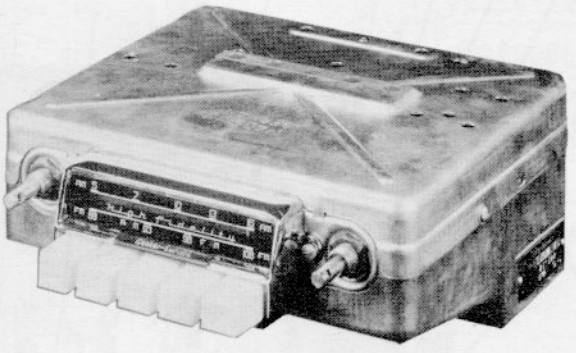
PHOTOFACT* Folder

EIA

BECKER MODELS "Europa" MU, MUK

BECKER MODELS
"Europa" MU, MUK



BECKER MODELS
"Europa" MU, MUK

TRADE NAME	Becker Models Europa MU, Europa MUK		
SUPPLIER	Witte Import Distributors, 613-19 S. 24th St., Philadelphia 46, Pa.		
TYPE SET	Battery Operated Universal FM-BC Receiver (Model Europa MU Has Marine Band)		
TUBES (Six)	Types 6AQ8/ECC85 FM AM RF Amp.-FM Conv., 6AJ8/ECH81 1st FM IF Amp.-AM Mixer-AM Osc., EBF89 2nd FM IF Amp.-AM IF Amp.-AM Det.-AVC, 6DA6/EF89 Limiter, 6T8/EABC80 Ratio Det.-AF Amp., 6BQ5/EL84 Output (Some Versions Have Push-Pull Output)		
POWER SUPPLY	Storage Battery (6 Volt or 12 Volt)	RATING	2.7 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	510KC - 1630KC	FREQ. MOD.	88MC - 108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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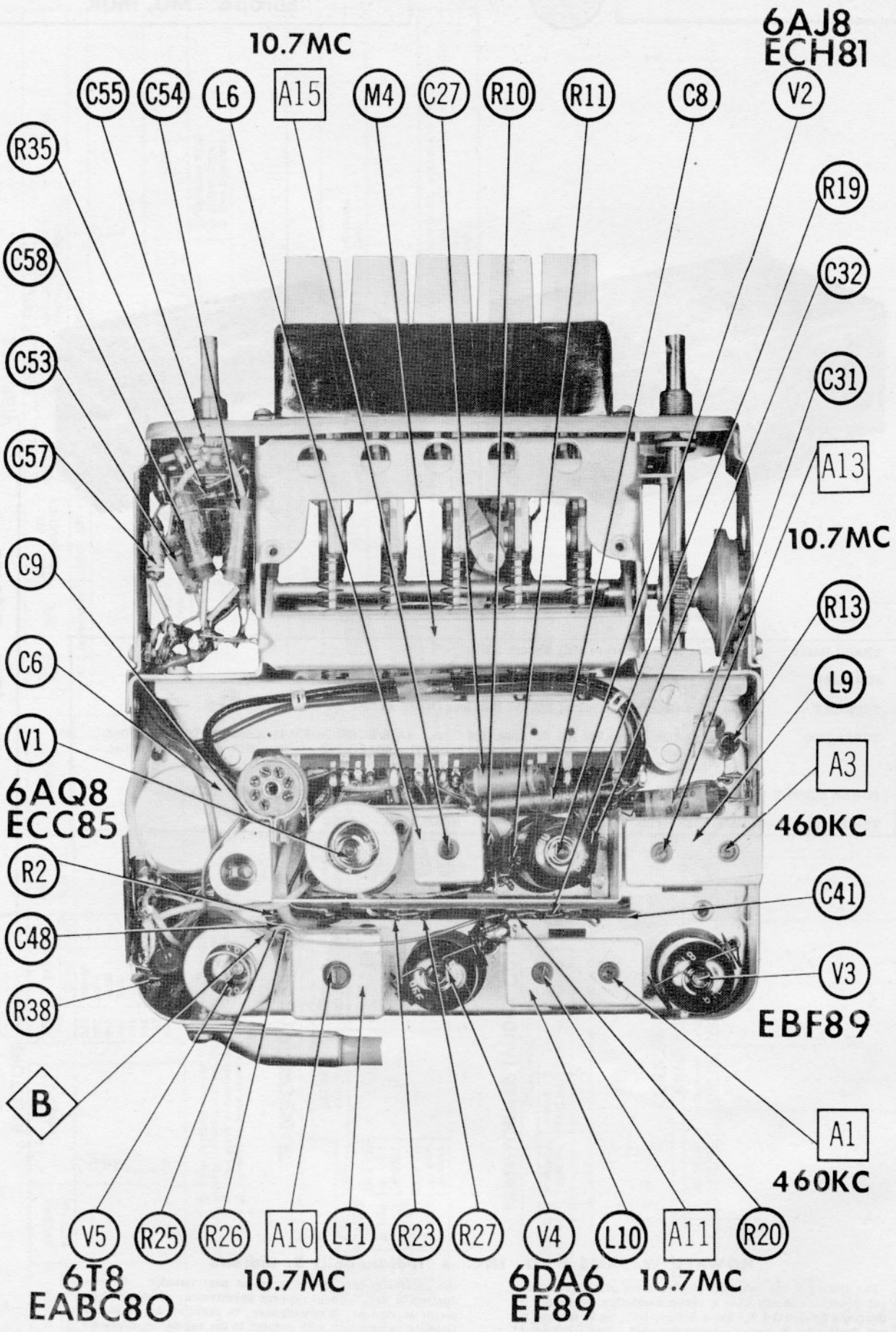


CHASSIS TOP VIEW

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. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 2 (grid) of 6AJ8/ECH81 (V2). Low side to chassis.	460KC (400∿ Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle	1630KC	"	"	"	A5	"
3.	"	"	510KC	"	Tune to 510KC signal	"	A6	"
4.	"	"	562KC	"	Tune to 562KC signal	"	A7, A8	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.01mfd	High side to pin 2 (grid) of 6DA6/EF89 (V4). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point Ⓐ. Low side to chassis.	A9	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
7.	"	High side to pin 2 (grid) of 6AJ8/ECH81 (V2). Low side to chassis.	"	"	"	DC probe to point Ⓐ. Low side to chassis.	A11, A12, A13, A14	Adjust for maximum deflection.
8.		Across antenna receptacle	"	"	"	DC probe to point Ⓐ. Low side to chassis.	A15, A16	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.01mfd	High side to pin 2 (grid) of EF89/ (V4). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. Amp. to point Ⓐ. Low side to chassis.	A9	Disconnect stabilizing capacitor C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
6.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A10	Reconnect C5. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.
7.	"	High side to pin 2 (grid) of ECH81 (V2). Low side to chassis.	"	"	"	Vert. Amp. to point Ⓐ. Low side to chassis.	A11, A12, A13, A14	Disconnect C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
8.		Across antenna receptacle	"	"	"	"	A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 2. Reconnect C5.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.		Across antenna receptacle in parallel with 180Ω carbon resistor.	86MC	FM	Tuning gang fully closed	DC probe to point Ⓐ. Common to chassis.	A17	Adjust for maximum deflection.
10.		"	91MC	"	Tune for 91MC signal	"	A18	Adjust for maximum deflection.

