



## Model 705

### SPECIFICATIONS

Model 705 is a Radio-Phonograph combination consisting of a nine (9) tube super-heterodyne radio and an automatic phonograph record changer.

#### RADIO SECTION

The radio incorporates the Philco Built-in Domestic and Overseas Aerial system; six electric push-buttons for automatically tuning stations in addition to manual tuning; five tuning ranges, covering 540 to 1600 K.C. and 6 to 18 M.C.; Bandsread 9.55-9.74 M.C.; 11.6-11.9 M.C.; 14.9-15.59 M.C.; variable tone control; automatic volume control; automatic bass compensation; push-pull pentode output tubes with screen phase inversion; loktal tubes; the new noise reducing XXL converter tube and a twelve (12) inch concert grand dynamic speaker.

INTERMEDIATE FREQUENCY: 460 K.C.

POWER SUPPLY: 115 volts; 60 cycles A.C. current. Power consumption 110 watts.

PHILCO TUBES USED: 7C5E Oscillator; XXL, Converter; two 7B7E I.F. Amplifiers; 7C6 Phonograph Amplifier; 7C6, 2nd Detector, 1st Audio, A.V.C., two 6F6EG Audio Output and an 80 Rectifier.

#### ADJUSTING ELECTRIC PUSH BUTTON TUNING:

Five push-buttons are used for automatically tuning stations including television sound and one push-button for the power switch.

The procedure for setting and operating electric push-button tuning for reception of stations is the same as that given for Model 54 in Radio Service Bulletin No. 360.

#### PHONOGRAPH SECTION

The Phonograph of this model included an automatic record changer which plays twelve 10-inch records or ten 12-inch records at one loading. The new Philco Photo-Electric Reproducer with 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.

### HOW TO OVERCOME FLUTTER, RUMBLE, DISTORTION AND MISTRACKING ON PHILCO RADIO COMBINATIONS

1—Rumble and mistracking may be due to not enough head weight or pressure where the jewel rides in the record groove. The weight or pressure can be increased to  $1\frac{1}{2}$  oz. maximum. The counterweight in the heel of the tone arm should be moved toward the spindle as far as possible and holes should be drilled in the counterweight to lighten it so that the weight or pressure of the head is increased. The head weight should be checked using the Philco Scale Part No. 45-2851.

2—Theoretically, the light beam is properly set when it is half "on" and half "off" the photoelectric cell. Due to the slight variations in the cell sensitivity there may be distortion in some extreme cases and it may be necessary to readjust the light beam to approximately one-third "on" the cell and two-thirds "off." This should only be done in cases of distortion. If this adjustment does not correct the trouble, the light beam should be set back again to half "on" and half "off."

3—Flutter, mistracking, rumble and distortion can all be caused by a stiff mirror and jewel assembly. Check the flexibility of this assembly. With the record changer stopped and the clutch opened, put a record on a turntable and place the tone arm on the record. Open the peep hole in the pick-up cover—the light beam should be  $\frac{5}{32}$ " wide and should be half "on" and half "off" the photoelectric cell. Hook the Philco Scale, Part No. 45-2851, under the cover at the nose and pull laterally, first toward the spindle and then away from the spindle. The jewel assembly should be sufficiently flexible to allow the light beam to be pulled completely off the cell and

completely on the cell with less than 1 oz. of lateral pull—from  $\frac{1}{2}$  oz. to  $\frac{3}{4}$  oz. is the most desirable. Replace the mirror and jewel assembly if more than 1 oz. pull is required.

