

# Engineering Data

## Stromberg-Carlson No. 140 Series Radio Receivers

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY  
Rochester, New York

### ELECTRICAL SPECIFICATIONS

Type of Circuit.....	Superheterodyne
Tuning Ranges.....	A—540 to 1500 Kc.; B—1450 to 3500 Kc.; C—5600 to 18,000 Kc.
Number and Types of Tubes.....	3 No. 6K7, 1 No. 6A8, 1 No. 6Q7, 2 No. 6F6, 1 No. 6E5, 1 No. 5Z3
Power Supply Voltage.....	105 to 125 Volts
Power Supply Frequency.....	25 to 60 Cycles and 50 to 60 Cycles
Input Power Rating:	
(Nos. 140-H, 140-K, 140-L).....	115 Watts
(No. 140-P).....	155 Watts
Frequency of Intermediate Amplifier.....	465 Kilocycles

### APPARATUS SPECIFICATIONS

No. 140-H.....	50 to 60 Cycles; P-26190 Chassis; P-26171 Loud Speaker
No. 140-HB.....	25 to 60 Cycles; P-26191 Chassis; P-26171 Loud Speaker
Nos. 140-K, 140-L.....	50 to 60 Cycles; P-26190 Chassis; P-26170 Loud Speaker
Nos. 140-KB, 140-LB.....	25 to 60 Cycles; P-26191 Chassis; P-26170 Loud Speaker
No. 140-P.....	60 Cycles Only; P-26664 Chassis; P-26170 Loud Speaker; P-26632 Phonograph Unit
No. 140-PB.....	25 Cycles Only; P-26665 Chassis; P-26170 Loud Speaker; P-26633 Phonograph Unit

### CIRCUIT DESCRIPTION

The No. 140 Series of Radio Receivers are nine tube receivers employing metal tubes. These receivers are divided into four groups as follows:

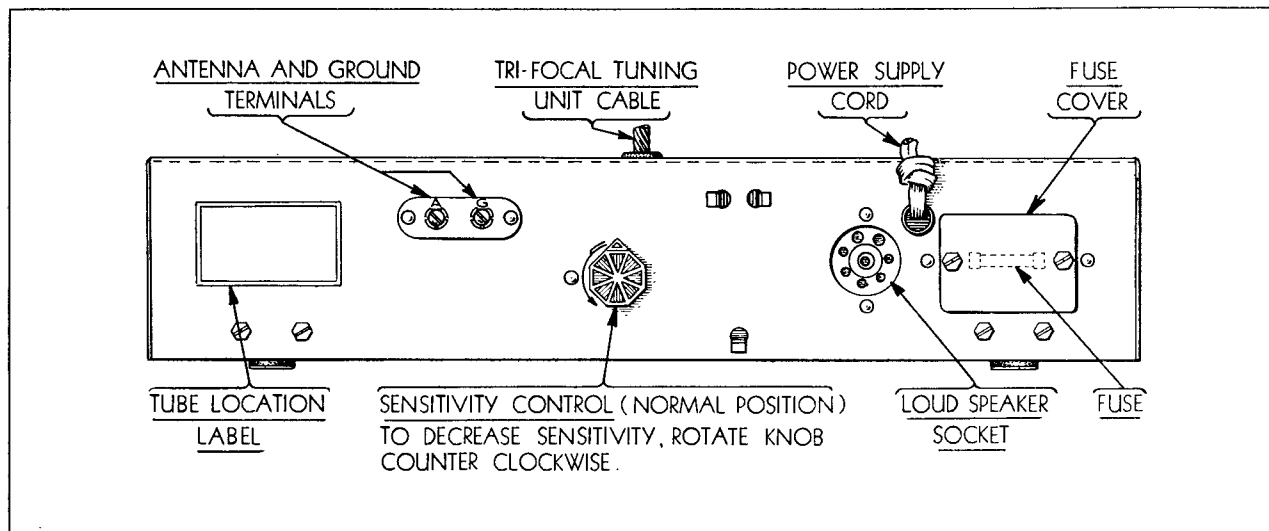
The No. 140-H Receiver is furnished with a highly efficient Stromberg-Carlson dynamic speaker and the exclusive "Patent Applied For" Stromberg-Carlson "Tri-Focal Tuning System."

