# RADIO-PHONOGRAPH

# Model, 42-1015, Code 121

### SPECIFICATIONS

MODEL 42-1015, CODE 121

Model 42-1015, Code 121 is a radio-phonograph consisting of a twelve (12) tube superheterodyne radio with four (4) tuning bands including a frequency modulation band, electric push-button tuning and a Phileo De Luxe Automatic Record Changer with a photoelectric reproducer.

#### RADIO SECTION

The radio incorporates the Philoo Built-in Super Aerial System for reception of standard and short wave broadcast stations; a Philoo F. M. Dipole Aerial for reception of frequency modulation stations; twelve (12) electric push-buttons for automatically funing six (6) stations in the standard broadcast band, turning the A. C. power off and selecting the phonograph circuit, standard, shortwave and frequency modulation bands; three (3) I. F. amplifler stages; two (2) variable tone controls which vary the bass and treble audio frequencies; automatic volume control; push-pull beam power pentode audio output stage; Philoc DoKTAL tubes; illuminated horizontal dial; illuminated tuning band and station indicators; concert grand balanced field electro-dynamic speakers; and a dual section tuning condenser. In addition this model is designed to receive the sound of a television program tuned in by special Philoc Television Receivers.

Tuning Band Frequencies: Broadcast, 540 to 1720 KC; Shortwave 1, 9 to 12 MC; Shortwave 2, 13.3 to 18 MC; Frequency Modulation 42 to 50 MC.

Intermediate Frequencies: Standard, 455 KC; F. M., 4.3 MC.

Audlo Output: 14 watts.

Power Supply: 115 volts, 60 cycles AC.

This model can also be operated on 115 volts, 50 cycle current by changing the phonograph motor parts as listed in the parts list.

Power Consumption: 145 watts.

PHILCO Tubes: XXL, oscillator; XXL, converter; three 7B7, I. F. ampliflers; XXFM, second detector, A. V. C., first audio; 7C5, phono light oscillator; 7A4, audio phase inverter; two 6L6G audio output; 7C6, phono pre amplifler and a 5X4G, rectifier.

#### PHONOGRAPH SECTION

The phonograph of each model consists of the PHILCO Automatic Record Changer with a stroboscope pitch and tempo control; a dual speed motor that can be adjusted to play not only normal speed records (78 RPM) but also slow speed records (38-1/3 to 39 RPM); the Philco Photo-Electric Reproducer with a floating jewel which reproduces sound on a beam of light, and a special phonograph amplifier stage for operation through the push-pull output tubes of the radio. The automatic record changer plays 12 ten-inch or 10 twelve-inch records at one loading. The automatic record changer is also equipped with provision for attaching a Philco Home Recording Unit Model HR-2 for making phonograph records in the home. The Home Recording Units can be obtained from your Philco distributor with complete instructions for installation and operation.

#### AUTOMATIC RECORD CHANGER

The Service Procedure for adjusting the Automatic Record Changer Mechanism will be found in Radio Service Bulletin No. 402.

#### EXTERNAL AERIAL CONNECTIONS

The built-in aerial system is designed to operate without an outside aerial or ground and to give exceptionally high receiving performance of stations in the standard, shortwave, or FM bands.

To operate the radio in steel reinforced buildings and other shielded locations where signal strength is weak, an external aerial is recommended. Three different types of aerial combinations are available, to improve reception on the standard, shortwave, or FM bands.

1-For Additional Sensitivity on Frequency Modulation only:

\*Philco Dipole Outdoor Aerial, Part No. 45-2926.

The plug at the end of the transmission line is inserted in the socket at the back of the chassis in place of the plug connected to the  $\mathbb{F}$ . M loop in the cabinet.

2-For Additional Sensitivity on ALL ranges:

\*Philco Dipole Outdoor Aerial, Part No. 45-2926.

Philco Aerial Coupler, Part No. 76-1361.

The coupler plugs into the socket at the back of the chassis in place of the plug connected to the FM loop. The aerial transmission line then connects to the terminals on the coupler marked "red" and "black." The local-distance switch on the coupler connects or disconnects the outdoor aerial from the standard broadcast and shortwave tuning ranges. The dipole remains connected to the FM band regardless of the position of the switch

3—For Additional Sensitivity on Standard Broadcast and Shortwave only in Areas where FM reception is not available.

Philco Safety Aerial, Part No. 40-6370

Philco Aerial Coupler, Part No. 76-1361.

