# PHILCO . . . . . Model 665

**SERVICE BULLETIN**
**No. 240**

**Special Data for Members**
**RADIO MANUFACTURERS SERVICE**
**A PHILCO SERVICE PLAN**

## General Specifications

**Type Circuit:** Superheterodyne, with push-pull pentodes connected as triodes in output; output 10 watts; built in connections for Philco All-wave aerial; aerial selector built into and operated by wave-band switch.

**Power Supply:** Alternating Current. Voltage and frequency as specified on chassis nameplate.

**Tubes Used:** Ten (10) Total: 1 type 78 R.F., 1 type 77 1st detector, 1 type 76 oscillator, 2 type 78 I.F., 1 type 75 2nd detector 1st audio, 1 type 42 driver, 2 type 42 output, 1 type 80 rectifier.

**Wave Bands:** Four—(1) Shortwave; (2) Police and amateur; (3) Standard Broadcast; (4) Longwave (weather forecasts).

**Frequency Ranges:** Band (1)—5.7-18.0 Megacycles; Band (2)—1.75-5.8 Megacycles; Band (3)—540 to 1750 K.C.; Band (4)—150-390 K.C.

**Program Control:** 4 positions: (1) Mellow, (2) Brilliant, (3) Normal, (4) Noise reducing. Last two positions recommended for foreign short wave stations.

**Tuning Meter:** Shadow type tuning meter, mounted directly above scale.

**Waveband Indicator:** Glowing arrow on tuning scale shifts to proper scale when waveband switch is turned.

**Automatic Volume Control:** Fully effective on all stations.

**Bass Compensation:** Automatic: Effective on first two positions of program control, with volume control turned down.

**Tuning Drive:** Dual planetary, ball bearing. 80 to 1 ratio for slow-speed tuning, 10 to 1 on main knob.

**Intermediate Frequency:** 460 K.C.

**Power Consumption:** 90 watts.

**Speaker:** Type H-13.

## Tube Socket and Power Transformer Voltages
## Line Voltage 115

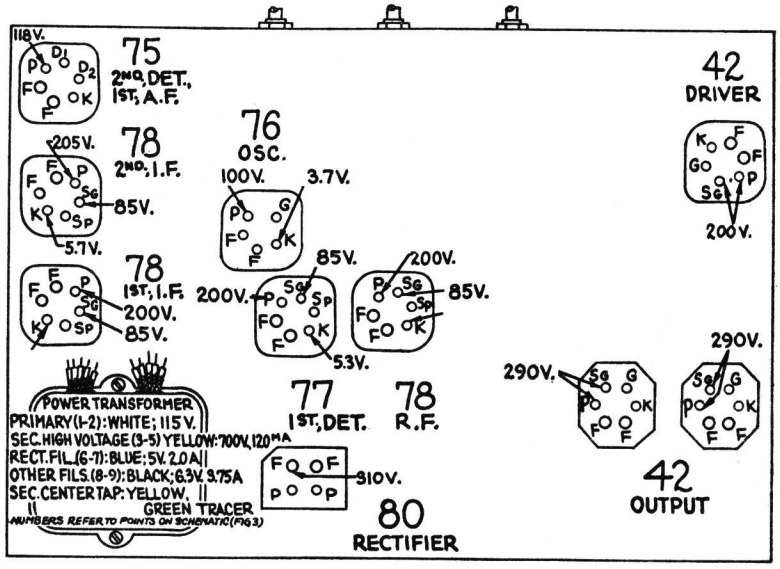



**Fig. 1. Sockets as Viewed from Bottom**

Socket voltages (measured to ground) obtained at points indicated by arrows. Above voltages were obtained by using a PHILCO type 025 Circuit Tester (or 048A All-purpose Tester), using test prods applied to sockets on underside of chassis. Volume control at minimum; dial at 60; waveband switch at standard broadcast (2d position from left). H-13 Speaker used.

