

MODEL 41-616, CODE 121

SPECIFICATIONS

TYPE OF CIRCUIT:—Model 41-616P and 41-616PW, Code 121, are Radio-Phonograph combinations consisting of a sixteen (16) tube super-heterodyne radio and Automatic Phonograph record changer. These two models are identical with the exception of the cabinet.

RADIO SECTION

The radio includes, Philco Wireless Remote Control—Electric push-button and manual tuning—Four tuning bands for reception of standard and short-wave frequencies—PHILCO Built-in American and Overseas Aerial system—Two I. F. Amplifier stages—Variable tone control—Automatic Volume Control—Automatic Audio Bass frequency compensation—Phase-Inverted Push-Pull Audio output stage—New type 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. In addition, the radio is designed to receive the sound of a Television program tuned in by special Philco Television radios.

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, 60 cycle A. C. The radio can also be operated on 118 volts, 50 cycle A. C. To do this it is necessary to replace the record changer motor as indicated in the parts list.

POWER CONSUMPTION: 200 Watts

PHILCO TUBES USED: Radio Section—715, oscillator; XXL, converter; two 7B7, I. F. amplifiers; 7C6, 2nd detector-first audio A. V. C.; 37, Phase Inverter; two 42 audio output, and an 80 rectifier; 7C7, Pre-Amplifier.

Wireless Remote Control Amplifier—78, 1st control amplifier; 6J7, second control amplifier; 6J5G, noise gate; 6Z5YG, noise gate, and a 2A4G Thyatron relay tube.

Remote Control Unit—one 30 tube, control oscillator.

CABINET DIMENSIONS:	Height	Width	Depth
41-616P	42"	41"	17 3/4"
Remote Control Unit	5 1/2"	7 1/2"	9 1/4"

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.

AUTOMATIC RECORD CHANGER

The Service Procedure for adjusting the Automatic Record Changer Mechanism will be found on page 145.

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 3/8" in width. The socket assembly is now rotated so that the spot of 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.

ADJUSTING PUSH-BUTTONS AND WIRELESS REMOTE CONTROL

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 and the one on the extreme right for selecting phonograph. The remaining push-buttons are used to select stations automatically by push-button operation.

In addition connections are provided for an outside aerial. The outside aerial should be used when operating the radio in steel reinforced buildings and other shielded locations. The Philco 1941 Outdoor Aerial Part Number 45-2817 is recommended for maximum receiving performance. This 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. The 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 six broadcast stations; increases and decreases sound volume; starts and stops record changer; rejects records; changes from radio to phonograph or phonograph to radio; turns the power supply of the radio and phonograph 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. Six of the push-buttons select stations, one for remote control and one push-button is used to operate the phonograph.

The "Phono" button starts and stops record changer and rejects records. Any station button changes from phonograph to radio and stops the phonograph motor.

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

PHONOGRAPH SECTION

The phonograph consists of a Philco DeLuxe Inter-Mix 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 automatic record changer plays fourteen 10 and 12 inch records intermixed in any order, fifteen 10 inch or thirteen 12 inch records at one loading. The changer can be controlled either at the cabinet or the remote control unit.

Connections are also provided on the rear of the radio chassis (No. 36 on the diagram) for installation of the Philco Home Recording Unit Model HR-1, part number 45-2820. With this unit records can be made in the home. The Home Recording Kit can be obtained from your Philco distributor with complete instructions for installation and operation.

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. 23 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 23 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.

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

The procedure for adjusting the push-buttons and wireless Remote Control of the model is the same as that given for Model 41-316 with the exception that six stations are set up instead of seven.

