

## R.C.A. Victor Co., Inc.

**Model: 301**

**Chassis:**

**Year: Pre October 1934**

**Power:**

**Circuit:**

**IF:**

**Tubes:**

**Bands:**

### Resources

**Riders Volume 5 - RCA 5-119**

**Riders Volume 5 - RCA 5-120**

**Riders Volume 5 - RCA 5-121**

**Riders Volume 5 - RCA 5-122**



**MODEL 301**

**Voltage, Alignment  
Pickup Data**

RCA-VICTOR CO., INC.

**SERVICE DATA**

Voltage Rating.....105-125 Volts  
 Frequency Rating.....25, 50 and 60 Cycles  
 Power Consumption.....45 Watts  
 Number and Types of Radiotrons—

1 RCA-6A7, 1 RCA-6F7, 1 RCA-41, 1 RCA-1-V

Undistorted Output.....1.9 Watts  
 Frequency Range.....540-1500 K. C. and 1600-3500 K. C.

This table type combination instrument consists of a four tube super-heterodyne chassis and a new compactly constructed motor board assembly. The receiver incorporates features such as wide tuning range, electro-dynamic loudspeaker, two-point tone control, illuminated dial and the inherent sensitivity, selectivity and tone quality of the super-heterodyne.

The following description of the circuit describes several new design features which are incorporated in this receiver.

The first tube is a combined first detector and oscillator using Radiotron RCA-6A7. Separate tuned circuits are provided for each function. The detector coil is tapped so that the tuning range may be extended merely by shorting out a portion of the coil. The oscillator circuit is not tapped, the high frequency range being obtained by use of its second harmonic instead of the fundamental for obtaining the I. F. frequency.

The next tube is a combined I. F. stage and second detector using Radiotron RCA-6F7. It has two sets of elements, one being used as a screen grid I. F. amplifier and one as a triode detector. The I. F. frequency in this receiver is 460 K. C. The output stage is a single Pentode RCA-41.

The rectifier is an RCA-1-V used in a half-wave rectifying circuit. A feature of this circuit is that only one transformer secondary is used. This is accomplished by having a cathode type rectifier, a series arrangement of filaments and a tapped secondary winding.

Figure A shows the pickup details, Figure B the assembly wiring, Figure C the schematic circuit and Figure D the wiring diagram and Figure E the loudspeaker wiring.

adjusting the tuning capacitor trimmer capacitors for maximum output, then changing the oscillator frequency and dial setting to 600 K. C. and adjusting the submounted trimmer capacitor for maximum output. The I. F. adjustments are made by adjusting the two trimmer capacitors located on the first I. F. transformer for maximum output when a 460 K. C. signal is connected between the control grid of the first detector and ground. Be sure and set the station selector at a point where no signal is being received when making I. F. adjustments.

**Pickup Service Data**

The magnetic pickup and tone-arm assembly of this instrument is of new design and unique construction. Service work will consist of centering the armature, replacing the rubber pivots and replacing the magnet coil.

**Disassembling the Pickup**

The pickup may be disassembled in the following manner:

- (a) Unsolder the two cable connections to the terminal strip.
- (b) Remove the needle screw and screws "A" and "B."
- (c) Remove the pickup assembly from the arm and housing.
- (d) Unsolder the two magnet coil leads attached to the terminals and then remove screw E. This will allow the removal of the fibre terminal board.
- (e) If centering the pickup armature is the only adjustment required, such centering can be done without removing the fibre terminal board indicated in (d). The armature is centered by loosening screw F, accessible through the hole shown, and holding the armature with the finger in proper position while screw F is tightened. "Feeling" the armature while deflecting it between its two extremes is the best manner of ascertaining proper centering. When centering, after work has been done or the magnet removed, it is important that the magnet be remagnetized while in place.
- (f) If the coil or pivot rubbers are to be replaced, the pickup must be further disassembled. This is done by removing the magnet and then removing screws C and D. The pole piece may now be removed and the old coil and sleeve disassembled. Acetone will be found helpful for dissolving the old cement that holds the coil in place. The new coil, with its sleeve, may now be replaced and cemented in a similar position to that occupied by the old coil. Duco household or Ambroid cement may be used to hold the coil in place. Be careful to center the coil with its paper sleeve before cementing.
- (g) The pivot rubbers are replaced by loosening the armature adjusting screw F and removing the armature from its bracket. The rubbers can then be removed by slipping them from each end of the pivot shaft.

