RCA VICTOR MODEL R-99

High-Fidelity Electrola

TECHNICAL INFORMATION

Electrical Specifications

RADIOTRON COMPLEMENT

(1) RCA-6L7.....Audio Volume Expander
(2) RCA-6C5.....Audio Driver
(3) RCA-2A3.....Power Output
(4) RCA-2A3.....Power Output
(5) RCA-6C5.....Expander Amplifier
(6) RCA-6H6.....Expander Rectifier
(7) RCA-5Z3.....Full-Wave Rectifier

Audio Frequency Range.....Approximately 30 to 8,000 cycles

POWER OUTPUT

Undistorted.....12 watts
Maximum.....15 watts

PICKUP

Type.....Low Impedance Magnetic
Impedance.....100 ohms at 1,000 cycles

LOUDSPEAKER

Type.....Super 12-inch Electrodynamic
Impedance (V.C.).....11¼ ohms at 400 cycles

PHONOGRAPH (MANUAL OPERATED)

Motor.....Synchronous Type
Speed (at rated frequency).....78 r.p.m.

POWER-SUPPLY RATINGS

Voltage.....105-125 volts
Frequency (two types).....50 or 60 cycles
Power Consumption.....180 watts

Mechanical Specifications

Height.....34 inches
Width.....25⅛ inches
Depth.....14⅞ inches
Weight (net).....112 pounds
Weight (shipping).....156 pounds
Amplifier Base Dimensions.....16¼ inches x 7½ inches x 2¾ inches
Over-all Amplifier Height.....7⅝ inches
Operating Controls.....(1) Power Switch—Tone, (2) Dynamic Expander, (3) Volume

General Description

The RCA Victor Model R-99 High-Fidelity Electrola comprises the ultimate in present-day record reproduction. It consists of the revolutionary dynamic expander; a high-quality, high-power output, power amplifier; a 12-inch, aluminum voice-coil, electrodynamic loudspeaker with a high-frequency tone diffuser; a light weight, high-fidelity pickup; an acoustically tapered volume control; a spring-balanced tone arm; a powerful synchronous motor; and a high audio-frequency tone control. The instrument will play either 10- or 12-inch records.

Dynamic Amplifier

Limitations imposed by present methods of disc recording necessitate a constricted range of sound intensity which may be recorded. The minimum intensity of sound which may be recorded is determined by unavoidable record surface-noise which masks the recorded sound when such sound approaches the intensity of the noise. The maximum sound intensity which may be recorded is determined by the thickness of the record groove-wall into which the record-cutting stylus makes an impression of the original sound. The amplitude of the lateral cutting is, therefore, regulated so that the stylus will not break over into the adjacent groove. It is because of these upper and lower limits that the volume range of sound reproduction cannot be identical to the original sound which is produced in the recording studio. In order to keep the recorded sound within the limits of the record, the recording control engineer regulates the recording amplifiers accordingly.

The dynamic amplifier of this reproducing instrument is designed to compensate for the above-mentioned recording limitations of volume range. It serves to restore the original intensity relations of the recorded sound by varying the amplification of the reproducing amplifier in direct accordance with the average intensity value of the sound. Thus, when there is a prevailing rise in the intensity of the recorded sound, the dynamic amplifier increases in gain accordingly, producing a further increase in volume, and conversely when there is a prevailing tendency toward a decrease of the recorded sound, the dynamic ampli-