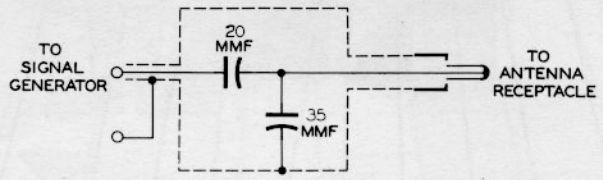


FIG.

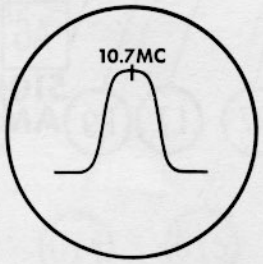


FIG. 2

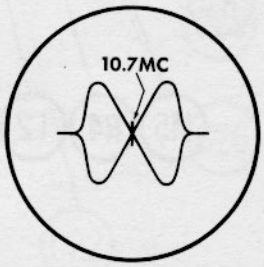
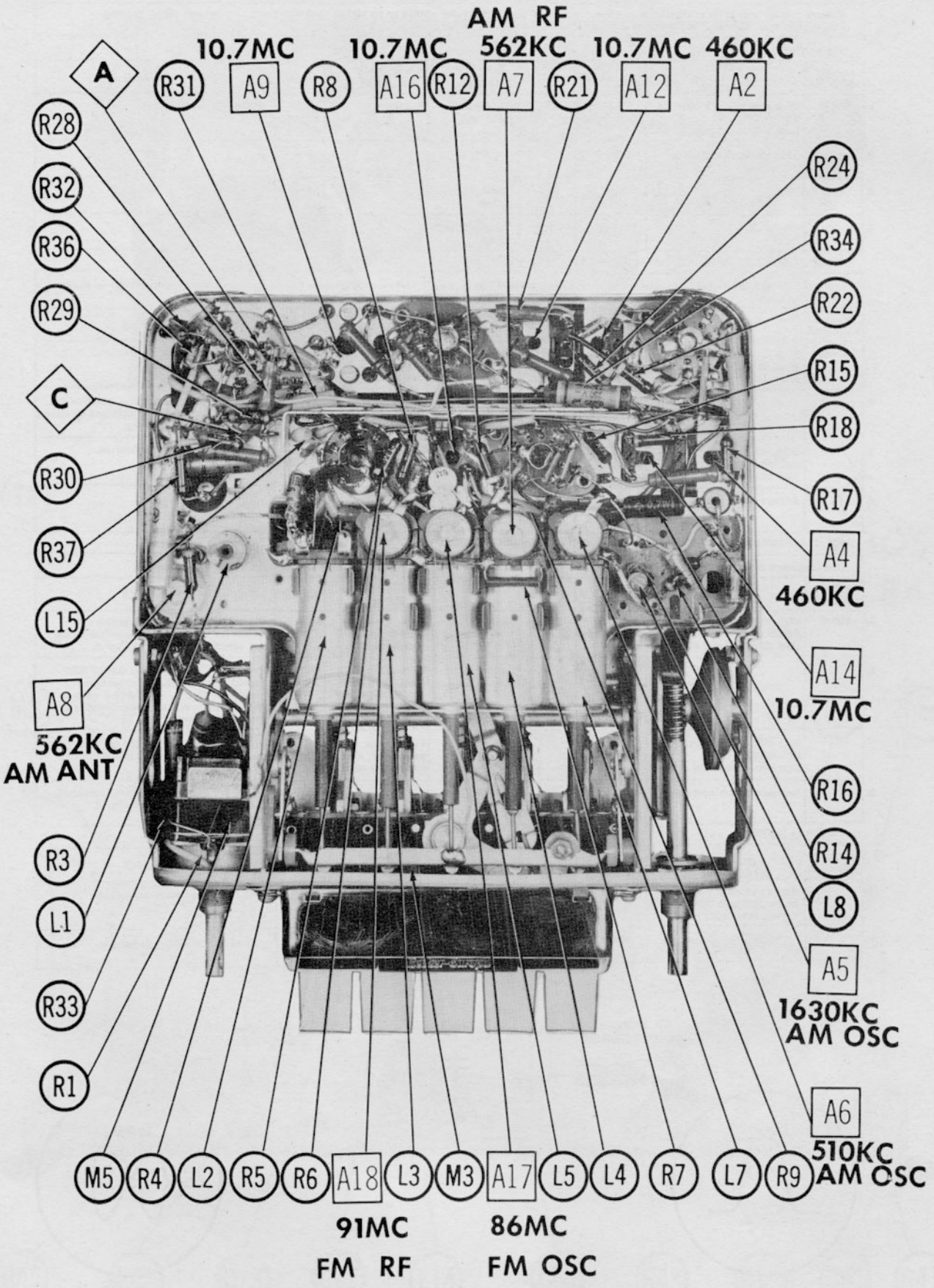
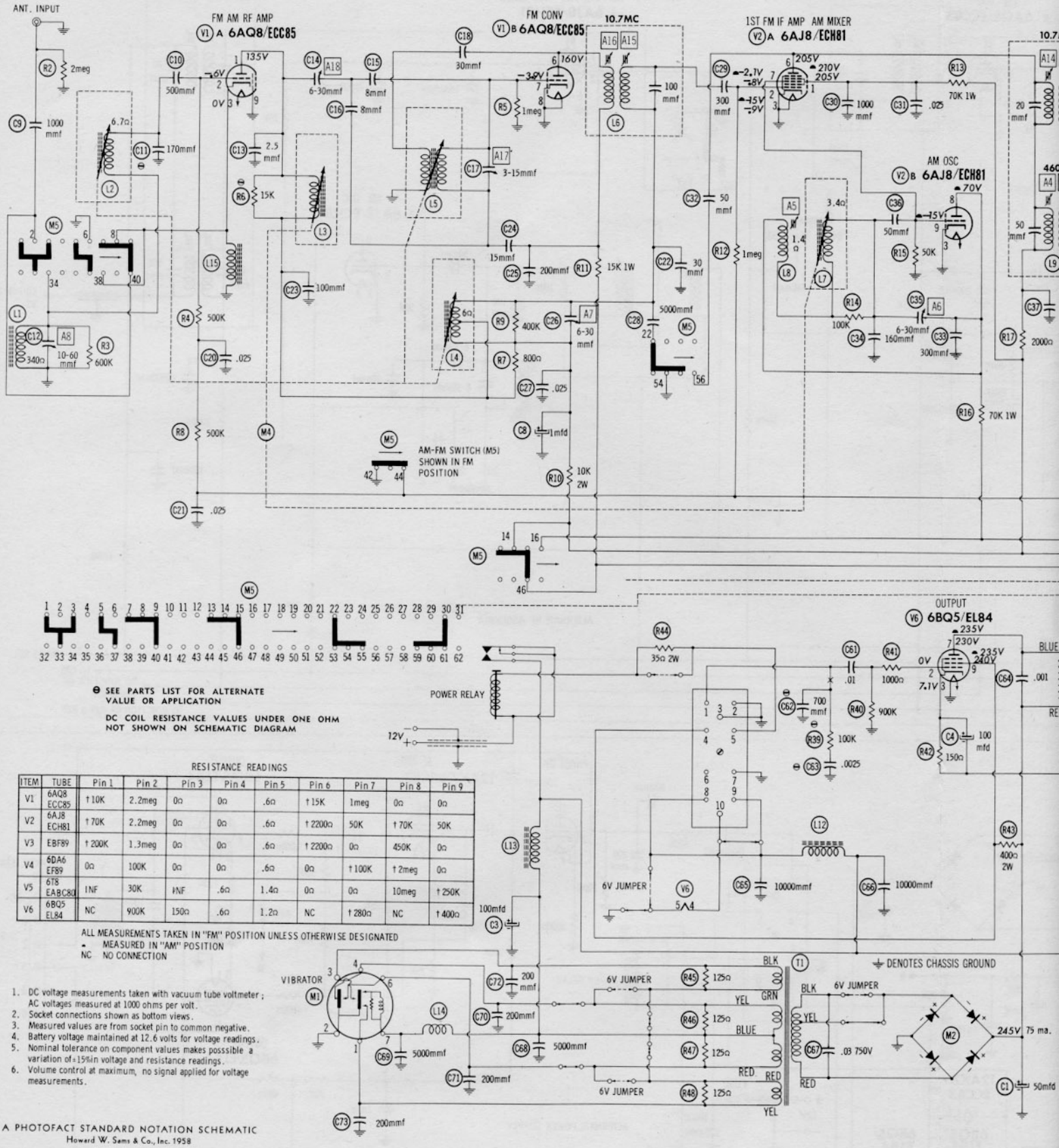


