SPECIFICATIONS

Models 41-610 and 41-611, Code 121 are Radio-Phonograph combinations consisting of a ten (10) tube super-heterodyne radio and automatic phonograph record changer. These models are similar in design with the exception of the cabinet and automatic record changer.

RADIO SECTION

The radio incorporates the PHILCO Built-in American and Overseas aerial system; eight electric push-buttons for automatically tuning stations in additon to manual tuning; three tuning ranges, covering 540 to 1720 K. C., 2.0 M. C. to 7.0 M. C. and 9.0 M. C. to 12 M. C.; variable tone control; automatic volume control; Bass compensation; degenerated push-pull pentode audio output stage; Loktal tubes, including the new noise reducing XXL converter tube and a concert grand dynamic speaker. In addition, the radio is designed to receive the sound of a television program tuned in by special PHILCO television radios.

INTERMEDIATE FREQUENCY: 455 K. C.

POWER SUPPLY: 115 volts, 60 cycle A. C. current.

POWER CONSUMPTION: 41-610 — 95 watts
41-611 — 95 watts

These models can also be operated on 115 volts, 50 cycle A. C. current. To do this it is necessary to replace the radio power transformer and phonograph motor, as indicated in the parts listed.

PHILCO TUBES USED: 7B5, Oscillator; XXL, Converter; two 7B7, I. F. Amplifiers; 7C6, second Detector, first Audio, A. V. C.; 7C7, Phonograph Amplifier; 37, Phase Inverter; two 41, Audio Output, and an 80 Rectifier.

ADJUSTING ELECTRIC PUSH-BUTTON TUNING: Seven (7) of the push-buttons are used for selecting broadcast stations and one as the power control (ON-OFF switch). The procedure for setting and operating the electric push-button tuning for reception of stations is listed on page 78. The lowest frequency station push-button labeled "Television" can be adjusted for reception of the sound channel of television programs. This push-button may also be used in conjunction with a PHILCO wireless Record Player.

AERIAL CONNECTIONS: The built-in loop aerial system is designed to operate without an outside aerial or ground and to give exceptionally sensitive receiving performance of stations on the standard and short wave frequencies. Another feature is its noise reducing characteristics. The loop can be turned to the position in which it picks up a minimum amount of interference or if interference is not present the loop may be set in the position where best reception is obtained. When operating the radio, however, in steel reinforced buildings and other shielded locations, the PHILCO 1941 Outdoor Aerial Part No. 45-2817 is recommended for maximum receiving performance. The outdoor aerial can be easily connected to the radio by inserting the plug attached to the transformer unit into the socket provided at the rear of the chassis. This aerial can be obtained from your local PHILCO distributors. A ground connection is not required with either type of installation.

PHONOGRAPH SECTION

The phonograph of each model consists of an automatic record changer; the new PHILCO Light-beam reproducer with a floating jewel which reproduces sound on a light-beam and a special phonograph amplifier stage for operation through the push-pull output tubes of the radio. The phonograph mechanism, however, of each model is different. Model 41-610 uses Automatic Record Changer, Part No. 35-1233, which plays twelve 10-inch records, or ten 12-inch records at one loading. Model 41-611 contains the PHILCO Deluxe Inter-Mix Record Changer, Part No. 35-1234. This mechanism plays fourteen 10 and 12-inch records inter-mixed, fifteen 10-inch or thirteen 12-inch records at one loading. Connections (No. 87 on the diagram) are also provided for installation of the PHILCO Home Recording Unit Kit Model HR-1, Part No. 45-2820, for making phonograph records in the home. The Home Recording Kits can be obtained from your PHILCO Distributors with complete instructions for installation and operation.

AUTOMATIC RECORD CHANGER ADJUSTMENTS

The service procedures for adjusting the Automatic Record changers will be found on page 135 for changer Part No. 35-1233 (Model 41-610) and page 145 for record changer Part No. 35-1234 (Model 41-611).

LIGHT-BEAM REPRODUCER ADJUSTMENTS

To reproduce the sound from a record, the light beam of the reproducer must be carefully positioned on the light sensitive cell. If the light beam is not carefully set, the sound reproduction will be distorted, weak or, if the light beam is completely on or off the cell, the phonograph will be silent.

If any of these conditions exist, the following adjustment procedure should be made:—

NOTE — These adjustments should be made with the power line voltage at 118 volts A. C.

