

Instructions for RCA Victor RE-40-P Double-Range Radio-Phonograph Combination Five-Tube Table Model

INSTALLATION

Location—The instrument should be placed on a level surface, such as a table, convenient to the antenna and ground connections and to an electrical outlet.

Phonograph—Remove the packing material from the phonograph compartment. With the speed shifter (lever projecting beneath turntable at front left-hand corner) set in the outward (78 R. P. M.) position, mount the turntable (packed in outfit package) on the motor spindle. Make sure that the drive pin engages the slot in the turntable hub. Insert the used-needle cup (also in outfit package) in the opening provided.

Antenna and Ground—An antenna 25 to 75 feet long, including the lead-in and ground connections, is recommended. The antenna should be well insulated from all objects, and should not be run close to or parallel with electric circuits inside or outside the building. Generally, an indoor antenna of short or medium length should be found satisfactory. An outdoor antenna of greater length may provide some increase in the receiving range, and is recommended for localities remote from broadcasting stations. When the receiver is installed in a building of metallic construction, an outdoor antenna is required for satisfactory results.

A good ground connection is essential for best performance. It should be as short and direct as possible, and preferably should be made to a cold water pipe. An approved ground clamp should be used to insure a tight and permanent connection.

Two flexible leads are provided at the rear of the receiver for connecting to the antenna and ground. Connect the *black*

lead to the antenna wire or lead-in and the *yellow* lead to the ground wire. Both connections should be soldered and wrapped with insulating tape.

Power Supply—Connect the power cord to an electrical outlet supplying alternating current at the proper voltage and frequency (cycles), as specified on the rating label inside the cabinet.

Radiotrons—The instrument is equipped and tested at the factory with RCA Radiotrons and is shipped with the tubes in the sockets. The set is therefore ready to operate when it is removed from the carton and external connections are made as described in the foregoing. The corrugated paper covers, used to protect the tubes during shipment, should be removed before operating the set.

If, when first installed, the receiver does not operate or performs imperfectly, one or more of the tubes, shields or dome terminal leads may have been jarred loose in shipment. Refer to the tube location diagram on the rating label and *make certain*:

- (a) That all tubes are in the proper sockets and pressed down firmly. *Never apply power to the instrument unless all Radiotrons are in place.*
- (b) That all shields are rigidly in place over the Radiotrons shown by double circles on the diagram.
- (c) That the spring connectors at the ends of the short flexible leads are securely attached to the dome terminals of the proper Radiotrons as indicated on the diagram.

NOTE—In order to remove the Radiotrons for test or replacement it is necessary to take out the four motorboard screws at the corners of the turntable compartment and raise the motorboard to provide the necessary clearance above the tubes.

OPERATION

The instrument has five operating controls located on the right-hand side panel of the cabinet, as follows:

- (1) **Radio Volume Control (Combined with Power Switch) (Left-hand Knob)**—In the extreme counter-clockwise position the power switch is "off." Rotating the knob slightly clockwise turns on the power—further rotation increases the volume.
- (2) **Record Volume Control (Combined with Radio-Record Switch) (Upper Middle Knob)**—For radio operation, this control must be set in the extreme counter-clockwise position. A slight clockwise rotation transfers the switch for phonograph operation—further rotation increases the volume on records.
- (3) **Tone Range Switch (Lower Middle Knob)**—This switch has two positions. The counter-clockwise position gives full range reproduction. In the clockwise position, high-frequency (treble) response is decreased; also in this position, static interference (when present) is reduced.
- (4) **Station Selector (Right-hand Knob—Symmetrical with Radio Volume Control)**—This control is equipped with an illuminated dial, calibrated to facilitate location and identification of stations (add one cipher to scale numerals to obtain frequency in kilocycles).
- (5) **Frequency Range Switch (Below and to Right of Station Selector)**—With this knob in the *counter-clockwise* position, broadcasting stations in the 540-1500 kilocycle range will be received (frequencies in this range are indicated by the large numerals adjacent to the scale graduations). With the knob in the *clockwise* position, stations operating in the 1400-2800 kilocycle range will be received (frequencies in this range are indicated approximately by the small numerals at the top of the dial), as follows:
 - (a) **Police Calls**—At dial settings near "80" for stations transmitting at 1712 kilocycles, and at "118-122" for stations operating in the 2450 kilocycle band.
 - (b) **Amateur Radio "Phone"**—At dial settings "90-95" (assigned band 1900-2000 kilocycles.)
 - (c) **Aviation Reports, Airport Beacons, Etc.**—At dial settings "95-118" (assigned band 2000-2400 kilocycles.)
 - (d) **Amateur Radio "CW" (Code)**—At dial settings "80-90" (assigned band 1715-1900 kilocycles). Signals of this class are normally unintelligible or inaudible with this type of receiver.