## Adjusting Compensating Condensers

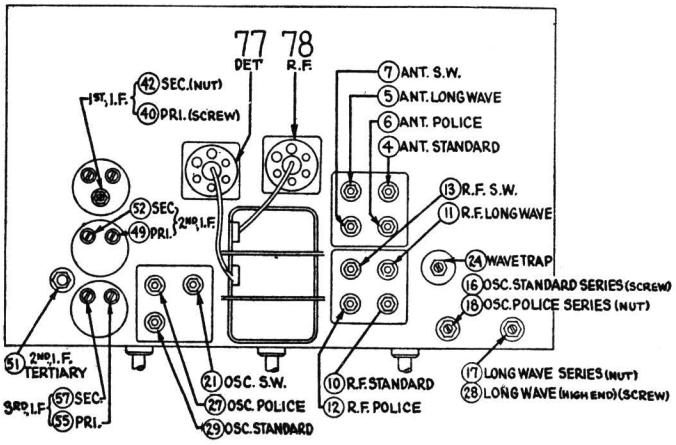



**Fig. 2. Location of Compensating Condensers**

Adjustment of compensating condensers in Model 665 requires an accurate signal generator covering long-wave, standard wave, police, and short-wave frequencies. The PHILCO Model 088 All-Wave Signal Generator, having a continuous range of from 100 to 20,000 K.C. (all fundamental frequencies) will be ideal for this purpose.

An output meter is also needed. PHILCO Model 025 Circuit Tester includes a high-grade output meter.

Philco No. 3164 fibre wrench and No. 27-7059 fibre handled screwdriver complete the equipment needed for making these adjustments. The locations of the various compensating condensers are shown in Fig. 2. Connect the output meter to the plate contacts of the output tubes (using the adapters provided with the "025") and set it at the 0-30 volt range.

**I.F.**—Set the Signal Generator at 460 K.C., and attach its antenna lead to the grid cap of the 77 1st detector tube (having removed the grid clip from the tube). Connect the ground