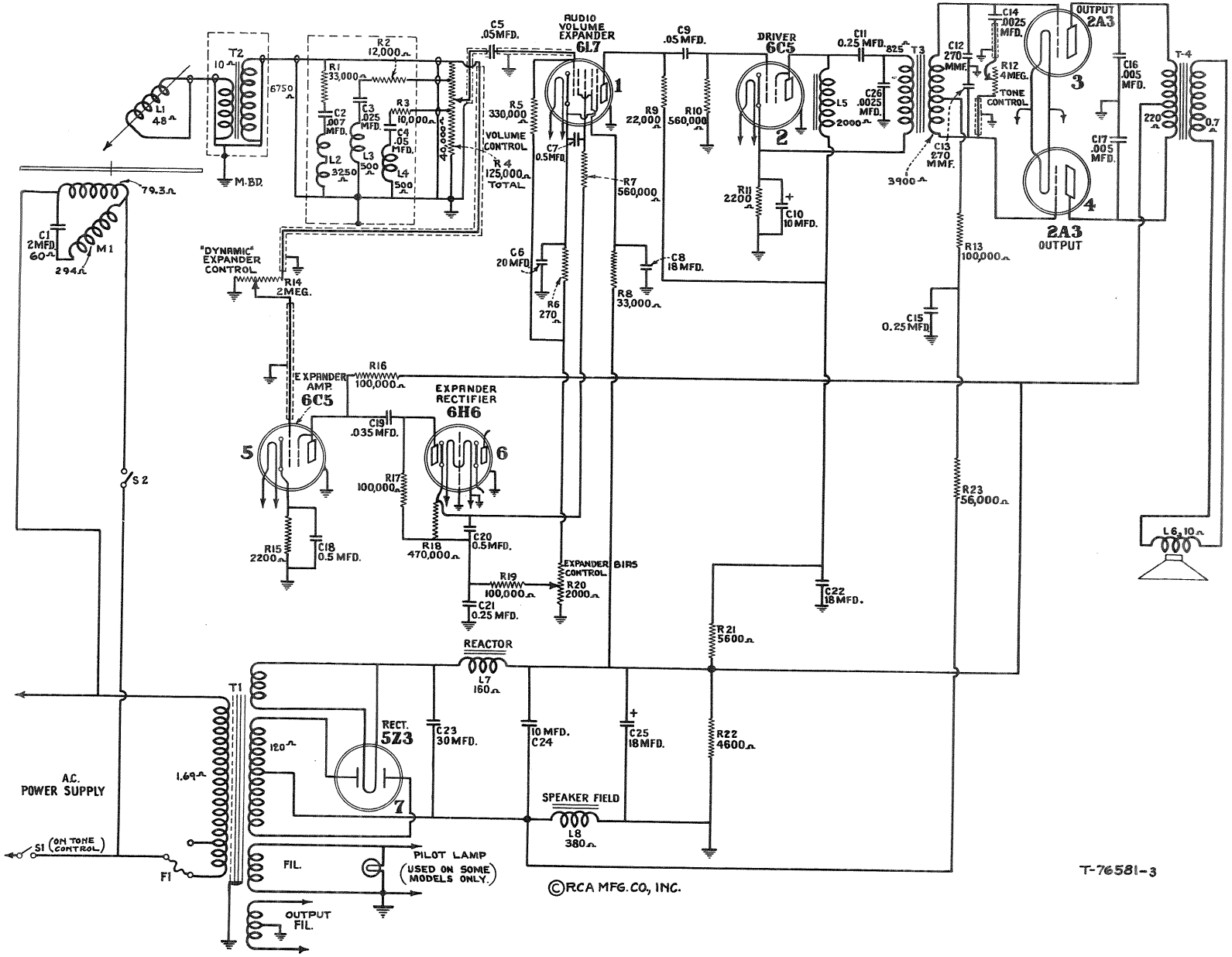

Figure 1—Schematic Circuit Diagram

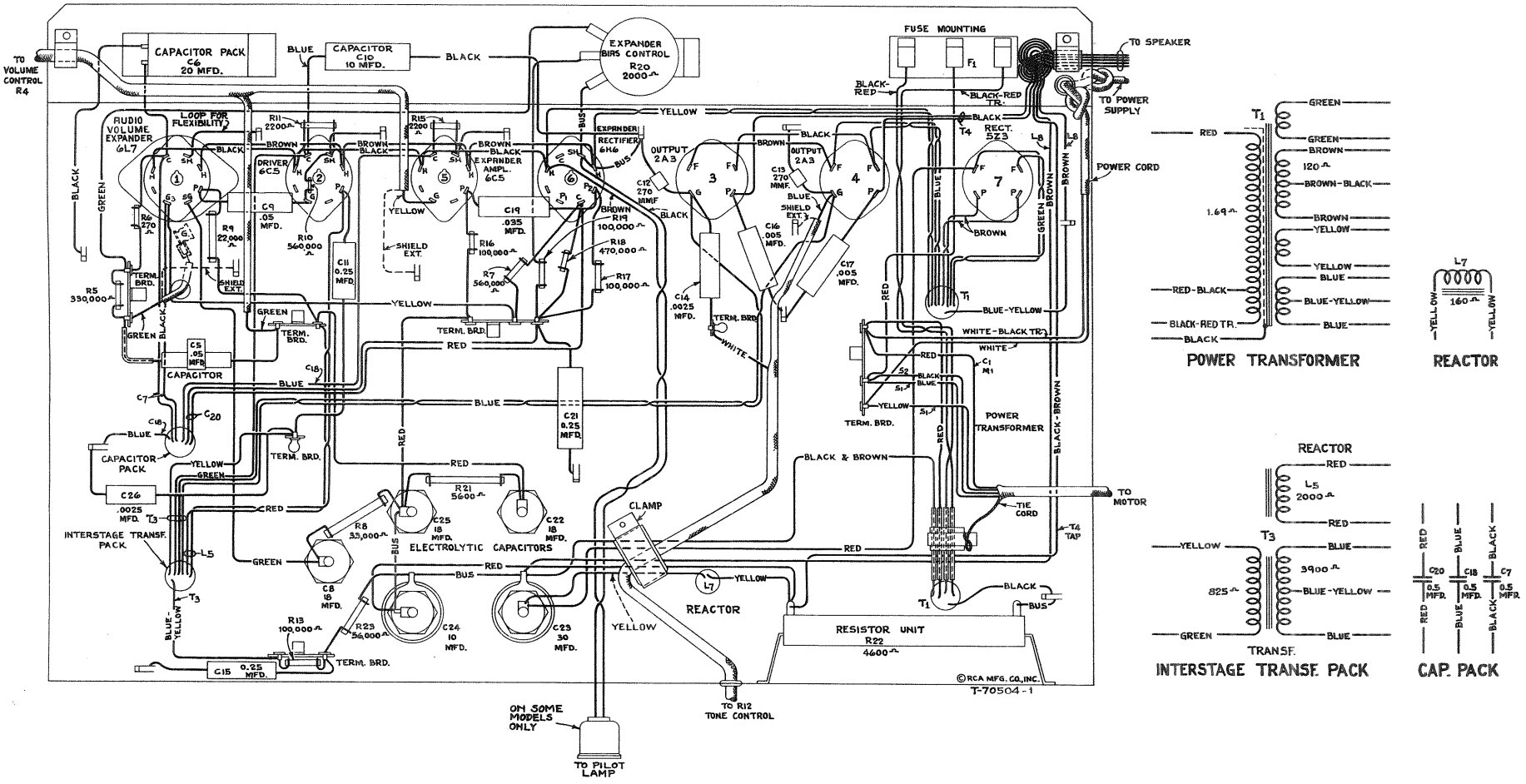

Figure 2—Chassis Wiring Diagram

fier decreases in gain, and produces a further decrease in volume. The functions of the dynamic amplifier are particularly advantageous in the reproduction of symphonic and certain other types of music where very great ranges of sound intensity are encountered. The dynamic amplifier causes the very loud or fortissimo, and the very soft or pianissimo passages to be reproduced in their natural relations, although they may have been somewhat modified in the actual recording on the record.

Power Amplifier

In order that the dynamic amplifier may bring about its designed purpose, the amplifier and reproducing system into which it works must have an undistorted range of amplification consistent with the degree of volume expansion provided in the dynamic amplifier. The power amplifier is, therefore, designed to have a maximum output of 15 watts.