FIG. 3

FOLDER 5



CHASSIS-BOTTOM VIEW



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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

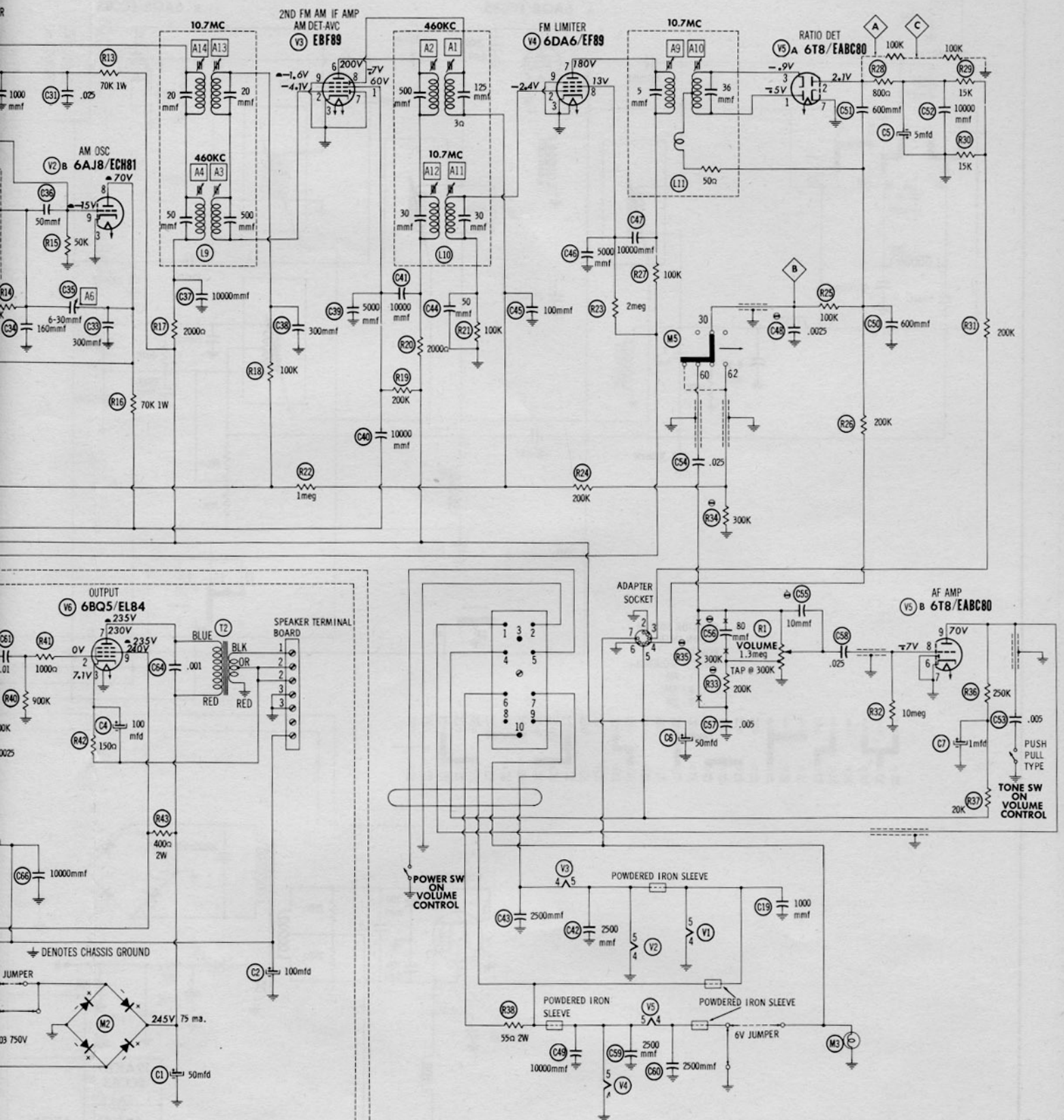
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8 ECC85	†10K	2.2meg	0Ω	0Ω	.6Ω	†15K	1meg	0Ω	0Ω
V2	6AJ8 ECH81	†70K	2.2meg	0Ω	0Ω	.6Ω	†2200Ω	50K	†70K	50K
V3	EBF89	†200K	1.3meg	0Ω	0Ω	.6Ω	†2200Ω	0Ω	450K	0Ω
V4	6DA6 EF89	0Ω	100K	0Ω	0Ω	.6Ω	0Ω	†100K	†2meg	0Ω
V5	6T8 EABC80	INF	30K	INF	.6Ω	1.4Ω	0Ω	0Ω	10meg	†250K
V6	6BQ5 EL84	NC	900K	150Ω	.6Ω	1.2Ω	NC	†280Ω	NC	†400Ω

