

## SERVICE BULLETIN No. 310 for members of RADIO MANUFACTURERS SERVICE

A PHILCO Service Plan

## **SPECIFICATIONS**

#### Model 39-55

TYPE CIRCUIT: Philco Model 39-55, code 121, is an 11-tube receiver employing a superheterodyne circuit for reception of standard broadcast stations with Philco Mystery Control for Electric Automatic Tuning of eight (8) stations. The Philco Mystery Control also controls Volume and turns off set without any connections between receiver and Control Unit. In addition, other features of design are—Automatic Volume Control; Continuously Variable Tone Control; Bass Compensations; Degenerated Push-pull Pentode Audio Output Circuit, and Compensators selected for minimum drift.

POWER SUPPLY: 115 volts, 50 to 60 cycles, A.C.

POWER CONSUMPTION: 180 watt. TUNING RANGES: 540 to 1720 K.C.

I.F. FREQUENCY: 470 K.C.

PHILCO TUBES USED: Receiver—6J8G, First Detector Oscillator; 78, I.F. Amplifier; 6Q7G, Second Detector, A.V.C. and first Audio; two (2) 42 Audio Output, and one 80 Rectifier.

Mystery Tuning Control Amplifier—78, First Control Amplifier; 6J7G, Second Control Amplifier; A.V.C.; 6ZY5G, A.V.C. and a 2A4G Thyratron Rectifier.

Mystery Control Unit—One type 30.

AUDIO OUTPUT: 10 watts.

CABINET DIMENSIONS:	Height	Width	Depth
Console		29½" 7¼"	143/8"
Note: The Schematic Diagram and will be found in Bulletin 310 A		Parts List fo	r Model 39-55

#### **Model 39-116**

TYPE CIRCUIT: Philco Model 39-116, code 121, is a 14-tube receiver employing a superheterodyne circuit with three tuning ranges for reception of standard and short wave broadcast stations and Philco Mystery Control for Electric Automatic Tuning of eight (8) standard broadcast stations. The Philco Mystery Control also controls the volume and turns the set

"off" without any connections between the receiver and control unit. In addition, other features of design are—Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation Degenerated Push-pull Pentode Audio Output Circuit, and Compensators selected for minimum drift.

POWER SUPPLY: 115 volts, 50 to 60 cycles, A.C.

POWER CONSUMPTION: 190 watts.

TUNING RANGES: 540 to 1720 K.C.; 1.7 to 5.8 M.C.; 5.8 to 18 M.C.

I.F. FREQUENCY: 470 K.C.

PHILCO TUBES USED: Receiver—6K7G, R.F. Amplifier; 6A8G, First Detector Oscillator; 78, I.F. Amplifier; 6Q7G, Second Detector, A.V.C. and first Audio; 37, Phase Invertor;

two (2) 42, Audio Output, and one 80, Rectifier;

Mystery Control Amplifier—78, First Control Amplifier;
6J7G, Second Control Amplifier; 6J5G, A.V.C.; 6ZY5G, and a 2A4G, Thyratron Rectifier.

Mystery Control Unit—One type 30.

AUDIO OUTPUT: 10 watts.

AERIAL AND GROUND: To obtain maximum performance from this receiver, the Philco Safety Aerial, Part No. 40-6370, should be used. The antenna circuit of this receiver is especially designed for use with this aerial. When installing the aerial, care should be taken to keep the aerial lead-in wire away from the horizontal inductor coil located in the bottom of the cabinet.

Do not coil up any excess lead-in and drop it in the back of the cabinet. Run the aerial lead-in directly to the "Ant" terminal post on the back of the receiver. A good ground connection should be connected to the terminal post marked "Gnd." When this is done, the link connecting to the "Gnd" terminal should be disconnected and swung around so that it does not touch the "Gnd" post. If, however, no ground is used this link should be connected to the "Gnd" terminal.

CABINET DIMENSIONS: Height Width 

### **Adjusting Mystery Control for Reception of Stations**

The procedure for setting up stations on the Mystery Control receivers is similar to the procedure followed in setting up Philco Electric Automatic Tuning Models. The eight (8) stations, however, are automatically dialed by the remote control unit instead

of by pushing buttons.

To set up stations on Mystery Tuning, proceed as follows:

1. Select and remove the desired eight (8) station call letters from the station tab card supplied with the receiver. Insert the station tabs in the apertures (windows) of the bezel. The lowest frequency station is placed in the first window on the left, and the remain-

ing station tabs in the order of increasing frequency.