It is important to remember that in all operations after reassembling but before placing in the tone arm, the pickup should be magnetized and the armature centered after remagnetizing. Magnetizing should be done by placing the pickup magnet on the magnetizer and sliding it onto the pole pieces, after magnetizing being careful not to break the magnetic circuit.

**RADIOTRON SOCKET VOLTAGES**

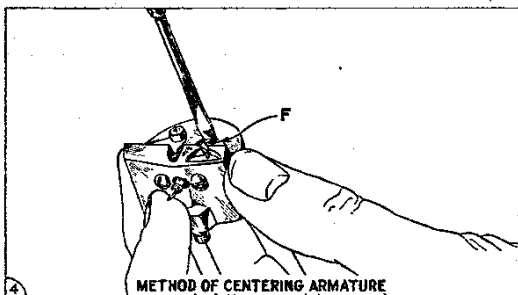
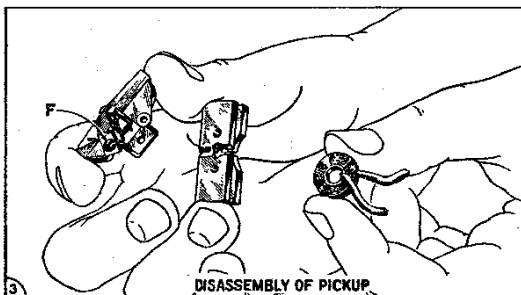
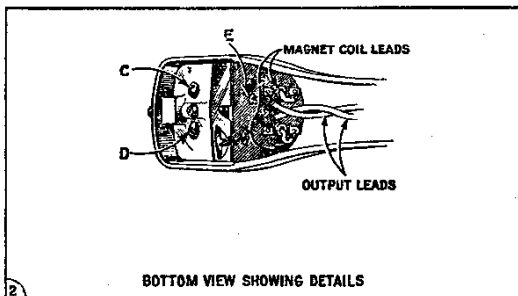
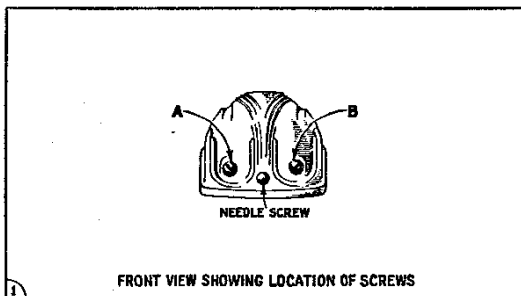
120 Volt, 60 Cycle Line—Maximum Volume Control  
 Setting—No Signal

Radiotron No.	Cathode to Control Grid, Volts D. C.	Cathode to Screen Grid, Volts D. C.	Cathode to Plate, Volts D. C.	Plate Current, M.A.	Heater or Filament, Volts
RCA-6A7	First Detector 1.25	70	235	2.5	6.3
	Oscillator —	—	180	3.5	
RCA-6F7	I. F. 1.25	70	235	5.5	6.3
	Second Det. 19	—	145*	0.4	
RCA-41	Output 17	240	230	26.5	6.3
RCA-1-V	Rectifier —	—	335 RMS	50	6.3

\* Actual voltage cannot be measured with ordinary voltmeter.

**Line-Up Adjustments**

The detector and oscillator line-up trimmer capacitors are adjusted by setting both the dial and an external oscillator first at 1400 K. C. and



**Figure A—Pickup Details**

RCA-VICTOR CO., INC.