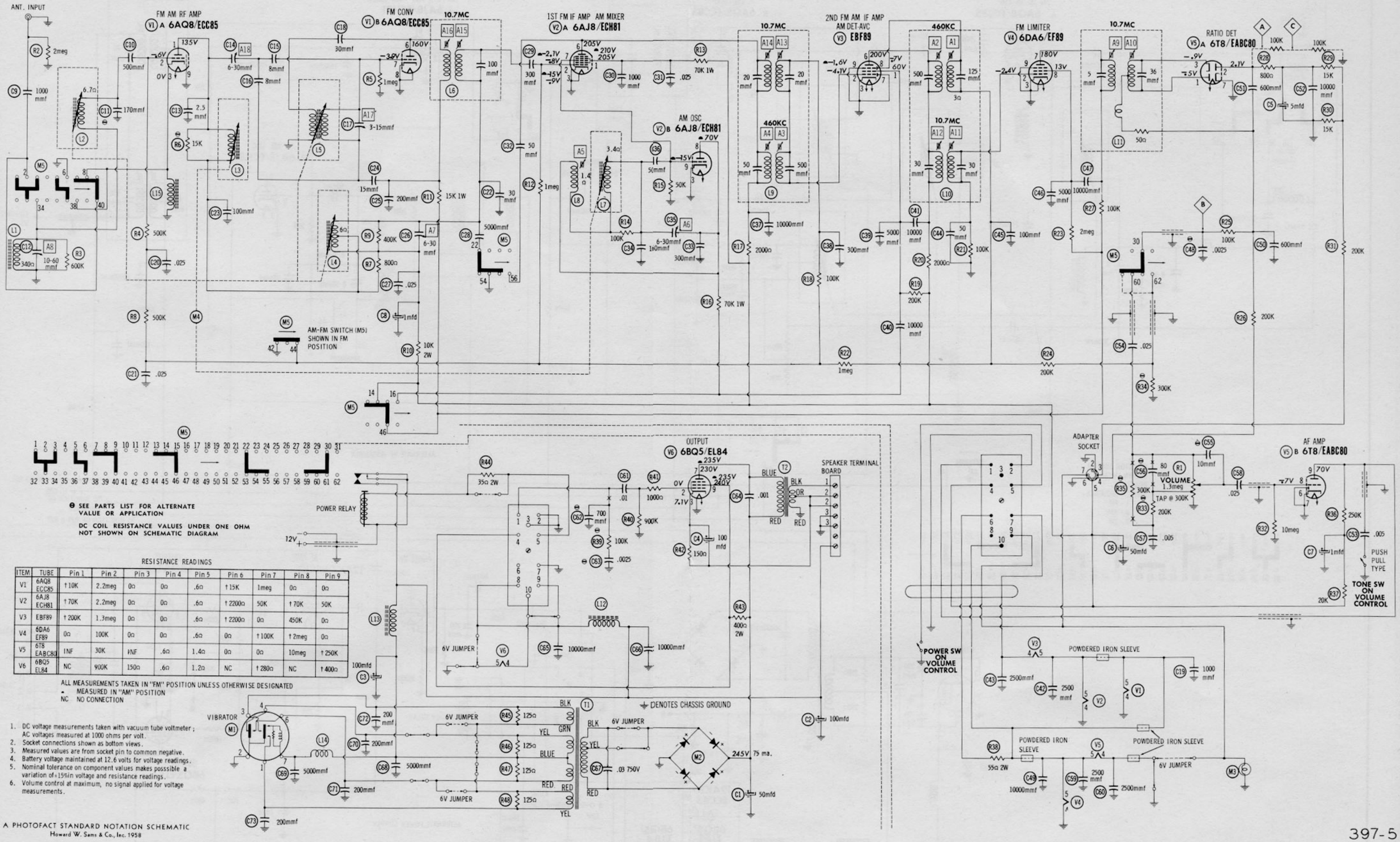
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
- MEASURED IN "AM" POSITION
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958


10.7MC
2ND FM AM IF AMP
AM DET-AVC
V3 EBF89
460KC
FM LIMITER
V4 6DA6/EF89
10.7MC
RATIO DET
V5A 6T8/EABC80
AM OSC
V2B 6AJ8/ECH81
460KC
10.7MC
ADAPTER SOCKET
AF AMP
V5B 6T8/EABC80
OUTPUT
V6 6BQ5/EL84
SPEAKER TERMINAL BOARD
VOLUME 1.3meg
TAP @ 300K
POWER SW ON VOLUME CONTROL
POWDERED IRON SLEEVE
POWDERED IRON SLEEVE
POWDERED IRON SLEEVE
6V JUMPER
PUSH PULL TYPE
TONE SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
JUMPER
245V 75 ma.