The Nos. 140-K, 140-L, and 140-P Receivers differ from the No. 140-H Receiver in that they are of a fixed high fidelity type. In these receivers the same chassis is used as in the No. 140-H Receiver, including the "Tri-Focal Tuning System" and Selectorlite dial arrangement. In addition to these features the Nos. 140-K, 140-L, and 140-P Receivers are equipped with a Carpinchoe high fidelity dynamic speaker in place of the standard broadcast speaker which is furnished in the No. 140-H Receiver. Audio reproduction is further improved in these three models by employing sound diffusing vanes in front of the loud speaker opening, which distribute the higher pitched tones, thereby providing excellent reproduction in all parts of the room by spreading out these directional frequencies.

In the Nos. 140-L and 140-P Receivers inclusion is made of the exclusive Stromberg-Carlson Acoustical Laboratories' revolutionary new development, the Acoustical Labyrinth. This new device extends the bass response, provides reproduction only from the front of the cabinet, and eliminates all cabinet resonance.

In addition to all of the above features, the No. 140-P Receiver is equipped with a highly efficient single record playing phonograph unit which has an entirely new type of pick-up suspension device. For any service information on the phonograph unit supplied with the No. 140-P Receivers see the P-26718, Form 1995, "Operating Instructions for Phonograph Unit of Stromberg-Carlson No. 140-P Radio Receiver," a copy of which is furnished with each No. 140-P Receiver.

These No. 140 Receivers have three tuning ranges. As a further aid in obtaining maximum performance from these receivers, a sensitivity control is provided for use on the standard broadcast band only. Its con-



**Fig. 1. Location and Operation of Sensitivity Control.**

trol knob is located on the rear of the chassis base. When either the "B" or "C" ranges are in operation, this sensitivity control is automatically cut out of the circuit so that the receiver will function at its maximum sensitivity on these two ranges. In some localities it will be found that without the use of this control, it will be impossible to eliminate adjacent channel interference. When this condition is obtained the receiver should be tuned accurately to the desired station, and this sensitivity control adjusted so that minimum interference is obtained from the interfering station. See Figure 1.

The various tubes are used in these receivers as follows: One No. 6K7 tube is used in the R. F. Amplifier, and the other two No. 6K7 tubes are used in the First and Second I. F. Amplifier Stages. The No. 6A8 tube functions as both Oscillator and Modulator tube. The No. 6Q7 tube is used as the Demodulator, Automatic Volume Control, and Audio Amplifier tube. The two No. 6F6 tubes are used in the Audio Power Output Stage. The No. 6E5 tube is used as the Indicator of the "Tri-Focal Tuning System", and the No. 5Z3 tube is the Rectifier tube of the Power Supply Unit.

### NORMAL VOLTAGE READINGS

The various values of voltages listed in the following table are obtained by measuring between the various tube socket contacts and the chassis base, with the tubes in their respective sockets. The receiver is, therefore, in operation when the measurements are made. Figure 2 shows the terminal layout of the sockets with the proper terminal numbers.

Voltages are given for a line voltage of 120 volts, and allowance should be made for differences when the line voltage is higher or lower. A meter having a resistance of 1000 ohms per volt should be used for measuring the D. C. voltages. Voltage values shown are those obtained on the lowest possible scale of a meter having the following ranges: 0-2.5, 0-10, 0-100, 0-250, 0-500, 0-1000 volts except when an asterisk appears after any given voltage value in which case the 1000 volt scale was used.

