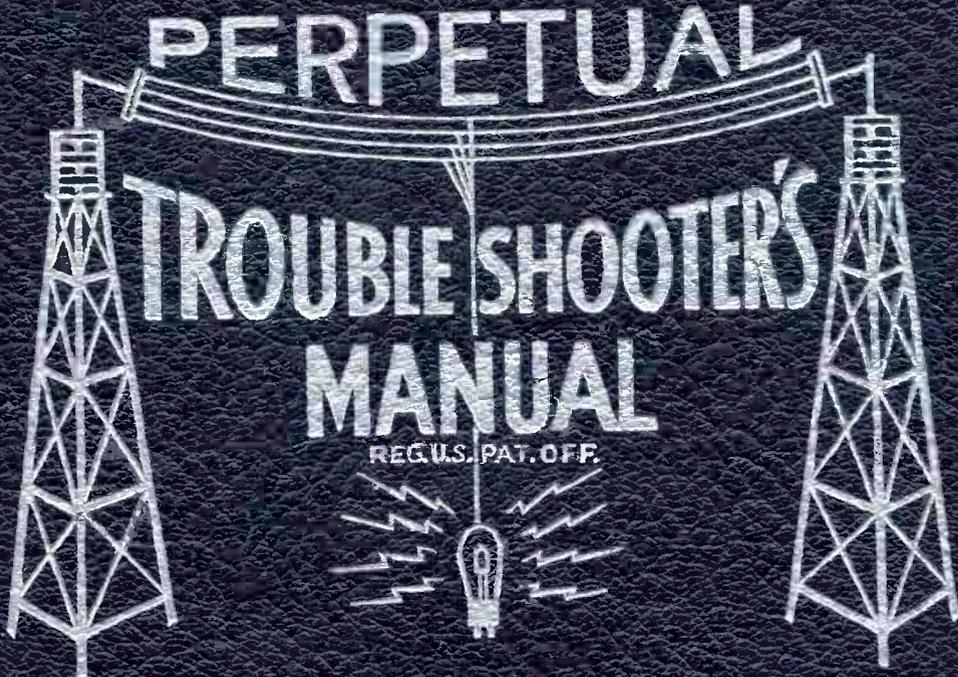


**VOLUME VII**

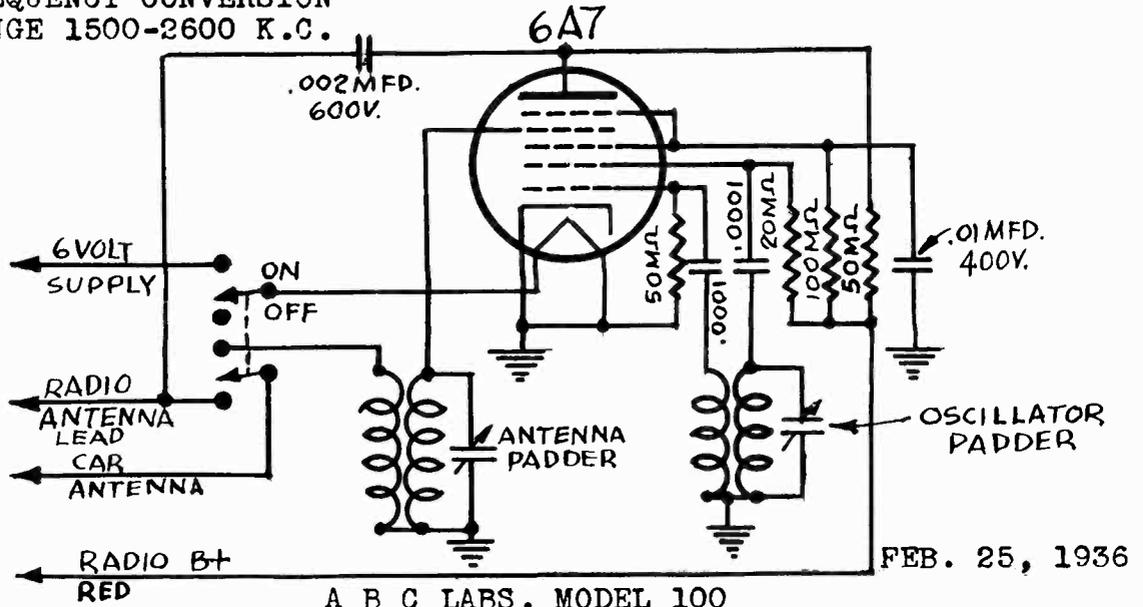


**JOHN F. RIDER**

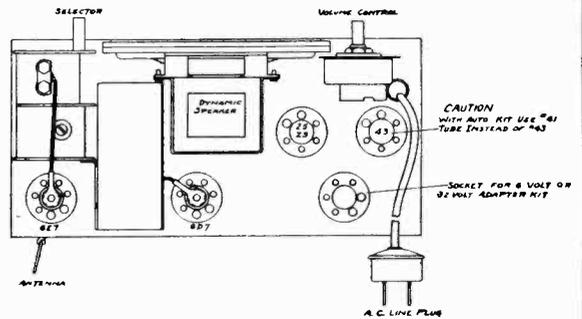
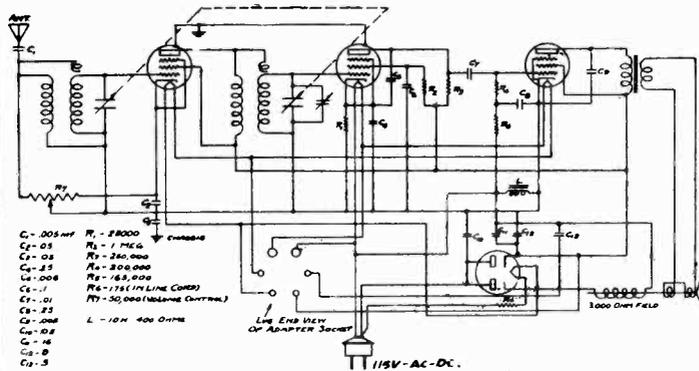
A B C RADIO LABORATORIES  
COLIN B. KENNEDY  
TURNER CO.

MODEL 100  
MODEL 1000  
MODEL G  
Schematics

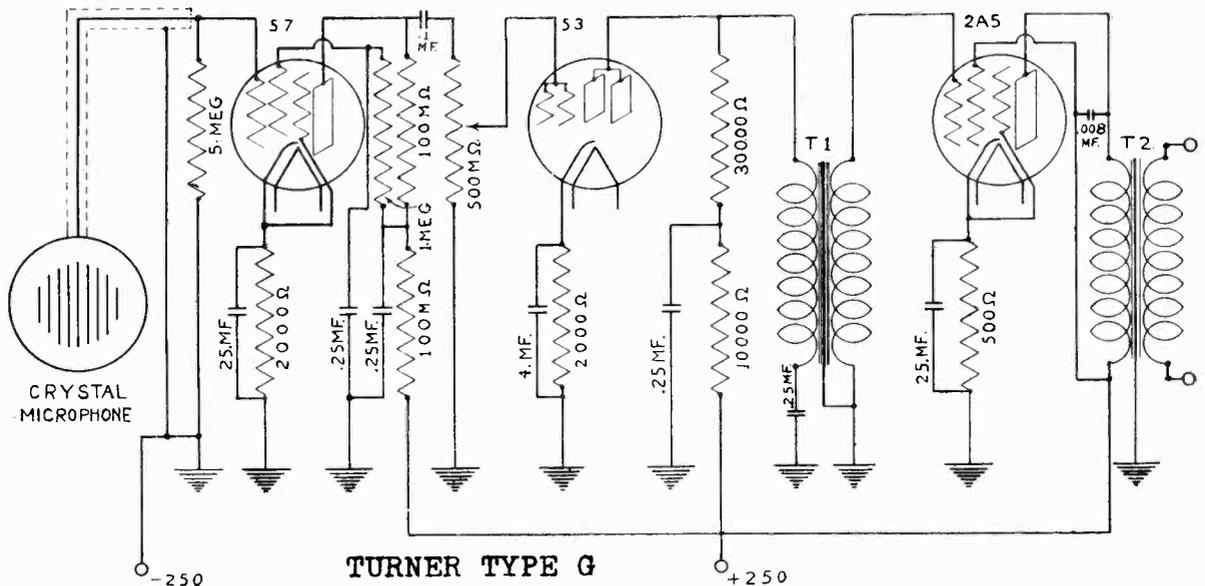
FREQUENCY CONVERSION  
RANGE 1500-2600 K.C.



A B C LABS. MODEL 100  
Police Converter



KENNEDY MODEL 1000



TURNER TYPE G

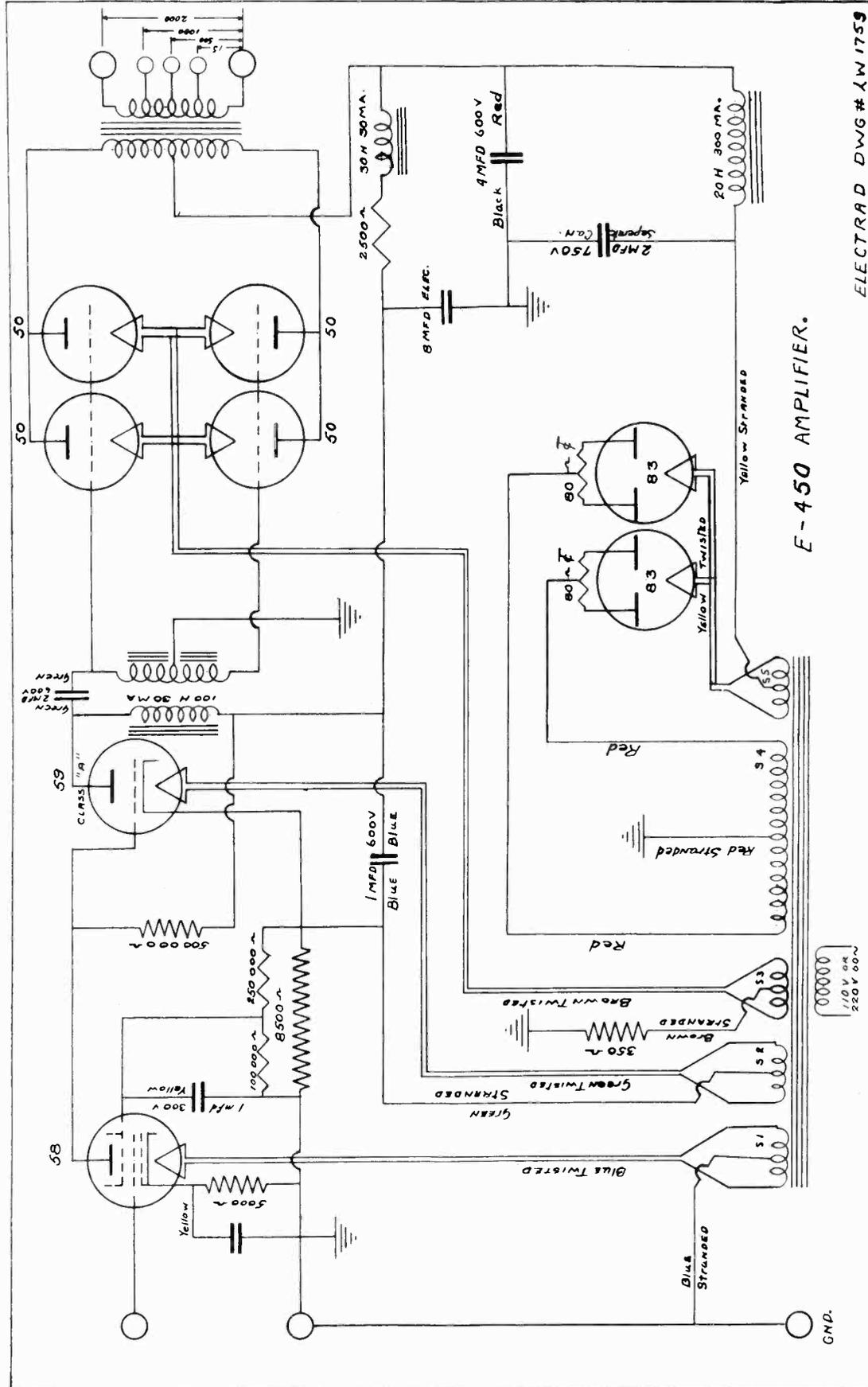






ELECTRAD, INC.

MODEL E-450 Amplifier Schematic



E-450 AMPLIFIER.

ELECTRAD DWG # LW1759

110V OR 220V 60~

GND.