MODEL 41-616, CODE 121 (CONTINUED)

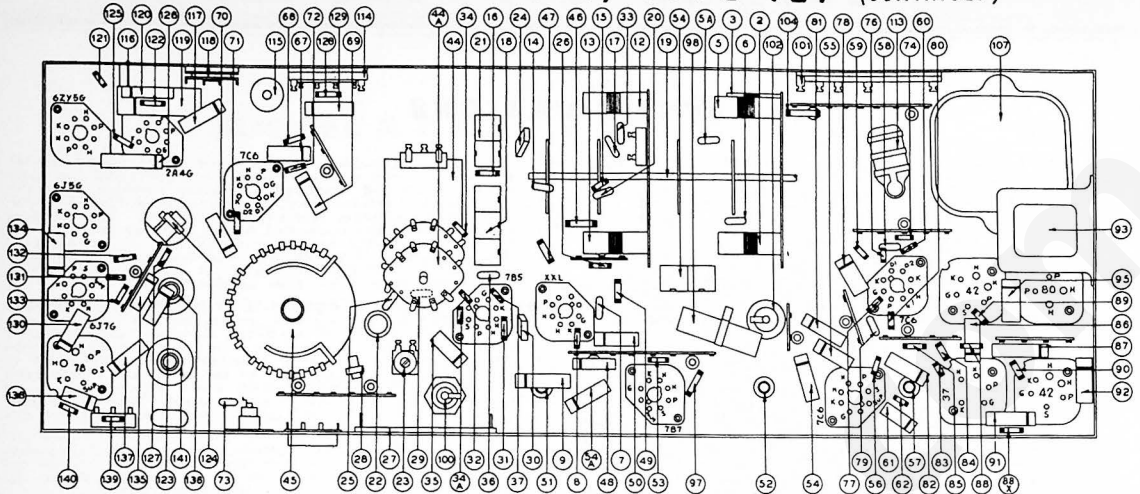


FIG. 1. PART LOCATIONS — UNDERSIDE OF CHASSIS

Replacement Parts — Model 41-616, Code 121

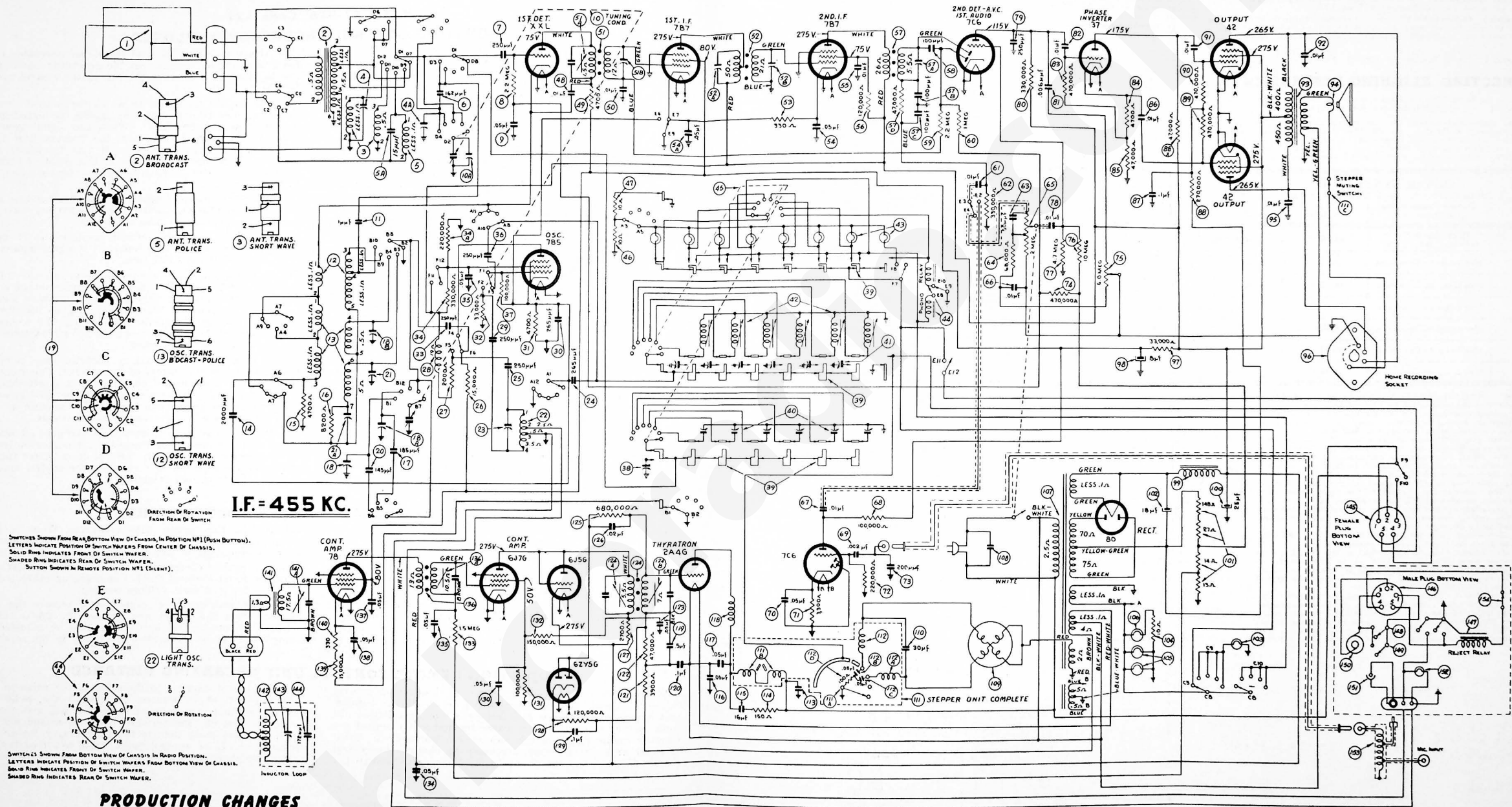
SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
1	Loop Aerial	76-1191	67	Condenser (.01 mfd., 400 volts)	30-4572	147	Reject Relay (Part of Changer)	42-1631
	Sleeve Mounting (2 required)	28-2257	68	Condenser (100.000 ohms)	33-410339	148	Power Cycling Switch (Record Changer)	42-1633
	Sleeve Mounting (1 required)	56-1907	69	Condenser (1.002 mfd., 400 volts)	30-4579	149	Record Changer Power Sw. (Rec. Chng.)	42-1632
	Washer	42-4196	70	Condenser 3-45 mfd., 400 volts)	30-4519	150	Record Changer Motor (115 volts, 60 c.)	35-1272
	Washer	W-151	71	Resistor (3300 ohms)	33-233339		Record Changer Motor (115 volts, 50 c.)	35-1273
	Screw	W-288	72	Resistor (200.000 ohms)	33-422339		Recording Lamp	32-4423
	Aerial Transformer (Broadcast)	32-3587	73	Condenser (200 mmfd.)	60-120137	152	Light Beam Pickup Complete	35-2309
2	Aerial Transformer (Short Wave)	32-3581	75	Resistor (170.000 ohms)	33-447339	153	Phonot & Home Recording Input Trans.	32-4148
3	Aerial Transformer (Short Wave)	32-3581	75	Tone Control	33-5325	154	Reject Cycling Switch	42-1630
4A	Compensator (12 M. C.) Part of 4	31-6391	76	Resistor (10 megohms)	33-420339			
5	Aerial Transformer (6 M. C.)	32-3580	77	Resistor (4.7 megohms)	33-547339			
5A	Mica Condenser (15 mmfd.)	60-011517	78	Condenser (.01 mfd., 400 volts)	30-4572	155	Primary Inductor	32-3097
6	Mica Condenser (162 mmfd.)	30-1178	79	Condenser (200 mmfd.)	60-125157	156	Ca Condenser (200 mmfd.)	30-1115
7	Mica Condenser (250 mmfd.)	60-126157	80	Resistor (330.000 ohms)	33-433339	157	Compensator	31-6268
8	Resistor (2.2 megohms)	30-451339	81	Condenser (.05 mfd., 400 volts)	30-4581	158	Pulsor Unit (Complete)	38-9706
9	Resistor (2.2 megohms)	33-522339	82	Condenser (.01 mfd., 400 volts)	30-4572	159	Condenser (.05 mfd.)	30-4519
10	Condenser (.05 mfd., 200 volts)	30-451339	83	Resistor (470.000 ohms)	33-447339	160	Resistor (500 ohms)	33-150339
