

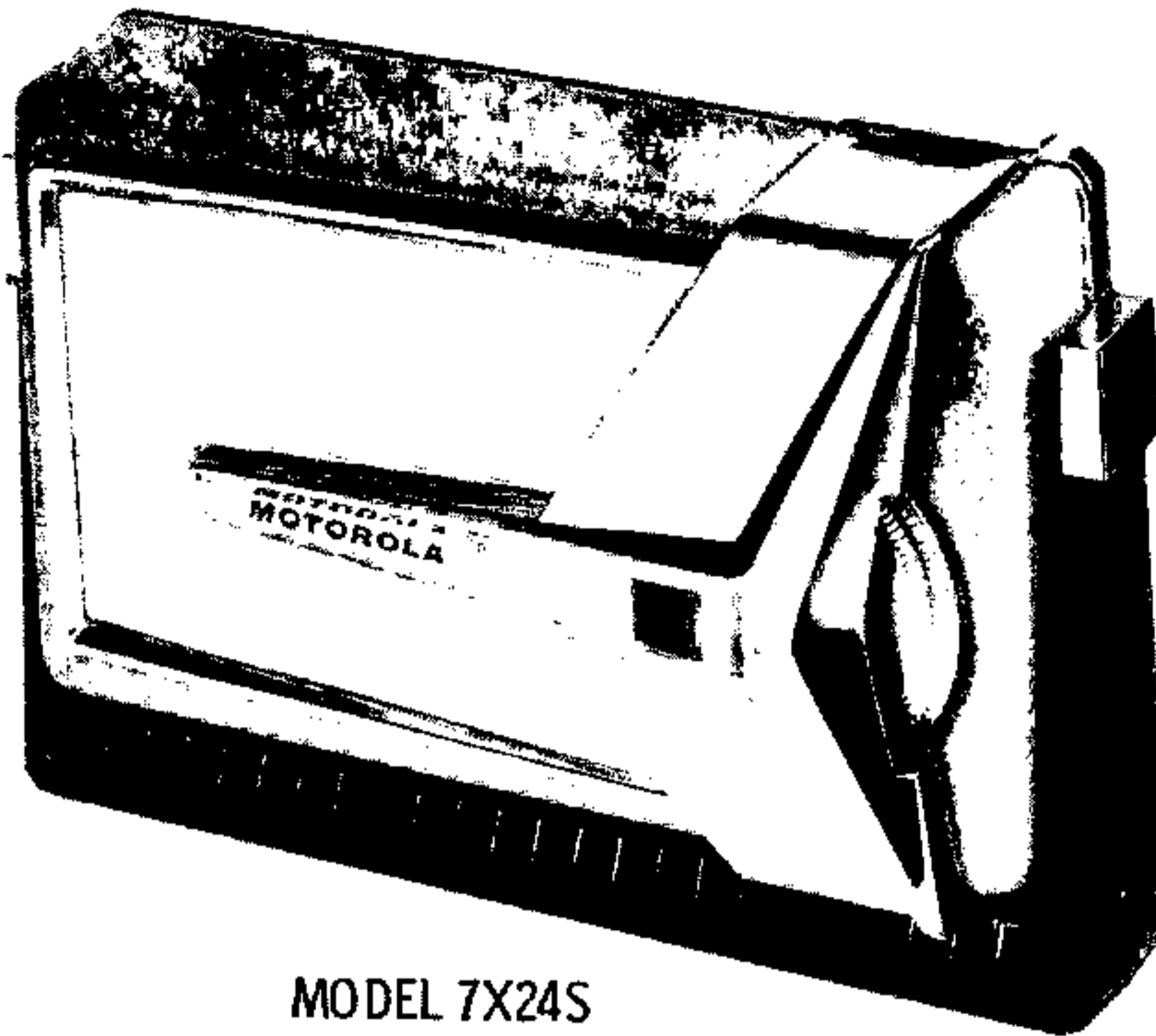
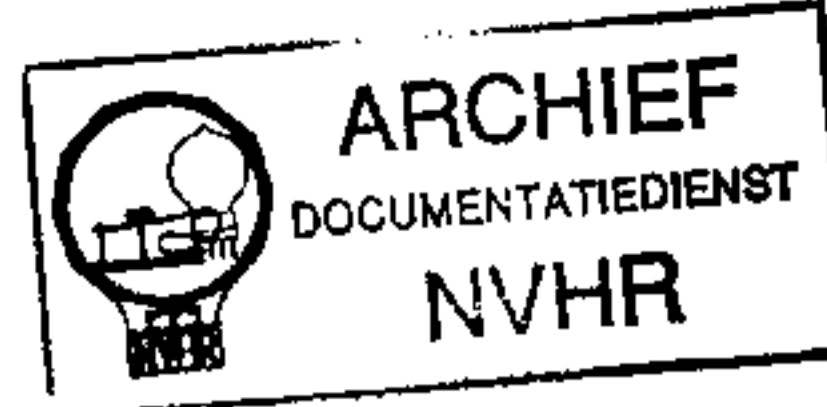


