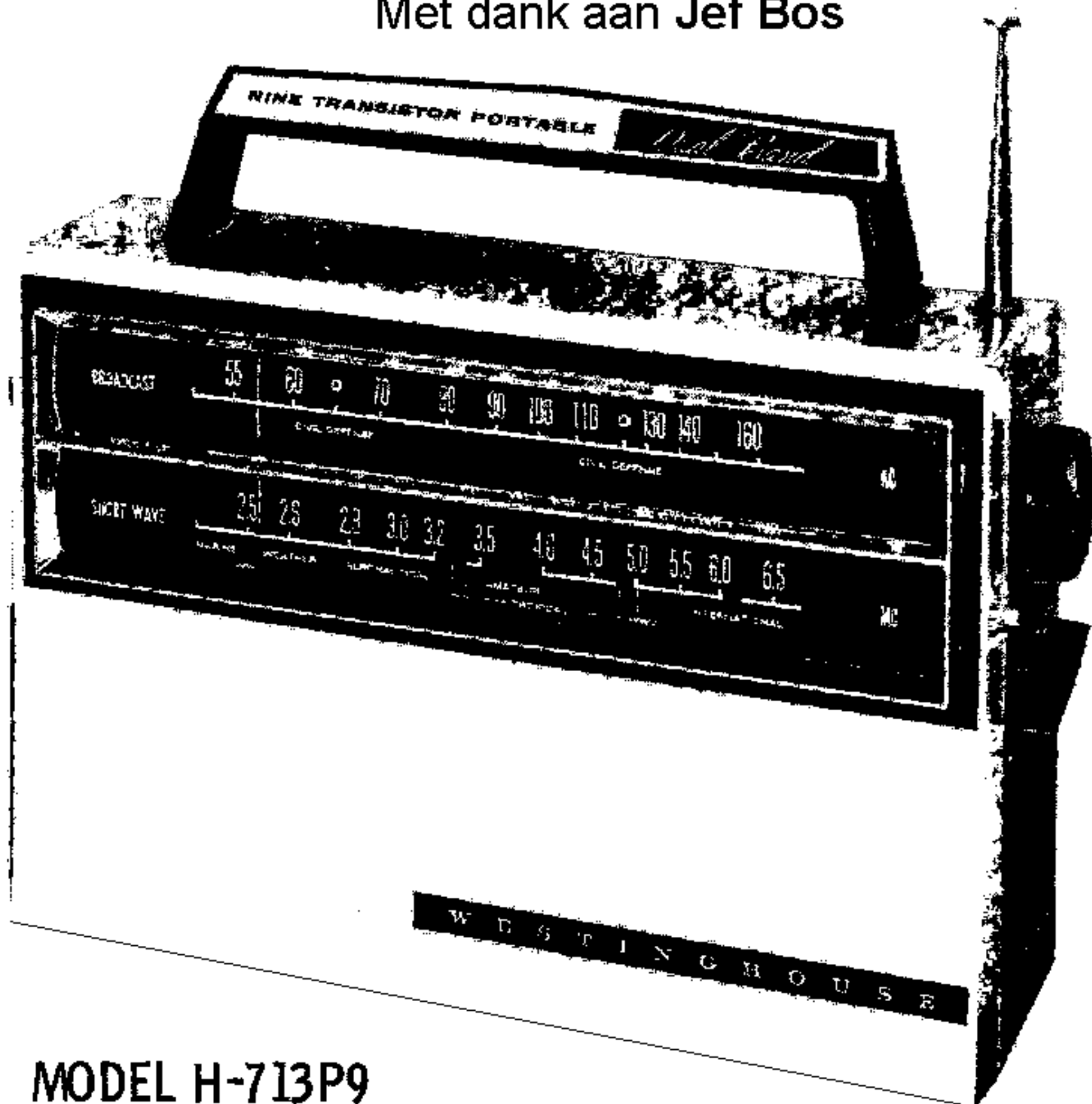


Met dank aan Jef Bos

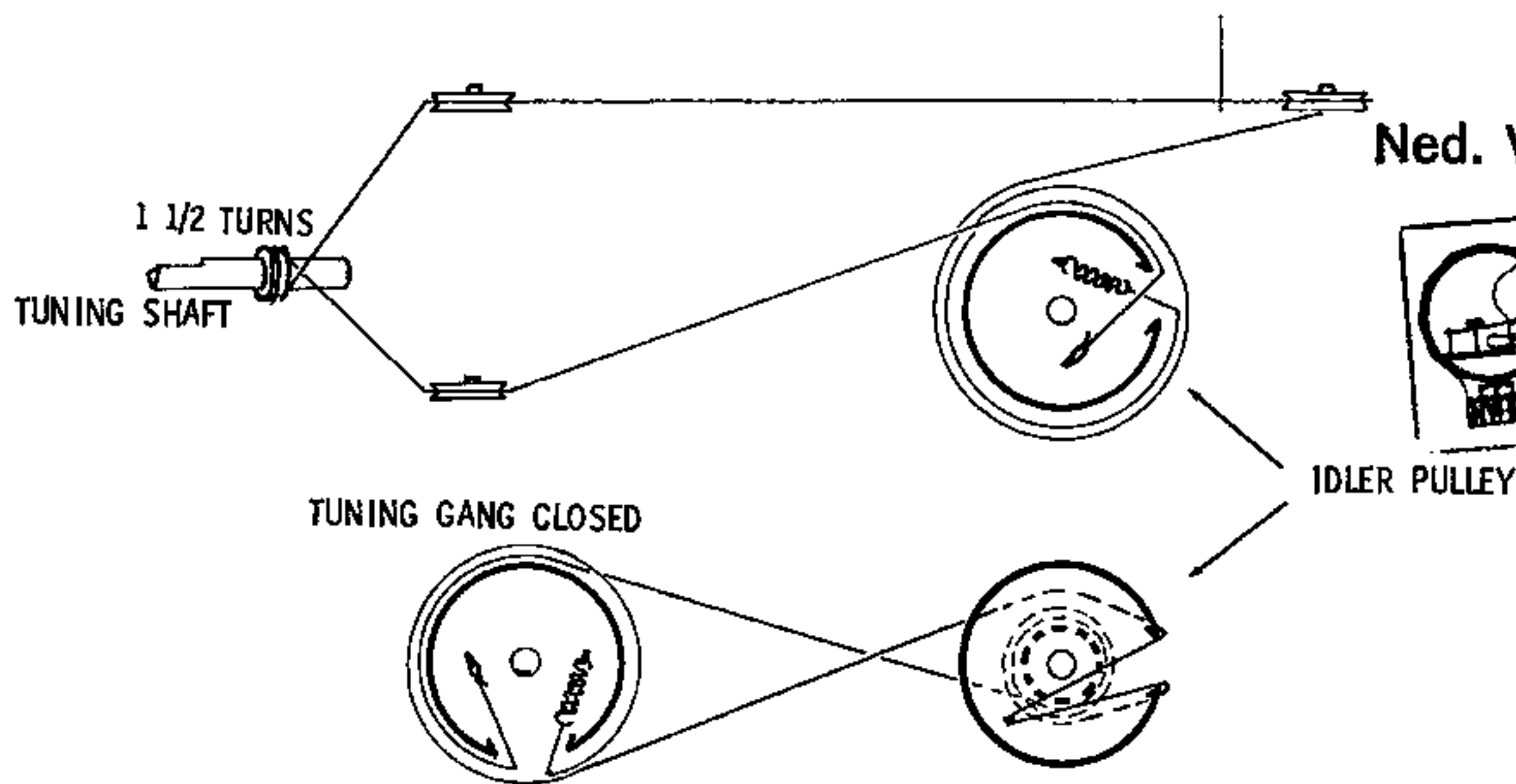


MODEL H-713P9

H-713P9 (CH. V-2399-1, V-2399-3)

TRADE NAME	Westinghouse Models H-712P9, H-713P9 (Ch. V-2399-1, V-2399-3)		
MANUFACTURER	Westinghouse Electric Corp., Radio-TV Div., Metuchen, N. J.		
TYPE SET	Battery Operated Transistorized Portable BC-SW Receiver		
POWER SUPPLY	9 Volts DC	RATING	9MA @ 9 Volts DC (No Signal, Min. Volume) 17MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE	BROADCAST 530-1625KC	SHORT WAVE	2.4-6.5MC