	Tuning Condenser	31-2507	84	Resistor (4700 ohms)	33-347339	161	Remote Control Battery Pack	41-4023
	Coupling	31-2291	85	Resistor (47.000 ohms)	33-347339		Bezel (Remote Unit)	56-1240
	Drive Cord (Tuning Drum)	31-2315	86	Condenser (.01 mfd., 400 volts)	30-4572		Washer	27-4129
	Drive Cord (Pointer)	31-2316	87	Condenser (.1 mfd.)	30-4586		Dial Cap	27-4783
	Drum and Shaft (Cable)	36-9716	88X	Resistor (270.000 ohms)	33-427339		Finger Stop	27-782
10A	Comp. (1500 M. C. Aerial) Part of 10		89	Resistor (47.000 ohms)	33-347339		Screw	W-139
11	Condenser (Consists of Wire and Lug from #10 to #3)		90	Resistor (470.000 ohms)	33-447339		Spacer	27-4784
12	Oscillator Transformer (Short Wave)	32-3578	91	Resistor (470.000 ohms)	33-447339		Socket (Tube)	27-4782
13	Oscillator Trans. (Poire and Broadcast)	32-3582	92	Condenser (.01 mfd., 1000 volts)	30-4381		Cable (Battery)	41-3447
14	Mica Condenser (2000 mfd.)	30-220324	93	Output Transformer	32-8138			
15	Resistor (6700 ohms)	33-221339	94	Comp. Assembly (For Spkr. 36-1530-4)	26-4311			
16	Resistor (8200 ohms)	30-282339	95	Condenser (.01 mfd., 1000 volts)	30-4381			
17	Mica Condenser (185 mmfd.)	30-1193	96	Socket (Horn Circuit)	76-1103			
18	Mica Condenser (185 mmfd.)	31-6362	97	Shunt Plug Assembly	33-104339			
18A	Compensator (13 M. C.) Part of 18		98	Resistor (33.000 ohms)	30-2473			
18B	Compensator (16 M. C.) Part of 18		99	Resistor (33.000 ohms)	30-2473			
19	Band Switch (R. F. Section)	42-1618	100	Field Coil (Replace Speaker 36-1530)	30-2360			
20	Mica Condenser (185 mmfd.)	31-1196	101	Electric Cond. (152 mfd., 500 volts)	33-3364			
21	Compensator (Oscillator, 1500 K. C.)	31-6365	102	Resistor (Wirewound, 148-27-1413 ohms)	30-2200			
21A	Compensator (Oscillator, 560 K. C.)	31-6365	103	Insulator	27-8800			
22	Oscillator Transformer (Supplies Power to Phonograph Pickup)	32-3527	104	Resistor (10 ohms, Cabinet Jewel)	33-010339			
23	Compensator (Adjusts Phonograph Pickup Light)	31-6394	105	Pilot Lamp (Push-button)	33-2061			
24	Mica Condenser (.265 mmfd.)	30-121517	106	Pilot Lamp (Cabinet Jewel)	34-2410			
25	Mica Condenser (.250 mmfd.)	60-125157	107	Power Transformer (115 volts, 60 cycle)	32-8137			