2. Connect a Model 077 Signal Generator to the "Ant" and "Gnd" terminals of the receiver, set the Signal Generator with modulation "On." Turn the range selector switch to "Broadcast" and tune in the lowest frequency station. This should be between 540 and 1030 K.C. Then adjust the Signal Generator to the frequency of the station until a heart are to the feature of the station until a heart and the search.

frequency of the station until a beat note is heard.

Leaving the Signal Generator connected, turn the Range Selector Disc of the receiver to "Automatic." Now, using a padding screw driver, adjust the first 540 to 1030 K.C. oscillator padder (bottom row of holes) at the rear of the chassis, until the station

identified by the modulated signal of the generator is tuned in to maximum signal. Next, adjust the first 540 to 1030 K.C. Antenna Padder (top row of holes) for maximum signal.

Turn the Signal Generator off the station frequency and readjust the "Ant" and "Osc" Padders for maximum output. This should be done with the volume control adjusted for low volume. This procedure is repeated for each of the remaining stations. The next station, of course, will be the next highest in frequency, that is within the 540 to 1030 K.C. range of the second set of padders. The Third Station is adjusted by the third set of padders under 670 to 1160 K.C. and the remaining stations in the order of increasing frequency.

5. Now, insert the small call letter tab of the first station in the third aperture of the bezel on the remote Mystery Control unit. Celluloid tabs are also supplied to be placed over each call letter. The remaining call letter tabs are then placed in the order of increasing frequency

around the bezel from right to left (counter clockwise). Insert the "loud" and "soft" tabs in the first and second apertures on the right hand side of the bezel. See instructions supplied with each model for dialing sta-

tions and controlling volume.

