RCA VICTOR

3-VF-04 Series—*The "Madrigal"*

Model 3-VF-045—*Mahogany Grained Contemporary*

Model 3-VF-046—*Walnut Grained Contemporary*

RCA SALES CORPORATION

A RADIO CORPORATION OF AMERICA SUBSIDIARY

600 NORTH SHERMAN DRIVE

INDIANAPOLIS 1, INDIANA

RADIO/"VICTROLA"® SERVICE DATA

—File: 1962 No. 8—

3-VF-04 Series

Tuner Chassis RC-1206E

Amplifier Chassis—RS-193H

Record Changer—RP-216B-2

SPECIFICATIONS

TUBE COMPLEMENT

Tuner Chassis—RC-1206E

(V101) RCA 12DT8	FM RF Amp. & Converter
(V2) RCA 12BE6	AM Converter
(V3) RCA 12BA6	1st FM IF Amplifier
(V4) RCA 12EQ7	AM & 2nd FM IF Amp., & AM Det.
(V5) RCA 12AL5	FM Ratio Detector
(V6) RCA 35W4	Rectifier

Power Amplifier Chassis—RS-193H

(V201) RCA 6EU7	Left and Right Channel AF Amp.
(V202) RCA 6BQ5	Right Channel Power Amp.
(V203) RCA 6BQ5	Left Channel Power Amp.
(V204) RCA 5Y3GT	Rectifier

TUNING RANGE

AM Broadcast	540-1620 kc
FM Broadcast	88-108 mc

INTERMEDIATE FREQUENCIES

AM ....455 kc FM ....10.7 mc

FREQUENCY RESPONSE....70 - 20,000 cycles

TUNING DRIVE RATIO....15:1 (7½ Turns of Knob)

POWER SUPPLY RATING

105-125 volts, 60 cycle ....120 watts

LOUDSPEAKERS

Two 8" PM	3.2 ohm voice coil
Two 3½" PM "Tweeters"	6-8 ohm voice coil

RECORD CHANGER—RP-216B-2

Turntable Speeds	16⅔, 33⅓, 45 or 78 rpm
Record Capacity	Up to fifteen 7 inch or twelve 10 inch or ten 12 inch or ten 12 inch and 10 inch intermixed
Pickup (Stock No. 110021)	Stereophonic Ceramic
Styli (Stock No. 110020)	0.7-mil and 3-mil syn. sapp.

MUSIC POWER OUTPUT

E.I.A. (Std. RS-234)	8.0 watts
Maximum	20.0 watts

CABINET DIMENSIONS

Height ....27⅝" Width ....37¾" Depth ....17⅜"

DESCRIPTION

Models of the 3-VF-04 Series are high-fidelity Radio/"Victrola" combination consoles; they are complete radio and stereophonic record playing systems comprised of a radio tuner chassis, a stereophonic record player, a dual channel amplifier and two speaker systems all housed in a single cabinet.

The six tube radio chassis (RC-1206E) provides for the reception of standard AM and FM broadcasts. Two controls (TUNING and AM/FM/AFC/PHONO) are provided for the operation of this chassis. The AM channel consists of a mixer oscillator stage, an IF amplifier stage, and a detector stage. The FM channel consists of an RF stage, a mixer oscillator stage, two IF amplifier stages, and a ratio detector stage. Superhetrodyne circuitry is employed in both channels with a minimum of switching being used, none of which is in the high frequency circuits. An isolation transformer is used in the power line to reduce shock hazard. The output of the radio chassis is fed to a dual channel power amplifier chassis (RS-193H).

The RP-216B-2 record changer is a stereophonic record player capable of playing 7", 10" and 12" records at speeds of 16⅔, 33⅓, 45 or 78 rpm. It is equipped with a "clip-in" "push-over" dual styli assembly containing a 0.7-mil "MG" and a 3-mil "78" synthetic sapphire styli.

The four tube power amplifier chassis (RS-193H) consists of an AF amplifier stage and a power output stage for each of the two channels. Four controls (OFF/ON/LOUDNESS, BASS, TREBLE and BALANCE) provide for the operation of this chassis. Dual controls, except the BALANCE control, are used to obtain simultaneous regulation of the channels.