A. ADJUSTING WIDTH OF LIGHT BEAM

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond this point until the rectangular spot of light is 3/32" in width. The socket assembly is now rotated so that the spot light is vertical.

B. POSITIONING THE LIGHT BEAM

To position the light beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

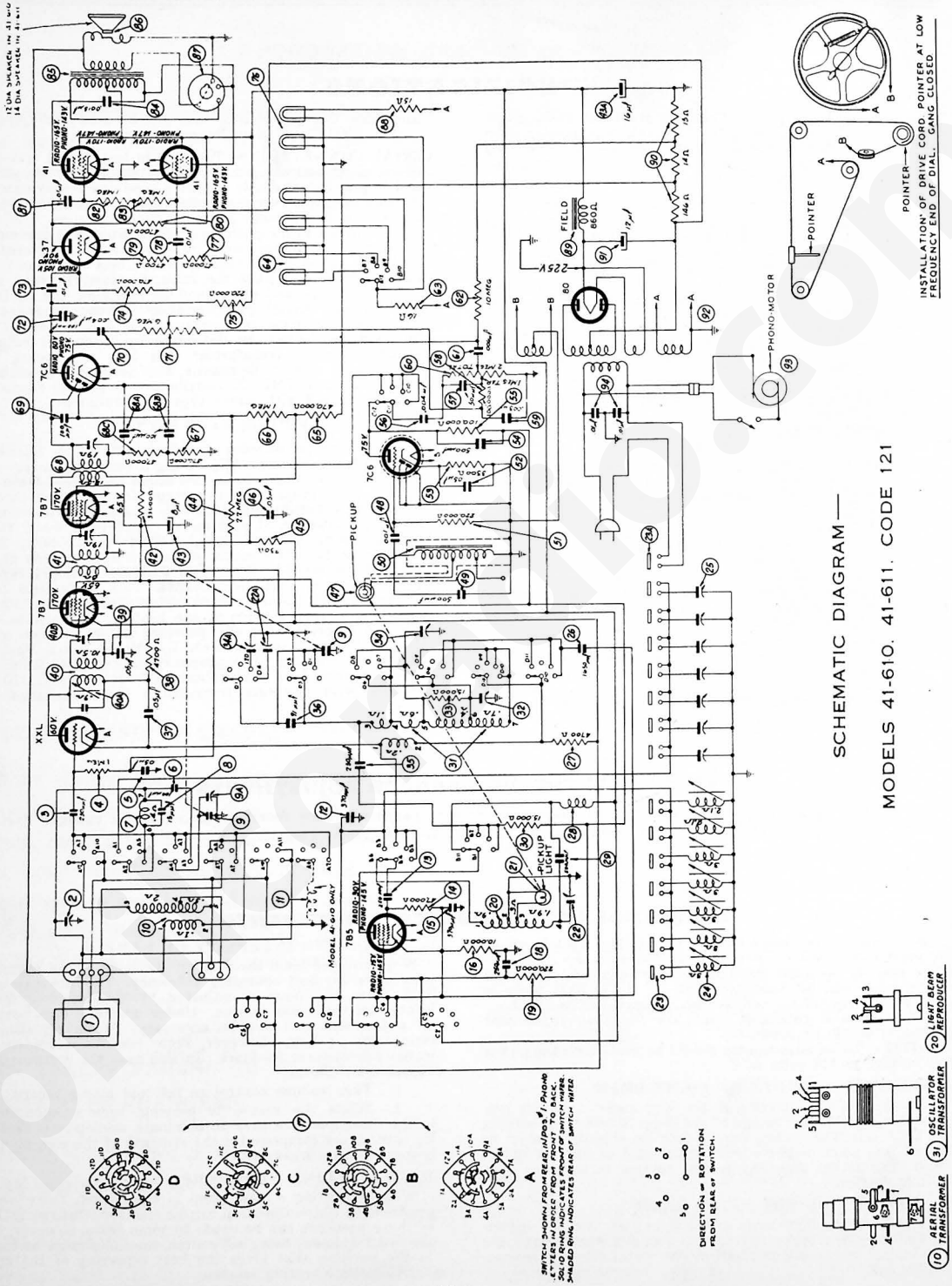
C. ADJUSTING INTENSITY OF LAMP

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator No. 22 located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator 22 in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

D. INSTALLING NEW LAMP

When installing a new lamp in the socket, there are two positions in which the lamp can be inserted. Ordinarily, either of these positions can be used. In some cases, however, due to the lamp filament being off center, the lamp must be inserted in the position that gives the best centering of the spot of light on the vibrating mirror.