DIAL CORD STRINGING

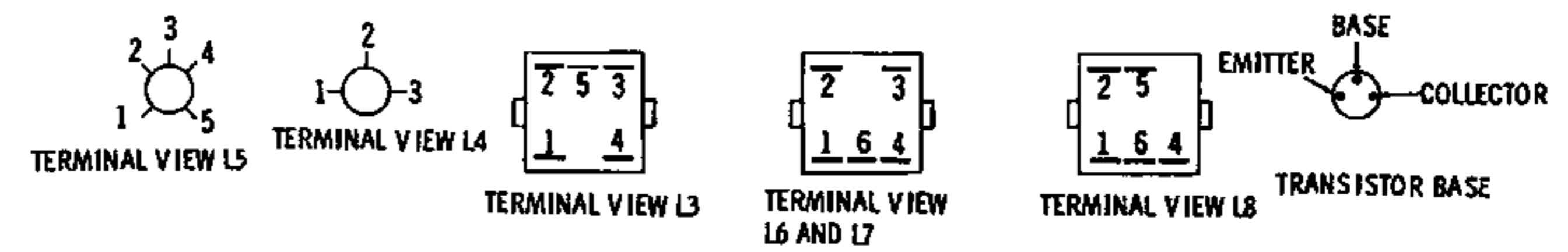
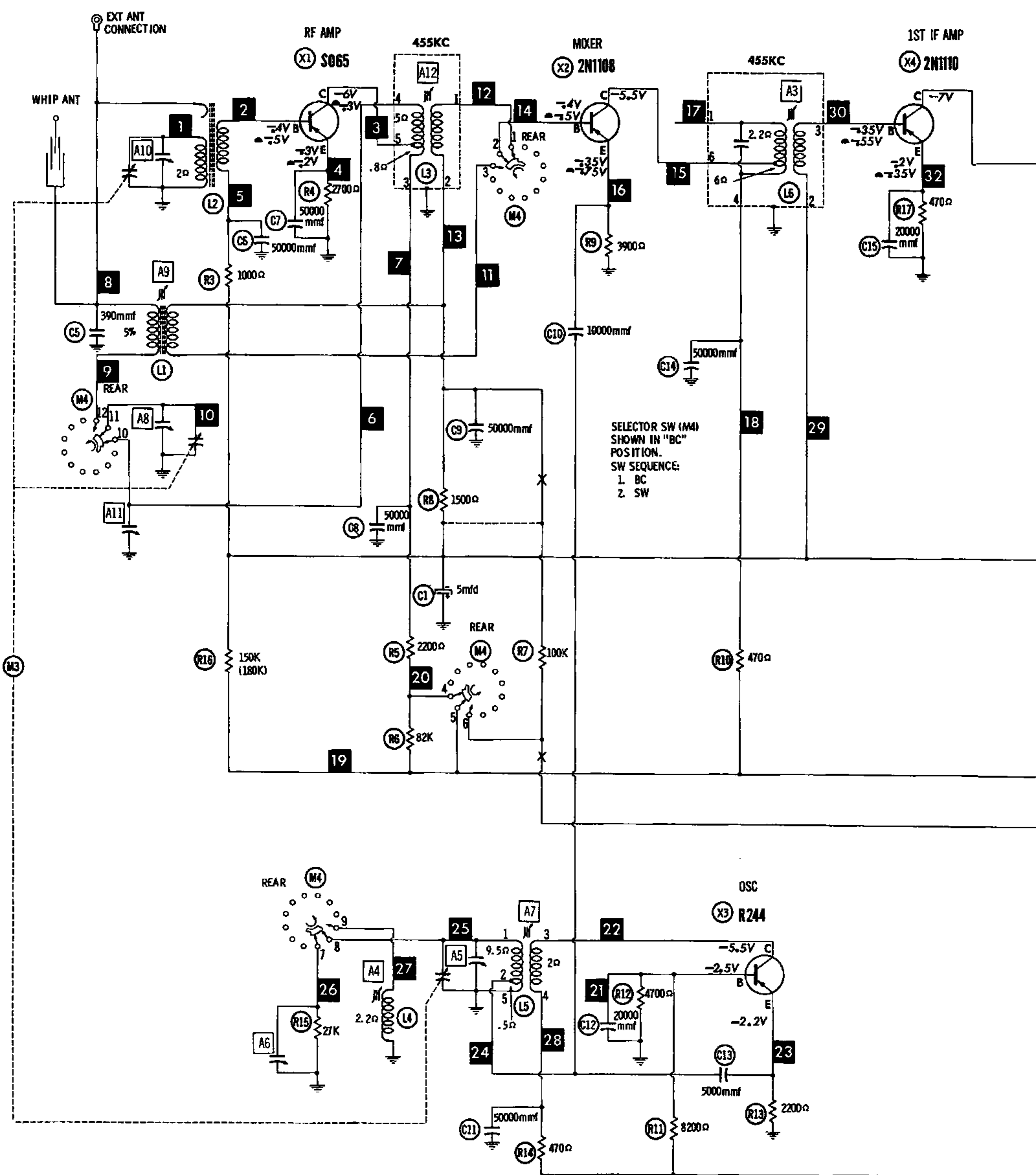