Connect the single wire lead-in of the aerial to the "black' terminal on the aerial coupler.

\*Accessories for this aerial are the Philco Aerial Mast Kit, the Philco Reflector Kit and Philco High Efficiency Transmission Line. See Service Bulletin No. 396 on Dipole Aerials.

NOTE: When installing the FM Philco Outdoor Dipole Aerial, it is very important that the aerial compensating condensers of the standard and shortwave band are repadded.

### ELECTRIC PUSH-BUTTON ADJUSTMENTS

The electric push-button tuning mechanism consists of twelve push-buttons. Six push-buttons control and select power supply, broadcast, shortwave 1, shortwave 2, and frequency modulation bands, and Phonograph Operation. The remaining six push-buttons are used for automatically selecting six standard broadcast stations.

Select six of the most popular stations received in the locality. Insert the station call letters into the spaces above the buttons. The station with the lowest frequency is placed in the second button from the left and the highest frequency is placed in the seventh push-button from the left. Each push-button is adjusted by two adjusting screws located on the rear of the chassis. Each set of screws is numbered and labeled "Ant.", "Osc." and covers a frequency range as shown in Fig. 1.

Looking at the front of the cabinet, the second button from the left is adjusted by adjusting screws No. 1. The next push-button by adjusting screws No. 2, and the remaining push-buttons in order.

To adjust the electric push-buttons accurately for reception of broadcast stations, a vacuum tube voltmeter such as Philoc Models 027 and 028 should be used. In addition, an insulated padding screw driver, Part No. 45-2610, and a PHILCO Model 070 Signal Generator are required. With this equipment at hand proceed as follows:

1. 'Press in "Broadcast" push-button.

2. Set up a Model 070 Signal Generator near the receiver and connect a loop aerial (made from a few turns of wire 12 inches in diameter) to the high and ground output jacks of the signal generator. Turn the output controls to maximum and set the modulation control to "MOD. ON."

Connect the negative (—) terminal of the vacuum tube voltmeter to the aligning test socket on the top centre of the chassis. Attach the positive (+) terminal of the voltmeter to the chassis.

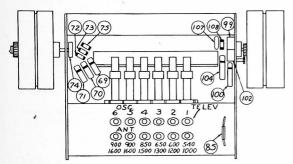
3. Manually tune in the station to be set up on the first station push-button. After doing this set the indicator of the 070 Signal Generator to the frequency of the station being received. As the indicator approaches the frequency of the station a whistle will be heard; leave the indicator at this point.

(Continued on page 2)

4. Press "in" the second push-button from the left of cabinet. Using the insulated screw driver, turn the No. 1 "Osc." screw until the broadcast station identified by the signal generator is heard; at this point, turn the indicator of the signal generator away from the frequency of the station. Readjust No. 1 "Osc." and "Ant." screws for maximum deflection of the vacuum tube voltmeter pointer.

After setting up the first station the same procedure as outlined above is used for the remaining stations. When these models are set up to receive the sound of a television program tuned in by the special type Philco Television Sets or if it is to be used in conjunction with a Philco Record Player, the lowest frequency push-button should be used. To tune in these programs, the same procedure as given for broadcast stations above is used.

Further details for setting up these Radios for operation with hilco Television Sets or Record Players are supplied with the instruments



-LOCATIONS OF PARTS AND PUSH BUTTON COMPENSATORS ON TUNING UNIT

# PHONO REPRODUCER ADJUSTMENTS

To reproduce the sound from a record, the light beam of the re-producer 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 AC.

## 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 5/32" in width. The socket assembly is now rotated so that the spot of light is vertical.

### 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 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.117 located on the rear of the radio chassis. Under ordinary cirmustances, 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:

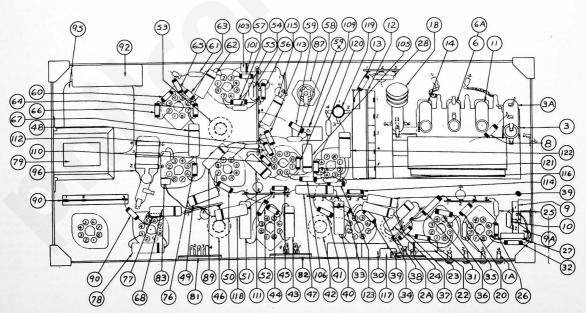
- 1. Turn volume control on full and play a record.
- While the record is playing turn compensator 117 in the di-rection necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

#### 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 flament 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.