PHONOGRAPH MOTOR SERVICE DATA

The synchronous motor used in this instrument is of simple design and foolproof construction. Among its many features are low power consumption, single moving part, ease of starting, oilless main bearing, resilient bumper, and long life with freedom from service repairs.

Figure E shows the main parts of the motor and the points that may require attention.

**Operation**—The two stator coils are connected in series and the motor is started by giving it a clockwise spin with the hand. If it is found to be difficult of starting, or if it runs at a sub-synchronous speed such as at 70 R. P. M., such action may result from one of the following causes:

**Difficult to Start**—This may be due to the stator falling to rotate on the outer bearing. This can be caused by the spaghetti sleeve being jammed in the slot, or sticking to the resilient bumper. The outer bearing not being properly lubricated may also cause this condition. It is important that the ball bearing be at the bottom of the main bearing assembly.

**Slow Speed**—If the turntable is jarred or slowed down, the motor may run at a sub-synchronous speed, such as 70 R. P. M. This is remedied by merely lifting the tone arm from the turntable, thereby removing the load. The turntable speed will then immediately increase to normal.

**Excessive Vibration and Hum**—A small amount of hum when starting decreasing to a

negligible amount while running is normal. If excessive vibration occurs either at starting or running, it may be due to one of the following:

- (1) Inefficient lubricant in outer bearing or any other failure that will cause the stator to bind.
- (2) The metal washer should be above the leather washer at the bottom of the main bearing.
- (3) Motor not properly supported from motor board. Unless the motor is properly supported from the motor board, normal vibration will be excessive.

**Removing Rotor from Stator**—The rotor which includes the turntable may be removed by loosening the screw shown in Figure E until it clears the rotor and then lifting the turntable. Be careful not to lose the ball end-bearing when this is removed. After replacing the rotor, tighten the restraining screw securely to eliminate the possibility of rattle in operation.

**Power Consumption**—The motor consumes 4 watts. It should never be turned on when the rotor is removed, as in this condition excessive current will be drawn with consequent increase in temperature.

**NOTE:** The above values of power consumption are average for a 60 cycle motor at 125 volts. At lower voltages the power consumption will be less.