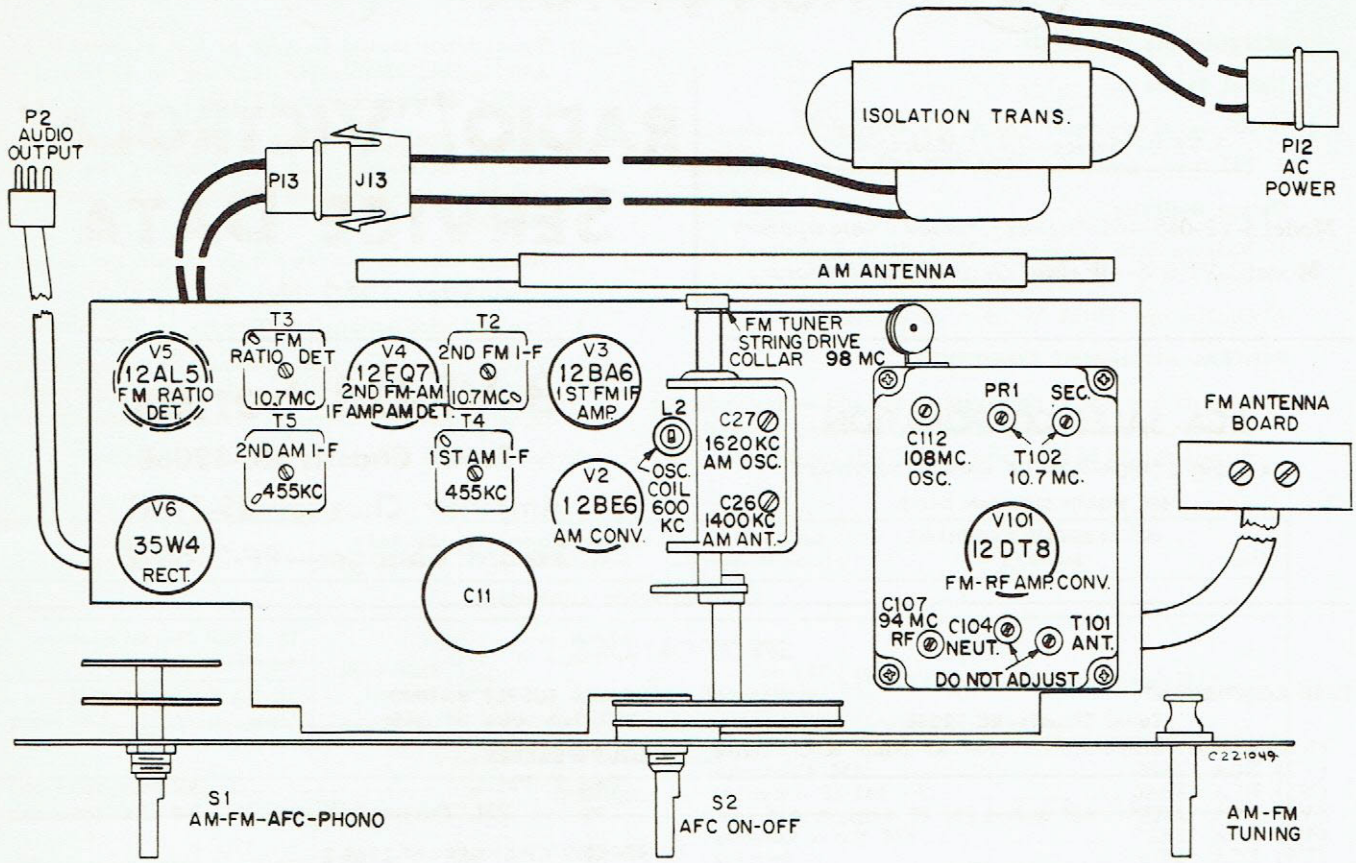
SUPPLEMENTARY INFORMATION LISTINGS

Vol.	Issue	Subject

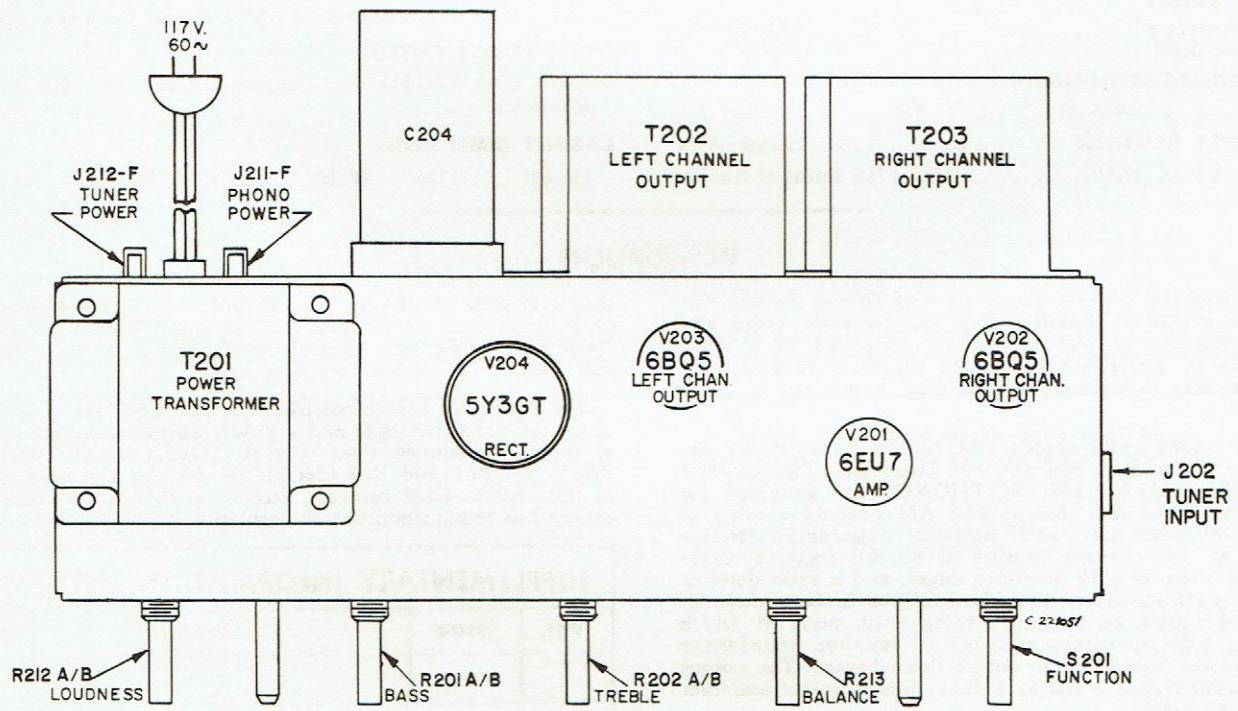
