

MODEL 41-316, CODE 121

SPECIFICATIONS

TYPE OF CIRCUIT—Model 41-316, code 121 is a fifteen tube wireless remote control, electric push-button and manually tuned superheterodyne radio with four (4) tuning bands for reception of standard and short wave broadcast stations. This model is also designed to receive the sound of a television program tuned in by special Philco television sets, and for use with a Philco Wireless Record Player.

In addition other features of design included are:—Philco Built-In American and Overseas Aerial System; two I.F. amplifier stages; Variable Tone Control; Automatic Volume Control; Audio Buss Frequency Compensation; Degenerated Push-Pull Pentode Audio Output Stage; new Philco XXL Noise-Reducing Converter Tube; Philco Loktal Tubes; Large balanced field Electro-Dynamic Speaker, and an Edge-Lighted Horizontal dial with an Illuminated Movable Band Indicator.

BUILT-IN AMERICAN AND OVERSEAS AERIAL SYSTEM—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 194 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 distributor. A ground connection is not required with either type of installation.

WIRELESS REMOTE CONTROL AND ELECTRIC PUSH-BUTTON TUNING—The wireless remote control automatically

tunes in seven broadcast stations; increases and decreases sound volume; turns the power supply of the radio OFF and has a silent position which silences the sound output without operating volume control. These operations are all controlled from the remote control unit without any connections with the radio.

The eight Electric Push-Buttons on the cabinet dial operate independently of the wireless remote control. Seven of the push-buttons tune in stations and one push-button is used to select wireless remote control.

The procedure for adjusting wireless remote control and the electric push-buttons for reception of broadcast stations is covered on this page.

TUNING BAND FREQUENCIES—540 to 1720 K. C., 2.3 to 7.0 M. C., 9 to 12 M. C., 13.5 to 18 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 10 Watts

POWER SUPPLY: 118 volts—50 to 60 cycle A. C.

POWER CONSUMPTION: 175 watts.

PHILCO TUBES USED: Radio Section—XXL oscillator; XXL converter; two 7D7, I. F. amplifiers; 7C6, 2nd detector-first audio A. V. C.; 37, Phase Inverter; two 42 audio output, and an 80 rectifier.

Wireless Remote Control Amplifier—78, 1st control amplifier; 6J7G, 2nd control amplifier; 6J5G, noise gate; 6ZV5G, noise gate, and a 2A4G Thyratron relay tube.

Remote Control Unit—one 30 tube, control oscillator.

CABINET DIMENSIONS:	H-height	Width	Depth
Console	36"	35 1/2"	16"
Remote Control Unit	3 1/2"	7 1/2"	9 1/8"

ADJUSTING FOR PUSH-BUTTON AND WIRELESS REMOTE CONTROL OPERATION

Broadcast stations can be tuned in automatically from the wireless remote control unit and in addition, can also be tuned in automatically by push-button operation. Eight push-buttons are provided on the radio chassis. One of these (extreme left) is used to select Remote Control Tuning. The remaining push-buttons are used to select stations automatically by push-button operation.

By using the remote tuning unit, seven broadcast stations can be tuned in; the volume can be raised and lowered; a silent position can be selected and the radio can be turned "OFF".

The selected broadcast stations can be set up for push-button and remote tuning control operation by adjusting the padders and coils located in back of the push-button assembly. Three adjustments must be made for each broadcast station selected.

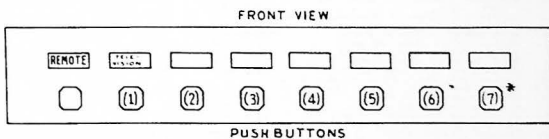
The bottom row marked "ANT" is for the antenna padder for remote control operation; the middle row of adjusting screws is for the oscillator coils used in remote control; the top row of adjusting screws is for the oscillator adjustment for push-button tuning. Each set of three padders is numbered from "1" to "7" corresponding to the numbers shown on the push-buttons in Figure above.

To set up stations on these models for best reception, a Signal Generator PHILCO Model 077, Vacuum Tube Voltmeter PHILCO Model 027 or 028 and Aikening Adaptor, Part No. 45-2767 should be used. With this equipment proceed as follows:

1. Select and remove the desired seven (7) station call letters from the receiver station tab card. Insert the station tabs in the windows of the bezel on the receiver. Place the lowest frequency station in the second window space on the right side of the bezel, and the remaining station tabs in the windows in the order of increasing broadcast frequency.

