

SEEBURG

TRANSISTORIZED STEREO AMPLIFIER

TYPE TSA1

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This is a fully transistorized dual channel stereo, low distortion, wide frequency range, constant voltage type amplifier. It is part of the Seeburg Stereophonic Sound System that includes the Seeburg stereo pickup, one or more pairs of Seeburg twin stereo speakers, as well as a speaker coupling network and speakers mounted in the cabinet.

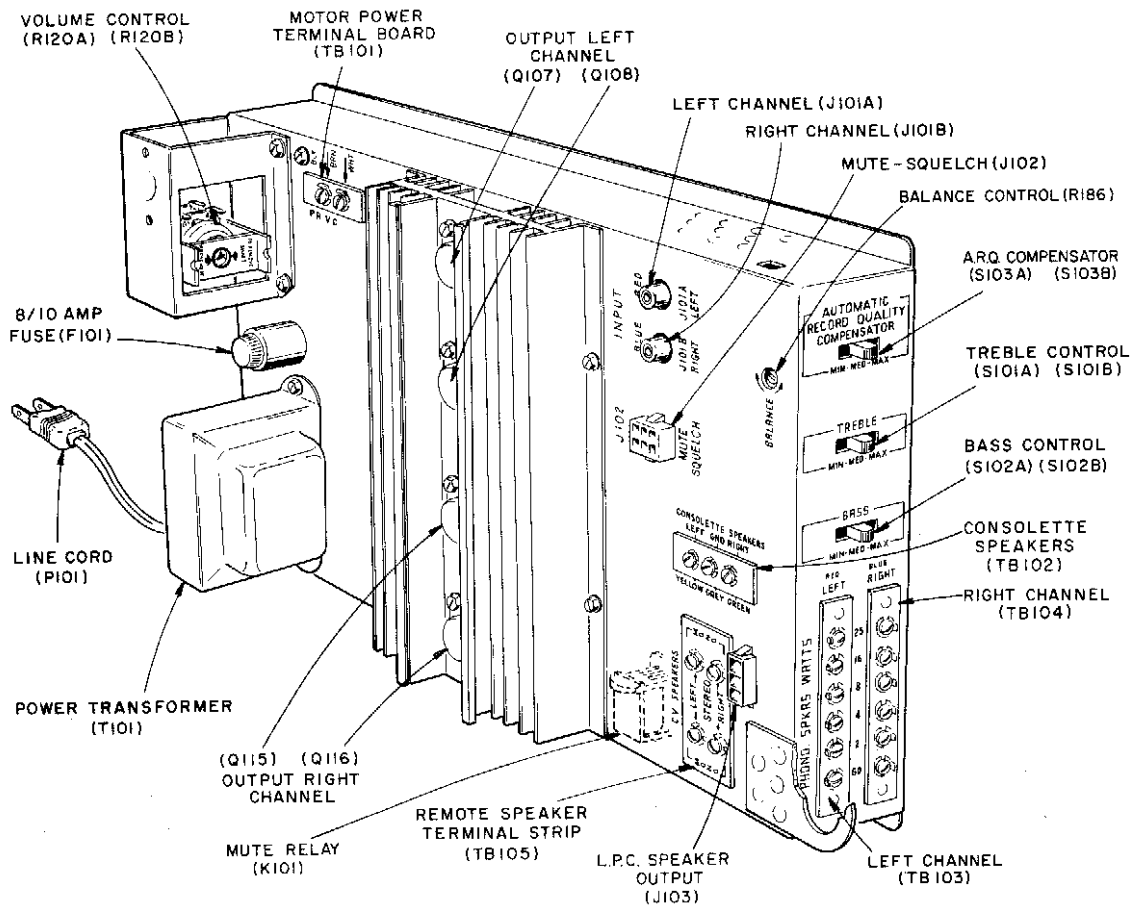
The two output signals of the low impedance magnetic pickup of the Select-O-Matic mechanism are connected to the amplifier through the input sockets and have a nominal signal level for each channel of five millivolts. Both signals are independently amplified, one in the left channel, one in the right channel. Each channel is complete with the tone controls and the volume control mechanically linked to provide equal and simultaneous positioning.