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ARCHIEF  
DOCUMENTATIEDIENST  
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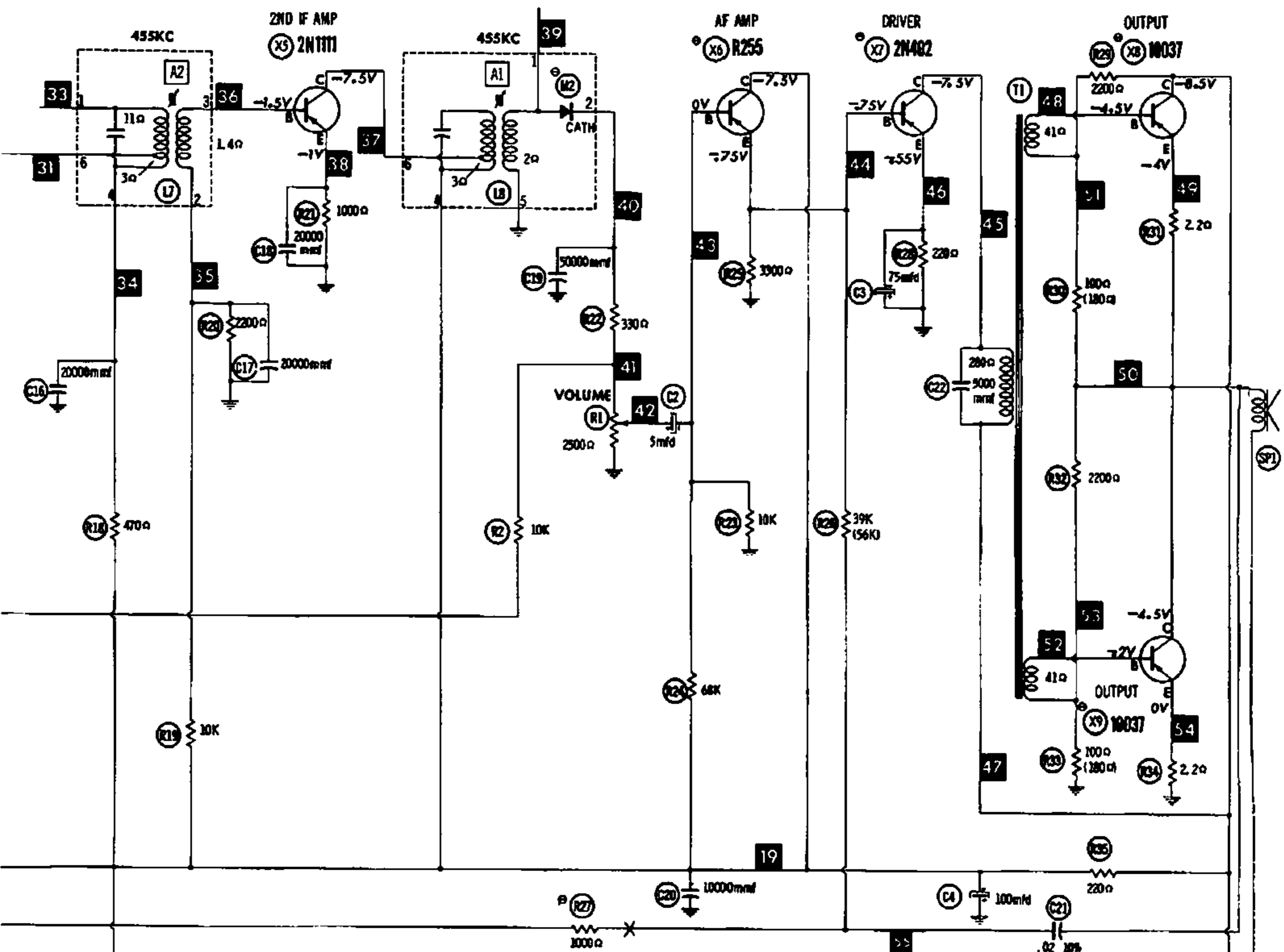
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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 JF860