SCHEMATIC DIAGRAM—
MODELS 41-610. 41-611. CODE 121
INSTALLATION OF DRIVE CORD. POINTER AT LOW FREQUENCY END OF DIAL. GANG CLOSED
POINTER
PHONO-MOTOR
PICKUP
FIELD
PICKUP LIGHT
SWITCH SHOWN FROM READ IN POS 1. PHONO LETTERS IN CIRCLES FROM FRONT TO BACK. SOLID RING INDICATES FRONT OF SWITCH WAFER. SHADED RING INDICATES REAR OF SWITCH WAFER
DIRECTION = ROTATION FROM REAR OF SWITCH.
(10) AERIAL TRANSFORMER
(31) OSCILLATOR TRANSFORMER
(20) LIGHT BEAM REPRODUCER

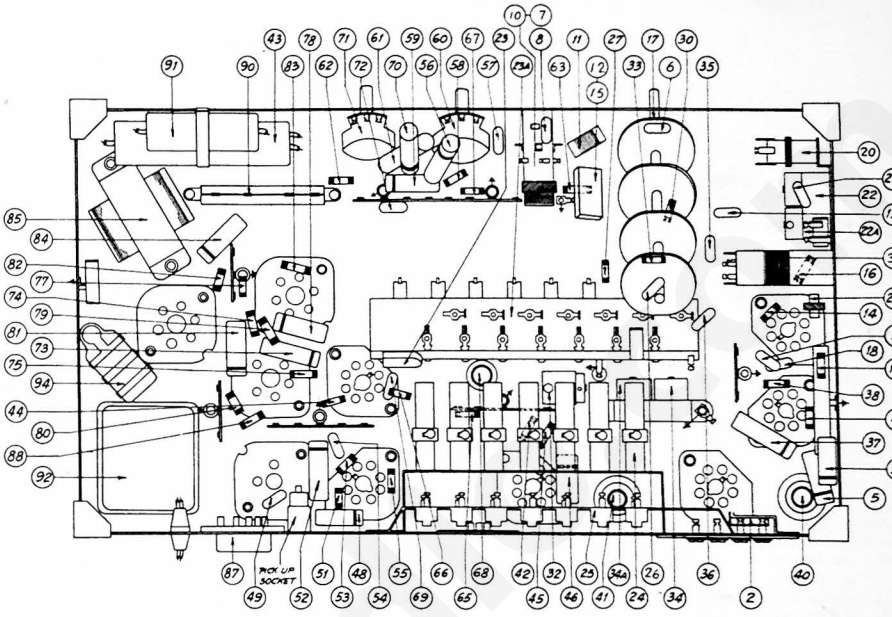
PRODUCTION CHANGES

Beginning with Run 6, a new band indicator and dial scale was used in these models. The new part numbers are as follows: Drive cord (band indicator), 31-2521; spring (for drive cord), 28-8954; dial scale, 27-5673; pilot lamp assembly (band indicator), 76-1171; pulley (band indicator), 56-2036; sleeve (pulley mounting) 56-1926; nut, W-2210.

To improve the sensitivity on 41-610 and 41-611, resistor (42) was changed from 33,000 ohms to 22,000 ohms, Part No. 33-322339.

Beginning with Run 4, the oscillator transformer assembly (7 coils-push button) is changed from Part No. 32-3486 to Part No. 32-3591.

On Run 4 models, the padder strip (push-buttons) is changed from Part No. 31-6366 to Part No. 31-6399.



PART LOCATIONS — UNDERSIDE OF CHASSIS

The Automatic Record Changer for Model 41-610 was changed from a gear drive turntable type to a rim drive turntable type. The service information for adjusting the changer will be found on page 135.

