

Engineering Data

Stromberg-Carlson No. 150 Radio Receiver

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY
Rochester, New York

ELECTRICAL SPECIFICATIONS

Type of Circuit.....	Superheterodyne
Tuning Ranges—	
X—145 to 370 Kc.; A—530 to 1700 Kc.; B—1700 to 5600 Kc.; C—5600 to 18,000 Kc.; D—18,000 to 60,000 Kc.	
Number and Types of Tubes.....	4 No. 6K7, 1 No. 6A8, 1 No. 6J7, 2 No. 6H6, 2 No. 6L6, 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.....	167 Watts
Frequency of Intermediate Amplifier.....	465 Kilocycles

APPARATUS SPECIFICATIONS

No. 150-L.....	50 to 60 Cycles; P-26454 Chassis Assembly; P-26170 Loud Speaker
No. 150-LB.....	25 to 60 Cycles; P-26455 Chassis Assembly; P-26170 Loud Speaker

CIRCUIT DESCRIPTION

The No. 150 Receiver is a twelve tube, "Adjustable High Fidelity" receiver employing metal tubes, including the new "Beam" power tubes. There are five tuning ranges in this receiver, one of which is the Ultra-Short Wave range. This range is also referred to as the Ultra-High Frequency (U. H. F.) range and also as the "D" band. This receiver uses a Carpinchoe high fidelity dynamic speaker, and has incorporated in it the exclusive "Patent Applied For", Stromberg-Carlson "Tri-Focal" tuning system and 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. Audio reproduction is further improved in this receiver 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.

Maximum selectivity between adjacent stations located in the standard broadcast band is obtained by the use of an additional tuned radio frequency ("Bi-resonator") circuit. When either the "X", "B", "C", or "D" ranges are in operation, this additional tuned radio frequency circuit is automatically cut out of the receiver circuit. Adjustable high fidelity is obtained from this receiver by means of the variable band width, intermediate frequency transformers which are used in the two intermediate amplifier stages.

The various tubes are used in this receiver as follows: One No. 6K7 tube is used in the R. F. Amplifier, one No. 6K7 is used in the First I. F. Amplifier, another No. 6K7 is used in the Second I. F. Amplifier, and the remaining No. 6K7 tube is used in the Audio Amplifier. The No. 6A8 tube is used as a Modulator tube, and the No. 6J7 tube is used as the Oscillator tube. One No. 6H6 tube is used as the Demodulator tube, and the other No. 6H6 tube is used as the Automatic Volume Control tube. The two No. 6L6 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.