26	Mica Condenser (.250 mmfd.)	30-1196	108	Power Transformer (115 volts, 60 cycle)	32-8137			
27	Resistor (2000 ohms, Wirewound)	33-3405	109	Power Transformer (115 volts, 60 cycle)	32-8137			
28	R. F. Choke (Phonograph Circuit)	32-3401		Power Transformer (115 volts, 60 cycle)	32-8137			
29	Mica Condenser (.265 mmfd.)	30-1196		Power Transformer (115 volts, 60 cycle)	32-8137			
30	Mica Condenser (.265 mmfd.)	33-247339		Power Transformer (115 volts, 60 cycle)	32-8137			
31	Resistor (4700 ohms)	33-233339	110	Resistor (33.000 ohms)	30-2473			
32	Resistor (33.000 ohms)	30-121517	111	Electrolytic Condenser (30 mfd., 500 volts)	36-1144			
33	Resistor (4700 ohms)	60-125157	112	Remote Control Stepper Unit Complete	76-1144			
34	Resistor (330.000 ohms)	30-451339	113	Stepper Contact Wafer	38-9761			
34A	Resistor (330.000 ohms)	33-433339	114	Stepper Relay Coils (Holding Coil)	38-9823			
35	Condenser (.05 mfd., 400 volts)	30-451339	115	Stepper Relay Coil (Stepping Coil)	38-9823			
36	Mica Condenser (.250 mmfd.)	60-125157	116	Stepper Mounting Switch	27-4789			
37	Resistor (100.000 ohms)	33-247339		Stepper Mounting Switch	27-4789			
38	Compensator (Aerial-Push-buttons)	31-6367		Stepper Mounting Switch	27-4789			
39	Push-button (Tone)	42-1618		Stepper Mounting Switch	27-4789			
40	Compensator Strip (Remote Control, Aerial)	31-6390		Stepper Mounting Switch	27-4789			
41	Oscillator Coil Swasm. (Remote Control)	32-3563	112	Filter Choke (Spark Filter, Stepper Unit)	30-4444			
	Coils (2-3-4)	32-3597	113	Filter Choke (Part of 112)	30-4444			
	Coils (5-6)	30-1041	114	Condenser (.05 mfd., 200 volts)	30-4444			
	Iron Core	28-6916	115	Resistor (100 ohms)	33-110339			
	Coil (C)	28-6916		Resistor (100 ohms)	33-110339			
43	Remote Control & Push-button Tuning Lgt. Socket Assembly	34-2064		Resistor (100 ohms)	33-110339			
	Light Cover	76-1146	113	Spark Filter Complete, consisting of 112, 113 & 114	38-9898			
44	Photograph Relay (Remote Control) Complete with Switch	42-1621	114	Condenser (Wirewound, 150 ohms)	36-15050			
44A	Changeover Switch	42-1647	115	Condenser (.16 mfd., 150 volts)	30-2387			