The output transformers of each channel have low and high impedance terminals. Each low impedance winding drives the phonograph speak-

ers whose connections are made through the speaker terminal boards, TB103 and TB104. On some phonograph models, the low impedance winding also drives a 16-ohm directional speaker (accessory) mounted on the phonograph and connected to socket J103. Stereo Consolette 32-ohm speakers are connected to the low impedance winding through terminal board TB102.

The high impedance secondaries of the output transformers are 70-volt C.V. outputs that terminate at A and B terminals of the remote speaker terminal strip, TB105. These outputs drive the side channels of one or more external stereo speakers that have, in their enclosure, a highpass network. External speakers for monaural operation may be connected to the remote speaker terminal strip, terminals A1 and B2 or to A2 and B1.

The total output power for each channel is divided between the directional speakers (on some phonograph models), the Stereo Consolette



NOTE: CONSOLETTA SPEAKERS, 32 OHMS; ALL OTHERS 16 OHMS; REFLECTED IMPEDANCE OF CABINET SPEAKERS AND COUPLING NETWORK, 16 OHMS EACH CHANNEL.

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speakers, the cabinet speakers in the phonograph and the external stereo speakers. The output power to the speakers in the phonograph and the external stereo speakers can be varied by positioning the phonograph speaker terminals and the loading taps on the external speakers. The phonograph speaker terminals are calibrated in watts with reference to the power delivered at full output by each output transformer to the 16-ohm phonograph speaker load. The output power to the directional speakers, when used, is fixed at 4 watts for each channel. The output to the Console speakers is connected to the 2 watt transformer tap; however, since the speaker impedance is 32 ohms, the effective power is one watt per speaker. The total load of the cabinet speakers in the phonograph as indicated on the speaker terminals and the load of remote speakers must not be greater than 25 watts for each channel.

Automatic volume compensation is incorporated in this amplifier to compensate for variations in the average volume levels of different records and makes possible a volume control setting for normal records without danger of "blasting" or high volume due to exceptionally loud records.

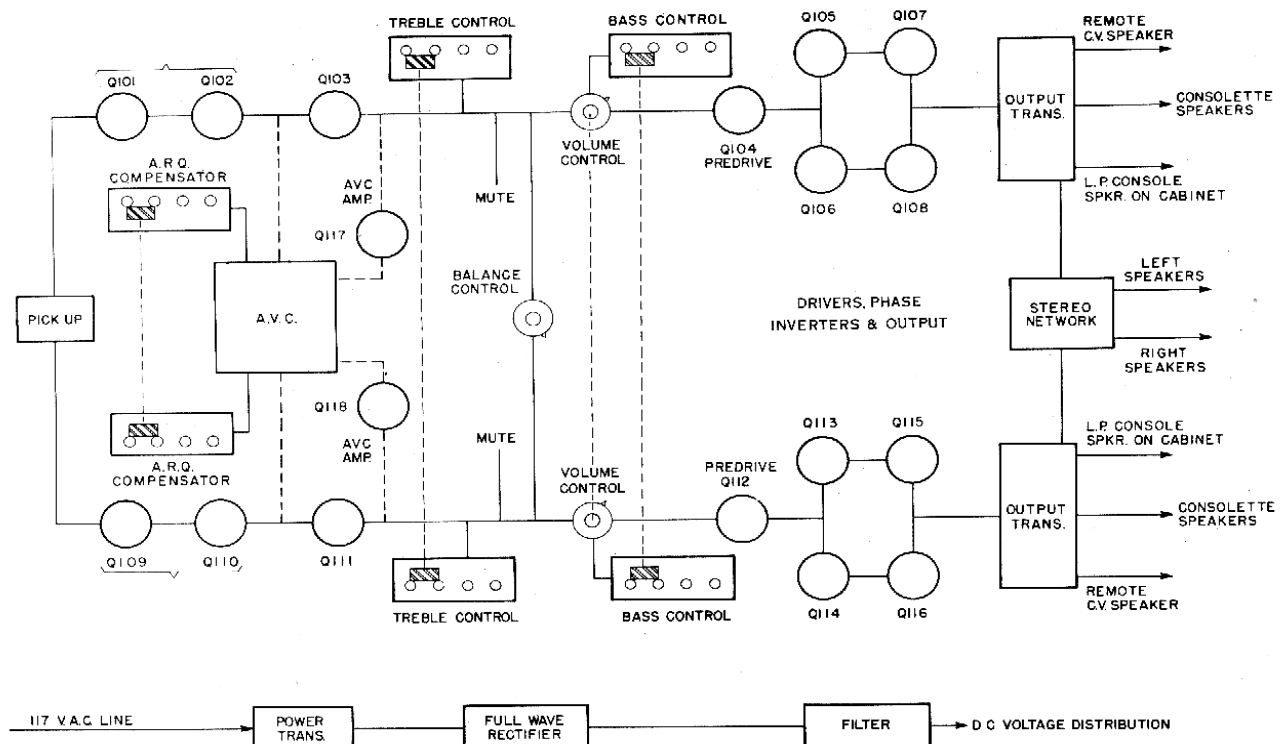
The output of the AVC amplifier transistors Q117 and Q118 is rectified by the back-to-back selenium rectifier (CR105) the output of which is applied as a varying DC bias to two pairs of matched selenium diodes (CR103) and

