VRA123M
VRA123C

RCA VICTOR

"HIS MASTER'S VOICE"

MODELS VRA123M & VRA123C

Twelve-Tube, Three-Band, A.M.-F.M. Superheterodyne Radio-Phonograph Combination

TECHNICAL INFORMATION AND SERVICE DATA

1948 No. 13

GENERAL SERVICE DIVISION • RCA VICTOR COMPANY LTD.

Model VRA123C

Model VRA123M

Electrical and Mechanical Specifications

FREQUENCY RANGE

Standard Broadcast S.B.	540-1600 K.C.
Short Wave 31 - 25 - 19 M.	9.4-15.8 M.C.
Frequency Modulation	88-108 M.C.
Intermediate Frequency A.M.	455 K.C.
Intermediate Frequency F.M.	10.7 M.C.
Tuning Drive Ratio	20 to 1

RADIOTRON COMPLEMENT (Radio chassis)

(1) Type 6BA6	R.F. Amplifier
(2) Type 6BE6	Converter
(3) Type 6BA6	1st I.F. (FM & AM)
(4) Type 6BA6	2nd I.F. (FM only)
(5) Type 6AL5	F.M. Ratio Detector
(6) Type 6AT6	A.M. Det., A.V.C. & 1st A.F.
(7) Type 6AT6	Phase Inverter
(8) Type 6V6GT/G	Power Output
(9) Type 6V6GT/G	Power Output
(10) Type 5Y3GT/G	Rectifier
Pilot Lamps (2)	Mazda No. 51 6-8 volts 0.2 amp.
(1)	Mazda No. 47 6-8 volts 0.15 amp.

RADIOTRON COMPLEMENT (Magic Monitor chassis)

(1) Type 6AV6	Control Amplifier and Rectifier
(2) Type 6BA6	Reactance Tube

POWER OUTPUT

Undistorted	4.5 Watts
Maximum	7.0 Watts

LOUDSPEAKER

Type	12 inch P.M.
Voice Coil impedance	2.2 ohms at 400 cycles

CABINET DIMENSIONS (Inches)

	Height	Width	Depth
Model VRA123M	33½	37	17
Model VRA123C	36¾	37¾	17¾

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycle, 110 watts
Rating B	105-125 volts, 25 cycle, 110 watts

PHONOGRAPH

Type	Automatic
Record Capacity	Fourteen 10-inch or Twelve 12-inch
Turntable Speed	78 r.p.m.

PICKUP

Type	Crystal
Impedance	100,000 ohms at 1,000 cycles
Average Output	1.4 volts at 400 cycles across 500,000 ohm load