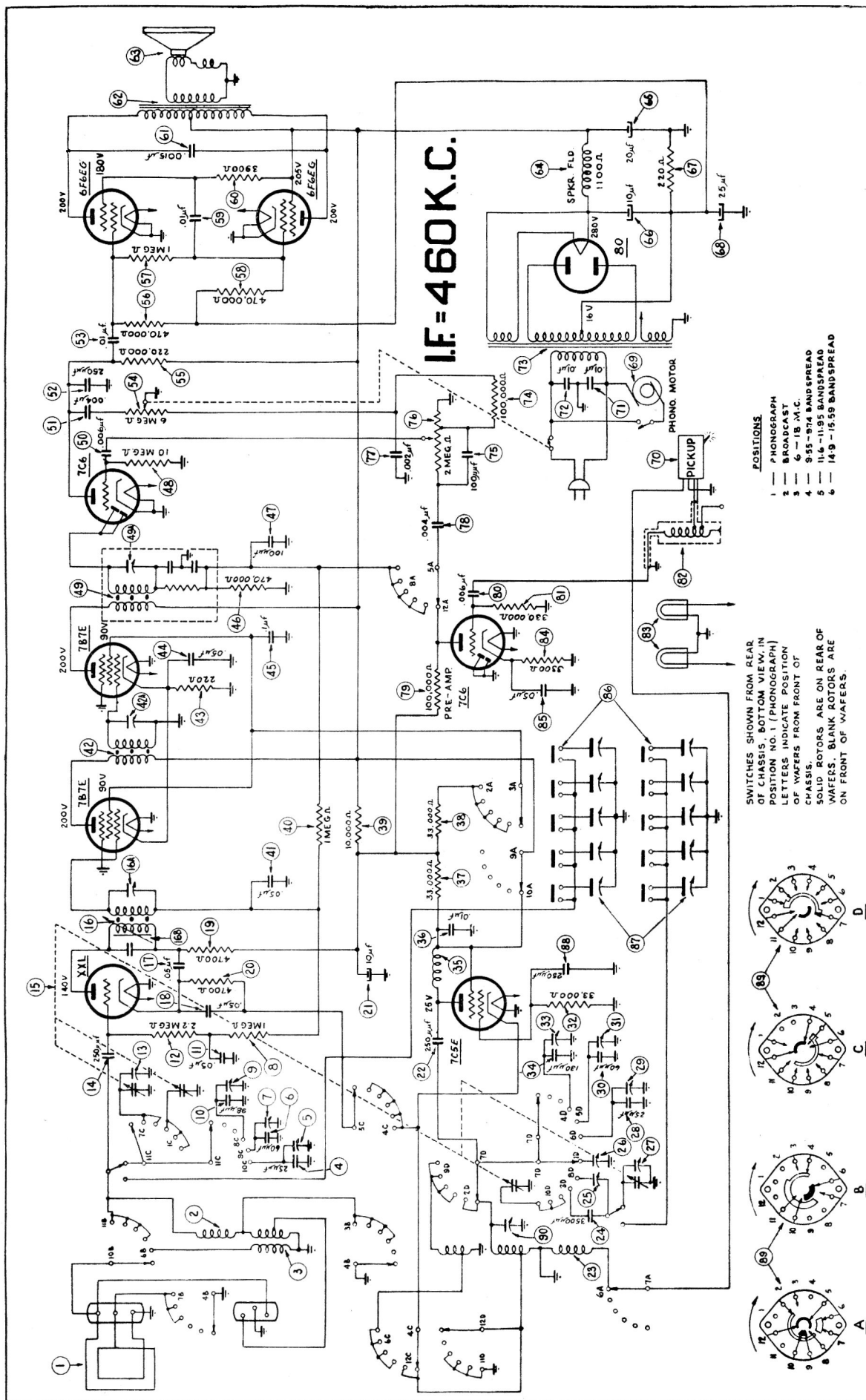
4—The jewel normally extends  $\frac{1}{32}$ " below the guard. It should be vertical with respect to the surface of the record when viewed from in front of the pick-up head. When viewed from the side, the jewel is at quite an angle to the surface of the record. Do not attempt to change this angle. It permits the jewel to track in the groove with a minimum of surface noise. Any change from the original setting will affect the frequency response.

5—While playing a record, observe the light beam through the peep hole in the cover to determine whether the tone arm drag is pulling the light beam "off" the photoelectric cell. There will be a noticeable pulsing due to the clutch action, but if the light beam is pulled "off" the cell, the tone arm should be checked for drag and the clutch checked for proper opening.

6—When replacing a mirror and jewel assembly or an exciter lamp, the light beam should be centered vertically and should not extend to the top nor to the bottom edge of the frame around the photo-electric cell. It may be necessary to use shims under the mirror and jewel assembly to line it up properly.

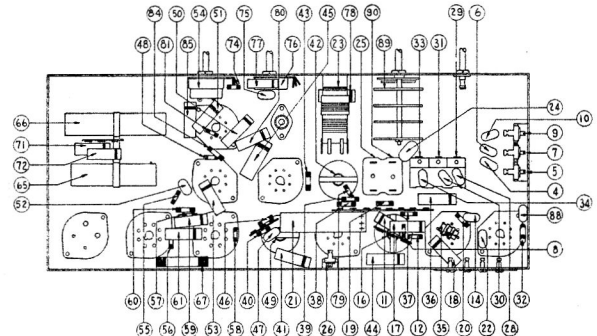
7—With the exception of the motor and associated parts, the record changer mechanism of the Model 705 is identical with that of the Model 715. For additional information on Model 705, refer to Bulletin No. 344 on Model 715.