with CIRCUITRACE



Met dank aan Jef Bos

Ned. Ver. v. Historie v



MODEL 7X24S

TRADE NAME	Motorola Models 7X23E, 7X24S, 7X24W (Ch. HS-688)		
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois		
TYPE SET	Battery Operated Portable Transistorized AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	9MA @ 6 Volts DC (No Signal, Min Volume)
TUNING RANGE—BROADCAST	535KC - 1620KC		14MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A6, A7 GENERAL CEMENT #8282, 8606, 8606L, 9091
 WALSCO #2526, 2541, 2543, 2544
 A4, A5 GENERAL CEMENT #5004, 5008, 5009
 WALSCO #2520

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1. .1mfid	High side to antenna lug of tuning gang. Low side to chassis.	455KC (400V Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.	Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	1400KC	"	A5	"
It is not necessary to perform steps 4, 5 and 6 unless the oscillator core has been tampered with or associated components have been replaced. Before proceeding, set oscillator trimmer (A4) 1/4 turn from tight.						
4.	Loop	600KC	600KC	Across voice coil	A6	Adjust for maximum output while rocking tuning gang.
5.	"	1620KC	Tuning gang fully open	"	A4	Adjust for maximum output. Repeat steps 4 and 5 until oscillator covers required range.
6.	"	1400KC	1400KC	"	A5	Adjust for maximum output.
7.	"	1400KC	1400KC	"	A7	Adjust for maximum output. If oscillations occur, adjust A7 clockwise until oscillations cease.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JF262

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PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N168A	RF Amplifier				2N168A	NPN
X2	2N168A	Converter				2N168A	NPN
X3	2N293	1st IF Amplifier				2N216	NPN
X4	2N293	2nd IF Amplifier				2N216	NPN
X5	2N265	Driver				2N406	PNP
X6	2N241	Output				2N241A	PNP
X7	2N241	Output				2N241A	PNP

Matched Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	50	10	23K640702	XPP-10050	ECPB215		ML50-15	VL-1134	
C2	25	3	23K637758	XPP-3025	NLW25-3	TT3X25	ML25-3	TE-1055	
C3	6	10	23K636769	XPP-10006	NLW6-25	TT12X5	ML6-15	TE-1127.1	
C4	50	10	23K640702	XPP-10050	ECPB215	PET1575	ML50-15	VL-1134	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

