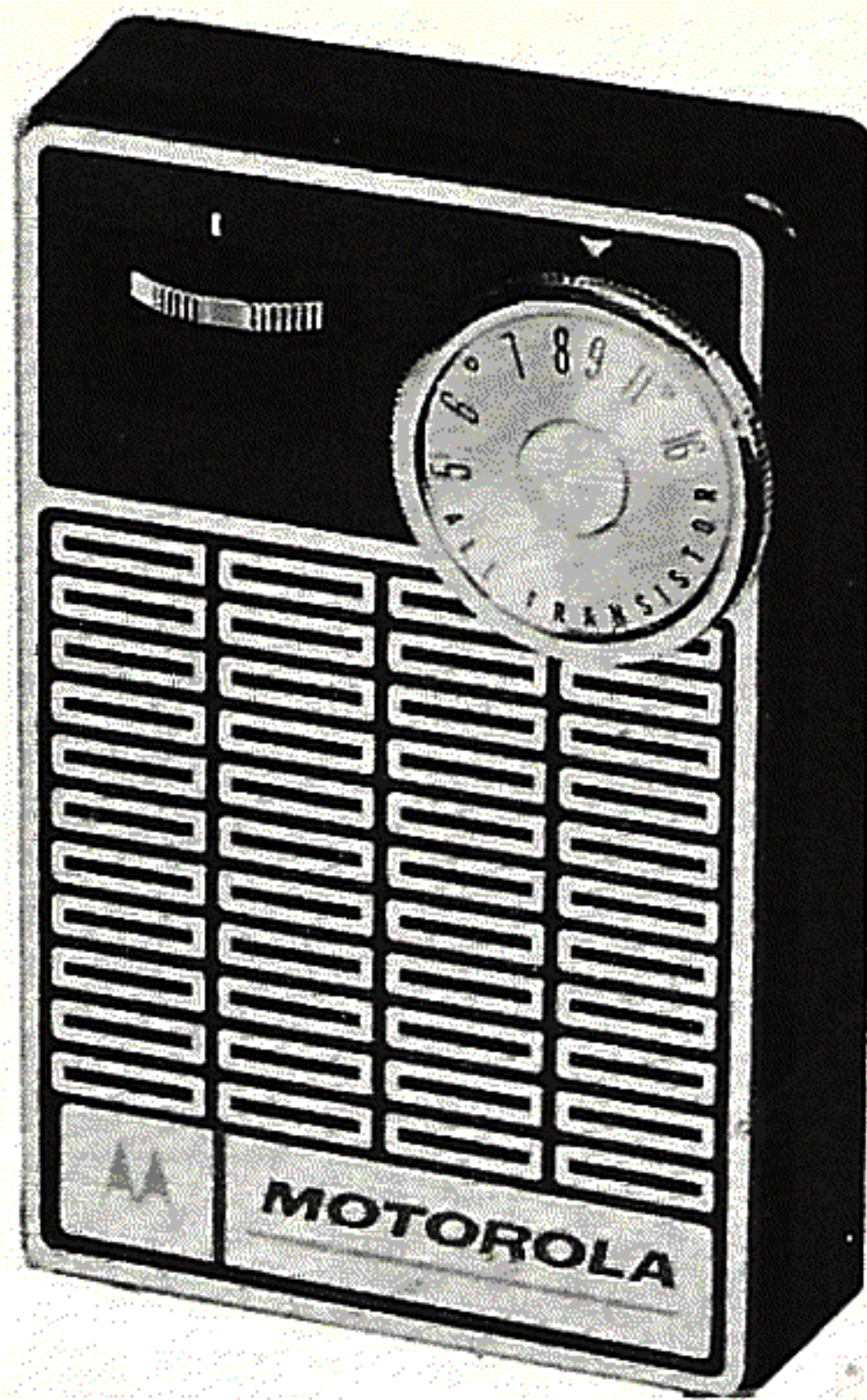


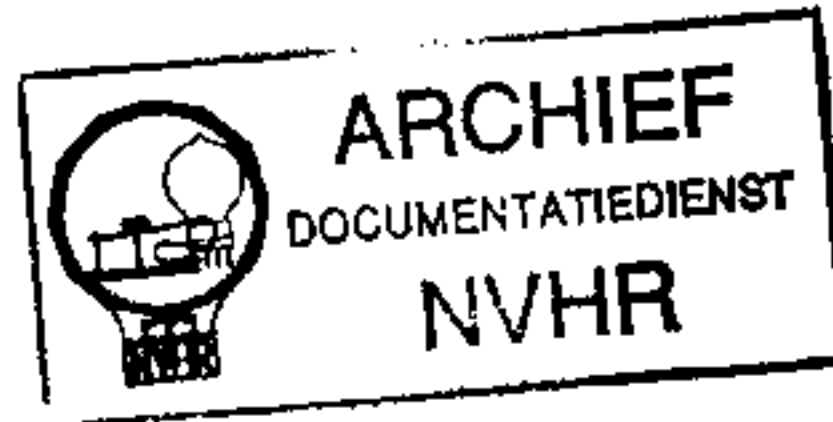
PHOTOFACT® Folder

with **CIRCUITRACE®**

**MOTOROLA MODELS X23B/E/V,
X24N/W (Ch. HS-880, HS-881)**



Ned. Ver. v. Historie v/d Radio



Met dank aan Jef Bos

MODEL X23E

TRADE NAME	Motorola Models X23B, X23E, X23V (CH. HS-880); X24N, X24W (CH. HS-881)		
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	9 Volts DC	RATING	5MA@9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC		9MA@9 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:

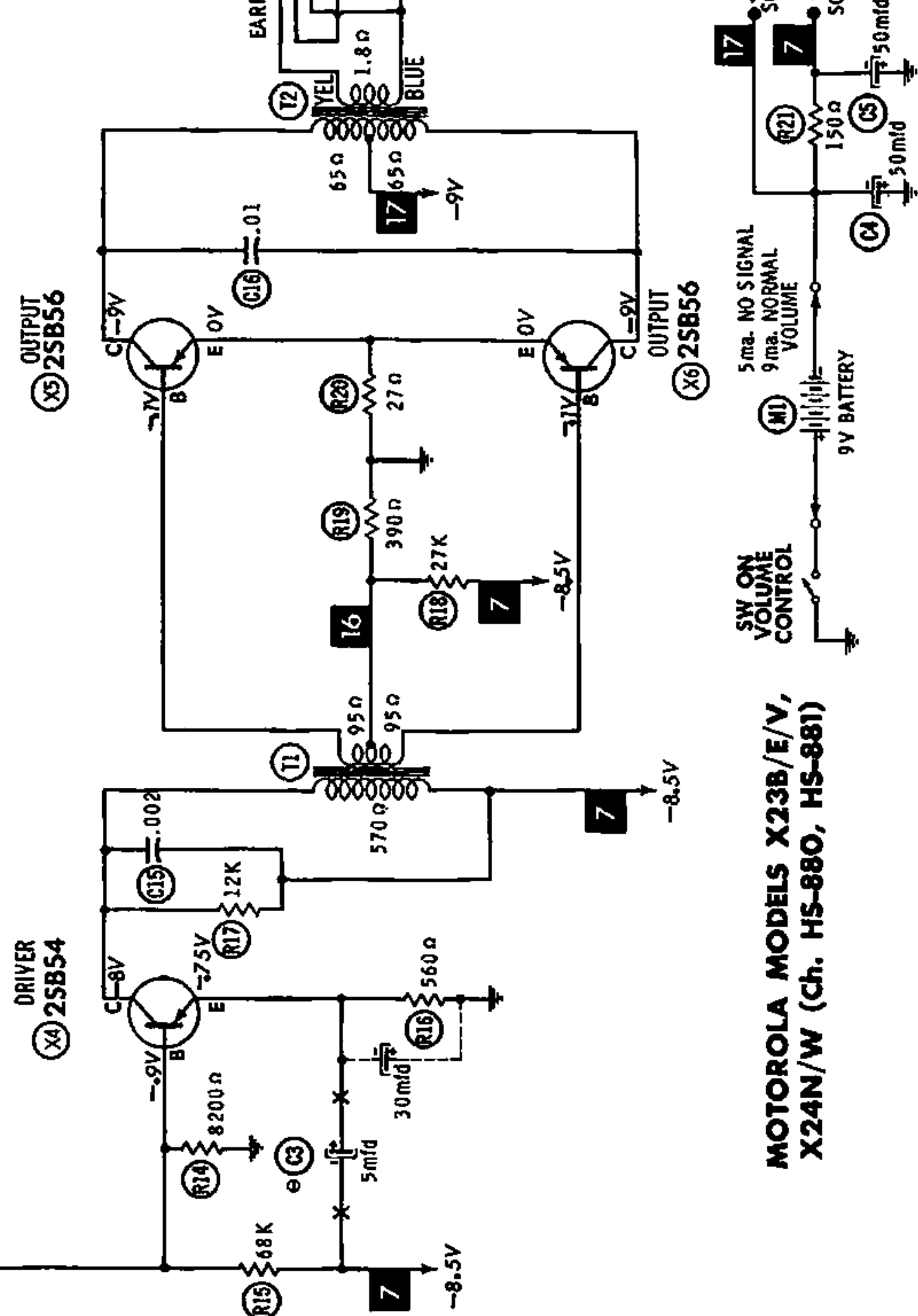
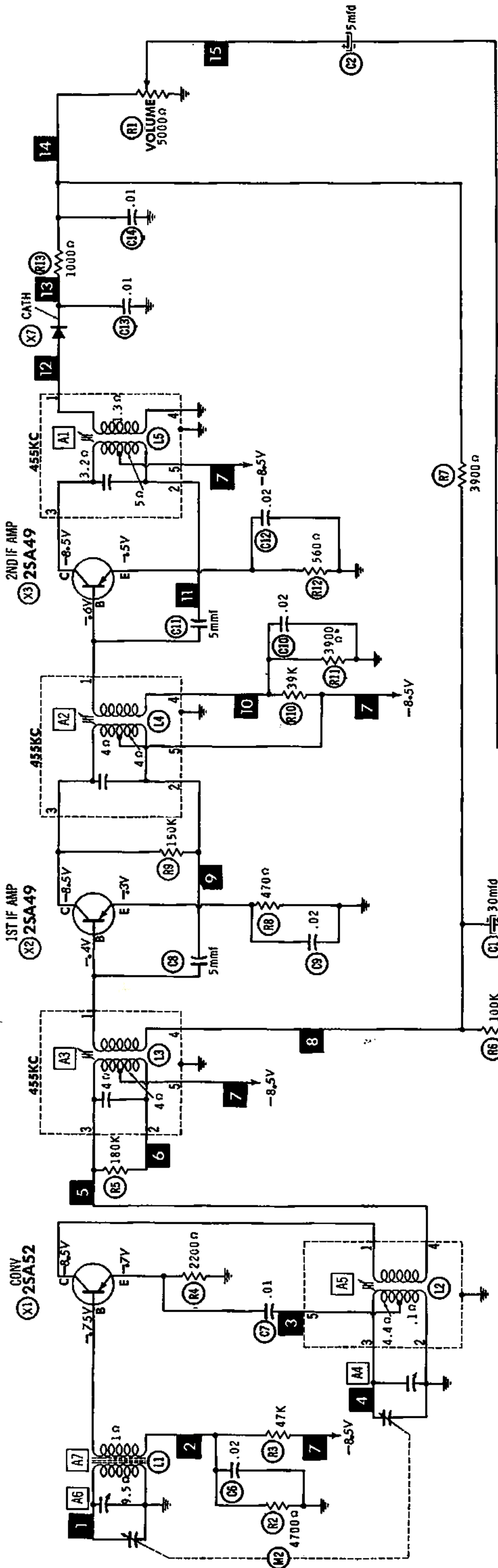
- A1, A2, A3, A5..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
- A4, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	"	1620KC	"	"	A4	"
3.	"	532KC	Tuning gang fully closed.	"	A5	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.
4.	"	1400KC	1400KC	"	A6	Adjust for maximum output.
5.	"	600KC	600KC	"	A7	Adjust for maximum output by moving antenna coil turns along ferrite core. Repeat steps 4 and 5.