2. Remove the tabs of the corresponding seven stations from the wireless control call letter card. Insert the LOUD, SOFT and SILENT tabs in the first, second and third spaces, respectively, on the right hand side of the bezel. Insert the tab of the lowest frequency station in the fourth space on the right side of the bezel on the remote control unit dial. Transparent tabs are also supplied. These should be placed over each call letter. Place the remaining call letter tabs around the bezel from right to left (counter-clockwise) in the order of increasing frequency.

3. Remove the 7C6 second detector tube from its socket and insert the Aikening Adaptor Part No. 45-2767. Replace the tab in the adaptor. Connect the negative (-) terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive (+) terminal of the voltmeter to the black wire of the adaptor.



4. Turn volume control and power switch to the "ON" position, and allow the receiver to heat up. Attach a loop consisting of a few turns of wire to the output terminals of the Model 077 Signal Generator. Turn the signal generator power switch to "MOD. ON". Turn the receiver "Band" selector to "Broadcast" and manually tune in the lowest frequency station desired. This station should be between 540 to 1030 K. C. Then tune the signal generator to the frequency of the same station and a beat note will be heard. Leave the signal generator pointer set at this frequency.

5. Press in the "Remote" push-button. Dial the first low frequency station on the remote control unit.

6. Using a padding screw driver adjust No. 1 "OSC Remote" (middle row) until the station identified by the modulated signal of the Signal Generator is tuned to maximum reading on the voltmeter. Next adjust the "No. 1 ANT" padder (bottom row) for maximum indication on the voltmeter.

- Press in the No. 1 push-button on the radio and adjust No. 1 "P.BUTTON OSC" padder (top row) for maximum output on the same station.

7. Turn the Signal Generator off the station frequency and readjust the No. 1 "OSC P.BUTTON" padder for maximum; then press REMOTE push-button and readjust No. 1 "Remote OSC" and No. 1 "ANT" padders for maximum reading with the station signal. This should be done with the volume control of the receiver at low volume.

Repeat this procedure for each of the remaining stations to be set up. They should be set up in the order of their increasing frequency.

8. After all stations have been set up for push-button and remote control operation, press in the fifth (5) push-button and adjust the padder "ANT COMPENSATOR" located to the right of the padder strip unit below the dial, for maximum signal strength. See Fig. 8 for compensator (31).

MODEL 41-316, CODE 121 (CONTINUED)