RADIO OPERATION

To operate the receiver, proceed as follows:

1. Set the radio-record transfer switch for "Radio" by turning the Record Volume Control to the extreme counter-clockwise position.
2. Set the Frequency Range Switch for the desired frequency band—see preceding paragraph (5).
3. Turn on the power and set the Radio Volume Control fully clockwise for maximum volume—reduce the setting if too noisy.
4. Allow approximately one-half minute for the tubes to heat, then turn the Station Selector slowly over the range of the dial until a desirable station program is heard.

NOTE—The majority of stations in the 1400-2800 kilocycle band do not offer continuous programs. Police calls are usually intermittent, at regular or irregular intervals. Strong local stations in the 540-1500 kilocycle broadcast band may be audible (sometimes at more than one point on the dial) when the Frequency Range Switch is set for 1400-2800 kilocycles.

5. For best reproduction reduce the Radio Volume Control setting and adjust the Station Selector accurately for loudest volume. Always use the Radio Volume Control—never the Station Selector—for regulation of volume.
6. Set the Tone Range Switch for the preferred tone quality.
7. When through operating, turn the Radio Volume Control knob fully counter-clockwise until the "off" click of the power switch is heard.

PHONOGRAPH OPERATION

Electric phonograph facilities are provided in this instrument for playing either standard (78 R. P. M.) records or long playing (33½ R. P. M.) records. The pickup mechanism is designed to use *Chromium Needles for Long Playing Records* (identified by the orange shank) for the reproduction of either long playing or standard records. These needles with care, should play 25 records. *Never re-insert a used Chromium needle after once removing from the pickup.*

Standard (78 R. P. M.) Records—Proceed as follows:

1. Turn the Record Volume Control clockwise from the "Radio" position. Set this control near the middle of its range.
2. Apply power by turning the Radio Volume Control knob slightly clockwise from the "off" position, until the "on" click of the power switch is heard and the dial is illuminated. Several seconds will be required for the Radiotrons to heat before reproduction is possible.

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3. Place a standard (78 R. P. M.) record on the turntable. Loosen the needle screw on the electric pickup. Insert a Chromium needle (either orange or green shank), or a full volume (full tone) steel or Tungstone needle, as far as it will go and tighten the needle screw. (Do not play more than one record with each *steel* needle.)

4. Pull the starting lever (right-hand side of turntable) forward to start the turntable. Set the speed shifter (left-hand side of turntable) outward for 78 R. P. M. Then place the needle on the smooth outer surface of the record and slide it into the first groove.

5. Adjust the Record Volume Control to obtain the desired volume.

6. The Tone Range Switch should normally be set in the counter-clockwise position, in which position most faithful reproduction over the entire musical range is obtained. To reduce needle scratch noise, particularly on old type records, this switch may be changed to the clockwise position.

7. When the record has been played, lift the pickup and move it to the right so as to clear the turntable, thereby stopping the motor. (When through playing an eccentric groove record the motor will stop automatically.)

8. When through operating, switch off the power by turning the Radio Volume Control knob to the extreme counter-clockwise position. The pickup should never be left with the needle resting on the record (or turntable) when not operating the phonograph.

Long Playing (33½ R. P. M.) Records—Repeat the procedure outlined under "Standard (78 R. P. M.) Records," with the following exceptions:

- (1) Use only *Chromium Needles for Long Playing Records* (identified by the orange shank).
- (2) Set the speed shifter inward, for 33½ R. P. M. This should be done while the turntable is rotating.

