

RESISTORS (cont)

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

- 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			BECKER PART No.	REPLACEMENT DATA		
	PRI.1	PRI.2	PRI.3		Merit	Stancor	Triad
	12V	24VCT	12V		PART No.	PART No.	PART No.
T1	① 1.5A	② 1.5A	③ 1.5A				
	④ .75A	⑤ 1.5A	⑥ .75A				

TRANSFORMER (AUDIO OUTPUT)

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

COILS (RF-IF)

ITEM No.	USE	BECKER PART No.	REPLACEMENT DATA			NOTES
			Meissner	Merit	Miller	
			PART No.	PART No.	PART No.	
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	1st FM IF					
L10	3rd FM IF					
L11	Ratio Det.					
L12	FIL. Choke					
L13	Hash Choke					
L14	RF Choke					
L15	Cathode Choke					2. 8 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQ. QUENCY	BECKER PART No.	REPLACEMENT DATA		NOTES
					CORRECTION DUBINER PART No.	MALLORY PART No.	
M1	Interrupter	12VDC	117%	6302/12		G4502	

RECTIFIERS

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

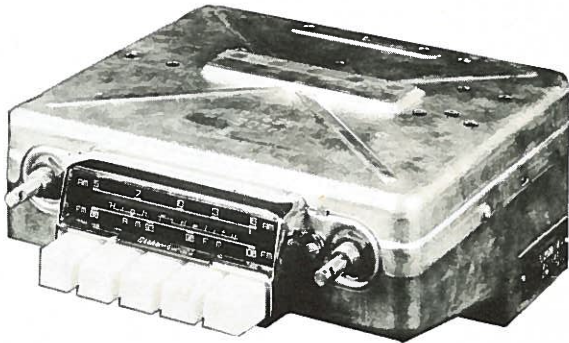
MISCELLANEOUS

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
 Shielded Hook-up Wire Use BELDEN No. 8524 (Stranded) Available in Ten Colors
 Bonding Strap Use BELDEN No. 8885
 Use BELDEN No. 8861