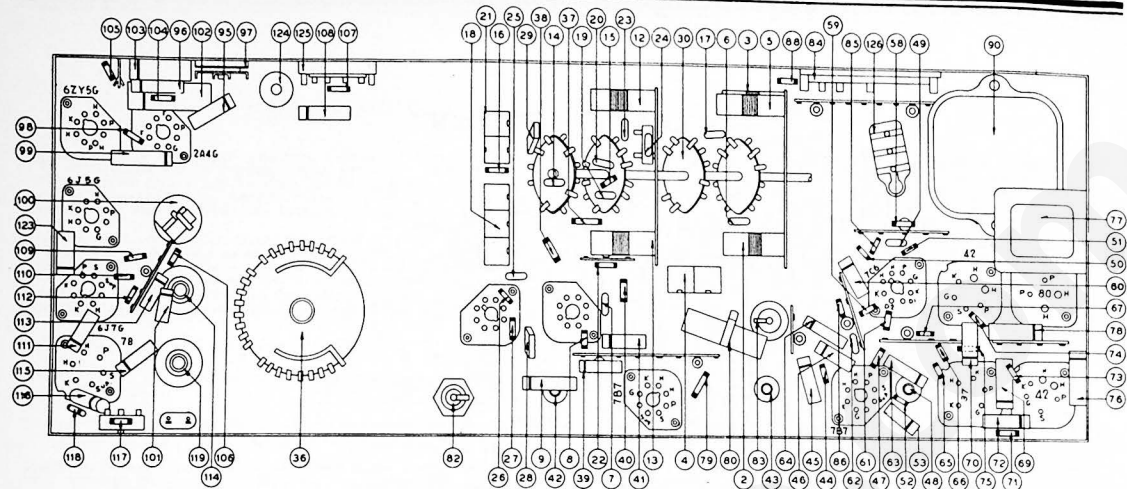


FIG. 1. PART LOCATIONS — UNDERSIDE OF CHASSIS

Replacement Parts — Model 41-316, Code 121

SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
1	Loop Aerial	76-1182	68	Tone Control	33-5325			
	Washer	28-4186	69	Condenser (.1 mfd., 200 volts)	30-4586			
	Washer (2 required)	W-151	70	Condenser (.01 mfd., 400 volts)	30-4572			
	Washer (2 required)	W-425	71	Resistor (.47, 100 ohms)	33-47339			
	Screw (2 required)	W-288	72	Condenser (.01 mfd., 400 volts)	30-4572			
	Sieve	38-3806	73	Resistor (470,000 ohms)	33-24339			
	Sieve	56-1907	74	Resistor (470,000 ohms)	33-447339			
	Sieve	56-1545	75	Resistor (270,000 ohms)	30-4381			
2	Aerial Transformer (Broadcast)	32-3588	76	Condenser (.01 mfd., 4000 volts)	33-427339			
	Clip	28-5002	77	Output Transformer	32-8138			
3	Aerial Transformer (Short Wave)	32-5000	78	Condenser (.01 mfd., 1000 volts)	30-4381			
	Clip	28-5002	79	Resistor (56,000 ohms)	33-356439			
4	Compensator (S. W., 18 M. C.)	32-3498	80	Insulator	33-2473			
4A	Compensator (S. W., 12 M. C.)	28-5002	81	Field Coil (Replace Speaker 36-1515-4)	38-4186			
	Clip	28-5002	82	Electrolytic Condenser (For Spkr. 36-1515-4)	30-2380			
5	Mica Condenser (.05 mfd.)	30-1178	83	Electrolytic Condenser (18 mfd., 475 v.)	30-2200			
7	Mica Condenser (.05 mfd.)	32-3498	84	Bias Resistor (14-27-14-13 ohms)	33-3364			
8	Resistor (2.2 megohms)	33-522154	84A	Part of 84				
9	Condenser (.05 mfd., 200 volts)	32-3498	84C	Part of 84				
10	Tuning Condenser	31-2507	84E	Part of 84				
	Coupling Assembly	31-2239	85	Resistor (2.2 megohms)	33-522339			
	Drive Card (Tuning Drum)	31-2315	86	Resistor (1 megohm)	33-510339			
	Drum and Shaft (Cable)	38-9716	87	Pilot Lamp (Band Indicator)	34-2064			
10A	Compensator	32-3578	88	Resistor (10 ohms, Jewel Pilot Lamp)	33-010439			
	Condenser (1 mfd.) Wire and Lug from D3 to B10 on Wave Sets	32-3578	89A	Pilot Lamp (Jewel)	34-2210			
12	Oscillator Transformer (Short Wave)	32-5002	90	Power Transformer (.15 volts, 60 cycle)	32-8800			
13	Oscillator Transformer (Broadcast, Police)	32-5002	91	Condenser (Part of Power Card L-3176)	33-1237			
	Clip	28-5002	92	Volume Control Motor	27-9770			
14	Mica Condenser (2000 mfd.)	60-13324		Motor Belt	27-9779			
15	Resistor (4700 ohms, 1/2 watt)	33-24339		Drive Pulley	56-8111			
16	Resistor (8200 ohms, 1/2 watt)	33-282339		Adjustment Bracket (Bell)	56-2014			
17	Mica Condenser (2 mfd.)	60-12517	93	Electrolytic Condenser (30 mfd., 300 v.)	30-2177			
18	Compensator (Oscillator, 18 M. C.)	31-6362	94	Stepper Unit Complete	76-1144			
18A	Compensator (Oscill., 6 M. C.) Part of 18	31-6362		Cover	76-1160			
18B	Compensator (Oscill., 6 M. C.) Part of 18	31-6362		Rubber Liner (End)	54-4841			
19	Mica Condenser (.185 mfd.)	30-1177		Rubber Liner (Side)	27-4800			
20	Mica Condenser (.185 mfd.)	30-1197		Rubber Liner (Top)	27-4801			
21	Compensator (Oscillator, 1800 K.C.) Part of 21	31-6365	94A	Spark Filter Choke (Part of 94A)	32-1216			
22	Resistor (33,000 ohms)	33-133339	94B	Spark Filter Choke (Part of 94A)	32-1216			
23	Mica Condenser (.250 mfd.)	60-12517	94C	Condenser (.05 mfd., 200 volts)	30-4518			
24	Mica Condenser (.10 mfd.)	60-101337	94D	Condenser (.05 mfd., 200 volts)	30-4518			
25	Mica Condenser (.250 mfd.)	60-12517	94E	100 ohms	33-110339			