Lubrication—The motor should be lubricated with light oil once every six months. Two oil holes on top of the motor are accessible when the turntable is removed. The ball bearing mechanism under the turntable should be lubricated once a year by prying off the cover and packing with vaseline or light motor grease, being careful to prevent any dirt particles from entering with the grease. Make sure that the speed shifter is in the outward (78 R. P. M.) position before replacing the turntable on the spindle.

SERVICE DATA

Voltage Rating.....	115 Volts
Frequency Rating.....	25-40 Cycles and 50-60 Cycles
Power Consumption.....	60 Cycles, 95 Watts
Number and Types of Radiotrons.....	1 UX-280, 1 RCA-2A5, 1 RCA-58, 1 RCA-57, 1 RCA-2A7—Total 5
Undistorted Output.....	1.75 Watts
Frequency Range.....	540 K. C. to 1500 K. C. and 1400 K. C. to 2800 K. C.

This combination radio-phonograph instrument uses a five-tube Super-Heterodyne receiver incorporating a dynamic loudspeaker, two-point tone control, single heater type Pentode Output tube and the inherent sensitivity, selectivity and tone quality of the Super-Heterodyne.

The standard RCA Victor two speed motor board equipment is used and the entire assembly enclosed in a table type cabinet.

A special feature is the Range Switch that allows reception of signals either of the broadcast band or higher frequencies. Figure B shows the assembly wiring, Figure C the schematic diagram and Figure D the chassis wiring diagram. With the switch in the broadcast band position, the frequency range is from 540 to 1500 K. C. At the higher frequency position, the receiver covers the 1400 to 2800 K. C. band.

The circuit consists of an R. F. stage, a combined oscillator and first detector in the RCA-2A7 tube, an intermediate stage consisting of a transformer using two tuned circuits, a second detector, an output tube and a rectifier.

Line-up Capacitor Adjustment

The line-up capacitor adjustments for the I. F. stage and the gang capacitors are made in the following manner:

- Procure a modulated oscillator giving a signal at 175 K. C., 1400 K. C., and 2440 K. C. An output meter and non-metallic screw driver are also necessary.
- The I. F. line-up capacitors should be first adjusted. This is done by placing the oscillator in operation at 175 K. C., coupling its output between the control grid and ground of the first detector, connecting the output meter across the cone coil of the loudspeaker and adjusting the two I. F. line-up capacitors until maximum output is obtained.
- After the I. F. circuits are aligned, the broadcast band R. F. is adjusted at 1400 K. C. This is done with the Range Switch at the broadcast position. A similar manner is used as that of the I. F., except that the oscillator is set at 1400 K. C., its output is connected from antenna to ground of the receiver, and the dial is set at 140. The adjustment is made with the trimming capacitors located on top of the gang capacitor and each capacitor is adjusted for maximum output.
- The high frequency band is adjusted at 2440 K. C. This is done in a similar manner to the R. F. adjustments except that the oscillator is set at 2440 K. C., the dial at 120 and the Range Switch in the high frequency position. The line-up capacitors on the selector switch are adjusted for maximum output at this frequency.

Service data for the magnetic pickup is included below.

RADIOTRON SOCKET VOLTAGES 115 Volt A. C. Line MAXIMUM VOLUME CONTROL SETTING—NO SIGNAL

Radiotron No.	Cathode to Control Grid, Volts	Cathode to Screen Grid, Volts	Cathode to Plate, Volts	Plate Current, M. A.	Heater Volts
1. RCA-58 R. F. Amplifier	3.0	95	250	5.0	2.33
2. RCA-2A7 First Detector Oscillator	3.0	95	250	3.0	2.33
3. RCA-57 Second Detector	6.0	89	170	0.3	2.33
4. RCA-2A5 Power Amplifier	18.0	235	220	32.0	2.33
5. RCA-80 Rectifier	275 Volts PLATE TO PLATE—60 M. A. TOTAL				4.82
TOTAL CATHODE CURRENT—11 M. A.					