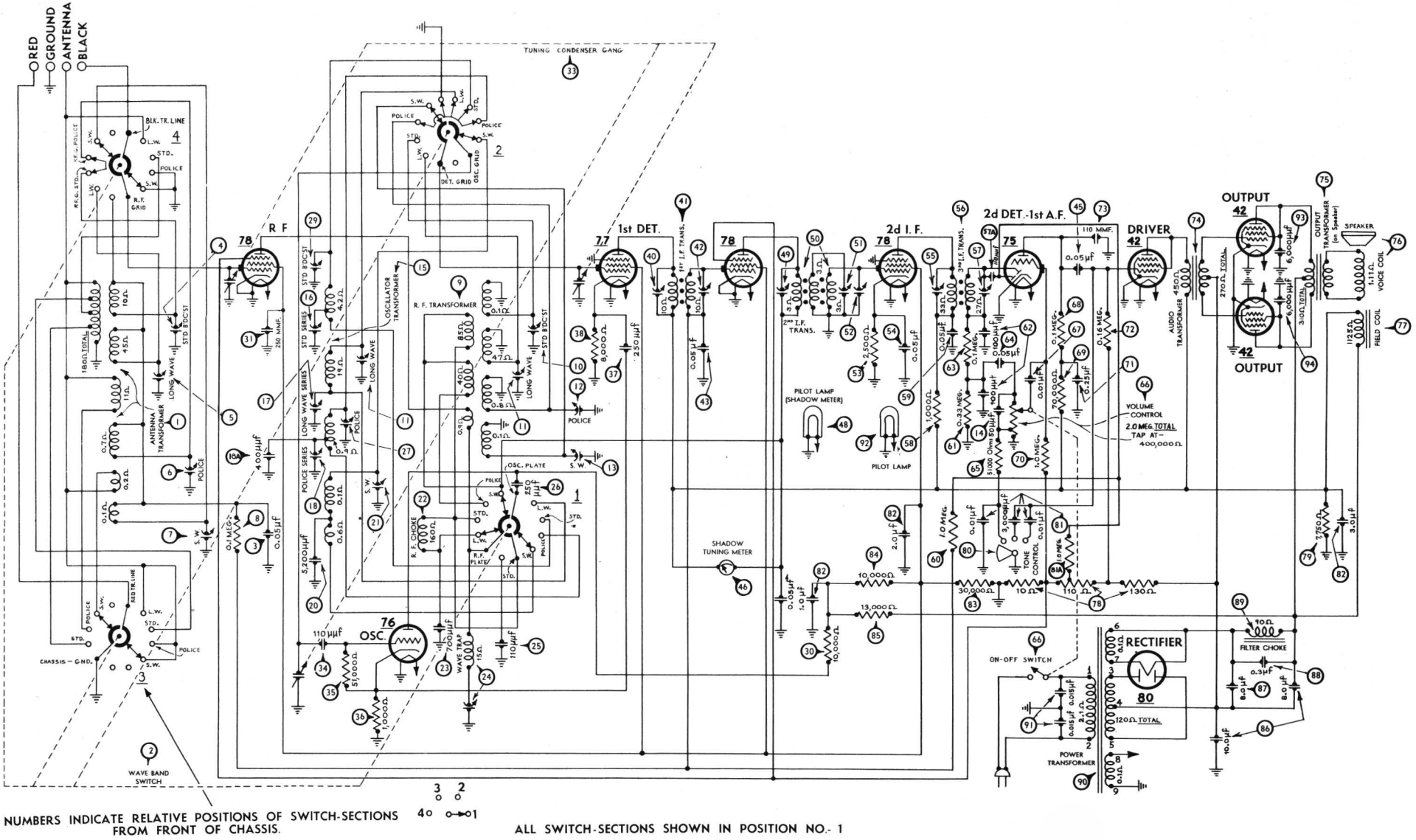
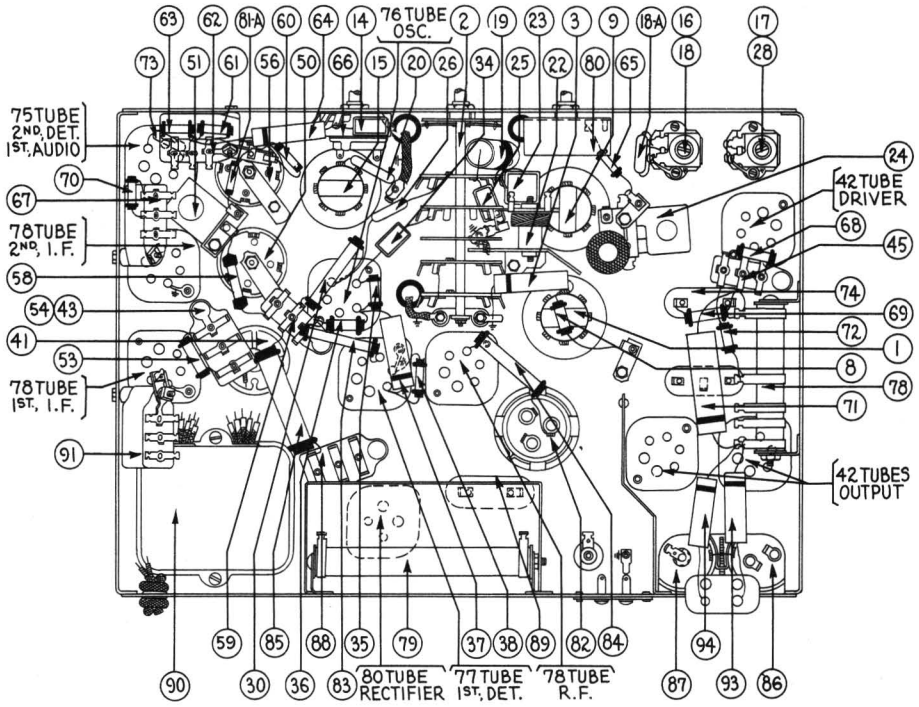