# Replacement Parts Model 39-116

Schen No.	1. Description	Part No.	Schem No.	. Description	Part No.	1	Mystery Control Unit	
No.	Antenna Transformer (BC)		71	Field Coil (Replace Speaker No. 36-1450)	Sch	em.		
2	Antenna Transformer (Police)	32-3053	72	Resistor (Wirewound—Bias)	33-3364 No		Description Part No.	
3	Antenna Transformer (S.W.)	32-3055	73	Power Transformer (115 V.—50 to 60 cycles).  Power Trans, (115 V.—25 to 40 cycles)	32-8001   124 32-8017   125	Silver	ary Inductor	
3	Tubular Condenser (.05 mfd.)	30-4519	74	Bypass Condenser ( 05 mfd.) (110 V. plug).	30-4576 126	Air P	Padder 31-6268	
6	Resistor (51.000 ohm-1/2 watt)	33-351339	75 76	Pilot Lamp (Bullseye)	34-2210   127 33-016431   128	Tubu	lar Cond. (.05 mf.)	
8	Antenna Iransiormer (S. W.) Commensator Antenna Shortwave Tubular Condenser (.05 mfd.) Resistor (51.000 ohm.—½ watt) Resistor (2.0 mg.—½ watt) Tubular Condenser (1 mfd.)	30-4455	77	Pilot Lamp Resistor (16 ohm)	34-2064 129	Myste	'adder     31-6268       lar Cond. (.05 mf.)     30-4519       tor (500 ohms—½ watt)     33-15039       ery Pack     41-8016	ł
9			78	Pilot Lamps (Dial)	32-7993 130	Dial	Unit (Pulser)	
10	Tuning Condenser	31-2308	79	Filament Trans. (115 V.—25 to 40 cycles) Motor Trans. (115 V.—50 to 60 cycles)	32-8016		Miscellaneous Parts	
11	R.F. Transformer (B.C.)	32-2379		Mctor Trans. (115 V.—25 to 40 cycles)	32-8015		Miscenaneous Parts	
13	R.F. Transformer (Police)	32-3054	80	Motor (Volume Control) Assembly	35-1151	Bezel	Assembly (Cabinet)	
14	R.F. Transformer (S.W.)	30-1097	82	Rotary Switch (Stepper Unit)	33-3363	Cable	Screws W-1835 (Tuning Drum) 31-2315	
16	Compensator R.F. Shortwave	31-6212	83	Pilot Lamp Assembly (Station Indicator)	34-2064	Cable	(Pointer) 31-2320	
17	Tubular Condenser (.05 mfd.)	30-4519	84 85	Switch (Volume Control—Motor)	42-1469	Dial	Pointer	
19	Oscillator Transformer (B.C.) (A3)	32-2120	86 87	Tubular Condenser ( 1 mfd )	30-4499	Disc	(Tuning) 27-4766	
20	Oscillator Transformer (Police)	32-3052	87 88	Tubular Condenser (.1 mfd.)	30-4499	Disc	(Volume)	
21	Oscillator Transformer (S.W.)	31-6266		Tubular Condenser (1 mfd.)	31-6264	Disc	(Tone Control) 27-4764	
23	Compensator Broadcast Low Frequency	31-6230	89 A 89 B	Compensator No. 1 ( 540-1030 K.C.) Part of 89		Pilot	Lamp Assembly	
20 21 22 23 24 25 26 27	Condenser Semi-fixed (1230 mmfd.) Condenser Semi-fixed (3425 mmfd.)	31-6262	89C	Push Button Padder Unit.  Compensator No. 1 (540-1039 K.C.) Part of 89  Compensator No. 2 (540-1039 K.C.) Part of 89  Compensator No. 3 (670-1160 K.C.) Part of 89  Compensator No. 4 (670-1160 K.C.) Part of 89  Compensator No. 5 (900-1470 K.C.) Part of 89  Compensator No. 6 (900-1470 K.C.) Part of 89  Compensator No. 7 (1100-1600 K.C.) Part of 89  Compensator No. 7 (1100-1600 K.C.) Part of 89  Compensator No. 8 (1100-1600 K.C.) Part of 89		Pilot	(Tone Control)         27-4764           Lamp Assembly         38-9694           Lamp Assembly (Dial)         38-9712           Lamp Assembly (Tabs)         38-9712	
26	Mica Condenser (250 mmfd.)	30-1032	89 D 89 E	Compensator No. 4 ( 670-1160 K.C.) Part of 89		SOURE	t (4 Dronk)	
27 28	Resistor (32,000 ohm—½ watt) Resistor (10,000 ohm—½ watt)	33-332339	89 F	Compensator No. 6 ( 900-1470 K.C.) Part of 89		Socke	et (5 prong) 27-6035	
29 30	Resistor (10.000 ohm— 1 watt)	33-310339	89 G	Compensator No. 7 (1100-1600 K.C.) Part of 89		Socke	t (6 prong)	
30 31	Resistor ( 5,000 ohm—2 watt) Electrolytic Condenser (4 mfd.—250 V.)	33-250339	89 H 90	Compensator No. 8 (1100-1600 K.C.) Part of 89 Electric Push Button Transformer Assembly				
32	Mica Condenser (250 mmfd.)	30-1032		(8 Trans.)	32-3091	Speak	ker 36-1450	