REAR VIEW OF CHASSIS SHOWING SOCKET LOCATION AND PHONO COMPENSATOR



-LOCATIONS OF PARTS-UNDER CHASSIS MODEL 42-1015, CODE 121

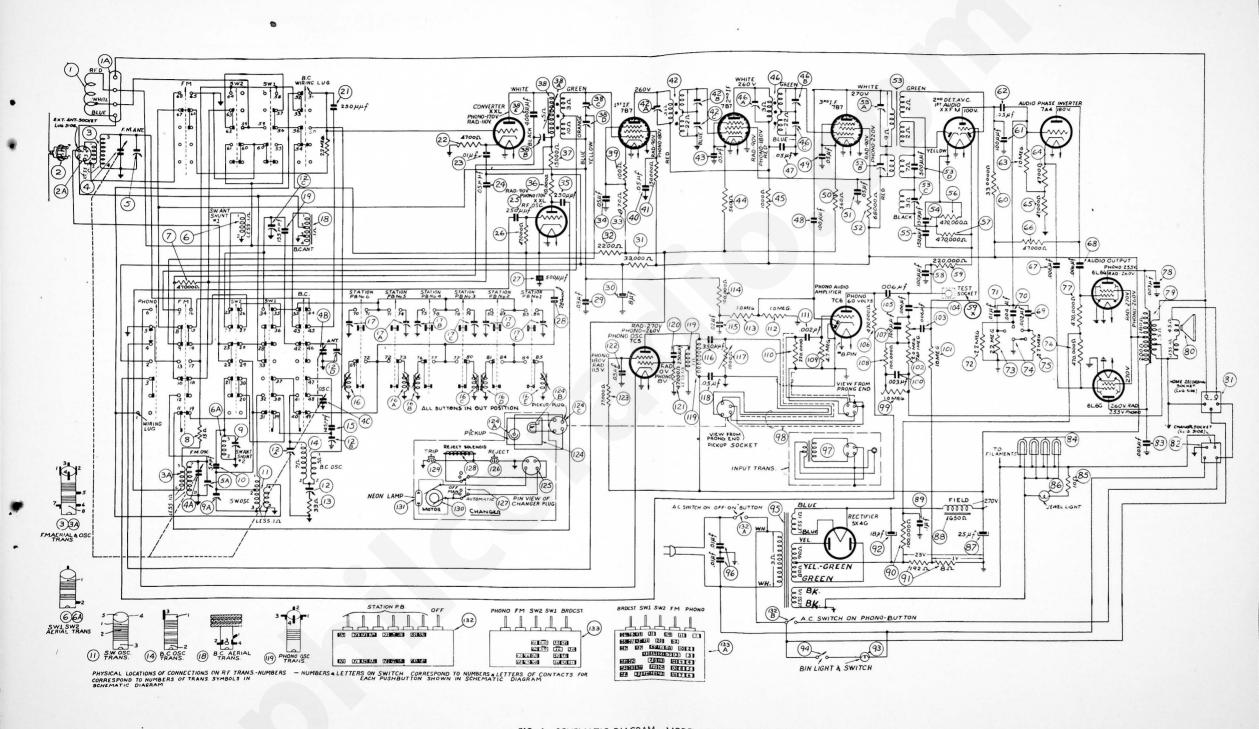


FIG. 4-SCHEMATIC DIAGRAM-MODEL 42-1015, CODE 121

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## REPLACEMENT PARTS-MODEL 42-1015, CODE 121