**Fig. 3 — Schematic Diagram — Model 665**




## Replacement Parts—Model 665

| | | | |
|---|---|---|---|
| ① | Antenna Transformer | 32-1750 | $3.25 |
| ② | Waveband Switch | 42-1120 | 2.50 |
| ③ | Condenser (.05 Mfd. Tubular) | 30-4020 | .35 |
| ④ | Compensater (Ant. Standard) | Part of ① | |
| ⑤ | Compensater (Ant. Longwave) | Part of ① | |
| ⑥ | Compensater (Ant. Police) | Part of ① | |
| ⑦ | Compensater (Ant. Shortwave) | Part of ① | |
| ⑧ | Resistor (99,000 ohm) (White, White, Orange) | 33-399343 | .20 |
| ⑨ | R. F. Transformer | 32-1751 | 3.00 |
| ⑩ | Compensater (R. F. Standard) | Part of ⑨ | |
| ⑪ | Compensater (R. F. Longwave) | Part of ⑨ | |
| ⑫ | Compensater (R. F. Police) | Part of ⑨ | |
| ⑬ | Compensater (R. F. Shortwave) | Part of ⑨ | |
| ⑭ | Condenser (.00005 Mfd. Mica) | 30-1029 | .20 |
| ⑮ | Oscillator Transformer | 32-1752 | 2.25 |
| ⑯ | Compensater (Standard Series) | Part of 31-6027 | .70 |
| ⑰ | Compensater (Longwave Series) | Part of 31-6054 | .45 |
| ⑱a | Condenser (.0004 Mfd. Mica) | 30-1000 | .25 |
| ⑱ | Compensater (Osc. Police Series) | Part of 31-6027 | .70 |
| ⑲ | Condenser (.1 Mfd. Tubular) | 30-4170 | .25 |
| ⑳ | Condenser (.0052 Mfd. Mica) | 30-1058 | .55 |
| ㉑ | Compensater (Osc. Shortwave) | Part of ⑬ | |
| ㉒ | R. F. Choke | 32-1745 | .65 |
| ㉓ | Condenser (.0007 Mfd. Mica) | 5863 | .25 |
| ㉔ | Wave Trap | 38-6850 | 1.10 |
| ㉕ | Condenser (.00011 Mfd. Mica) | 30-1031 | .20 |
| ㉖ | Condenser (.00025 Mfd. Mica) | 30-1032 | .25 |
| ㉗ | Compensater (Osc. Police) | Part of ⑬ | |
| ㉘ | Compensater (Longwave H. F. End) | Part of 31-6054 | .45 |
| ㉙ | Compensater (Osc. Standard) | Part of ⑬ | |
| ㉚ | Resistor (10000 ohms) (Brown, Black, Orange) | 33-310433 | .20 |
| ㉛ | Condenser (.00025 Mica) | 30-1032 | .25 |
| ㉜ | Tuning Condenser Assembly | 31-1609 | 5.50 |
| ㉞ | Condenser (.00011 Mfd. Mica) | 30-1031 | .20 |
| ㉟ | Resistor (51000 ohms) (Green, Brown, Orange) | 33-351143 | .20 |
| ㊱ | Resistor (1000 ohms) (Brown, Black, Red) | 33-210343 | .20 |
| ㊲ | Condenser (.00025 Mica) | 30-1032 | .25 |
| ㊳ | Resistor (8000 ohms) (Gray, Black, Red) | 33-280133 | .20 |
| ㊵ | Compensater (1st I. F. Primary) | Part of ㊵ | |
| ㊶ | 1st I. F. Transformer | * 32-1642 | 2.00 |
| ㊷ | Compensater (1st I. F. Secondary) | Part of ㊵ | |
| ㊸ | Condenser (.05 Mfd. Bakelite Block) | + 3615-DG | .40 |
| ㊸ | Condenser (.05 Mfd. Bakelite Block) | + 3615-SU | .35 |
| ㊻ | Shadow Tuning Meter | 45-2083 | 2.50 |
| ㊽ | Pilot Lamp (Shadow Tuning Meter) | Part of ㊻ | |
| ㊾ | Compensater (2nd I. F. Primary) | 31-6067 | .45 |
| ㊿ | 2nd I. F. Transformer | 32-1865 | 1.00 |
| 51 | Compensater (2nd I. F. Tertiary) | 04000-R | .45 |
| 52 | Compensater (2nd I. F. Secondary) | Part of ㊾ | |
| 53 | Resistor (2500 ohms) (Red, Green, Red) | 33-225333 | .20 |
| 54 | Condenser (.05 Mfd. Twin Bakelite Block) | Part of ㊸ | |
| 55 | Compensater (3rd I. F. Primary) | Part of 31-6003 | .45 |
| 56 | Third I. F. Transformer | △ 32-1188 | .65 |
| 57 | Compensater (3rd I. F. Secondary) | Part of 31-6003 | .45 |
| 57a | Condenser (.110 Mmf. Mica) | 30-1031 | .20 |
| 58 | Resistor (1000 ohms) (Brown, Black, Red) | 33-210633 | .20 |
| 59 | Condenser (.05 Mfd. Bakelite) | 3615-SG | .35 |
| 60 | Resistor (1.0 Meg. ¼ Watt) | 33-510143 | .20 |
| 61 | Resistor (330000 ohms) (Orange, Orange, Yellow) | 33-33133 | .20 |
| 62 | Condenser (.00011 Mfd. Twin Bakelite Block) | + 8035-DG | .25 |