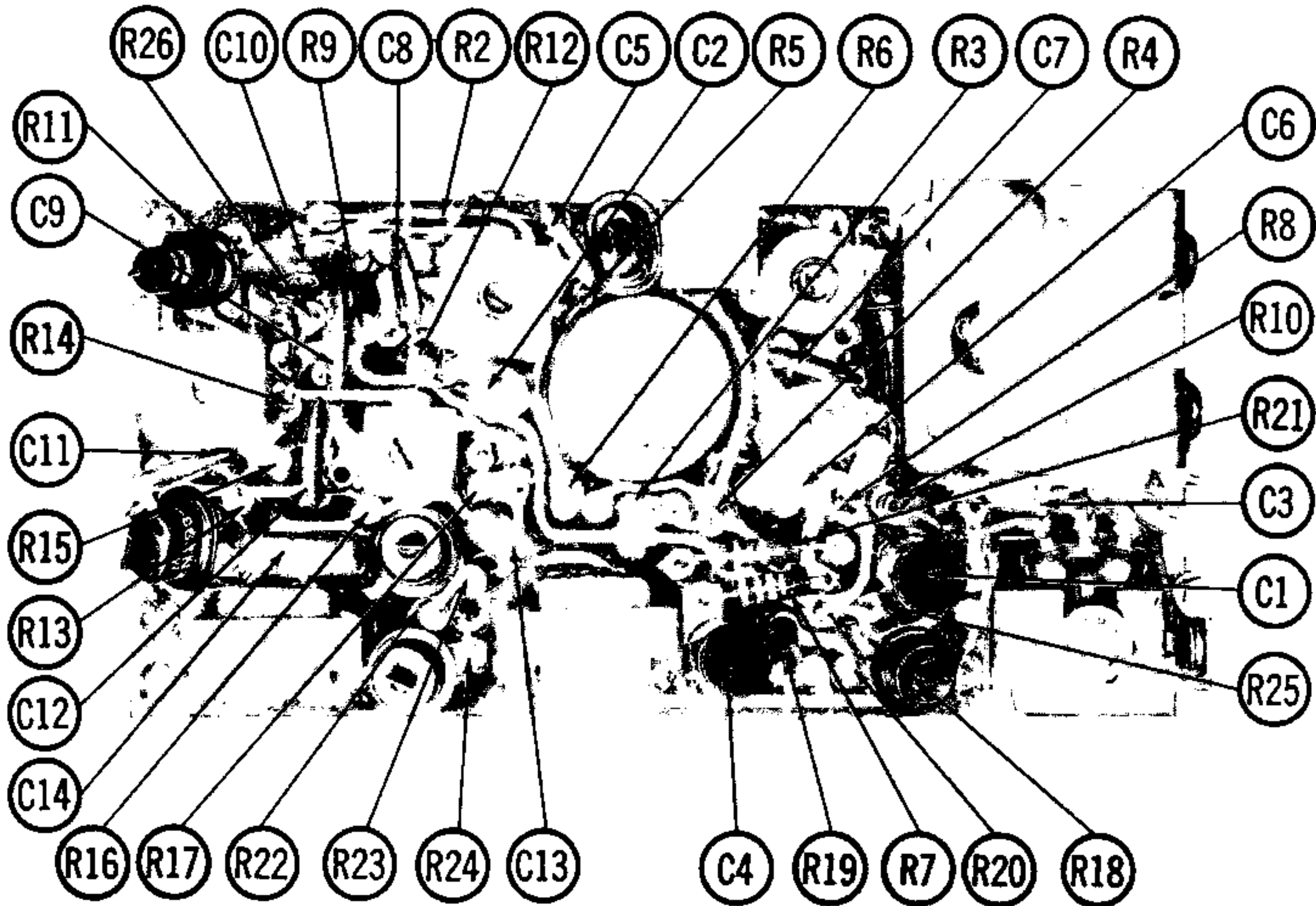
ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP.	VOLT	TOL	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	40000			21B635399	BPD-05	DA-503	H-05S5	TA-150	3GAB-S47	
C6	40000			21B635399	BPD-05	DA-503	H-05S5	TA-150	3GAB-S47	
C7	10000			21K640366	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C8	10000			21K640366	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C9	10000			21R128284	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C10	10000			21R128284	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C11	10000			21R128284	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C12	10000			21R128284	BPD-01	DM-103	H-05S1	TA-110	3GAB-S1	
C13	40000			21B635399	BPD-05	DA-503	H-05S5	TA-150	3GAB-S47	
C14	200000			21K642714						①

① Some versions may use 400000mmf in this application (Part #21K642714). Manufacturer recommends 400000mmf as replacement.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	10K	$\frac{1}{2}$	18B640209					Volume & Switch

