

# PHILCO . . . . . Models 38-4 & 38-5—Code 121



## SERVICE BULLETIN No. 281 for members of RADIO MANUFACTURERS SERVICE

A PHILCO Service Plan

### Electrical Specifications

**TYPE CIRCUIT:** An eight tube A.C. operated super-heterodyne circuit is incorporated in these receivers with features, such as Philco foreign tuning system; a high gain R.F. amplifier; two tuning ranges; iron core adjusted I.F. transformers; automatic volume control; bass compensation, and a pentode push-pull audio output circuit.

The same circuit is used in both models. The features, however, such as tuning mechanism; speaker, and cabinets differ in each model.

**Mode. 38-4** employs the **Philco Cone-Centric Automatic Tuning System**; Type "H29" dynamic speaker unit and is assembled in a console cabinet type "XX".

**Model 38-5** differs from the 38-4 in the tuning mechanism. The tuning mechanism of this receiver is of the manually operated type with vernier control and incorporates a shadowmeter for visual tuning. The receiver is designed for a table model cabinet type "B" and a console cabinet type "X". The B cabinet utilizes a dynamic speaker type "K39" and the "X" cabinet a dynamic speaker type "H29".

POWER SUPPLY: Voltage	Frequency	Consumption
110	60 cycle	95 watts
110	25 to 40 cycle	95 watts
115/230	50 to 60 cycle	95 watts

Different transformers are required for operation on the frequencies listed above. The part numbers of these transformers are listed on page 3.

**INTERMEDIATE FREQUENCY:** 470 K. C.

**TUNING RANGES:** Two Range 1—540 to 1720 K. C.  
Range 2—5.7 to 18.2 M. C.

**UNDISTORTED OUTPUT:** 5 watts.

**PHILCO TUBES USED:** Eight—6U7G, R. F. amp.; 6A8G, Det. Osc.; 6K7G, I. F. amp.; 6J5G, 2nd Det., A.V.C.; 6K5G, 1st audio; two 6F6G, audio output; and one 5Y4G rectifier.

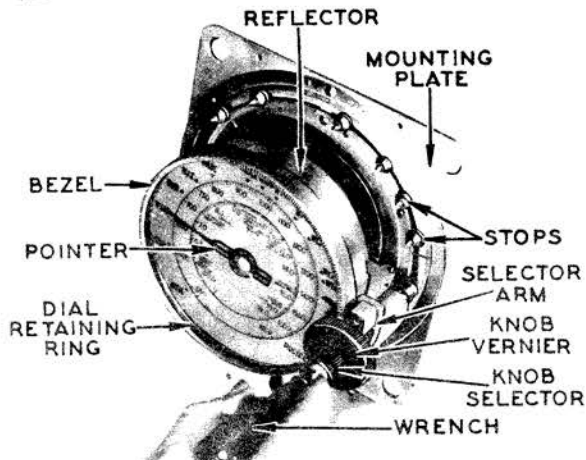


Fig. 2—Cone-Centric Automatic Tuning Mechanism, Model 4

**TONE CONTROL:** Four positions.

SPEAKERS:	37-4	37-5
B cabinet	—	K39
X cabinet	—	H29
XX cabinet	H29	—

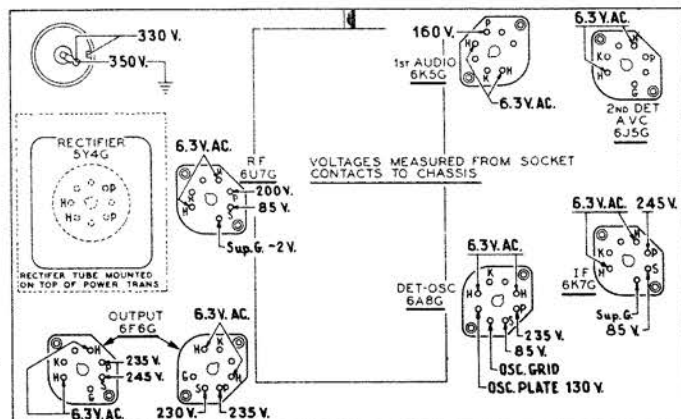


Fig. 1—Socket Voltages—Underside of Chassis View

The Voltages indicated by arrows were measured with a Philco 026 Circuit Tester which contains a sensitive voltmeter. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

### Service Data

#### FOR CONE-CENTRIC TUNING MECHANISM—MODEL 4

Complete information for setting the stations on the Cone-Centric Tuning mechanism of Model 38-4 will be found in the instruction sheet (Form No. 39-5533) which is supplied with each set.