GEF MAY 9 1933

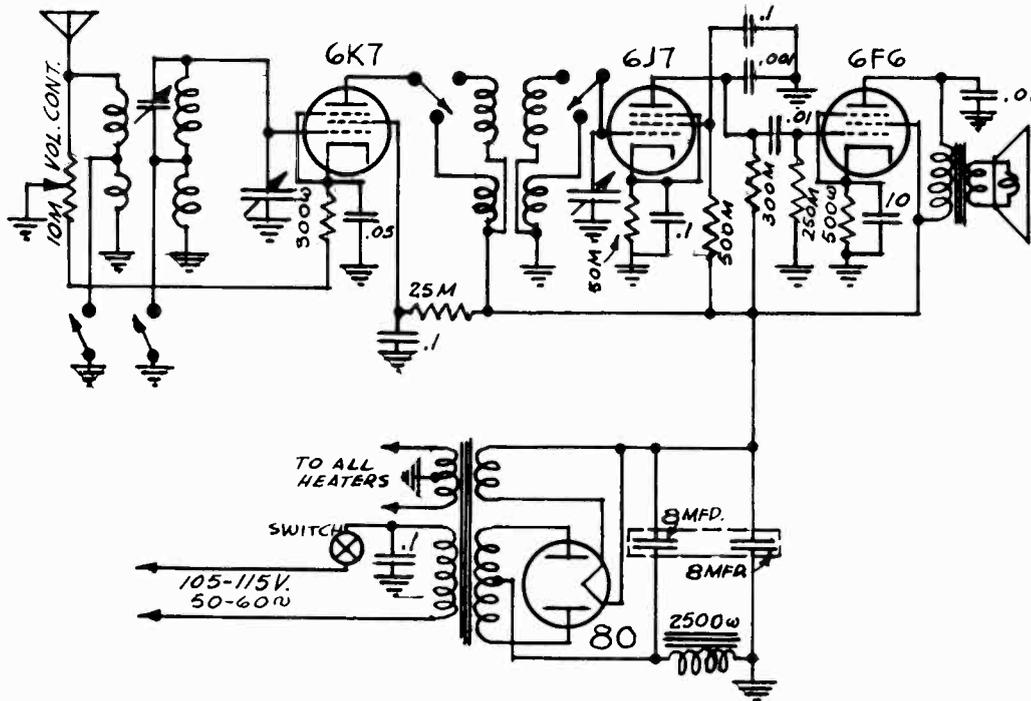




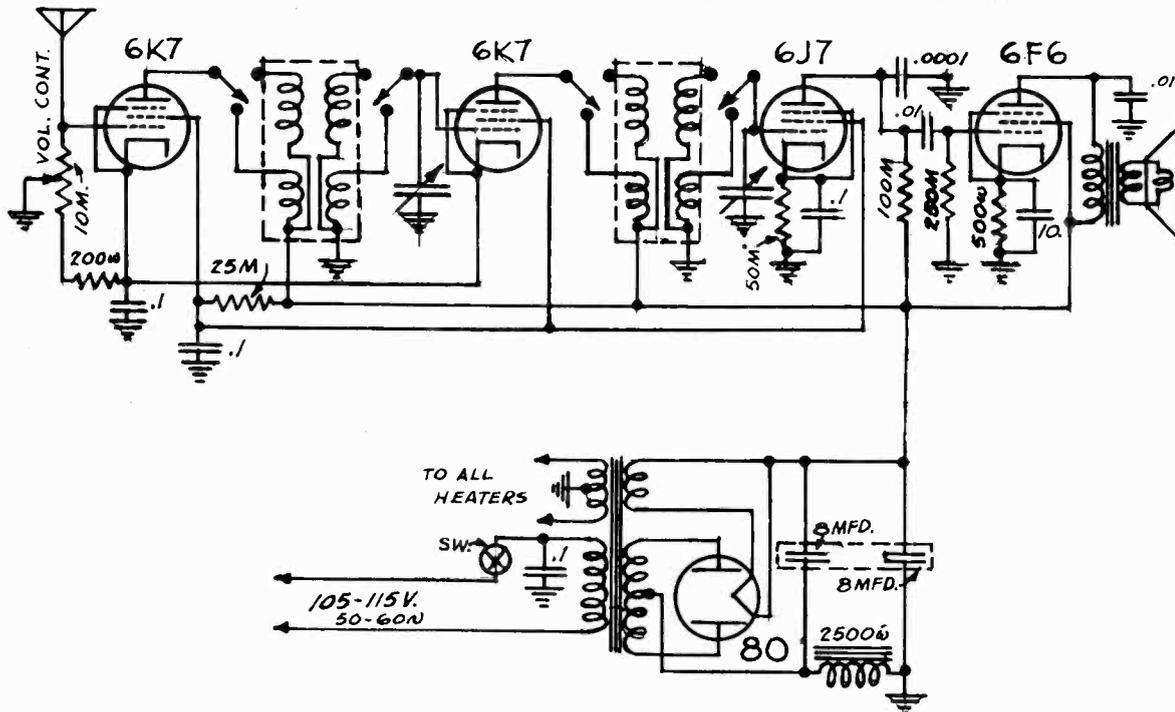
MODEL L-44-T  
MODEL L-55-T  
Schematics

LAUREHK MFG. CO.

1937 4 Tube "MUSIQUE" TRF Receiver MODEL L-44-T  
Frequency Ranges, 1600KC to 540KC, and 1600KC to 4500KC.



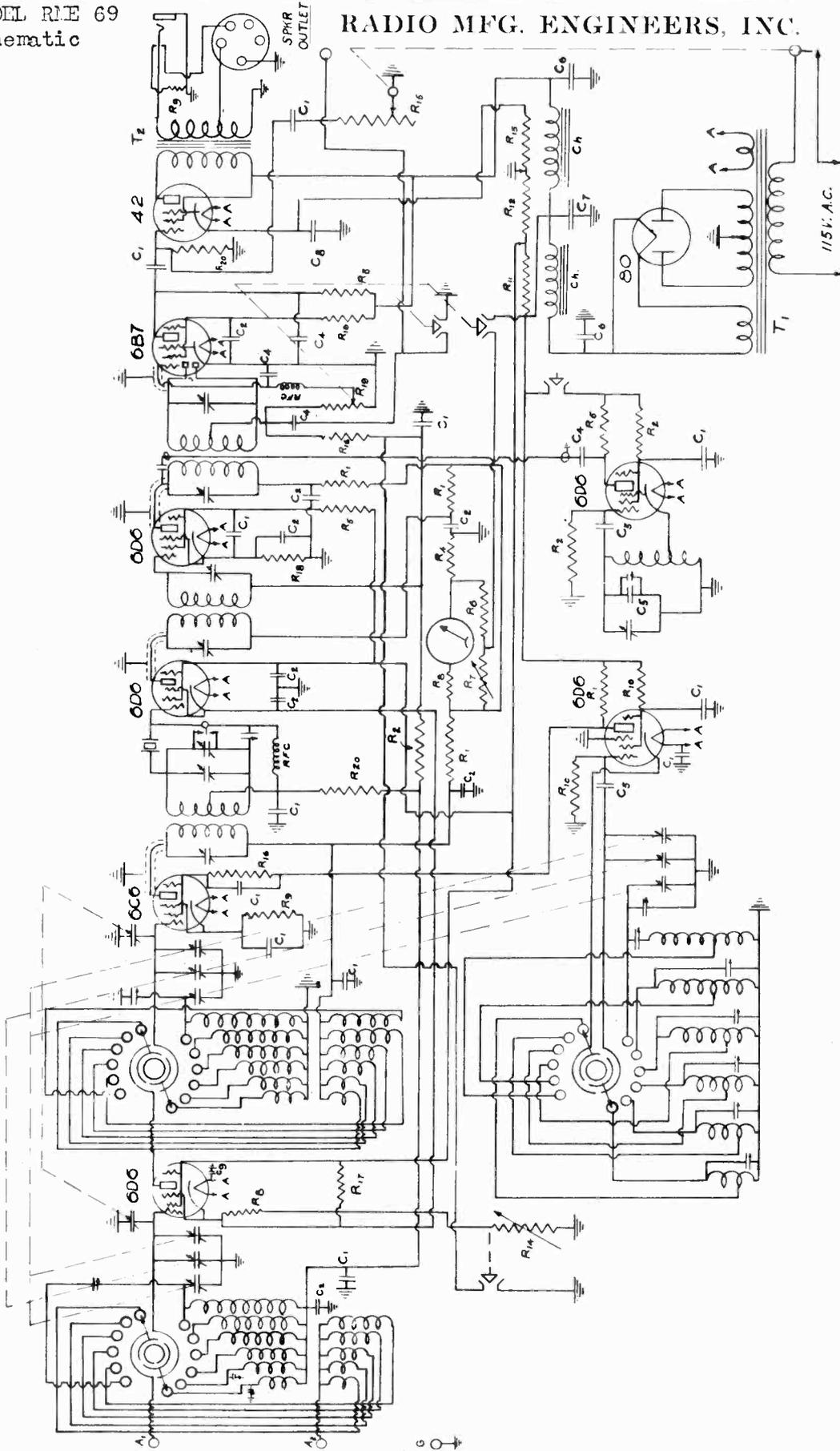
1937 5 Tube "MUSIQUE" TRF Receiver MODEL L-55-T  
Frequency Ranges, 1600KC to 540KC, and 1600KC to 4500KC.





MODEL RME 69  
Schematic

RADIO MFG. ENGINEERS, INC.



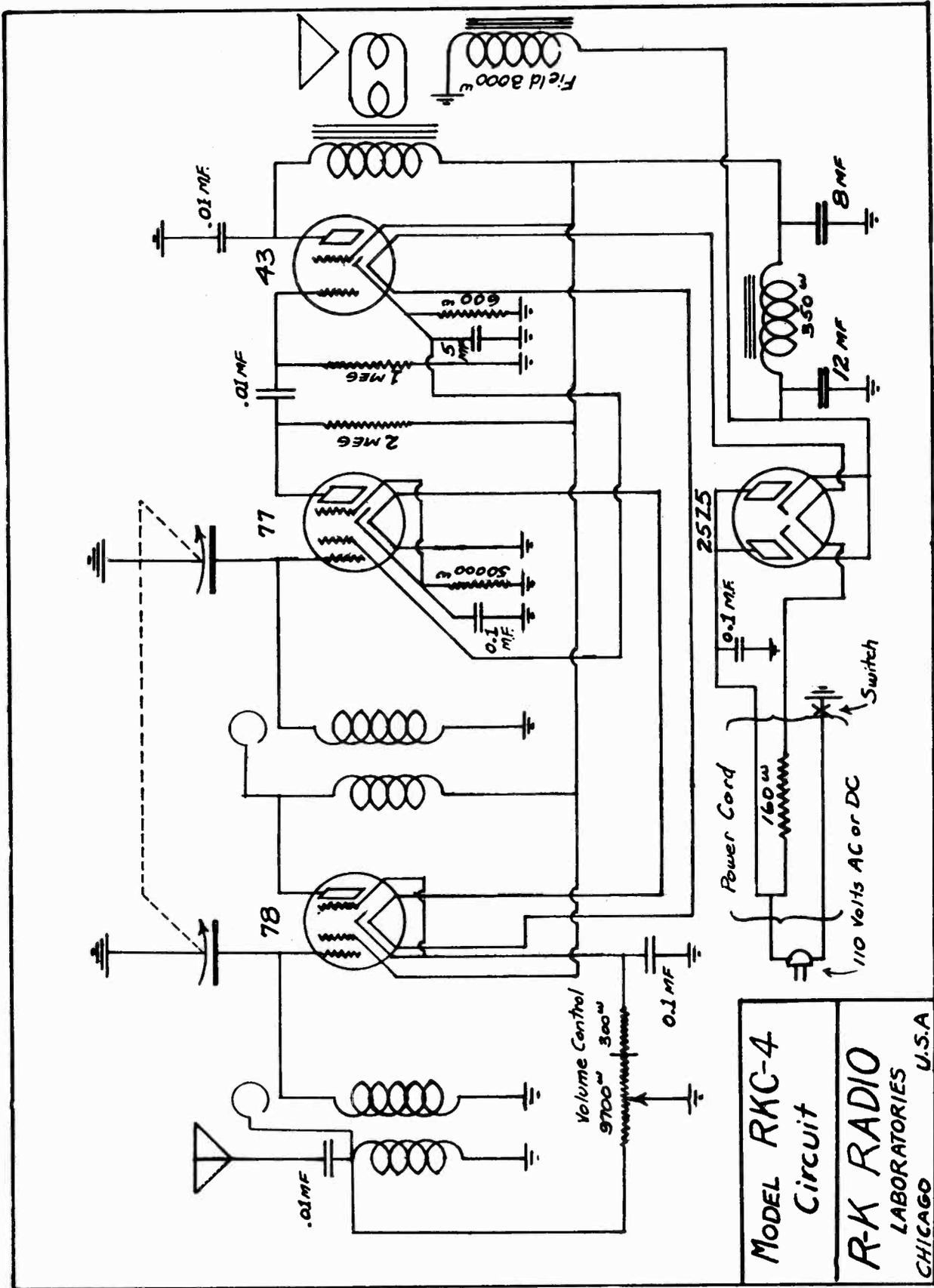
DRAWN BY \_\_\_\_\_ DATE \_\_\_\_\_ CHANGED BY \_\_\_\_\_

RADIO MFG. ENGINEERS, Inc.  
306 FIRST AVENUE  
PEORIA, ILLINOIS, U.S.A.

RME 69 CIRCUIT SCHEMATIC

RK RADIO LABORATORIES, INC.

MODEL RKC-4  
Schematic



MODEL RKC-4  
Circuit

R-K RADIO  
LABORATORIES  
CHICAGO U.S.A



**Atwater Kent 55**

The early type of Model 55—see *A-K page 3-21 in Rider's Volume III and page 159 in the Rider-Combination Manual*—can be distinguished from the late type—see *A-K page 3-23 in Rider's Volume III and page 161 in the Rider-Combination Manual*—by the volume control. The first type has a single wire-wound volume control of 6000 ohms, with the movable arm going to the screen grid of the 1st r-f. tube and the late type has a dual wire-wound and carbon volume control. The wire-wound unit of 6000 ohms has its movable arm connected to the screen grids of the r-f. tubes and the carbon unit of 10,000 ohms is connected in the antenna circuit.

*Early or First Type:*

This set has only one bleeder resistor, which is connected in series with the positive lead to the volume control. In early production of the first type (also known as the Early type) the bleeder is a 6000-ohm tubular resistor No. 15286A (colored purple over the entire resistor) or a 4000-ohm tubular resistor, Part No. 15286B (with a purple band about 3/4 inch wide). In later production of the first type Model 55, the bleeder is a 4000-ohm wire-wound resistor, Part No. 16295, which supersedes No. 15286A. No. 15286B is superseded by wire-wound resistor No. 16330.

This set has only one bias resistor and in all cases it is 160 ohms, which value is critical. In early productions of the first type Model 55, the r-f. bias resistor was wound on the same fibre base with the filament-shunt resistor, the part number of the combined unit being 15274. If either section of this unit is found to be defective, remove the resistor and use a No. 16988, 160-ohm resistor as the r-f. bias, and a No. 17077 flexible 10-ohm resistor as the filament shunt. In later production of the first type of Model 55, the r-f. bias resistor is a separate unit and, when defective, should be replaced with a No. 16988 resistor.

*Late or Second Type:*

This set has two bleeder resistors, which are connected in series with the wire-wound section of the volume control. Bleeder No. 1 (4000 ohms) is in the positive lead to the volume control and bleeder No. 2 (850 ohms) is in the negative lead to the volume control. Bleeder resistor No. 1 is Part No. 16295.

Bleeder resistor No. 2 was made in two different styles. At first it was wound on the same fibre base with the r-f. bias resistor, the part number of

the combined unit being 16868. If either section of this unit is defective, remove the resistor and install a No. 16988 as the r-f. bias and a No. 16340 as bleeder No. 2.