26	Resistor (100,000 ohms)	33-410339		Stepper Relays (Stepper Coil)	38-9821			
27	Resistor (10,000 ohms)	32-3597		Stepper Relays (Hold-in Coil)	38-9823			
28	Mica Condenser (.263 mfd.)	30-1196	95	Condenser (.05 mfd., 400 volts)	30-4518			
29	Mica Condenser (.263 mfd.)	30-1196	96	Condensator (.05 mfd., 200 volts)	30-4518			
30	Band Switch	42-1618	97	R. F. Choke	32-1281			
31	Compensator (Aerial—Push-button)	31-6367	98	Resistor (68,000 ohms)	33-368339			
32	Push-button Switch	42-1627	100	2nd Control, Amplifier Transformer	32-3275			
33	Compensator (Aerial—Remote Control)	31-6392	101	Condenser (.02 mfd., 400 volts)	30-4518			
33A	Compensator (Oscillator—Push-button)	32-3587	102	Condenser (.05 mfd., 200 volts)	30-4500			
34	Push-button Oscill. Coil Strip (7 coils)	32-3587	103	Condenser (.05 mfd., 200 volts)	30-4500			
	Oscillator Coil Strip (7 coils)	32-3587	104	Resistor (47,000 ohms)	33-347339			
	Oscillator Coils (5 to 7)	32-3041	105	Resistor (3900 ohms)	33-293339			
35	Push-button (19)	32-3597	106	Resistor (2700 ohms)	33-412339			
36	Stepper Rotary Switch	42-1620	107	Resistor (150,000 ohms)	33-415339			
	Contact Arm	38-9764	108	Resistor (150,000 ohms)	33-415339			
	Drive Arm	38-9763	109	Resistor (47,000 ohms)	33-415339			
	Nut	28-6967	110	Resistor (150,000 ohms)	33-415339			
	Washer	W-400	111	Resistor (.05 mfd., 200 volts)	30-4519			
	Insulating Washer	27-7397	112	Condenser (.05 mfd., 200 volts)	33-515339			
	Insulating Washer	27-7397	113	2nd Control, Amplifier Transformer	32-3087			
	Rubber Sleeve	32-3587	114	Condenser (.05 mfd., 400 volts)	30-4519			
37	Resistor (33 ohms)	33-14934	115	Condenser (.05 mfd., 200 volts)	30-4519			
38	Resistor (10 ohms)	33-010434	116	Condenser (.05 mfd., 200 volts)	30-4519			
39	Condenser (.05 mfd., 400 volts)	30-4572	117	Resistor (330 ohms)	33-133339			
40	Condenser (.05 mfd., 200 volts)	30-4519	118	Resistor (330 ohms)	33-133339			
41	1st I. F. Transformer	32-3498	119	1st Control, Amplifier Transformer	33-133339			
42	2nd I. F. Transformer	32-3498	120	Secondary Inductor (Cab.—Remote Cont.)	76-1163			
43	Resistor (47,000 ohms)	33-41339	121	Compensator (Mounted on 120)	31-6268			
44	Condenser (.05 mfd., 400 volts)	30-4518	122	Mica Condenser (.172 mfd.)	30-1198			
45	Resistor (47,000 ohms)	33-41339	123	Condenser (.05 mfd., 400 volts)	30-4518			
46	Resistor (120,000 ohms)	33-112339	124	Electrolytic Condenser (150 v., 150 v.)	30-2387			
47	F. Transformer	32-3597	125	Resistor (Wirewound—450 ohms)	33-3362			
48	Mica Condenser (.100 mfd.)	60-11017	126	Condenser (.05 mfd., 200 volts)	30-4500			
49	Resistor (2.2 megohms)	33-522339						
50	Resistor (330,000 ohms)	33-103339						
51	Resistor (88,000 ohms)	60-050117						
52	Mica Condenser (.80 mfd.)	33-41339						
54	Mica Condenser (.80 mfd.)	33-41339						
55	Resistor (88,000 ohms)	60-050117						
56	Volume Control	33-8417						
	Drive Arm	31-6139						
	Set Screw	W-2105						
57	Condenser (.01 mfd., 400 volts)	30-4572						
58	Resistor (47,000 ohms)	33-447339						
59	Resistor (2 megohms)	33-610339						
60	Condenser (.01 mfd., 400 volts)	30-4572						
61	Resistor (330,000 ohms)	33-43339						
62	Mica Condenser (.250 mfd.)	60-12517						
63	Condenser (.01 mfd., 400 volts)	30-4572						
64	Resistor (47,000 ohms)	33-447339						
65	Resistor (470,000 ohms)	33-47339						
67	Resistor (47,000 ohms)	33-47339						