The locations of a few assemblies of the Cone-Centric Automatic Tuning mechanism is illustrated in Fig. 2. The part numbers and prices of these assemblies are listed on page 3. A complete list of replacement parts and detailed service data for the mechanism will be found in bulletin 282.

### Aerial Connections

To obtain the full advantage of the sensitivity of these receivers, the Philco High Efficiency Aerial Part No. 40-6112 must be used.

For attaching the aerial to the receiver a terminal panel is provided at the rear of the chassis. This panel contains three screw terminals marked "Red", "Blk" and "Gnd". Connect the red and black wires of the Philco High Efficiency Aerial transmission line to the "Red" and "Blk" terminals respectively.

If you use a temporary aerial, connect it to the "Red" terminal. A good ground connection is necessary for best reception. The terminal mark "Gnd" should be connected to a water pipe or any other good ground source.

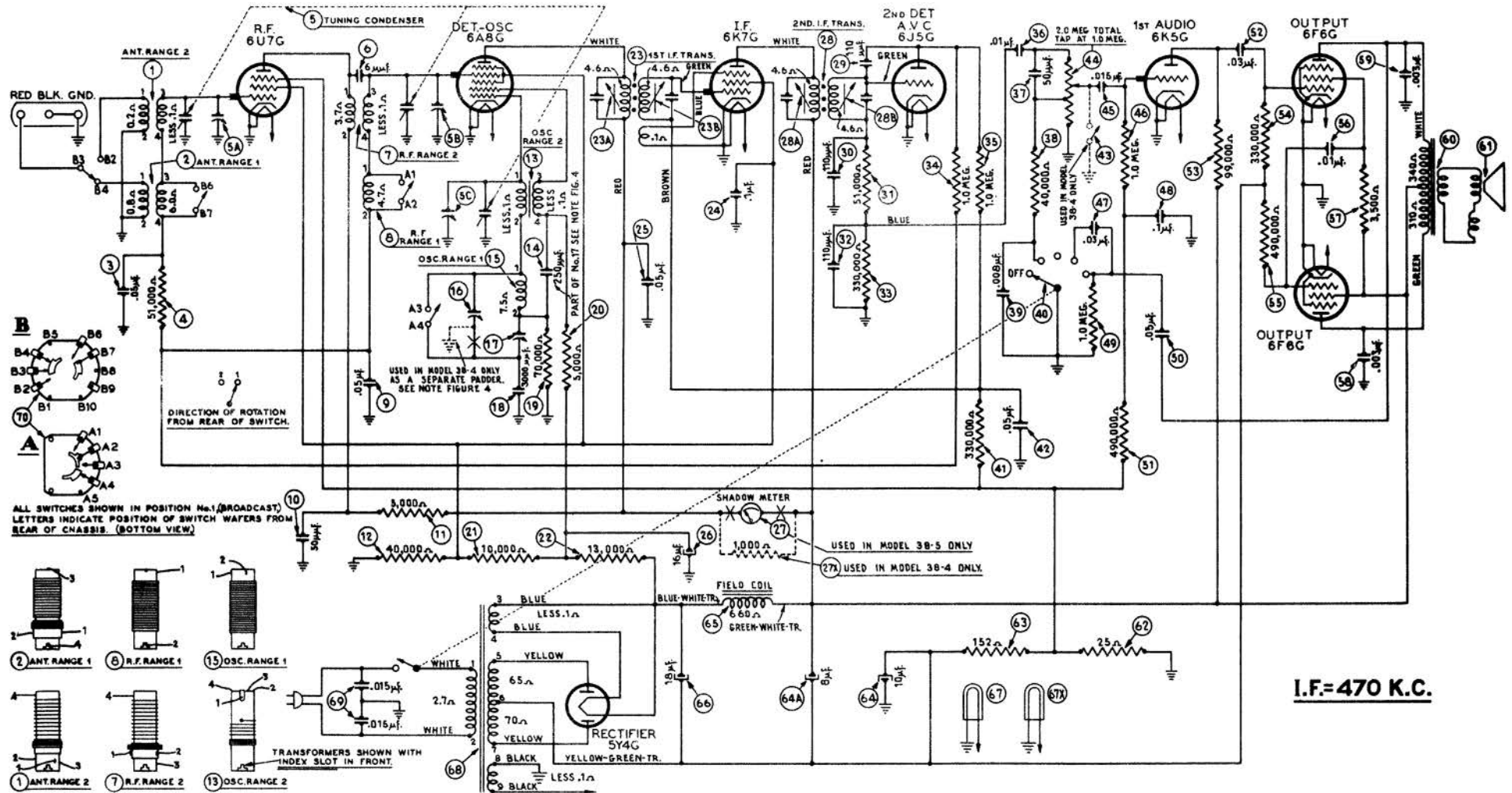


Fig. 3—SCHEMATIC DIAGRAM

Models 38-4, 38-5; Code 121

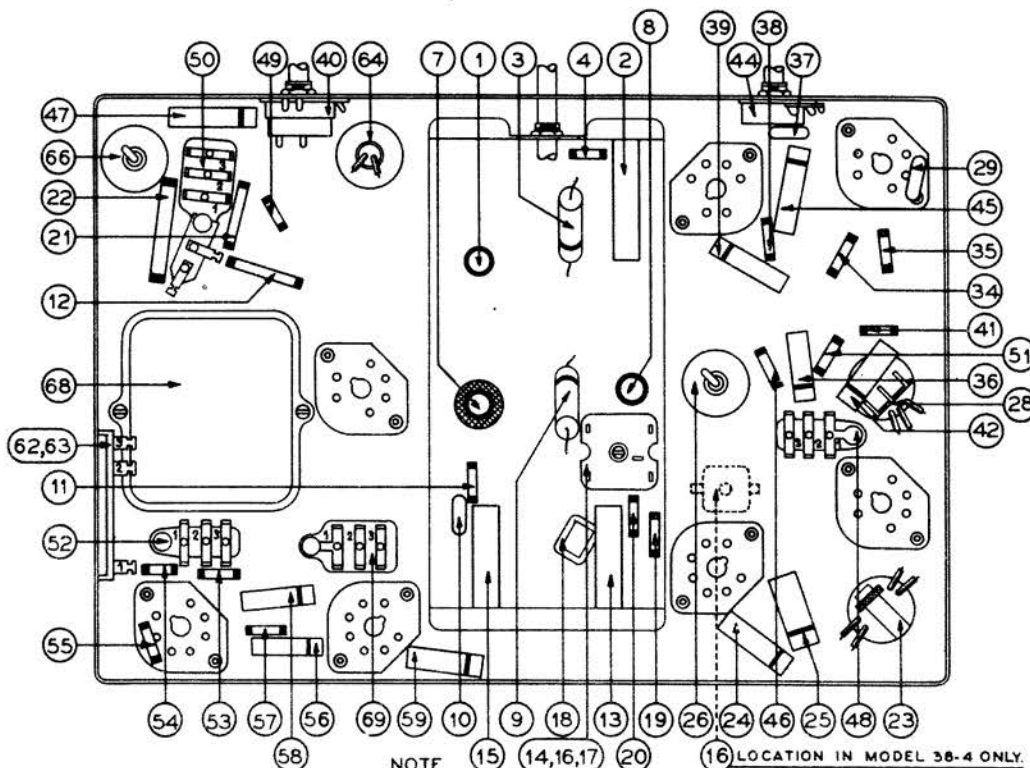


Fig. 4—Locations of Parts, Underside of Chassis

**REPLACEMENT PARTS—Models 38-4, 38-5**

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price
1	Antenna transformer (range 2)	32-2558		42	Condenser (0.05 mfd., tubular)	30-4519	\$0.20		Gear (Small) Cone-Centric	45-2490	
2	Antenna transformer (range 1)	32-2629		43	(Used on Model 38-4 only) Audio shorting switch, section of 45-2476 Selector arm				Gear (Large) Cone-Centric	45-2491	