SERVICE DATA ON MAGNETIC PICKUP

This magnetic pickup is of a new design that results in excellent reproduction. While in physical appearance, it is similar to that of the older type, details of construction are considerably different. It consists of essentially a chromium steel magnet, two thin pole pieces, a mechanism support and bracket, a coil, and an armature.

REPLACING MAGNET COIL, PIVOT RUBBERS, OR ARMATURE

In order to replace a defective magnet coil or hardened pivot rubbers, it is necessary to proceed as follows:

- Remove the pickup cover by removing the center holding screw and needle screw.
- Remove the pickup magnet and the magnet clamp by pulling them forward.
- Unsolder the coil leads and remove the mechanism assembly from the back plate by releasing the two mounting screws.
- Remove screws A and B, Figure A, and then remove the mechanism assembly from the pole pieces.
- The coil or the front pivot rubber may now be removed and replaced. If it is desired to replace the rear pivot rubber, then the end of the armature soldered to the mechanism support must be unsoldered.
- The mechanism should now be reassembled except for the magnet which must be magnetized. After being magnetized the mechanism—with the pole pieces upward, should be placed so that the magnet may be slid from the magnetizer onto the pole pieces without breaking physical contact. After placing the pole pieces on the magnet, the entire assembly should be remagnetized thoroughly, being careful not to change polarity.

- After reassembling to the mechanism, the entire assembly should be fastened to the back plate by means of the two screws provided, making sure support is down against pads on back. At the same time, the metal dust cover must be placed in position.

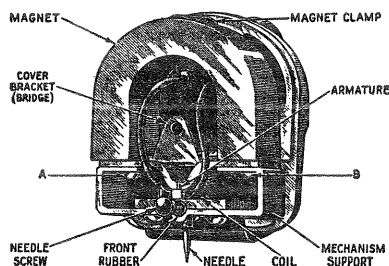


Figure A—View of Pickup showing parts

- After remagnetizing, it is necessary to correctly center the armature. This may be done quite accurately by feeling its play after the needle is inserted. A little practice will quickly show which way an adjustment is necessary to have the armature centered properly. The adjustment is made by loosening screws A and B (Figure A), and sliding the mechanism slightly in relation to the pole pieces.
 - The cover may be now replaced over the entire assembly, and the pickup returned to the tone arm.
- Only rosin core solder should be used for any soldering in conjunction with the pickup. However, if great care to wipe clean and use as small amount as possible is exercised, paste or liquid flux may be used for soldering the end of the spring.