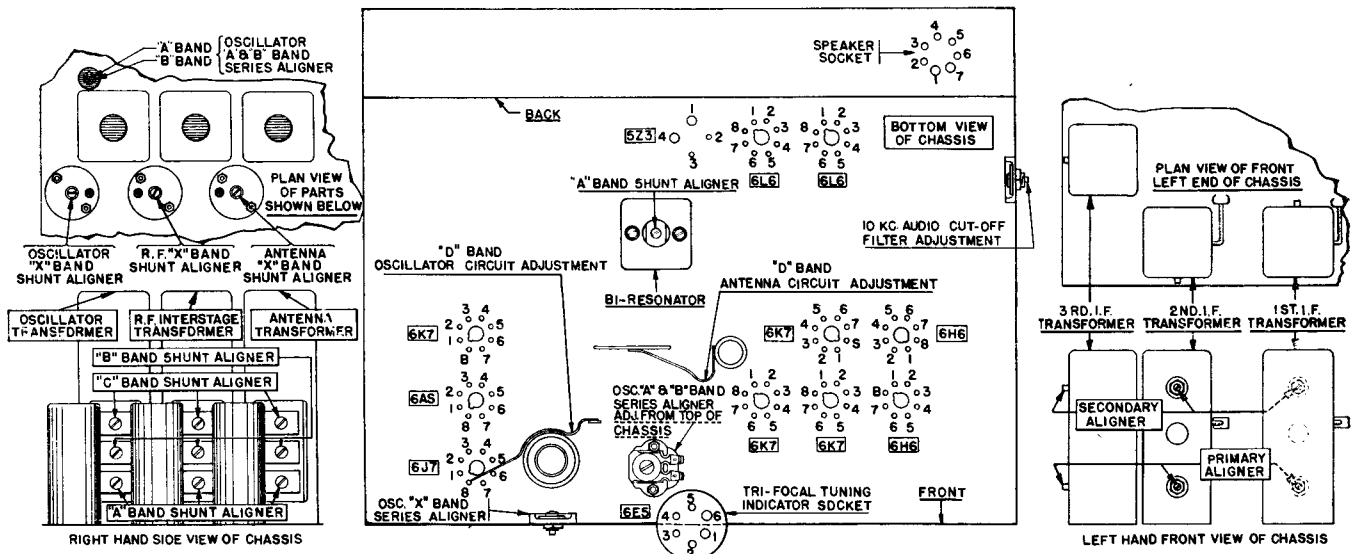


Fig. 1. Terminal Layout for Voltage Measurement Chart and Location of the Various Aligning Capacitors.

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 1 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	+210	+ 95	+6.5	—	<i>6.3</i>	+6.5	2-7	<i>6.3</i>
6A8	Modulator	0	0	0	+210	+ 95	— 35	+ 95	<i>6.3</i>	+5.5	2-7	<i>6.3</i>
6J7	Oscillator	— 65	0	0	+200	+125	0	—	<i>6.3</i>	0	2-7	<i>6.3</i>
6K7	1st I. F. Amp.	0	0	0	+210	+ 95	+ 7	+ 4	<i>6.3</i>	+ 7	2-7	<i>6.3</i>
6K7	2nd I. F. Amp.	0	0	0	+210	+ 95	+ 6	+2.5	<i>6.3</i>	+ 6	2-7	<i>6.3</i>
6H6	Demodulator	—	0	0	— .3	0	— .3	+ 4	<i>6.3</i>	0	2-7	<i>6.3</i>
6H6	A. V. C.	—	0	0	0	+ 6	0	0	<i>6.3</i>	+ 6	2-7	<i>6.3</i>
6K7	Audio Amp.	0	0	0	+135*	+ .2	+ .7	—	<i>6.3</i>	+ .7	2-7	<i>6.3</i>
6L6's	Audio Output	—	0	0	+360	+235	0	—	<i>6.3</i>	+ 15	2-7	<i>6.3</i>
6E5	Tuning Ind.	—	<i>6.3</i>	+ .6	+6.6	+215	+ 6	0	—	—	1-6	<i>6.3</i>
5Z3	Rectifier	—	+380	<i>390</i>	<i>390</i>	+380	—	—	—	—	1-4	<i>4.8</i>
Speaker		—	+365	0	0	+375	+375	—	+235	—		

Voltage across vernier dial pilot lamp—5.3 volts
Receiver tuned to 1000 Kc., no signal. A. C. voltages are indicated by italics.