45	Stepper Switch	40-1120	116	Condenser (.05 mfd., 400 volts)	30-4518			
	Insulating Washer	27-7397	117	Condenser (.05 mfd., 400 volts)	30-4518			
	Insulating Washer	27-7397	118	Spark Filter Choke Coil	32-1281			
	Rubber Sleeve	41-859	120	Sparker Filter (.1 mfd., 200 volts)	30-4586			
	Contact Arm	38-9763	122	Resistor (330.000 ohms)	33-347339			
	Wash. Arm	28-6967	123	Condenser (.05 mfd., 400 volts)	30-4518			
46	Resistor (10 ohms)	30-10434	125	2nd Control Amplifier Transformer	31-6227			
47	Resistor (10 ohms)	30-10434	126	Resistor (680.000 ohms)	33-488339			
48	Condenser (.01 mfd., 400 volts)	30-4572	127	Resistor (2700 ohms)	33-227339			
49	Resistor (4700 ohms)	30-10434	128	Condenser (.05 mfd., 400 volts)	30-4518			
50	Condenser (.01 mfd., 400 volts)	30-4572	129	Condenser (.1 mfd., 200 volts)	30-4586			
51	1st I. F. Transformer	32-3493	130	Condenser (.05 mfd., 400 volts)	30-4518			
52	2nd I. F. Transformer	31-6394	131	Resistor (150.000 ohms)	33-110339			
53	Resistor (330 ohms)	33-133336	132	Resistor (150.000 ohms)	33-110339			
54	Condenser (.05 mfd., 400 volts)	30-4518	134	Condenser (.05 mfd., 400 volts)	30-4518			
55	Resistor (120.000 ohms)	33-122339	136	2nd Control Amplifier Transformer	30-4587			
56	Resistor (120.000 ohms)	33-122339	137	Condenser (.05 mfd., 400 volts)	30-4518			
57	3rd I. F. Transformer	30-01517	138	Condenser (.05 mfd., 400 volts)	30-4518			
58	Resistor (2.2 megohms)	33-522339	139	Resistor (15.000 ohms)	31-315339			
59	Resistor (2.2 megohms)	30-121517	140	Secondary Inductor	30-4586			
60	Resistor (.01 mfd., 400 volts)	30-4572	141	1st Control Amplifier Transformer	32-3086			
61	Condenser (.01 mfd., 400 volts)	30-4572	142	Compensator (Secondary Inductor)	76-1159			
62	Mica Condenser (50 mmfd.)	60-050137	143	Mica Condenser (Secondary Inductor)	30-1198			
63	Resistor (68.000 ohms)	33-368339	144	Volume Control Cable and Plug Assembly	41-3606			
64	Volume Control Cable and Plug Assembly	41-3606	146	Power Cable and Plug Assembly (Record Changer)	41-3560			
65	Drive Pulley	W-2105						
66	Condenser (.01 mfd., 400 volts)	30-4572						