VRA123M
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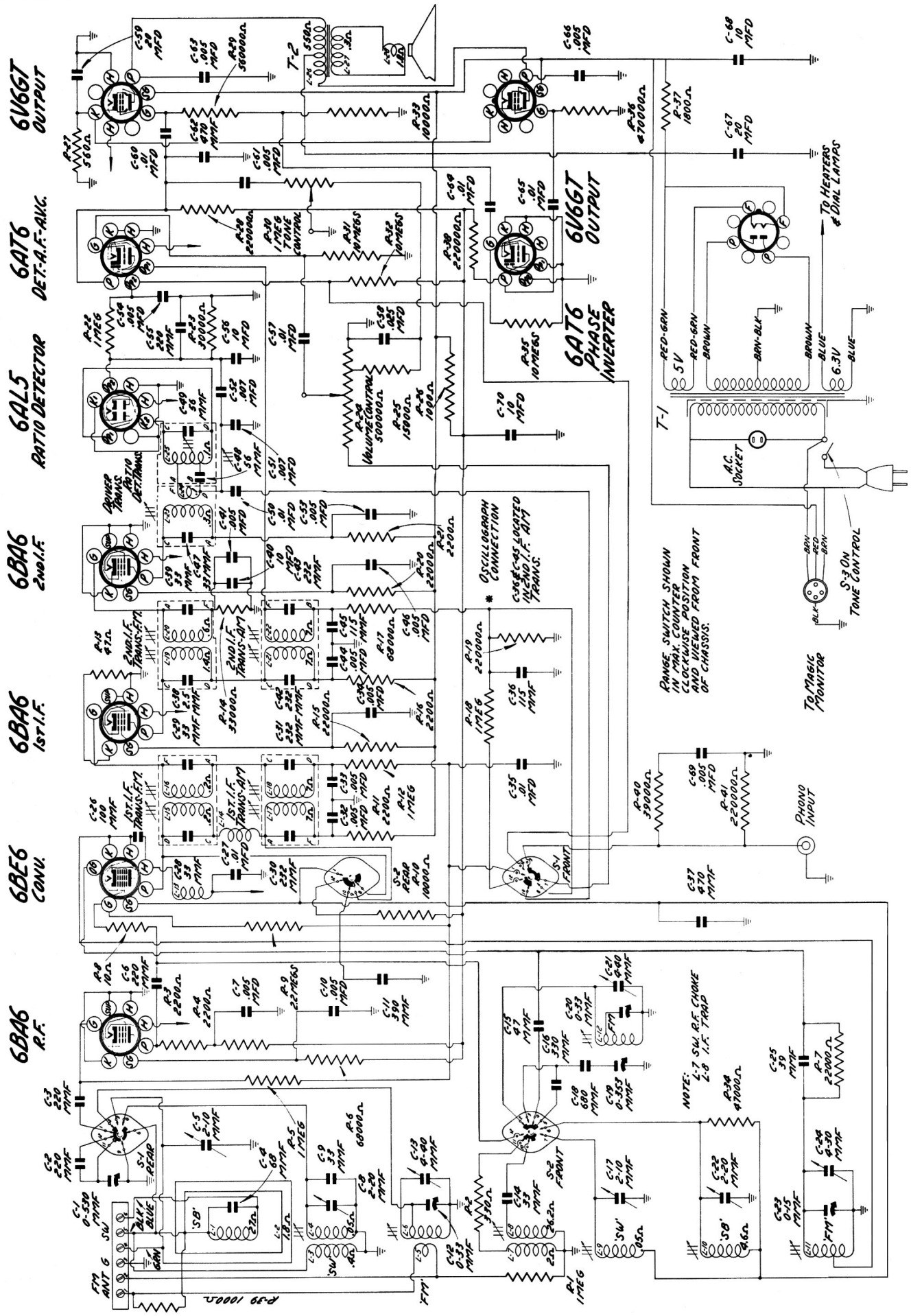

GENERAL DESCRIPTION

The RCA Victor Models VRA123M and VRA123C AM-FM radio-phonograph combinations are housed in cabinets of striking beauty. The AM-FM receiver is a twelve tube, three band superheterodyne using the most up-to-date circuits for high quality radio reproduction. Features of the design include: Built-in folded dipole antenna for F.M. reception; Built-in short wave antenna; Adjustable standard broadcast loop antenna. Miniature tubes for improved high frequency performance; R.F. stage; Iron core R.F.; Oscillator and I.F. coils; "Amplitude Ignorer" for improved rejection of AM when receiving F.M.; Ratio detector for high quality F.M. reproduction; Automatic volume control circuits; Full range variable tone control; Tone compensated volume control; Magic Monitor for improved phonograph reproduction; Push-pull pentode output stage; Twelve inch P.M. loudspeaker. Models VRA101M and VRA101C use type 9600001-4 automatic record changer mechanism with high fidelity, low noise crystal pickup. Refer to the 960001-4 Service Note for adjustment details and list of replacement parts for this mechanism.

NOTE: Refer to VRA101M and VRA101C Service Note for alignment instructions, chassis wiring drawings and other service data.

MAGIC MONITOR SERVICE DATA

GENERAL DESCRIPTION

The RCA Magic Monitor circuit reduces the high frequency surface noise during the low-level passages on a phonograph record and permits maximum treble response during the high-level passages. The circuit consists of a reactance tube (6BA6), a half-wave rectifier (diode section of a 6AV6) and an amplifier (triode section of a 6AV6).

A portion of the audio signal is amplified, rectified and applied as a bias voltage to the grid of the reactance tube. This tube (connected across the output of the Magic Monitor) functions as a variable capacitance which shunts a controlled amount of the surface noise frequencies to ground.

During the low-level passages, when the surface noise tends to mask the high frequencies, the low bias voltage increases the capacitance of the reactance tube, and the surface noise is reduced. During the high-level passages, when the surface noise itself is masked by the signal, the high bias voltage decreases the capacitance of the tube, thus permitting all audio frequencies to pass relatively unaffected.