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R2	1500Ω		R11	2200Ω		R20	220Ω	
R3	68K		R12	220Ω		R21	2700Ω	
R4	4700Ω		R13	2200Ω		R22	10Ω	
R5	4700Ω		R14	10K		R23	68Ω	
R6	82Ω		R15	100Ω		R24	10Ω	
R7	33K		R16	470Ω		R25	100Ω	
R8	100K		R17	1500Ω		R26	27K	
R9	1000Ω		R18	10K				
R10	3300Ω		R19	68K				

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	1V641317						Note 1
L2	RF Trans.	24C641016						
L3	Osc. Coil	24K641099						
L4	1st IF Trans.	24K640526						
L5	2nd IF Trans.	24K640527						
L6	3rd IF Trans.	24K637483						

Note 1. Model 7X24W uses Part #1V640383; Model 7X23E uses Part #1V64038L.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	
T1	1	1	25K640349					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	
T2	325Ω CT	13Ω	25K637642	TR-16			TA-20	TR-16	

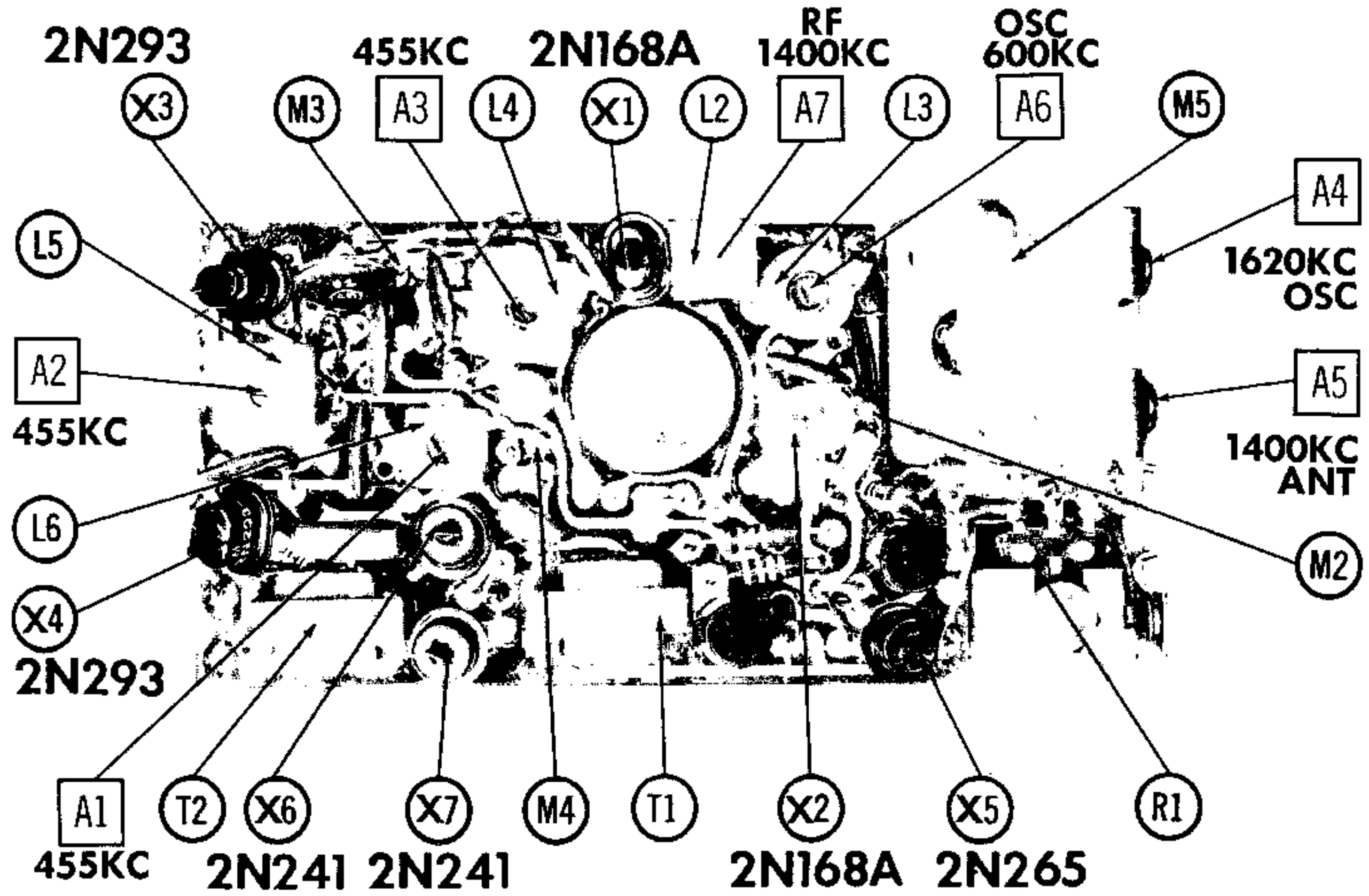
SPEAKER

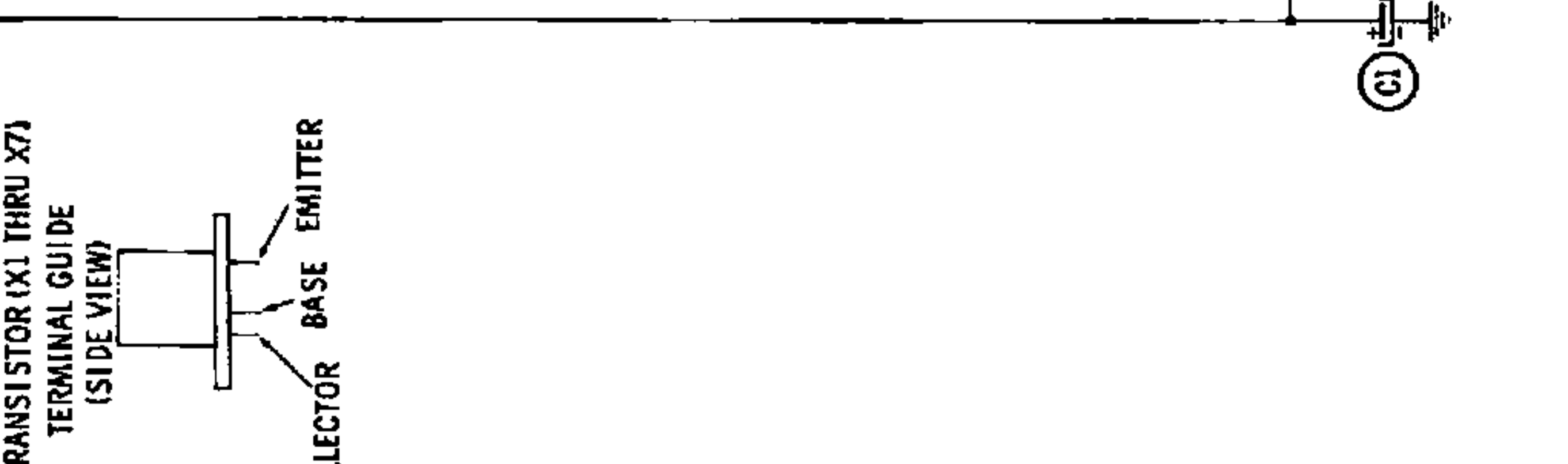
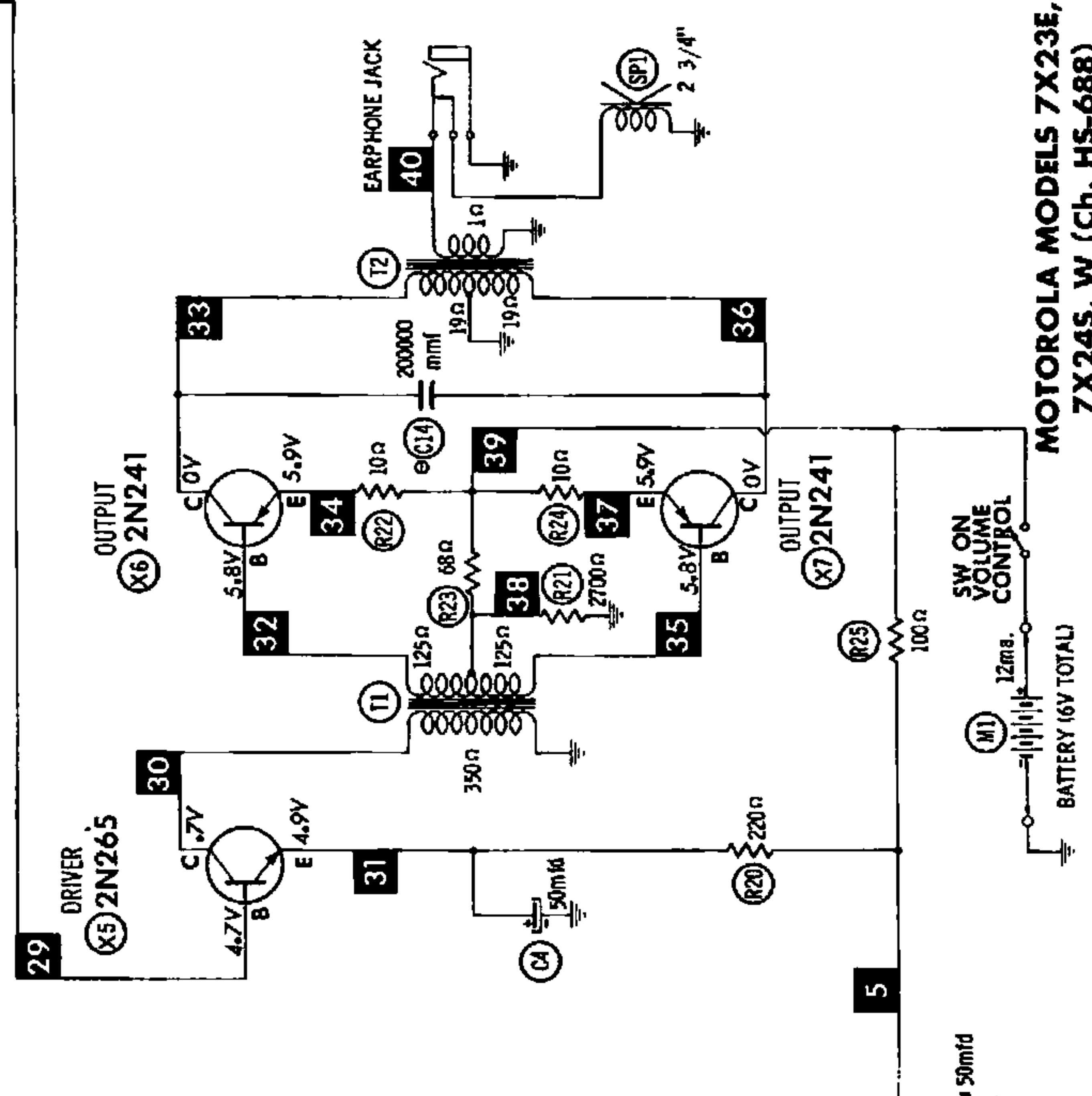
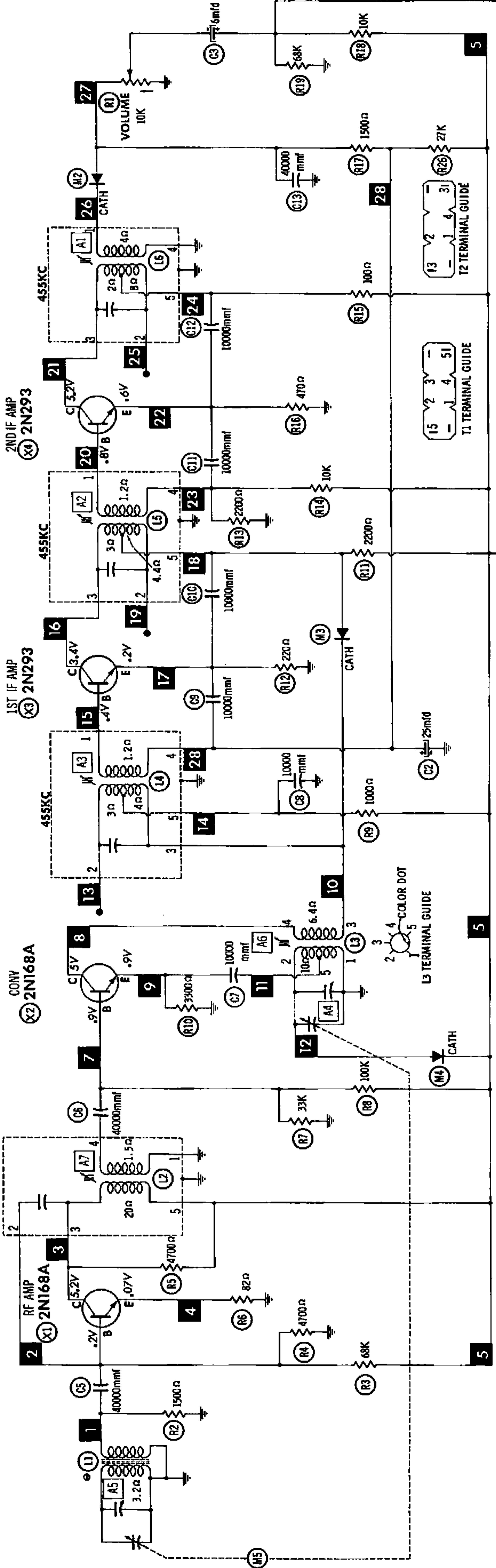
ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	2 3/4"	PM	14-15Ω	50B641011		