The record changer part numbers are as follows:

Power Supply	Gear Drive Part No.	Rim Drive Part No.
115 volt, 60 cycle	35-1233	35-1268
115 volt, 50 cycle	35-1239	35-1269

Replacement Parts — Models 41-610, 41-611, Code 121

SCHE. No.	DESCRIPTION	PART No.
1	Loop Aerial (Model 41-610)	76-1189
	Loop Aerial (Model 41-611PW)	76-1181
	Loop Aerial (Model 41-611PM)	76-1188
	Sleeve (Loop Mounting; 2 required)	28-2257
	Sleeve (Loop Mounting; 1 required)	56-1907
	Spring Washer	28-4186
	Washer (Loop Mounting; 2 required)	W-151
	Screw (Loop Mounting)	W-288
	Washer (Loop Mounting; 1 required)	W-245
2	Compensator (Aerial, Short Wave)	31-6388
3	Mica Condenser (250 mmfd.)	60-125157
4	Resistor (1 megohm)	33-510339
5	Condenser (.05 mfd., 200 volts)	30-4519
6	Mica Condenser (100 mmfd.)	60-110157
7	Aerial Transformer (Police) Part of 10	
8	Condenser (15 mmfd.)	60-015337
9	Tuning Condenser	31-2482
	Tuning Shaft	76-1088
	"C" Washer	28-2043
	Spring Washer (Tuning Shaft)	56-1659
	Drum (Tuning Condenser)	38-9856
	Drive Cord (Pointer)	31-2521
	Drive Cord (Tuning Condenser)	31-2502
	Spring (Drive Cord)	28-8913
	Spring Washer (Tuning Shaft)	56-1659
	Pointer	56-1516
10	Aerial Transformer (Broadcast)	32-3525
11	Loop Shunt Transformer (Short Wave)	32-3558
12	Condenser (270 mmfd.)	30-11565
13	Condenser (250 mmfd.)	60-125157
14	Resistor (47,000 ohms)	33-347339
15	Condenser (370 mmfd.) Part of 12	
16	Resistor (10,000 ohms)	33-310339
17	Band Switch	2-16315
18	Condenser (250 mmfd.)	60-125157
19	Resistor (220,000 ohms)	33-422339
20	Oscillator Trans. (Light-Beam Reproducer)	32-3527
21	Light-Beam Lamp (In Reproducer)	34-2408
22	Comp. (Light-Beam Reproducer Adjust.)	31-6382
22A	Compensator (S. W. Oscillator) Part of 22	
23	Push-button Switch	42-1587
23A	Power Switch (Part of 23)	
24	Push-button Oscillator Coil Strip	32-3591
	Oscillator Coils 1 to 5	32-3597
	Oscillator Coils 6 to 7	32-3041
	Iron Core	28-6916
	Centering Cap	28-6936
25	Push-button Padder Strip	31-6399
26	Condenser (880 mmfd.)	60-216324
27	Resistor (4700 ohms)	33-247339
28	Oscillator R. F. Choke	32-3401
29	Condenser (800 mmfd.)	60-190157
30	Resistor (15,000 ohms)	33-315339
31	Oscillator Transformer	32-3557
32	Compensator (880 K. C.)	31-6383
33	Resistor (15,000 ohms)	33-315339
34	Compensator (Oscillator, 1500 K. C.)	31-6395
34A	Comp. (Oscillator, 6 M. C.) Part of 34	
35	Condenser (250 mmfd.)	60-125157
36	Resistor (85 mmfd.)	30-11945
37	Condenser (.08 mfd., 400 volts)	30-4518
38	Resistor 4700 ohms)	33-247339
39	Condenser (.05 mfd., 200 volts)	30-4519
40	1st I. F. Transformer)	32-3482
40A	Compensator (Part of 40)	
40B	Compensator (Part of 40)	
41	2nd I. F. Transformer	32-3483
41A	Compensator (Part of 41)	
42	Resistor (33,000 ohms)	33-333339