Sch. No.	Description	Part No.	Sch. No.	Description	Part No.	Sch. No.	Description	Part No.
1.	Loop Aerial (Std. & S. W.		38C.	Secondary Compensator (455 KC)		102.	Volume Control Condenser (.006 mfd, 400 volts) Condenser (.006 mfd, 400 volts) Condenser (.006 mfd, 400 volts)	33-5286 30-4591
	Mtg. Sleeve	76-1404 28-3806	38D.	Part of 38 Secondary Compensator (4.3 MC) Part of 38		103. 104. 105.	Condenser (.006 mfd, 400 volts)	30-4591 30-4591 30-4591
	Spring Washer Washer Washer	28-3806 28-4186 W-151FA3	38E.	Part of 38		105.	Resistor (470,000 ohms)	33-447339
	Washer	W-151FA3 W-425 W-722	3815.	Part of 38 Condenser (4,000 mmfd) Mart of 38 Misser of 38	W 1040	107.	Resistor (470,000 ohms) Mica Condenser (100 mmfd) Resistor (100,000 ohms) Resistor (177 mecohms) Condenser (100 mfd, 600 volts) Resistor (1 megohm) Mica Condenser (350 mmfd) Mica Condenser (350 mmfd) Phono Reproducer Light Control Condenser (55 mfd, 400 volts) Oscillator Transformer (Reproduce Condenser (250 mmfd) Mica Condenser (250 mmfd) Resistor (47,000 ohms)	60-110257 33-410339
1A.	Screw Terminal Panel	W-722 38-9870	39.	Mtg. Nut , Resistor (100 ohms)	W-1949 33-110336	108.	Resistor (4.7 megohms)	33-547339 33-422339
2. 2A.	F. M. Dipole Aerial Socket (F. M. Dipole Aerial) F. M. Aerial Transformer F. M. Oscillator Transformer (Part of 3)	38-9870 76-1346	40.	Condenser (.05 mfd, 400 volts)	30-4518 33-415339	110. 111.	Resistor (220,000 ohms) Condenser (002 mfd, 600 volts)	30-4622
3.	F. M. Aerial Transformer	27-6181 32-3825	41. 42.	Second I. F. Transformer	32-3821	112.	Resistor (1 megohm)	33-510339 33-510339
3A.	F. M. Oscillator Transformer (Part of 3)		42A.	Primary Compensator (4.3 MC)		114.	Resistor (1 megonin) Resistor (100,000 ohms)	
	Mtg. Cun	28-5002	42B.	Part of 42 Secondary Compensator (4.3 MC) Part of 42 Secondary Compensator (455 KC)		115.	Condenser (.02 mfd, 200 volts)	30-4516 60-135257 33-5435 30-4518
IA.	Tuning Condenser (F. M. Aerial) Tuning Condenser (F. M.	31-2600	42C.	Secondary Compensator (455 KC)		116. 117. 118.	Phono Reproducer Light Control	33-5435
4B.	Tuning Condenser (F. M. Aerial) Tuning Condenser (F. M. Oscillator) Part of 4 Tuning Condenser (Std. & S. W.			Part of 42 Mtg. Nut Condenser (.05 mfd, 200 volts)	W-1949	118.	Oscillator Transformer (Repro-	
	Aerial) Part of 4		43. 44.	Condenser (.05 mfd, 200 volts)	30-4519 33-156336	120	ducer Light) Mice Condenser (250 mmfd)	32-3818 60-125157 33-347339
4C.	Aerial) Part of 4 Tuning Condenser (Std. & S. W. Oscillator) Part of 4 Coupling (Cond. to Drum) Drive Cord (Pointer) Drive Cord (Tuning Condenser) Springs		44.	Resistor (560 ohms) Resistor (1,000 ohms)	33-210339	120. 121. 122.	Mica Condenser (250 mmrd) Resistor (47,000 chms) Condenser (27,000 chms) Photo-Electric Reproducer and Tone Arm Complete (Metal Tone Arm) (Bakelite Tone Arm) (Bakelite Tone Arm)	33-347339
	Coupling (Cond. to Drum)	31-2291	46. 15 A.	Third I. F. Transformer Primary Compensator (4.3 MC)	32-3821	122	Resistor (27,000 ohms)	30-4518 33-327339
	Drive Cord (Tuning Condenser)	31-2291 31-2316 31-2315 28-8913 38-9716		Part of 46		124	Photo-Electric Reproducer and	
	Springs Drum (Drive Cord)	28-8913 38-9716	46B.	Primary Compensator (4.3 MC) Part of 46			(Metal Tone Arm)	35-2519 35-2540 318-2678
	Drum (Drive Cord) Pointer (Dial) Rubber Grommet	56-2272 27-4771	46C.	Part of 46 Secondary Compensator (455 KC) Part of 46 Mtg. Nut		124A.	Photo-Electric Cell (Part of 124	318-2678
5.	Compensator (F. M. Aerial)	31-6364		Mtg. Nut	W-1949	124B.	Reproducer Lamp Pickup Cable Plug (Mounted on	34-2478
5A.	Compensator (F. M. Aerial) Compensator (F. M. Oscillator) Part of 5	,	47.	Condenser (.05 mfd, 400 volts) Mica Condenser (100 mmfd)	30-4518 60-110257 30-4519	124C.	Changer)	217-1396
6.	Aeriai Transformer (S. W. 1		48. 49.		30-4519 33-156336	125. 126.	Changer) Power Plug (Changer Cable) Reject Switch (Mounted on	35-2547