1962 No. 8

First Edition First Printing

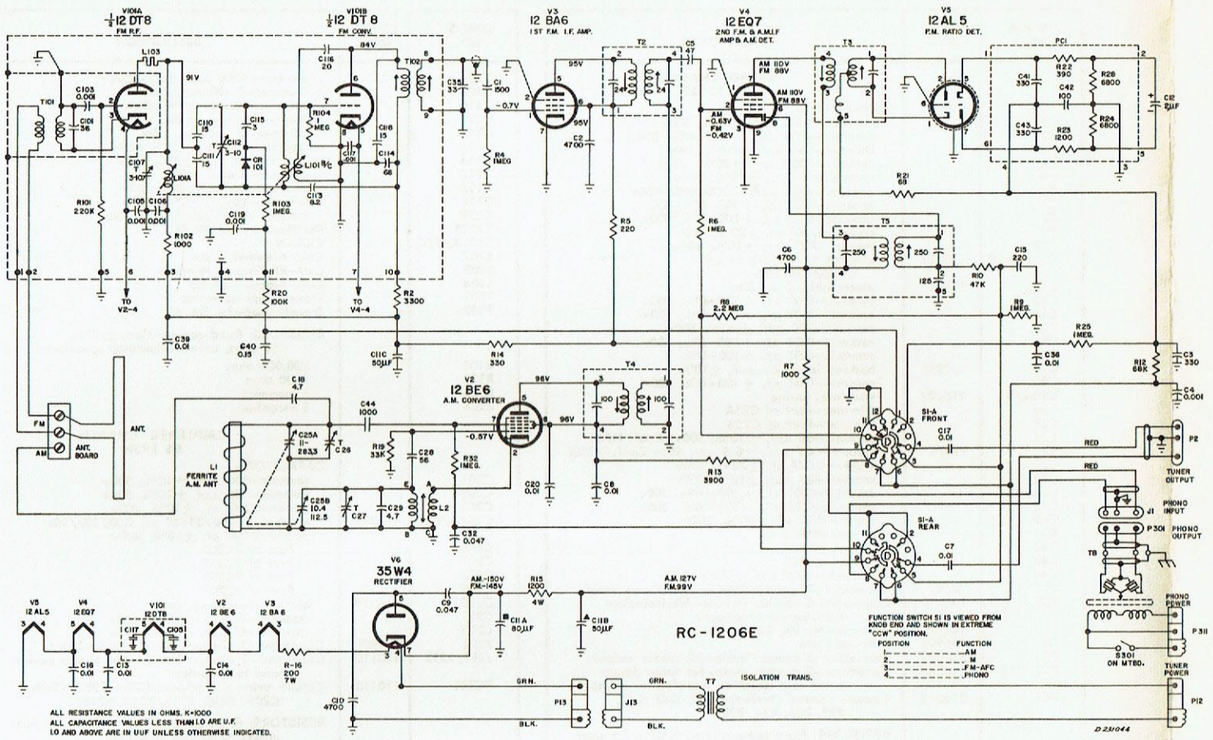
Printed in U.S.A.