33	1st I F. Transformer Assembly	32-3089	90A 96B	Oscillator Trans. No. 1 ( 540-1030 K.C.) Oscillator Trans. No. 2 ( 540-1030 K.C.)	32-3042	Sprin	og (Tuning Cables)	
33 34 35 36 37 38 39	Tubular Condenser (.01 mfd.)	33-510339	90C	Oscillator Trans. No. 2 ( 540-1030 K.C.) Oscillator Trans. No. 3 ( 670-1160 K.C.)	32-3042	Wash	ker	
36	Resistor (1.0 meg.—½ watt) Resistor (330,000 ohm—½ watt) Resistor (330,000 ohm—½ watt) Pad I.F. Transformer Assembly	33-433339	90 D	Oscillator Trans. No. 4 ( 670-1160 K.C.) Oscillator Trans. No. 5 ( 900-1470 K.C.)	32-3042			
38	2nd I.F. Transformer Assembly	32-2645	90 F	Oscillator Trans. No. 6 ( 900-1470 K.C.) Oscillator Trans. No. 7 (1100-1600 K.C.)	32-3041		Mystery Control Unit	
39	Mica Condenser (110 mmfd.)	30-1031	90 G 90 H	Oscillator Trans. No. 7 (1100-1600 K.C.) Oscillator Trans. No. 8 (1100-1600 K.C.)	32-3041	Bezel	56-1240	
40	Tubular Condenser (.01 mfd.)	30-4479	91	Silver Mica Condenser (370 mmfd.)	30-1110	('an '	Screws W-2138 Tuning Disc 27-4793	
42	Volume Control	33-5300	92	Silver Mica Condenser (370 mmfd.)	30-1110	Disc	(Tuning) 97-4709	
43 44 45	Resistor (70,000 ohm—½ watt) Tubular Condenser (004 mfd.)	33-370339	93 94 95 96 97	Resistor (150 ohm)	33-3362	Ston	(Tuning Disc) 97-4704	
45	Resistor (2.0 meg.—½ watt) Tubular Condenser (.015 mfd.) Resistor (1.0 meg.—½ watt) Tubular Condenser (.1 mfd.)	33-520339	95	Electrolytic Condenser (16 mfd.—200 V.)	30-2356	Socke	et (4 prong). 27-6119 r (Finger Stop) W-2139 er (Finger Stop) 27-4795	
46 47	Tubular Condenser (.015 mfd.)	30-4529		Cho'te Coil	30-4123	Screw	(Finger Stop)	
48	Tubular Condenser (.1 mfd.)	30-4527	98 99	Tubular Condenser (.05 mfd.)	30-4123	Брасс	i (Finger Stop)	
49 50	Resistor (99,000 ohm—½ watt) Tubular Condenser (.01 mfd.)	33-399339	100	Tubular Condenser (.1 mfd.) Tubular Condenser (.5 mfd.)	30-4499			
. 51	Resistor (490.000 ohm—1/2 watt)	33-449339	101	Resistor ( 4.000 ohm—1/2 watt)	33-240339	(2)	) <u></u>	
52	Resistor (5.000 ohm—1/2 watt)	33-250339	102	Resistor (4.000 ohm—½ watt). Resistor (51.000 ohm—½ watt). No. 3 Control Amp. Transformer	33-351339	~	7 g   1 k   / _	
53 54	Resistor (45,000 ohm—½ watt)	30-4481	104	Tubular Condenser (.02 mfd.)	30-4516	30	\ ``ヨ	
55	Tone Control (3 meg.)	33-5287	105	Mica Condenser (550 mmfd.)	30-1092		Tam (100)	
56 57	Tubular Condenser (.01 mfd.)	30-4572	107	Resistor (750,000 ohm—½ watt) Resistor (1.0 meg.—½ watt) Resistor (199,000 ohm—½ watt) Tubular Condenser (.05 mfd.)	33-510339		150	
58	Resistor (51,000 ohm—½ watt)	33-351339	108	Tubular Condenser (05 mfd)	33-399339	<b>**</b>	7/ 11/2 0000	
59	Resistor (490,000 ohm—1/2 watt)	33-449339	110	Resistor (99,000 onm-1/2 watt)	33-399339		\5******\[ \5****** (3)	7
60	Resistor (490,000 ohm—½ watt)	33-449339	111	Tubular Condenser (.05 mfd.)  Tubular Condenser (.05 mfd.)	30-4123	П	3 1 27-1	
62	Tubular Condenser (.1 mfd.)	30-4499	113	Resistor (1.5 meg.—½ watt)	33-515339	11		
63 64	Tubular Condenser (.01 mfd.)	30-4501	114	Tubular Condenser (05 mfd.)	30-4519	11		
65	Output Transformer	32-7996	116	Tubular Condenser (.05 mfd.)	30-4444			
	36-1450)	36-4089	117	Sensitivity Control Resistor (300 ohm—½ watt)	33-5295	1		
66 67	Tubular Condenser (.01 mfd.)	30-4501	119			-		
68	Resistor (1.0 meg.—1/2 watt)	33-510339	120	Silver Mica (200 mmfd.)	30-1122	3 VOI	.113	
69	Electrolytic Condenser (25 mfd.—300 V.)	30-2360	122	Silver Mica (200 mmfd.).  Compensator (Secondary Inductor).  Secondary Inductor (Mystery Tuning)	40-6415	3.5	-4 - C + 177 '- D'	
70	Electrolytic Condenser (18 mfd.—475 V.)	30-2200	123	Wave Switch	42-1451	My	stery Control Unit Diagram	