| 63 | Resistor (99000 ohms) (White, White, Orange) | 33-399143 | .20 |
| 64 | Condenser (.05 Mfd. Tubular) | 30-4020 | .20 |
| 65 | Resistor (5000 ohms) (Green, Brown, Orange) | 33-351143 | .20 |
| 66 | Volume Control & On-Off Switch | 33-5110 | $1.45 |
| 67 | Condenser (.01 Mfd. Bakelite Block) | + 3903-SU | .25 |
| 68 | Resistor (99000 ohms) (White, White, Orange) | 33-399143 | .20 |
| 69 | Resistor (70000 ohms) (Violet, Black, Orange) | 33-370343 | .20 |
| 70 | Resistor (1 Meg.) (Brown, Black, Green) | 33-510143 | .20 |
| 71 | Condenser (.25 Mfd. Tubular) | 30-4134 | .35 |
| 72 | Resistor (160000 ohms) (Brown, Blue, Orange) | 33-416133 | .20 |
| 73 | Condenser (.00011 Mfd. Mica) | 30-1031 | .20 |
| 74 | Audio Transformer | 32-7057 | 3.50 |
| 75 | Output Transformer | 32-7078 | 1.25 |
| 76 | Cone & Voice Coil Assembly (H-13) | 02625 | 1.20 |
| 77 | Field Coil & Pot Assembly (H-13) | 36-3104 | 2.70 |
| 78 | Resistor (B. C., Wirewound) (10 ohms, 110 ohms, 130 ohms) | 33-3226 | .25 |
| 79 | Resistor (Wirewound, 7750 ohms) | 33-3020 | .35 |
| 80 | Tone Control | □ 30-4378 | .75 |
| 81 | Condensers in Tone Control | Part of ㊽ | |
| 81a | Resistor (1.0 Meg. ¼ Watt) | 33-510143 | .20 |
| 82 | Condenser (Electrolytic) (3 Mfd., 2 Mfd., 1 Mfd.) | 30-2122 | 1.85 |
| 83 | Resistor (30000 ohms) (Orange, Black, Orange) | 33-330443 | .20 |
| 84 | Resistor (10000 ohms) (Brown, Black, Orange) | 33-310433 | .20 |
| 85 | Resistor (13000 ohms) (Brown, Orange, Orange) | 33-313633 | .30 |
| 86 | Condenser (Electrolytic, 8 Mfd., 10 Mfd.) | 30-2045 | 1.80 |
| 87 | Condenser (Electrolytic, 8 Mfd.) | ○ 30-2025 | 1.35 |
| 88 | Condenser (.3 Mfd. Bakelite Block) | + 6287-DU | .40 |
| 89 | Filter Choke | 32-7056 | 2.20 |
| 90 | Power Transformer 115 Volts 60 Cycles | 32-7440 | 6.00 |
| | 115 Volts 25 Cycles | 32-7441 | 8.75 |
| | 230 Volts 50 Cycles | 32-7442 | 6.75 |
| 91 | Condenser (.015 Mfd. Twin Bakelite Block) | + 3793-DG | .40 |
| 92 | Pilot Lamp (Dial) | 34-2039 | .15 |
| 93 | Condenser (.006 Mfd. Tubular) | 30-4024 | .25 |
| 94 | Condenser (.006 Mfd. Tubular) | 30-4024 | .25 |
| | Dial Scale | 27-5115 | .40 |
| | Dial Mask and Hub Assembly | 31-1724 | .15 |
| | Dial Hub | 28-7129 | .10 |
| | Dial Spring Clamp | 28-2837 | .10 |
| | Socket—4-Prong | 27-6042 | .10 |
| | Socket— 5-Prong | 27-6035 | .11 |
| | Socket—6-Prong | 27-6036 | .11 |
| | Speaker Plug Socket | 27-6033 | .08 |
| | Knob (Volume, Tone, Waveband) | 27-4208 | .10 |
| | Knob (Station Selector) | 27-4206 | .12 |
| | Knob (Slow Speed) | 27-4207 | .10 |
| | Tube Shield (4 used) | 28-2726 | .10 |
| | Tube Shield (2 used) | 28-2755 | .05 |
| | Tube Shield Base | 28-2725 | .03 |
| | A. C. Cord & Plug | L-943A | .60 |
| | Bezel | 28-3165 | .50 |
| | Bezel Glass | 27-8011 | .55 |
| | Chassis Mtg. Bolt | W-1496A | 1.60 per C |
| | Chassis Mtg. Washer (Rubber) | 27-4201 | 1.40 per C |
| | Chassis Mtg. Bumper (Rubber) | 27-4200 | 3.75 per C |
| | Mask | 27-5136 | .30 |
| | Scale and Mask Guide | 29-3272 | .05 |
| | R. F. Shield Assy. | 38-6938 | .35 |
| | I. F. Shield Assy. | 38-6872 | .35 |
| | Elec. Condenser Clamp | 29-2460 | .05 |
| | Elec. Condenser Clamp | 6440 | .05 |
| | Elec. Condenser Insulator | 27-7194 | .01 |
| | Shadow Meter Light Shield | 28-2917 | .02 |
| | Wave Switch Coupling | 28-7150 | .20 |
| | Inverted Dial Scale | 27-5123 | .40 |