Loudspeaker

The 12-inch dust-proof electrodynamic loudspeaker provided with this unit is of massive design. It is constructed with an aluminum voice coil, which permits the weight of the moving unit to be greatly reduced, with consequent increase of the frequency range. A high-frequency tone diffuser is provided in front of the cone of the loudspeaker unit to disperse the higher frequency sound waves over a wide acoustic angle instead of being emitted in a concentrated beam directly in front of the unit.

Pickup

The magnetic pickup and tone arm assembly is of an improved design. It is constructed with a short and very light armature for the most delicate response. The tone arm is spring-balanced, allowing the effective weight of the pickup on the record to be materially reduced.

Electrical Circuits

The circuits consist of a phonograph pickup with compensating filters, dynamic expander stage, expander amplifier stage, expander diode-rectifier stage, audio driver stage, push-pull power output stage, and a full-wave rectifier.

The electrical impulses, generated in the pickup coil L1, are boosted in the input transformer T2 before they are fed to the dynamic amplifier. A compensation filter is placed in shunt with the output of T2 to correct the frequency response of the reproducing system so as to compensate for the recording characteristic.

Dynamic Amplifier

The signal from the input transformer T2 is supplied to control grid No. 1 of the RCA-6L7 (expander) through the acoustically tapered volume control R4, and is simultaneously applied through the expander control R14 to the control grid of the first RCA-6C5 (expander amplifier). The signal applied to this latter tube is first amplified and then fed to the RCA-6H6 (expander diode-rectifier) tube where it is rectified. The output of the RCA-6H6 is of the nature of a pulsating direct current, the amount varying in direct relation with the average value of intensity of the audio signal. This pulsating voltage appears across resistor R18 and is applied to the second control grid of the RCA-6L7 (expander) through a delay filter (R7 and C7). The value of the bias on this control grid determines the amplification of the RCA-6L7 expander stage. The gain of the dynamic amplifier is, therefore, automatically regulated by the average intensity of the audio signal.

Audio Driver

The audio output of the RCA-6L7 is resistance-capacitance coupled to the control grid of RCA-6C5 audio driver. The output of this tube is shunt fed to the primary of the interstage transformer T3 by means of the reactance L5 and blocking capacitor C11. This arrangement prevents the plate current of the RCA-6C5 from flowing through the primary of T3, permitting increased fidelity.

Power Amplifier

The audio signal developed across the secondary of T3 is applied to the control grids (push-pull) of the RCA-2A3 tubes for final power amplification. The bias for these control grids is developed across the loudspeaker field winding L8 and is applied through a suitable resistance-capacitance filter. The output of the power-amplifier stage is transformer-coupled to the voice coil of the electrodynamic loudspeaker.

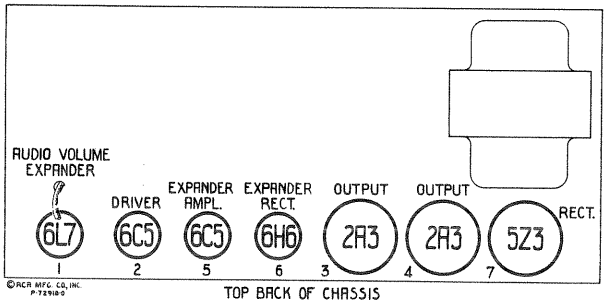

Figure 3—Radiotron Locations

Power Supply

The power-supply system consists of an RCA-5Z3 rectifier tube, which is supplied from an efficiently designed power transformer, and which works into a suitable filter. The potentials required for the plate, screen, control grid, and cathode circuits are obtained from this filter. The electrodynamic loudspeaker field coil is used as a filter reactor.

The various diagrams in the booklet contain such information as will be needed to locate causes for defective operation if such develops. The values of various resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles, such as L1, C2, R1, etc., are provided for reference between the illustrations, and the Replacement Parts List. The coils, reactors, and transformer windings are rated in terms of their d-c resistance only. Resistance values of less than one ohm are generally omitted.

Dynamic Amplifier Adjustments

It is essential that correct voltages and currents exist at the RCA-6L7 audio expander stage in order that the expanding function may take place in the proper manner. A screw-driver adjustment is accordingly provided to regulate the RCA-6L7 control grid No. 2 bias to the correct operating value. Two methods of adjustment are applicable. Either method requires a normal voltage of 300 volts across the filter output (resistor R22, see figure 7). The one to be preferred (a) requires the use of the **RCA Stock No. 9633 Beat Frequency Oscillator** or the equivalent, a 100-ohm resistor, a 200-ohm resistor, and a 1,000-ohm-per-volt a-c voltmeter (rectifier-type) having a "low" range of 1.0 volt and a "high" range of 250 volts or greater. The less accurate method (b) requires the use of the **RCA Stock No. 12353 Split Plate Adapter** (supplied with instrument), and a suitable d-c milliammeter. Both of these procedures are outlined below. **CAUTION: Before using either method, be sure that power-supply fuse is in proper position for the line voltage.**

(a) Preferred Method.

Turn power switch (left front) off. Connect the 200-ohm and the 100-ohm resistors in series between the beat-frequency oscillator terminals (upper "250" and "CT") with the 100-ohm resistor connected to "CT." Calibrate the beat-frequency oscillator, adjust it to 1,000 cycles, and reduce its output. Connect the 1,000-ohm-per-volt a-c voltmeter (1-volt range) to the beat-frequency oscillator terminals (upper "250" and "CT"). Remove the "M" plug from the "F" receptacle on the shielded cable running between the input transformer T2 and the compensator pack "Comp." (see figure 9). Connect beat-frequency oscillator terminal "CT" to the large pin on the "M" plug. Connect the junction of the 200-ohm and the 100-ohm resistors to the small pin on the "M" plug.