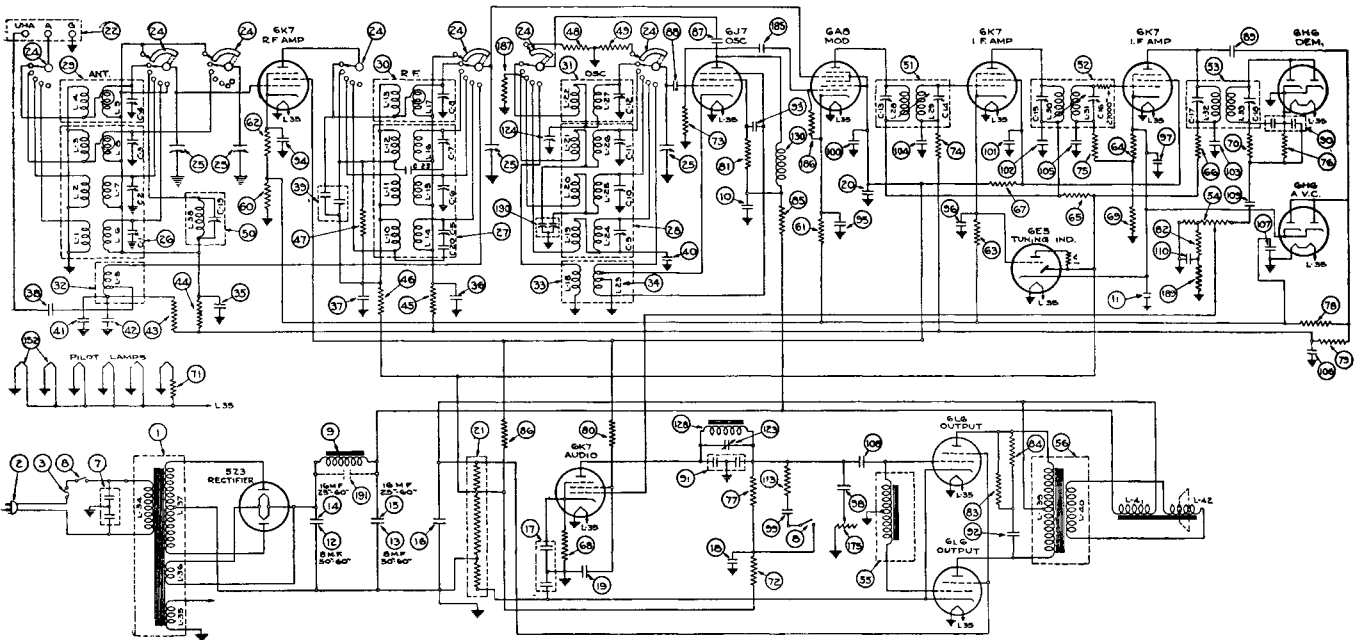


Fig. 2. Schematic Circuit of Receiver.

ALIGNMENT DATA

All alignment adjustments are accurately made at the factory on this receiver, 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 1 shows the location of all the aligning capacitors used in this receiver.

Intermediate Frequency Amplifier Adjustments

Because of the necessity of obtaining the proper shape of resonance curve of these stages in a high fidelity receiver, it is recommended that unless it is absolutely essential, these I. F. adjustments be untouched. In the factory these adjustments are made using a visual system which allows the operator to see the exact shape of the resonance curve. For this reason it is best to have these adjustments made at the factory. However, in the case where this cannot be done, the following procedure should be followed.

Operate the range switch of the receiver to the "A" range position. Set the tuning dial at its extreme low frequency position, and operate the "Tone-Fidelity" control knob so that the receiver is adjusted for the standard fidelity position as indicated by the fidelity indicator located on the front panel of the receiver. **Never attempt to align the I. F. circuits of this receiver with the "Tone-Fidelity" control set at any position other than the standard fidelity.** The I. F. circuits may then be checked for alignment by adjusting the aligning capacitors in the exact order as follows:

1. Secondary of 3rd I. F. Trans. (Capacitor C-18).
2. Primary of 3rd I. F. Trans. (Capacitor C-17).
3. Secondary of 2nd I. F. Trans. (Capacitor C-16).
4. Primary of 2nd I. F. Trans. (Capacitor C-15).
5. Secondary of 1st I. F. Trans. (Capacitor C-14).
6. Primary of 1st I. F. Trans. (Capacitor C-13).

Radio Frequency Adjustments

The alignment of the radio frequency circuits for the various ranges in this receiver should be very carefully made in the order and at the frequencies specified.

It will be noted that no instructions are given for aligning the receiver at other than two frequencies for any range. Each receiver is given an exacting check for "tracking" at various frequencies in each range before leaving the factory. It is felt by the manufacturers that should any receiver through accident require a check on the "tracking", it should be returned to the factory, where this may be easily and accurately done.