Tube	Circuit	Cap	Terminals of Sockets								Heater Voltages Between Heater Terminals	
			1	2	3	4	5	6	7	8	Socket Terminal Numbers	Volts
6K7	R. F. Amp.	0	0	0	+ 52	+ 93	+ 6	—	6.3	+ 6	2-7	6.3
6A8	Mod.-Osc.	0	0	0	+242	+ 69	-0.7	+150	6.3	+6.9	2-7	6.3
6K7	1st I. F. Amp.	0	0	0	+242	+ 90	+6.2	+3.5	6.3	+6.2	2-7	6.3
6K7	2nd I. F. Amp.	0	0	0	+242	+ 90	+5.6	+2.6	6.3	+5.6	2-7	6.3
6Q7	Dem.—A. V. C.— Audio Amp.	0	0	0	+148	0	+20*	+3.5	6.3	+ 23	2-7	6.3
6F6	Audio Output		0	0	+258	+265	0	—	6.3	+ 17	2-7	6.3
5Z3	Rectifier		+445	400	400	+445	—	—	—	—	1-4	4.8
6E5	Tuning Indicator		6.3	+0.6	+ 6	+240	+5.6	0	—	—	1-6	6.3
Speaker Socket			+262	0	0	+445	+445	—	+425			

Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

### ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on these receivers and ordinarily no readjustments are necessary. However, should it become necessary to make any readjustments, this alignment procedure should be carefully followed.

In making any alignment adjustments always adjust the signal generator's output to the minimum value where a good alignment may still be obtained. Never attempt to make any alignment adjustments using a strong signal.

Figure 2 shows the location of all the aligning capacitors used in this receiver.

### Intermediate Frequency Amplifier Adjustments

The intermediate frequency used in these receivers is 465 kilocycles. In making these I. F. circuit adjustments always align in the following order:

1. Secondary of 3rd I. F. Transformer (Capacitor C-15).
2. Primary of 3rd I. F. Transformer (Capacitor C-14).
3. Secondary of 2nd I. F. Transformer (Capacitor C-13).
4. Primary of 2nd I. F. Transformer (Capacitor C-12).
5. Secondary of 1st I. F. Transformer (Capacitor C-11).
6. Primary of 1st I. F. Transformer (Capacitor C-10).

## Radio Frequency Adjustments

The adjustments of the aligning capacitors used in the radio frequency circuits in this receiver should be very carefully made in the following order and at the frequencies specified below:

1. Oscillator's "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-9).
2. R. F. Interstage "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-6).
3. Antenna "C" Band Shunt Aligner at 17 Megacycles (Capacitor C-3).
4. Oscillator's "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-8).
5. R. F. Interstage "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-5).
6. Antenna "B" Band Shunt Aligner at 3.4 Megacycles (Capacitor C-2).
7. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-7).
8. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
9. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).
10. Oscillator's "A" Band Series Aligner at 0.6 Megacycles (Capacitor (30) ).
11. Oscillator's "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-7).
12. R. F. Interstage "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-4).
13. Antenna "A" Band Shunt Aligner at 1.4 Megacycles (Capacitor C-1).