397-5



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8 ECC85	†10K	2.2meg	0Ω	0Ω	.6Ω	†15K	1meg	0Ω	0Ω
V2	6AJ8 ECH81	†70K	2.2meg	0Ω	0Ω	.6Ω	†2200Ω	50K	†70K	50K
V3	EBF89	†200K	1.3meg	0Ω	0Ω	.6Ω	†2200Ω	0Ω	450K	0Ω
V4	6DA6 EF89	0Ω	100K	0Ω	0Ω	.6Ω	0Ω	†100K	†2meg	0Ω
V5	6T8 EABC80	INF	30K	INF	.6Ω	1.4Ω	0Ω	0Ω	10meg	†250K
V6	6BQ5 EL84	NC	900K	150Ω	.6Ω	1.2Ω	NC	†280Ω	NC	†400Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
- MEASURED IN "AM" POSITION
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
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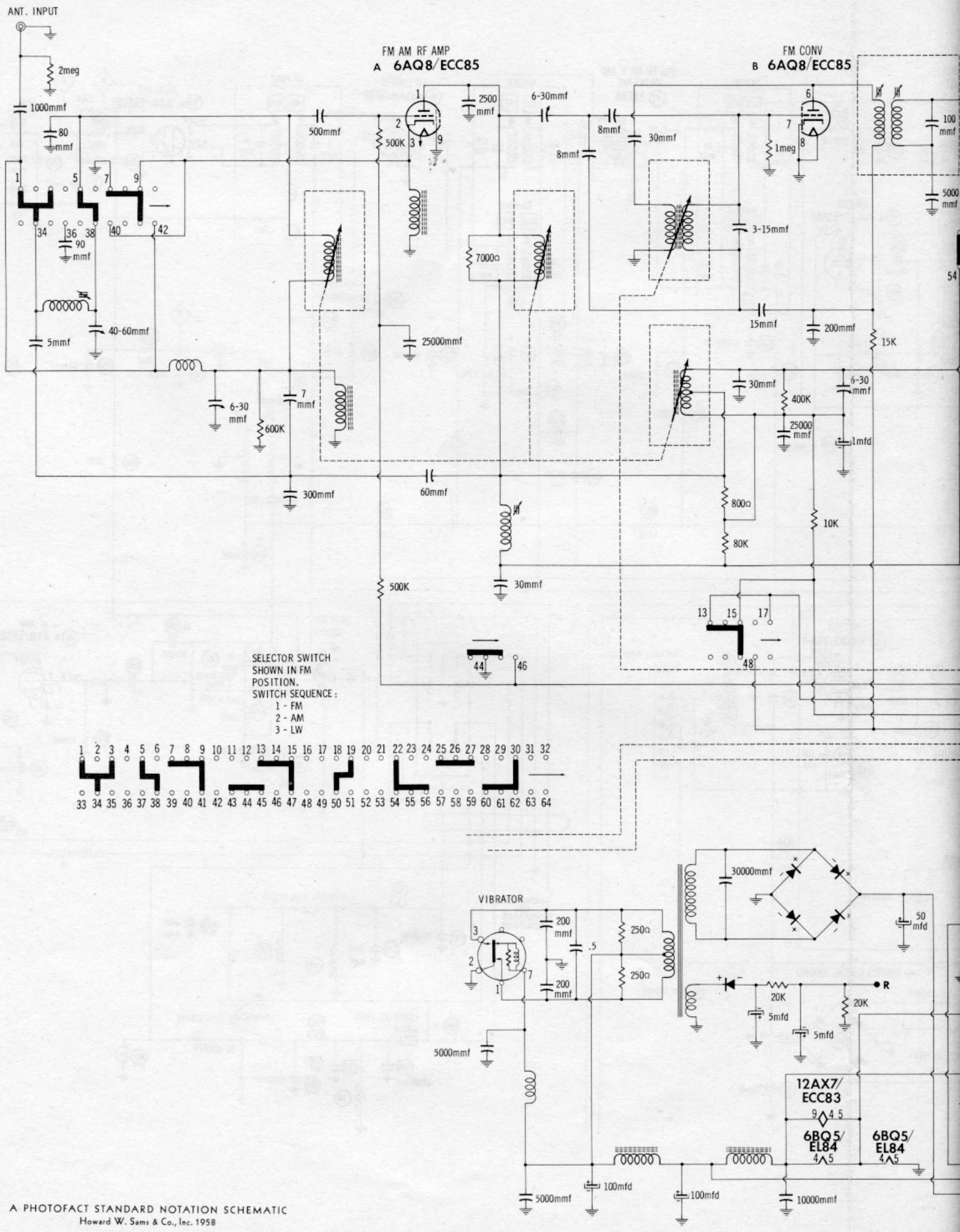
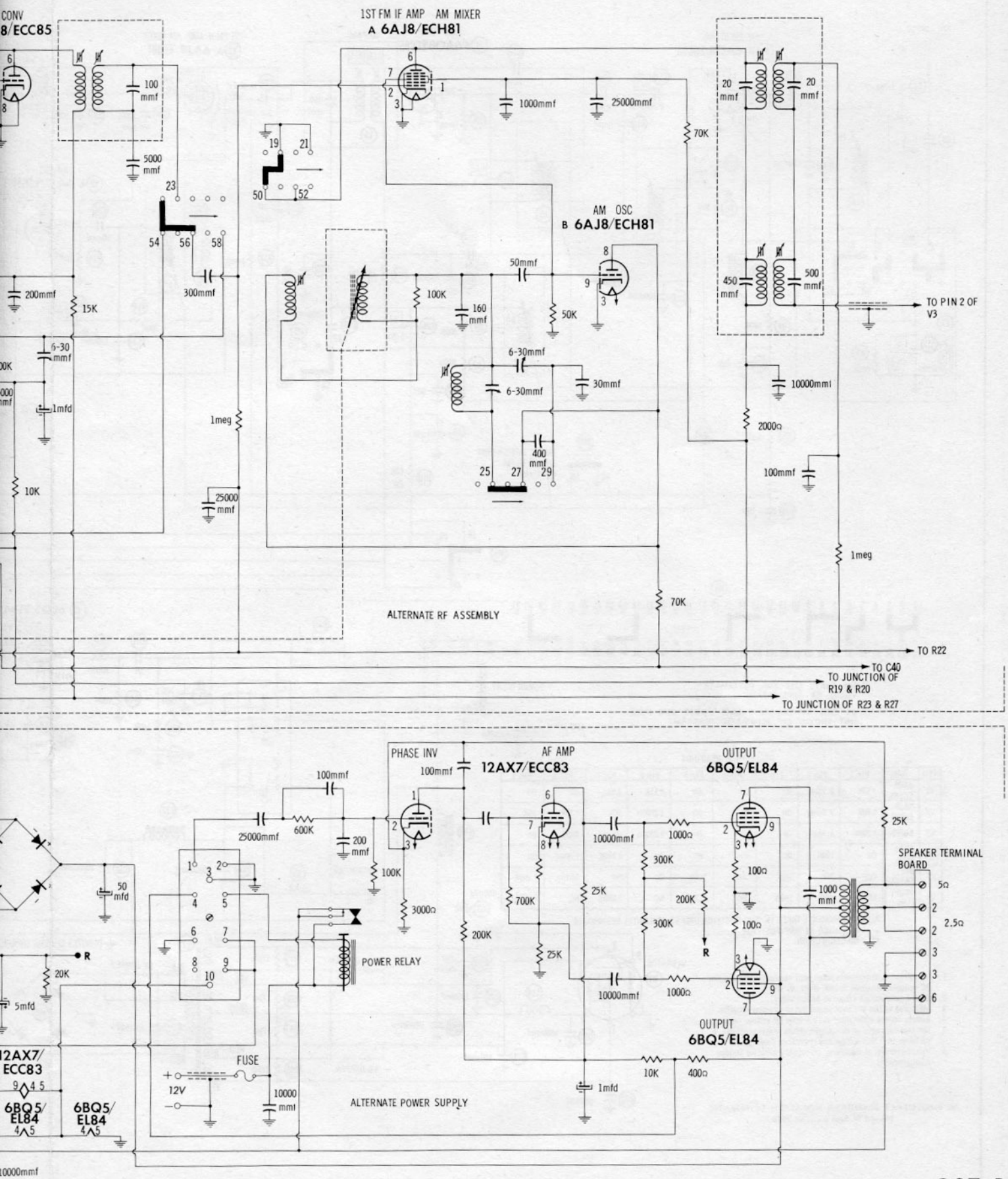
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