MISCELLANEOUS PARTS

Bezel (Dial) Cabinet	40-662K
Band Indicator (Dial Scale)	27-560R
Cord (Power)	1-3176
Cabinet (Wireless Remote Control Unit)	10350A
Cabinet	10501
Cable (Speaker)	41-3610
Cable (P. B. Switch, Station Light)	41-3603
Cable (P. B. Switch, Oscillator)	41-3604
Cable (P. B. Switch, Antenna)	41-3605
Cable (Volume Control to 7C6 Tube)	L-3279
Clip	28-5002
Drive Cord (Pointer)	31-2316
Drive Cord (Tuning Drum)	31-2315
Drum Control (Volume)	54-4027
Drum Control (Tuning)	54-4029
Drum Control (Tone)	54-4027
Drum Control (Wave Switch)	54-4030
Control Bracket (Left Hand)	28-6924
Control Bracket (Right Hand)	27-5658
Dial Scale (Cabinet)	56-1034
Clamp	56-1034
Jewel (Cabinet Pilot Lamp)	27-4777
Knob (Push-button)	34-4009
Rubber Grommets Tuning Unit Mtg.	3914 and 3915
Rubber Grommet (P. B. Sw., Stepper Unit)	27-4596
Rubber Grommet (Tuning Condenser Mtg.)	27-4771
Rubber Washer (Chassis Mounting)	27-4571
Rubber Corner (Chassis)	54-4040
Shield (Tube)	28-2726
Shield (Tube)	28-2726
Speaker	36-1154
Socket Assm. (Pilot Lamp, Band Ind.)	36-1154
Socket Assm. (Pilot Lamp, Light)	76-1063
Socket Assm. (Pilot Lamp, L. H.)	36-9712
Socket Assm. (Pilot Lamp, R. H.)	36-9695
Socket Assm. (Jewel)	38-9694
Socket (5 prong)	27-6167
Socket (6 prong)	27-6168
Socket (Octal)	27-6166
Socket Assm. (Loktal, Rubber Oscillator)	27-6129
Socket (Loktal, Bakelite)	27-6138
Socket (3 prong, Aerial)	27-6145
Screw (Bezel Mounting)	W-2087
Screw (Tuning Unit to Cabinet)	W-1351
Screw (Chassis Mounting)	W-1345
Screw (Inductor Loop Mounting)	W-2087
Sieve (P. B. Sw. to Stepper Unit Mtg.)	28-3806
Tab (Remote, Push-button)	27-5655
Tab Kit (Stations) Push-buttons	40-6387
Washer (Chassis Mounting)	28-5114
Washer (Tuning Unit to Cabinet)	W-658