CR104). Varying the DC bias on these diodes varies inversely the AC reactance and consequently controls the signal level at the bases of voltage amplifier transistors Q103 and Q111. The back-to-back selenium rectifier (CR105) also permits squelch voltage to be applied when a record is not being played.

A mute relay (K101) located in the amplifier is energized through the trip switch and allied circuits in the phonograph. It serves to mute the amplifier by grounding the signal circuits, to control the amplifier squelch operation and initiate transfer of a record from playing position.

An Automatic Record Quality Compensator switch (S103A and S103B) controls attenuation in the AVC circuit. Its use permits full range operation of the amplifier, but automatically reduces record surface noise when music is at low level.

The volume control adjusts the level of sound from the Select-O-Matic speakers and the remote speakers. It is located on the amplifier so it is accessible from the back of the cabinet. A Powered Remote Volume Control, Type PRVC2 or PRVC3, may be used by installation of a motor on the amplifier volume control. The motor is remotely controlled to increase or decrease the phonograph volume.

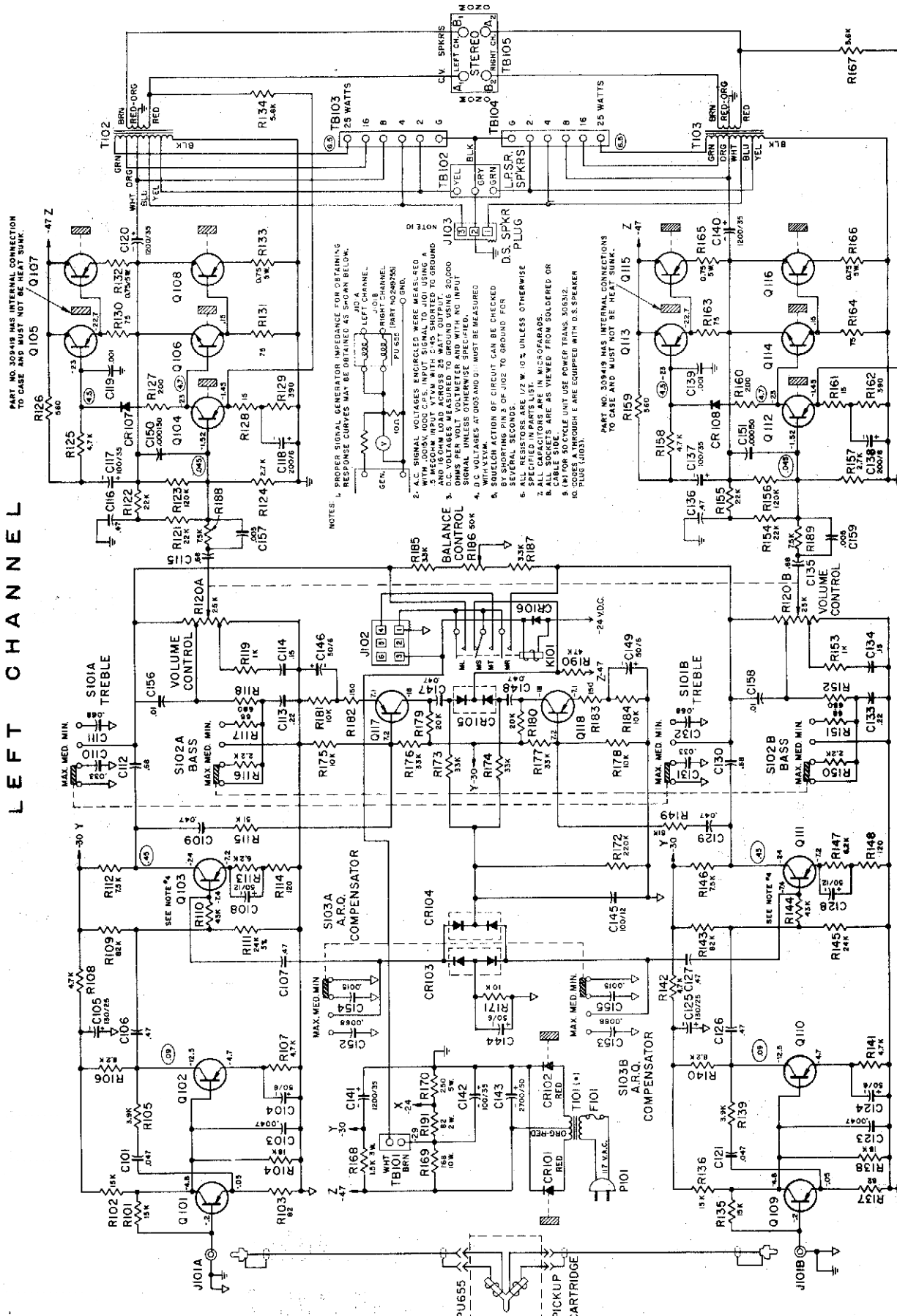


Amplifier Block Diagram.

TRANSISTORIZED STEREO AMPLIFIER, Type TSA1

LEFT CHANNEL

RIGHT CHANNEL



Schematic Diagram for Transistorized Stereo Amplifier, Type TSA1.

TRANSISTORIZED STEREO AMPLIFIER, Type TSA1 (Code F)