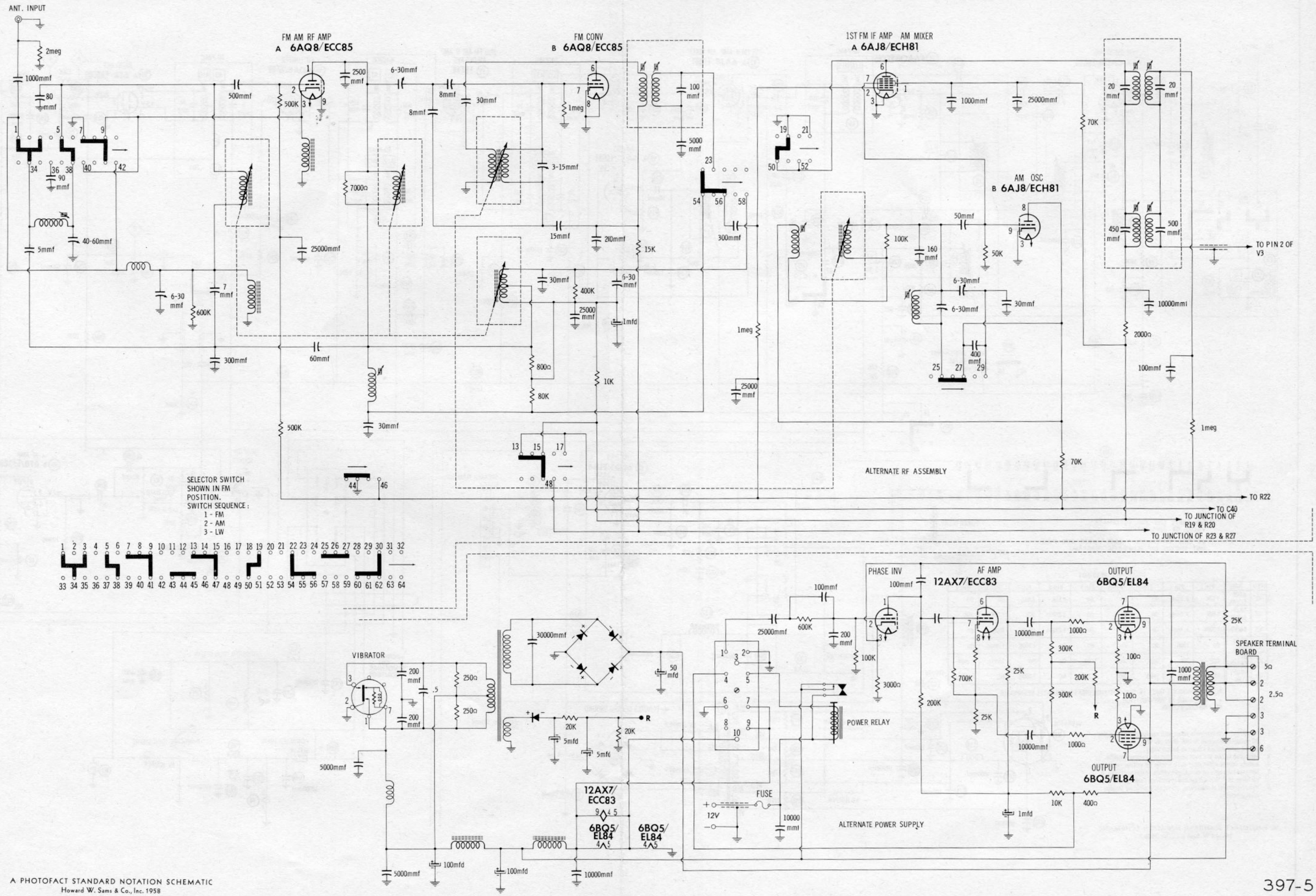
397-5



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

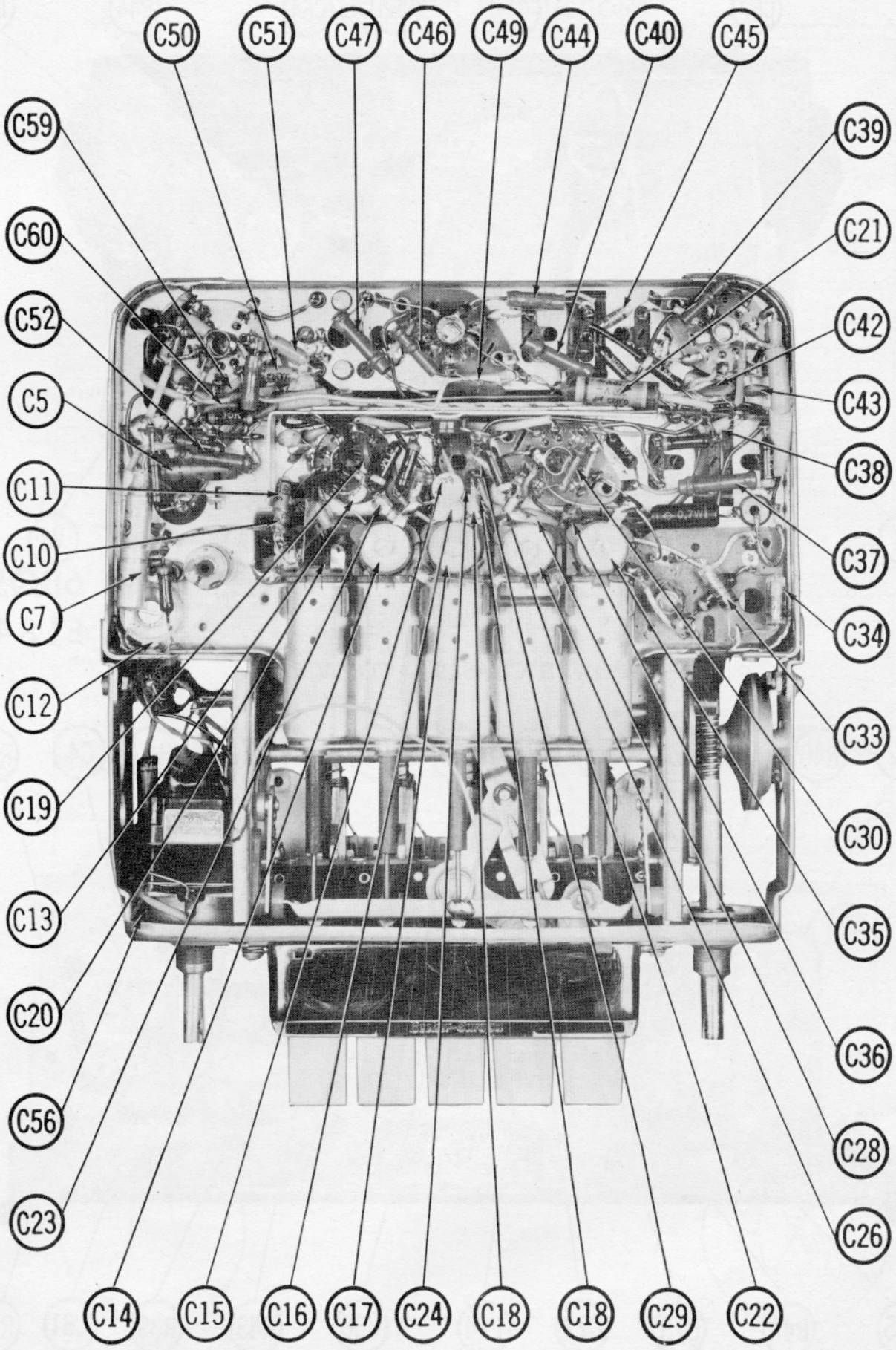

CONV
8/ECC85
1ST FM IF AMP AM MIXER
A 6AJ8/ECH81
AM OSC
B 6AJ8/ECH81
ALTERNATE RF ASSEMBLY
TO PIN 2 OF V3
TO R22
TO C40
TO JUNCTION OF R19 & R20
TO JUNCTION OF R23 & R27
PHASE INV
12AX7/ECC83
AF AMP
OUTPUT
6BQ5/EL84
SPEAKER TERMINAL BOARD
POWER RELAY
FUSE
12V
ALTERNATE POWER SUPPLY
12AX7/ECC83
6BQ5/EL84
6BQ5/EL84