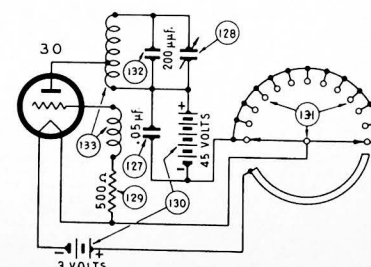
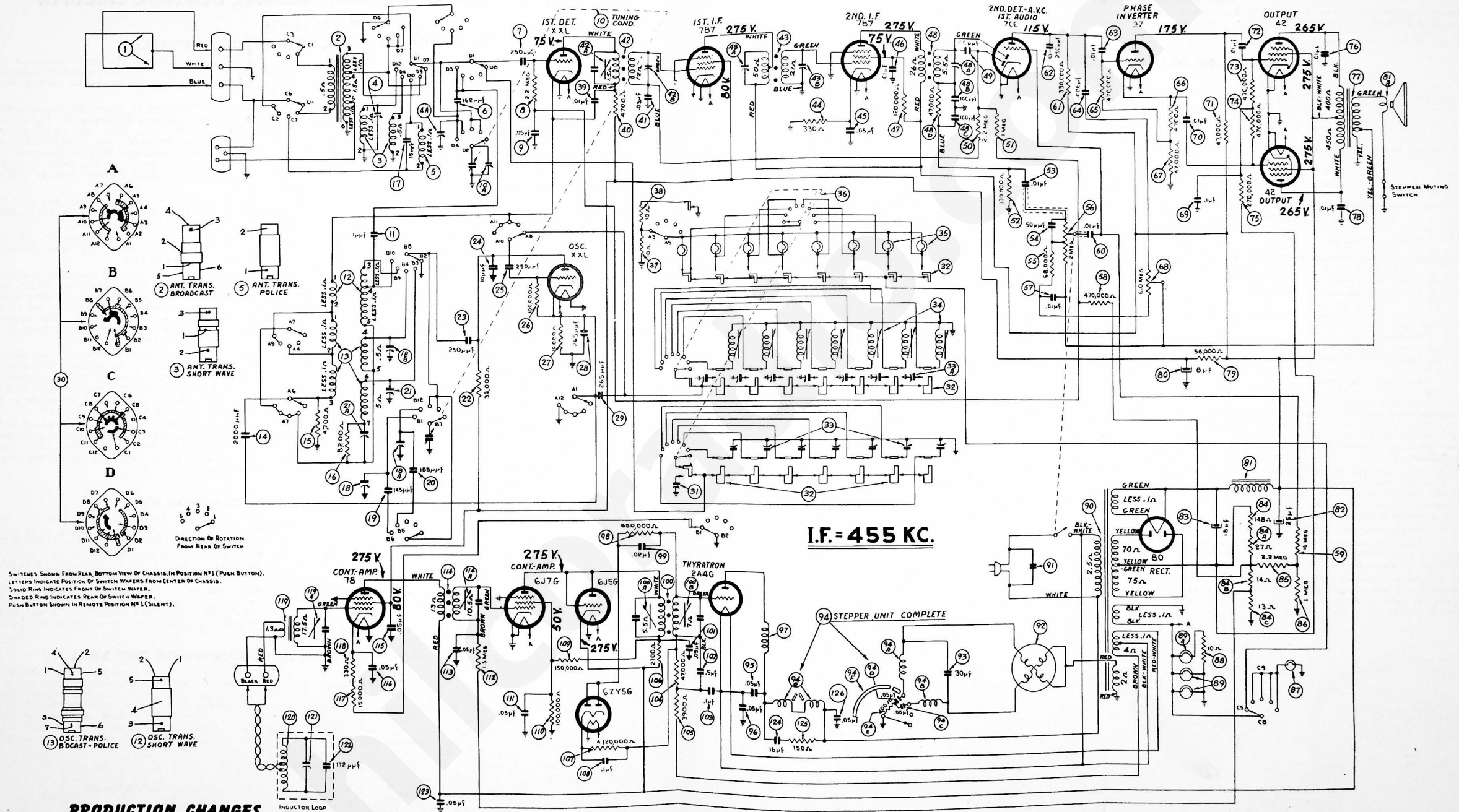


FIG. 2. WIRELESS REMOTE CONTROL UNIT WIRING

* NOTE: Stepper Speaker Filter Assembly complete consisting of 44A, 94B, 94C, 94D, 94E. 38-9898



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ALIGNING R. F. AND I. F. COMPENSATORS 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. 15-2610.

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: If this type of meter is used as an aligning indicator, it should be connected to the plate terminals of the 42 tubes. Adjust the meter for the 0 to 50 volt A. C. scale.