CIRCUIT ARRANGEMENT

Audio signals from the phonograph pickup pass from Magic Monitor input to output through the parallel combination C 71 R 40 which functions as a tone compensation network. Connected across the output is the grid circuit of the reactance tube through 1000 mmfd. coupling capacitor C 77. This tube functions as a variable capacitance by virtue of the well known "Miller" effect. The capacity presented by the reactance tube (6BA6) grid is dependent upon the grid plate capacity C 78 and the reactance tube circuit gain. A decrease in grid-plate capacity or in circuit gain will decrease the effective capacity presented by the reactance tube grid. In the Magic Monitor, a variable-mu tube (6BA6) is used and control exerted by variations in grid bias. A negative bias, dependent on the amplitude of the high frequency components in the signal, is provided by the diode section of the 6AV6 and filtered by the RC network between 6AV6 diode plate and 6BA6 reactance tube grid. The triode section of the 6AV6 amplifies a portion of the incoming signal and passes the high frequency components to the diode rectifier through the 180 mmfd coupling capacitor C 73.

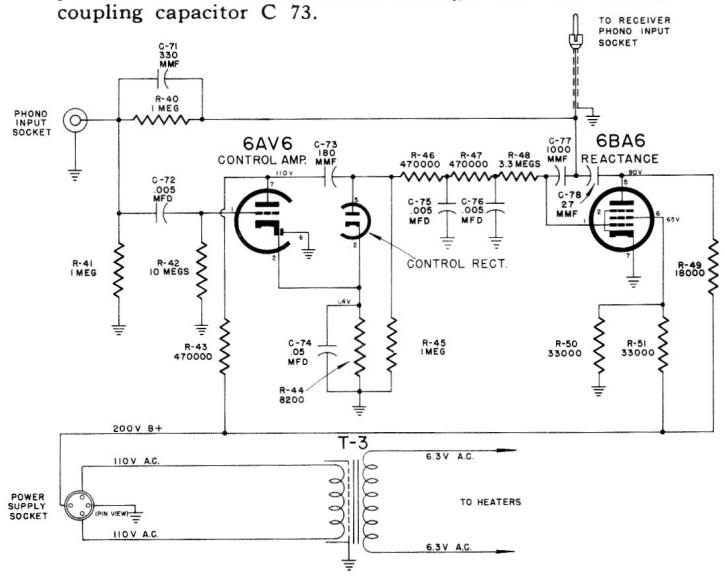

Fig. 3 — Magic Monitor Schematic Circuit Diagram

TEST PROCEDURE

The Magic Monitor circuits may be tested for correct operation as follows:

1) Set the volume control for maximum amplifer gain.
2) Set the tone control for maximum high frequency response.
3) Connect an audio signal generator to the phono input socket through a 1500 mmfd capacitor.
4) Set the audio signal generator frequency to 5000 c.p.s. and adjust the output level until the voltage across the loudspeaker voice coil = 1.5 volts.
5) Ground the control rectifier diode plate (pin #5 on 6AV6 socket). This removes the bias from the 6BA6 reactance tube and increases the effective grid circuit capacity to its maximum value. The voltage across the loudspeaker voice-coil should be reduced to approximately .9 volt when the reactance tube operation is normal.
6) Adjust the audio signal generator output voltage to 0.25 volt.
7) Use an RCA Voltohmyst or equivalent instrument to measure the D.C voltage developed across the control rectifier diode load resistor R 45. This voltage should be approximately —10 volts when the control amplifier and rectifier operation is normal.

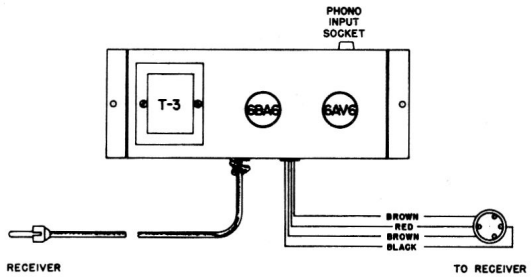

Fig. 2 — Magic Monitor Chassis Layout

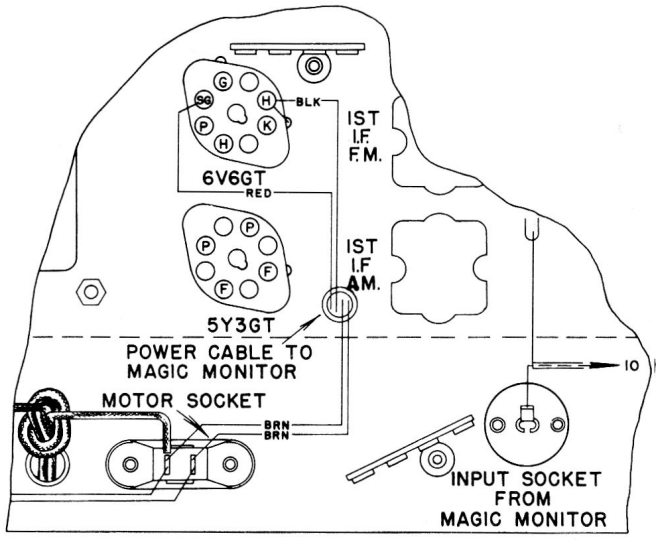

Fig. 4 — Section of Chassis Wiring Diagram Showing Magic Monitor Power Cable Connections