397-5

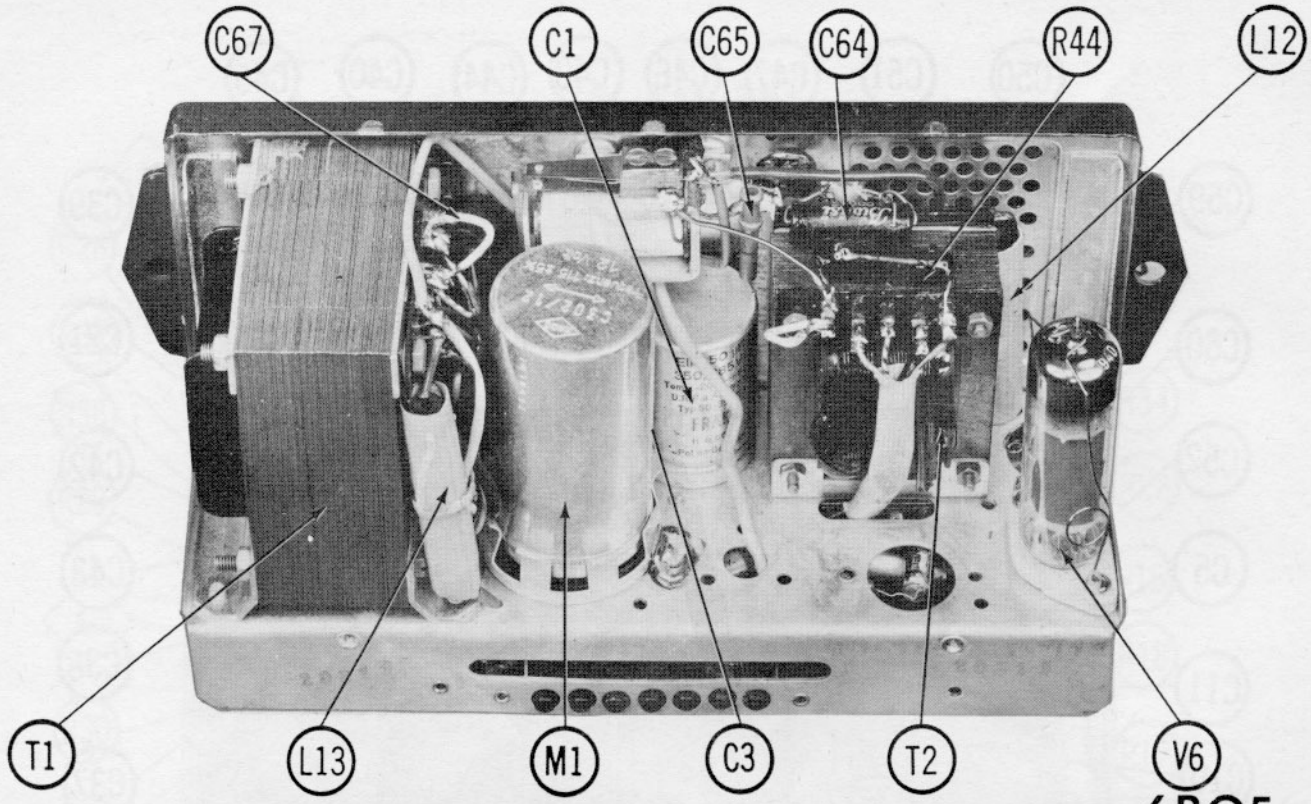


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

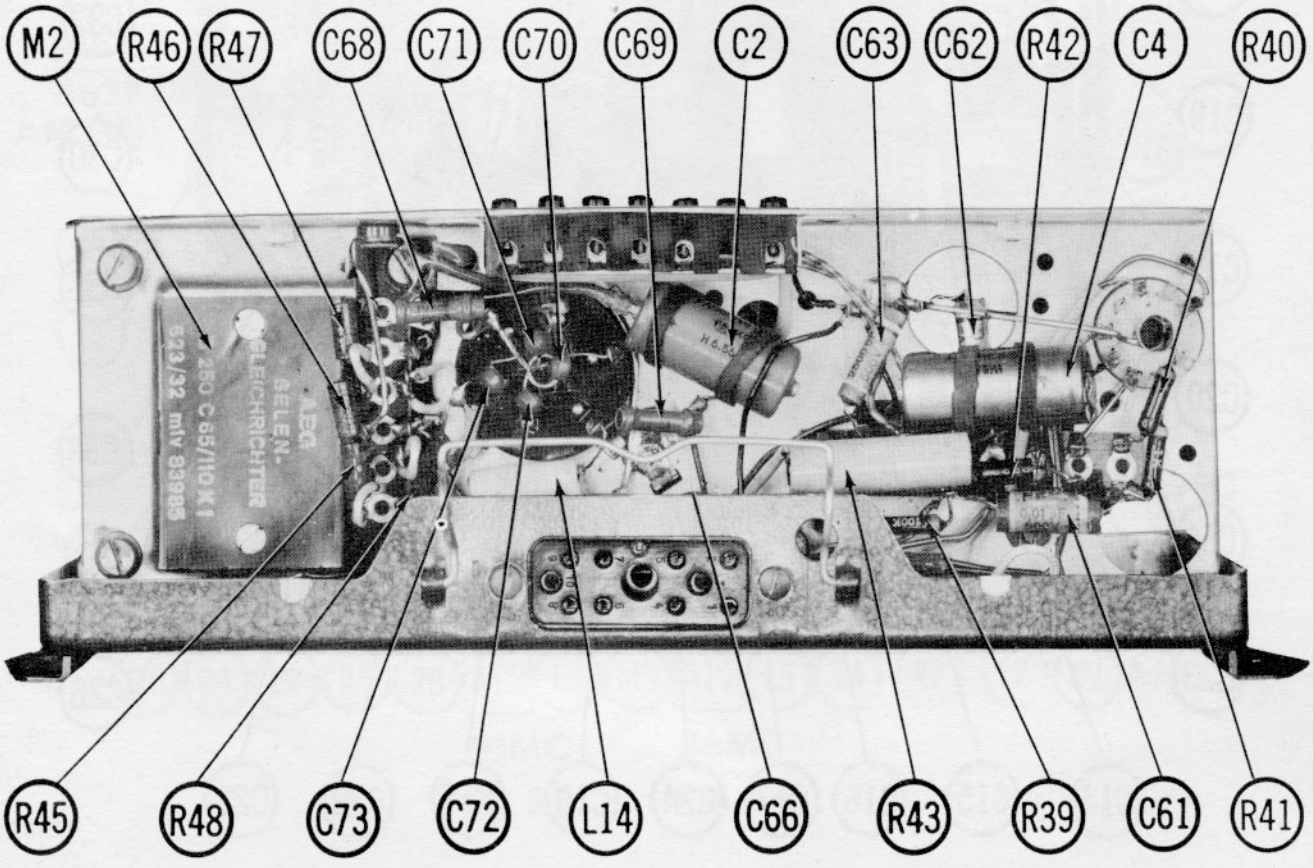
397-5



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



POWER CHASSIS - TOP VIEW



POWER CHASSIS - BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM AM RF Amp.-FM Conv.	6AQ8/ECC85
V2	1st FM IF Amp.-AM Mixer-AM Oscillator	6AJ8/ECH81
V3	2nd FM AM IF Amp.-AM Det.-AVC	EBF89
V4	FM Limiter	6DA6/EF89
V5	Ratio Det.-AF Amp.	6T8/EABC80
V6	Output	6BQ5/EL84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BECKER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	385							R2652 *
C2	100	25		PRS25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C3	100	25		PRS25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C4	100	25		PRS25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C5	5	40		PRS50V5	BBR5-50	TC30	TD-5-50	MT-0504	TVA-1303
C6	50	385							
C7	1	385		PRS450V1	BR145			MMT-4501	R2622 *
C8	1	385		PRS450V1	BR145			MMT-4501	R2622 *