43	Electrolytic Condenser (8-16 mfd.)	30-2480
43A	Electrolytic Cond. (16 mfd.) Part of 43	
44	Resistor (2.2 megohms)	33-522339
45	Resistor (330 ohms)	33-133339
46	Condenser (.05 mfd., 200 volts)	30-4519
47	Light-Beam Reproducer (41-610)	35-2175
	Light-Beam Reproducer (41-611)	35-2209
	Input Cable (Reproducer)	41-3554
	Cable (Reproducer Light) 41-610	41-3559
	Cable (Reproducer Light) 41-611	41-3616
48	Condenser (.001 mfd., 1200 volts)	30-4453
49	Condenser (500 mmfd.)	60-150157
50	Phonograph Reproducer Input Transformer	32-8135
	Connector (Input Transformer)	57-0591
51	Resistor (220,000 ohms)	33-422339
52	Condenser (.05 mfd., 200 volts)	30-4519
53	Resistor (330 ohms)	33-133339
54	Condenser (500 mmfd.)	30-1114
55	Resistor (100,000 ohms)	33-410339
56	Condenser (.004 mfd., 400 volts)	30-4578
57	Condenser (50 mmfd.)	60-050157
58	Resistor (100,000 ohms)	33-410339
59	Condenser (.003 mfd.)	30-4469
60	Volume Control	33-5008
	Painut	W-2157
61	Condenser (.006 mfd., 400 volts)	30-4591
62	Resistor (10 megohms)	33-510339
63	Resistor (1.6 ohms, Wirewound)	33-916336
64	Pilot Lamps (Push-buttons, Indicator)	34-2064
65	Resistor (470,000 ohms)	33-447339
66	Resistor (1 megohm)	33-510339
67	Resistor (470,000 ohms)	33-447339
68	3rd I. F. Transformer	32-3484
68A	Condenser (100 mmfd.) Part of 68	
68B	Condenser (100 mmfd.) Part of 68	
68C	Resistor (47,000 ohms) Part of 68	33-347339
69	Condenser (100 mmfd.)	60-110157
70	Condenser (.004 mfd., 400 volts)	30-4578
71	Tone Control	33-5403
72	Condenser (100 mmfd.)	60-110157
73	Condenser (.01 mfd., 400 volts)	30-4572
74	Resistor (470 000 ohms)	33-447339
75	Resistor (220,000 ohms)	33-422339
76	Pilot Lamps (Tuning Dial)	34-2063
77	Resistor (47,000 ohms)	33-347339
78	Condenser (.01 mfd., 400 volts)	30-4572
79	Resistor (4700 ohms)	33-247339
80	Resistor (47,000 ohms)	33-347339
81	Condenser (.01 mfd., 400 volts)	30-4572
82	Resistor (1 megohm)	33-510339
83	Resistor (1 megohm)	33-810339
84	Condenser (.0015 mfd., 1000 volts)	30-4616
85	Output Transformer	32-8070
86	Speaker Cone	
	(For Spkr. 36-1524-4, Model 41-610)	36-4178
	(For Spkr. 36-1530-4, Mod. 41-611PW)	36-4181
87	Home Recording Socket	27-6150
	Shunt Plug	56-1103
88	Resistor (15 ohms)	33-016339
89	Field Coil	
	(Replace Spkr. 36-1524, Model 41-610)	
	(Replace Spkr. 36-1530, Mod. 41-611PW)	
90	Bias Resistor (146-14-15 ohms)	33-3305
91	Electrolytic Condenser (12 mfd.)	30-2481
92	Power Transformer (115 volts, 60 cycle)	32-8120
93	Phono. Motor (115 v., 60 cycle) 41-610	35-1252
	Phono. Motor (115 v., 50 cycle) 41-610	35-1251
	Changer Cable & Plug Assem. (41-610)	41-3890
	Changer Cable & Plug Assem. (41-611)	41-3849
93A	Phonograph Motor Switch	42-1646
94	Condenser (Dual, .01 mfd.)	3903090