BECKER MODELS
 "Europa" MU, MUK

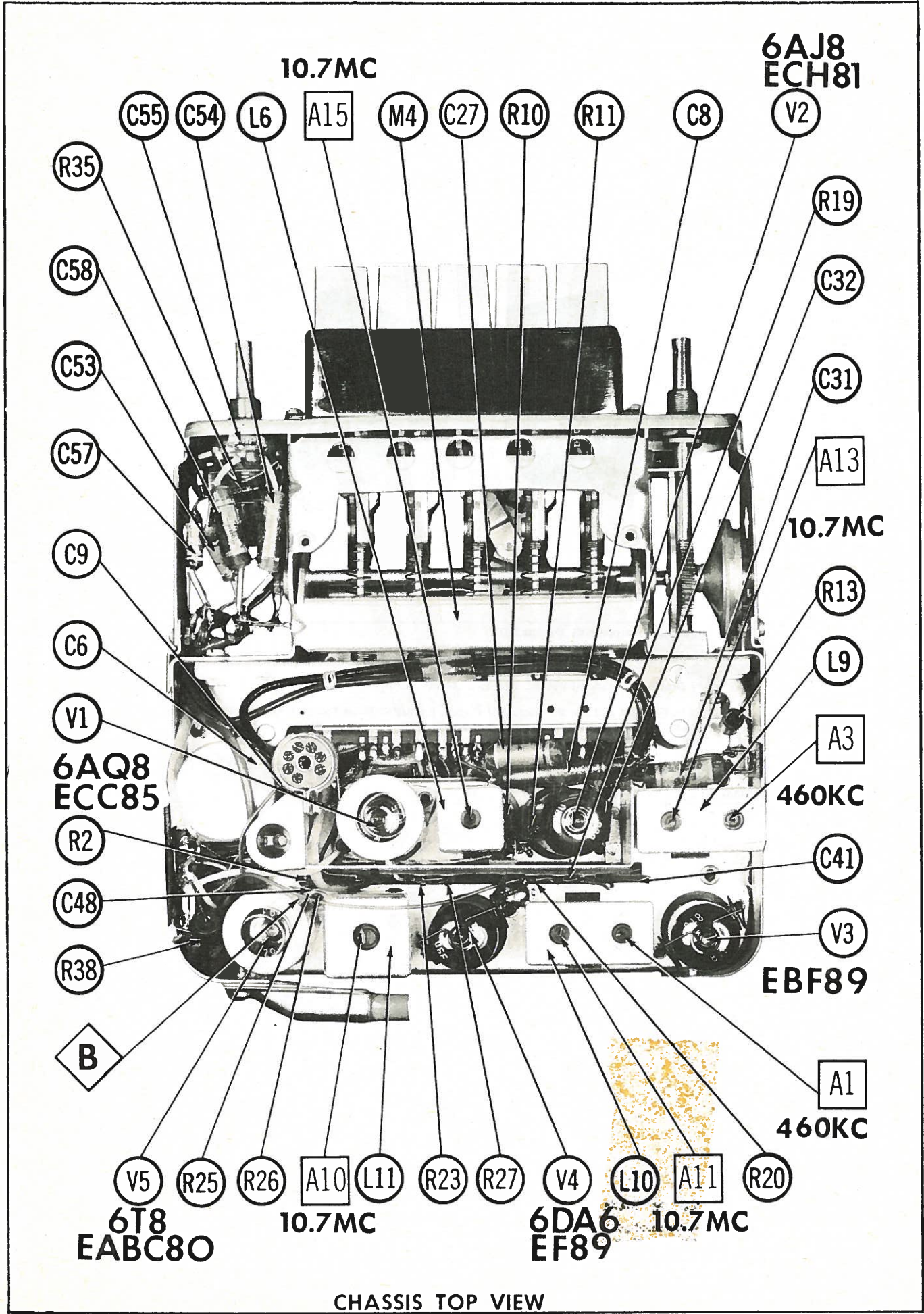


TRADE NAME	Becker Models Europa MU, Europa MUK		
SUPPLIER	Witte Import Distributors, 613-19 S. 24th St., Philadelphia 46, Pa.		
TYPE SET	Battery Operated Universal FM-BC Receiver (Model Europa MU Has Marine Band)		
TUBES (Six)	Types 6AQ8/ECC85 FM AM RF Amp.-FM Conv., 6AJ8/ECH81 1st FM IF Amp.-AM Mixer-AM 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. 71 Amp. @ 12. 6 Volts DC
TUNING RANGE—BROADCAST	510KC - 1630KC	FREQ. MOD.	88MC - 108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, 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 H472

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM AM IF Amp.-FM Conv.	6AQ8/ECC85
V2	1st FM IF Amp.-AM Mixer-AM Oscillator	6AJ8/ECH81
V3	2nd FM AM IF Amp.-AM Det.-AFC	EBF89

ELECTROLYTIC CAPACITORS

REPLACEMENT DATA			
ITEM No.	RATING CAP.	VOLT.	TYPE
C1	50	385	PR25V1000
C2	100	25	PR25V1000
C3	100	25	PR25V1000
C4	100	25	PR25V1000
C5	5	40	PR25V1000
C6	50	385	PR25V1000
C7	1	385	PR25V1000
C8	1	385	PR25V1000

* 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.