Later production of the second type Model 55 used a separate No. 16340 as the No. 2 bleeder.

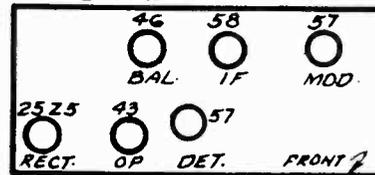
The early production of the second type Model 55 had a combined r-f. bias resistor and bleeder No. 2, the part number of the combined unit being 16868. If either section of the unit becomes defective, remove the unit and replace with a No. 16988 as bias resistor and a No. 16340 as bleeder No. 2.

Later production of the second type Model 55 used a separate No. 16988 as the r-f. resistor.

**Majestic 400**

The accompanying illustration shows the socket layout for the Majestic Model 400, the schematic diagram

MODEL 400



of which appears on page 3-42 of *Rider's Volume III and page 1234 of the Rider-Combination Manual*.

**Philco Model G-Code 122**

Run No. 1. A 25,000-ohm resistor, No. 71, Part No. 3656 has been added. One end is connected to the screen grid lead for the r-f., oscillator and i-f. tubes and the other end is grounded.

Run No. 2. Tuning condenser, No. 4, removed. Part No. 31-1274 added.

Run No. 7. Resistor No. 20 (1,500 ohms) replaced with Part No. 33-3048 (2,000 ohms).

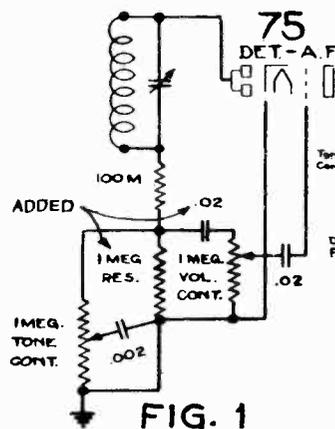


FIG. 1

**G. E. A-66 and A-86**

Please make a note in your *Index to Rider's Volume VI* that the General Electric receiver, Model A-66, uses the same chassis as Models A-64 and A-67. Also that Model A-86 uses the same chassis as Models A-82 and A-87.

**G.E. A-70, A-75**

On *G. E. page 6-19 of Rider's Volume VI* please change the value of the condenser, C-44, in the line between the switch S-6 and the resistor, R-4, in the cathode circuit of the 6A8, from 100 mmf. to 50 mmf.

In the list of replacement parts on *G.E. page 6-23*, delete "RC-235 Capacitor 100 mmf. (C-44)" and substitute for it "RC-210 Capacitor 50 mmf. (C-44) Mica Dielectric". In the stock number column you will find RC-091. Change the C-29 to C-28.

**G. E. A-63**

If a noisy Model A-63 is found, the trouble may be due to the field coil breaking down to ground. This trouble is not readily apparent, but it should be checked if you come across a very noisy receiver.

**Silvertone 1822, 1831, 1824, 1830**

A simple circuit change will correct noisy volume controls. Its effect is to remove the d-c. diode current from the volume control and in practically all cases, it will be found that the trouble will be corrected without changing the volume control. However, if the volume control is replaced, the circuit change should be made in addition to prevent noise difficulties.

Connect a 1-megohm resistor across the outer terminals of the tone control, as indicated in Fig. 1, the schematic, and Fig. 2, the wiring diagram.

Unsolder the two leads from the ungrounded outer terminal of the volume control and solder both these leads to one side of a 0.02-mf. condenser. Connect the other side of this condenser to the volume control terminal from which the two leads were removed.

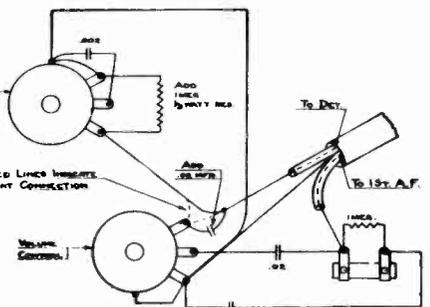


FIG. 2

By the addition of a 1-megohm resistor and a 0.02-mf. condenser, as shown in the diagrams above, noisy volume controls are quieted in these Silvertone sets.

**Pilot 93**

The Pilot model 93 is shown in Rider's Manual, page Pilot 5-5. Add to the schematic, the information that the i-f. peak is 115 kc. The tube placement is as follows, looking towards the rear of the chassis, with the tuning knob nearest to you: To the right of the 1st i-f. transformer, the 6A7. Between the two i-f. transformers, the 6D6. To the left of the 2nd i-f. unit, the 75 demodulator. Immediately to the left of the speaker transformer, the 25Z5 and on line, but to the rear of the volume control, is the 43 output tube. The i-f. transformers are accessible through the rear of the i-f. cans. The model 93 covers from 545 kc. to 1500 kc. and from 5750 kc. to 15,800 kc. The voltage table, which you should add to the page is as follows:

Tube	Plate	Cathode	Screen	Fil.
Osc.—1st Det	115	3	75	6.3
I-F Amp	115	2.5	75	6.3
2nd Det	50*	1.5	...	6.3
Output	95	15	105	25
Rect.	...	135	...	25

\*Voltage measured through plate resistor.

All plate and screen voltages measured to cathode. All cathode voltages measured to chassis. Speaker field voltage is 110 volts.

The alignment trimmers are placed in various parts of the chassis. Broadcast band alignment trimmers for 1st detector is on side of first section of gang, nearest the front of the set. The pre-selector unit broadcast band trimmer is on the side of the middle gang and the oscillator trimmer for broadcast band is on side of third section. These trimmers are aligned at 1400 kc. The slide wire adjustment is the image suppressor trimmer, aligned at 160 kc. for MINIMUM response. Broadcast band trimmers aligned for maximum response. Short wave trimmer, aligned at 12,000 kc., is located on rear of chassis on line with the phonograph jack. The 600 kc. oscillator trimmer is located on the front of the chassis. To adjust image suppressor, tune the receiver and the test oscillator, feeding into the antenna and ground of receiver, 1630 kilocycles. Slide the wire in or out of the pre-selector circuit until response is MINIMUM. Then repeat alignment of the broadcast band at 1400 kc. for maximum signal.

**Airline Model 62-153**

This Montgomery-Ward receiver is the same as Models 62-124 and 62-129, found on page 5-5 of Rider's Manual, with the exception of the following:

A voltage regulator is incorporated on the chassis, this being mounted in the back left corner by means of a two-prong plug and a receptacle on the chassis. When no regulator unit is employed, the receptacle is covered with a piece of fibre, which is eye-letted in place to protect the jumper wire.

When these sets are shipped with a 3-volt dry "A" battery the regulator unit is in place on the chassis and the initial voltage adjustment has already been made. If the set was originally not equipped with a regulator and it is desired to change from a 2-volt battery to one of 3 volts, the regulator may be inserted by removing the fibre cover, pulling out the jumper wire and inserting the unit by matching up the two-prong plug with the receptacle and pushing down the unit until it rests firmly in the socket. The voltage regulator is connected internally in series with the plus A line.

In some of these sets considerable variation in the type 19 tubes has been experienced with the result that the tone quality has been poor when this tube was operated at a bias of 6 volts. This bias has been changed, therefore, to 4.5 volts, which has been found to be satisfactory in all cases. To effect this change, connect the white battery lead with the "C-6" marker to the -4.5 volt tap on the "C" battery. This lead and the green and yellow lead, with the "-4.5" volt marker, will then be connected to the same -4.5 volt tap on the battery.

**Airline Models 62-149, 62-155, 62-160, 62-162**

These Montgomery-Ward receivers are the same as those described on page 5-3 of Rider's Manuals (Models 62-120, 62-122, 62-126 and 62-128) with the same exceptions as those noted elsewhere for Airline Model 62-153.

**Belmont 580**

Starting with serial number 11501 the following changes have been made in the receiver, whose schematic diagram is shown on Belmont page 2-1 of Rider's Specialized Auto Radio Manual, Volume II:

The cathode and the suppressor grid of the 6D6 tube are now connected to R-3, R-5 and C-5 and so to the cathode of the 6A7 tube, instead of to C-1 and R-2. These last mentioned parts are now out of the circuit.

The value of R-6 has been changed to 19,000 ohms from 12,000 ohms and R-11 from 250,000 ohms to 500,000 ohms.

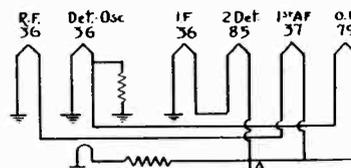
**Philco 802**

The alignment data for the Philco 802, the schematic of which will be found on Philco page 2-57 of Rider's Specialized Auto Radio Manual, Volume II, is the same as the alignment data for Model 800-Code 12?, which may be found on Philco page 2-56 of the same volume.

Run No. 2. Condenser, No. 52 (50 mmf.) removed and Part No. 30-1032 (250 mmf.) added. Filter choke, Part No. 32-1374 added, being connected in series between pilot lamp, No. 51, and resistor No. 53 and condenser No. 52.

**Philco 12-Code 122**

The original Model 12 was similar to the Model 8, shown on Philco page 3-5 and page 1599 in the Radiotron-Complete Manual, and was properly known as Model 12-Code 121. The later Model 12 is the Model 12-Code 122 and is similar to Model 9, except that it is for 12-volt operation. The tubes, circuit and base arrangement are the same, but the tube heater circuit is that shown in the accompanying illustration. Since 6.3-volt tubes are used,



Heater connections for Philco Model 112-Code 122

a series multiple connection must be used to operate them from a 12-volt battery.

The shunt resistor on the oscillator tube is Part No. 33-3002 and is 21 ohms. The speaker employed is the A-9 and is equipped with a 12-volt field. The Model EE dynamotor is used, supplying 40 milliamperes at 220 volts.

The Model 12 has been designed especially for bus and boat installations, where 12-volt battery systems are employed.

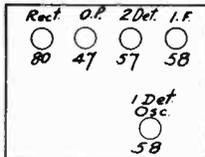
The alignment procedure for the Model 12-Code 122 will be found on Philco page 4-53 in Rider's Manual, Volume V.

**Philco-Hupmobile H**

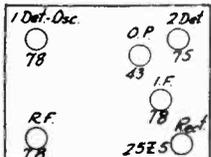
Run No. 6. The first i-f. transformer, No. 17, replaced with a new type having the same part number. It may be identified by the green paint mark on the fibre. For schematic, see Philco page 2-19, Volume II, Rider's Auto Radio Manual.

**EMERSON**

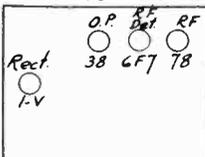
Model 26 (D-5)



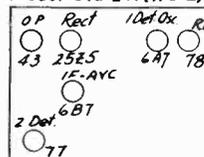
Model 35 (T-6)



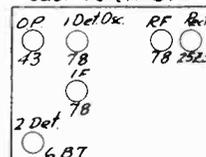
Model 409 (A-4)



Model 375-LW (W6-L)

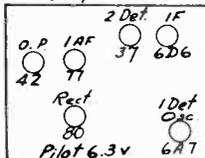


Model 40 (W-6)

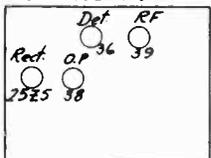


**FADA**

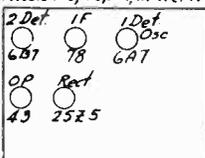
Model 15 (152) (NE)



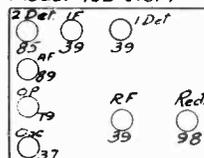
Model 103 (RL)



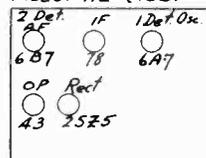
Models 105, 106, 107, 111 (RN)



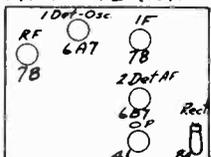
Model 102 (RP)



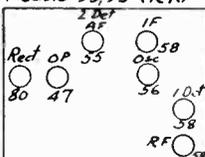
Model 112 (RS)



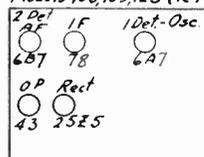
Model 104-B (RV)



Models 93, 95 (RX)



Models 108, 109, 125 (RY)

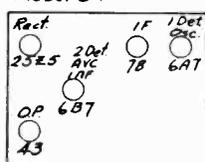


**NOTE**

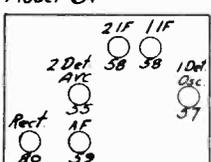
Bottom of sketches indicates front of chassis. All top views

**FRANKLIN**

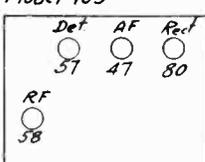
Model 54



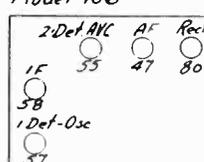
Model 64



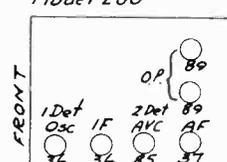
Model 105



Model 106



Model 200



**Emerson, Fada and Franklin Layouts**

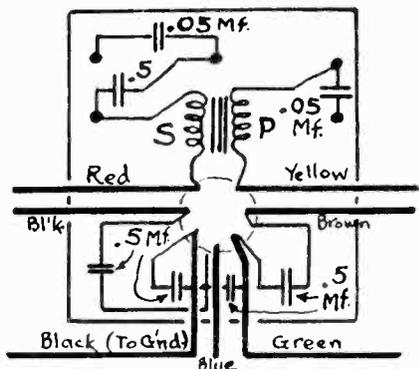
Below will be found the pages in Rider's Manuals on which the schematic diagrams for the socket layouts given herewith will be found. It is suggested that these layouts be cut out and pasted on the respective pages.

Emerson Radio & Phonograph Co.		Fada Radio & Electric Corp.	
Model	Page	Model	Page
26 (D-5)	4-1	375 LW (W6-L)	4-7
35 (T-6)	4-8	409 (A-4)	4-8
		40 (W-6)	4-20

Fada Radio & Electric Corp.		Franklin Radio Corp.	
Model	Page	Model	Page
RV	4-7	106	4-14
RX	4-1	200	4-15
RY	4-10		
RL	3-25		
	4-11		

**Radiola 66**

The schematic diagram of the a-f. transformer and bypass condensers contains incorrect values of capacities. Kindly make the necessary changes from



Corrected values of condensers in Radiola Model 66 a-f. amplifier

the accompanying diagram in the condensers' values in the corresponding diagram in your Manuals, where it will be found on the following pages: 1-42, \*499 and 1883 in the Radiotron-Complete.