3	Condenser (.05 mfd., tubular)	30-4444	\$0.20	44	Volume Control (Model 5)	33-5224			Knob Ass'y Vernier (Large) 38-4	45-2477	
4	Resistor (51000 ohms, 1/2 watt)	33-351339	.20	45	Volume Control (Model 4)	33-5225			Knob Ass'y Selector (Small) 38-4	27-4572	
5	Tuning Condenser assembly (Model 4)	31-2038		46	Condenser (0.015 mfd., tubular)	30-4358	.20		Knob (Tuning) (Model 5)	27-4331	\$0.10
6	Tuning Condenser (Model 5)	31-2052		47	Resistor (1.0 megohms, 1/2 watt)	33-510339			Knob (Tuning, Vernier) (Model 5)	27-4331	.10
7	Condenser (strip of copper foil, 6 mm.)			48	Condenser (.03 mfd., tubular)	30-4447			Knob (Tone & Volume)	27-4332	.10
8	R. F. transformer (range 2)	32-2632		49	Condenser (0.1 mfd. bakelite)	4989SG	.35		Mtg. Plate Ass'y, Cone-Centric Tuning Mechanism	45-2479	
9	R. F. transformer (range 1)	32-2630		49	Resistor (1.0 megohms, 1/2 watt)	33-510339	.20		Mtg. Washer, Rubber (Chassis)	27-4571	
10	Condenser (.05 mfd., tubular)	30-4444	.20	50	Condenser (.05 mfd., bakelite)	8326SU	.25		Mtg. Cushion (Tuning Condenser)	27-4599	
11	Resistor (5000 ohms, 1/2 watt)	33-250339	.20	51	Resistor (49000 ohms, 1/2 watt)	33-449339	.20		Mtg. Corners (Chassis)	27-4564	.10
12	Resistor (5000 ohms, 1/2 watt)	33-250339	.20	52	Condenser (0.03 mfd., bakelite)	8318SU	.35		Pilot Lamp Socket Assembly (38-5)	38-8954	
13	Resistor (40000 ohms, 1 watt)	33-340439	.20	53	Resistor (99000 ohms, 1/2 watt)	33-399339	.20		Reflector Assembly Cone-Centric Mechanism	45-2478	
14	Osc. transformer (range 2)	32-2633	1.25	54	Resistor (330000 ohms, 1/2 watt)	33-433339	.20		Selector Arm Assembly (Cone-Centric)	45-2476	