6A.	Band)	32-3831	50. 51.	Condenser (.05 mfd, 400 volts)	30-4518 33-368339		Changer) Changeover Switch (Mounted on	35-2555
	Band) Part of 6	00 5000	52.	Resistor (68,000 ohms)	33-368339 32-3822	127.		35-2547
7.	Aerial Transformer (S. W. 2 Mg. Clip Resistor (47,000 ohms) Resistor (55 ohms) Compensator (S. W. 2 Aerial) Compensator (S. W. 2 Oscillator) Mica Condenser (5 mmfd)	28-5002 33-347339	51. 52. 53. 53 A.	Condenser (.05 mId, 200 Volts) Resistor (560 ohms) Condenser (.05 mfd, 400 volts) Resistor (68,000 ohms) Fourth I. F. Transformer Primary Compensator (4 3 MC)		128.	Reject Solenoid (Mounted on	318-2875
8.	Resistor (15 ohms)	33-015339 31-6448	53B.	Part of 53 Primary Compensator (455 KC)		129.	Changer) Electric Reject Trip (Mounted on Changer)	010-2013
9A.	Compensator (S. W. 2 Oscillator)	01-0110		Part of 53				318-2785 35-2563
10	Part of 9 Mica Condenser (5 mmfd)		53C.	Part of 53	111 1010		Trip Switch Assembly Phono Motor (115 volts, 60	
11	Mica Condenser (5 mmfd) Oscillator Transformer (SW-1, SW-2)	39-2634	531).	Part of 53 Primary Compensator (455 KC) Part of 53 Secondary Compensator (4.3 MC) Part of 53 Mig. Nut Mice. Contenser (500 mmfd) Mice. Contenser (150 mmfd) Mice. Contenser (150 mmfd)	W-1949	130.		35-2553
	Mtg. Clip	32-3834 28-5002		Part of 53	60-115137		cycles) Turntable (60 cycles) Turntable (50 cycles) Pulley (60 cycles) Pulley (50 cycles)	35-2554 35-3059
12.	Compensator (Brdcst Band- 580 KC)	31-6451	54. 55.	Mice Condensor (150 mmfd)	60-115137		Pulley (60 cycles)	35-3059 218-1448 56-6173
12A.	Compensator (Brdest Band-	31-0431	55. 56.	Resistor (470,000 ohms) Resistor (470,000 ohms)	33-447339 33-447339			218-1450
	Compensator (Brdest Band- 1500 KC) Part of 12		57. 58. 59.	Mica Condenser (100 mmfd) Resistor (220,000 ohms) Resistor (330,000 ohms)	60-110157	131. 132.	Neon Speed Lamp (Changer) Push-Button Switch (P. B. Colls and Padders)	34-2483
12B.	Compensator (SW-1 Oscillator) Part of 12		60.	Resistor (220,000 ohms)	33-422339 33-433339	132.	and Padders)	42-1706 28-3806
12C.	Compensator (SW-1 Aerial) Part of 12		61.	Resistor (330,000 ohms) Mica Condenser (100 mmfd) Condenser (105 mfd, 400 volts) Resistor (1 mecohm) Resistor (1 mecohm) Resistor (47,000 ohms) Condenser (100 mfd, 400 volts) Condenser (100 mfd, 600 volts) Condenser (100 mfd, 600 volts) Condenser (20 mfd, 600 volts) Condenser (2 mecohms) Condenser (2 mecohms)	60-110257 30-4518		Mtg. Sleeve Snap Fasteners	28-4342 W-151
			62 63 64	Resistor (1 megohm)	33-510339 33-247339	1204	Snap Fasteners Mtg. Washer Power Switch (ON-OFF) Push-	
12D.	Compensator (Brdest Aerial) Part of 12		64.	Resistor (47.000 ohms)	33-347339	132A.	Button)	42-1726
13.	Resistor (33 ohms)	33-033336	65. 66.	Resistor (47,000 ohms)	33-347339	132B.	Cover Power Switch (Phono Push-	76-1343
14.	Oscillator Transformer (Brdcst)	32-3809	68	Condenser (.006 mfd, 400 volts)	30-4591 30-4591 30-4622	132.0	Button)	42-1727 76-1343
15.	Mica Condenser (145 mmfd)	20-014511	69. 70.	Condenser (.002 mfd, 600 volts)	30-4622 30-4623 30-4572	133	Cover Push-Button Switch (Under Chassis—Top Section)	
10.	P. B. Oscillator Transformer (540 to 1000 KC	32-3780	71 72	Condenser (.01 mfd. 400 volts)	30-4572 33-522339	133A.		42-1707
16A.	P. B. Oscillator Transformer (600 to 1200 KC)	32-3780	73.	Resistor (2.2 megohns)	33-522339	1.5574.	Chassis—Bottom Section) Part of 133	
16B.	1' B. Oscillator Transformer	0.50 300000	74.	Tone Control Switch	42-1700		Part of 133	
	l'. B. Oscillator Transformer (650 to 1300 KC)	32-3780		Mtg. Nut	W-2157FA3		MISCELLANEOUS PARTS	
16C.	P. B. Oscillator Transformer (850 to 1500 KC)	32-3779	75.	Resistor (2.2 megohms)	33-522339 33-447339		Automatic Record Changer	35-1289
16D.	P. B. Oscillator Transformer (900 to 1600 KC)	32-3779	76. 77.	Resistor (470,000 ohms) Resistor (470,000 ohms)	33-447339		Bezel (Cabinet-42-1015W)	30-6686
	(900 to 1600 KC)  P. B. Oscillator Transformer	32-3119	78.	Condenser (.003 mfd, 1,000 volts)	30-4469		Screw	W-2073FA9
