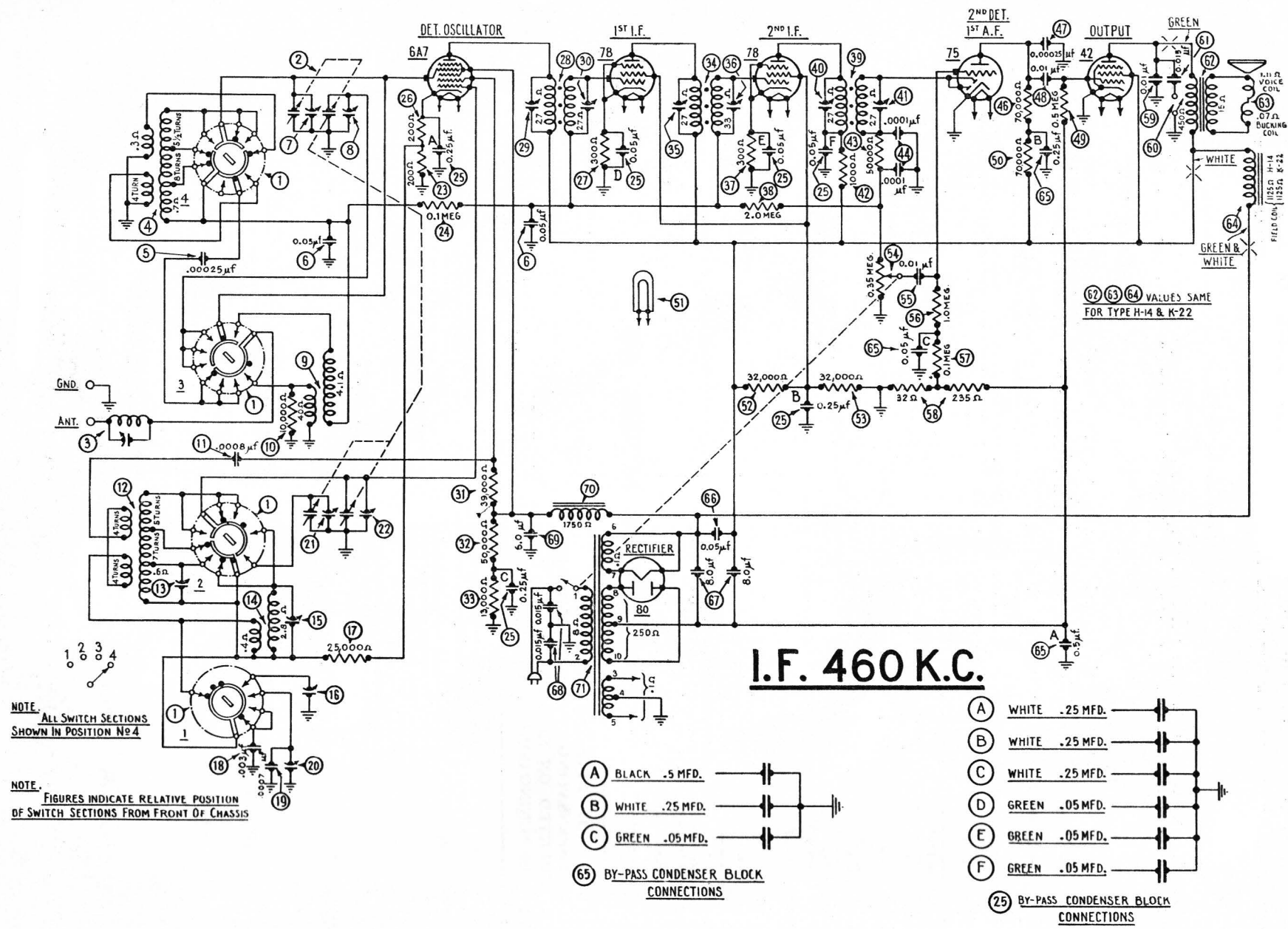


FIG. 2—Position of Compensating Condensers Reached from Above Chassis



Terminal Arrangement of Tube Sockets Viewed From Under Side of Chassis



I.F. 460 K.C.