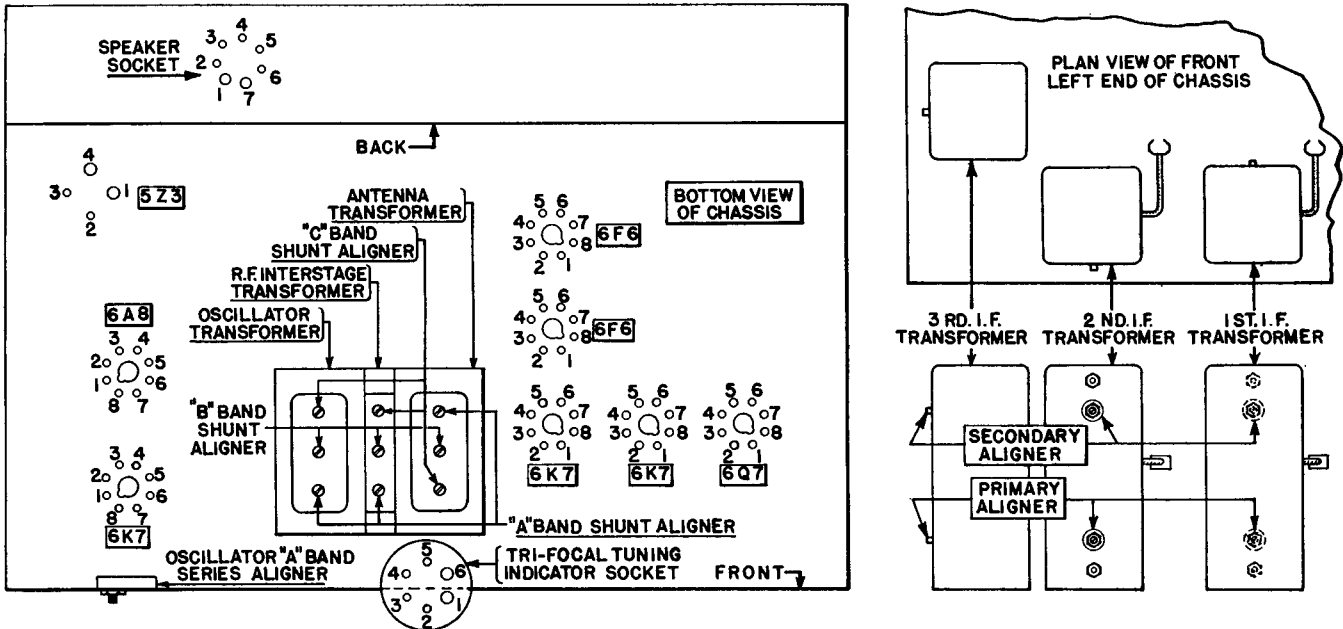


Fig. 2. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

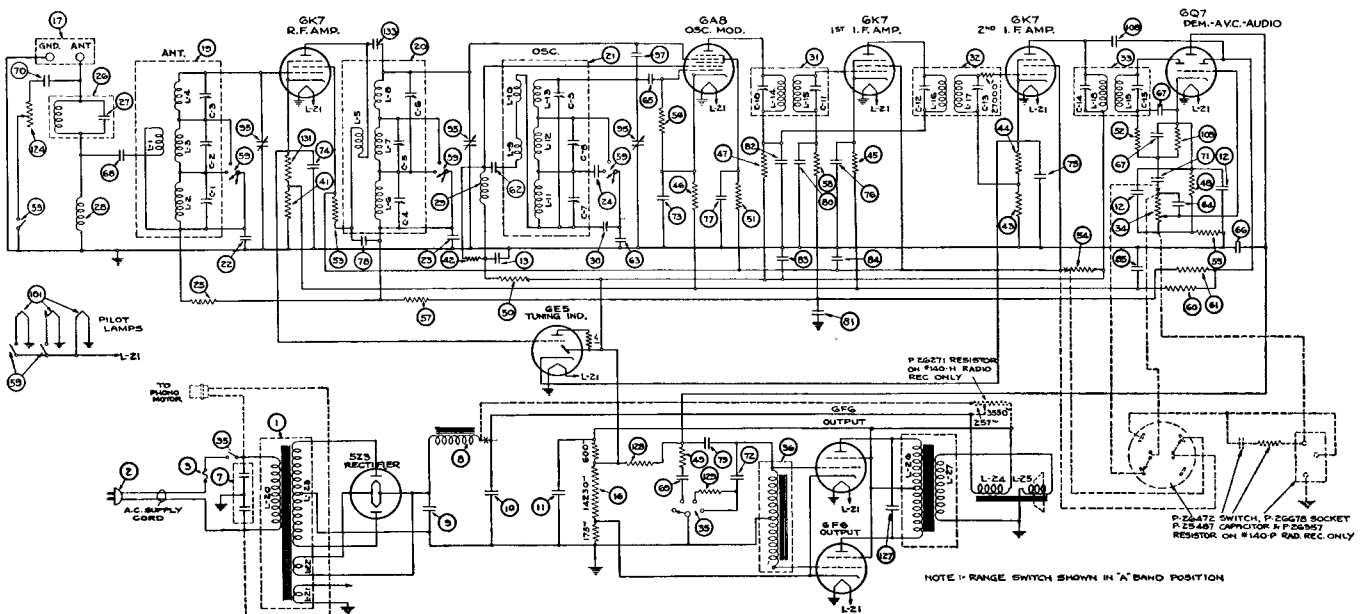


Fig. 3. Schematic Circuit of Receiver.



## REPLACEMENT PARTS

Item Number	Piece Number	Part	Item Number	Piece Number	Part
1	25434	Power Transformer (50 to 60 Cycles Chassis)	64	24166	Capacitor, 25 Mmf.
1	25435	Power Transformer (25 to 60 Cycles Chassis)	65	24559	Capacitor, 100 Mmf.
2	24268	Cord (A. C. Power Supply)	66	24559	Capacitor, 100 Mmf.
3	23150	Fuse (2 Amperes)	67	26512	Capacitor, 2—100 Mmf.
7	21585	Capacitor Assembly (2—.01 Capacitors)	68	25150	Capacitor Assembly, .02 Mf.
8	26260	Choke Assembly (Rectifier Filter)	69	25149	Capacitor Assembly, .01 Mf.
9	22757	Electrolytic Capacitor (50 to 60 Cycles Chassis)	70	25149	Capacitor Assembly, .01 Mf.
9	26510	Electrolytic Capacitor (25 to 60 Cycles Chassis)	71	25150	Capacitor Assembly, .02 Mf.
10	22789	Electrolytic Capacitor (50 to 60 Cycles Chassis)	72	25150	Capacitor Assembly, .02 Mf.
10	26511	Electrolytic Capacitor (25 to 60 Cycles Chassis)	73	25150	Capacitor Assembly, .02 Mf.
11	25458	Electrolytic Capacitor, 16 Mf.	74	25150	Capacitor Assembly, .02 Mf.
12	26048	Electrolytic Capacitor, Dual, 10 Mf.	75	25483	Capacitor Assembly, .1 Mf.
13	25788	Electrolytic Capacitor, 1 Mf.	76	25483	Capacitor Assembly, .1 Mf.
14	26059	Bracket (Chassis Spacer)	77	25483	Capacitor Assembly, .1 Mf.
16	25437	Resistor, "B" Voltage Divider	78	25481	Capacitor Assembly, .002 Mf.
19	25510	Coil Assembly, Antenna	79	24405	Capacitor Assembly, .04 Mf.
20	25511	Coil Assembly, R. F.	80	24405	Capacitor Assembly, .04 Mf.
21	25512	Coil Assembly, Oscillator	81	24405	Capacitor Assembly, .04 Mf.
22	25488	Capacitor, .002 Mf.	82	24994	Capacitor Assembly, .05 Mf.
23	25527	Capacitor, .0027 Mf.	83	24994	Capacitor Assembly, .05 Mf.
24	25490	Capacitor, .0038 Mf.	84	24994	Capacitor Assembly, .05 Mf.
25	26388	Resistor, Type "EI", .1 Megohm	85	24994	Capacitor Assembly, .05 Mf.