WIRELESS REMOTE CONTROL UNIT

SCHE. No.	DESCRIPTION	PART No.
32-3097	Primary Inductor	32-3097
30-1115	Ca Condenser (200 mmfd.)	30-1115
31-6268	Compensator	31-6268
38-9706	Pulsor Unit (Complete)	38-9706
30-4519	Condenser (.05 mfd.)	30-4519
33-150339	Resistor (500 ohms)	33-150339
41-4023	Remote Control Battery Pack	41-4023
56-1240	Bezel (Remote Unit)	56-1240
27-4129	Washer	27-4129
27-4783	Dial Cap	27-4783
27-782	Finger Stop	27-782
W-139	Screw	W-139
27-4784	Spacer	27-4784
27-4782	Socket (Tube)	27-4782
41-3447	Cable (Battery)	41-3447

MISCELLANEOUS PARTS

SCHE. No.	DESCRIPTION	PART No.
35-1264	Automatic Record Fibanger (115 v., 50 c.)	35-1264
35-1260	Automatic Record Changer (115 v., 60 c.)	35-1260
54-3034	Rubber Cushion (Mounting Changer)	54-3034
28-414	Washer	28-414
28-8970	Spring	28-8970
W-288	Nut	W-288
40-6628	Band Indicator Scale	40-6628
27-8608	Bezel	27-8608
W-2073	Screw	W-2073
105168	Cabinet (Walnut)	105168
31-6268	Cabinet (Mahogany)	31-6268
41-3606	Cabinet (Phone Input)	41-3606
41-3607	Cable (Phone Pickup Light)	41-3607
41-3608	Cable (Remote Changer)	41-3608
41-3595	Cable (Speaker)	41-3595
41-3598	Cable (Station Lights to Rotary Switch)	41-3598
41-3599	Cable (Rotary Switch)	41-3599
41-3600	Cable (Aerial Circuit—P. B. Switch to Rotary Switch)	41-3600
1-3258	Cable (Phone Input to 7C7)	1-3258
1-3259	Cable (7C7 to Phone Switch)	1-3259
1-3270	Cable (Volume Control to 7C6)	1-3270
1-3271	Cable (Volume Control to Phone Switch)	1-3271
1-3272	Cable (I. F. to Phone Switch)	1-3272
31-7176	Coil (Power)	31-7176
27-5858	Dial Scale	27-5858
27-4785	Clamp (Dial)	27-4785
54-3024	Control Drum (Volume)	54-3024
27-4786	Control Drum (Wave Control)	27-4786
27-4786	Control Drum (Tuning)	27-4786
27-4884	Control Drum (Wax Switch)	27-4884
28-6924	Shaft (Control Drums, Left Hand)	28-6924
76-1073	Shaft (Control Drums, Right Hand)	76-1073
56-1983	Bracket (Left Hand Controls)	56-1983
56-1984	Bracket (Right Hand Controls)	56-1984
54-4009	Jewel (J. Lamp)	54-4009
39-1514	Knobs (Push-buttons)	39-1514
39-1515	Rubber Grommet (Speaker Mounting)	39-1515
39-1516	Rubber Grommet (Speaker Mounting)	39-1516
54-3034	Rubber Washer (Ch. Mtg. Mahog. Cab.)	54-3034
54-4040	Rubber Cushion (Changer Mounting)	54-4040
27-4771	Rubber Corner (Chassis, Speaker Mtg.)	27-4771



I.F. = 455 KC.

SWITCHES SHOWN FROM REAR BOTTOM VIEW OF CHASSIS IN POSITION N1 (PUSH BUTTON).
 LETTERS INDICATE POSITION OF SWITCH WAFERS FROM CENTER OF CHASSIS.
 SOLID RING INDICATES FRONT OF SWITCH WAFER.
 SHADED RING INDICATES REAR OF SWITCH WAFER.
 BUTTON SHOWN IN REMOTE POSITION N1 (SILENT).