Item	Part No.	Description	Item	Part No.	Description	Item	Part No.	Description	Item	Part No.	Description
C101	86327	0.047 Mfd. 50 V. Mylar	C152	86332	0.0068 Mfd. 50 V. Mylar	R109	82447	82000 Ohm 1/2 W. 10%	R157	82670	2700 Ohm 1/2 W. 5%
C103	86330	0.0047 Mfd. 50 V. Mylar	C153	86240	0.0015 Mfd. Ceramic	R110	82678	43000 Ohm 1/2 W. 5%	R158	82630	6800 Ohm 1/2 W. 5%
C104	87696	50 Mfd. 6 V. Lytic	C154	86313	0.01 Mfd. Ceramic	R111	82605	24000 Ohm 1/2 W. 5%	R159	82421	560 Ohm 1/2 W. 10%
C105	87717	130 Mfd. 25 V. Lytic	C155	86254	0.005 Mfd. Ceramic	R112	308962	12,000 Ohm 1/2 W. 5%	R160	82686	240 Ohm 1/2 W. 5%
C106	86329	0.47 Mfd. 50 V. Mylar	C157	86313	0.01 Mfd. Ceramic	R113	82610	6200 Ohm 1/2 W. 5%	R161	82402	15 Ohm 1/2 W. 10%
C107	87703	50 Mfd. 12 V. Lytic	C158	86254	0.005 Mfd. Ceramic	R114	82413	120 Ohm 1/2 W. 10%	R162	82688	390 Ohm 1/2 W. 5%
C108	86327	0.047 Mfd. 50 V. Mylar	CR101	309387	Silicon Rectifier U-212	R115	82796	51000 Ohm 1/2 W. 5%	R163	82649	75 Ohm 1/2 W. 5%
C109	86336	0.033 Mfd. 50 V. Mylar	CR102	309398	Dual Selenium Diode	R116	82428	2200 Ohm 1/2 W. 10%	R164	81231	0.75 Ohm 5 W. 10%
C110	86351	0.068 Mfd. 50 V. Mylar	CR103	309397	Dual Selenium Diode	R117	82410	68 Ohm 1/2 W. 10%	R165	82433	5600 Ohm 1/2 W. 10%
C111	86354	0.68 Mfd. 50 V. Mylar	CR104	309399	Dual Selenium Diode	R118	82422	680 Ohm 1/2 W. 10%	R166	81242	1500 Ohm 3 W. 10%
C112	86331	0.22 Mfd. 50 V. Mylar	CR105	309399	Dual Selenium Diode	R119	82424	1900 Ohm 1/2 W. 10%	R167	81243	168 Ohm 10 W. 10%
C113	86303	0.15 Mfd. 50 V. Mylar	CR106	309384	Semi Conductor Rectifier (Silicon)	R120A	306318	Volume Control 25,000 Ohm.	R168	81201	250 Ohm 5 W. 10%
C114	86354	0.68 Mfd. 50 V. Mylar	CR107	309316	8/10 Amp. Ste-Blo	R120B			R169	82436	10,000 Ohm 1/2 W. 10%
C115	86329	0.47 Mfd. 50 V. Mylar	CR108	306306	Input Socket	R121	82639	22000 Ohm 1/2 W. 5%	R170	82436	10,000 Ohm 1/2 W. 10%
C116	87700	100 Mfd. 35 V. Lytic	F101	306316	8/10 Amp. Ste-Blo	R122	82899	120,000 Ohm 1/2 W. 5%	R171	82436	10,000 Ohm 1/2 W. 10%
C117	87702	200 Mfd. 6 V. Lytic	J101A	306302	Mute Jack	R123	82670	2700 Ohm 1/2 W. 5%	R172	82452	220,000 Ohm 1/2 W. 10%