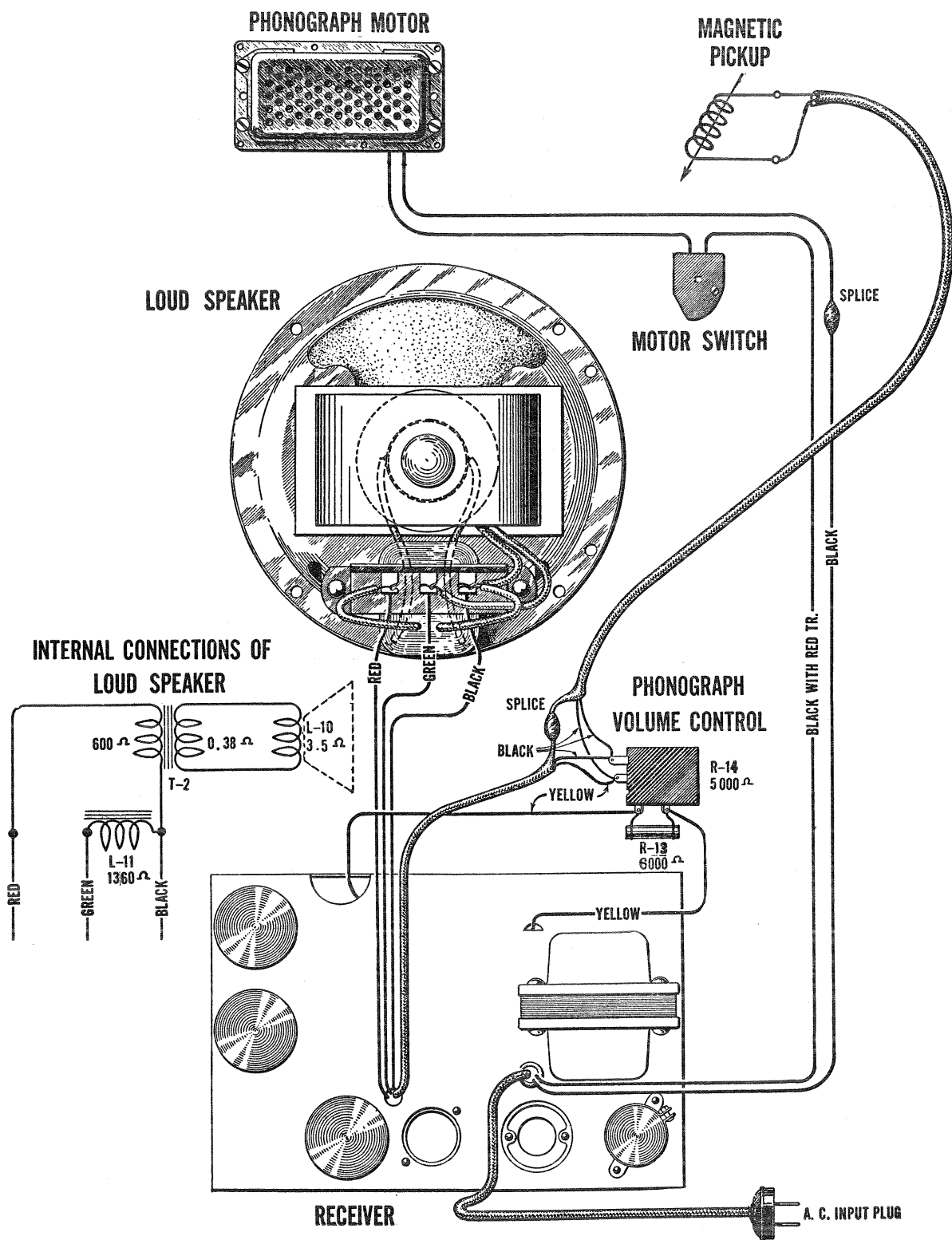


Figure B—Assembly Wiring

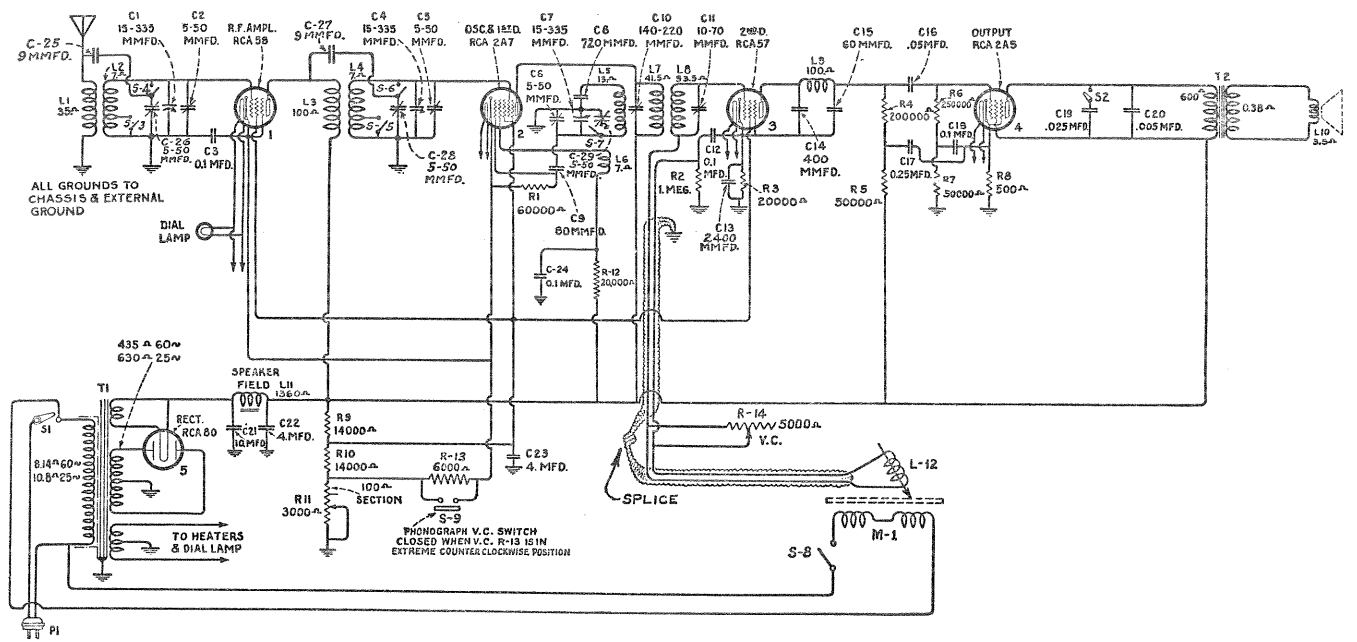


Figure C—Schematic Circuit

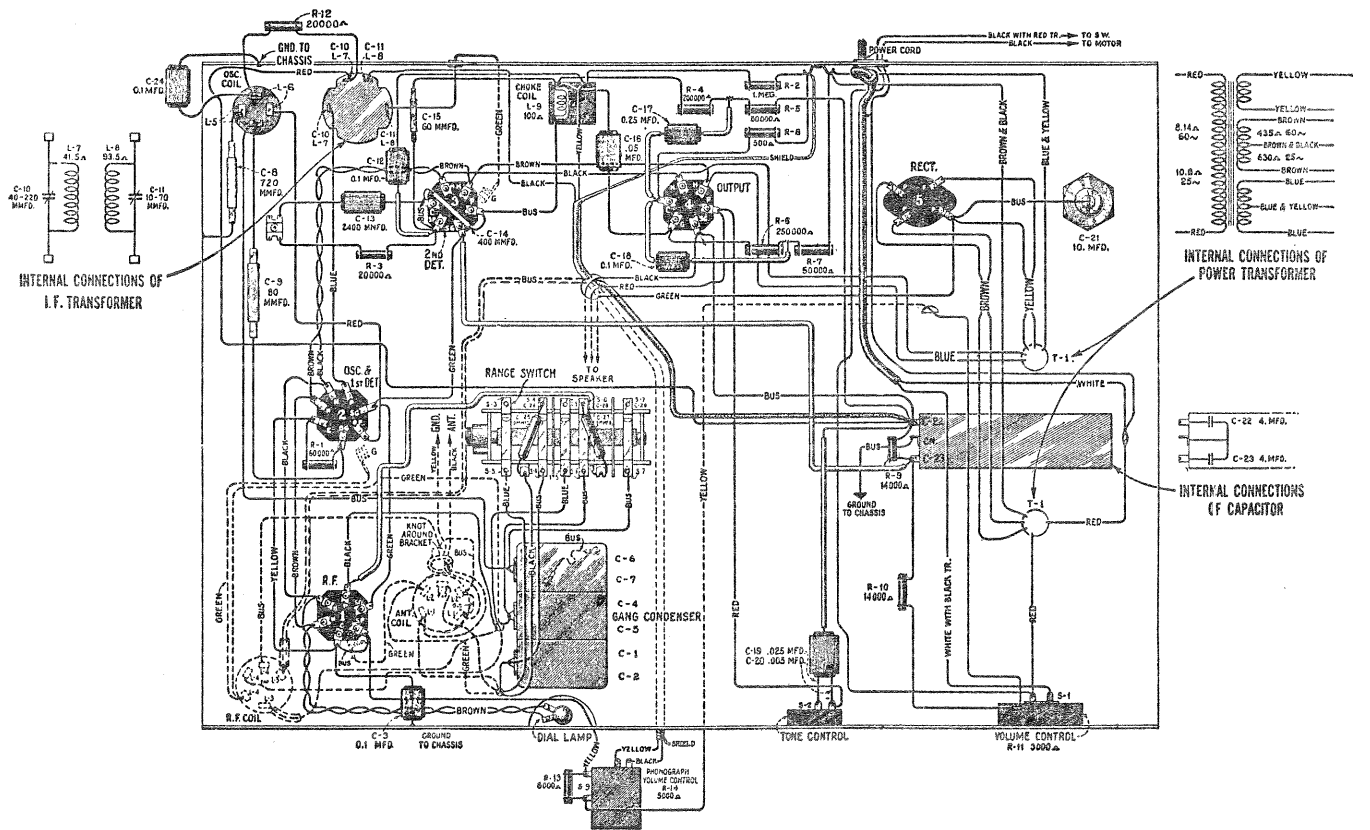


Figure D—Wiring Diagram

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
RECEIVER ASSEMBLIES			MOTOR ASSEMBLIES		
2269	Capacitor—720 mmfd	\$0.75	3599	Motor mounting washer assembly—Comprising one screw, one washer and one lockwasher—Package of 3 sets	\$0.30
2563	Resistor—6,000 ohms—Carbon type—1 watt—Located on volume control—Package of 5	1.10	8989	Motor—Motor complete 105-125 volts—60 cycle	18.52
2747	Contact cap—Package of 5 . . . . .	.50	8990	Motor—Motor complete 105-125 volts—50 cycle	18.52
2749	Capacitor—2,400 mmfd . . . . .	.35	8991	Motor—105-125 volts—40 cycle	23.36
2994	Coil—R F choke coil . . . . .	.45	8992	Motor—Motor complete 105-125 volts—25 cycle	23.36
3050	Resistor—14,000 ohms—Carbon type—3 watts . . . . .	.25	8993	Rotor and shaft for 105-125 volts, 60 cycle motor	7.00
3076	Resistor—1 megohm—Carbon type—½ watt—Package of 5	1.00	8994	Spindle—Turntable spindle with fibre gear for 60 cycle motor	4.75
3456	Capacitor—0.05 mfd . . . . .	.44	8995	Rotor and shaft for 105-125 volts, 50 cycle motor	7.00
3459	Capacitor—80 mmfd . . . . .	.44	8996	Spindle—Turntable spindle with fibre gear for 50 cycle motor	4.75
3472	Capacitor—0.0024 mfd . . . . .	.32	8997	Rotor and shaft for 105-125 volts, 40 cycle motor	8.00
3514	Resistor—250,000 ohms—Carbon type—½ watt—Package of 5	1.00	8998	Spindle—Turntable spindle with fibre gear for 40 cycle motor	5.50