26	25513	Coil Assembly, Wave Trap	95	26276	Gang Tuning Capacitor
27	25488	Capacitor, .002 Mf.	97	26417	Capacitor Assembly (Gimmick)
28	25814	Coil Assembly, R. F. Choke Coil	101	26287	Pilot Lamp
29	25814	Coil Assembly, R. F. Choke Coil	108	24560	Capacitor, 50 Mmf.
30	26047	Oscillator Series Aligning Capacitor	109	26362	Resistor, Type "E", 270,000 Ohms
31	26266	1st I. F. Transformer Assembly	124	26095	Potentiometer (Sensitivity Control)
32	26269	2nd I. F. Transformer Assembly	126	26499	Knob (For Sensitivity Control)
33	26270	3rd I. F. Transformer Assembly	127	24461	Capacitor, .004 Mf.
34	26114	Potentiometer (Volume Control)	128	26357	Resistor, Type "E", .1 Megohm
35	26404	Switch ("Off-On" and Tone Control)	129	26341	Resistor, Type "E", 4700 Ohms
36	26272	Transformer Assembly, Audio	131	26329	Resistor, Type "E", 470 Ohms
37	26274	Transformer Assembly, Output			
38	22988	Socket, 4 Prong			
39	23517	Socket, 7 Prong			
40	25539	Socket, 8 Prong			
41	26324	Resistor, Type "E", 180 Ohms			
42	26350	Resistor, Type "E", 27,000 Ohms			
43	26328	Resistor, Type "E", 390 Ohms			
44	26329	Resistor, Type "E", 470 Ohms			
45	26329	Resistor, Type "E", 470 Ohms			
46	26330	Resistor, Type "E", 560 Ohms			
47	26330	Resistor, Type "E", 560 Ohms			
48	26340	Resistor, Type "E", 3,900 Ohms			
49	26350	Resistor, Type "E", 27,000 Ohms			
50	26350	Resistor, Type "E", 27,000 Ohms			
51	26345	Resistor, Type "E", 10,000 Ohms			
52	26345	Resistor, Type "E", 10,000 Ohms			
53	26345	Resistor, Type "E", 10,000 Ohms			
54	25526	Resistor, Type "E", 15,000 Ohms			
55	26353	Resistor, Type "E", 47,000 Ohms			
56	26353	Resistor, Type "E", 47,000 Ohms			
57	26357	Resistor, Type "E", .1 Megohm			
58	26357	Resistor, Type "E", .1 Megohm			
59	26264	Range Switch			
60	26369	Resistor, Type "E", 1 Megohm			
61	26369	Resistor, Type "E", 1 Megohm			
62	25487	Capacitor, .001 Mf.			
63	25489	Capacitor, .00125 Mf.			