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

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

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.

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

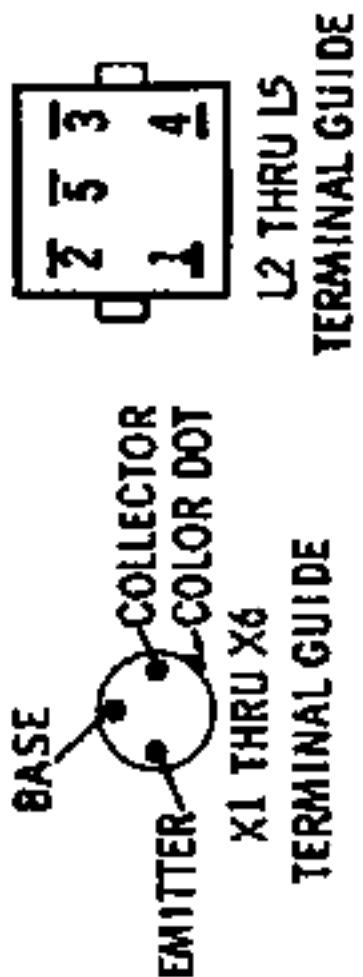
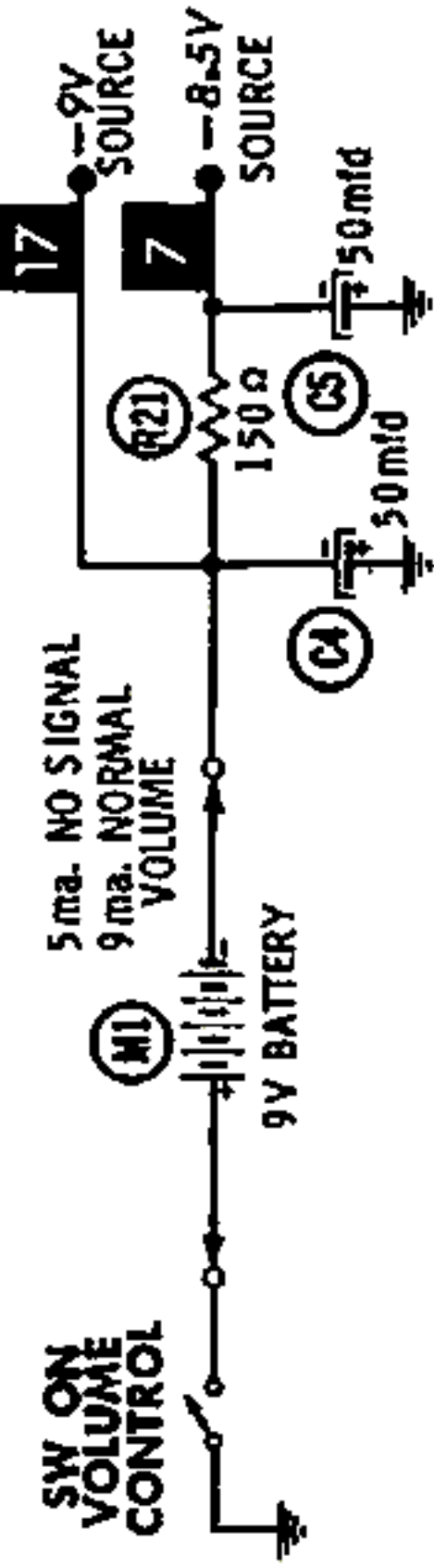
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITACE

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MOTOROLA MODELS X23B/E/V, X24N/W (Ch. HS-880, HS-881)



PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG TYPE	USE	REPLACEMENT DATA		NOTES
			RCA PART No.	RAYTHEON PART No.	
X1	2SA52	Converter	2N412	2N486	PNP
X2	2SA49	1st IF Amplifier	2N410	2N483	PNP
X3	2SA49	2nd IF Amplifier	2N410	2N483	PNP
X4	2SB54	Driver	2N406	2N362	PNP
X5	2SB56	Output	2N408	2N632	PNP
X8	2SB56	Output	2N408	2N632	PNP

POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	CURRENT RATING (Measured)	ORIGINAL Part or Type No.	RECTIFIERS		DIODES		NOTES
			RCA PART No.	SARKES TARZIAN PART No.	GENERAL ELECTRIC PART No.	RAYTHEON PART No.	
X7		48K64731L				1N60	Detector

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	30	3	23C60496A02						
C2	5	6	23C60496A03						TE-1084
C3	5	6	23C60496A03 ①						TE-1084
C4	50	10	23C60496A04						
C5	50	10	23C60496A04						

① Some versions use 30mfd@3V Part #23C60496A02.

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.02			DA-203	H-05S2		TA-120	TG-S20
C7	.01			DM-103	H-05S1		TA-110	TG-S10
C8	5		NPO-DI 5.0	DTZ-4R7	L10V5	CCTO-4R7	CNO-547	10TCC-V50
C9	.02			DA-203	H-05S2		TA-120	TG-S20
C10	.02			DA-203	H-05S2		TA-120	TG-S20
C11	5		NPO-DI 5.0	DTZ-4R7	L10V5	CCTO-4R7	CNO-547	10TCC-V50
C12	.02			DA-203	H-05S2		TA-120	TG-S20
C13	.01			DM-103	H-05S1		TA-110	TG-S10
C14	.01			DM-103	H-05S1		TA-110	TG-S10
C15	.002		BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C16	.01			DM-103	H-05S1		TA-110	TG-S10

CONTROLS

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

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA				
			MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.
R1	Volume & Switch	5000Ω	18B60512A01				