**Missing I-F. Peaks**

Please add to page Franklin 3-1, the reference that the model 100 and the model 102 employ an i-f. peak of 175 kc.

On Galvin page 3-7 in Rider's Manual, add the data that the i-f. peak is 175 kc. This is the model 7T-47-A. Add the same data onto page Galvin 3-15, covering the model 61. Also add the same information onto Galvin page 3-13 and 3-14 in Rider's Manual, Volume III. This applies to the model 88.

**Airline Model 62-165**

This Montgomery-Ward receiver is the same as Models 62-152 and 62-137, described on page 5-8 of Rider's Manuals, with the following exception:

Part No. 98006, a three-section wire-wound resistor, has been replaced with Part No. 98006A, a resistor of the same type. The new resistor has the same resistance values, the only change being in the 6,000-ohm section (R-14), where a heavier and different wire is now used. This change was made because of breakage being encountered

in this section in some of the early receivers. It is suggested that this section of the resistor be checked if this chassis is serviced. In the case of complete receivers in stock, it is NOT necessary to change this unit.

If in servicing, this section is found to be open, a complete new three-section unit or a separate 6,000-ohm, 1.5 watt, carbon resistor may be used for replacement. Should a separate unit be used, be sure NOT to use the end connection on the old three-section unit when making this repair, as the old 6,000-ohm section may be open intermittently. Unsolder all the wires which are connected to the end of the candohm resistor and resolder them to one end of the carbon replacement resistor.

**Pilot 114 and 115**

The intermediate frequency used in these receivers is 456 kc.

I-F Peaks

We suggest that you make note of the i-f peaks given in the accompanying table upon the correct pages in the Rider Manuals. These peak frequencies were not available when the schematic wiring diagrams were first published and we trust that you were not greatly inconvenienced.

Model	I-F Peak	Radiotron Cunningham Complete	Other Rider Manual Page
<b>Audiola Radio Corp.</b>			
23-S-8	177.5	342	3-2
23-S-8Q	177.5	343	3-8
23-S-10	177.5	344	3-4
<b>Crosley Radio Corp.</b>			
121-A	175	724	2-8
121-B	175	724	2-8
167	456		4-9
164	181.5		4-11
176	456		4-11
<b>DeWald Radio (Pierce-Airo)</b>			
50	175	787	4-2
51	175	787	3-12
52	175		4-3
55	456	789	3-7
55-R	456		4-4
56	456		4-5
80	456		4-14
100	456		4-15
BAG	175	791	3-9
KAF	175	793	3-11
<b>Halsion Radio</b>			
20-B	456		4-1
NS-50	456		4-3
Roadmaster	456		4-5
<b>Freed Telev. &amp; Radio</b>			
FE-98	175	102K	3-10
354	456		4-3
<b>Howard Radio</b>			
EX	140	1324	3-2
35-A (AVO)	175	1335	3-11

Sparton 80, 83, 84, 85-X, 86-X

In some of the early receivers of this model, the resistor R-13, designated as 5,000 ohms, was 3,000 ohms. If this resistor burns out, check the condenser C-8, located in the plate-voltage supply lead to the r-f. tube. The early production used a 200-volt, .2-mfd. unit for C-8. If replacement is necessary, replace with a 600-volt unit. This receiver is shown on page Sparton 5-15 in Rider's Volume V.

Sparton 16-AW, 26-AW, 60, 28

The intermediate frequency of the converter used in these receivers is 900 kc. This data is omitted from the sche-

matic shown on pages 2-10, 2-11 and 2-16 in the Sparton section in Rider's Volume II. The same frequency applies to the model 60 converter shown on page 2259 of the Rider-Radiotron Combination, page 2-39 in the revised Rider II, and on page 568-X-8 of the early Rider II. The model 28 employs 172.5 kc.

Silvertone 1806, 1823, 1829

Failure of the tuning meter to change its reading as a station is tuned in, together with failure of the AVC may be due to the following cause:

The lock washer under the screws that mount the No. 3 and No. 4 band short-wave coils to their trimmers may short to the stator plate of these trimmers. Although the likelihood is less, it is also possible for the lock washer to short to the movable plate of the trimmer, in which case the receiver will not operate.

If the tuning meter fails to function properly in these models (except 1806 which has no meter) or if the AVC fails to operate, examine the mounting of these coils to their condensers under the chassis. The trouble can be eliminated by loosening the screw, pushing the lock washer away from the condenser and then tightening the screw while holding the lock washer in this position. Service data covering these receivers appears on pages 5-35 and 5-36 in the Sears-Roebuck section in Rider's Volume V.

Philco Model 38, Code 123 Changes

In Run No. 7 a 0.1 mf. condenser (part No. 30-4122) was connected between the plus terminal of the 30 tube (1st A-F.) socket and ground. In Run No. 8 and thereafter, this becomes a 0.25 mf. tubular condenser (part No. 30-4146). This condenser acts as a by-pass and prevents oscillation. The schematic diagram of Model 38 will be found on page 4-22 of Rider's Manual.

Effective with run No. 9 a change in the volume control will be made. The

value of the new volume control, which is Part No. 33-5094, is the same as before, i.e., 20,000 ohms; however, the lead from the antenna series condenser (40) will be connected to the arm of the control instead of the upper end, which now will be open. Also a by-pass condenser, Part No. 6287K (0.15 mf. bakelite block) will be added from the lower end of the volume control to ground. These changes produce quieter operation of the set.

Colonial Model 657

In later production runs, the pilot light circuit has been changed. See schematic diagram on Colonial page 5-40, Rider's Volume V. In place of the two 115-volt pilot lamps, a 50-ohm center-tapped resistor has been connected in the heater circuit between the 25Z5 and the 6A7. A 6.3-volt lamp (part No. R-2288) is connected across each half of this resistor. The sockets for these lamps with brackets are parts numbers R-10373-A and R-10363-F and are mounted on the variable condenser and volume control brackets respectively.

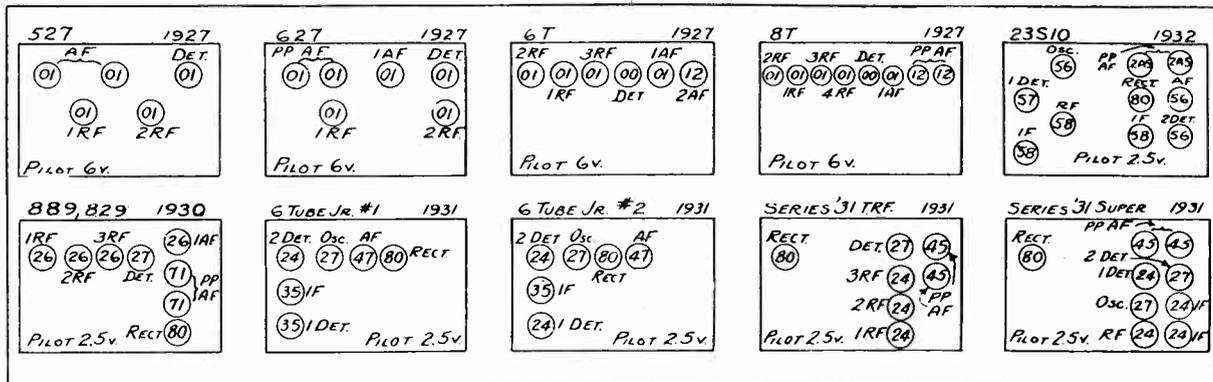
Colonial Models 651, 655, 657

In the sketches supplied by the manufacturer showing locations of the trimmers which will be found reproduced on Colonial pages 5-27, 5-35 and 5-40 for models 651, 655 and 657 respectively, the coil marked "Short Wave Antenna Coil" should in each case be marked "Broadcast Antenna Coil."

Audiola Socket Layouts

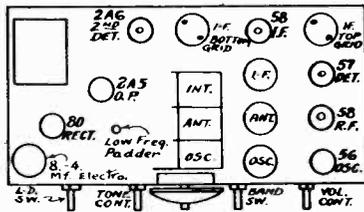
Below will be found a list of the pages in Rider's Manuals on which the schematic diagrams corresponding to the socket layouts in the accompanying illustration will be found.

Model	Revised Page	Early Page	Radiotron Complete Page
527	1-1	*115	325
627	1-1	*115	325
6-T	1-2	*116	326
8-T	1-2	*116	326
23-S-10	3-4		344
889-829	1-10	*119	328
6 Tube Jr. No. 1	2-6	120-A-2	334
6 Tube Jr. No. 2	2-6	120-A-2	334
Series '31 T.R.F.	1-5	*120	329
Series '31 Super	1-6	*120-A	330



**Silvertone 7124, 7132**

The voltage data for the above Sears-Roebuck models will be found below. The schematic and other data will be



Chassis layout for Models 7124, 7132.

found on Sears page 5-65 in Rider's Volume V.

Type	Function	Cath-ode	Cont. Grid	Suppr. Grid	Screen Grid	Plate
58	R-F.	3.2	0	3.2	90	245
57	Det.	4.3	0	4.3	90	245
56	Osc.	4.1	0	—	—	155
58	I-F.	3.2	0	3.2	90	245
2A6	2nd Det.	1.1	0	—	—	88
2A5	O.P.	16.	0	—	250	235

Line Voltage—117 volts, a.c.

Herewith is also given the tube socket layout for this chassis.

**Midwest 16-34**

Procedure for rebalancing the Midwest 16 tube, 1934 model is as follows: Peak the 1st, 2nd, and 3rd i-f. transformers at 450 kc. to maximum a-f. output. Do not measure the AVC voltage as is usually done. Trim the small AVC amplifier to maximum a-f. output.

Turn wave change switch to M position and dial to 12 mc. Adjust trimmers in oscillator and mixer section. (See Midwest page 6-11 in Rider's Volume VI for locations of trimmers.) Set switch to L position and adjust trimmers in r-f., mixer and oscillator sections at 4.5 mc. Turn dial to 1.6 mc. and adjust padder in oscillator section. Turn switch to A position and adjust trimmers in r-f., mixer, and oscillator sections at 1500 kc. Adjust A padder at 530 kc. Turn switch to E position and adjust trimmers in the r-f. oscillator and mixer sections to 370 kc. Adjust E oscillator padder to 160 kc. On H band no adjustment can be made, as this is done at the factory by spacing the turns.

The schematic diagram of this receiver will be found on page 6-7, 6-8 of Rider's Volume VI.

**General Motors 251**

The condenser, C-9, in the antenna circuit of the schematic diagram shown in Rider's Volume II on page 2-9 in the revised edition and page 346-G in the early edition, and in the Rider-Combination page 1099, should be marked C-7. This condenser has a value of 0.01 mf. Please make this change on the diagram in your Manual.

**Wilcox-Gay 4G7, 4H11, 4J6, 4JA6, 4JB6, 4JC6 Alignment**

The following alignment instructions apply to the above models *in toto*, with the exception of Models 4JA6 and 4JB6. When aligning either of these two models, disregard that part of the instructions pertaining to the No. 5 Long-Wave Band. Schematics and other data will be found on the following pages in Rider's Volume VI for the respective models: 4G7, 6-5; 4H11, 6-6; 4JA6 and 4JB6, 6-3; 4J6 and 4JC6, 6-4.

**I-F. Amplifier:**

Set signal generator to 456 kc. and connect output to grid of first detector. Use minimum signal input consistent with proper indication. The first i-f. transformer is the one furthest to the left at the rear of the set. These two circuits should be tuned for maximum amplitude. After ganging the first transformer, the second one should be ganged, and then the third, which is the transformer in back of the variable condenser.

**Ganging Oscillator and Preselector Circuits Broadcast Band:**

Connect the output of the signal generator to the antenna and ground posts of the set through a dummy antenna. Set the signal generator at 1400 kc., the wave change switch to its fourth position and the tuning dial set so that No. 4 band reads 1400 kc. At this point the trimmer on the first section of the variable condenser should be adjusted. Then the two preselector trimmers on the second and rear sections of the variable condenser should be trimmed for maximum output. Change the signal generator and dial of the set to read 600 kc. and vary the reciprocal trimmer for the broadcast band, which is the left upper of the four trimmers on the front of the chassis, until the 600-kc. signal is indicated on the output meter. Tune the signal generator and the receiver again to 1400 kc. and retune the trimmer on the first section of the condenser for maximum amplitude at 1400 kc. Check the sensitivity at 1000 kc.

**Police Band No. 3**

Set wave band switch to No. 3 position, signal generator to 4 mc. Adjust upper trimming adjustment to the right of the wave change switch. Then adjust signal generator and receiver to 1.5 mc. and the left lower trimmer to the left of the wave change switch should be adjusted for maximum output. Reset to 4 mc. and recheck.

**No. 2 Band:**

Set wave change switch to the No. 2 position. Set signal generator to 10 mc. and the dial in the vicinity of this frequency. The center trimmer to the right of the wave change switch should be adjusted for maximum amplitude. Tune generator and set to 4 mc. and adjust the left lower trimmer on the left side of the wave change switch for maximum output.

**No. 1 Band:**

Set wave change switch to No. 1 position, signal generator to 20 mc. Adjust dial to vicinity of 20 mc. for maximum output and then vary the lower adjustment to the right of the wave change switch on the front of the chassis for maximum amplitude.

**No. 5 Long Wave Band:**

Adjust signal generator and receiver to 350 kc. and the wave change switch to No. 5 position. Adjust the left-hand trimmer of the three occurring immediately to the left of

the variable condenser on the chassis top, until the signal is maximum. Afterwards the two adjustments immediately to the right of this adjustment should be trimmed for maximum amplitude. The generator and the dial should be set to 150 kc. and the adjustment furthest to the left above and to the left of the wave change switch should be adjusted for peak signal. Check again at 350 kc.

**Tuning the Trap:**

Set signal generator to 450 kc. and its output to antenna and ground. Its output should be a fairly high level. The trimming adjustment on the trap, which is the one immediately to the right of the first detector, should be trimmed for *minimum* response.