Alignment of Long-Wave-Weather Range (Also Referred to as "X" Band) Circuits

1. Oscillator's "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-12).
2. R. F. Interstage "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-8).
3. Antenna "X" Band Shunt Aligning Capacitor at 350 Kilocycles (Capacitor C-4).
4. Oscillator "X" Band Series Aligning Capacitor at 150 Kilocycles (Capacitor Item 124). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

Alignment of Standard Broadcast Range (Also Referred to as "A" Band) Circuits

1. Oscillator's "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-11).
2. R. F. Interstage "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-7).
3. Antenna "A" Band Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-3).
4. "A" Band, R. F. Bi-resonator Shunt Aligning Capacitor at 1500 Kilocycles (Capacitor C-19).
5. Oscillator "A" Band Series Aligning Capacitor at 600 Kilocycles (Capacitor with screw adjustment. Item 190). When operation No. 5 has been completed repeat operations 1, 2, 3, and 4 again and in the exact order given.

Alignment of Amateur, Police, and Aircraft Range (Also Referred to as "B" Band) Circuits

1. Oscillator's "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-10).
2. R. F. Interstage "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-6).
3. Antenna "B" Band Shunt Aligning Capacitor at 5 Megacycles (Capacitor C-2).
4. Oscillator "B" Band Series Aligning Capacitor at 1.8 Megacycles (Capacitor with nut adjustment. Item 190). When operation No. 4 has been completed repeat operations 1, 2, and 3 again and in the exact order given.

Alignment of Short-Wave-Foreign Range (Also Referred to as "C" Band) Circuits

1. Oscillator's "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-9).
2. R. F. Interstage "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-5).
3. Antenna "C" Band Shunt Aligning Capacitor at 16 Megacycles (Capacitor C-1).

Alignment of Ultra Short-Wave Range (Also Referred to as "D" Band) Circuits

1. The only adjustment which it is necessary to make for bringing the "D" Band Oscillator's circuit into alignment is accomplished by bending the ground loop (shown in Figure 1 as "D" Band Oscillator Circuit Adjustment) either closer to the coil or farther away from the coil. This adjustment should be made with the signal generator set to a frequency of 20 megacycles.
2. The only adjustment which it is necessary to make for bringing the "D" Band Antenna's Circuit into alignment is accomplished by bending the grid lead loop (shown in Figure 1 as "D" Band Antenna Circuit Adjustment) so as to form either a smaller or larger loop. This adjustment should also be made with the signal generator set to a frequency of 20 megacycles.

Adjustment of 10 Kilocycle Audio Cut-Off Filter

The adjustment of this filter is correctly made at the factory and no additional adjustment is required.