Signal Generator: When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1

mfd condenser to terminal 3 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. If the chassis is to be aligned outside the cabinet the loop should be in the same relative position near the chassis as when assembled 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 on Fig. 7. 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 Settings	Adjust Compensators in Order		
1	High side to No. 3 terminal loop Panel.	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Position	48D, 43A, 43B, 42A, 42B		
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Broadcast	21, 10A	Note A	
3	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch Broadcast	21A	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"	18B	Note C	
6	Use Loop on Generator	12 M. C.	12 M. C.	Range Switch "S. W." 1	18A, 4A	Note D	
7	Use Loop on Generator	18 M. C.	18 M. C.	Range Switch "S. W." 2	18, 4	Note E	

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 Fig. 6.

NOTE B — When adjusting the compensator, 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 — Adjust compensator (18B) to the SECOND signal peak from the tight (closed) position.

NOTE D — Adjust compensator (18A) to the FIRST signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver dial at 12 M. C. and turn the signal generator to 11,090 M. C.

NOTE E — Adjust compensator (18) to the SECOND signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver at 18 M. C. and turning the signal generator to 18,910 M. C. When adjusting compensator (4) roll the tuning condenser, See Note "B" on how to roll the condenser.

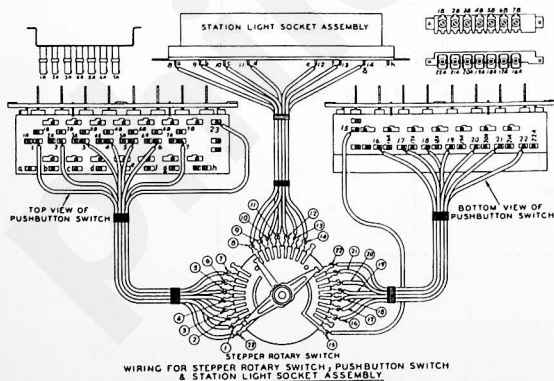


FIG. 4. CABLE WIRING FROM STEPPER ROTARY SWITCH TO PUSH-BUTTON SWITCH AND STATION LIGHTS

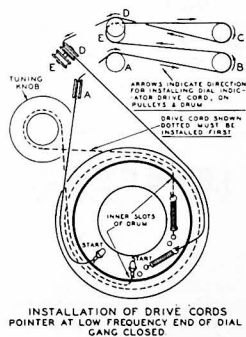


FIG. 6. DIAL POINTER AND CABLE ARRANGEMENT

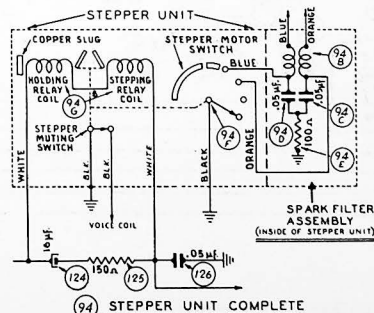


FIG. 3. INTERNAL WIRING OF STEPPER UNIT NUMBERS CORRESPOND TO SCHEMATIC

ADJUSTMENT OF WIRELESS REMOTE CONTROL CIRCUITS

Model 41-316

ADJUSTING CONTROL FREQUENCY AMPLIFIER

The wireless remote control models are shipped with 5 different control frequencies which range from 350 to 400 K. C. These frequencies are identified by code numbers appearing on the serial number ticket and on the rear of the chassis. The code numbers and frequencies are as follows:

Code 5.....355 K. C.	Code 7.....375 K. C.
Code 6.....367 K. C.	Code 8.....383 K. C.
Code 9.....395 K. C.	

The purpose of the different control frequencies is to prevent interaction between two or more wireless remote control models which are on the same floor or exceptionally close together. When several wireless remote control models are to be located close together, it will be necessary to use different control frequencies. These frequencies should be 20 K. C. apart. For example, if three models are to be operated at the same time and are closely situated, it will be advisable to adjust the control frequency of the first set to 355 K. C., the second set to 375 K. C., and the third set to 395 K. C.

In order to realign or change the control frequency of these models, the following equipment is required:

1. Philco Model 077 signal generator with a loop attached to the output terminal. (A few turns of wire 12 inch in diameter).
2. Philco wireless remote control aligning adapter. Part No. 45-2769.
3. Philco aligning screw driver, Part No. 45-2610.