REPLACEMENT DATA			
ITEM No.	RATING CAP.	VOLT.	TYPE
C9	1000	500	5HK-D1
C10	500	500	5HK-D1
C11	170	500	5HK-D1
C12	10-40	500	5HK-D1
C13	2.5	500	5HK-D1
C14	6-30	500	5HK-D1
C15	8	500	5HK-D1
C16	3-15	500	5HK-D1
C17	30	500	5HK-D1
C18	1000	500	5HK-D1
C19	1000	500	5HK-D1
C20	1000	500	5HK-D1
C21	1000	500	5HK-D1
C22	1000	500	5HK-D1
C23	1000	500	5HK-D1
C24	1000	500	5HK-D1
C25	1000	500	5HK-D1
C26	1000	500	5HK-D1
C27	1000	500	5HK-D1
C28	1000	500	5HK-D1
C29	1000	500	5HK-D1
C30	1000	500	5HK-D1
C31	1000	500	5HK-D1
C32	1000	500	5HK-D1
C33	1000	500	5HK-D1
C34	1000	500	5HK-D1
C35	1000	500	5HK-D1
C36	1000	500	5HK-D1
C37	1000	500	5HK-D1
C38	1000	500	5HK-D1
C39	1000	500	5HK-D1
C40	1000	500	5HK-D1
C41	1000	500	5HK-D1
C42	1000	500	5HK-D1
C43	1000	500	5HK-D1
C44	1000	500	5HK-D1
C45	1000	500	5HK-D1

PARTS LIST AND DESCRIPTIONS (Continued)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V4	FM Limiter	6DA6/EF89
V5	Ratio Det. - AF Amp.	6T8/EABC80
V6	Output	6PQ5/EL84

ELECTROLYTIC CAPACITORS

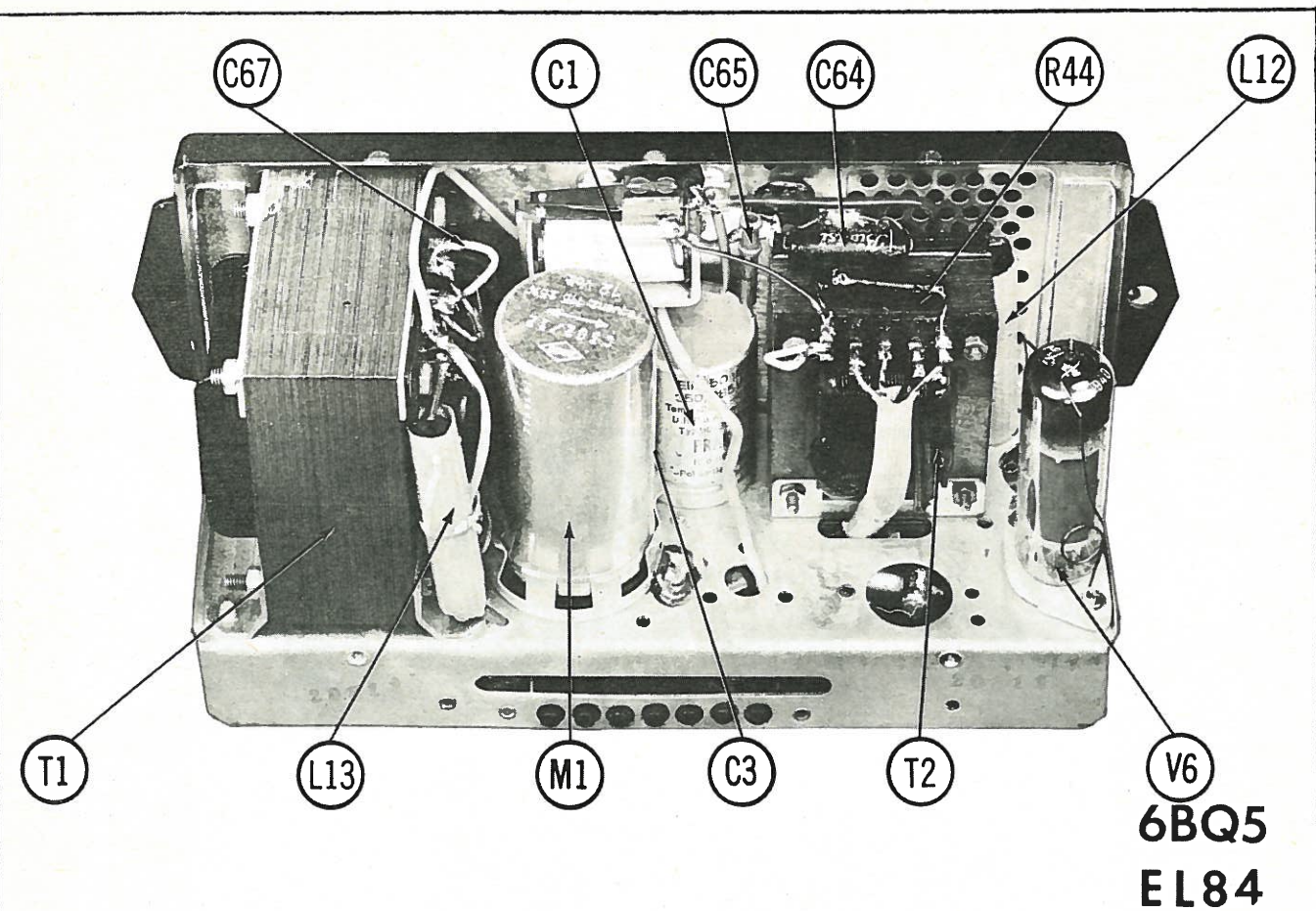
REPLACEMENT DATA			
ITEM No.	RATING CAP.	VOLT.	TYPE
C1	50	385	PR25V1000
C2	100	25	PR25V1000
C3	100	25	PR25V1000
C4	100	25	PR25V1000
C5	5	40	PR25V1000
C6	50	385	PR25V1000
C7	1	385	PR25V1000
C8	1	385	PR25V1000