REPLACEMENT PARTS

Item Number	Piece Number	Part	Item Number	Piece Number	Part
1	26685	Power Transformer (50 to 60 Cycles Chassis)	87	25487	Capacitor, Type "W", .001 Mf.
2	26686	Power Transformer (25 to 60 Cycles Chassis)	88	24560	Capacitor, Type "Q", 50 Mmf.
3	24268	Cord (Power Supply)	89	24560	Capacitor, Type "Q", 50 Mmf.
4	23234	Fuse, 2½ Amperes	90	26512	Capacitor, Type "W", 2—100 Mmf.
7	21535	Capacitor Assembly (2—.01 Mf. Capacitors)	91	26512	Capacitor, Type "W", 2—100 Mmf.
8	26061	Switch ("Off-On" and Bass Control)	92	25535	Capacitor, Type 3L, .008 Mf.
9	26704	Choke Assembly (Filter of Rectifier)	93	25535	Capacitor, Type 3L, .008 Mf.
10	25783	Electrolytic Capacitor, 1 Mf., 450 Volts	94	24402	Capacitor Assembly, .1 Mf.
11	24207	Electrolytic Capacitor, 12 Mf., 25 Volts	95	24402	Capacitor Assembly, .1 Mf.
12	22757	Electrolytic Capacitor, 8 Mf., 500 Volts	96	24402	Capacitor Assembly, .1 Mf.
13	22757	Electrolytic Capacitor, 8 Mf., 500 Volts	97	24402	Capacitor Assembly, .1 Mf.
14	26510	Electrolytic Capacitor, 16 Mf., 500 Volts	98	25149	Capacitor Assembly, .01 Mf.
15	26510	Electrolytic Capacitor, 16 Mf., 500 Volts	99	25149	Capacitor Assembly, .01 Mf.
16	26773	Electrolytic Capacitor, 16 Mf., 350 Volts	100	24994	Capacitor Assembly, .05 Mf.
17	25498	Electrolytic Capacitor (2—10 Mf.), 25 Volts	101	24994	Capacitor Assembly, .05 Mf.
18	24580	Electrolytic Capacitor, 4 Mf., 450 Volts	102	24994	Capacitor Assembly, .05 Mf.
19	26693	Electrolytic Capacitor, 4 Mf., 350 Volts	103	24994	Capacitor Assembly, .05 Mf.
20	26693	Electrolytic Capacitor, 4 Mf., 350 Volts	104	24405	Capacitor Assembly, .04 Mf.
21	26736	Resistor, "B" Voltage Divider	105	24405	Capacitor Assembly, .04 Mf.
24	26746	Range Switch Assembly	106	24405	Capacitor Assembly, .04 Mf.
25	26444	Gang Tuning Capacitor Assembly	107	24405	Capacitor Assembly, .04 Mf.
26	26446	Coil Assembly, Antenna ("A", "B" and "C" Ranges)	108	24405	Capacitor Assembly, .04 Mf.
27	26447	Coil Assembly, R. F. ("A", "R" and "C" Ranges)	109	24405	Capacitor Assembly, .04 Mf.
28	26448	Coil Assembly, Oscillator ("A", "R" and "C" Ranges)	110	24405	Capacitor Assembly, .04 Mf.
29	26507	Coil Assembly, Antenna ("X" Range)	113	26349	Resistor, Type "E", 22,000 Ohms
30	26508	Coil Assembly, R. F. ("X" Range)	123	26568	Adjustable Capacitor (High Frequency Cut-Off Filter)
31	26509	Coil Assembly, Oscillator ("X" Range)	124	26569	Capacitor (Oscillator Series Aligner, "X" Range)
32	26758	Coil Assembly, Antenna ("D" Range)	125	26485	Potentiometer and Bracket Assembly (Tone Control and High Fidelity)
33	26787	Oscillator Primary Coil ("D" Range)	128	26515	Coil Assembly (High Frequency Cut Off Filter)
34	26765	Oscillator Secondary Coil ("D" Range)	130	25814	Choke Assembly, 5 Millihenrys
35	24405	Capacitor Assembly, .04 Mf.	132	26519	Drive Disc Assembly
36	24405	Capacitor Assembly, .04 Mf.	133	26570	Dial Bracket Assembly
37	24994	Capacitor Assembly, .05 Mf.	184	26534	Bar Assembly (Pulley)
39	26513	Capacitor (2—200 Mmf.)	135	26211	Pulley
40	26944	Capacitor, .004 Mf.	136	26518	Gear Assembly
41	24637	Capacitor, .0017 Mf.	137	26220	Drive Shaft Assembly