**Pockard Bell 45 M**

To align this receiver proceed as follows: Have the variable condenser plates fully meshed. Set signal generator to 460 kc., the i-f. peak. Connect the output of the generator to the control grid of the 6A8 tube (top cap). Adjust trimmers on i-f. transformers for maximum gain. Tune the generator to 1700 kc. and the receiver to approximately the same frequency and adjust the trimmers of the oscillator and modulator condensers for maximum output. Be sure that the wave change switch is turned to the right. In case the receiver will not track, tune the generator to 1400 kc. and readjust for maximum output. The adjustments for 1000 and 600 kc. are made by bending the outside rotor plates of the gang condenser. Then turn the wave-change switch to the left and tune the signal generator to 18 mc. Adjust the trimmer condensers of the short-wave oscillator and modulator coils for maximum output. The adjustment at 6 mc. will have to be made by spacing turns of these two coils, but unless the receiver has been tampered with, it is unlikely that this adjustment will have to be made.

The schematic diagram for this receiver will be found on page 6-4 of Rider's Volume VI.

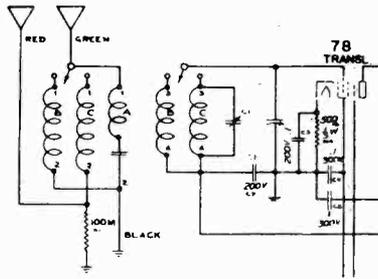
**Packard Bell 35**

The alignment of this receiver is as follows: Set signal generator to 460 kc., the i-f. peak, and the volume control full on. Set variable condenser with the plates fully meshed. Adjust the i-f. trimmers, directly beneath the variable condenser, for maximum output. Then tune the signal generator to 1700 kc. and adjust the trimmers on the variable condenser for maximum output. The adjustments at 1000 kc. and 600 kc. will have to be made by bending the outside rotor plates of the variable condensers for maximum signal.

The schematic will be found on page 6-4 of Rider's Volume VI.

**Colonial 603**

Changes have been made in the antenna circuit of this receiver, the schematic of which will be found on



Circuit change in Colonial 603

Colonial page 5-19 of *Rider's Volume V*. The new circuit is shown in the accompanying illustration. The rest of the wiring remains unchanged.

**Colonial 656**

In the schematic diagram of this circuit, appearing on page 5-37 of *Rider's Volume V*, the third section of the gang condenser was omitted in the antenna circuit, only the trimmer being shown. Please draw in on the above-mentioned schematic a variable condenser shunted across the trimmer, appearing in the extreme upper left-hand corner of the diagram.

The fixed condenser shunted across the 3000-ohm resistor in the cathode circuit of the 75 tube has a value of 0.1 mf. Please mark this in opposite this condenser.

The value of the resistor connected between the 500,000-ohm receiver in the grid circuit of the 42 tube and the junction of the speaker field and the 350-ohm resistor, has been changed from 4000 to 5000 ohms.

**RCA D7-7**

In some sets bearing the above model number, the value of the resistor, R-5, is 12,000 ohms. This ordinarily is 33,000 ohms. The resistor is connected between the screen grid of the 6K7 i-f. amplifier, and the ungrounded side of the 10-mf. condenser, C-22.

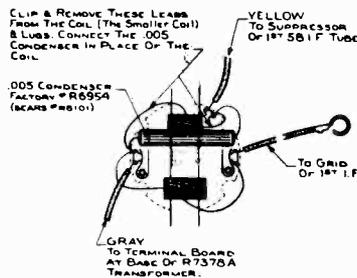
The usual value of the resistor, R-19, which is connected between the grounded heater terminal of the 6A8 tube and the same tube's oscillator grid, is 100,000 ohms. In some sets the value of R-19 is 56,000 ohms.

Sometimes heterodyning may be encountered on these sets due to excessive antenna capacitance. This may be corrected by reducing the size of the antenna or by inserting a 150-mmf. condenser in series with the antenna lead. This may be done in the receiver by

removing the brown lead which goes from the antenna terminal to the wave trap inductance, L-1, and inserting the condenser between these two points. In some instances, interference in the form of "beats" may be remedied by tuning the antenna wave trap to that station. The wave trap will tune up to 700 kc.

**Silvertone 1650**

The selectivity of this set can be improved by disconnecting the two leads to the small choke coil in the 1st i-f. circuit and inserting in its stead a 0.005-mf. fixed condenser. (This choke coil is in parallel with the 20,000-ohm re-



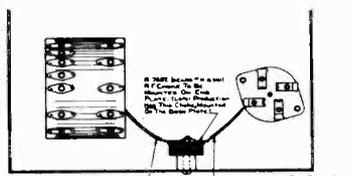
Substituting a condenser for the choke in the i-f. amplifier improves selectivity of Model 1650.

sistor in the input circuit of the 58 i-f. tube. See *Rider's Volume VI, Sears page 6-7.*) After this substitution, the i-f. stages must be re-aligned with an oscillator. This re-balancing is very important, as the effect of the change will be lost if it is not done. See accompanying sketch for locations of coil to be removed and condenser to be substituted.

**Silvertone 1640**

Reception can be often improved by the insertion of a choke (Part No. R-8301) in the red plate lead of the 283 rectifier. This will reduce the hiss or feedback. In some instances this tube may cause interference within the set, as well as other sets in the vicinity. If the use of one choke does not eliminate the trouble, a similar choke can be inserted

ILLUSTRATION FOR INSTALLING R.F. CHOKE IN MODEL 1640 TO PREVENT RECTIFIER INTERFERENCE (VIEWED FROM BOTTOM)



How the choke is inserted in the Sears-Roebuck 1640 for reducing hiss.

in the other plate lead of the 283. See accompanying illustration for installation of this choke. For schematic dia-

gram, see *Rider's Volume III, Sears page 3-12 and page 2098 in Rider-Combination Manual.*

The undesirable effect of time lag (weak programs interrupted during bursts of static) can be greatly reduced by replacing the 0.1-mf. condenser, connected between the plate and cathode leads in the type 57 AVC tube, with one having a value of 0.01 mf. Making this change minimizes the time lag difficulty when tuning in distant stations in some localities without affecting the AVC action. The reduction of capacity lessens the charging time of the condenser and therefore the AVC recovery is practically instantaneous.

**Silvertone 1855**

The schematic diagram of this Sears-Roebuck receiver, appearing on page 5-45 of *Rider's Volume V*, should be changed according to the manufacturer.

There should be no choke coil across the upper 0.5-mf. condenser in the vibrator circuit.

The on-off switch should be in the other 32-volt line—not in the same line with the 2.5-amp. fuse.

The tap in the primary winding of the power transformer should go to the 32-volt line to the right of the on-off switch. In other words, the 0.5-mf. condenser should be across the 32-volt main.

The secondary of the power transformer should be tapped and connected to the junction of the two 0.3-mf. condensers that are shunted by the Global resistor.

**Silvertone 1822, 1831**

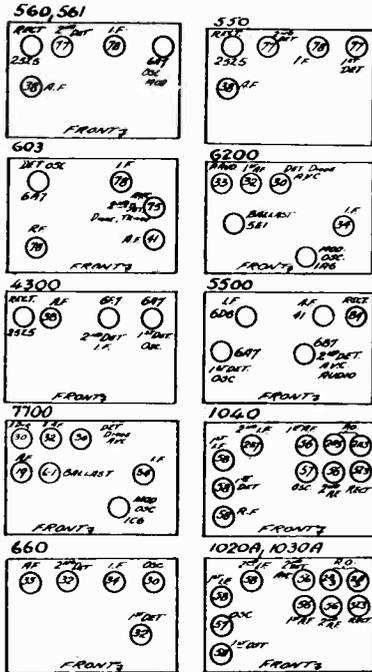
In some receivers carrying these model numbers a felt ring between the small speaker and the baffle was omitted, with a rattling of the speaker resulting. This is due to the fact that when the mounting screws of the speaker draw the speaker tightly against the baffle, the speaker frame may become slightly bent, throwing the cone off center. The felt ring acts as a cushion mounting to prevent this bending. Do not tighten the mounting screws any more than is necessary. If this felt ring is missing, one should be inserted, its part number being R9959.

**Fada 25, 25-Z**

The volume control used in this receiver is rated at 3,000 ohms. The schematic wiring diagram appears in the *Rider Combination* on page 915 and on page 1-15 in the *Fada* section and also on page \*79 in the early editions of *Rider's Volume I*.

**Sentinel Socket Layouts**

Below will be found socket layouts for several Sentinel receivers. It is suggested that they be cut out and pasted



on the respective pages of the *Rider's Manuals* indicated. The schematic diagrams of the sets appears on the following pages: 560, page 3-3 and 2117 in the *Rider-Combination*; 550, page 5-9; 603, page 5-17; 6200, page 5-34; 4300, page 5-24; 5500, page 5-25; 7700, page 5-35; 1040, page 5-21; 660 Battery, page 5-19; and 1020-A, page 4-15.

**Erla Model 6200**

The 0.02-mf. condenser, Part No. 9714, used to bypass the grid return of the first i-f. transformer was a 0.01-mf. condenser in early production. To eliminate any tendency of the i-f. amplifier to oscillate, the 0.01-mf. condenser has been changed to 0.02 mf. in later production. If receivers are encountered in which i-f. oscillation occurs, replace the 0.01-mf. condenser, if there is one, with one having a value of 0.02 mf.

The 10,000-ohm resistor, Part No. 6786, and the 0.005-mf. condenser, Part No. 1275, have been added to the plate circuit of the 33 output tube, where they are in series with the plate and ground. This addition improves the tone quality and decreases background noise. Excessive background noise and high-pitched tone in these sets can be rectified by adding these two components as indicated. Early production sets did not have this resistor and condenser.

The 4-mf. wet electrolytic condenser, Part No. 1291, connected between ground and the connection between

the primary of the first i-f. transformer and the 10,000-ohm resistor in the No. 2 grid circuit of the 1A6 tube, has been added in late production sets to eliminate motorboating when the set is operated with low "B" battery voltages. If sets are encountered that motorboat when the "B" battery is low, install a 4-mf. condenser, as indicated.

The complete servicing data on this receiver will be published in Volume VI of *Rider's Manual*.

**Erla Models 7700, 7732, 7741**

In early production of these sets the value of the condenser in the grid return of the first i-f. transformer was .01 mf., Part No. 7860. To eliminate tendency of the i-f. amplifier to oscillate, this condenser has been changed to .02 mf., Part No. 9714. If any receivers are found having i-f. oscillations, change the .01 mf. condenser to one having a value of .02 mf.

To eliminate self modulation of the 1C6 tube the 50,000-ohm resistor, Part No. 6879, has been changed to 35,000-ohm resistor, Part No. 1618. Whenever self modulation occurs, try another 1C6 tube or replace the 50,000-ohm resistor with one having a value of 35,000 ohms.

**Sentinel 108**

The voltage and alignment data for Model 108 will be found herewith. The schematic diagram for this receiver appears on *Sentinel* page 1-3 of the revised edition of *Rider's Volume I*; page \*624-A of the early edition and on page 2107 of the *Rider-Combination Manual*.

Type	Function	Fila-ment	Plate	Grid	Screen	Plate MA
224	R-F.	2.4	250	4	75	2.15
224	1st Det.	2.4	250	6.0	80	.25
224	I-F.	2.4	250	4	75	2.25
227	Osc.	2.4	60	—	—	4.75
224	2nd Det.	2.4	100*	6	40*	.25
245	Output	2.4	250	50**	—	30.
280	Rect.	4.85	—	—	—	27 per plate

\* Comparative readings; not true voltage applied.  
\*\* To take 245 bias reading, read between the electrolytic cans.

**Alignment Data:**

Set the signal generator to 175 kc. and connect the output to the grid of the 224, 1st detector, from which the grid cap has been removed. Trimmers of the i-f. transformers are accessible through the small holes in the top of the cans. Align the grid trimmer of the first i-f. coil, then the second i-f. coil.

Replace the grid cap on the 1st detector and connect the signal generator's output to the antenna and ground posts of the set, having tuned it to 1435 kc.

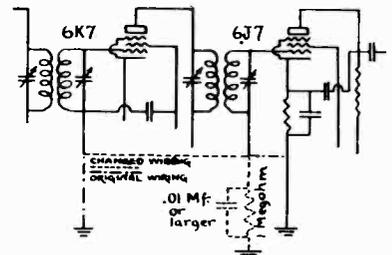
Set the receiver's dial to this frequency also. Track the variable condensers by adjusting the trimmers in the following order: Oscillator, antenna and r-f. (The sections of the condenser are in this order, starting at the front of the set.) Then check the condensers at 1295 kc., by bending the end plate of the rotors. Check also at 880, 650, and 550 kc.

**Erla Model 9100**

Some of the early Model 9100 receivers had a tendency to motorboat on the broadcast band when the tone control was turned to the bass position. This has been rectified in later production by removing the 0.002-mf. condenser, Part No. 6590, and by passing the plate of each 30 a-f. tube with a 0.004-mf. condenser to the chassis base. Make this change if motorboating should be encountered in any Model 9100 receiver.

**International 53, 553**

The first production of these models, in which a 6J7 tube is used as the second detector, does not incorporate AVC. When operated in the vicinity of powerful broadcast stations, a tendency toward overloading may be found on strong signals. It is evidenced by blocking out of the signals as the volume control is advanced. This condition can be corrected by making the simple change shown in the accompanying illustration.

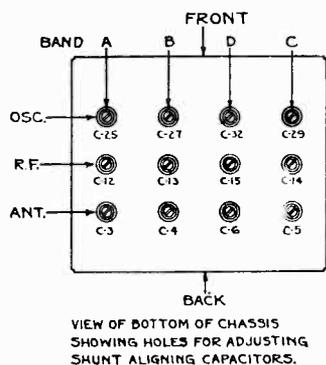


Partial schematic diagram of early Models 53, 553 showing changes to prevent blocking.

Originally the grid returns of the 6K7 and the 6J7 tubes go directly to ground. See schematic diagram in *Rider's Volume VI*, page 6-8. These should be removed from ground, tied together and returned to ground through a 1-megohm resistor shunted by a condenser of 0.01-mf. or larger. In making this change, be sure that the cathode of the 6J7 tube is connected as shown in the illustration and not left connected to the low end of the second i-f. transformer grid winding.