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



A PHOTOFAC STANDARD NOTATION SCHEMATIC  
with **CIRCUITRACE**

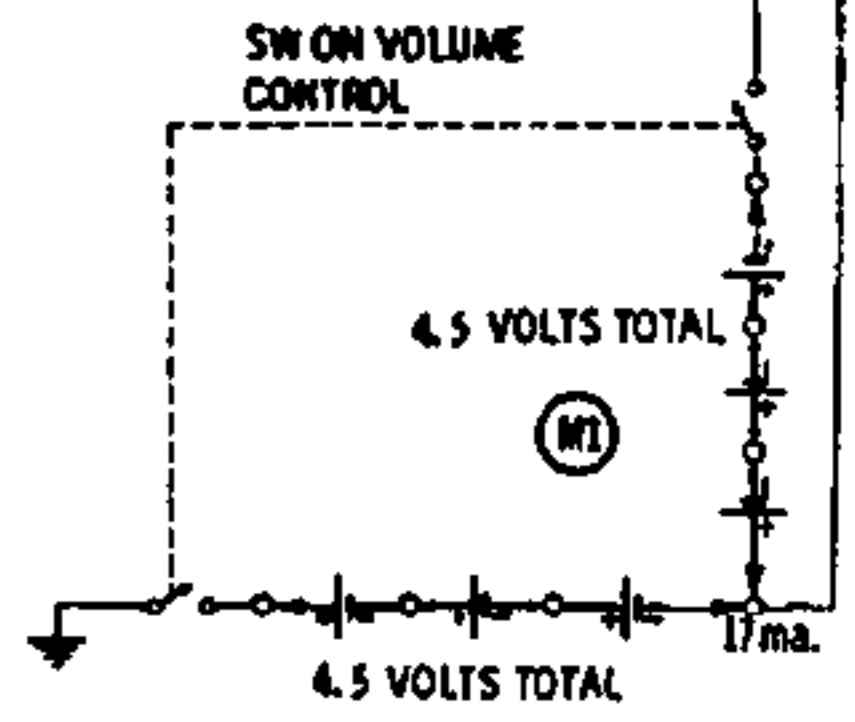


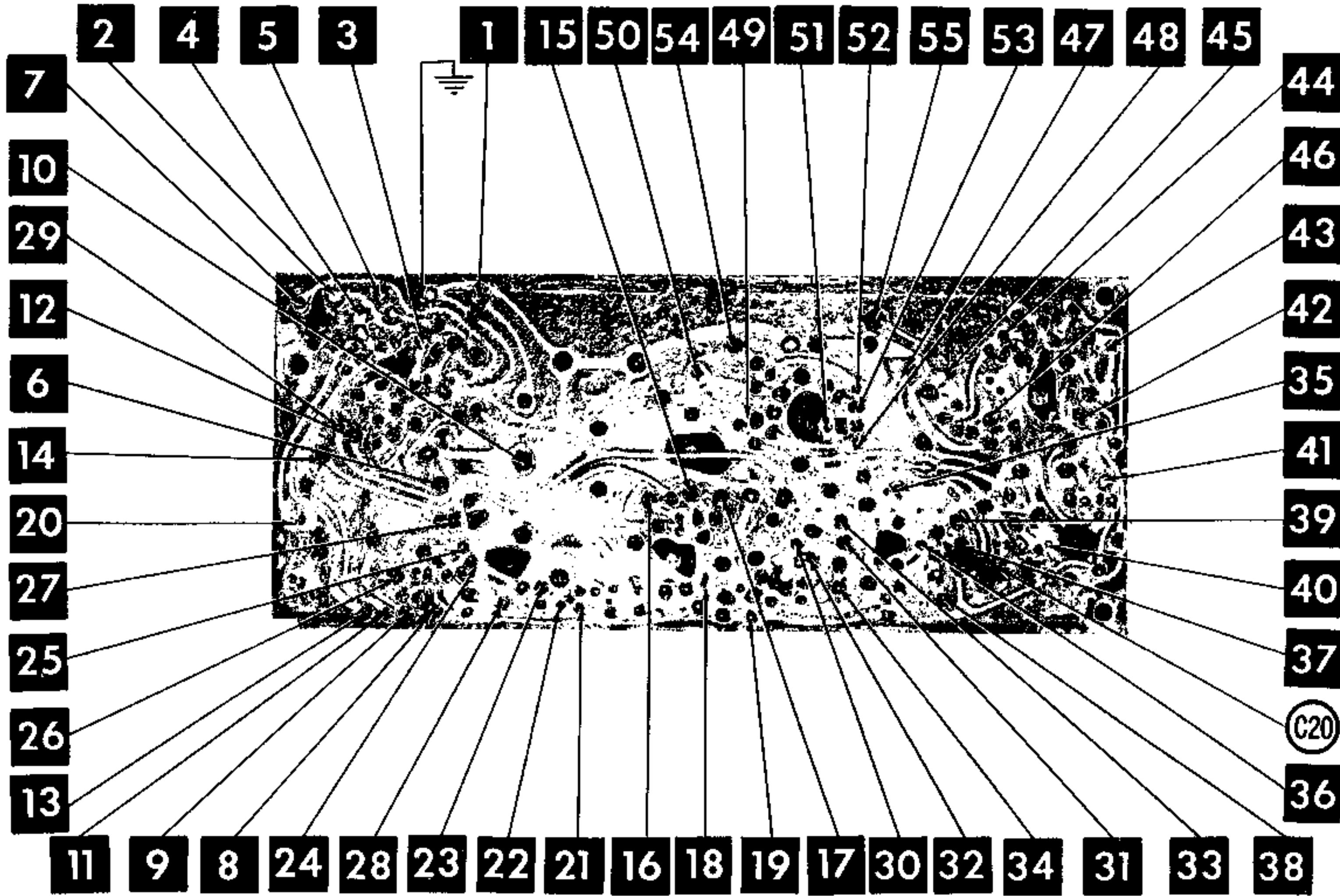
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION  
 DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