16E.	(900 to 1600 KC)	32-3779	79.	Output Transformer	32-8184		Bezel (Cabinet—42-1015M)	40-6696 L-3245
	Iron Core	56-6100 28-6936	80.	Speaker Cone Assembly	36-15 <del>6</del> 1 36-4216		Cable (Power) Cabinet (Model 42-1015W)	10556A
	Cap Clip	56-2250		Cable	41-3651		Cabinet (Model 42-1015M)	10556E
17.	P. B. Aerial Compensator			Mtg. Sleeve	56-2044		Control Drum (Bass & Treble)	54-4149 54-4150
	(540 to 1000 KC)	31-6454		Rubber Grommet (Mtg. Spkr)	27-4596		Control Drum (Volume)	54-411
17A.	P. B. Aerial Compensator (600 to 1200 K. C.) Part of 17			Washer (Spker Mtg.) Nut	28-3320 W-124		Control Drum (Tuning) Washer (Between Control	
17B.	P. B. Aerial Compensator (650 to 1300 KC) Part of 17		81.	Home Recording Socket	27-6179		Drums)	28-397
	(650 to 1300 KC) Part of 17			Shorting Bar	56-2270		Keyed Washer Spring Washer (Vol. Drum)	56-1029FA 56-138
17C.	P. B. Aerial Compensator (850 to 1500 KC) Part of 17		82.	Record Changer Power Socket	27-6182		Spring Washer (Vol. Drum) Spring Washer (Tuning Drum)	56-165
17D.	P. B. Aerial Compensator (900 to 1600 KC) Part of 17		83.	Condenser (.003 mfd, 1,000 volts)  Dial and Push-Button Lights	30-4469 34-2064		Clutch Plate	56-227
17E.	P. B. Aerial Compensator		31.	Socket Assembly (Dial Lamp)	38-9695		Dial Scale	27-576 27-922
17.027	P. B. Aerial Compensator (900 to 1600 KC) Part of 17	20 2020		Socket Assembly (P. B. Lights)	76-1359		Felt Gasket Mtg. Clamp	56-1034FA
18.	Brdcst Aerial Transformer Mtg. Clip	32-3830 28-5002	85.	Resistor (10 ohms)	33-010430	Į.	Jewel (Pilot Light Cabinet)	27-477
19.	Mica Condenser (155 mmfd)	20-015511	86.	Pilot Light Cabinet Socket Assembly	34-2068 76-1112		Knob (Push-Buttons-Model 42-1015W)	54-414
20.	Resistor (2.2 megohm)	33-522339	87.	Electrolytic Condenser (25 mfd,				76-137
21.	Mica Condenser (250 mmfd)	60-125157 33-247339		300 volts)	30-2532		Spring Assembly Knobs (Push-Buttons-Model	
22.	Resistor (4700 ohms) Condenser (.01 mfd, 400 volts)	30-4572		Mtg. Clamp	56-1314		42-1015M)	54-415
23.	Condenser (.05 mfd, 400 Volts)	30-4518	88. 89	Field Coil (Replace Speaker) Condenser (.1 mfd, 200 volts)	36-1561 30-4586		Rubber Grommet (Tuning Unit Mtg.)	391
25.	Mica Condenser (250 mmfd)	60-125157	90.	Resistor (100,000 ohms)	33-410339		Rubber Grommet (Tuning Unit	
26.	Resistor (47,000 ohms)	33-347339 30-1138	91.	Bias Resistor (8-192 ohms)	33-3420		Mtg.)	391 27-457
27.	Mica Condenser (500 mmfd) Mica Condenser (280 mmfd)	30-1138	92.	Electrolytic Condenser (18 mfd, 475 volts)	30-2527		Rubber Grommet (Chassis Mtg.) Rubber Corner (Chassis)	54-401
28.	Condenser (.03 mfd, 400 volts)	30-4517	93.	Record Changer Compartment	2001 1000000		Screw (Chassis Mtg.)	W-1345FA
30.	Electrolytic Condenser (8 mfd,			Light	34-2484		Socket (6L6G & 5X4 Tubes)	27-617
	350 volts)	30-2473 56-1452FA5	94.	Socket and Cable Assembly Switch and Cable (Compartment'	41-3634	ALC: N	Socket (LOKTAL Tubes)	27-61° 28-225
31.	Mtg. Strap Resistor (33,000 ohms)	33-333439	34.	Light)	76-1364		Sleeve (Tuning Unit Mtg.) 59X Test Socket	28-22
31.	Resistor (2,200 ohms)	33-223339		Spring	28-8991		Tab Cover	27-576
33.	Register (470 ohms)	33-147336	0.5	Screw Power Transformer (115 volts	W-560		Tab (OFF)	27-57
34.	Condenser (.05 mfd, 200 volts)	30-4519 60-125157	95.	Power Transformer (115 volts, 60 cycles)	32-8227		Tab (Phono)	27-57
35.	Mica Condenser (250 mmfd) Resistor (10,000 ohms)	33-310339	96.	Condenser (.01-01 mfd)	3903-ODG		Tab (Broadcast)	27-57
36.	Resistor (15,000 ohms)	33-315339	97.	Phono Input Transformer	32-8196		Tab (SW-1) Tab (SW-2)	27-57 27-57
38.		32-3820	98.	Input Cable (Pickup Cell and Light)	41-3645		Tab (SW-2)	27-57
	Part of 38		99.	Bass Tone Control	33-5472		Tab (Television)	27-57
38A.					30-4582	1	Tab Kit (Stations)	40-66
38A. 38B.	Part of 38 Primary Compensator (4.3 MC) Part of 38		100. 101.	Condenser (.002 mfd, 600 volts) Resistor (10 megohms)	33-610339	1	Washer (Chassis Mtg.)	28-51