NOTE. ALL SWITCH SECTIONS SHOWN IN POSITION No 4

NOTE. FIGURES INDICATE RELATIVE POSITION OF SWITCH SECTIONS FROM FRONT OF CHASSIS

- (A) BLACK .5 MFD.
- (B) WHITE .25 MFD.
- (C) GREEN .05 MFD.
- (65) BY-PASS CONDENSER BLOCK CONNECTIONS

- (A) WHITE .25 MFD.
- (B) WHITE .25 MFD.
- (C) WHITE .25 MFD.
- (D) GREEN .05 MFD.
- (E) GREEN .05 MFD.
- (F) GREEN .05 MFD.
- (25) BY-PASS CONDENSER BLOCK CONNECTIONS

FIG. 3—Schematic Wiring Diagram

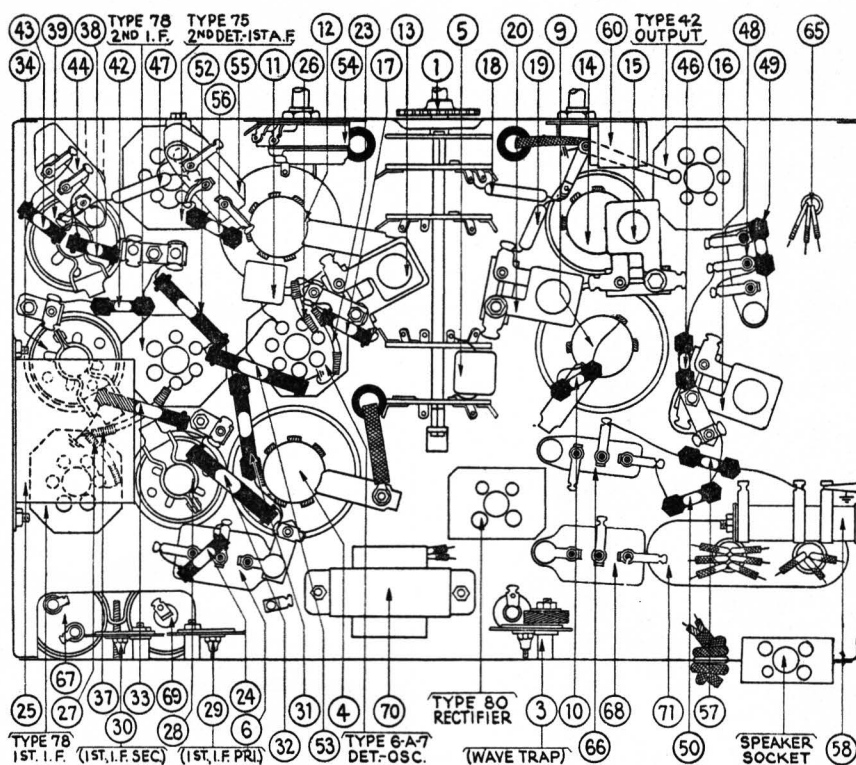


FIG. 4—Bottom View of Chassis, Showing Parts, and Position of Compensating Condensers Located,—and Reached,—from Below Chassis,

ADJUSTING MODEL 44

DO NOT ATTEMPT TO ADJUST the compensating condensers of Model 44 unless full instruction has been received in the actual adjustment.

Each of the compensating condensers of Model 44 has 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.

The adjustment of Model 44 is the same generally as that described in Service Bulletin No. 120-C, "Adjusting Philco Superheterodynes".

DO NOT ATTEMPT TO ADJUST the compensating condensers mounted upon sections numbered 3 and 4 of the Tuning Condenser Assembly (2). These have been adjusted, and sealed, at the Factory.