### MISCELLANEOUS PARTS

Piece Number	Part
26250	Cone Assembly (For P-26170 Speaker)
25492	Cone Assembly (For P-26171 Speaker)
26043	Plug (For Loud Speaker Cable)
26369	Resistor, Type "E", 1 Megohm (Used at Socket of No. 6E5 Tube)
26147	Pilot Lamp Socket
26303	Knob (For Volume Control, Used only on No. 140-H Receiver)
26302	Knob (For Volume Control, Used on Nos. 140-K, 140-L, and 140-P Receivers)
26307	Knob (For "Stations" Selector Control Shaft, Used only on No. 140-H Receiver)
26305	Knob (For "Stations" Selector Control Shaft, Used on Nos. 140-K, 140-L, and 140-P Receivers)
26308	Knob (For "Vernier" Stations Selector Control Shaft, Used only on No. 140-H Receiver)
26306	Knob (For "Vernier" Stations Selector Control Shaft, Used on Nos. 140-K, 140-L, and 140-P Receivers)
26390	Knob (For Range Switch, Used only on No. 140-H Receiver)
26389	Knob (For Range Switch, Used on Nos. 140-K, 140-L, and 140-P Receivers)
26298	Knob (For "Off-On" Switch and Tone Control, Used only on No. 140-H Receiver)
26384	Knob (For "Off-On" Switch and Tone Control, Used on Nos. 140-K, 140-L, and 140-P Receivers)
26697	Knob (For Radio-Phono Control, Used only on No. 140-P Receivers)