SCHEMATIC DIAGRAM — MODEL 705



## REPLACEMENT PARTS LIST — MODEL 705

Schem. No.	Description	Part No.	Schem. No.	Description	Part No.	Schem. No.	Description	Part No.	Schem. No.	Description	Part No.
1	Loop Antenna	18-0063	45	Tubular Cond. (.1 mfd, 400v)	30-4455	90	1500 K.C., Osc. Pad. (Part of 25)	56-6060		Tuning Shaft Bushing	56-6060
2	Short Wave Antenna Coil	12-0040	46	Res. (470,000 ohms, ½ watt)	33-447254		Speaker Cable	03-0007		Input Connector	57-0591
3	Broadcast Antenna Coil	12-0039	47	Mica Condenser (100 mmfd.)	60-110157		Socket (octal)	07-0037		Pilot Lamp Assembly	
4	Silver Mica Cond. (25 mmfd.)	20-002507	48	Resistor (10 meg, ½ watt)	33-610254		Socket (4 prong)	07-0046		Washer (changer mounting)	W-1715
5	15.5 M.C. R.F. Padder	31-6374	49	Third I.F. Transformer	12-0057		Dial Back Plate	08-0007		Screw (chassis mounting)	W-2030
6	Silver Mica Cond. (60 mmfd.)	10-0006	50	Tubular Cond. (.006 mfd, 400v)	30-4591		Pointer	08-0008		Screw (dial mounting)	W-2073
7	11.9 M.C. R.F. Padd. (Part of 6)		51	Tubular Cond. (.004 mfd, 400v)	30-4578		Tuning Shaft	08-0009		Bolt (changer mounting)	W-2225
8	Resist. (1 meg, Res., ½ watt)	33-510254	52	Mica Cond. (250 mmfd.)	60-125157		Push-Button Bracket	08-0012		Wing Nut (changer mtg.)	W-2239
9	9.6 M.C. R.F. Padder (Part of 6)		53	Tubular Cond. (.01 mfd, 400v)	30-4572		Drive Cord	11-0004		Knob (motor switch)	07-0030
10	Silver Mica Cond. (98 mmfd.)	20-009807	54	Tone Control (6 megohms)	13-0002		Motor Connector	15-0001		Knob (push-button)	07-0049
11	Tubular Cond. (.05 mfd, 200v)	30-4519	55	Resist. (220,000 ohms, ½ watt)	33-422254		Speaker Plug	27-4420		Dial Scale	07-0050
12	Resistor (2.2 meg, ½ watt)	33-522254	56	Resist. (470,000 ohms, ½ watt)	33-447254		Drive Cord Pulley	27-4981		Cabinet Back	07-0078
13	1500 K.C. Bcst. R.F. Padder		57	Resistor (1 meg, ½ watt)	33-510254		Socket (Loktal)	27-6158		Dial Clamp	08-0011
	(Part of Gang)		58	Res. (470,000 ohms, ½ watt)	33-447254		Contact (Speaker Cable)	28-4528		Speaker	16-0007
14	Mica Cond. (250 mmfd.)	60-125357	59	Tubular Cond. (.01 mfd, 400v)	30-4572		Dial Plate Stud	28-6886		Phono Motor Switch	22-0008
15	Tuning Condenser	11-0003	60	Resistor (3900 ohms, ½ watt)	33-239334		Drive Cord Spring	28-8954		Knob (volume, etc.)	27-4987
16	First I.F. Transformer	32-3465	61	Tub. Cond. (.0015 mfd, 1000v)	30-4616		Drive Drum	38-9856		Record Changer	35-1290
17	Tubular Cond. (.05 mfd, 200v)	30-4519	62	Output Transformer	16-0007		Input Cable	41-3554		Switch Cover	38-9660
18	Tubular Cond. (.05 mfd, 200v)	30-4519	63	Cone and Voice Assembly	25-0038		Upright Bracket	56-1433		Rubber (changer mounting)	54-4048
19	Resistor (4700 ohms, ½ watt)	33-247354	64	Speaker Field (not replaceable)			Chassis Foot	56-1802		P.B. Bezel	56-1893FA9
20	Resistor (4700 ohms, ½ watt)	33-247354	65	Electrolytic Cond. (20 mfd.)	10-0004						
21	Electrolytic Cond. (10 mfd, 350v)	30-2459	66	Electrolytic Cond. (10 mfd.)	10-0005						
22	Mica Cond. (250 mmfd.)	60-125357	67	Resistor (220 ohms, 2 watt)	33-122336						
23	Oscillator Coil	12-0041	68	Electro. Cond. (25 mfd, 25v)	10-0011						
24	Mica Cond. (3500 mmfd.)	60-235124	69	Phono. Motor (Rim drive, 60 cy.)	15-0005						
25	600 K.C., Osc. Padder	11-0007	70	Photo-Electric Pick-up	35-2175						
26	Phono Light Padder	11-0008	71	Tubular Cond. (.01 mfd, 400v)	30-4572						
27	18 M.C. Osc. Padder (Part of Gang)		72	Tubular Cond. (.01 mfd, 400v)	30-4572						
28	Silver Mica Cond. (25 mmfd.)	20-002507	73	Power Transf. (60 cycle)	12-0032						
29	15.5 M.C. Osc. Padder	31-6374	74	Res. (100,000 ohms, ½ watt)	33-410254						
30	Silver Mica Cond. (60 mmfd.)	10-0006	75	Mica Condenser (100 mmfd.)	60-110157						
31	11.9 M.C. R.F. Padder (Part of 29)		76	Volume Control	13-0004						
32	Res. (33,000 ohms, ½ watt)	33-333354	77	Tub. Cond. (.002 mfd, 400v)	30-4579						
33	9.6 M.C. R.F. Padder (Part of 29)		78	Tub. Cond. (.004 mfd, 400v)	30-4578						
34	Silver Mica Cond. (130 mmfd.)	10-0007	79	Res. (100,000 ohms, ½ watt)	33-410254						
35	Osc. Plate Choke	32-3615	80	Tub. Cond. (.006 mfd, 400v)	30-4591						
36	Tubular Cond. (.01 mfd, 400v)	30-4572	81	Res. (330,000 ohms, ½ watt)	33-433254						
37	Res. (33,000 ohms, ½ watt)	33-333354	82	Input Transformer	32-8148						
38	Res. (33,000 ohms, ½ watt)	33-333354	83	Pilot Lamp	34-2064						
39	Res. (10,000 ohms, ½ watt)	33-310354	84	Res. (3,300 ohms, ½ watt)	33-233334						
40	Resistor (1 meg, ½ watt)	33-510254	85	Tub. Cond. (.05 mfd, 200v)	30-4519						
41	Tubular Cond. (.05 mfd, 200v)	30-4519	86	Push-Button Switch	22-0010						
42	Second I.F. Transformer	12-0056	87	Push-Button Padders	31-6316						
43	Resistor (220 ohms, ½ watt)	33-122336	88	Mica Condenser (250 mmfd.)	60-125357						
44	Tubular Cond. (.05 mfd, 200v)	30-4519	89	Wave Switch	22-0014						