C118	86309	0.001 Mfd. Ceramic	J101B	306302	Mute Jack	R124	82630	6800 Ohm 1/2 W. 5%	R173	82442	33,000 Ohm 1/2 W. 10%
C119	87718	1200 Mfd. 35 V. Lytic	J102	803725	D.S. Output Jack	R125	82630	6800 Ohm 1/2 W. 5%	R174	82436	10,000 Ohm 1/2 W. 10%
C120	86327	0.047 Mfd. 50 V. Mylar	J103	803725	D.S. Output Jack	R126	82421	560 Ohm 1/2 W. 10%	R175	82442	33,000 Ohm 1/2 W. 10%
C121	86330	0.0047 Mfd. 50 V. Mylar	K101	306352	Mute Trip Relay	R127	82686	240 Ohm 1/2 W. 5%	R176	82436	10,000 Ohm 1/2 W. 10%
C122	87696	50 Mfd. 6 V. Lytic	Q101	309413	GC-112A PNP Low Noise Germ. Transistor	R128	82402	15 Ohm 1/2 W. 10%	R177	82436	10,000 Ohm 1/2 W. 10%
C123	86329	0.47 Mfd. 50 V. Mylar	Q102	309414	GC-112 PNP Germ. Transistor	R129	82688	390 Ohm 1/2 W. 5%	R178	82601	20,000 Ohm 1/2 W. 5%
C124	87703	50 Mfd. 12 V. Lytic	Q103	309420	GC-380 PNP High Gain Germ. Transistor	R130	82649	75 Ohm 1/2 W. 5%	R179	82436	10,000 Ohm 1/2 W. 10%
C126	87703	50 Mfd. 12 V. Lytic	Q104	309421	RCA 34573 PNP Germ. Transistor	R131	81231	0.75 Ohm 5 W. 10%	R180	82414	150 Ohm 1/2 W. 10%
C128	86327	0.047 Mfd. 50 V. Mylar	Q105	309419	SC-365 PNP Silicon Transistor	R132	82433	5600 Ohm 1/2 W. 10%	R181	82436	10,000 Ohm 1/2 W. 10%
C129	86354	0.68 Mfd. 50 V. Mylar	Q106	309418	SC-350 NPN Silicon Transistor	R133	308967	15000 Ohm 1/2 W. 10%	R182	82436	10,000 Ohm 1/2 W. 10%
C130	86336	0.033 Mfd. 50 V. Mylar	Q107	309412	GC-114 PNP Germ. Power Transistor	R134	82411	82 Ohm 1/2 W. 10%	R183	82430	3300 Ohm 1/2 W. 10%
C131	86351	0.068 Mfd. 50 V. Mylar	Q108	309413	GC-112A PNP Low Noise Germ. Transistor	R135	82439	18000 Ohm 1/2 W. 10%	R184	306319	50,000 Ohm Balance Control
C132	86331	0.22 Mfd. 50 V. Mylar	Q109	309414	GC-112 PNP Germ. Transistor	R136	82626	3900 Ohm 1/2 W. 5%	R185	82430	3300 Ohm 1/2 W. 10%
C133	86303	0.15 Mfd. 50 V. Mylar	Q110	309420	GC-380 PNP High Gain Germ. Transistor	R137	308968	8200 Ohm 1/2 W. 10%	R186	82631	7500 Ohm 1/2 W. 5%
C134	86354	0.68 Mfd. 50 V. Mylar	Q111	309421	RCA 34573 PNP Germ. Transistor	R138	82432	4700 Ohm 1/2 W. 10%	R187	82444	47000 Ohm 1/2 W. 10%