15	Condenser (250 mmfd.) on compensator section. See Note fig. 4			55	Resistor (490000 ohms, 1/2 watt)	33-449339	.20		Shield (R. F. Unit) 38-5	38-8814	
16	Osc. transformer (range 1)	32-2631		56	Condenser (0.01 mfd., tubular)	30-4169	.20		Screen Brkt. Assembly (38-5)	31-2050	
17	Compensators (dual, 1500 and 580 K.C. Model 5)	31-6194		57	Resistor (3500 ohms, 1/2 watt)	33-235339	.20		Socket (7 prong)	27-6087	.11
18	Compensators (air type, 1500 K.C. Model 4)	31-6194		58	Condenser (0.003 mfd., tubular)	30-4469	.20		Socket (6 prong)	27-6086	.11
19	Compensator (580 K.C., Model 5; Part of 16)	31-6196		59	Condenser (0.003 mfd., tubular)	30-4469	.20		Socket (6 Prong) Power Tubes	27-6057	.11
20	Compensator (580 K.C., Model 4, condenser 14 is part of this unit)	31-6199		60	Out put transformer (H29, K39)	32-7754	1.50		Terminal Panel (Ant.)	38-8746	
21	Condenser (3000 mmfd., mica)	30-1028	.45	61	Voice Coil and Cone Assembly (K39)	36-3174	1.00		Tube Shield (Round)	28-2726	.10
22	Resistor (70,000 ohms, 1/2 watt)	33-370339	.20	62	Voice Coil and Cone Assembly (H29)	36-3801	1.40		Tube Shield Base (Square)	28-2725	.12
23	Resistor (5000 ohms, 1/2 watt)	33-250339	.20	63	Bias resistors (25 ohms and 152 ohms) Part of 62, 152 ohm Section	33-3317			Tube Shield Base (Round)	28-5030	.03
24	Resistor (10000 ohms, 1/2 watt)	33-310439	.20	64	Dual Electrolytic Condenser (8 & 10 mfd.)	30-2201	1.75		Vernier Drive (Model 5)	31-2089	
25	Resistor (13000 ohms, 2 watt)	33-313539	.30	65	Field Coil and Pot Assembly (H29)	36-3218	4.25		Wrench (Station, Setting) Model 4	45-2475	.45