3555	Capacitor—0.1 mfd.—Oscillator filter . . . . .	.36	8999	Rotor and shaft for 105-125 volts, 25 cycle motor	8.00
3572	Socket—Radiotron 7 contact socket . . . . .	.38	9001	Spindle—Turntable spindle with fibre gear for 25 cycle motor	5.50
3573	Socket—Radiotron 4 contact socket . . . . .	.32	PICKUP, PICKUP ARM ASSEMBLIES		
3575	Socket—Dial lamp socket and bracket . . . . .	.34	3386	Cover—Pickup cover . . . . .	.56
3584	Ring—R. F. or oscillator coil retaining ring—Package of 5 . . . . .	.40	3387	Screw assembly—Pickup mounting screw assembly comprising one screw, one nut and one washer—Package of 10 sets . . . . .	.40
3590	Escutcheon—Station selector escutcheon—Package of 5	1.40	3388	Screw—Pickup needle holding screw—Package of 10 . . . . .	.60
3591	Escutcheon—Name plate escutcheon—Package of 5	1.40	3389	Rod—Automatic brake trip rod with lock nut—Package of 5 . . . . .	.40
3592	Knob—Station selector or volume control knob—Package of 5 . . . . .	.80	3390	Escutcheon—Pickup arm escutcheon complete with mounting rivets . . . . .	.46
3593	Screw—Chassis mounting screw—Package of 10 . . . . .	.30	3417	Armature—Pickup armature . . . . .	.72
3594	Resistor—50,000 ohms—Carbon type—½ watt—Package of 5	1.00	3419	Screw—Pickup cover mounting screw—Package of 10 . . . . .	.40
3596	Capacitor—60 mmfd . . . . .	.36	3600	Coil—Pickup coil . . . . .	.50
3597	Capacitor—0.25 mfd . . . . .	.40	6346	Back—Pickup housing back . . . . .	.45
3598	Capacitor—0.1 mfd . . . . .	.36	6474	Pickup—Pickup unit complete	4.00