Philco Model 048 All-Purpose Set Tester is recommended for the adjustment of the intermediate frequency and low frequency compensating condensers, and for any adjustments requiring the use of an accurately calibrated signal generator supplying a signal between the frequency limits of 105 kilocycles and 2000 kilocycles. The Model 048 Set Tester is extremely useful in many other tests.

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.

PHILCO MODEL 44 is adjusted:

ADJUSTMENT OF THE INTERMEDIATE FREQUENCY—

The "ANT" output terminal of the signal generator (Model 048 Set Tester) is connected to the grid cap of the Detector-Oscillator tube (Type 6A7),—after removing the grid clip. The "GND" output terminal (of the Model 048) is connected to the "GND" terminal of the receiver chassis.

The output meter is connected to the primary terminals of the Output Transformer. Set the signal generator of the Model 048 at 460 K.C.,—the intermediate frequency of Model 44,—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 and Figure 4. Figure 2 shows the position of the compensating condensers of the 2nd, I.F. Transformer (34) and of the 3rd, I.F. Transformer (39). Each of these transformers has its dual compensating condenser mounted at its top, and accessible through a hole in the top of the coil shield. In the dual compensators, the Primary circuit is adjusted by the SCREW; the Secondary circuit is adjusted by the hex-head nut. The adjustment of the primary and secondary circuits of the 1st, I.F. Transformer (25) is made by means of two single compensating condensers (29) and (30) mounted underneath, and at the rear of the chassis and accessible from the rear. They are shown in Figures 2 and 4.

ADJUSTMENT OF THE WAVE TRAP—

Replace the grid clip upon the Detector-Oscillator tube (Type 6A7). Connect the output of the signal generator (Model 048) to the antenna and ground terminals of the receiver. Set the Wave-Band Switch (1) of the Model 44 to the standard broadcast band (520-1500 K.C.) (Range 1), and the Station Selector at the low frequency (520 K.C.) end. Adjust the Wave Trap (3) condenser to give minimum response to a 460 K.C. signal from the Model 048's signal generator. The Wave

Trap (3) is located at rear and underneath the chassis, and is shown in Figures 2 and 4. It is reached from the rear of the chassis.

ADJUSTMENT OF THE DIAL FREQUENCIES—

In the following procedure, the frequency ranges 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.

The Tuning Condenser (2) has four sections. The individual compensating condensers are shown in Figure 2. They also are identified as numbered sections 1 to 4 inclusive, with 1 as the front section.

Do not attempt to adjust Compensating Condensers on Sections 3 and 4.

Connect the output terminals of the Model 091 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. The meter of Model 048 may be used as Output Meter. Set the Wave-Band Switch (1) 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 (21) on Section 1 of Tuning Condenser to give maximum response in the output of the receiver, measured with the output meter.

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 gotten. Adjust the compensating condenser (22) 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. The output of the Signal Generator will be too great, otherwise. Adjust the compensating condenser (13) to give maximum response in the output circuit. This compensating condenser is located underneath the chassis and is not accessible from above. See Figure 4.

The Model 048 Set Tester is used again. Turn the Wave-Band Switch to Range 2, Station Selector to 1.5 M.C. Set the Signal Generator (Model 048) at 1500 K.C. (1.5 M.C.). The "Antenna" connection between the Signal Generator and the chassis should be restored. Adjust compensating condenser (20), located underneath the chassis, (Figure 4). Adjustment is possible from the underside of the chassis.

Place the Wave-Band Switch at Range 1, and the Station Selector to 1400 K.C. Set the Signal Generator (Model 048) at 1400 K.C. Adjust the compensating condenser (16), which is located underneath the chassis. See Figure 4. This adjustment is possible from the underside of chassis.

With Wave-Band Switch at Range 1, and Station Selector at 520 K.C., set the Signal Generator of the Model 048 at 520 K.C., and adjust the compensating condenser (19), (Figure 4). This compensating condenser is mounted underneath the chassis, and is reached from below.