* Non Catalog Item

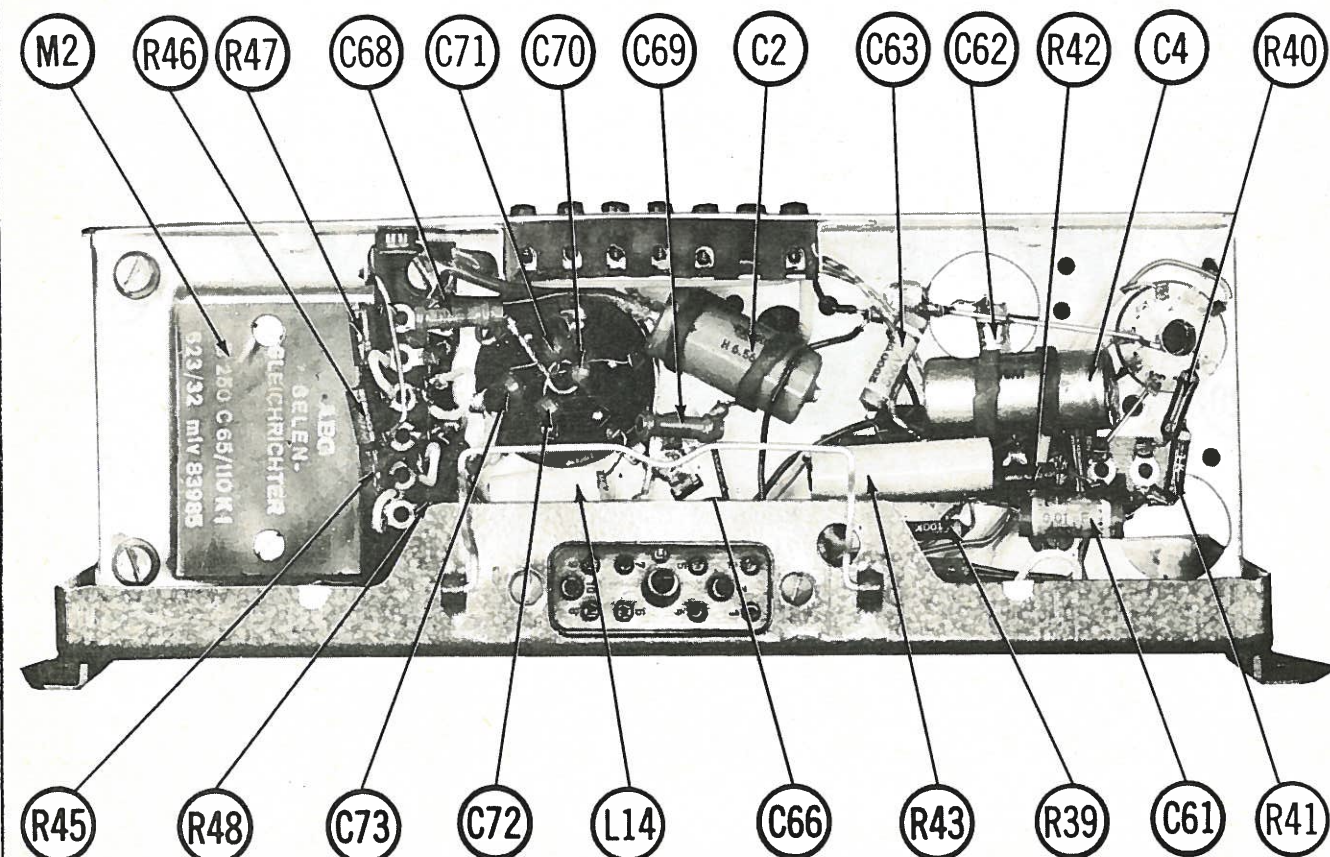
FIXED CAPACITORS

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

REPLACEMENT DATA			
ITEM No.	RATING CAP.	VOLT.	TYPE
C9	1000	500	5HK-D1
C10	500	500	5HK-D1
C11	170	500	5HK-D1
C12	10-40	500	5HK-D1
C13	2.5	500	5HK-D1
C14	6-30	500	5HK-D1
C15	8	500	5HK-D1
C16	3-15	500	5HK-D1
C17	30	500	5HK-D1
C18	1000	500	5HK-D1
C19	1000	500	5HK-D1
C20	1000	500	5HK-D1
C21	1000	500	5HK-D1
C22	1000	500	5HK-D1
C23	1000	500	5HK-D1
C24	1000	500	5HK-D1
C25	1000	500	5HK-D1
C26	1000	500	5HK-D1
C27	1000	500	5HK-D1
C28	1000	500	5HK-D1
C29	1000	500	5HK-D1
C30	1000	500	5HK-D1
C31	1000	500	5HK-D1
C32	1000	500	5HK-D1
C33	1000	500	5HK-D1
C34	1000	500	5HK-D1
C35	1000	500	5HK-D1
C36	1000	500	5HK-D1
C37	1000	500	5HK-D1
C38	1000	500	5HK-D1
C39	1000	500	5HK-D1
C40	1000	500	5HK-D1
C41	1000	500	5HK-D1
C42	1000	500	5HK-D1
C43	1000	500	5HK-D1
C44	1000	500	5HK-D1
C45	1000	500	5HK-D1



POWER CHASSIS - TOP VIEW



POWER CHASSIS - BOTTOM 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.	480KC (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 ($\pm 1\%$) resistors in series from point Δ 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 Δ . Low side to chassis.	A9	Adjust for maximum deflection.
6. "	"	"	"	"	DC probe to point ∇ . Common to point Δ .	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 Δ . Low side to chassis.	A11, A12, A13, A14	Adjust for maximum deflection.
8. "	Across antenna receptacle	"	"	"	DC probe to point Δ . 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 120v 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 Δ . 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 Δ . 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 180 Ω carbon resistor.	88MC	FM	Tuning gang fully closed	DC probe to point Δ . Common to chassis.	A17	Adjust for maximum deflection.
10. "	"	91MC	"	Tune for 91MC signal	"	A18	Adjust for maximum deflection.