26	First I. F. transformer	32-2643		66	Field Coil and Pot Assembly (K39)	36-3239	4.25		Wrench (Set Screws)	45-2481	.40
27	Condenser (0.1 mfd., tubular)	30-4455	.55	67	Electrolytic Condenser (18 mfd.)	30-2200	1.40				
28	Condenser (0.05 mfd., tubular)	30-4123	.20	68	Pilot Lamp	34-2064	.07				
29	Condenser (electrolytic, 16 mfd.)	30-2212	1.05	69	Lamp (Shadowmeter Model 5)	34-2064					
30	Shadowmeter (Model 38-5)	45-2307	2.50	70	Power Transformer, 115V, 50/60 cycles	32-7837	8.00				
31	Resistor (1000 ohms, 1/2 watt)	33-210339	.20		" " " " 115V, 25/40 cycles	32-7598					
32	Second I. F. transformer	32-2645			" " " " 115/230V, 50-60 cycles	32-7839					
33	Condenser (110 mmfd., mica)	30-1071	.20		Condensers (0.015 mfd., dual bakelite)	3793DG	.40				
34	Condenser (110 mmfd., mica)	30-1031	.20		Range Switch (Model 5)	42-1335					
35	Resistor (51000 ohms, 1/2 watt)	33-351339	.20		Range Switch (Model 4)	42-1340					
36	Condenser (110 mmfd., mica)	30-1031	.20		Brace (38-4, Tuning Unit)	28-5119					
37	Resistor (330000 ohms, 1/2 watt)	33-433339	.20		Cable (Speaker) (38-5 & 38-4)	41-3324					
38	Resistor (1.0 megohm, 1/2 watt)	33-510339	.20		Cable Power	L-2778	.40				
39	Resistor (1.0 megohm, 1/2 watt)	33-510339	.20		Cable (Shadowmeter, Model 5)	41-3225	.40				
40	Condenser (0.01 mfd., tubular)	30-4124	.25		Clip (R. F. Transformer)	28-5002	.02				
41	Condenser (50 mmfd., mica)	30-1029	.20								
42	Resistor (40000 ohms, 1/2 watt)	33-340339	.20								
43	Condenser (0.008 mfd., tubular)	30-4112	.20								
44	Tone Control Switch and off-on switch	42-1341									
45	Resistor (330000 ohms, 1/2 watt)	33-433339	.20								