Adjust beat-frequency oscillator output until the voltmeter reads exactly 1.0 volt. Remove the voltmeter leads from beat-frequency oscillator terminals without disturbing any of the oscillator adjustments. Place the voltmeter to its 250-volt or greater range and connect it between the plate prongs of the two RCA-2A3 power-output tubes. Connections to the tube prongs may be made by stripping approximately ½ inch of insulation from the ends of two short leads of rubber-covered wire, wrapping one bare end around each plate prong (being careful not to allow the bare ends to short on the chassis when the tubes are placed in their sockets), and connecting the voltmeter to these leads. **CAUTION: Do not touch these plate connections after the power is turned on since the potential at these points is rather high and carelessness might result in a serious shock.**

Set the expander "Dynamic" control (center front) to its extreme counter-clockwise position. Set the phonograph volume control (right front) to its extreme clockwise position. Turn on power switch (left front) and rotate this control to its extreme clockwise position, allowing it to remain in this position for all adjustments. Allow a few minutes for the instrument to become stabilized. Adjust the expander bias control R20, on rear apron of amplifier (see figure 9), until the voltmeter reads 195 volts. Turn phonograph volume control to extreme counter-clockwise position. Transfer lead from the junction of the 200-ohm and the 100-ohm resistors to the beat-frequency oscillator (upper "250") terminal without disturbing any of the oscillator adjustments. Adjust phonograph volume control (right front) until the voltmeter reads 50 volts. Turn the expander "Dynamic" control (center front) to its extreme clockwise position allowing maximum expansion to take place. The voltmeter reading should now read not less than 150 volts if the expander circuit is operating correctly. Failure to do so indicates a defect in the system and the usual service procedure should be followed.

(b) Alternate Method.

Turn power switch (left front) off. Place **RCA Stock No. 12353 Split Plate Adapter** under the RCA-6L7. Connect a suitable d-c milliammeter to the adapter. Turn both the phonograph volume control (right front) and the expander "Dynamic" control (center front) to their extreme counter-clockwise positions. Turn on power switch (left front) and allow a few minutes for the instrument to become stabilized. Adjust expander bias control R20, on rear apron of amplifier (see figure 9), to give 1.0 milliampere of plate current with no signal input to the dynamic amplifier.

Magnetic Pickup

The pickup used in the phonograph unit is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to

maintain proper adjustment and to provide a limiting effect on the movement of the armature. The frequency response is substantially uniform over a wide range. Service operations which may be necessary on the pickup are as follows:

Centering Armature

Refer to figure 4 showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i.e., exactly centered. Whenever this centering adjustment has been disturbed, the

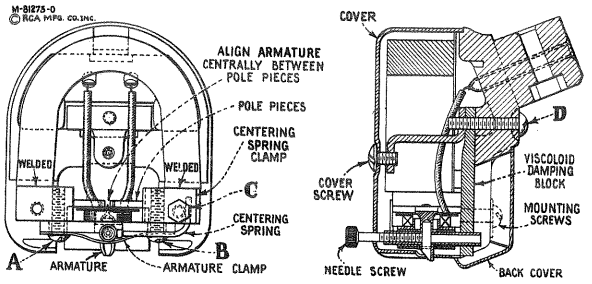

Figure 4— Details of Pickup

screws A, B, and C should be loosened and the armature clamp adjusted to the point where the vertical axis of the armature is at right angles to the horizontal axis of the pole pieces, and centered between them. This centering operation may be facilitated by inserting a small rod or nail into the armature needle hole, using it as a lever to test the angular movement of the armature. The limitations of the movement in each direction will be caused by the armature striking the pole pieces. The proper adjustment is obtained when there is equal angular displacement of the armature and adjustment rod or nail to each side of the vertical axis of the magnet and coil assembly. The screws A and B should then be secured, observing care not to disturb the adjustment of the armature clamp. Then place the pickup in a vise and secure the centering spring-clamp by means of the screw C, allowing the centering spring to remain in the position at which the armature is exactly centered between the pole pieces. With a little practice, the correct adjustment of the armature may be readily obtained. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other such foreign materials which would obstruct the movement of the pickup armature.

Damping Block

The viscoloid block which is attached to the back end of the armature shank serves as a mechanical filter to eliminate undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, it may be done by removing screw D and the cover support