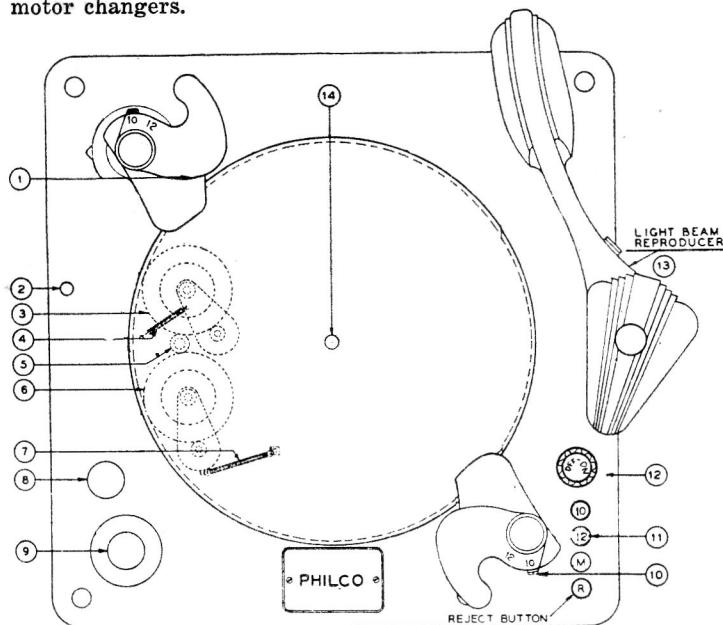
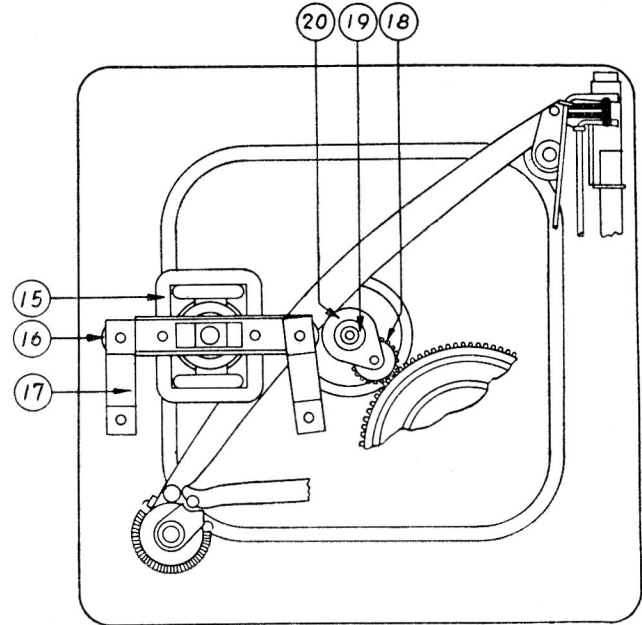