42	24637	Capacitor, .0017 Mf.	138	26520	Dial Assembly (Secondary)
43	26357	Resistor, Type "E", .1 Megohm	139	26694	Dial Assembly (Main)
44	26357	Resistor, Type "E", .1 Megohm	140	26672	Drive Cord Assembly (Volume Indicator Disc)
45	26357	Resistor, Type "E", .1 Megohm	141	26683	Cord Assembly (Dial Elevator)
46	26333	Resistor, Type "E", 1000 Ohms	142	26226	Spring
47	26353	Resistor, Type "E", 47,000 Ohms	143	26555	Volume Indicator Disc Assembly
48	26321	Resistor, Type "E", 100 Ohms	144	26608	Fidelity Indicator Disc Assembly
49	26321	Resistor, Type "E", 100 Ohms	145	26572	Bracket Assembly
50	26474	Coil Assembly (Bi-Resonator)	146	26682	Reel Assembly (Range Switch)
51	26481	1st I. F. Transformer	147	26667	Reel Assembly (Tone-Fidelity Control)
52	26482	2nd I. F. Transformer	148	26666	Reel Assembly (Volume Control)
53	26243	3rd I. F. Transformer	149	26580	Front Dial Plate Assembly
54	26077	Potentiometer (Volume Control)	150	26147	Lamp Socket
55	26700	Transformer Assembly, Audio Input	151	26257	Lamp Shades
56	26702	Transformer Assembly, Audio Output	152	26287	Pilot Lamp
57	22988	Socket, 4 Prong	155	26497	Cable Assembly, Tri-Focal Indicator
58	23517	Socket, 7 Prong	156	26692	Lamp Socket Assembly
59	25539	Socket, 8 Prong	175	26439	Potentiometer
60	26324	Resistor, Type "E", 180 Ohms	176	26673	Drive Cord Assembly (Fidelity Indicator Disc)
61	26326	Resistor, Type "E", 270 Ohms	185	24560	Capacitor, Type "Q", 50 Mmf.
62	26328	Resistor, Type "E", 390 Ohms	186	26357	Resistor, Type "E", .1 Megohm
63	26330	Resistor, Type "E", 560 Ohms	187	26341	Resistor, Type "E", 4700 Ohms
64	26330	Resistor, Type "E", 560 Ohms	189	26345	Resistor, Type "E", 10,000 Ohms
65	26330	Resistor, Type "E", 560 Ohms	190	26564	Capacitor Assembly, Oscillator Series Aligners ("A" and "B" Ranges)
66	26333	Resistor, Type "E", 1000 Ohms	191	22775	Capacitor Assembly, .3 Mf.
67	26333	Resistor, Type "E", 1000 Ohms			
68	26338	Resistor, Type "E", 2700 Ohms			
69	26328	Resistor, Type "E", 390 Ohms			
70	26345	Resistor, Type "E", 10,000 Ohms			
71	26780	Resistor, Flexible, 3.5 Ohms (Pilot Lamp)			
72	26353	Resistor, Type "E", 47,000 Ohms			
73	26353	Resistor, Type "E", 47,000 Ohms			
74	26357	Resistor, Type "E", .1 Megohm			
75	26357	Resistor, Type "E", .1 Megohm			
76	26357	Resistor, Type "E", .1 Megohm			
77	26357	Resistor, Type "E", .1 Megohm			
78	26369	Resistor, Type "E", 1 Megohm			
79	26369	Resistor, Type "E", 1 Megohm			
80	26369	Resistor, Type "E", 1 Megohm			
81	26349	Resistor, Type "E", 22,000 Ohms			
82	26341	Resistor, Type "E", 4700 Ohms			
83	26775	Resistor, Type "F", 20,000 Ohms			
84	26775	Resistor, Type "F", 20,000 Ohms			
85	26776	Resistor, Type "F", 12,000 Ohms			
86	25526	Resistor, Type "F", 15,000 Ohms			

MISCELLANEOUS PARTS

Piece Number	Part
26250	Cone Assembly (For P-26170 Speaker)
26043	Plug (For Loud Speaker Cable)
26369	Resistor, Type "E", 1 Megohm (Used at Socket of No. 6E5 Tube)
26302	Knob (For "Volume" Control)
26299	Knob (For "Tone-Fidelity" Control)
26305	Knob (For "Stations" Selector Control Shaft)
26306	Knob (For "Vernier" Stations Selector Control Shaft)
26301	Knob (For "Range" Switch)
26300	Knob (For "Off-On-Bass" Control)