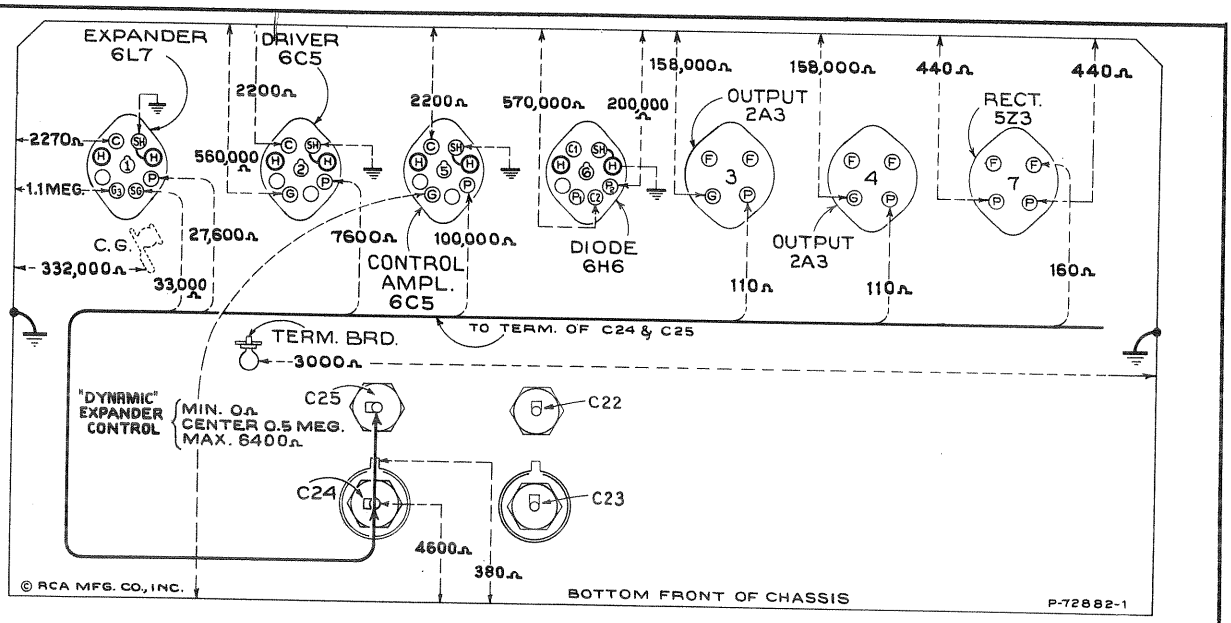

Figure 5—Resistance Diagram

Power supply disconnected—Radiotrons in sockets

The resistance values shown between Radiotron socket contacts, grid caps, resistors, terminals, and amplifier chassis ground, on figure 5, have been carefully selected so as to facilitate a rapid continuity check of the circuits. The use of this diagram in conjunction with the Schematic Circuit Diagram, figure 1, and Chassis Wiring Diagram, figure 2, will permit the location of certain troubles which might otherwise be difficult to ascertain. Each value as specified should hold within $\pm 20\%$. Variations in excess of this limit will usually be indicative of trouble in circuit under test. When measuring the resistance between points of the circuit and ground, it will be necessary to connect the negative terminal of the resistance meter to chassis-ground. If the polarity of the resistance meter is not known, it may be readily ascertained by connecting a d-c voltmeter of indicated polarity across the terminals of the device.

bracket from the mechanism and taking off the old viscoloid block. The surface of the armature which is in contact with the viscoloid should be thoroughly

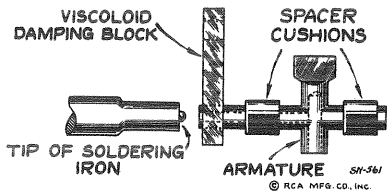

Figure 6—Special Soldering-Iron Tip

cleaned with fine emery cloth. Then insert the new block so that it occupies the same position as it did originally. Make certain that the block is in correct vertical alignment with the armature. The hole in the new viscoloid block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the viscoloid aligned on the armature, screw D and the cover support bracket should then be replaced. Heat should be applied to the armature (viscoloid side) so that the viscoloid block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron constructed as shown in figure 6 will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block and cause a small bulge on both sides.

Replacing Coil

Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. The method of replacement will be obvious upon inspection of the pickup assembly and by study of the cut-a-way illustrations. Make sure that the new coil is properly centered with the hole in the support strip and glued securely in that position. It is important to re-adjust the armature as previously explained after re-assembly of the mechanism. Only rosin core solder should be used for soldering the coil leads in

Radiotron Cathode Current Readings

Measured with Milliammeter Connected at Tube Socket Cathode Terminal under Conditions Similar to Those of Voltage Measurements

(1) RCA-6L7—Expander	7.6	ma.
(2) RCA-6C5—Audio Driver	4.4	ma.
(3) RCA-2A3—Power Output	41	ma.
(4) RCA-2A3—Power Output	41	ma.
(5) RCA-6C5—Expander Amplifier	1.9	ma.
(6) RCA-6H6—Expander Rectifier	0	ma.
(7) RCA-5Z3—Rectifier	165	ma.*

(* Cannot be measured at socket)

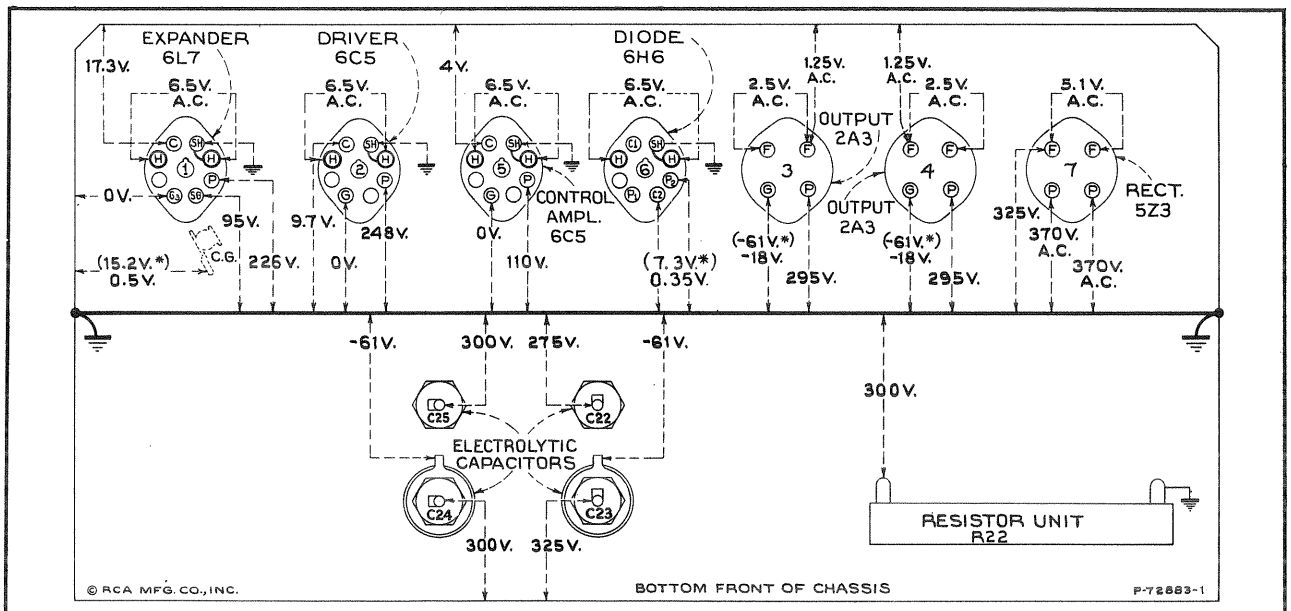

Figure 7—Radiotron Socket Voltages

Measured at 120 volts on 120-volt tap, rated frequency—Volume control minimum—Expander "Dynamic" control minimum—Dynamic amplifier adjusted as per text—No signal

Note: *Two voltage values are shown for some readings. The higher value shown in parenthesis with asterisk (*) indicates operating conditions without voltmeter loading. The lower value is the actual measured voltage and differs from the higher value because of the additional loading of the voltmeter through the high series circuit resistance.*

The voltage values indicated from the Radiotron socket contacts, grid caps, resistors, and terminals to amplifier chassis ground on figure 7 will assist in locating cause for faulty operation. Each value as specified should hold within ±20% when the amplifier is normally operative at its rated line voltage. Variations in excess of this limit will usually be indicative of trouble in the basic circuits. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, 500, and 1,000 volts. Use the nearest range above the voltage to be measured. A-c voltages were measured with a corresponding a-c meter.