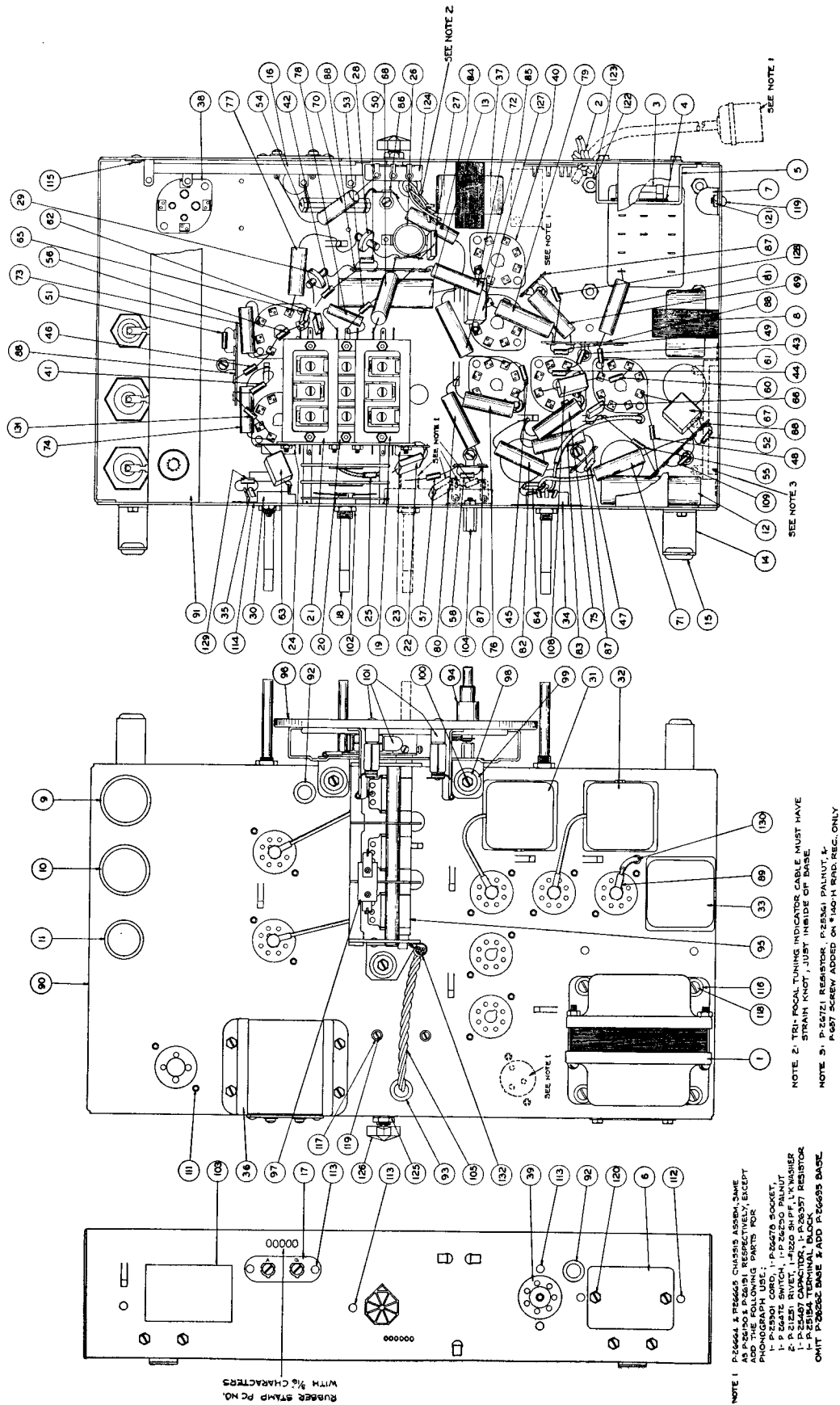


Fig. 5. Chassis Assembly.