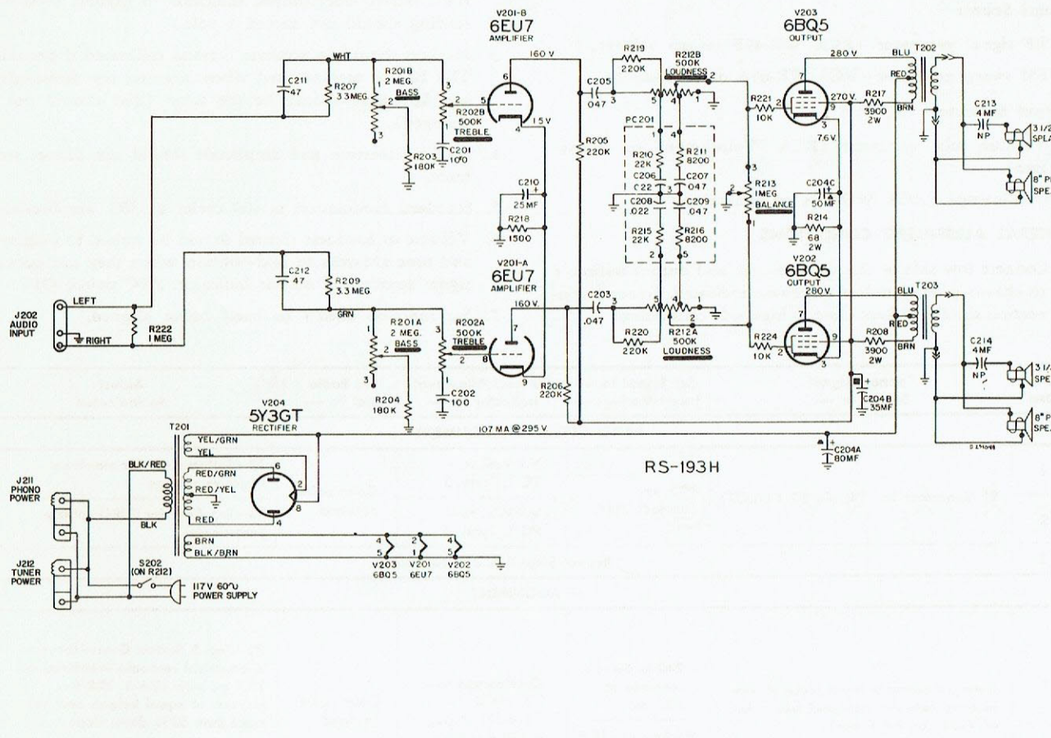


Chassis RC-1206E—Location of Major Components



Chassis RS-193H—Location of Major Components





Schematic Diagram

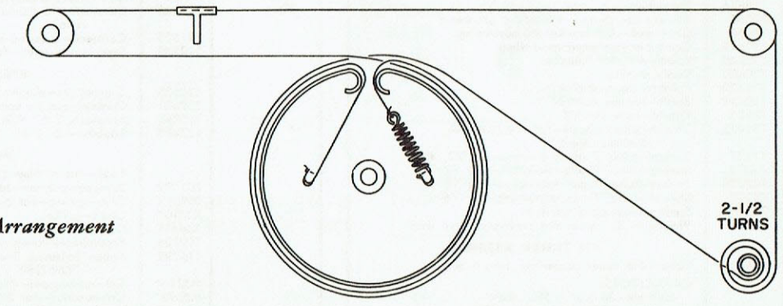
CRITICAL LEAD DRESS

Chassis RC-1206E

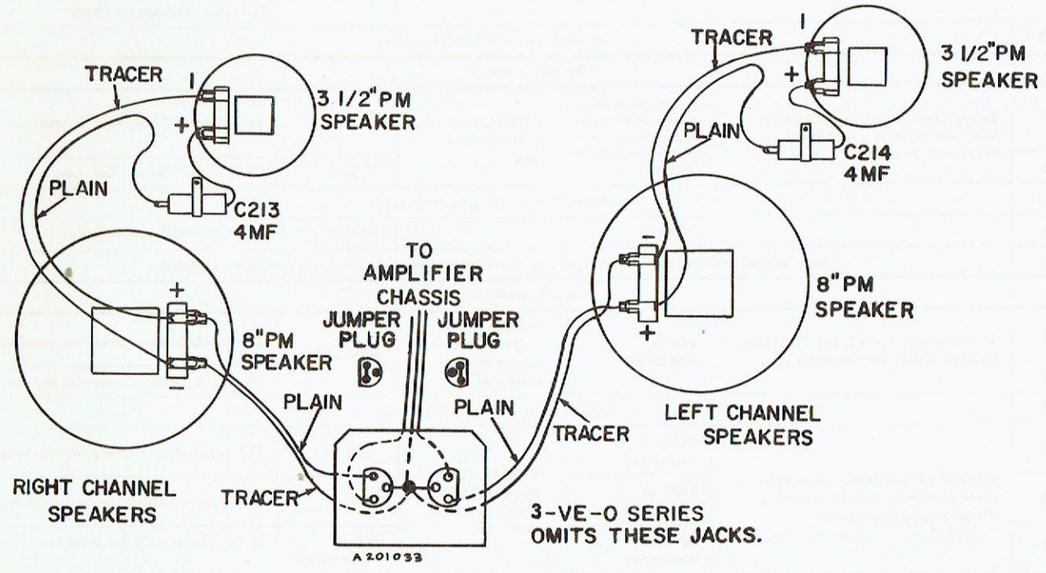
1. 10.7 mc IF grid and plate wiring must be short and dressed close to chassis.
2. Connect AVC side of AM antenna to top side of tuning gang, and dress clear of 12BE6 and 12BA6 tubes.
3. Dress heater lead which connects to pin 4 of 12BE6 along rear apron and to rear of 12BA6 socket.
4. B+ lead from pin 6 of 12BE6 to T4 must be short and dressed along chassis.
5. All RF bypass capacitor leads must be short and direct.
6. All heater leads must be close to chassis.

Chassis RS-193H

1. Dress all heater leads close to chassis and away from all grid connections.
2. Dress all green and white leads against front apron.
3. Dress all leads to pins 6 and 8 of V204(5Y3) close to chassis.
4. Dress all leads from T202 and T203 against back apron.
5. Dress R8 and R17 (3900Ω) close to back apron keeping leads as short as possible.
6. Bend terminal 2 away from terminals 1 and 3 of J211 on RS-193H amplifier.
7. Dress leads away from all power resistors.