3601	Coil—Choke coil . . . . .	.68	7593	Arm—Pickup arm complete less escutcheon, pickup, pickup mounting screw, nut and washer	6.00
3602	Resistor—60,000 ohms—Carbon type—¼ watt—Package of 5	1.00	TURNTABLE ASSEMBLIES		
3603	Resistor—500 ohms—Carbon type—1 watt—Package of 5	1.10	3261	Bushing—Rubber bushing—Used on turntable spindle for long playing records—Package of 5 . . . . .	.40
3604	Capacitor—400 mmfd . . . . .	.30	3338	Ring—Clamp ring assembly—Comprising spring, latch lever and stud . . . . .	.50
3606	Capacitor—Comprising one 0.005 mfd. and one .025 mfd. capacitors . . . . .	.40	3340	Washer—Thrust washer—Package of 2 . . . . .	.56
3623	Shield—R. F. or oscillator coil shield . . . . .	.30	3341	Pin—Groov-Pin—Package of 2 . . . . .	.56
3705	Scale—Dial scale assembly . . . . .	.50	3342	Spring—Latch spring—Located on clamping ring—Package of 2 . . . . .	.56
3783	Capacitor—9 mmfd —Package of 2 . . . . .	.50	3343	Sleeve—Sleeve complete with ball race	2.86
6228	Resistor—200,000 ohms—Carbon type—½ watt—Package of 5	1.00	3344	Cover—Grease retainer cover—Package of 2 . . . . .	.70
6303	Resistor—20,000 ohms—Carbon type—½ watt—Package of 5	1.00	3346	Bushing—Speed shifter lever bushing—Package of 4 . . . . .	.66
6306	Resistor—14,000 ohms—Carbon type—1 watt—Package of 5	1.10	3347	Spring—Speed shifter lever spring—Package of 2 . . . . .	.30
6464	Transformer—I. F. transformer	1.88	3399	Lever—Speed shifter lever with mounting screws . . . . .	.50