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			930 ↓		1015 ① E9 ①②		M-15R ↓ ZM8 ①②	↓ 4 Used. ② Mercury Type

CHASSIS—TOP VIEW





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

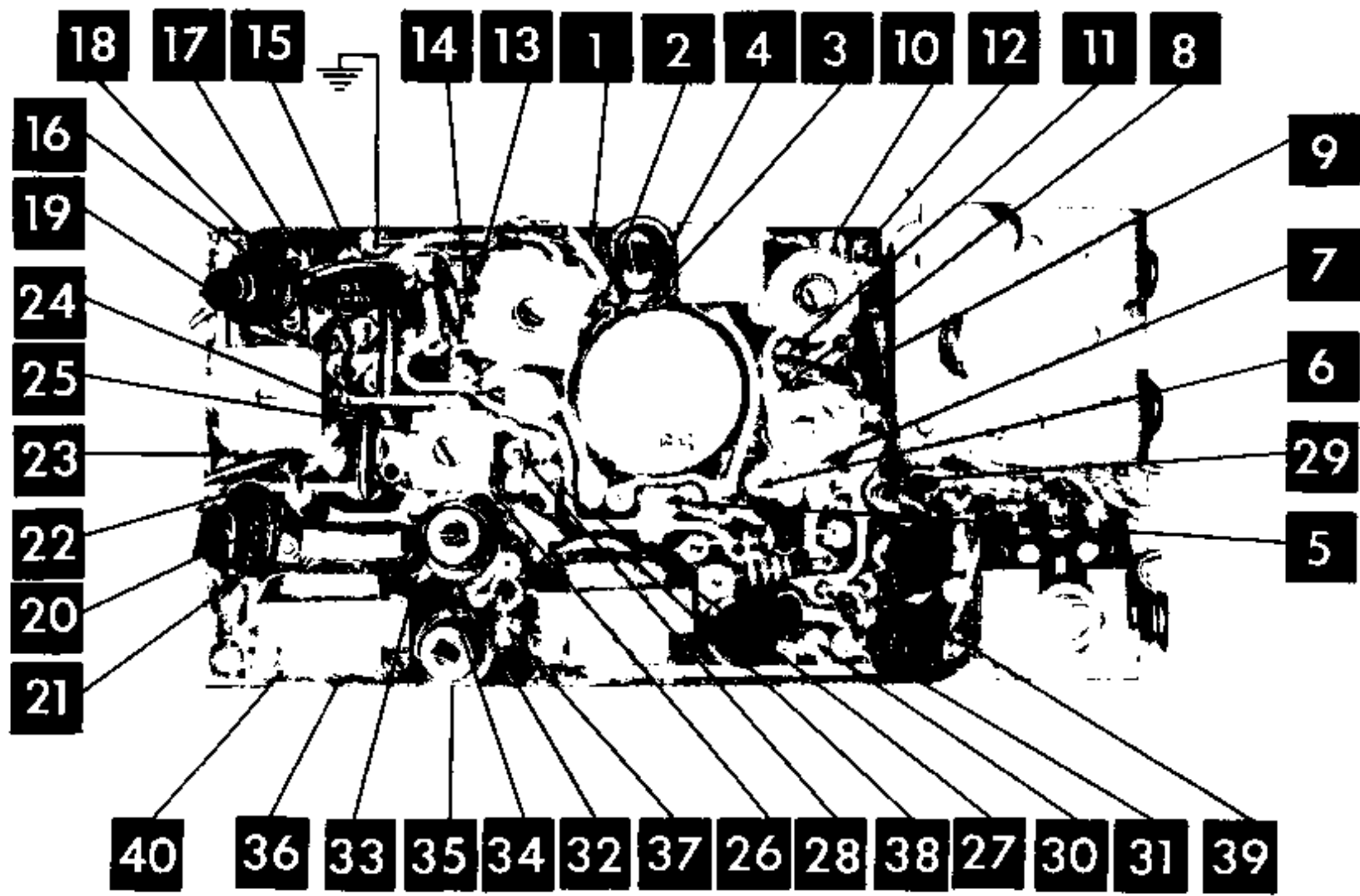
RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)