Dial Cord Arrangement



Speaker Wiring

ALIGNMENT PROCEDURE

INSTRUMENTS REQUIRED

Signal Source

1. RF signal generator (RCA WR-49B or equivalent).
2. FM sweep generator (RCA WR-69A or equivalent).

Output Indicator

3. Vacuum tube voltmeter (RCA "Voltohmyst" or equivalent).
4. Oscilloscope (RCA WO-91A or equivalent).

GENERAL ALIGNMENT CONDITIONS

1. Connect low side of the signal source and output indicator to chassis ground unless otherwise indicated. Ground connection should be kept close to high side connection.
2. Signal input should be kept as low as possible to avoid AVC action. (Set output indicator to highest sensitivity, reading should not exceed 1 volt.)
3. Markers should be accurate (crystal calibrated if possible). The 10.7mc marker used when aligning the demodulator and IF stages should be the same (dial should not be changed).
4. Marker insertion and amplitude should not distort scope trace.
5. Standard modulation is 400 cycles at 30% amplitude.
6. Volume or loudness control should be turned to maximum and tone controls to mid-position when they are between signal source and output indicator. AFC switch OFF.
7. Set function switch to band being aligned.

Step	Connect Signal Source To —	Set Signal To — Insert Markers —	Connect Alignment Indicator To —	Set Radio Dial To —	Adjust As Indicated
		RATIO DETECTOR ALIGNMENT			
1	RF Generator To—V4, pin #2 (12EQ7)	10.7 mc (unmodulated)	V.T.V.M. to—PC 1, Term. 5	Quiet point on band	T3—Bottom Core for maximum negative voltage
2			V.T.V.M. to—PC 1, Term. 4		T3—Top Core for ZERO voltage (cross-over)
3	Repeat Steps 1 & 2 as Necessary				
		IF ALIGNMENT			
1	Sweep Generator to—a piece of wire inserted between tube and tube shield of V101 (on FM Tuner)	240 kc Sweep centered at 10.7 mc Markers at—10.6, 10.7 & 10.8 mc	Oscilloscope to—V4, pin 2 (12EQ7) through a 180 k resistor	Quiet point on band	T2—Top & Bottom Cores—for max. symmetrical response—centered at 10.7 mc with 10.6 & 10.8 mc markers at equal heights and not more than 50% down slope
2					T102—pri. & sec. (on FM Tuner)—for same response as above
3	Repeat Steps 1 & 2 as Necessary				
		RF ALIGNMENT			
1	Sweep Generator across antenna terminals through a matching network if necessary	98 mc, 22.5 kc sweep, 400 cycle modulation	V.T.V.M. to—Audio Output Jack	98 mc	Adjust string-drive collar for max.
2		10.8 mc		10.8 mc	C112 (osc. trimmer) for max.
3	Repeat Steps 1 & 2 as Necessary				
4		94 mc		94 mc	C107 (RF trimmer)—for max.
5	Check overall response curve and repeat above steps as necessary to obtain maximum sensitivity.				
		AM ALIGNMENT			
1	RF Generator to—V2, pin 7 (12BE6) through a 0.01 mf Capacitor	455 kc modulated	V.T.V.M. as an audio voltmeter—across speaker voice coil	fully open	T5—Top & Bottom Cores—for maximum
2					T4—Top & Bottom Cores—for maximum
3	Repeat Steps 1 & 2 as Necessary				
4	Connect RF Generator to—a short piece of wire or to a loop of wire placed near AM antenna	1620 kc modulated	V.T.V.M. as an audio voltmeter—across speaker voice coil	1620 kc	C27 (oscillator trimmer) for maximum
5		1400 kc modulated		1400 kc	C26 (antenna trimmer) for maximum
6		600 kc modulated		600 kc (rock gang)	L2 (oscillator coil) for maximum
7	Repeat 4, 5, & 6 for maximum sensitivity				