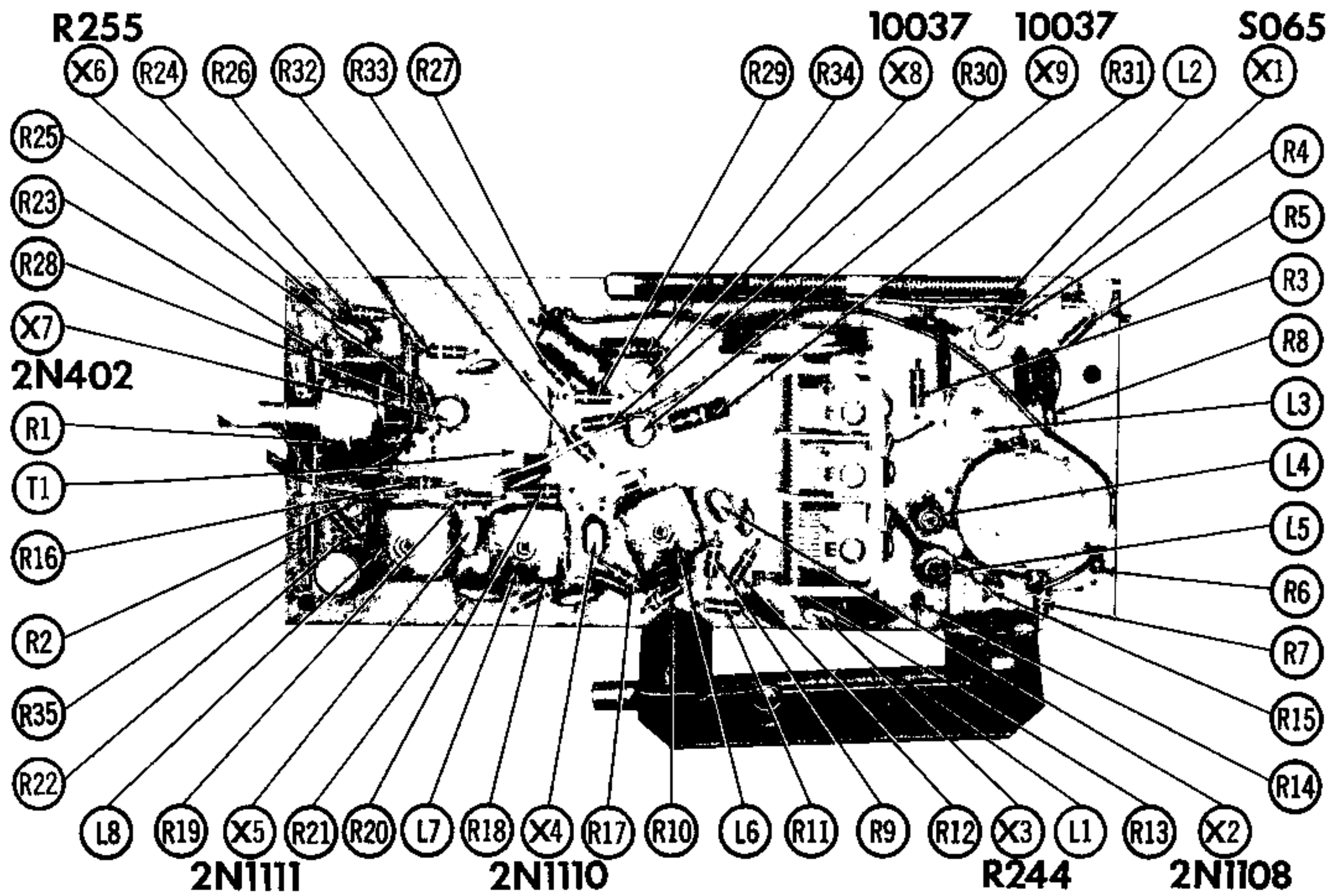
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

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.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.  
 ALL MEASUREMENTS TAKEN IN DC POSITION.  
 \* MEASURED IN SW POSITION







CHASSIS TOP VIEW - RESISTOR, INDUCTOR & TRANSISTOR IDENT.

# ALIGNMENT INSTRUCTIONS

## PRE-ALIGNMENT INSTRUCTIONS

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, A4, A7, A12 ..... GENERAL CEMENT #9440  
 A5, A6, A8, A10, A11 ..... GENERAL CEMENT #5004, 5008, 5009  
 WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to Base of Mixer. Low side to chassis.	455KC (400% Mod.)	(BC) Tuning gang fully open	Across speaker voice coil thru AC probe.	A1, A2, A3	Adjust for maximum deflection.
2.	"	6.5MC	(SW) Tuning gang fully open	"	A4	Rotate A5 fully clockwise then back off $\frac{1}{2}$ turn. Adjust A4 for maximum deflection.
3.	"	7.41MC	"	"		Increase generator output until image signal is heard. If signal cannot be heard, oscillator is tuned to wrong side of incoming signal. Rotate A4 counterclockwise until image signal is heard.
4.	"	6.5MC	"	"	A5	Adjust for maximum deflection.
5.	"	2.4MC	Tuning gang fully closed	"		Retouch A4 for maximum deflection. Repeat steps 4 and 5.
6.	"	1625KC	(BC) Tuning gang fully open	"	A6	Adjust for maximum deflection.
7.	"	530KC	Tuning gang fully closed	"	A7	Adjust for maximum deflection. Repeat steps 6 and 7.
8.	External antenna connection thru 15mmf. Low side to chassis.	5.8MC	(SW) Tune to 5.8MC signal	"	A8	Adjust for maximum deflection.
9.	"	2.6MC	Tune to 2.6MC signal	"	A9	Adjust for maximum deflection. Repeat steps 8 and 9.
10.	External antenna connection thru 200mmf. Low side to chassis.	1400KC	(BC) Tune to 1400KC signal	"	A10, A11	Adjust for maximum deflection.
11.	"	600KC	Tune to 600KC signal	"	A12	"
12.	"	1400KC	Tune to 1400KC signal	"		Retouch A11 for maximum deflection.