For proper and accurate adjustment of Model 44, the procedure must be followed exactly in the order given. The adjustment should not be undertaken without full information and proper equipment. Your Distributor can supply both.

REPLACEMENT PARTS FOR MODEL 44

(THESE PRICES ARE EFFECTIVE SEPTEMBER 15, 1933)

No. on Figs.	Description	Part No.	List Price	No. on Figs.	Description	Part No.	List Price
①	Wave-Band Switch.....	42-1045	.....	④⑥	Resistor (70,000) (Violet-Black-Orange).....	5385	\$.24
②	Tuning Condenser Assembly.....	31-1106	.....	④⑦	Condenser (.00025).....	5858	.19
③	Wave Trap.....	38-5199	\$.30	④⑧	Condenser (.01).....	3903-AN	.24
④	Antenna Transformer (H. F. Bands).....	32-1271	.....	④⑨	Resistor (.5 meg.) (Yellow-White-Yellow).....	4517	.24
⑤	Condenser (.00025).....	5858	.19	⑤⑩	Resistor (70,000) (Violet-Black-Orange).....	5385	.24
⑥	Condenser (Double) (.05-.05).....	3615-AM	.24	⑤⑪	Pilot Lamp (Station Selector).....	6608	.14
⑦	Compensating Condenser (Ant.; H. F.) (Part of ②).....	.....	.....	⑤⑫	Resistor (32,000) (Orange-Red-Orange).....	3525	.24
⑧	Compensating Condenser (Ant.; B'dc'st.) (Part of ②).....	.....	.....	⑤⑬	Resistor (32,000) (Orange-Red-Orange).....	3525	.24
⑨	Antenna Transformer (B'dc'st. Bands).....	32-1270	.....	⑤⑭	Volume Control and "On-Off" Switch.....	33-5025	.....
⑩	Resistor (10,000) (Brown-Black-Orange).....	4412	.24	⑤⑮	Condenser (.01).....	3903-J	.24
⑪	Condenser (.0008).....	5878	.24	⑤⑯	Resistor (1.0 meg.) (Brown-Black-Green).....	4409	.24
⑫	Oscillator Transformer (H. F. Bands).....	32-1273	.....	⑤⑰	Resistor (.1 meg.) (White-White-Orange).....	4411	.24
⑬	Compensating Condenser (Range 2).....	04000-C	.10	⑤⑱	Voltage Divider Resistor.....	33-3037	.....
⑭	Oscillator Transformer (B'dc'st. Bands).....	32-1272	.....	⑤⑲	Condenser (.01) (Part of ⑥⑩).....	.....	.....
⑮	Compensating Condenser (Osc.; Range 1).....	04000-A	.14	⑥⑩	Tone Control.....	30-4080	.....
⑯	Compensating Condenser (B'dc'st.; Series).....	04000-S	.30	⑥⑪	Condenser (.015) (Part of ⑥⑩).....	.....	.....
⑰	Resistor (25,000) (Red-Green-Orange).....	4516	.24	⑥⑫	Output Transformer (H-14).....	2580	1.50
⑱	Condenser (.003).....	6009	.36	⑥⑬	Voice Coil and Cone Assembly (H-14).....	02625	.66
⑲	Condenser (.0007).....	5863	.22	⑥⑭	Speaker Field Coil and Pot Assembly (H-14).....	02767	2.70
⑳	Compensating Condenser (Range 2; Series).....	04000-R	.42	⑥⑮	By-pass Condenser Block (3-section).....	30-4087	.....
㉑	Compensating Condenser (Osc.; Range 4) (Part of ②).....	.....	.....	⑥⑯	Condenser (.05).....	3615-H	.24
㉒	Compensating Condenser (Osc.; Range 3) (Part of ②).....	.....	.....	⑥⑰	Condenser (Electrolytic) (Double) (8.0-8.0).....	30-2028	.....