REPLACEMENT PARTS

SYMBOL NO.	STOCK NO.	DESCRIPTION
		RADIO CHASSIS RC 1206E
		CAPACITORS:
C1		ceramic—1500 μμf, ±20%, 500v
C2		ceramic—4700 μμf, +100—0%, 500v
C3		ceramic—330 μμf, ±20%, 500v
C4		ceramic—1000 μμf, ±20%, 500v
C5		ceramic—47 μμf, ±10%, 500v
C6		ceramic—4700 μμf, +100—0%, 500v
C7		ceramic—0.01 μf, +100—0%, 500v
C8		ceramic—0.01 μf, +100—0%, 500v
C9		paper—0.047 μf, ±20%, 400v
C10		paper—4700 μμf, ±20%, 600v
C11A/B/C	110421	electrolytic—80/50/50 μf, 175/150/150v
C12	79181	electrolytic—2 μf, 50v
C13		ceramic—0.01 μf, +100—0%, 500v
C14		ceramic—0.01 μf, +100—0%, 500v
C15		ceramic—220 μμf, ±20%, 500v
C16		ceramic—0.01 μf, +100—0%, 500v
C17		ceramic—0.01 μf, +100—0%
C18	102235	headed lead—4.7 μμf, ±20%
C20		ceramic—0.01 μf, +100—0%, 500v
C25A/B	110422	variable, tuning
C26		trimmer—Part of C25A
C27		trimmer—Part of C25B
C28		ceramic—56 μμf, ±10%, 500v, Coef. N750
C29	77471	ceramic—4.7 μμf, ±0.5 μμf, 500v Coef. N3300
C32		paper—0.047 μf, ±20%, 400v
C35		ceramic—33 μμf, ±10%, 500v
C36		ceramic—0.01 μf, +100—0%, 500v
C39		ceramic—0.01 μf, +100—0%, 500v
C40		paper—0.15 μf, ±20%, 200v
C41		Part of PC1
C42		Part of PC1
C43		Part of PC1
C44		ceramic—1000 μμf, ±20%, 500v
J1	74882	Connector—3 contact female—for phono input
J13	110119	Connector—2 contact female—for isolation transformer secondary
L1	108999	Antenna—ferrite, AM
L2	108997	Coil—oscillator
P2	101998	Connector—3 contact male—for audio output
P12, P13	110145	Connector—2 contact male—for tuner power input and isolation transformer primary
PC1	110362	Circuit—printed (Includes C41, C42, C43, R22, R23, R24, R28)
		RESISTORS: fixed composition, ±10%, ½ watt, unless otherwise specified
R2		3300 ohm
R4		1 megohm
R5		220 ohm
R6		1 megohm
R7		1000 ohm
R8		2.2 megohm
R9		1 megohm
R10		47,000 ohm
R12		68,000 ohm
R13		3900 ohm
R14		330 ohm
R15	101881	wirewound—1200 ohm, 4w
R16	110425	200 ohm, ±5%, 7w, wirewound
R19		33,000 ohm
R20		100,000 ohm
R21		68 ohm
R22		Part of PC1
R23		Part of PC1
R24		Part of PC1
R25		1 megohm
R28		Part of PC1
R32		1 megohm
S1	110877	Switch—rotary function
T3	110006	Transformer—FM ratio detector
T4	108995	Transformer—1st AM, IF
T5	108996	Transformer—2nd AM, IF
T6	110005	Transformer—2nd FM, IF
T7	110439	Transformer—Isolation
	110419	Backplate—control dial and pulley assembly
	73935	Clip—retaining—for IF transformer
	101825	Connector—closed end splicing—for isolation transformer leads
	72953	Cord—dial drive, (250 ft. spool)
	110876	Escutcheon—control
	77057	Eyelet—for chassis mounting grommet
	16058	Grommet—dial backplate mounting
	110415	Grommet—antenna mounting
	110840	Knob—AM/FM function
	110800	Knob—tuning
	110420	Pointer—control dial
	110418	Shaft—tuning control
	73521	Shield—tube for V5
	110423	Shield—plastic heat—for AM/FM/MX function switch
	77937	Socket—tube, 7 pin minature—for V2, V3
	76971	Socket—tube, 9 pin miniature—for V4
	102238	Socket—tube, 7 pin miniature—for V5
	73117	Socket—tube, 7 pin miniature—for V6
	72540	Spring—dial cord tension
	77585	Washer—"C" type—for tuning control shaft
		FM TUNER ASSEMBLY
	108444	Tuner—FM tuner assembly, less tubes
		CAPACITORS:
C101		ceramic—36 μμf ±5%, 500v
C103		ceramic—1000 μμf, ±5%, 500v
C105		ceramic—1000 μμf, ±5%, 500v