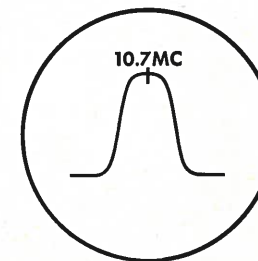
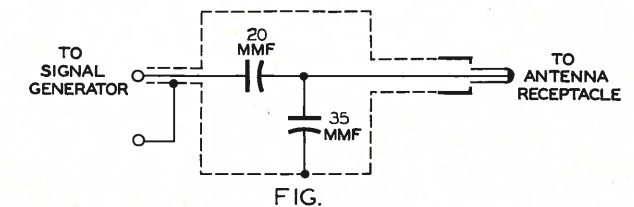


FIG. 2

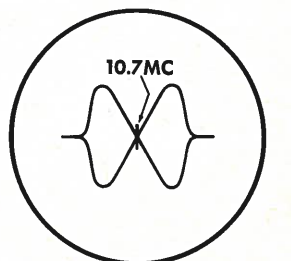
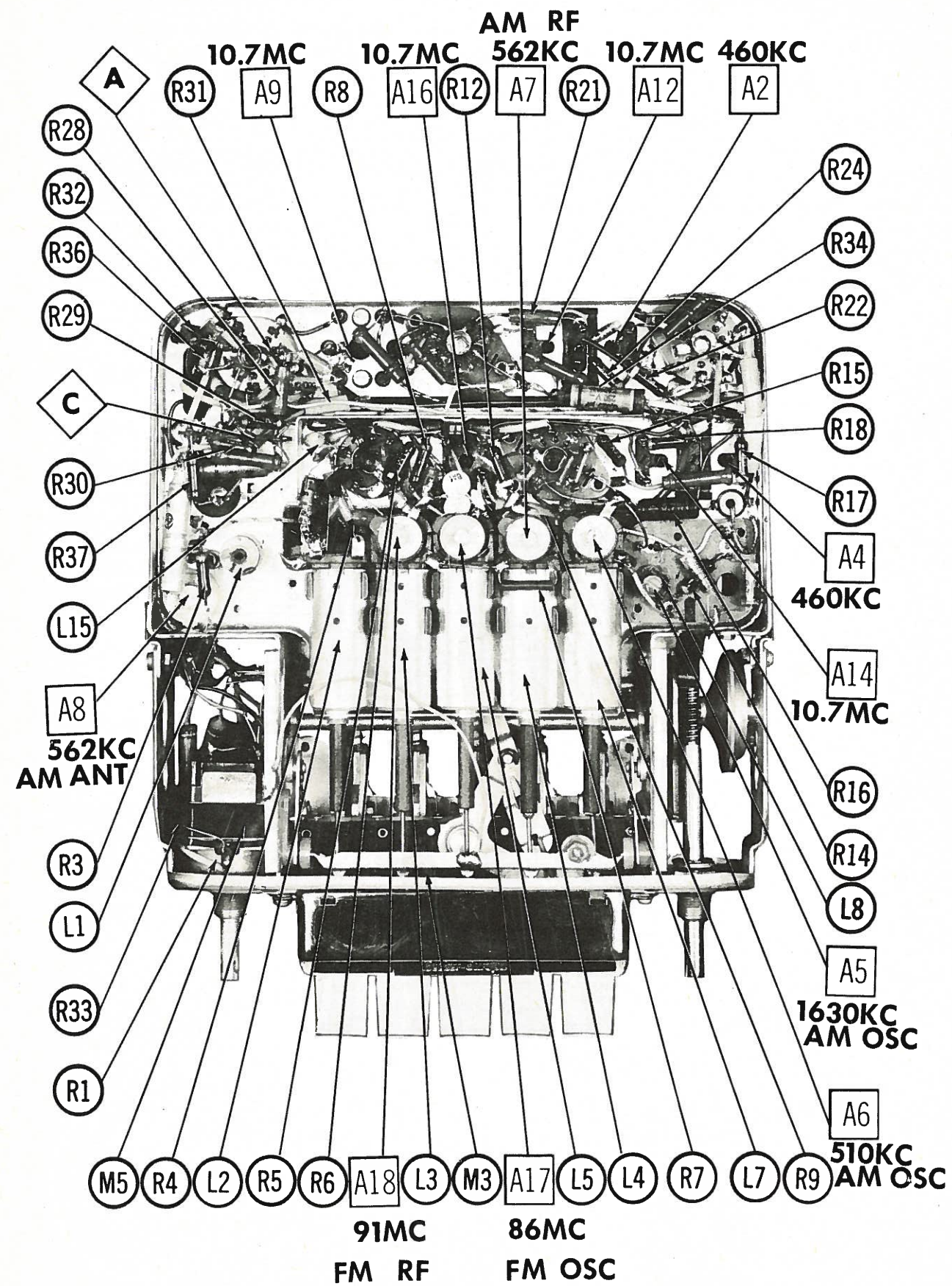
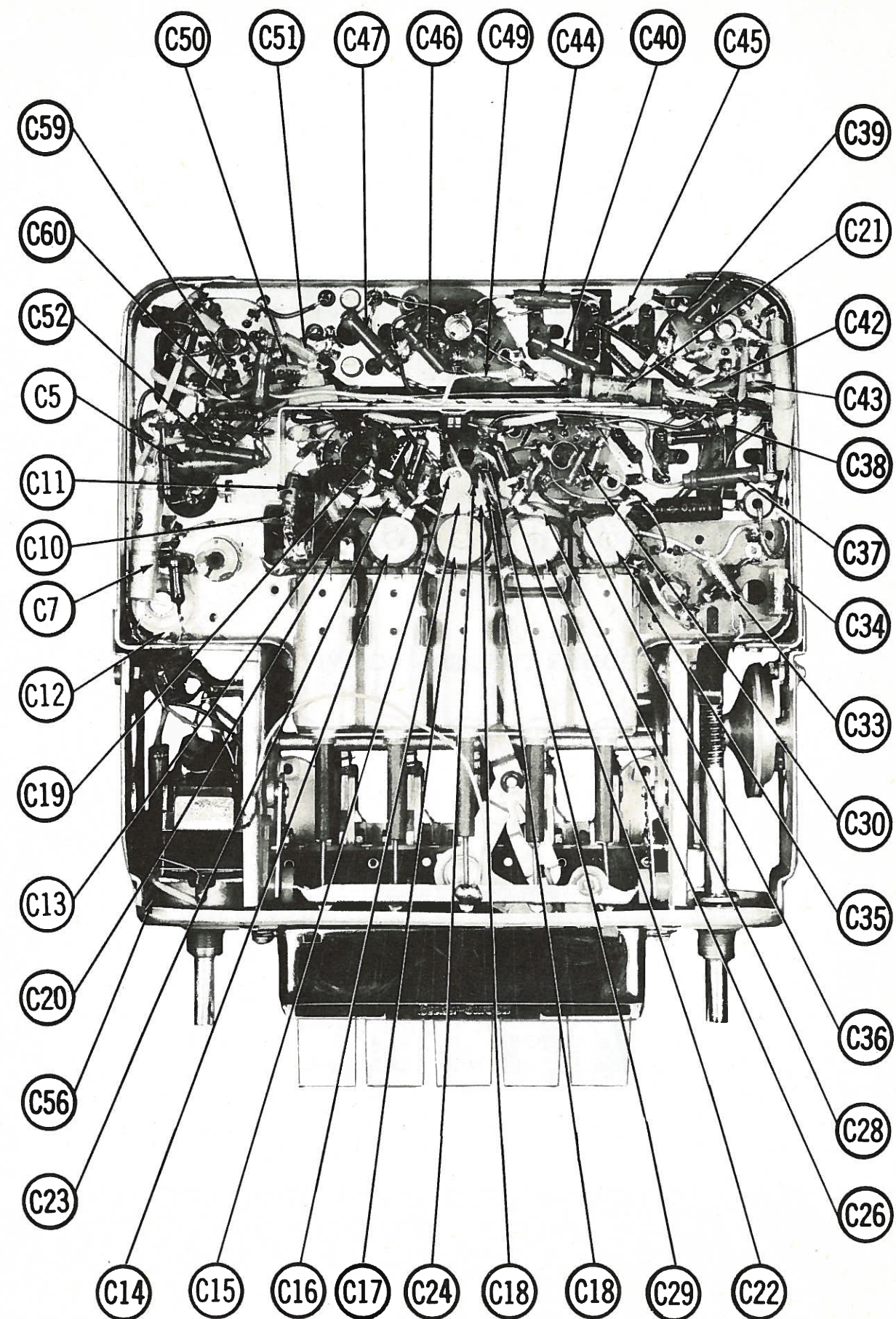