**Stromberg-Carlson 68, 68-X**

Since Volume V of Rider's Manual has gone to press, we have learned of the production of what is known as the Stromberg-Carlson 68-X. Basically, this receiver is the same as the model 68, which is shown in Rider's Volume V, pages 5-5 to 5-10, inclusive. However, the X models, which can be identified by an "X" following the serial number, incorporate certain changes. First, the secondary winding of the oscillator band A transformer contains a .00045-mfd. fixed condenser in shunt with the series trimmer, or in shunt with C-26.



Second, a 10,000-ohm fixed resistor is inserted into the common lead joining the band B and band C secondary windings in the r-f. tube grid circuit. Third, a fixed condenser has been added between the common lead connecting the band A and band B secondaries of the r-f. input transformer, and ground. Fourth, the fixed condenser C-24, located between the common lead joining all of the oscillator primary windings and ground has been changed from .1 mfd. to .05 mfd. The location of the twelve shunt aligning condensers is shown in the accompanying illustration. The numbers correspond to the designating numbers shown upon the schematic and selector chassis wiring.

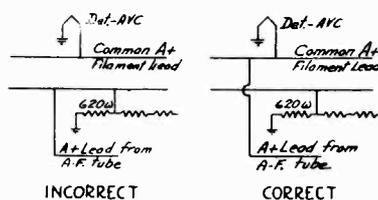
**Sears-Roebuck 1857**

A unique form of volume control is used in this receiver and we feel that it deserves mention. The schematic is shown upon pages 5-47 in the various issues of Rider's Manual Volume V. The output i-f. transformer is equipped with variable coupling between the primary and secondary windings. The variation in signal transfer between these two windings, as a consequence of the change in coupling, is the volume control. Incidentally, the i-f. coupling unit, employed between the i-f. amplifier tube and the demodulator or second detector, is resistance-capacity coupling. Only the input and output i-f. coupling units are of the transformer variety.

Certain instructions pertaining to the increase of "high" audio response has been furnished by the manufacturer. Connect a 15-mmfd. condenser between the plate terminal of the input i-f. transformer primary and the grid terminal of the input i-f. transformer secondary. This condenser can be mounted inside the i-f. transformer shield can, atop of the Isolantite base. It will be necessary to re-peak the i-f. transformer at 175 kc.

**Sentinel Model 7700, 7732, 7735, 7741**

An error is acknowledged in the schematic of this receiver as shown upon page Sentinel 5-35 in Rider's Manual. The A plus lead is connected to the grid circuit instead of to the common filament lead. The diagram as shown and as correct appears below.



Correction in filament circuit of Sentinel 7700, 7732, etc.

**Philco Model 16 (Codes 126, 127)**

Starting January 10th the Shadowmeter shunt resistor, number 78, was changed from part No. 5310, which has a value of 5000 ohms, to part No. 7775, which has a value of 2500 ohms. This prevents the shadow from becoming too wide. Please note that this change will *not* be made in the model of 16 Code 125 receivers. However, it will be made in Model 500, Code 122 and Model 501, Code 122.

**Philco Model 34**

Starting with run No. 4, an r-f. choke, part No. 32-1514 is added, connected in the 135-volt B battery lead, between the points where diagram parts No. 37 and 45 join it. This prevents oscillation in the i-f. stage. For schematic see Rider's Volume V, Philco page 5-21.

**Philco Model 144**

Starting with run No. 3, the following change was made to improve stability:

The 0.25-mf. section of diagram part No. 26 bypass, which has been used as cathode bypass on the 6A7 tube, is now used as cathode bypass on the first 78 i-f. tube. A 0.25-mf. tubular condenser part (part No. 30-4146) is added, as bypass for the 6A7 cathode.

The cathode bypass on the 78 first i-f. tube previous to this change was a 0.5-mf. tubular condenser (in Code 125); in code 121 it was a section of the diagram part No. 26 bypass block, as shown in the schematic on page Philco 5-41 in Rider's Volume V.

These changes also apply to Model 506, code 122, Radio Phonograph.

A change was also made in the shadowmeter circuit to improve its operation. Referring to the schematic, the upper end of the shadowmeter is no longer connected to the diagram part No. 65 resistor, but only to diagram part No. 33 second i-f. transformer primary and also to the primary of diagram part No. 28 first i-f. transformer. The lead from diagram part No. 52 now goes to lower end of shadowmeter only. A connection must then be made from the lower end of resistor No. 65 to the junction of diagram parts No. 52, 46 resistor and 42 condenser, to complete the circuit.

The shadowmeter used will now be part No. 45-2028 and an 8000-ohm resistor (part No. 33-1114) will be connected across it to prevent too wide a shadow.

**Detrola "Roadmaster"**

The i-f. peak of this receiver, shown on page Detrola 5-2 in Rider's Manual, Volume V, is 456 kc. Please make this addition to your manuals.

**Sparton Model 35**

The i-f. peak of this receiver is 172.5 kc. Please make a note of this on the schematic diagram, which will be found on page 3-5 of Rider's Volume III, and on page 2245 of the Radiotron-Complete edition.

**Sparton Model 36**

To protect the life of the vibrator in the Sparton model 36 auto radio receiver, add a 0.01 mfd condenser, rated at 1,600 volts, across the secondary winding of the power transformer in the eliminator unit.

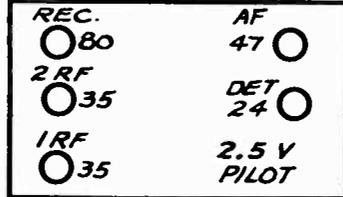
**Oscillation in Sparton 65, 66**

In case the metal braid shielding on the control-grid lead to either of the type 78 tubes becomes pushed down on the leads, these receivers may oscillate or otherwise operate improperly. This shielding may be pushed down accidentally when removing or installing the tube packing or changing tubes. Therefore, always pull these shields up to their full length in case of oscillation in these models. Sparton models 65 and 66 are shown upon Sparton page 5-7, 5-8, and 5-9 in Rider's Volume V.

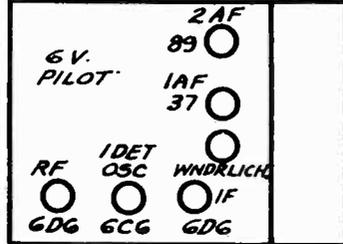
**Audiola Socket Layouts**

The accompanying illustrations show the socket layouts of six Audiola chassis, the schematics for which will

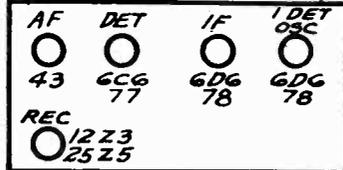
**23T5, 23T5-SW (1932)**



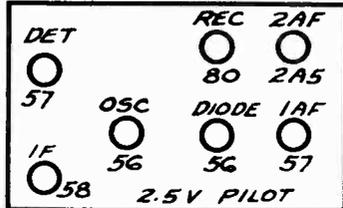
**33A6 (AUTO) (1933)**



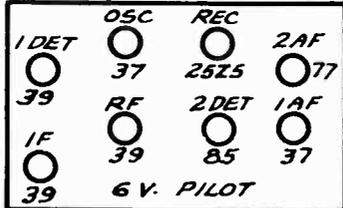
**33S5 (1933)**



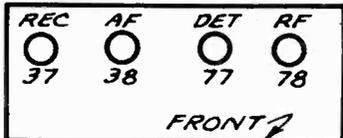
**33S7**



**33S8 (32V.)**



**33T4**



Audiola socket layouts.

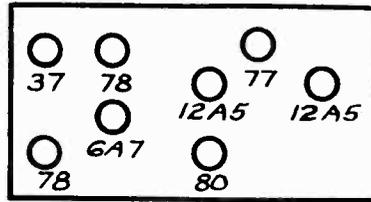
be found on the pages in Rider's Manuals indicated opposite the model numbers below:

Model 23T5, 23T5-SW on Audiola page 3-6 in *Rider's Volume III* and page 346 in the *Rider-Combination Manual*; 33A6, page 4-5; 33S5 and 33S7, page 4-7; 33S8, page 4-4; and 33T4, page 4-7.

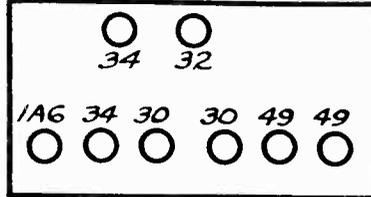
**Howard Socket Layouts**

Herewith will be found five socket layouts for Howard receivers, the sche-

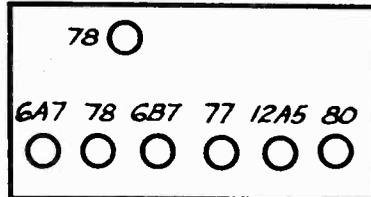
**HOWARD "Q"**



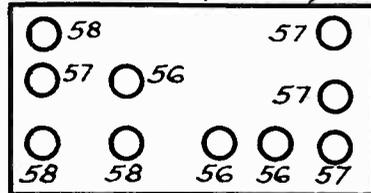
**HOWARD S-2**



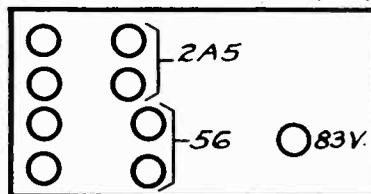
**HOWARD X-2**



**"W" EXPLORER (REVISED) REC.**



**"W" EXPLORER - PWR. PACK**



matics of which appear on the following pages in Rider's Manuals:

Model	Page
"Q"	4-3
S-2	4-1
X-2	4-5
"W" Explorer (Revised)	6-13

The last layout—that of the power-pack of the "W" Explorer—applies to both the early and the revised models. See pages 5-6 and 6-13.

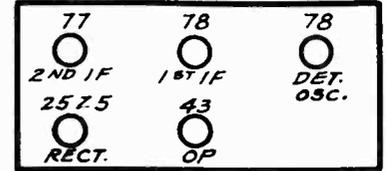
The schematics for the Halson receivers were run on the following pages: Model 515, 3-1 in *Rider's Volume III* and 1271 in the *Rider-Combination Manual*; Model 615, 3-3 in *Rider's Volume III* and 1273 in the *Rider-Combination*.

**Halson Layouts**

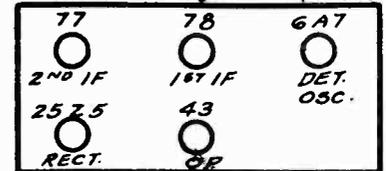
The accompanying socket layouts of Halson receivers are for those schematics that will be found on the following pages in *Rider's Manual, Volume IV*:

Model	Page
20-A	4-1
20-B	4-1
NS-40	4-3
NS-50	4-3
Roadmaster	4-5

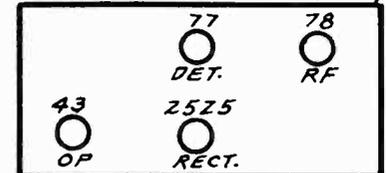
**HALSON 20-A (1932)**



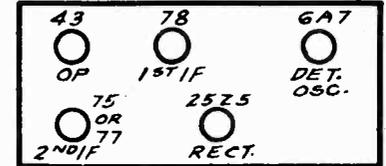
**HALSON 20-B; (1932)**



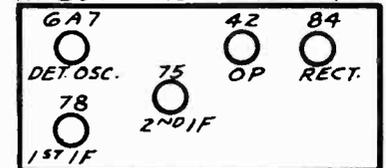
**HALSON NS-40 (1933)**



**HALSON NS-50**

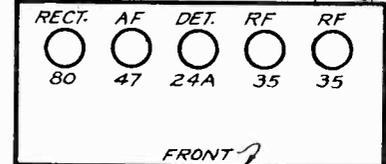


**HALSON "ROADMASTER" (1933)**

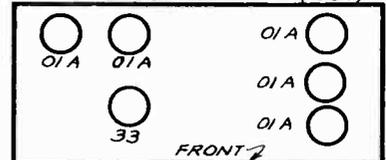


FRONT

**HALSON \*515 (1932)**



**HALSON \*615 (1932)**



**Atwater Kent 60**

The first or early type of Model 60—see A-K page 3-29 in *Rider's Volume III* and page 167 in the *Rider-Combination Manual*—has a single volume control and the second or late type—see A-K page 3-31 in *Rider's Volume III* and page 169 in the *Rider-Combination Manual*—has a dual volume control made up of combined wire-wound and carbon resistors.

**First or Early Type:**

When replacing the bleeder resistor, use No. 16295 wire-wound resistor, 4000 ohms. When replacing the first r-f. bias resistor, use No. 16253 wire-wound resistor, 1500 ohms and replace the r-f. bias resistor with No. 16988, 160 ohms.

**Second or Late Type:**

The bleeder resistor No. 1 was made in two types. The first type, No. 16905, consists of two 3000-ohm wire-wound resistors riveted together and connected in series. The second type, No. 17041, is a single 6000-ohm wire-wound resistor with a tap at the center. Use No. 17041 for servicing.

In early production of the second type Model 60, bleeder resistor No. 2 was wound on the same fibre base as the first r-f. bias resistor, the part number of the combined unit being No. 16872. If either section of this combined unit is defective, remove the unit and use a No. 16253 (1500 ohms) as r-f. bias, and a No. 15660 (1050 ohms) as bleeder No. 2. Later production of the second type Model 60 used a separate No. 15660 resistor as bleeder No. 2.

In early production of the second type Model 60, the first r-f. bias resistor was wound on the same fibre base as bleeder resistor No. 2, the number of the combined unit being No. 16872. If either section of this unit is defective, remove the unit and use a No. 16253 as a first r-f. bias resistor and a No. 15660 as bleeder No. 2. Later production of the second type Model 60 used a separate No. 16253 as first r-f. bias resistor.

Use a No. 16988 resistor (160 ohms) for replacement of the r-f. bias resistor.