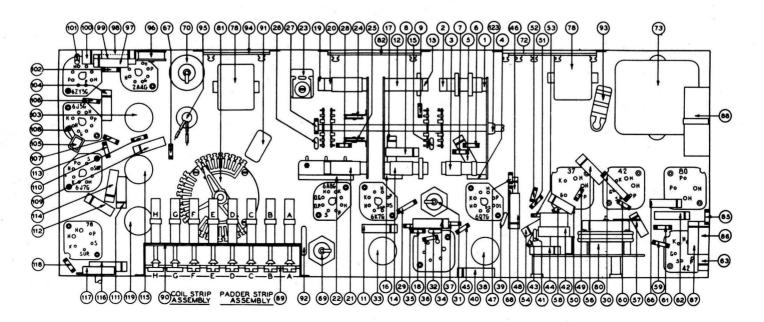
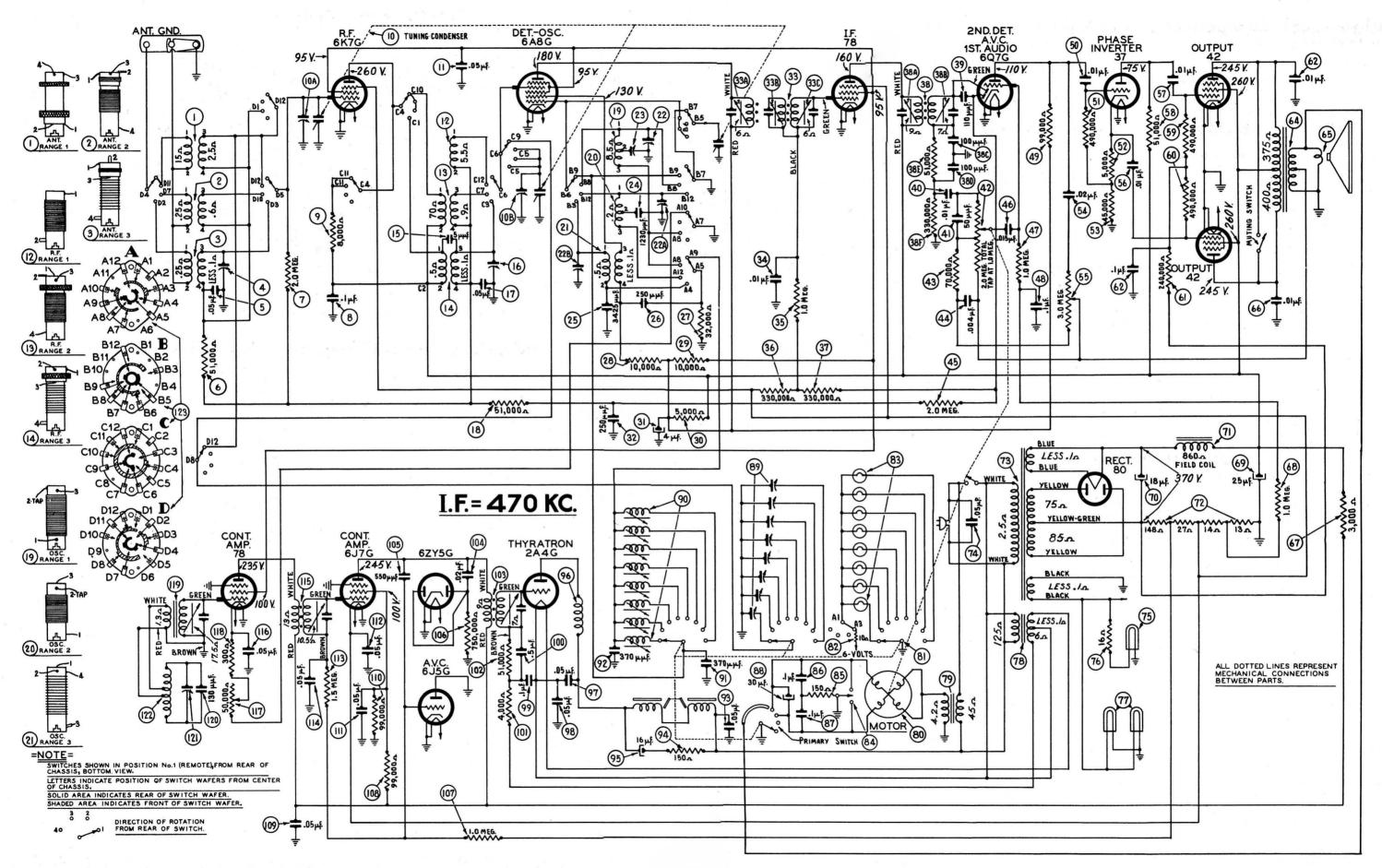