REPLACEMENT PARTS FOR MODELS VRA123M & VRA123C

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

STOCK NO.	DESCRIPTION
	CHASSIS ASSEMBLY
S-4017	Board-Terminal board
S-3614	Capacitor-Mica trimmer (C13,C21)
S-3697	Capacitor-Trimmer assembly (C5,C8,C17,C22)
S-3698	Capacitor-Ceramic trimmer (C24)
39616	Capacitor-33 MMF Mica 5% (C9,C14)
S-4219	Capacitor-39 MMF Ceramic 5% (C25)
S-4220	Capacitor-47 MMF Ceramic 5% (C15)
S-3510	Capacitor-68 MMF Mica 20% (C4)
45233	Capacitor-100 MMF Ceramic 10% (C26)
S-4221	Capacitor-220 MMF Ceramic 5% (C3,C6,C55)
39636	Capacitor-220 MMF Mica 5% (C2)
39640	Capacitor-330 MMF Mica 5% (C16)
39642	Capacitor-390 MMF Mica 5% (C11)
39644	Capacitor-470 MMF Mica 5% (C37,C62)
14498	Capacitor-680 MMF Mica 5% (C18)
S-3646	Capacitor-.005 MFD (C7,C10,C32,C33,C34, C41,C44,C46,C53,C61,C63,C66)
S-3647	Capacitor-.007 MFD (C51,C52)
S-3648	Capacitor-.010 MFD (C27,C35,C50,C57,C60, C64,C65)
S-3651	Capacitor-.025 MFD (C58)
36718	Capacitor-Electrolytic 10 MFD (C40,C56)
S-2894	Capacitor-Electrolytic 10 MFD (C70)
S-3720	Capacitor-Electrolytic 20-10-20 MFD (C59, C67,C68)
S-3684	Condenser-Variable & drum (C1,C12,C19,C20, C23)
S-3607	Coil-Antenna coil S.W. (L3,L4)
S-3679	Coil-Oscillator coil S.W. (L9)
S-3680	Coil-Oscillator coil S.B. (L10)
S-3678	Coil-Oscillator coil F.M. (L11)
S-3621	Indicator-station selector pointer
11765	Lamp-Dial lamp (Mazda #51)
S-4300	Plate-Dial backplate and pulleys
34761	Resistor-10 ohms, 1/4 watt (R6)
30732	Resistor-47 ohms, 1/2 watt (R13)
30538	Resistor-330 ohms,1/2 watt (R2)
5164	Resistor-560 ohms,1/4 watt (R27)
34766	Resistor-1000 ohms,1/2 watt(R26)
S-3682	Resistor-1800 ohms,W.W. (R37)
34767	Resistor-2200 ohms,1/2 watt(R3,R4,R11,R16)
14659	Resistor-6800 ohms,1/2 watt(R17)
3078	Resistor-10000 ohms, 1/2 watt (R10,R33)
36714	Resistor-15000 ohms,1/4 watt (R25)
30492	Resistor-22000 ohms,1/2 watt (R7,R15,R20)
3077	Resistor-30000 ohms,1/2 watt (R23)
30685	Resistor-33000 ohms,1/2 watt (R14)
30787	Resistor-47000 ohms,1/2 watt (R34)
14138	Resistor-68000 ohms,1/2 watt (R6)
14583	Resistor-220000 ohms,1/2 watt(R19,R28,R38)
30648	Resistor-470000 ohms,1/2 watt(R36)
30653	Resistor-560000 ohms,1/2 watt(R29)
30652	Resistor-1 Megohm,1/2 watt(R1,R5,R12,R18, R22)
30649	Resistor-2.2 Megohm,1/2 watt (R9)
30992	Resistor-10 Megohm,1/2 watt(R31,R32,R35)
S-4226	Shaft-Drive shaft
31364	Socket-Dial lamp socket
36069	Socket-Tube socket(Miniature with centre shield)
51384	Socket-Tube socket(Miniature)
31319	Socket-Tube socket(Octal)
14278	Socket-Phono socket
31418	Spring-Drive cord spring (Pkg.2)
S-4223	Switch-Range switch (S1,S2)
S-4225	Tone-Control,1 Megohm (S3,R30)
S-3667	Transformer-1st I.F.A.M.(L17,L18,C30,C31)
S-3668	Transformer-2nd I.F.A.M.(L21,L22,C36,C42, C43,C45)
S-4010	Transformer-1st I.F.F.M.(L15,L16,C28,C29)
S-4011	Transformer-2nd I.F.F.M.(L19,L20,C38,C39)
S-3703	Transformer-Driver-F.M.(L23,L24,C47)
S-3702	Transformer-Ratio Detector F.M.(L25,C48,C49)
S-3722	Transformer-Power,60-cycle (T1)
S-4297	Transformer-Power,25-cycle (T1)
S-4038	Transformer-Output (T2) (L26,L27)
S-4224	Volume Control-500,000 ohms (R24)
2917	Washer-"C" Washer for drive shaft(Pkg.10)
S-3739	Wave trap-(L-8) Choke (L7)