MISCELLANEOUS PARTS

DESCRIPTION	PART No.
Automatic Record Changer	
(41-610, 115 volts, 60 cycles)	35-1233
(41-611, 115 volts, 60 cycles)	35-1234
(41-610, 115 volts, 50 cycles)	35-1239
(41-611, 115 volts, 50 cycles)	35-1243
Mounting Rubber (41-610 Changer)	54-4048
Mounting Washer (41-610 Changer)	W-1715
Mounting Washer (41-611 Changer)	28-3541
Mtg. Spring (41-610, 61-611 Changer)	28-8970
Mtg. Nut (41-610, 41-611 Changer)	W-149
Mounting Bolt (41-610 Changer)	W-2225
Mounting Bolt (41-611 Changer)	W-2226
Bezel (41-610)	54-4042
Screw (Bezel)	W-2023
Cord (Power)	L-3199
Cable (Speaker) 41-610	41-3593
Cable (Speaker) 41-611	41-3584
Clip (Mounting Aerial Coil)	28-5002
Clip (Mounting Oscillator Coil)	28-5003
Clamp (Electrolytic Condenser)	56-1848
Cabinet (41-610)	10510A
Cabinet (41-611PW)	10506A
Cabinet (41-611PM)	10506B
Dial Scale	27-5655
Rubber Channel	27-4854
Clamp (Dial)	56-1517
Dial Background Plate	27-4990
Spring (Background Plate)	28-8906
Jewel (Pilot Lamp)	27-4777
Knob (Tuning-Volume) 41-611PM	27-4987
Knob (Tuning-Volume)	27-4987
Knob (P. B.)	54-4009
Rubber Corner	27-4564
Rubber Washer (Chassis Mounting)	27-4571
Rubber Bumper (Cabinet)	27-5664
Screw (Chassis Mounting)	W-1345
Socket (80 Tube)	27-6166
Socket (37 Tube)	27-6167
Socket (41 Tube)	27-6168
Socket (Loktal-Oscillator Tube)	27 6120
Socket (Loktal-R. F., I. F. Tubes)	27-6158
Socket (Aerial)	27-6145
Socket Assembly (P. B. Indicator)	38-9607
Socket Assembly (Band Indication)	76-1079
Socket Assembly Dial Lighting)	76-1080
Socket Assembly (Pilot Light)	76-1112
Speaker (41-610P)	36-1524
Speaker (41-611PW)	36-1530
Rubber Grommet (Mounting Speaker)	27-4596
Spacer	56-2044
Washer	28-4481
Nut	W-124
Spring (Tilt Front) 41-610	28-8978
Spring (Tilt Front) 41-611	28-8979
Tab Kit	40-6595
Tab (Television)	27-5648
Tab (Off-On)	27-5647
Tab Cover	27-5629
Washer (Chassis Mounting)	28-5114

ALIGNING R. F. AND I. F. COMPENSATORS

The following procedure is the same for both models:

EQUIPMENT REQUIRED

1. SIGNAL GENERATOR: Covering the frequency range of the receiver, such as Philco Models 077 or 177.
2. ALIGNING INDICATOR: Either a vacuum tube voltmeter or an audio output meter may be used as an aligning indicator. Philco Models 027 and 028 circuit testers contain both these meters.
3. TOOLS: Philco Fiber Screw Driver, Part No. 45-2610.

CONNECTING ALIGNING INSTRUMENTS

Either a vacuum tube voltmeter or an audio output meter may be used as a signal indicator when adjusting the receiver.

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (—) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

Audio Output Meter: Terminal No. 1 is provided on the loop aerial panel for connecting one lead of the audio output meter to the voice coil of the speaker. The other lead of the meter is connected to the chassis. When using these connections, the lowest A. C. scale of the meter must be used. (0 to 10 volts).

The audio output meter can also be connected between the plate of the output tube and the ground of the chassis.

Signal Generator: When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal 4 of the loop aerial terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the ground of the receiver.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiving loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

After connecting the aligning indicator, adjust the compensators in the order shown in the tabulation below. Locations of the compensators are shown below. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

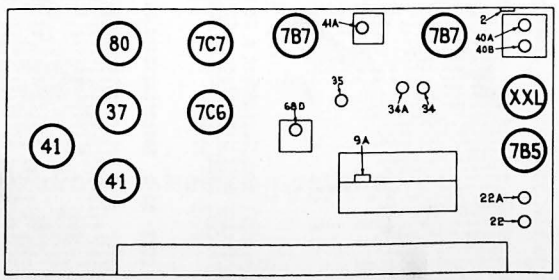
Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	High Side to No. 4 Terminal Loop Panel	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Positions	40A, 40B 41A, 68D	
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	34, 9A	Note A
3	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	32	Roll Tuning Condenser Note B
4	Use Loop on Generator	Repeat Operation No. 2 Again				
5	Use Loop on Generator	6 M. C.	6 M. C.	Range Switch "Police"	34A	
6	Use Loop on Generator	12 M. C.	12 M. C.	Range Switch "S. W."	22A, 2	Note C

NOTE A — 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, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in the schematic.

NOTE B — When adjusting the low frequency compensator of Range One (Broadcast) or the aerial padders of the high frequency tuning range; the receiver Tuning Condenser must be adjusted (rolled) as follows: First, tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until maximum output reading is obtained.

NOTE C — To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator (22A) to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a first peak is obtained on the output meter. Adjust the compensator for maximum output at this first peak.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 910 K. C. above the frequency being used on any high frequency range. The aerial padder (2) must be adjusted to maximum by rolling the tuning condenser. If two signal peaks occur when turning the padder, adjust to maximum output on the second signal peak from the tight position (screw all the way down) of the padder.



COMPENSATOR LOCATIONS — TOP OF CHASSIS