# PARTS LIST AND DESCRIPTIONS

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	S065	RF Amplifier					PNP
X2	2N1108	Mixer			2N485		PNP
X3	R-244	Oscillator			2N486	2N412	PNP
X4	2N1110	1st IF Amplifier			2N483	2N409	PNP
X5	2N1111	2nd IF Amplifier			2N483	2N409	PNP
X6	R-255 †	AF Amplifier		2N406	2N362		PNP
X7	2N402 *	Driver		2N406	2N362	2N217	PNP
X8	10037 †	Output		2N408	2N633		PNP
X9	10037 †	Output		2N408	2N633		PNP } Matched Pair

† Type 2N1273 used in Chassis V-2399-3.

\* Type 2N2311 may be used in Chassis V-2399-1. Type 2N1274 used in Chassis V-2399-3.

• Types 10036, 10038, 10039 may be used in Chassis V-2399-1. Type 2N1273 used in Chassis V-2399-3.

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
	CAP	VOLT.							
C1	5	3	218V012H19	PWE3005	EC5-6	TT6X5	ML5-6	TE-1052.2	
C2	5	3	218V012H19	PWE3005	EC5-6	TT6X5	ML5-6	TE-1052.2	
C3	75	3	218V012H17	PWE3100	EC75-6	TT6X80	ML75-3	TE-1059	
C4	100	10	218V012H20	BCD10010	ECPB417	PET1400	ML100-15	VL-1140	

## FIXED CAPACITORS

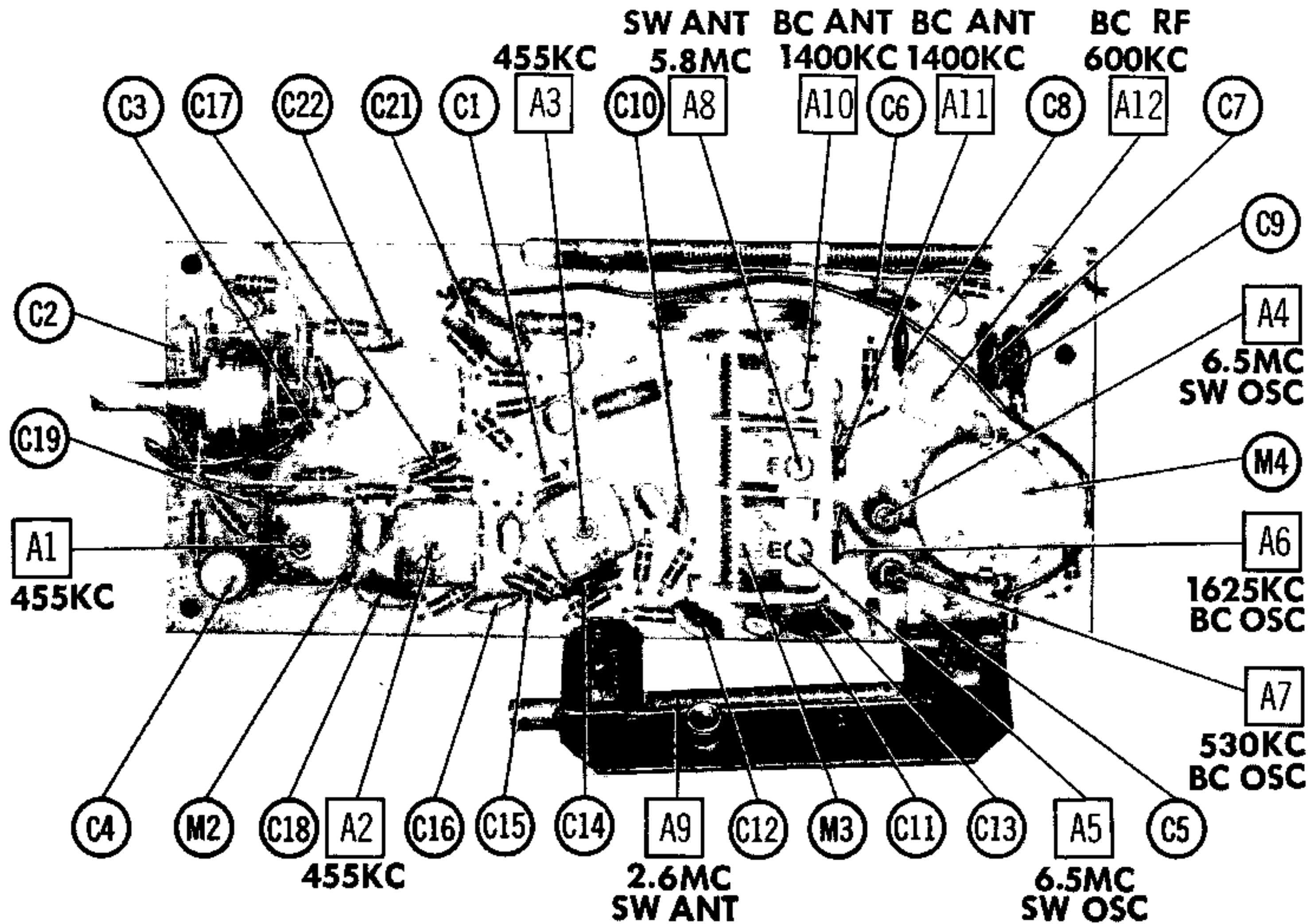
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA				
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.
C5	390	5%		1469-00039		5R5T39	CM-19V-391J	MCE243	MS-339
C6	50000			BPD-05	DD-503	ST2S5	1DP-2-503	GP150	5HK-S50
C7	50000			BPD-05	DD-503	ST2S5	1DP-2-503	GP150	5HK-S50
C8	50000			BPD-05	DD-503	ST2S5	1DP-2-503	GP150	5HK-S50
C9	50000			BPD-05	DD-503	ST2S5	1DP-2-503	GP150	5HK-S50
C10	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C11	50000			BPD-05	DD-503	ST2S5	1DP-2-503	GP150	5HK-S50
C12	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C13	5000			BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C14	50000			BPD-05	DD-503	ST2S5	1DP-2-503	GP150	5HK-S50
C15	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C16	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C17	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C18	20000			BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C19	50000			BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C20	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C21	.02	200V	10%	V84C2S2-10%		PM2S2	4DP-2-203		2TM-S2
C22	5000			BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50

## CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
RIA B	2500Ω Switch	½	270V027H15					Volume Power Off-On

**CHASSIS—TOP VIEW**





# PARTS LIST AND DI

## RESISTORS

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

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R2	10K		R14	470Ω		R26	39K	(56K) †
R3	1000Ω		R15	27K		R27	1000Ω	Note 1
R4	2700Ω		R16	150K	(180K) *	R28	220Ω	
R5	2200Ω		R17	470Ω		R29	2200Ω	
R6	82K		R18	470Ω		R30	100Ω	(180Ω) †
R7	100K		R19	10K		R31	2.2Ω	
R8	1500Ω		R20	2200Ω		R32	2200Ω	(180Ω) †
R9	3900Ω		R21	1000Ω		R33	100Ω	
R10	470Ω		R22	330Ω		R34	2.2Ω	
R11	8200Ω		R23	10K		R35	220Ω	
R12	4700Ω		R24	68K				
R13	2200Ω		R25	3300Ω				

\* Alternate Value.

† Used in Chassis V-2399-3.

Note 1. Not used in Chassis V-2399-3.

## COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Westinghouse PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	
L1	SW Loopstick	310V053H01					
L2	BC Loopstick	310V052H02					
L3	BC RF Trans.	235V050H01					
L4	SW Osc. Coil	230V078H01					
L5	BC Osc. Coil	230V077H01					
L6	1st IF Trans.	235V051H02					
L7	2nd IF Trans.	235V051H01					
L8	3rd IF Trans.	235V052H01					

## TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.1	Westinghouse PART No.	Haldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	
T1	3	1 SEC.2 1	490V076H01					

## SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	4"	PM	26-28Ω	570V065H01	4A1Z27	

## BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA				NOTES		
			BURGESS		EVEREADY			MALLORY	
			"A"	"B"	"A"	"B"	"A"	"B"	
B1	1.5V	*		850 *		A100 *		M-151C *	* 8 Required

# SCRIPTIIONS (Continued)

## CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		296V002H01 *	1N295	1N295	1N295	Detector (Pigtail)

\* Type #1N295 or 1N87A may be used.

## MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3 M4	Tuning Cap. Switch Antenna	330V028H01 756V038H01 318V005H01	3 Gang Band Selector Telecoping

## CABINETS & CABINET PARTS

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

NAME	PART NO.	DESCRIPTION
Knob	550V096H05	Tuning
Knob	550V096H04	Volume
Knob	550V115H01	Band Selector
Dial Pointer	558V232H01	
Cabinet Front Ass'y	513V047H01	
Cabinet Back Ass'y	513V050H02	Model H-713P9
Cabinet Back Ass'y	513V050H01	Model H-712P9

## WIRING DATA

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