SYMBOL NO.	STOCK NO.	DESCRIPTION
C106		ceramic—1000 μμf, ±5%, 500v
C107		Trimmer—3—10 μμf, 250v
C110		ceramic—15μμf, ±2%, 500v
C111		ceramic—15μμf, ±2%, 500v
C112		Trimmer—3—10 μμf, 250v
C113		ceramic—8.2 μμf, ±5%, 500v
C114		ceramic—68 μμf, ±5%, 500v
C115		ceramic—3 μμf, ±5%, 500v
C116		ceramic—20μμf, ±5%, 500v
C118		ceramic—15μμf, ±2%, 500v
C119		ceramic—1000 μμf, ±5%, 500v
CR101		Rectifier—crystal diode
L101A/B/C		Coil—IF
L102		Coil—filament choke
L103		Coil—RF Choke (Printed)
L104		Coil—filament choke
T101		Transformer—antenna
T102		Transformer—1st FM, IF
		RESISTORS: fixed composition, ±10%, ½ watt, unless otherwise specified
R101		220,000 ohm
R102		1000 ohm
R103		1 megohm
R104		1 megohm
		AMPLIFIER CHASSIS RS 193H
		CAPACITORS:
C201		ceramic—100 μμf, ±10%, 500v
C202		ceramic—100 μμf, ±10%, 500v
C203		paper—0.047 μf, ±10%, 400v
C204A/B/C	110335	electrolytic—80/35/50 μf, 350/300/15v
C205		paper—0.047 μf, ±10%, 400v
C206		Part of PC201
C207		Part of PC201
C208		Part of PC201
C209		Part of PC201
C210	110329	electrolytic—25 μf, 6v
C211		ceramic—47 μμf, ±10%, 500v
C212		ceramic—47 μμf, ±10%, 500v
J202	101998	Connector—3 pin female—for audio input
J211, J212	110119	Connector—2 contact female—for phono power, and tuner power
PC201	110118	Circuit—printed (Includes C206, C207, C208, C209, R210, R211, R215, R216)
		RESISTORS: fixed composition, ±10%, ½ watt, unless otherwise specified
R201A/B	110332	control—dual, bass
R202A/B	110331	control—dual treble
R203		180,000 ohm
R204		180,000 ohm
R205		220,000 ohm
R206		220,000 ohm
R207		3.3 megohm
R208		3900 ohm
R209		3.3 megohm
R210		Part of PC201
R211		Part of PC201
R212A/B	110427	control—dual loudness with Switch S202
R213	110333	control—balance
R214		68 ohm, 2w
R215		Part of PC201
R216		Part of PC201
R217		3900 ohm, 2w
R218		1500 ohm
R219		220,000 ohm
R220		220,000 ohm
R221		10,000 ohm
R222		1 megohm
R224		10,000 ohm
S202		Part of R212
T201	110330	Transformer—power
T202	110027	Transformer—output
T203	110027	Transformer—output
	70392	Cable—AC power
	110109	Socket—9 pin miniature—for V201
	204900	Socket—9 pin miniature—for V202, V203
	70827	Socket—octal—for V204
		RECORD CHANGER WIRING
P301	74882	Connector—3 contact male—for pickup cable
P311	110145	Connector—3 contact male—for phono power cable
	101825	Connector—closed-end type—for motor leads
	110238	Terminal—board—for pickup cable
		SPEAKER ASSEMBLY
	110138	Capacitors—electrolytic, 4 μf, 10v
	110501	Contact—single contact—for speaker cable
	105395	Speaker—3½" P.M., 8 ohm, V.C.
	107475	Speaker—8" P.M., 3.2 ohm, V.C.
		MISCELLANEOUS
		Book—Instruction (IB-1403730-1)
	101199	Bumper—rubber—for pickup arm rest
	109288	Clip—spring—for control knobs
	X5390*	Cloth—grille
	104411	Cushion—for control knob plate escutcheon
	110336	Escutcheon—knob plate
	110792	Knob—Balance, Treble, Bass, and "ON-OFF"/Loudness controls
	M5391*	Lid—mahogany—for 3VF045
	M5392*	Lid—walnut—for 3VF046
	110337	Retainer—"45" spindle clamp
	108500	Washer—nylon—for knob 110792

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