## ALIGNING R. F. AND I. F. COMPENSATORS

SIGNAL GENERATOR:

EQUIPMENT REQUIRED Covering the frequency of the receiver, such as the Philco Model 070.

Audio Output Meter. Philco Models 027 and 028. Circuit testers contain a sensitive output meter and are recommended. Philco Fiber Screw Driver, Part No. 45-2810.

ALIGNING INDICATOR:

#### CONNECTING ALIGNING INSTRUMENTS

AUDIO OUTPUT METER: Terminal No. 1 is provided on the loop agrial 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 voice were used to the speaker. The audio output meter can also be connected between the plate of the output tube and the chassis.

SIGNAL GENERATOR: When adjusting the "I F." padders, the high side of the slight agreement of a connected through a 1 mfd. condenser to the points indicated a signal scientator column "output connections" to receiver in the tabulations below.

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 and dipole aerial lead. Do not remove the receiving loops from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

After connecting the aligning instruments adjust the compensators in the order shown in the tabulation below. Location of the compensators are shown in Fig. 5. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

### STANDARD AND S. W. BANDS ALIGNING PROCEDURE

Operations	SIGNAL GENERATOR						
In Order	Output Connections	Dial Setting	Dial Setting	Control Settings	Adjust Compensators In Order	Special Instructions	
1	Aerial Section of Standard Tuning Cond & Grd	455 KC	580 KC	Vol. max. push-button Bdcst. "IN"	53B, 46C, 42C, 38C, 38A		
2	Use loop on generator	1500 KC	1500 KC	Vol. max. push-button Bdcst. "IN"	12A, 12D	Note A	
3	Use loop on generator	580 KC	580 KC	Vol. max. push-button Bdcst. "IN"	12	Roll Tuning Condensers Note B	
4	Use loop on generator	Readjust as given in Operation 2					
5	Use loop on generator	12 MC	12 MC	Push-button SW-1	12B, 12C	Note C	
6	Use loop on generator	18 MC	18 MC	Push-button SW-2	9A, 9	Roll Condensers Note C	