With this apparatus the control frequency is adjusted as follows:

1. Remove the 2A4G control tube from its socket and replace with the aligning adapter. Connect the red lead of the aligning adapter to the positive terminal of the vacuum tube voltmeter. The black lead of the adapter is connected to the negative terminal of the vacuum tube voltmeter.
2. Remove the 78 control amplifier tube, its shield and the shield of the 6J7G tube. Apply power to the set and turn the range selector disc to "remote".

3. Attach the "high" side of the signal generator output to the grid of the 6J7G tube. Set the generator modulation control to "mod on" and turn the attenuator control about one-fourth on.

4. The control frequency to which the control amplifier is tuned can now be determined by tuning the signal generator between 350 and 400 K. C. When the signal generator is tuned to the control frequency, the vacuum tube voltmeter will show maximum deflection. If this frequency is to be used, leave the signal generator at this point or turn the indicator to any other frequency desired between 350 and 400 K. C.

5. After the control frequency has been found or changed, compensators (100A), (100B) are adjusted for maximum indication on the vacuum tube voltmeter.

6. After adjusting this circuit, replace the 78 tube and shields in their sockets and remove the signal generator lead from the grid of the 6J7G tube.

7. Place the small loop mentioned above into the "high" and "ground" terminals of the signal generator output and place the signal generator near the secondary inductor loop in the bottom of the cabinet. When doing this, do not disturb the setting of the signal generator indicator. The compensators (114A) and (119A) are now adjusted for maximum reading on the vacuum tube voltmeter.

8. Next adjust the secondary inductor loop compensator (121) located in the bottom of the cabinet. This compensator is encased in a cardboard container that is attached to one corner of a loop. Extreme care should be used in adjusting the compensator to the exact point of resonance as the secondary inductor is a very sharply tuned circuit.

9. If the vacuum tube voltmeter pointer goes off scale when adjusting the compensators, turn the attenuator control of the signal generator toward the "off" position. After these compensators are adjusted to maximum, the control amplifier is tuned to the frequency selected.

ADJUSTING WIRELESS REMOTE CONTROL UNIT

The wireless remote control unit is now adjusted to the control frequency of the amplifier as follows:

1. Turn off the signal generator, then dial any one of the stations indicated on the remote control unit by pulling the selector to the stop position; release the selector and at the same time press the stop down and hold it in this position.
2. Now bring the wireless remote control unit close to the receiver. Using a padding wrench, Philco Part No. 3164, tune the compensator (128) Fig. 2, located on the bottom of the remote control unit until a maximum voltage reading is

indicated on the vacuum tube voltmeter. When tuning this compensator, it should be done very slowly so as not to pass over the frequency to which the control amplifier is tuned.

3. The remote control unit is now moved a short distance from the radio (several feet). Compensator (128) is then re-adjusted for maximum voltage reading.

4. After making these adjustments, remove the aligning adapter from the socket and replace the 2A4G tube. The wireless remote control unit should now be adjusted to the same frequency as the control frequency in the receiver.

ADJUSTING REMOTE CONTROL UNIT OPERATING DISTANCE

When shipped from the factory the wireless remote control circuit is adjusted to control the radio from an average distance that has been found to be satisfactory in most installations. In some special cases, however, where the radio and control are situated near large metal objects or installed in metal shielded areas, it may be necessary to change the control circuit to get adequate remote control (increase sensitivity)

from certain distances. In these cases, the value of resistor (117) 15,000 ohms, located underneath the radio chassis, should be changed to a lower value that will give the desired range of control. The resistor, however, should not be lowered in value more than is found necessary for the special installation. If the control range is too sensitive, the resistor should be changed to a higher value (more resistance).

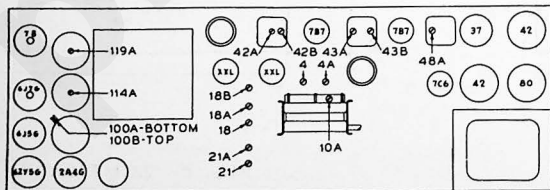


FIG. 7. COMPENSATOR LOCATIONS—TOP OF CHASSIS

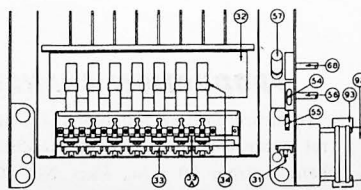


FIG. 8. LOCATION OF PARTS. TUNING UNIT