**Motorola Golden Voice**

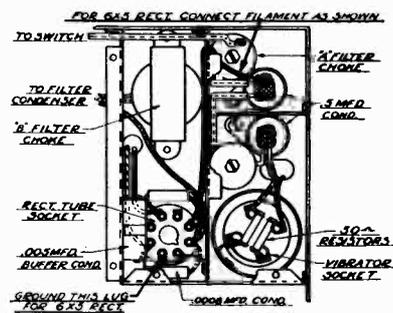
We have been advised by the manufacturer that intermittent operation of their Motorola Golden Voice models, is due to low battery voltage delivered to the set from the car's battery. Check all connections between the car battery and the radio set to avoid undue voltage drop in the car wiring, as the OZ-4 rectifier tube will fail to start

and fail to operate on a battery voltage of less than 5½ volts.

The OZ-4 tube requires 15 milliamperes or more of drain to produce ionization and proper rectification in this tube, and on battery voltages of less than 5½ volts the plate current drain of the receiver is insufficient to provide the 15 milliamperes starting current: Should the car wiring and the condition of the car battery indicate that at times the voltage may fall below 5½ volts, replace the OZ-4 rectifier tube with a 6X5 metal filament type rectifier.

With the exception of a few Golden Voice sets the filament contacts of the rectifier socket have been wired at the factory and the 6X5 rectifier may be plugged in the socket in place of the OZ-4. This will completely eliminate the difficulty due to low battery voltage.

On those Golden Voice sets not having the filament contacts of the rectifier socket wired, this wiring can be inserted by inverting the chassis and removing the cover from the hash compartment and connecting the filament contacts of the rectifier socket, as shown in the accompanying sketch. One contact to ground as indicated by



Connections when using a 6X5 in Motorola Golden Voice set

the heavy arrow at the bottom of the socket and the other contact to the .5 mfd. condenser as indicated by heavy arrow at the top of the sketch. When replacing cover be sure that all screws are tight.

**Federal Model K**

Below will be found the voltage data for this receiver, the schematic of which appears on the following pages in *Rider's Manuals: 1-21 in the revised edition; \*284 in the early edition, and 987 in the Rider-Combination Manual.*

Scr. Grid  
Plate to Grid to to

Tube	Function	Frame	Cathode	Frame
227	1st R.F.	120	7.5	—
224	2nd R.F.	110	1.5	60
227	Det.	65	0.1	—
227	1st A.F.	135	7.5	—
171A	P.P.O.P.	205	40	—

**Emerson 108, 110**

The changes listed below have been made in Chassis 15A, on models bearing serial numbers above 758,100. The schematic for models 108 and 110 appeared on *Emerson page 6-17 of Rider's Volume VI.*

Resistor, R-9, changed from 500,000 ohms, Part No. KR-56, to 50,000 ohms, Part No. KR-53. Resistor, R-11, changed from 500,000 ohms to 200,000 ohms, Part No. LR-61. Resistor, R-12, changed from 500,000 ohms to 100,000 ohms, Part No. KR-54. Condenser, C-13, changed from 0.01 mf., Part No. CCC-127, to 0.02 mf., 200 volts, Part No. FC-29. Condenser, C-14, from 0.1 mf. to 0.9 mf., 200 volts, Part No. BBC-131.

**Sparton I-F. Peaks**

The following receivers manufactured by Sparks Withington have an i-f. peak of 172.5 kc.:

Models 9-X, 13, 14-A, 15-X, 16-AW, 17, 25-X, 27-X, 28, 30-A, 33, 34, 35, 36, 111-X, 620-X, 750-A, 750-X, 870-A, 870-X.

The following Sparton models have an i-f. peak of 456 kc.: 71, 71-B, 81, 82, 333.

Model 60 has an i-f. peak of 900 kc.

Note: The s-w. converter in Model 16-AW operates on an intermediate frequency of 900 kc.

It is suggested that you write these i-f. peaks on the schematics for these models in your Rider Manuals.

**Atwater Kent 55 and 60**

If the first a-f. bleeder resistor is defective in either of these models, replace with a No. 15660 resistor (1050 ohms).

When either the yellow (No. 15544) or the maroon (No. 15545) second a-f. bias resistor requires replacing, do not use a new yellow or maroon resistor, but follow the procedure found below.

Remove both the yellow and maroon resistors and replace the yellow one with a white resistor (No. 16724), 40,000 ohms, 1 watt, and the maroon resistor with a black (No. 15592), 65,000 ohms, 1 watt.

These changes affect only the second a-f. bias resistors in Models 55, 55C, 60 and 60C.

**Garod I-F. Peaks**

The i-f. peak of the receivers of this manufacturer, that are shown in *Volume VI of Rider's Manuals*, is 456 kc.



**Wells-Gardner 7G and OD Series**

If the double end pointer remains stationary when the tuning knob is turned, the following possibilities should be investigated and procedure followed:

First, be sure that the tuning condenser rotor has not reached the end of its travel. Also, see if the screw at the center of the large pointer is tight. Next inspect each pointer to be sure that it is not caught at some place.

If slippage continues, remove the chassis from the cabinet. Turn the knob to the point where the shaft seems to bind. See if the drive shaft set screw is tight, and if the idler and idler spring are in position—See Fig. 2.

Take off the two pointers, the large one by taking out the pointer screw and the small micrometer pointer by unscrewing it off of the shaft (turn it counter-clockwise to do this). Turn the

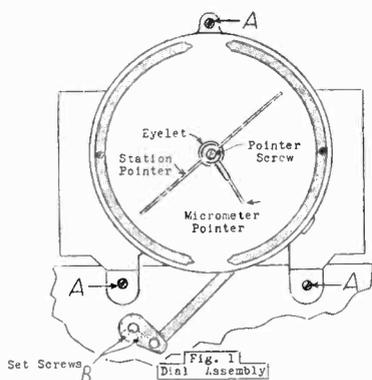


Fig. 1. Front view of the Wells-Gardner dial assembly.

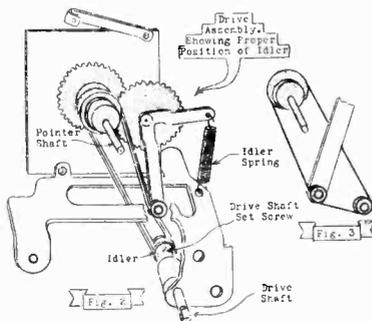
tuning knob and see if pointer shaft turns properly. Inspect the shaft to determine if it is at the center of the eyelet in the dial scale. If the shaft appears to be binding against the eyelet, loosen the three screws A, Fig. 1, which hold the dial assembly in position. Shift this assembly until the shaft is centered, tighten the screws and again see if the shaft turns properly when the tuning knob is rotated.

If the shaft continues to stick, remove the dial assembly by taking out the three screws A and the two set screws, B—See Fig. 1. Turn the tuning condenser rotor and see if the pointer shaft wobbles. If it does, straighten it by pressing the shaft to one side.

Also, in a few of the dial assemblies there is a burr at the back edge of the eyelet which can bite into the shaft. If this is the case, take a small round file and file down the burr. A penknife can be used if no file is available.

See if the pointer shaft and tuning condenser rotor turn the entire length of travel. If they do, put the dial as-

sembly back into position to again determine if the drive turns properly. If the shaft and rotor do not turn the entire length of travel, inspect the gears for dirt, damaged teeth and any obstruction to the rotor.



Figs. 2 and 3. Rear views of the Wells-Gardner dial assembly.

In some cases the belt may slip because it is too long. The best way to correct this condition is to put on a new belt. It can also be corrected in many cases by putting the idler on the inside of the belt as shown in Fig. 3. This method should be followed only as a last resort and is not, in general, as satisfactory as changing the belt. If the idler is moved to the inside of the belt, the idler spring may not be under sufficient tension to keep the belt tight. To remedy this, take the spring off, cut off a piece and again put it back in place. Care should be taken when reducing the spring length not to make the belt too tight as this would cause the drive to turn hard.

After the above procedure has been followed, the drive should operate properly after reassembling. If it does not, it will be necessary to get in touch with the factory for further instructions. See *Rider's Volume VI*, page 6-20 for further data on the 7G series.

**G.E. A-64, A-67**

In the schematic diagram for Models A-64 and A-67, on *G.E.*, page 6-14 of *Rider's Volume VI*, you will find a connection between the low side of L-6 and the high side of L-8 (oscillator coils). This connection should be deleted. In the parts list for these models, note that the capacity for C-5 (Stock No. RC-210) is listed as 50 mf. This is incorrect; it should be 50 mmf., as is shown on the schematic diagram mentioned above. The parts list will be found on *G.E.* page 6-18.

The electrostatic shield of the 0.05-mf. condenser (C-23) that shunts the bleeder resistor R-7-8-9, sometimes makes contact with the high-voltage a-c. terminal of the 5Z4 rectifier tube

socket. This causes a decided a-c. hum, which has none of the characteristics of the a-c. hums usually encountered.

This condenser, C-23, is mounted near the high-voltage terminal of the rectifier socket and vibration in shipment and operation, or pressure accidentally applied when the chassis is being serviced, may cause it to be moved against the terminal. This brings the electrostatic shield (the layer of foil just under the outer layer of wax paper) in contact with the terminal.

Dressing the condenser away from the terminal so as to assure permanent clearance, will eliminate the hum.

**Philco 10**

Run No. 3. A ground strap was added (Part No. 9481) from tuning condenser housing to receiver housing.

Run No. 8. The first and second i-f. transformers, Parts No. 16 and 25, were replaced with new types having the same part numbers. They can be identified by the red paint marks on the spools.

See Philco page 4-56, *Rider's Volume IV*.

**Philco 10-Code 122**

Run No. 2. Condenser Part No. 61 (50 mmf.) was removed and Part No. 30-1032 (250 mmf.) was added.

Run No. 3. The first i-f. transformer, Part No. 18, was replaced with a new type, having the same part number. This can be identified by the green paint marks on the fibre.

Run No. 4. Resistor, Part No. 23 (500 ohms) was removed and Part No. 6443 (700 ohms) was added.

For schematic diagram see *Rider's Volume V*, Philco page 5-5.

**Philco-Pierce Arrow MT-3 and Philco-Reo RT-3**

Run No. 1. An antenna choke, Part No. 32-1372, No. 75, has been added. It is connected in series with the antenna lead and the antenna transformer No. 1 and condenser No. 2.

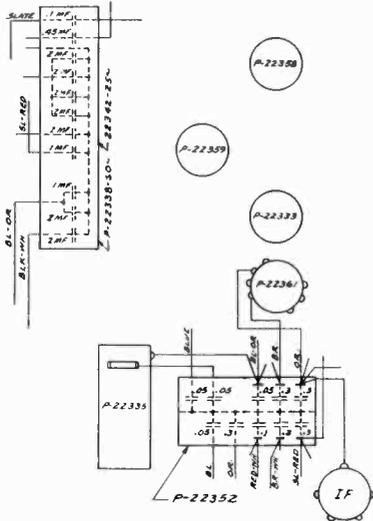
Run No. 3. Wire the white lead of the output transformer directly to the plate of the 42 tube socket instead of to the pin jack.

Run No. 4. Tone control, No. 56, removed. Part No. 30-4298 added. When using this new tone control, condenser No. 47 is also removed.

See *Philco pages 6-99 and 6-102 in Rider's Manuals for data.*

**Stromberg-Carlson 29**

The chassis wiring diagram of this model, which appears on page 2-15 of *Rider's revised Volume II*; page 614-R of the early edition; and page 2401 of the *Rider-Combination Manual*, is not clear in one or two places. So that no doubt will be in your mind when checking over two of the condenser banks,



Condenser banks of Stromberg Model 29

we are showing herewith enlarged drawings of the bank having eleven condensers, in the upper right-hand side of the diagram, and the nine-condenser bank that is shown in about the middle of the page. You can identify their positions on the wiring diagram by the apparatus in the vicinity and by the color and position of the leads. Notice that the top of the sketch shown here goes to the right-hand side of the diagram in your Manual.

**Philco Model 144**

Effective April 15, 1935 the center tap is removed from the filament winding on the power transformer. If a hum is experienced in reception, connect a 20-ohm, wire-wound resistor across the filament winding, with center tap of resistor grounded. This set is shown on page 5-41 in *Rider's Manual Volume V*.

**"X" Models In The Sparton Line**

Some of the Sparton model numbers conclude with the letter "X". The following data will no doubt be of value when seeking equivalent circuits in *Rider's Manuals*. In some instances, the "X" denotes a receiver intended for export sale and containing a special power transformer. In other cases, the letter "X" denotes some addition to the basic circuit.

Model 27-X is the model 18 chassis used in a model 27 cabinet. (*Rider*

*Manuals Sparton* page 3-10, 3-11, 4-2, 4-3.)

Model 67-X is the same as the model 67 with a special power transformer and is intended for export. (*Rider Manual Sparton* 5-10, 5-11, 5-12.)

Model 73-BX is an export model.

Model 80-X is the same as the model 80, with a special power transformer and is intended for export. (*Rider Manual Sparton* 5-15, 5-16, 5-17, 5-18.)

Model 81-X is the same as the model 81, with the addition of a wave trap. (*Rider Manual Sparton* 4-16.)

Model 82-X is the same as model 82, with the addition of a wave trap. (*Rider Manual Sparton* page 4-17.)

**Stromberg-Carlson 55, 56**

The i-f. peak of these models, the schematic of which appears on page 4-10 of *Rider's Volume IV*, is 175 kc. Please make a notation of this on the above-mentioned schematic.

**Bosch 239**

Please make a note that Model 239 is similar electrically to the Bosch models 236 and 237, the servicing data on which are found on page 3-11 in *Rider's Volume III* and on page 2531 in the *Rider-Combination Manual*. This Model 239 was used in a table installation and the only difference between it and the other models mentioned is that the antenna and ground leads were braided together with the power supply cord in Model 239.

**Howard Grand**

Please make a notation that the power unit shown on *Howard* page 6-16 of *Rider's Volume VI* is for Series 2 of this model, as well as Series 1.