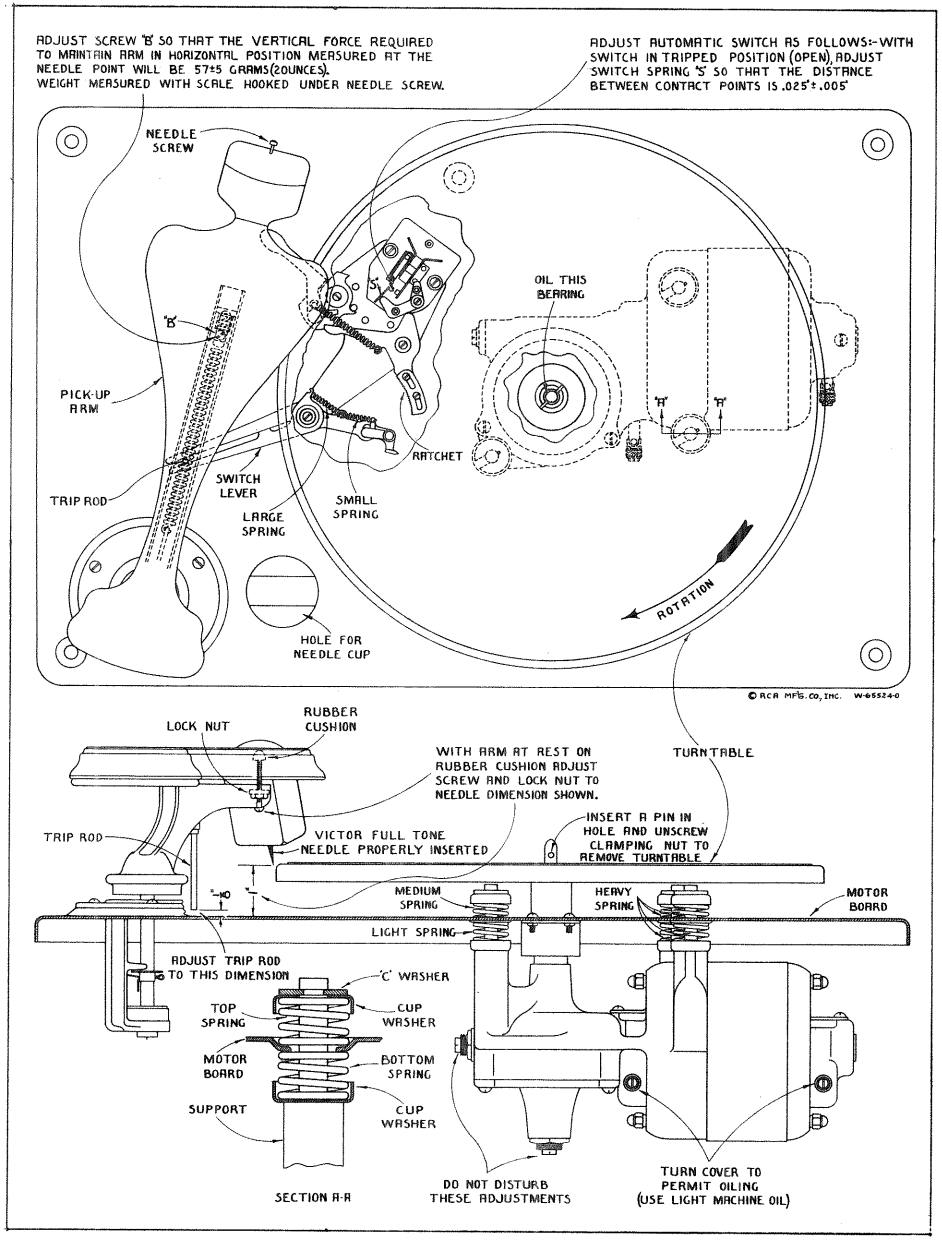

Figure 8—Motor Board Adjustments

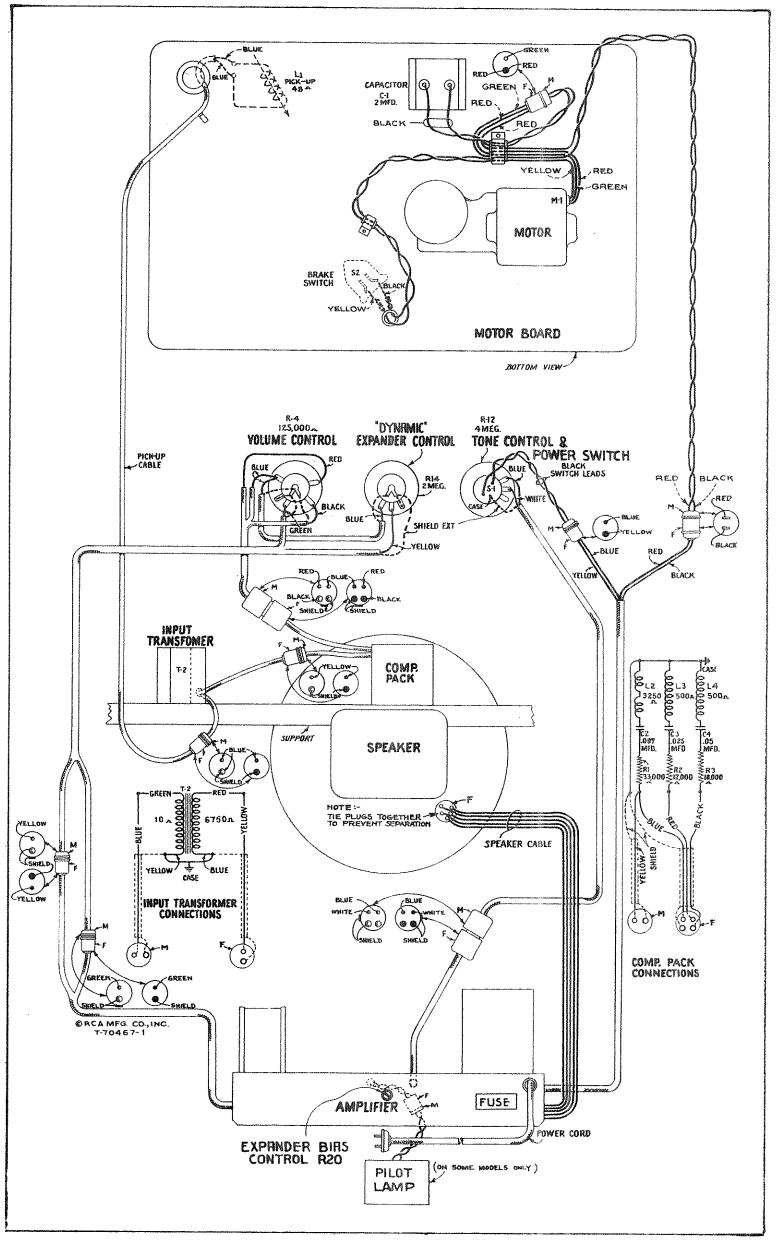

Figure 9—Assembly Wiring

the pickup. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing

Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to re-magnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the **RCA Stock No. 9549 Pickup Magnetizer** and charging the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to re-magnetize it so that the same polarity is maintained.

Phonograph Mechanism

The phonograph motor is of the synchronous type and is designed to be simple and foolproof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in figure 8.

Loudspeaker

Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone using care not to allow the acetone to flow down into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

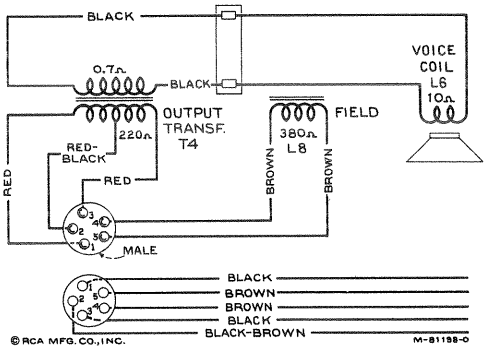

Figure 10—Loudspeaker Wiring

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

Stock No.	Description	List Price	Stock No.	Description	List Price
	AMPLIFIER ASSEMBLIES		11332	Resistor—22,000 ohms, carbon type, 1 watt (R9)—Package of 5	1.10
11350	Cap—Grid contact cap—Package of 5	$0.20	12487	Resistor—33,000 ohms, carbon type, 2 watt (R8)	.25
12110	Cap—Top shield cap for 6L7 Radiotron	.14	12286	Resistor—56,000 ohms, insulated, ¼ watt (R23)—Package of 5	1.00
12488	Capacitor—270 Mmfd. (C12, C13)	.20	12263	Resistor—100,000 ohms, insulated, ¼ watt (R13, R16, R17, R19)—Package of 5	1.00
5107	Capacitor—.0025 Mfd. (C14, C26)	.16	12452	Resistor—330,000 ohms, insulated, ¼ watt (R5)—Package of 5	1.00
4838	Capacitor—.005 Mfd. (C16, C17)	.20	12285	Resistor—470,000 ohms, insulated, ¼ watt (R18)—Package of 5	1.00
5196	Capacitor—.035 Mfd. (C19)	.18	12486	Resistor—560,000 ohms, insulated, ¼ watt (R7, R10)—Package of 5	1.00