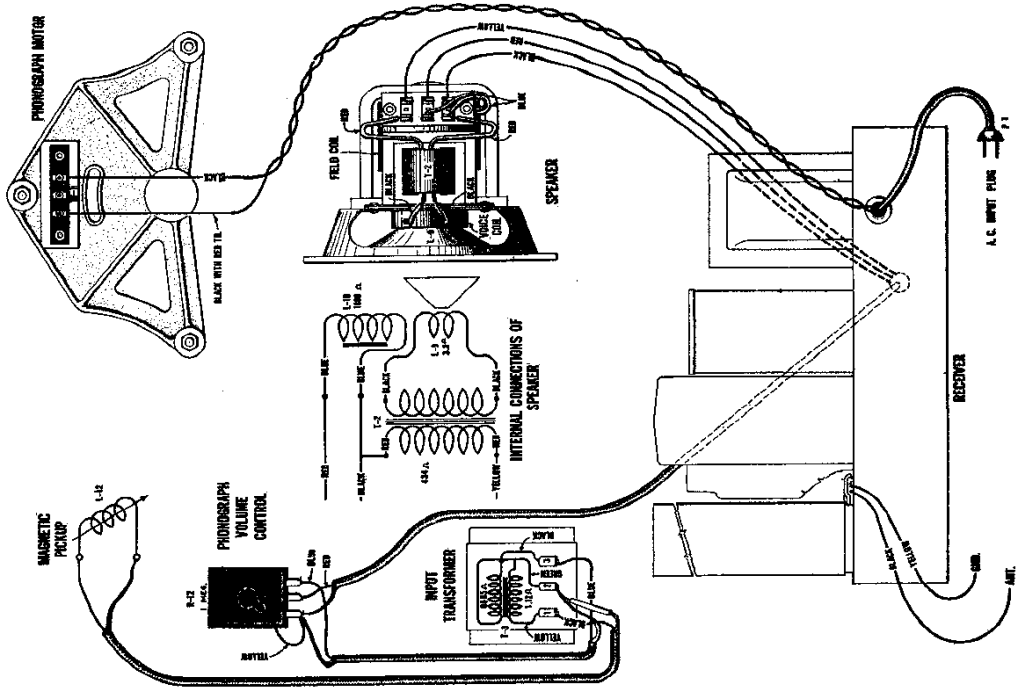


Figure B—Assembly Wiring

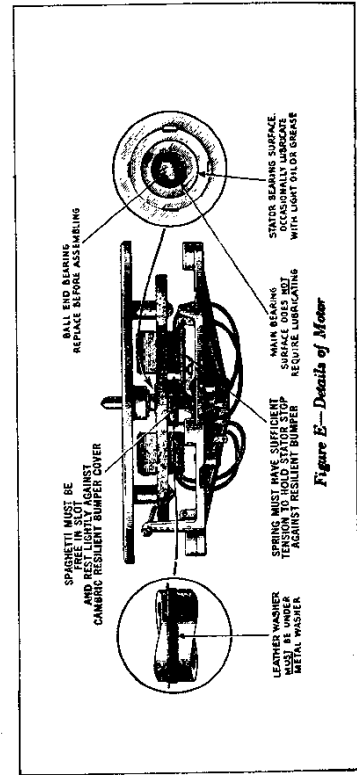


Figure E—Details of Motor

MODEL 301  
Parts List

RCA-VICTOR CO., INC.