## FREQUENCY MODULATION ALIGNING PROCEDURE

Note: The Frequency Modulation Circuits Must Be Adjusted With the Dipole Aerial Connected

#### F. M. BAND ALIGNING PROCEDURE

Operations	SIGNAL GENERATOR						
In Order	Output Connections	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in Order	Special Instructions	
1	3rd I. F., F. M. input connection	4.3 MC	1400 KC	Vol. max. F. M. push- button "IN"	53C (Note D) 53A (Note E)		
2	2nd I. F., F. M. input connection	4.3 MC	1400 KC	F. M. push-button "IN"	46B, 46A (Note F)		
6	1st I. F., F. M. input connection	4.3 MC	1400 KC	F. M. push-button "IN"	42B, 42A, (Note F)		
3	Ant. Section of F. M. Tuning Cond. and Grd.	4.3 MC	1400 KC	F. M. push-button "IN"	38D, 38B (Note F)		
4 -	Use test loop on generator; place near dipole aerial	48.5 MC	85 (Note G)	F. M. push-button "IN"	5A (Note G) 5 (Note H)	Roll tuning condenser when adjusting 5. See Note B.	
5	Use test loop on generator; place near dipole aerial	48.5 MC	85	F. M. push-button "IN"	5A		

NOTE A.—DIAL CALIBRATION. In order to adjust the receiver correctly, the dial pointer must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning con-denser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end

NOTE H—When adjusting the low frequency compensator of the 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 slight of the tuning condenser is continued until maximum output reading is obtained.

NOTE C.—Adjust compensators (12B and 9A) to the second signal peak from the closed position (maximum

capacity). The aerial compensators (12C and 9) must also be adjusted to maximum on the first signal peak by rolling the tuning condenser. (See Note B.)

NOTE D.—With the signal generator set to 4.3 MC, padder (53C) is adjusted to the point where minimum signal indication is observed on the output meter.

signal indication is observed on the output meter.

NOTE E.—Turn the signal generator first ta approximately 125 KC below 4.3 MC (4.17 MC) and then 125 KC below 4.3 MC (4.17 MC) and then 125 KC below 4.3 MC (4.2 MC). A signal peak should be observed on the output meter at approximately each of these points 4.17 and 4.42). The two peak signals snould be of equal reading on the output meter and the peaks are unequal in amplitude, padder (5.3A) must be adjusted in the direction necessary to make both peaks equal. This is done by slightly turning padder and then turning signal generator above and below 4.3 calculations are signal sized, as the signal generator as the signal sciencial set the signal generator at 3 MC. The output meter should show zero reading at 4.3 MC. If a signal

indication is observed readjust padder (53C) until zero reading is obtained on the meter. After this adjustment is made padder No. 53A should be reset for equal peaks as given above.

NOTE F.—Adjust padders 46B, 46A, 42B, 42A, 38D, 38B for equal signal peaks and equal frequency spacing each side of 4.3 MC.

NOTE G.—The dial scale numbers are listed in tenths of mexacycles less the first digit: i.e.: 49 MC the FM scale. Adjust part of \$0.10 the point where minimum signal indication is observed on the output meter.

meter.

NOTE H.—In order to adjust padder (5) the signal generator should be set to either the signal peak approximately 125 KC below 48.5 MC (8.375 MC). or 125 KC above 48.5 MC (8.52 MC). Adjust padder (5) to maximum output reading on either of these peak signals and padder 5 is being adjusted roll the tuning about the safety of the set o

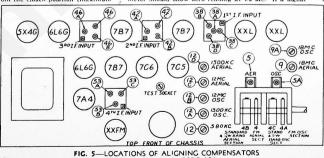
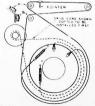


FIG. 5—LOCATIONS OF ALIGNING COMPENSATORS MODEL 42-1015. CODE 121



(POINTER AT LOW FREQUENCY END OF DIAL)
TUNING CONDENSER MALLMUM CAPACITY
(FOLLY CLOSTO)
INSTALLATION OF DRIVE CORDS

FIG. 6-TUNING DRIVE CORD ARRANGEMENT