* Code 122: 32-1864 △ Code 122: 32-1866 □ Code 122: 30-4379 ○ Code 122: 30-2014

+ The letter O should be added to parts ㊸, ㊺, ㊷, ㊼, ㊼, ㊽, ㊶, for Code 122. Example (3615-DG = 3615-ODG).

## Adjusting Compensating Condensers (Continued)

terminal of the Signal Generator to the ground terminal of the set. Turn on the set, turn the waveband switch to standard broadcast (second position from left) and set dial at 60. Turn condenser (61) (2nd I.F. tertiary) all the way down before adjusting the other I.F. Compensators. Now with the fibre screwdriver, adjust condensers (57) and (55) (3rd I.F.), (52) and (49) (2nd I.F.), and then (42) and (40) (1st I.F.) until maximum reading is obtained in the output meter. Turn down the "attenuator" on the signal generator if the output meter needle goes off the scale. Now adjust condenser (61) (2nd I.F. tertiary) for maximum reading.

**WAVE TRAP**—Connect the Signal Generator antenna lead to the grid cap of the 78 R.F. tube. Replace the grid clip on the 77 tube cap. With the signal generator operating at 460 K.C. and the set controls adjusted as for I.F., adjust wavetrap (24) until the **minimum** reading is obtained in the output meter.

**SHORTWAVE**—Turn wave band switch to the shortwave position (extreme right). Set signal generator at 18 megacycles and dial of set at 18.0 (top scale). Now adjust the oscillator, Antenna, and R.F. shortwave compensators in turn, for maximum reading. These are (21), (13) and (7) respectively.

**POLICE AND AMATEUR BAND**—Turn the waveband switch to position 3 (from left). Set the dial and signal generator at 4.5 megacycles and adjust condensers (27), (12) and (6) respectively for maximum reading.

Set the signal generator at 1800 K.C. and turn the dial to 1.8. Adjust condenser (18) (nut), oscillator police series, to maximum reading.

**STANDARD BROADCAST BAND**—Turn the waveband switch to position 2 (from left). Set the dial and signal generator at 1500 K.C. and adjust condensers (20), (10) and (4) for maximum reading.

Set the dial and signal generator at 600 K.C. and adjust condenser (16) (screw), broadcast series, for maximum reading.

**LONGWAVE BAND**—Turn waveband switch to position 1 (left). Set the dial and signal generator at 340 K.C. and adjust condenser (28) (screw) to maximum. Then adjust (11) and (5) for maximum reading. Finally, set the dial and signal generator at 175 K.C. and adjust condenser (17) (nut) for maximum reading. This is the longwave series compensator.

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