4886	Capacitor—.05 Mfd. (C9)	.20	4794	Socket—4-contact 5Z3 or 2A3 Radiotron socket	.15
4518	Capacitor—.05 Mfd. (C5)	.52	11197	Socket—6 contact 6C5 Radiotron socket	.14
5170	Capacitor—.25 Mfd. (C11)	.25	11198	Socket—7-contact 6H6 or 6L7 Radiotron socket	.15
4840	Capacitor—.25 Mfd. (C15, C21)	.30	12464	Transformer—Interstage transformer (T3, L5)	5.95
11240	Capacitor—10 Mfd. (C24)	1.08	12463	Transformer—Power transformer, 110-120 volt, 50-60 cycle (T1)	8.58
12472	Capacitor—10 Mfd. (C10)	1.00		MISCELLANEOUS CABLES AND PLUGS	
5212	Capacitor—18 Mfd. (C8, C22)	1.16	12547	Cable—2-conductor shielded pickup cable, 25 inches long, complete less female connector, Stock No. 11488	.44
11496	Capacitor—18 Mfd. (C25)	1.15	12489	Cable—Power cable, approximately 30 inches long, complete with two female connectors	.58
12470	Capacitor—20 Mfd. (C6)	1.10	12563	Cable—Shielded input cable, approximately 9 inches long, complete with 4-contact male connector	.26
12467	Capacitor—30 Mfd. (C23)	1.40			
12465	Capacitor—Capacitor pack, comprising 3 sections, each 0.5 Mfd. (C7, C18, C20)	1.50			
11272	Clamp—Volume control or speaker cable clamp	.10			
5240	Cover—Fuse cover	.24			
12468	Expander—Control (R20)	1.00			
10907	Fuse—3-ampere fuse (F1)—Package of 5	.40			
5239	Mounting—Fuse mounting	.36			
12471	Plate—6L7 socket mounting plate assembly, less socket	.15			
12466	Reactor—Filter reactor (L7)	2.35			
12206	Resistor—270 ohms, insulated, ¼ watt (R6)—Package of 5	1.00			
12195	Resistor—2,200 ohms, insulated, ¼ watt (R11, R15)—Package of 5	1.00			
12469	Resistor—4,600 ohms, wire wound (R22)	1.25			
11298	Resistor—5,600 ohms, carbon type, 1 watt (R21)	.22			

The prices quoted above are subject to change without notice.