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
<b>RECEIVER ASSEMBLIES</b>					
2747	Contact cap—Package of 5.....	\$0.50	6669	Switch—Tone control switch (S2).....	\$0.50
3047	Resistor—1500 ohms—Carbon type— $\frac{1}{2}$ watt (R7)— Package of 5.....	1.00	6832	Capacitor—4.0 mfd. (C10).....	.86
3076	Resistor—1 megohm—Carbon type— $\frac{1}{2}$ watt (R10)— Package of 5.....	1.00	9464	Transformer—Power transformer—105-125 volts—50-60 cycles (T1).....	3.20
3118	Resistor—100,000 ohms—Carbon type— $\frac{1}{2}$ watt (R1)— Package of 5.....	1.00	9465	Transformer—Power transformer—105-125 volts—25-40 cycles.....	4.38
3077	Resistor—30,000 ohms—Carbon type— $\frac{1}{2}$ watt (R9)— Package of 5.....	1.00	<b>REPRODUCER ASSEMBLIES</b>		
3459	Capacitor—80 mmfd. (C5).....	.44	6788	Transformer—Output transformer (T2).....	1.60
3597	Capacitor—0.25 mfd. (C18).....	.40	8987	Cone—Reproducer cone complete (L9)—Package of 5.....	5.00
3572	Socket—7-contact Radiotron socket.....	.38	9437	Coil assembly—Comprising field coil, magnet and cone support (L10).....	2.72
3584	Ring—Oscillator coil retaining ring—Package of 5.....	.40	9467	Reproducer complete.....	5.15
3602	Resistor—60,000 ohms—Carbon type— $\frac{1}{2}$ watt (R2)— Package of 5.....	1.00	<b>TURNTABLE AND MOTOR ASSEMBLIES</b>		
3603	Resistor—500 ohms—Carbon type—1 watt (R11)— Package of 5.....	1.10	3808	Board—Motor terminal board.....	.20
3641	Capacitor—0.1 mfd. (C9).....	.35	4052	Spring—Package of 5.....	.40
3682	Shield—Radiotron shield.....	.22	3813	Motor suspension assembly—Comprising one screw, one metal bushing, two rubber bushings, one flat washer, one lockwasher and one nut—3 sets.....	.56
3701	Capacitor—0.01 mfd. (C1).....	.30	4083	Washer—Leather washer—Package of 10.....	.20
3713	Capacitor—0.05 mfd. (C17).....	.32	4084	Washer—Metal washer—Package of 10.....	.26
3857	Coil—Detector choke coil (L8).....	.90	7651	Coil—Stator coil—60 cycle operation.....	.48
3858	Socket—Dial lamp socket and bracket.....	.26	7652	Coil—Stator coil—50 cycle operation.....	.48
3859	Socket—4-contact Radiotron socket.....	.30	7653	Lamination—Stator laminations—Assembled—60 cycle operation—110 or 220 volts.....	.66
3862	Screw—Chassis mounting screw and washer—Package of 4.....	.24	7654	Lamination—Stator laminations—Assembled—50 cycle operation.....	.66
3865	Capacitor—160 mmfd. (C16).....	.30	7655	Lamination—Rotor lamination assembly—60 cycle opera- tion.....	1.00
3869	Resistor—170,000 ohms—Carbon type— $\frac{1}{2}$ watt (R8)— Package of 5.....	1.00	7656	Lamination—Rotor lamination assembly—50 cycle opera- tion.....	1.00
3873	Capacitor—1500 mmfd. (C3).....	.30	7657	Base—Motor base and bearing assembly.....	1.20
3877	Capacitor—0.1 mfd. (C14).....	.32	7714	Lamination—Rotor laminations—Assembled—60 cycles— 220 volts.....	1.76
3886	Reflector—Dial light reflector.....	.30	7715	Coil—Stator coil—60 cycles—220 volts.....	.68
3887	Scale—Dial scale—Package of 5.....	.60	9038	Motor complete—105-125 volts—60 cycles.....	4.20
3889	Resistor—25,000 ohms—Carbon type—3 watt (R4).....	.25	9039	Motor complete—105-125 volts—50 cycles.....	4.20
3917	Capacitor—0.25 mfd. (C18).....	.40	9040	Turntable complete—With spindle for 50 or 60 cycle operation.....	1.16
3932	Capacitor—2400 mmfd. (C15).....	.30	10194	Ball—Steel ball bearing—Package of 20.....	.25
3933	Capacitor—630 mmfd. (C2).....	.32	<b>PICKUP AND ARM ASSEMBLIES</b>		
4000	Capacitor—Adjustable capacitor (C7).....	.78	3811	Screw—Needle holding screw—Package of 10.....	.46
4018	Coil—Choke coil (L11).....	.90	3812	Armature.....	.32
6676	Socket—6-contact socket.....	.40	6825	Pickup and arm assembly complete.....	4.82
6787	Capacitor—Comprising one .005 mfd. and one .017 mfd. capacitors (C20, C21).....	.30	6826	Coil—Pickup coil (L12).....	.64
6114	Resistor—20,000 ohms—Carbon type—1 watt (R3, R5)— Package of 5.....	1.10	<b>MISCELLANEOUS PARTS</b>		
6660	Condenser—2-gang variable condenser (C4, C6, C24, C25).....	2.78	3961	Knob—Phonograph volume control knob—Package of 5.....	.60
6661	Capacitor pack—Comprising two 5.0 mfd. and two 8.0 mfd. capacitors (C13, C19, C22, C23).....	2.70	4075	Knob—Range switch or volume control knob—Package of 5.....	1.00
6662	Transformer—First intermediate frequency transformer (L4, L5, C11, C12).....	2.34	4086	Knob—Tone control switch knob—Package of 5.....	1.00
6663	Transformer—Second intermediate frequency transformer (L6, L7).....	1.06	4087	Screw and washer—Chassis mounting screw and washer assembly—Package of 4.....	.20
6664	Coil—Oscillator coil (L2, L3).....	.94	6827	Volume control—Phonograph volume control (R12).....	1.46
6665	Shield—Oscillator coil shield and mounting bracket.....	.34	6828	Transformer—Phonograph input transformer (T3).....	2.60
6666	Coil—Antenna coil (L1, C1, R1).....	1.08			
6667	Volume control (R6, S3).....	1.58			
6668	Switch—Range switch (S1).....	.58			