FIG. 1-Model 39-116 Part Locations Underside of Chassis



No. 310

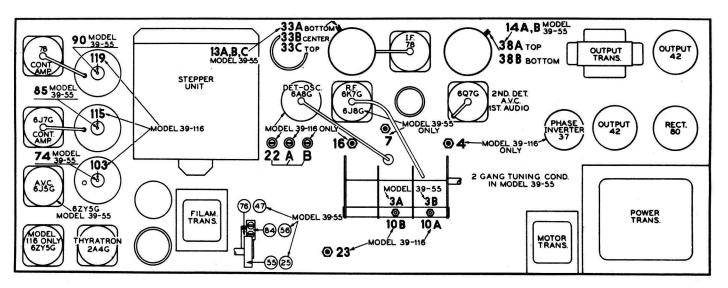


FIG. 4-Locations of Compensators-Model 39-55 and 39-116

#### **Adjusting Control Frequency Amplifier**

The Mystery Control receivers are shipped with five (5) different control frequencies which range from 350 to 400 K.C. These are identified by code numbers appearing on the serial number ticket and on the rear of the chassis. These code numbers and frequencies are as follows:

Code 5—355 K.C. Code 6—367 K.C. Code 7—375 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 Mystery Control receivers which are on the same floor or are exceptionally close together. When several Mystery Control receivers are to be located close together, it will be necessary to use different control frequencies to avoid interaction between the receivers. In order to prevent interaction between receivers, there should be a difference of 20 K.C. between their control frequencies.

If three receivers 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 to 395 K.C.

When realigning or changing the control frequency of the Mystery Control circuit, a Philco Model 077 Signal Generator with a coil of wire (about 4 or 5 turns—12" in diameter) attached to the output terminals is required. The leads between the coil of wire and Signal Generator should be long enough so that the coil of wire can be placed near the large secondary inductor in the bottom of the receiver cabinet.

With this apparatus, the Control Frequency is adjusted as follows:

- 1. With the temporary coil of wire in the center of (or near) the secondary inductor, the control frequency to which the Mystery Control Amplifier is tuned can be determined by tuning the Signal Generator between 350 and 400 K.C. When the Signal Generator is tuned to the control frequency, the Thyratron (2A4G) tube will glow (blue haze). If this frequency is to be used, leave the Signal Generator indicator at this point or turn the indicator to any other frequency desired between 350 and 400 K.C.
  - 2. When the control frequency is selected, turn the sensitivity control (117) in Model 116 and (89) Model 55

located on the left rear of the chassis—towards the position marked "extreme." Using the 2A4G Thyratron tube as a resonance indicator, adjust padders (103), (115), (119) in Model 116 and (74), (85), (90) in Model 55 for maximum signal. This will be indicated by the brilliance of the glow in the 2A4G Thyratron tube. As the padders are adjusted, gradually turn the sensitivity control to the "near" position or reduce the output from the Signal Generator. When the padders are correctly adjusted to maximum, the Thyratron will glow with the sensitivity control (117) at the "near" position and with a very weak signal from the Signal Generator.

- 3. Next, adjust the padding condenser (121) in Model 116 and (92) in Model 55 on the secondary inductor located in the bottom of the receiver. The padding condenser is located in one corner of the secondary inductor and is encased in a cardboard container. This padding condenser should be carefully adjusted for maximum glow in the 2A4G tube. Use the weakest signal possible from the Signal Generator that will cause the 2A4G to glow. Also, have the sensitivity control as close as possible to the "near" position. Extreme care should be used in adjusting the padder to the exact point of resonance, as the secondary inductor is a very sharply tuned circuit. After adjusting the circuit, remove the Signal Generator and loop from the receiver.
- 4. The Mystery Control unit is now adjusted as follows:
  - A. Dial any one of the stations indicated on the remote unit by pulling the selector to the "Stop" position. Then, as the dial is released at the "Stop," press the "Stop" down and hold it in this position.
  - B. Holding the "Stop" in this position, bring the Mystery Control unit close to the receiver. Using the padding wrench, tune the padding screw (126) located on the bottom of the unit until the 2A4G Thyratron in the receiver glows at full brilliance.

Now, turn the sensitivity control on the receiver towards the "near" position until a point is reached where the 2A4G tube almost stops glowing. Then, readjust the padder (126) of the unit again for maximum brilliance in the 2A4G tube. The Mystery Control unit should now be adjusted to the same frequency as the control frequency in the receiver.

# PHILCO RADIO AND TELEVISION CORPORATION Parts and Service Division Philodelphia, Pa.