* Non Catalog Item

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 CAP.	RATING VOLT	REPLACEMENT DATA BECKER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C9	1000			1468-001	D6-102	1W5D1	ED-1000	MC255	1FM-21	
C10	500			1468-0005	D6-501	5W5T5	ED-500	MC245	1FM-35	
C11	170									①
C12	10-60									
C13	2.5									
C14	6-30									
C15	8					C10V8C				
C16	8					C10V8C				
C17	3-15									
C18	30									
C19	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C20	.025	125		P288N-025		CUB4S22		GEM-4125	4TM-S25	
C21	.025	125		P288N-025		CUB4S22		GEM-4125	4TM-S25	
C22	30			1468-00003	DD-300	5W5Q3	ED-30		1FM-43	
C23	100			1468-0001	D6-101	5W5T1	ED-100	MC235	1FM-31	
C24	15			1468-000015	D6-150	5W5Q15	ED-15	UC-5415	1FM-415	
C25	200			1468-0002	D6-201	5W5T2	ED-200	MC237	1FM-32	
C26	6-30									
C27	.025	500		P688N-025		CUB4S22		GEM-4125	6TM-S25	
C28	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C29	300			1468-0003	D6-301	5W5T3	ED-300	MC241	1FM-33	
C30	1000			SI 1000	D6-102	LT6D1	GP-1000	UC-521	5HK-D1	
C31	.025	500		P688N-025		CUB4S22		GEM-6125	6TM-S25	
C32	50			1468-00005	D6-500	5W5Q5	ED-50	MC225	1FM-45	
C33	300			1468-0003	D6-301	5W5T3	ED-300	MC241	1FM-33	
C34	160					5W5T16			1FM-316	
C35	6-30									
C36	50			1468-00005	D6-500	5W5Q5	ED-50	MC225	1FM-45	
C37	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C38	300			1468-0003	D6-301	5W5T3	ED-300	MC241	1FM-33	
C39	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5HK-D5	
C40	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C41	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C42	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5HK-D25	
C43	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5HK-D25	
C44	50			1468-00005	D6-501	5W5Q5	ED-50	MC225	1FM-45	
C45	100			1468-0001	D6-101	5W5T1	ED-100	MC235	1FM-31	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BECKER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C46	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5HK-D5	
C47	10000			SI 10000	D6-103	SI 10000	GP-10000	DC511	5HK-S1	
C48	.0025	125			D6-252	CUB6D22	GP-2500	GEM-6225	6TM-D25	②
C49	10000			SI 10000	DD-103	LT6S1	ED-01	DC511	5HK-S1	
C50	600				D6-601	1W5T6			1FM-36	
C51	600				D6-601	1W5T6			1FM-36	
C52	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C53	.005	500		P688N-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C54	.025	125		P288N-025		CUB4S22		GEM-4125	4TM-S25	
C55	10			1468-00001	D6-100	5W5Q1	ED-10	MC215	1FM-41	③
C56	80									④
C57	.005	125		P288N-005	D6-502	CUB6D5	GP-5000	GEM-425	6TM-D5	
C58	.025	125		P288N-025		CUB4S22		GEM-4125	4TM-S25	
C59	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5HK-D25	
C60	2500			BPD-0025	DD-252	BYA10D25	ED-0025	UC-5225	5HK-D25	
C61	.01	600		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C62	700					1W5T7				④
C63	.0025	500		P688N-0025	D6-252	CUB6D22	ED-0025	GEM-6225	6TM-D25	④
C64	.001	750		P1088N-001		CUB10D1		GEM-1021	10TM-D1	
C65	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C66	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5HK-S1	
C67	.03	750		P1088N-03		CUB10S3		GEM-1013	10TM-S3	
C68	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C69	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C70	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	
C71	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	
C72	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	
C73	200			BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	

① Not used in Model MUK.
② Some versions may use 2500mmf in this application.
③ Some versions may use 100mmf in this application.
④ Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BECKER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.3meg	½						Volume, Tap ② 300K
B	Switch							Tone
C	Switch							On-Off

RESISTORS

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

ITEM No.	RATING OHMS	RATING WATT	BECKER PART No.	NOTES
R2	2meg			
R3	600K			
R4	500K			
R5	1meg			
R6	15K			①
R7	800Ω			
R8	500K			
R9	400K			
R10	10K	2		
R11	15K	1		
R12	1meg			
R13	70K	1		
R14	100K			
R15	50K			
R16	70K	1		
R17	2000Ω			
R18	100K			
R19	200K			
R20	2000Ω			
R21	100K			
R22	1meg			
R23	2meg			
R24	200K			
R25	100K			
R26	200K			
R27	100K			
R28	800Ω			
R29	15K			
R30	15K			
R31	200K			

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	BECKER PART No.	NOTES
R32	10meg			
R33	200K			②
R34	300K			③
R35	300K			④
R36	250K			
R37	20K			
R38	55Ω	2		
R39	100K			④
R40	900K			

ITEM No.	RATING OHMS	RATING WATT	BECKER PART No.	NOTES
R41	1000Ω			
R42	150Ω			
R43	400Ω	2		
R44	35Ω	2		
R45	125Ω			
R46	125Ω			
R47	125Ω			
R48	125Ω			

① Some versions may use 7000Ω in this application.
② Some versions may use 100K in this application.
③ Some versions may use 200K in this application.
④ Not used in some versions.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING PRI. 1	RATING PRI. 2	RATING PRI. 3	RATING SEC.	REPLACEMENT DATA BECKER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	12VDC OPERATION									
T1	12V @ 1.5A	24VCT @ 1.5A	12V @ 1.5A	220V Tap @ 200V @ .060A						
	6VDC OPERATION									
	3V @ .75A	12VCT @ 1.5A	3V @ .75A	220V Tap @ 200V @ .060A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA BECKER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	34:	1								

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA BECKER PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	AM Antenna Coil						
L2	AM Antenna Coil						
L3	FM RF Coil						
L4	AM Mixer Coil						
L5	FM Osc. Coil						
L6	1st FM IF						
L7	AM Osc. Coil						
L8	AM Osc. Coil						
L9	2nd FM IF 1st AM IF						
L10	3rd FM IF 3nd AM IF						
L11	Ratio Det.						
L12	Fil. Choke						
L13	Hash Choke						
L14	RF Choke						2.8 Microhenries
L15	Cathode Choke						

PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA BECKER PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1	Interrupter	12VDC	115∿	6302/12		G4502		

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BECKER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M2	.075A			60-9150 ① ③	D-64 ①	① Selenium Type ② Silicon Type ③ Two Required

MISCELLANEOUS

ITEM No.	PART NAME	BECKER PART No.	NOTES
M3	Dial Lamp		12-14V .1A
M4	Tuner		Pushbutton, 5 Section, Variable Inductance
M5	Switch		AM-FM (Multiple Contact, Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661