6465	Volume control—Complete with mounting nut	1.22	7084	Cover—Suede cover for turntable . . . . .	.40
6466	Switch—Tone control switch . . . . .	.45	8948	Turntable—Complete	5.50
6471	Coil—Oscillator coil assembly . . . . .	.74	MISCELLANEOUS PARTS		
6527	Coil—Antenna coil	1.08	2947	Leather—Friction leather—Package of 20 . . . . .	.50
6528	Coil—R. F. coil assembly . . . . .	.94	3322	Switch—Automatic brake switch with mounting screws . . . . .	.75
6529	Switch—Range switch	1.25	3430	Box—Needle box with lid—Package of 2 . . . . .	.90
7485	Socket—Radiotron 6 contact socket . . . . .	.40	3615	Knob—Tone control, band selector or operating switch knob—Package of 5 . . . . .	.60
7487	Shield—Radiotron tube shield . . . . .	.25	6475	Volume control—Phonograph volume control	1.25
7588	Condenser—3 gang variable tuning condenser	2.85	10174	Springs—Automatic brake springs—One set of 4 springs—Package of 2 sets . . . . .	.50
7589	Capacitor—Filter capacitor—Two 4.0 mfd. in container	1.64	10184	Plate—Automatic brake latch trip plate with mounting screws—Package of 5 . . . . .	.40
7590	Capacitor—10 mfd	1.40			
8985	Transformer—Power transformer—105-125 volts—50-60 cycles	4.26			
9002	Transformer—Power transformer—105-125 volts—25-50 cycles	6.00			
9034	Transformer—Step-down—250-125 volts—50-60 cycles	4.00			
REPRODUCER ASSEMBLIES					
6467	Transformer—Output transformer	1.44			
8987	Cone—Reproducer cone—Package of 5	5.00			
9003	Coil assembly—Comprising field coil, magnet and cone support	2.35			

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