PART LOCATIONS—BOTTOM VIEW OF CHASSIS

## REPLACEMENT PARTS — RIM DRIVE MOTOR CHANGER

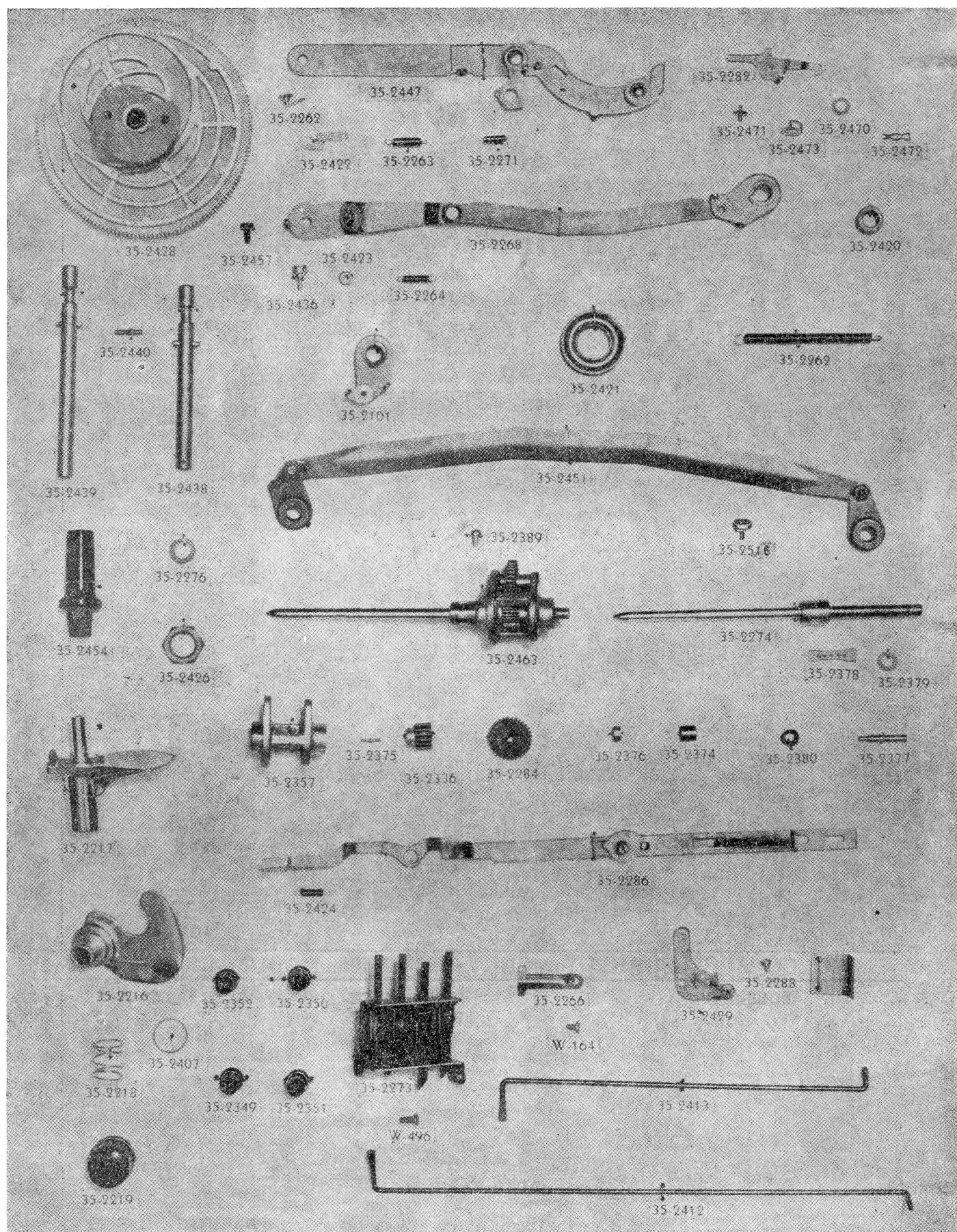
## RECORD CHANGER 35-1290 (115 Volts, 60 Cycle)

The replacement parts listed below cover the turntable motor drive parts and selector plate assembly used in the rim drive record changers. All other parts used in this type changer are the same as those listed for the gear type motor changers in Service Bulletin No. 344. The same mechanical adjustments listed in the Radio Service Bulletin No. 344 are also used for the rim drive motor changers.