㉓	Resistor (200) (Flexible Wire-Wound) (Red-Black-Brown).....	7217	.18	⑥⑱	Condenser (Double) (.015-.015).....	3793-H	.24
㉔	Resistor (.1 meg.) (White-White-Orange).....	4411	.24	⑥⑲	Condenser (Electrolytic) (6.0).....	30-2020	1.00
㉕	By-pass Condenser Block (6-section).....	30-4077	.....	⑦⑩	Filter Choke.....	5930	1.68
㉖	Resistor (200) (Flexible Wire-Wound) (Red-Black-Brown).....	7217	.18	⑦⑪	Power Transformer (50-60 cycle).....	32-7137	.....
㉗	Resistor (300) (Flexible Wire-Wound) (Orange-Black-Brown).....	33-3010	.18	.....	Tube Shield.....	28-1107	.12
㉘	1st. I. F. Transformer.....	32-1274	.....	.....	Four-Prong Tube Socket.....	7544	.07
㉙	Compensating Condenser (1st. I. F. Pri.).....	04000-J	.24	.....	Six-Prong Tube Socket.....	7547	.12
㉚	Compensating Condenser (1st. I. F. Sec.).....	04000-J	.24	.....	Seven-Prong Tube Socket.....	27-6005	.12
㉛	Resistor (39,000) (Orange-White-Orange).....	33-1027	.24	.....	Speaker Socket.....	4957	.10
㉜	Resistor (50,000) (Green-Brown-Orange).....	5868	.42	.....	Dial Scale (Station Selector).....	27-5028	.....
㉝	Resistor (13,000) (Brown-Orange-Orange).....	3766	.24	.....	Drum Assembly (Tuning Condenser).....	31-1055	.....
㉞	2nd. I. F. Transformer.....	32-1306	.....	.....	Idle Shaft Assembly (Tuning Condenser).....	31-1056	.....
㉟	Compensating Condenser (2nd. I. F. Pri.).....	31-6007,	.....	.....	Tuning Shaft Assembly (Tuning Condenser).....	31-1057	.....
㊱	Compensating Condenser (2nd. I. F. Sec.).....	(included as part of ㉞)	.....	.....	Gear (Wave-Band Switch).....	28-7012	.....
㊲	Resistor (300) (Flexible Wire-Wound) (Orange-Black-Brown).....	33-3010	.18	.....	Knob (large).....	27-4025	.....
㊳	Resistor (2.0 meg.) (Red-Black-Green).....	5872	.24	.....	Knob (medium).....	03063	.10
㊴	3rd. I. F. Transformer.....	32-1307	.....	.....	Knob (small).....	03064	.07
㊵	Compensating Condenser (3rd. I. F. Pri.).....	31-6007,	.....	.....	Knob Spring.....	5262	.42 per C
㊶	Compensating Condenser (3rd. I. F. Sec.).....	(included as part of ㉞)	.....	.....	Knob Screw (Brass) (Secures large knob to shaft).....	W-267	.53 per C
㊷	Resistor (1,000) (Brown-Black-Red).....	5837	.24	.....	Bezel.....	27-4039	.....
㊸	Resistor (50,000) (Green-Brown-Orange).....	4518	.24	.....	Bezel Mounting Screw.....	W-841	.....
㊹	Condenser (Double) (.0001-.0001).....	8035-K	.25	.....	Bezel Felt.....	6732	.25 per C.
				.....	Mounting Bolt (Chassis).....	W-567	2.88 per C.
				.....	Mounting Washer (Chassis) (Rubber).....	5189	.04
				.....	Mounting Washer (Chassis) (Steel).....	5058	.82 per C.
				.....	Speaker (K-22) (Baby Grand Only):		
				.....	Output Transformer.....	2580	1.50
				Voice Coil and Cone Assembly.....	36-3174
				Speaker Field Coil and Pot Assembly.....	02767	2.70

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