**Packard Bell 34**

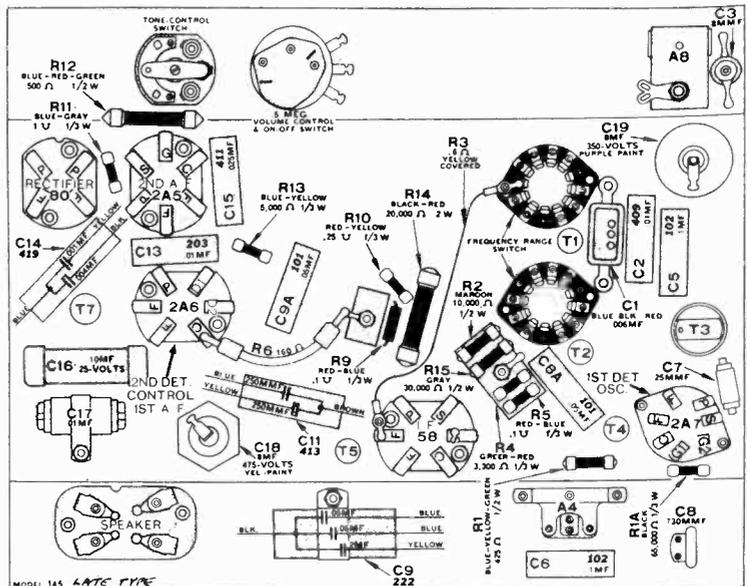
If this set should need to be readjusted, the procedure is as follows: Set dial to about 1700 kc. and connect the output of a signal generator, set at the same frequency, to the antenna. Adjust the trimmer condensers of the r-f. and detector stages for maximum output. All adjustments at 1000 kc. and 600 kc. are made by bending the outside rotor plates of the variable condenser tuning the r-f. stage. The schematic diagram of this receiver will be found on page 6-4 of *Rider's Volume VI*.

**Crosley 815**

We have received word from the manufacturer that no servicing data has ever been issued for the 815, but if you get one in the shop look up Model 8B3, on page 6-10 in *Volume VI of Rider's Manuals*. We are advised that the 8B3 is practically the same as the 815.

**Atwater Kent 145, 325**

The schematic diagram shown on page 5-7 of *Rider's Volume V* is for the early model but the note at the bottom of the diagram covers the changes that were made in the late model. The elimination of the condenser, C4, in the frequency-changing switch in the late models necessitated a rearrangement of the parts. The chassis layout for the late model is shown in the accompanying illustration.



The bottom view of the chassis used in A-K. Models 145 and 325 of the late type

**Wells-Gardner 7A Series Chassis**

In a few receivers of this model, the tone control condenser C-9, 0.05 mf., 400 volts, has broken down. When this occurs the output plate voltage is applied across the tone control resistor and in many cases the resulting current burns the tone control. For this reason, if it is necessary to replace the condenser or the tone control resistor in this model; connect the side of the condenser which formerly went to ground to the +B end of the output transformer primary, as shown in Fig. 1.

This connects the tone control condenser and resistor across the primary of the output transformer. In this

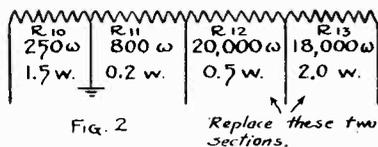
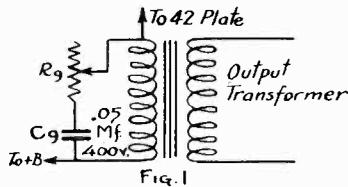


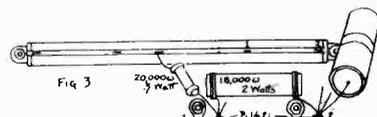
Fig. 1. New connections for tone-control circuit of Wells-Gardner 7A chassis.

Fig. 2. Resistor values of four-section unit.

method of connection, should the tone control condenser break down, no damage will be done to the resistor.

In case either the 18,000 or the 20,000-ohm section of the four section armoured wire-wound resistor becomes open, it is unnecessary to replace the entire resistor. A separate 18,000 ohms, 2 watt or 20,000 ohms, 0.5 watt carbon resistor may be used. **DO NOT USE THE OLD LUGS OF THE WIRE WOUND RESISTOR TO MOUNT THE CARBON RESISTORS, AS THE OLD UNIT MAY HAVE AN INTERMITTENTLY OPEN CONNECTION.** If one of these two sections, as mentioned, becomes open, it will be best to replace both of them. The values of the four sections of this unit are given in Fig. 2.

If the entire four-section unit is replaced, the old mounting holes and the old wiring connections are used. However, if the separate 18,000 and 20,000-ohm carbon resistors are used, they are mounted and connected as shown in



Method of mounting and replacing resistors in Wells-Gardner 7A Series chassis. See Fig. 2.

Fig. 3. Two single terminal mounting strips can be used for the wiring connections. The leads, which connected to terminals No. 1 and No. 2 on the old unit, are connected to the separate terminals marked No. 1 and No. 2 in the illustration.

- P-98002A. 4 Section Resistor (2 wire wound, 2 carbon)
- P-D-94183. 18,000-ohm, 2 watt resistor
- P-B-94203. 20,000-ohm, 0.5 watt resistor
- P-1421. Single terminal Mounting strip

**Silvertone 1904, 1906, 1908, 1911, 1914, 1938, 1954, 1964, 1984**

Several changes have been made in the chassis used in the above models and they should be noted on the schematic, appearing on *Sears page 6-45 of Rider's Volume VI.*

The resistor, R1, has been changed from 30,000 ohms to 40,000 ohms. R3 has been increased from 5000 to 20,000 ohms. R5 has been decreased from 50,000 ohms, 0.5 watt, to 25,000 ohms, 1 watt. This last change was made to correct motorboating that was sometimes experienced on the s-w. band "C," due to the 6A7 tube variations.

A tone control circuit has been added. One side of a 0.02-mf. condenser is connected to the lead coming from the grid of the 6F6 to the 200,000-ohm resistor, R11, and the other side of this condenser is connected to one side of the 500,000-ohm tone control. The variable arm is grounded.

A condenser, 0.1 mf., 300 volts, has been shunted across the 8-mf. condenser, C20.

Metal glass tubes are used in the i-f., a.v.c., and output stages. These tubes are the same types as shown on the schematic in *Rider's Volume VI.*

Note the added model numbers above that should be included in your Volume VI index.

**G.E. M-106 Changes**

A change is recorded in the G.E. M-106 receiver. The type 76 tube originally used as the 2nd detector and AVC, has been replaced by a type 1-V tube. R-16 in the diagram, originally 1,000,000 ohms, now is 1,100,000 ohms. The G.E. M-106 is referred to in *Rider's Manual Volume V*, as the RCA 262, shown on page 5-103 in the RCA section.

**RCA RAE-68**

The RAE-68 receiver employs the model 82 Radiola 82 chassis with remote control and the automatic electric phonograph.

**Sparton Chassis Similarities**

It is possible that some Sparton models may come in for service and that you will not be able to identify the exact chassis because of some suffix letter which may appear in conjunction with the model number. Accordingly, it might be well if you added the following data to your Rider Manual Index:

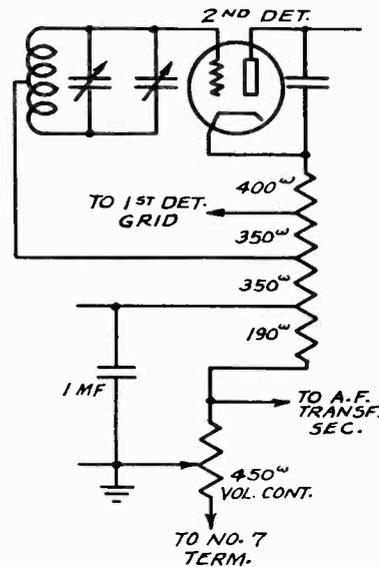
Models 57-A and 57-B are basically the same as the model 57, shown on page Sparton 5-3, 5-4 and 5-5.

The model 81-A is basically the same as model 81, shown on page Sparton 4-18 in *Rider's Manual.*

The model 105 is basically the 104, shown on page 5-19 and 5-20 in *Rider's Manual Volume V.*

**Radiola 62**

The values of the tapped resistor strip and the volume control of the Radiola 62 were omitted from the manufacturer's schematic. These values are shown in the accompanying illustration. The part



Values of resistor strip and volume control of Radiola 62

number of the tapped resistor is 5810 and that of the volume control is 5811.

The schematic for this receiver will be found on *RCA page 1-40 in the revised edition; page \*497 in the early edition, and on page 1878 of the Rider-Combination Manual.*

**Philco Model 32**

Starting with Run No. 6, the part number of the volume control is changed from 33-5063 to 33-5004, and the wave-band switch from 42-1017 to 42-1123. This makes the design and connection of these parts the same as in Model 89. See *Rider's Manual, Volume V*, page 5-17.

**RCA R-10 DC**

With the exception of the interlock, the R-10 DC is identical with the R-7 and R-9 DC chassis, shown on pages RCA 2-8, 2-9 and 2-10 in Rider's Manual, Volume II, pages 504-D-3 and 504-D4 in the early issues and on pages 1772, 1773 and 1774 in the Rider-RCA Combination Manual.

**RCA RE-16**

The RCA RE-16 receiver employs the standard R-7, R-9 AC Superette chassis already listed in Rider's Manual. To this chassis is added the phonograph motor, pickup and volume control. Service information other than those relating to replacement parts can be had by referring to the service notes covering the Superette and the Radiola 86 receivers.

In view of the absence of phonograph pickup connection to the Superette receiver, the pickup leads in the RE-16 are connected to terminals 1 and 2, the connecting link being removed. The ground connection upon the shielded lead is joined to terminal 4. The d.c. resistance of the pickup coil is 4.5 ohms. The pickup volume control is 60 ohms. The input transformer is tapped and the following values of d.c. resistance apply. Between terminals 1 and 2, 3.2 ohms; between terminals 2 and 3, 150 ohms, and between terminals 3 and 4, 4300 ohms. The connections of the pickup correspond with the data shown for the RE 16-A receiver, shown on pages RCA 4-19 and 4-20.

**Crosley 5V2 and 5A3**

The i-f. peak in these receivers is 181.5 kc. The alignment and servicing procedure for the 5V2 is the same as that for the 5V1, shown on pages Crosley 5-21 and 5-22 in Rider's Manual, Volume V. The circuit is substantially the same except for the addition of a 2,000-ohm resistor between the moving arm of switch 48 and the terminal which is a part of switch 48 and which connects to the low end of the input coil to the mixer portion of the 6A7. The voltage for the 5V2 is the same as that for the 5V1, shown in Rider's Manual.

**Airliner Model 62-166**

The present production of these receivers differs from the early runs. In the early models the plate circuit of the 75 triode, contained only the plate coupling resistor of 150,000 ohms. In the

later models a plate filter resistor of 50,000 ohms was added. In addition a .25-mfd. bypass condenser, which bypassed this plate filter resistor, was also added.

In the early models the capacity range of the trimmers used across the windings of the first i-f. transformer, was 150 to 300 mmfds.

**Majestic 400**

The receiver schematic appears upon page Majestic 3-42 and in the RCA-Rider Combination Manual on page 1234.

In some receivers the 250-ohm resistor R-3 and the 2000-ohm resistor R-11 were replaced by a 160-ohm and a 2500-ohm resistor respectively. The purpose of this was to make the G-57A-S modulator tube oscillate more readily. If a 250-ohm and a 2000-ohm resistor are used in the receiver, it may be necessary to try two or three different tubes in this stage, when replacement is being made, before a tube is found, which will oscillate readily over the entire frequency band. If trouble is experienced along this line, the changing of either one or both of the resistors mentioned should eliminate the difficulty.

Condenser C-17 will be found to have a value of .05 mfd, in a number of receivers; however, it should be replaced with a .1-mfd unit, as shown in the schematic.

**Silvertone 1840, 1842 Oscillator Plate Resistor**

In some instances, the 10,000-ohm wire-wound resistor in the oscillator plate circuit of the models 1840 and 1842 opens during operation. The cause of the breakdown is mechanical, rather than electrical. Apparently, the form on which the resistance wire is wound expands sufficiently during operation to break the wire. If this break occurs during operation, a small arc occurs at the point of open, making a burnt mark upon the resistor and creating the impression that the unit failed due to overload. As has been stated, such is not the case. At any rate, replacement should be made with a 10,000-ohm carbon resistor rated at 2. watts and bearing part No. R10465.

**Montgomery-Ward Models 62-185, 62-187, 62-190, 62-196**

In the early models 6D6 and 42 glass tubes were used. These have been replaced by the metal tubes, 6K7 and 6F6 respectively.

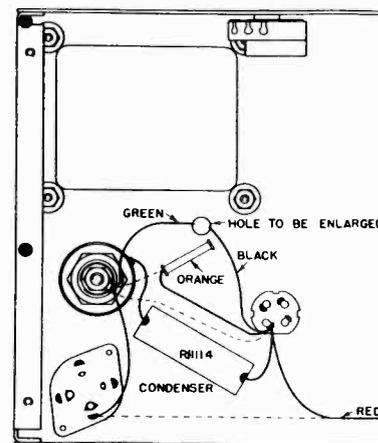
**Silvertone 1720, 1725, 7065**

Any trouble due to hum in these models can be eliminated by performing the following operations, the purpose being to add an additional section of filtering to the power supply.

Enlarge the hole in the chassis near the power transformer to about 0.25 inch diameter, as indicated in the illustration.

Remove the cover of the power transformer. To do this, it is first necessary to remove the four nuts on the under side of the chassis and then to unscrew the bolts that pass through the laminations. The tone control and switch will have to be dismantled in order to get at one of the transformer's nuts.

Mount a Part No. R10793B choke on top of the power transformer in place of the original transformer cover. Be sure to mount the choke so that its leads can come down through the enlarged hole in the chassis. Also be sure to tighten the bolts well, in order



Changes to be made in Silvertone Models 1720, etc.

to prevent hum. Then remount the transformer and choke assembly on the chassis and remount the tone control.

Make the wiring changes indicated in the illustration. The dotted lines represent the original wiring, which is to be changed and the solid lines show the new connections. Note that a new part, a 2-mf., 440-volt, dry electrolytic condenser, Part No. R11114, is added.

See page 4-22 of Rider's Manual for schematic diagram.

**Sparton Models 61, 62**

A 50-ohm, 2-watt resistor, Part No. B-6061-1, has been added in series with the plate lead of the 25Z5 that is drawn nearest the speaker field in the schematic diagram, shown on Sparton page 4-11 in Rider's Volume IV. This resistor protects the 25Z5 tube against voltage surges.

It is advisable to put this resistor in any Models 61 and 62 not so equipped that you may service.