SWITCHES SHOWN FROM BOTTOM VIEW OF CHASSIS IN RADIO POSITION.
 LETTERS INDICATE POSITION OF SWITCH WAFERS FROM BOTTOM VIEW OF CHASSIS.
 SOLID RING INDICATES FRONT OF SWITCH WAFER.
 SHADED RING INDICATES REAR OF SWITCH WAFER.

PRODUCTION CHANGES

To insure positive action of the volume control motor, condenser (110) on diagram was changed from 30 mfd. Part No. 30-2361 to 45 mfd. Part No. 30-2459.
 To improve the operating performance of the phonograph circuit the following changes were made: Condenser (67) .01 mfd. changed to .0015 mfd. Part No. 30-4525. Condenser (69) .002 mfd. changed to .0015 mfd. Part No. 30-4252. Condenser (66) .01 mfd. changed to .003 mfd. Part No. 30-4489. Resistor (64) changed from 100,000 ohms to 100,000 ohms. Part No. 33-410339.
 Correction: Interchange the positions on the diagram of R. F. choke (28) and resistor (27). The coil should connect to P5 switch contact and the resistor to P11 switch contact.
 To prevent abnormal oscillation a 10 mfd. condenser Part No. 60-010137 was connected from P5 switch contact at coil (28) to the chassis ground.

FIG. 2. SCHEMATIC DIAGRAM — MODEL 41-616. CODE 121

THE VOLTAGES INDICATED AT THE TUBE ELEMENTS ABOVE WERE MEASURED WITH A 1000 OHMS PER VOLT VOLTMETER. PHILCO MODEL O27. LINE VOLTAGE 118 VOLTS. A. C. BAND SWITCH (BROADCAST). NO STATION BEING RECEIVED

ALIGNING R. F. AND I. F. COMPENSATORS EQUIPMENT REQUIRED

- Signal Generator:** Covering the frequency range of the receiver, such as Philco Models 977 or 177.
- 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.
- 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 volt-

meter 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 30 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 in Figure 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. 4 terminal loop Panel.	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Position	57A, 52A, 52B, 51B, 51A		
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 Figure 4.

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.

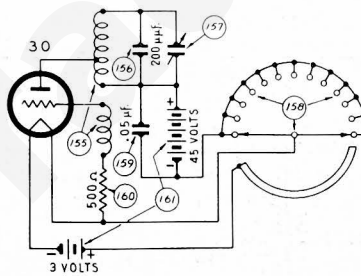


FIG. 3. WIRELESS REMOTE CONTROL UNIT WIRING

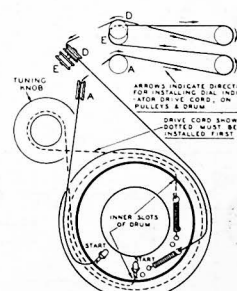


FIG. 4. DIAL POINTER AND CABLE ARRANGEMENT

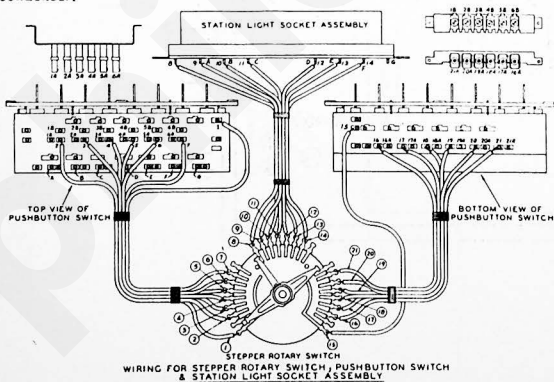


FIG. 5. CABLE WIRING FROM STEPPER ROTARY SWITCH TO PUSH-BUTTON SWITCH AND STATION LIGHTS

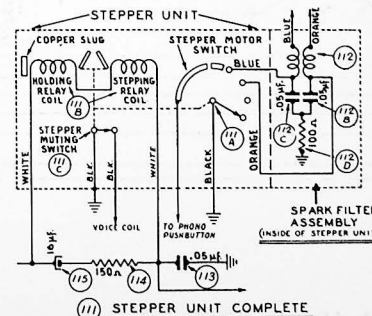


FIG. 6. INTERNAL WIRING OF STEPPER UNIT. NUMBERS CORRESPOND TO SCHEMATIC