REPLACEMENT PARTS (Continued)

Stock No.	Description	List Price
12564	Cable—Shielded tone control cable, approximately 20¼ inches long, with 4-contact male connector	.34
12490	Cable—Shielded tone control cable, approximately 14 inches long, complete with female connector	.58
12562	Cable—Shielded volume control cable, approximately 28 inches long, complete with 2 male connectors	.38
12491	Cable—Shielded volume control cable, approximately 17 inches long, complete with 2 female connectors	.68
12492	Cable—Speaker cable, approximately 40 inches long, complete with female connectors	.44
4674	Connector—2-contact male connector for volume control cable, input transformer cable, compensator cable, motor leads, tone control switch leads and indicator lamp cable (socket end)	.25
11488	Connector—2-contact female connector for pickup cable, Stock No. 12547, or indicator lamp cable (chassis end)	.14
4577	Connector—2-contact male connector for motorboard power leads	.30
12565	Connector—4-contact male tone control and input cable connector	.20
12567	Connector—5-contact male connector plug for reproducer housing	.22
4573	Connector—Power cable 2-contact female connector with oblong openings	.30
12493	Connector—Speaker cable 5-contact female connector	.20
12494	Connector—Tone control or compensator cable 4-contact female connector	.18
	PICKUP AND ARM ASSEMBLIES	
12542	Arm—Pickup arm, complete less pickup unit	6.50
11548	Back—Pickup back	.52
10941	Ball—Pickup arm pivot shaft bearing—Package of 20	.25
12543	Bracket—Pickup arm spring adjusting bracket and screw	.12
12541	Coil—Pickup coil (L1)	.64
3521	Cover—Pickup back cover with mounting screws	.18
11708	Cover—Pickup front cover	.15
12850	Damper—Comprising one upper damper and bushing assembly, one lower bushing and one lower bearing	.25
3390	Escutcheon—Pickup arm escutcheon and rivets	.46
14115	Mechanism—Comprising one armature and spring assembly, one armature clamp, and one damper	1.35
12538	Pickup—Pickup unit, complete	7.00
12546	Plug—Pickup arm pivot shaft plug—Package of 2	.14
12545	Rod—Pickup arm trip rod and nut—Package of 5	.26
11549	Screw—Pickup front cover screw—Package of 10	.42
12539	Screw—Pickup needle screw—Package of 10	.20
3387	Screw—Screw, nut and washer for mounting pickup to arm—Package of 10	.50
12544	Spring—Pickup arm adjusting spring—Package of 10	.25
	MOTORBOARD ASSEMBLIES	
12051	Capacitor—2 Mfd. motor capacitor, complete with cable and 2-contact male connector (C1)	4.18
6122	Clamp—Brake switch cable clamp—Package of 15	.30
	MOTOR ASSEMBLIES	
9693	Motor—105-125 volts, 50 cycles (M1)	40.85
9692	Motor—105-125 volts, 60 cycles (M1)	40.85
12551	Suspension Spring—Motor mounting spring, washer and stud assembly—comprising 6 springs, 6 cup washers, 3 spring washers and 3 studs	.45
	AUTOMATIC SWITCH ASSEMBLIES	
3994	Cover—Automatic switch cover and screw	.28
10184	Plate—Automatic brake trip latch plate with mounting screws—Package of 5	.40
12550	Springs—Automatic brake springs—Package of 4	.16
12549	Switch—Automatic brake and switch, complete	2.54
3322	Switch—Switch only for automatic brake (S2)	.75
	REPRODUCER ASSEMBLIES	
8059	Board—Reproducer terminal board (2 terminals)	.14
8060	Bracket—Output transformer mounting bracket	.14
8058	Clamp—Cone rim clamp—Package of 5	.44
12566	Coil—Field coil, magnet and cone housing (L8)	11.10
12474	Cone—Reproducer cone (L6)—Package of 5	6.80
12569	Diffuser—Reproducer sound diffuser	.78
9694	Reproducer—Reproducer, complete	18.25
12568	Transformer—Output transformer (T4)	3.30
	MISCELLANEOUS ASSEMBLIES	
12353	Adapter	.48
12557	Bolt—Motorboard suspension bolt and spring assembly, consisting of 1 bolt, 1 C washer, 2 cup washers, 1 bottom spring, 1 top spring, 1 lockwasher and 1 cap nut	.38
5211	Bolt—Reproducer mounting bolt assembly—Package of 2	.24
4594	Box—Used needle box	.30
13103	Cap—Indicator lamp cap—Package of 5	.65
12561	Cap—Turntable spindle cap	.15
6122	Clamp—Volume control and pickup cables clamp—Package of 15	.30
4420	Clamp—Volume control cable clamp—Package of 10	.40
12560	Compensator Pack—with 2 shielded cables, 1 male and 1 female connector assembled (C2, C3, C4, L2, L3, L4, R1, R2, R3)	3.74
11580	Cover—Indicator lamp cover	.12
11193	Cover—Reproducer cover	.82
12559	Cover—Turntable cover	.58
12552	Expander Control (R14)	1.06
11347	Knob—Expander, tone and switch or volume control knob—Package of 5	.75
5226	Lamp—Indicator lamp—Package of 5	.70
3396	Receptacle—Needle receptacle	.52
11210	Screw—Amplifier mounting screw assembly—Package of 4	.28
11573	Socket—Indicator lamp socket	.28
11349	Spring—Retaining spring for knob, Stock No. 11347—Package of 5	.15
12553	Tone control and switch (R12, S1)	1.12
12555	Transformer—Input transformer, complete with 2 shielded cables, 1 male and 1 female connector assembled (T2)	6.00
12558	Turntable—Complete	2.42
12554	Volume Control (R4)	1.52

First Edition.

The prices quoted above are subject to change without notice.