FIG. 1 PART LOCATIONS—TOP OF CHANGERS  
RIM DRIVE TYPEFIG. 2 PART LOCATIONS—BOTTOM OF CHANGERS  
RIM DRIVE TYPE

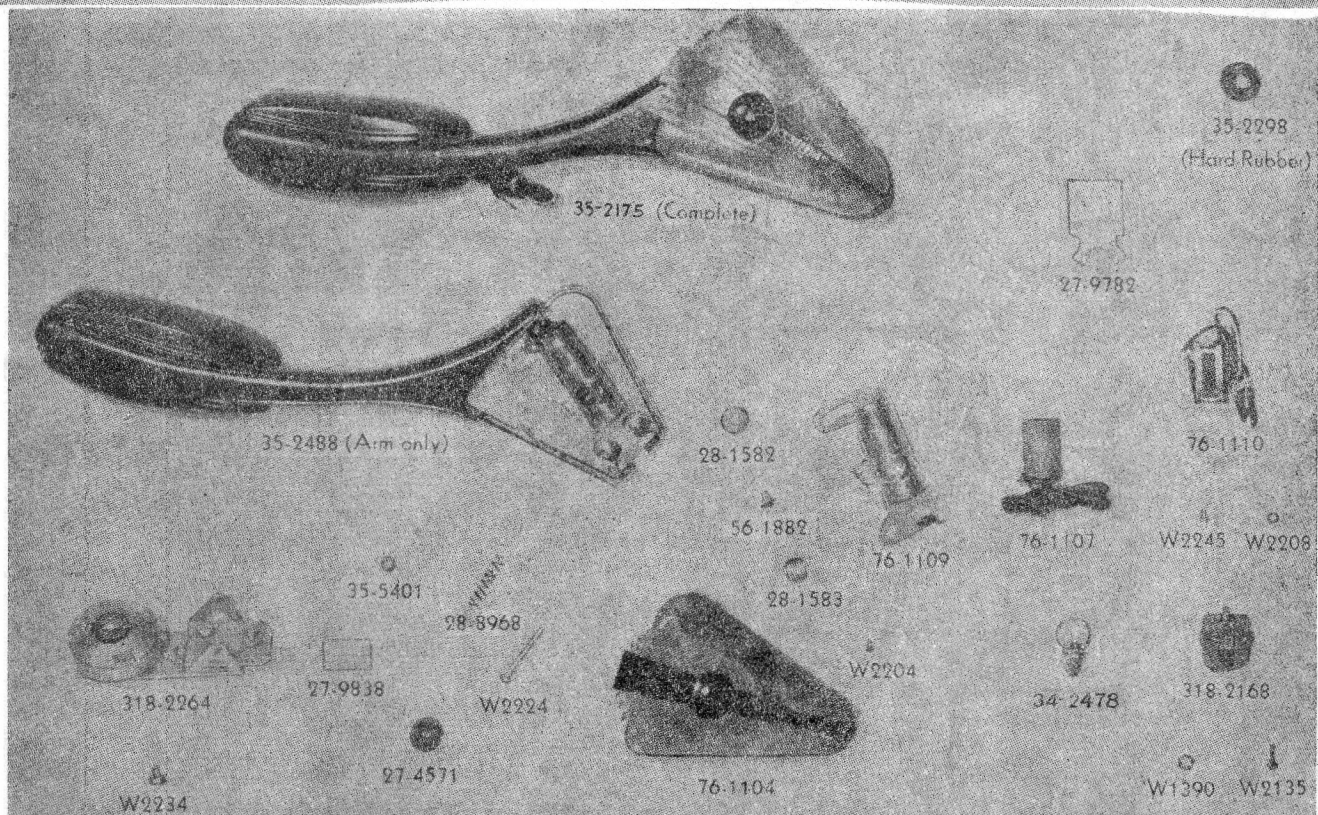
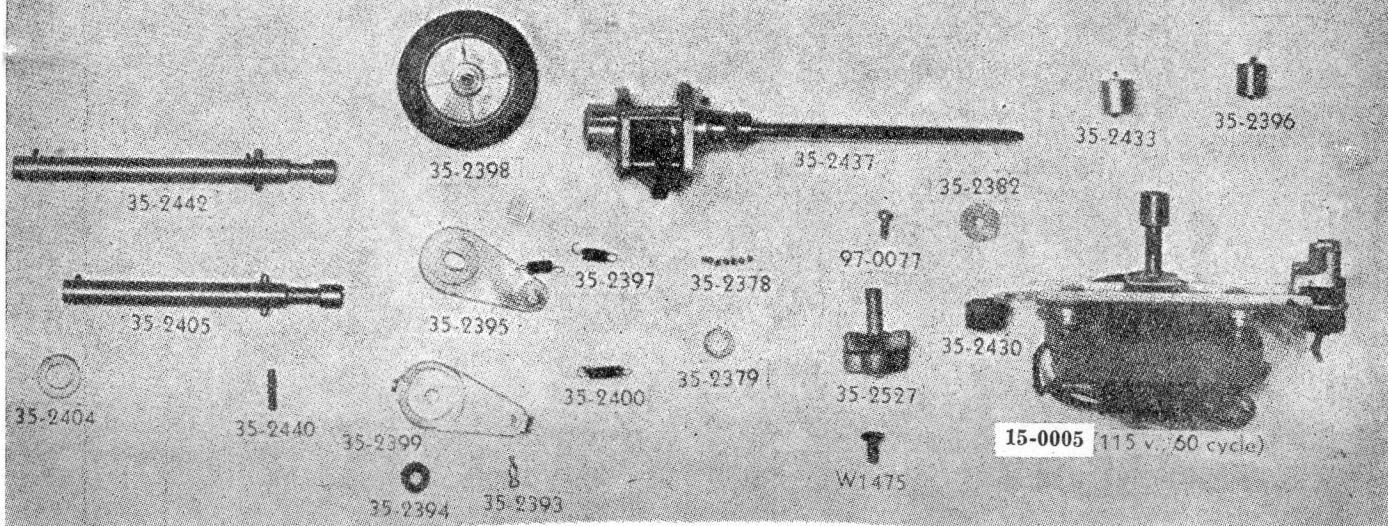
Diagrams 1 and 2 Numbers	DESCRIPTION	Part No.	Diagrams 1 and 2 Numbers	DESCRIPTION	Part No.	Diagrams 1 and 2 Numbers	DESCRIPTION	Part No.
2	Plug Button			Selector Plate	35-2216		Ball Bearings	35-2378
3	Turntable Pulley (Rear)	35-2398		Shelf Plate	35-2217		Ball Bearing Washer	35-2379
	Pulley Link Assembly	35-2395		Shaft	35-2405		Turntable Spindle, Cone and Gear	35-2437
	Spring Clip	35-2393		Shaft Pin	35-2440		Housing Assembly	35-2389
	Washer	35-2394		Washer	35-2404		Mounting Screws	35-2437
4	Spring (Rear Pulley)	35-2397	11	Push-Buttons		15	Motor (115 volts, 60 cycle)	15-0005
5	Motor Shaft Pulley (115 volt, 60 cycle Motor)	35-2396		"R" Button	35-2351	16	Motor Mounting Stud	35-2431
6	Turntable Pulley (Front)	35-2398		"M" Button	35-2352	17	Motor Mounting Strap	
	Pulley Link Assembly	35-2399		"12" Button	35-2349		Rubber Grommets	35-2430
7	Spring (Front Pulley)	35-2400		"10" Button	35-2350	18	Intermediate Drive Gear	35-2284
8	Plug Button (Small)	35-2293	12	On-Off Switch	22-0008		Shaft	35-2377
9	Plug Button (Large)	35-2289		Knob	07-0030		Thrust Washer	35-2380
10	Selector and Shelf Plate	35-2222	13	Light-Beam Reprod. (Complete)	35-2175		Upper Spacer	35-2376
	Front Shelf Post	35-2454		Reproducer Bracket			Lower Spacer	35-2374
	Knob (Selector Plate)	35-2219		(Light-Beam Reprod.)	35-2406	19	Spindle Drive Gear	35-2386
	Spring (Knob)	35-2218	14	Turntable Spindle and Cone Assembly	35-2274		Gear Pin	35-2375
						20	Spindle Housing Assembly	35-2357