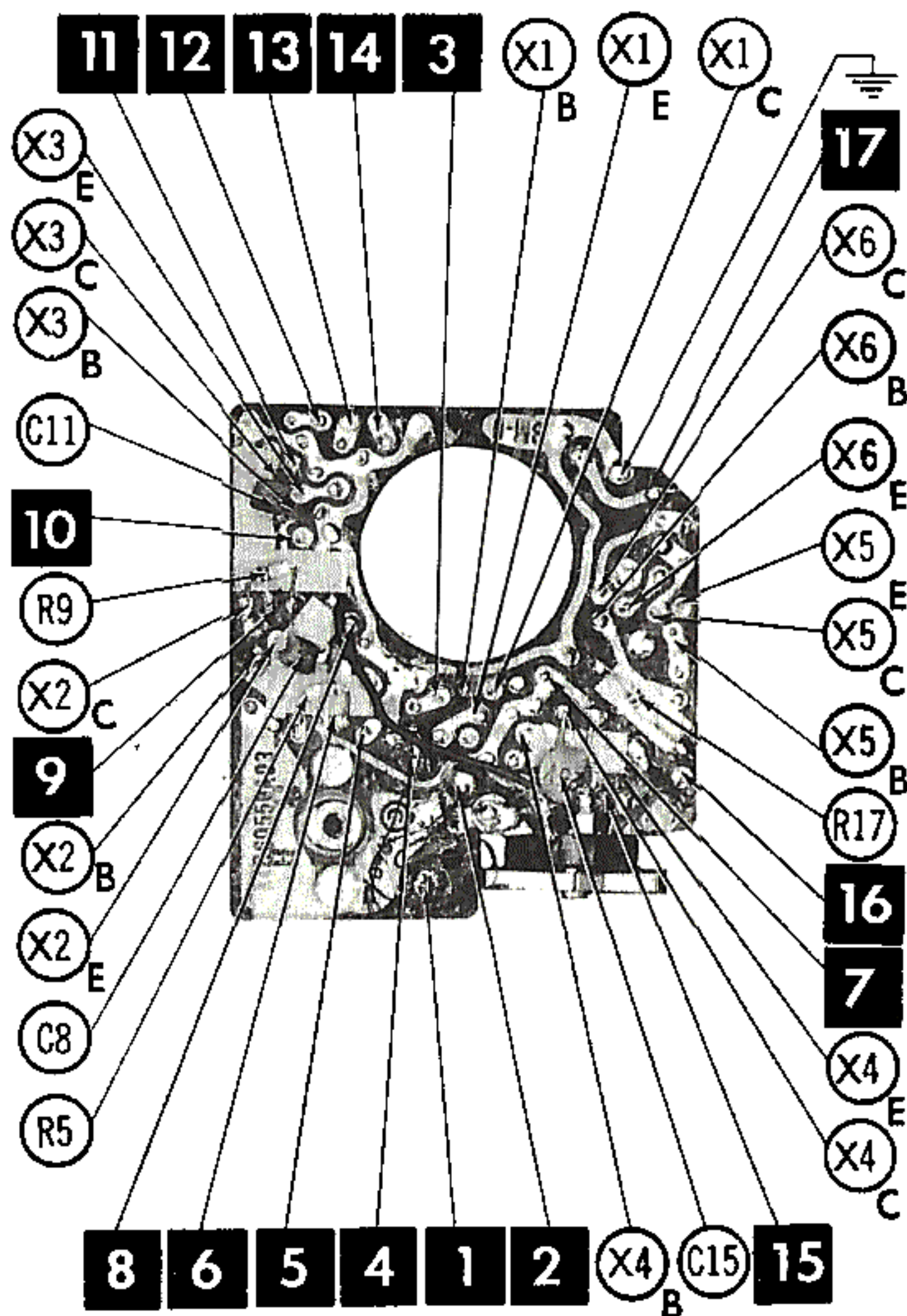
RESISTORS

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

ITEM No.	RATING	REPLACEMENT DATA			ITEM No.	RATING	REPLACEMENT DATA		
		IRC PART No.	WORKMAN PART No.	REMARKS			IRC PART No.	WORKMAN PART No.	REMARKS
R2	4700Ω				R12	560Ω			
R3	47K				R13	1000Ω			
R4	2200Ω				R14	8200Ω			
R5	180K				R15	68K			
R6	100K				R16	560Ω			
R7	3900Ω				R17	12K			
R8	470Ω				R18	27K			
R9	150K				R19	390Ω			
R10	39K				R20	27Ω			
R11	3900Ω				R21	150Ω			

PRINTED BOARD

A Howard W. Sams **CIRCUITAGE** Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman PART No.	
L1	Loopstick	24B60660A01					① Part #24B60660A02 used in Model X24
L2	Osc.	24C60527A01					
L3	1st IF	24C60513A01					
L4	2nd IF	24C60513A02					
L5	3rd IF	24C60513A03					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
	PRI. SEC.						
T1	2 1	25B60484A01			TR-40		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	350Ω CT	6-8Ω	25B60502A01					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	2"	PM	6-8Ω	50B60544A01		

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			L6		206		M-1611	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuning Cap. Printed Board Ass'y.	19B60499A01 1V60030A92	2 Gang Less All Components (Includes Printed Board Part #84C60550A04)

CABINETS & CABINET PARTS

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

NAME	PART NO.	DESCRIPTION
Knob, Tuning	36C60592A01	Models X23 Series
Knob, Tuning	36C60592A02	Models X24 Series
Knob, Volume	36B60546A01	Models X23 Series
Knob, Volume	36B60546A02	Models X24 Series
Cabinet Back	1V60030A63	Black, Model X23E
Cabinet Back	1V60030A62	Blue, Model X23B
Cabinet Back	1V60030A64	Violet, Model X23V
Cabinet Back	1V60030A65	Brown, Model X24N
Cabinet Back	1V60030A66	White, Model X24W
Cabinet Front	1V60030A79	Black, Model X23E
Cabinet Front	1V60030A7B	Blue, Model X23B
Cabinet Front	1V60030A80	Violet, Model X23V
Cabinet Front	1V60030A68	Brown, Model X24N
Cabinet Front	1V60030A69	White, Model X24W

WIRING DATA

General-use Unshielded Hook-up Wire Use BELDEN No. 8530 (Solid 22AWG) Available
 8524 (Stranded 22AWG) in
 8570 (Stranded 26AWG) 12 Colors

CHASSIS—TOP VIEW