C135	86329	0.47 Mfd. 50 V. Mylar	Q112	309419	SC-365 PNP Silicon Transistor	R139	82413	120 Ohm 1/2 W. 10%	R188	81237	82 Ohm 2 W. 10%
C136	87700	100 Mfd. 35 V. Lytic	Q113	309418	SC-350 NPN Silicon Transistor	R140	82432	4700 Ohm 1/2 W. 10%	R189		
C137	87702	200 Mfd. 6 V. Lytic	Q114	309418	GC-114 PNP Germ. Power Transistor	R141	82432	4700 Ohm 1/2 W. 10%	R190		
C138	86309	0.001 Mfd. Ceramic	Q115	309412	GC-112 PNP Germ. Transistor	R142	82447	82000 Ohm 1/2 W. 10%	R191		
C139	87718	1200 Mfd. 35 V. Lytic	Q116	309414	GC-112 PNP Germ. Transistor	R143	82678	43000 Ohm 1/2 W. 5%	S101	306329	Treble Switch
C140	87718	1200 Mfd. 35 V. Lytic	Q117	308967	15000 Ohm. 1/2 W. 10%	R144	82605	24000 Ohm 1/2 W. 5%	S102	306329	Bass Switch
C141	87700	100 Mfd. 35 V. Lytic	Q118	308967	15000 Ohm. 1/2 W. 10%	R145	82650	12,000 Ohm 1/2 W. 5%	S103	306329	Auto. Record Quality Compensator
C142	87721	2700 Mfd. 50 V. Lytic	R101	82411	82 Ohm 1/2 W. 10%	R146	308962	12,000 Ohm 1/2 W. 5%	T101	306312	Power Transformer for 50 cycles
C143	87696	50 Mfd. 6 V. Lytic	R102	82439	18000 Ohm 1/2 W. 10%	R147	82610	6200 Ohm 1/2 W. 5%	T102	306311	Power Transformer for 60 cycles
C144	87724	50 Mfd. 12 V. Lytic	R103	82626	3900 Ohm 1/2 W. 5%	R148	82413	120 Ohm 1/2 W. 10%	T103	306314	Output Transformer
C145	87696	50 Mfd. 6 V. Lytic	R104	82626	3900 Ohm 1/2 W. 5%	R149	82796	51000 Ohm 1/2 W. 5%	TB101	306313	Output Transformer
C146	86327	0.047 Mfd. 50 V. Mylar	R105	82626	3900 Ohm 1/2 W. 5%	R150	82428	2200 Ohm 1/2 W. 10%	TB102	306343	2 Lug Terminal Board
C147	87696	50 Mfd. 6 V. Lytic	R106	82626	3900 Ohm 1/2 W. 5%	R151	82410	68 Ohm 1/2 W. 10%	TB103	305831	3 Lug Terminal Board
C148	87696	50 Mfd. 6 V. Lytic	R107	82432	4700 Ohm 1/2 W. 10%	R152	82422	680 Ohm 1/2 W. 10%	TB104	306304	6 Lug Terminal Board
C149	87696	50 Mfd. 6 V. Lytic	R108	82626	3900 Ohm 1/2 W. 10%	R153	82424	1000 Ohm 1/2 W. 10%	TB105	306338	4 Lug Terminal Board
C150	86243	0.000150 Mfd. Ceramic				R154	82639	22000 Ohm 1/2 W. 5%			
C151						R155	82899	120,000 Ohm 1/2 W. 5%			