STOCK NO.	DESCRIPTION
	SPEAKER ASSEMBLY
S-4298	Board-Speaker terminal board
13867	Dust Cap (Pkg.5)
S-4299	Cone-Cone & Voice Coil Assembly (L28)
S-4288	Speaker-complete
	AUTOMATIC RECORD CHANGER MECHANISM
	Refer to Model 960001-4 Service Note for replacement parts and service data.
	PULL OUT MECHANISM ASSEMBLIES
S-4182	Door balancing assembly (complete)
S-4180	Fibre Washer (Pkg.3)
S-4169	Hex.nut for door balance assembly
S-4373	Roll out mechanism arm
S-4374	Roll out mechanism roller
S-4179	Rubber washer (Pkg.2)
S-4176	Set screw for door balance assembly (Pkg.3)
S-4046	Slide holder and carriage
S-4047	Slide bar (LH)
S-4048	Slide bar (RH)
S-4177	Spring washer for door balance assembly(Pkg.3)
S-4166	Spring-balance spring
S-4178	Stud for door balancing assembly
S-4168	Support-door fall support
	MISCELLANEOUS ASSEMBLIES
	Antenna-F.M. (See R.F. transmission line).
33545	Cap-pilot lamp cap
S-3924	Catch-door catch and strike plate (VRA123C)
S-3925	Catch-door catch and strike plate (VRA123M)
S-4167	Clamp-Back cover clamp (Pkg.10)
S-4228	Cloth-Grille cloth (VRA 123C)
S-4229	Cloth-Grille cloth (VRA 123M)
S-4216	Decal-(front panel)
36386	Decal-(Record Drawer)
S-3658	Dial-Dial Scale (VRA123M)
S-4227	Dial-Dial Scale (VRA123C)
S-4230	Grille-Metal grille (VRA123C)
S-4231	Grille-Metal grille (VRA123M)
S-4293	Handle-Door handle (VRA123C)
S-4289	Handle-Door handle (VRA123M)
13103	Jewel-Amber jewel
S-4291	Knob-Door knob (VRA 123C)
S-4292	Knob-Door knob (VRA 123M)
34489	Knob-Tuning-Volume-Tone
37837	Knob-Range
31480	Lamp-Pilot lamp (Mazda 47)
S-4022	Loop-Antenna loop
5133	Pin-Speaker cable pin (Pkg.5)
S-4009	Spring-Conical spring to Mount Record Changer
14270	Spring-Retaining spring for knob (Pkg.3)
70788	R.F. transmission line
	MAGIC MONITOR
70935	Capacitor-27 MMF 10% Ceramic (C78)
71922	Capacitor-180 MMF 10% Ceramic(C73)
71919	Capacitor-330 MMF 10% Ceramic(C71)
S-4425	Capacitor-1000 MMF 20% Ceramic (C77)
S-3646	Capacitor-.005 MFD (C72,C75,C76)
70615	Capacitor-.05 MFD (C74)
14250	Resistor-8200 ohms,1/2 watt (R44)
3219	Resistor-18000 ohms,1/2 watt(R49)
30685	Resistor-33000 ohms,1/2 watt(R50,R51)
30648	Resistor-470000 ohms,1/2 watt(R43,R46,R47)
30652	Resistor-1 megohm, 1/2 watt(R40,R41,R45)
31417	Resistor-3.3 Megohm, 1/2 watt(R48)
30992	Resistor-10 Megohm, 1/2 watt(R42)
S-4426	Socket-Tube socket-Miniature
S-4202	Socket-Phono socket
S-4427	Transformer-Power transformer,60 cycle (T3)
S-4428	Transformer-Power transformer,25 cycle (T3)

All prices and parts are subject to change or withdrawal without notice.