## PARTS SHOWN BELOW USED ON RIM DRIVE CHANGERS ONLY



## PHILCO ACCESSORIES for SERVICE USE and COUNTER SALES

## POLISHES



Part No.	Description	Amount	List Price
45-1175	Furniture polish	1-8 oz. bottle	\$ .75
45-1364	Furniture polish	52 oz. tin	3.95
45-1321	Furniture polish kit	6-8 oz. bottles	4.50
45-1453	Wax base polish	1-8 oz. bottle	.75
45-2930	Wax base polish	6-8 oz. bottle	4.50
45-1080	Wax polish	1-6 1/2 oz. tin	.55
8020-3	Refrigerator polish	1-8 oz. bottle	.80
8900-1	Refrigerator polish	6-8 oz. bottle	4.75

## PHILCO SWITCH LUBRICATOR

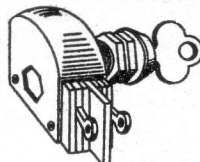
Works like magic in silencing noisy push button switch contacts, and for all other radio lubrication purposes.

Part No. 45-2806  
Tube—List \$ .50

Also in display cartons  
of 12 tubes—List 6.00

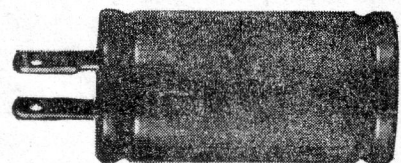


## AUTO RADIO LOCKS



Electrical Lock, Part 40-8074. List \$1.35  
Mechanical Lock, Part 28-8272. List 1.35

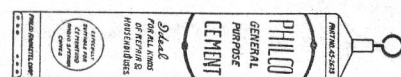
## NOISE ELIMINATOR



Quieter radio reception for all radios where electrical interference is being brought in on the A.C. power line. Simply plugs into the wall socket.

Part 30-4603 List \$1.00

## SPEAKER CONE CEMENT



Effectively and quickly fastens paper to metal.  
Part No. 45-2623 List price \$ .80

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

## EQUIPMENT REQUIRED

1. **Signal Generator:** Covering the frequency range of the receiver, such as Philco Model 177.
2. **Aligning Indicator:** Either a vacuum tube voltmeter or an audio output meter may be used as an aligning indicator. Philco Model 028. Circuit testers contain both these meters.
3. **Tools:** Philco Fibre Screw Driver, Part No. 45-2610.

## CONNECTING ALIGNING INSTRUMENTS

**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:** Connect the 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 the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

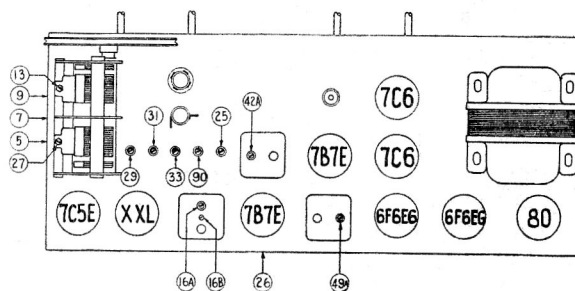
When aligning the R.F. padders a loop is made from a few turns of wire and connected to the signal generator out-

put terminals; the signal generator is then placed close to the loop of the radio.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

The receiver can be adjusted in the cabinet or removed from the cabinet. If adjustments are made outside the cabinet a Service Tuning Scale, Part No. 45-2825 will be required. This scale is placed underneath the pointer on the metal dial plate.

After connecting the aligning instruments, adjust the compensators as shown in the tabulation below. Location of the compensators are shown in the schematic diagram. If the indicating meter pointer goes off scale when adjusting the compensator, reduce the strength of the signal from the generator. Keep volume control of radio at maximum position.



LOCATION OF COMPENSATORS

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	OUTPUT CONNECTIONS TO RECEIVER	DIAL SETTING	DIAL SETTING	CONTROL SETTING	ADJUST COMP. IN ORDER	
1	Ant. section of Tuning Condenser in series with a .1 mfd. Condenser	460 K.C.	Tuning Cond. Closed	Volume Max. Band Switch B.C.	49A 42A 16A-16B	
2	Loop, Signal Gen.	15 M.C.	15 M.C.	Volume Max. Band Switch S.W.	27	Note B
3	Loop, Signal Gen.	1500 K.C.	1500 K.C.	Volume Max. Band Switch B.C.	90	
4	Loop, Signal Gen.	600 K.C.	600 K.C.	Volume Max. Band Switch B.C.	25	
5	Loop, Signal Gen.	1500 K.C.	1500 K.C.	Volume Max. Band Switch B.C.	13	
6	Loop, Signal Gen.	9.6 M.C.	9.6 M.C.	Volume Max. Band Switch S.W. 31 Metre	33	
7	Loop, Signal Gen.	9.6 M.C.	9.6 M.C.	Volume Max. Band Switch S.W. 31 Metre	9	Note D
8	Loop, Signal Gen.	11.6 M.C.	11.6 M.C.	Volume Max. Band Switch S.W. 25 Metre	31	
9	Loop, Signal Gen.	11.6 M.C.	11.6 M.C.	Volume Max. Band Switch S.W. 25 Metre	7	Note D
10	Loop, Signal Gen.	15.5 M.C.	15.5 M.C.	Volume Max. Band Switch S.W. 19 Metre	29	Note C
11	Loop, Signal Gen.	15.5 M.C.	15.5 M.C.	Volume Max. Band Switch S.W. 19 Metre	5	

NOTE A—Compensator (49A) must be adjusted before compensator (42B) and should be done in the following manner: Turn (42A) all the way up, then turn down selecting the first I.F. peak, compensator (49A) is now padded to maximum.

NOTE B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the

maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE C—Antenna compensator should be preset at approximately two turns from tight position.

NOTE D—Reset oscillator padders after padding R.F. padders on Short Wave due to slight pull from antenna padder on oscillator.