PRINTED BOARD

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		48K640754	1N60	1N60	1N60	Detector - AVC Overload Osc. Clamper
M3		48K640754	1N60	1N60	1N60	
M4		48K640754	1N60	1N60	1N60	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M5	Tuning Cap. Printed Board	19B640096 84K640080	2 Gang Does not include Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36B640278	Tuning
Knob	36B640270	Volume
Knob	36B640199	Dial
Cabinet	1V641174	Complete, Suntan, Model 7X24S
Cabinet	1V641175	Complete, Antique White, Less Escutcheon, Model 7X24W
Cabinet	1V641187	Complete, Navy Blue, Less Escutcheon, Model 7X23E
Cabinet Front	16K642008	Suntan, Less Escutcheon, Model 7X24S
Cabinet Front	16K642010	Antique White, Less Escutcheon, Model 7X24W
Cabinet Front	16K642006	Navy Blue, Less Escutcheon, Model 7X23E
Cabinet Back	1V642012	Gold, Model 7X24S
Cabinet Back	1V642013	Gold, Model 7X24W
Cabinet Back	1V641999	Silver, Model 7X23E
Handle Assembly	1V641317	Brown, Includes Loop Antenna, Model 7X24S
Handle Assembly	1V640383	White, Includes Loop Antenna, Model 7X24W
Handle Assembly	1V640381	Navy Blue, Includes Loop Antenna, Model 7X23E

DISASSEMBLY

1. Remove escutcheon mounting screw from inside cabinet below tuning gang.
2. Insert screwdriver under escutcheon and work free.
3. Remove tuning knob and dial by pulling.
4. Remove chassis mounting screw.
5. Turn handle perpendicular to chassis. Grasp handle near one end and pull out from side of cabinet to free mounting bushing. Lift this side slightly away from cabinet. Repeat for other end of handle.
6. Lift handle, chassis and speaker away from cabinet.
7. Unscrew earphone jack.

If necessary for further disassembly, proceed as follows:

Unsolder: Wire connecting gang to chassis, speaker lug, lead from earphone jack, 3 volume control leads, 3 mounting lugs.

Free chassis by working away from each mounting lug.