Prices subject to change without notice.

### Alignment of Compensators

**EQUIPMENT REQUIRED:** (1) Signal Generator, having a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36000 K. C. is the correct instrument for this purpose; (2) Output meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, part No. 27-7059 and Fibre Wrench, part No. 3164.

**OUTPUT METER:** The 026 output meter is connected to the plate and cathode terminals of one of the 6F6G tubes. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

**DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial of each model proceed as follows:

#### Model 38-4

1. Loosen the tuning condenser shaft coupling set screws (use wrench Part No. 45-2481), and turn the tuning condenser to the maximum capacity position (Plates fully meshed). Turn the selector knob until the dial pointer is on the small black dot at the low frequency end of the Range One scale. With condenser and pointer set in this position tighten set screws.
2. Now turn the selector knob clockwise until the dial pointer moves 1/16 of an inch to the left of the small dot and the first straight line on the scale (See Fig. 6). Hold pointer and condenser in this position, and carefully loosen shaft coupling set screws.

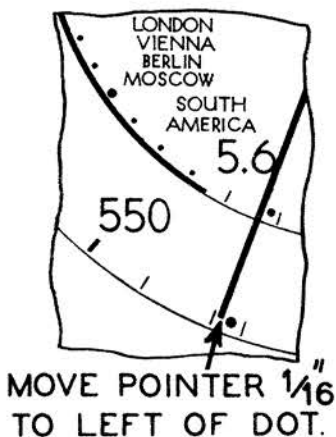


Fig. 6. Dial Calibration Model 4

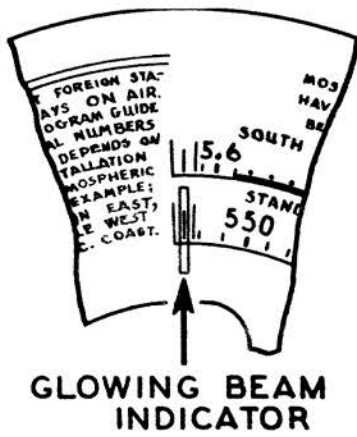


Fig. 7. Dial Calibration Model 5

3. After set screws are loose, turn the selector knob until dial pointer is again on the small black dot at the low frequency end of Range One scale.

Be careful when turning the selector knob that the position of the tuning condenser is not disturbed.

Tighten shaft coupling set screws with condenser and dial pointer in this position.

#### Model 38-5

1. Turn the tuning condenser to maximum capacity position (plate fully meshed).
2. Holding the tuning condenser in this position, loosen the dial clamp; then turn the dial until the indicator is centered on the middle index line (See Fig. 7). Tighten clamp in this position.

Before any of the following adjustments are made, the receiver should be turned "on" for at least 5 minutes.

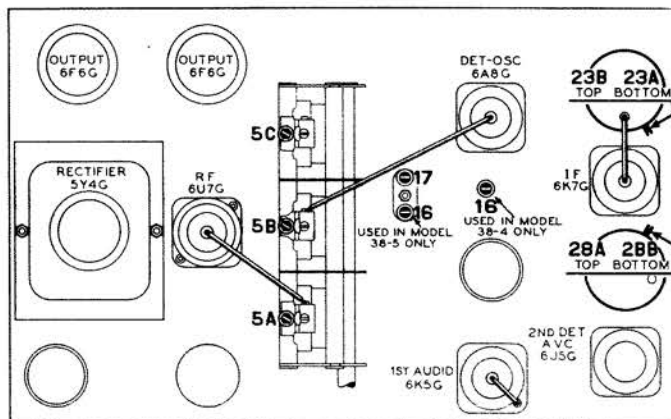


Fig. 5. Locations of Compensators--Top of chassis

### INTERMEDIATE FREQUENCY CIRCUIT

Insert the signal generator shielded output lead into the "Med" jack on the panel of the generator. Connect the other end of the output lead through a .1 mfd. condenser to the grid of the 6A8G, det. osc. tube and the ground connection of the signal generator to the chassis. Set the signal generator and receiver controls, and adjust the I. F. compensators as follows:

1. Set Signal Generator at 470 K. C. Turn "Multiplier" Control to 1000 and the "Attenuator" for maximum output.
2. Turn the receiver dial to 580 K. C.
3. Receiver Volume Control maximum.
4. Range Switch Broadcast Position.
5. Adjust compensators (28B), (28A), (23B), and (23A) for maximum output. If the output meter goes off scale when adjusting the compensators retard signal generator attenuator.

### RADIO FREQUENCY CIRCUIT

**Tuning Range: 5.7 to 18.2 M. C.**

1. With one end of the shielded lead of the signal generator output lead in the "Med" jack, connect the other end through the .1 mfd. condenser to the "Red" terminal of the aerial panel of the receiver. The output lead ground must be connected to the black terminal or to the chassis.

2. Set the controls and adjust the R. F. compensators as follows:

Volume Control	Range Switch	Signal Generator and Receiver Dial	Compensators in Order
Max.	2	18 M. C.	(5C) See Note A

**Tuning Range: 530 to 1720 K. C.**

Range Switch	Signal Generator and Receiver Dial	Compensators in Order
1	1500 K. C.	(16), (5B), (5A)
1	580 K. C.	(17)
1	1500 K. C.	(16), (5B), (5A)

**NOTE A**—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting the compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on the high frequency range.

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