FIG. 3

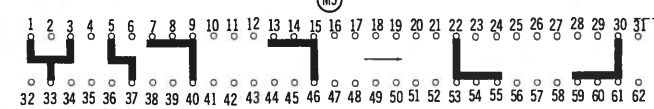
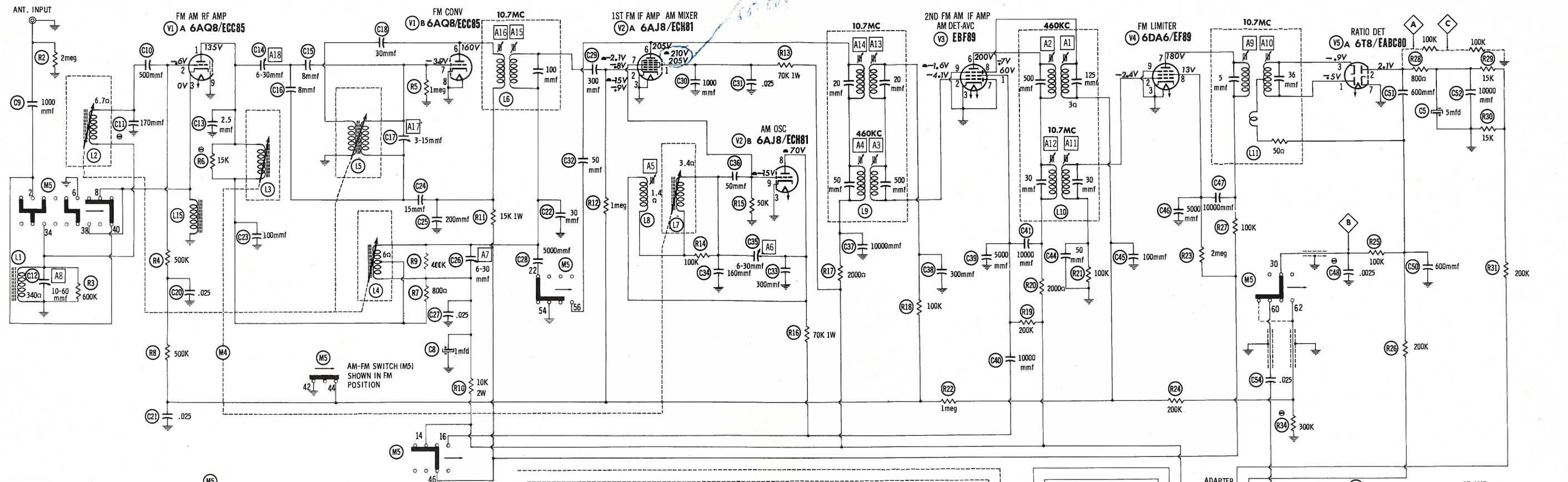


CHASSIS-BOTTOM VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION





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

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	10K	2.2meg	0Ω	0Ω	.6Ω	220Ω	50K	10K	50K
V3	EBF89	200K	1.3meg	0Ω	0Ω	.6Ω	220Ω	0Ω	450K	0Ω
V4	6DA6/EF89	0Ω	100K	0Ω	0Ω	.6Ω	0Ω	100K	2meg	0Ω
V5	6T8/EABC80	1N	30K	1N	.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

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

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

