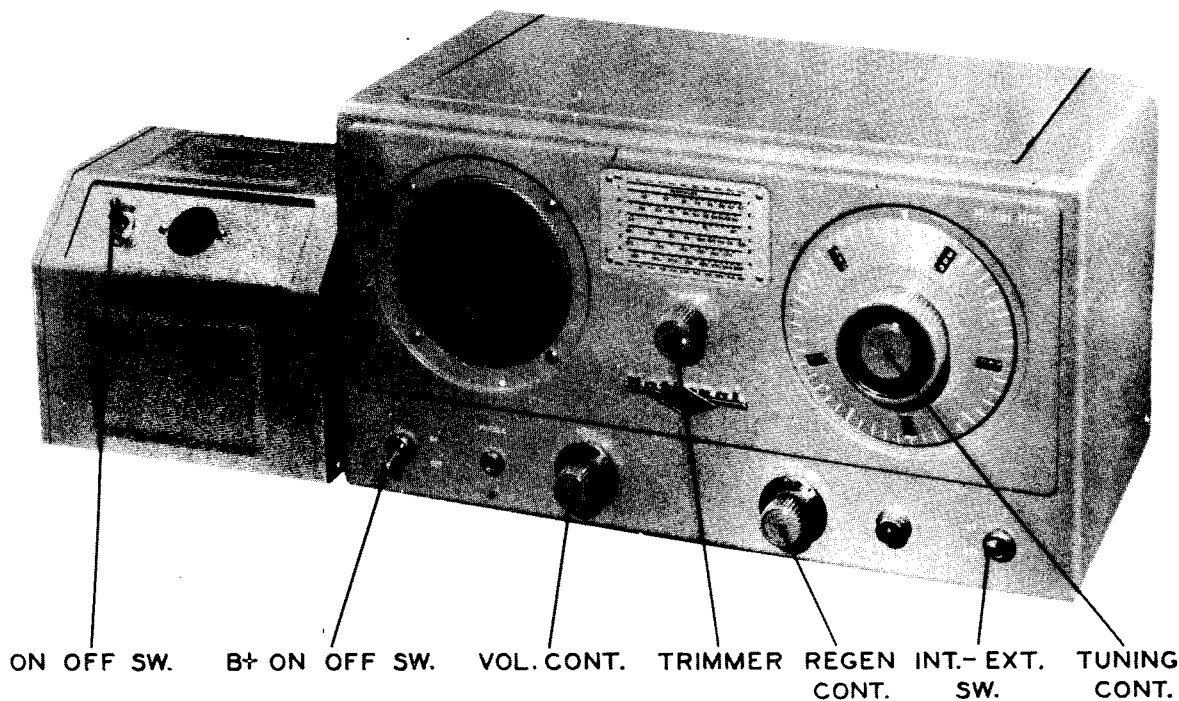


PHOTOFACT* Folder

NATIONAL
MODEL HFS

MODEL HFS

NATIONAL
MODEL HFS



NATIONAL MODEL HFS

TRADE NAME	National, Model HFS
MANUFACTURER	National Company, Inc., Malden, Mass.
TYPE SET	AC or Battery Operated Multi-Band Superheterodyne Receiver
TUBES(EIGHT)	Types 6AK5 Mixer, 9002 Oscillator, 6SG7 IF Amp., 6SK7 Detector, 6J5 Cathode Follower, 6J5 AF Amp., 6V6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	110-120, 220-240 Volts AC or 6 Volt Storage Battery
RATING	.36 Amp. @ 117 Volts AC
TUNING RANGE-	Band F 27-42MC, Band E 41-60MC, Band D 56-80MC, Band C 80-120MC, Band B 120-178MC, Band A 178-250MC.

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Connect the high side of the signal generator through .001 MFD shunted by 50KΩ resistor to the grid pin of the first detector coil socket. This will necessitate the removeable of the 1st detector coil from its socket. Connect low side of signal generator to chassis. Pre-set the front panel controls as follows: Audio-----To desired volume
Int.-Ext.---Internal
Regeneration---Set for background hiss. (Approx. 4 on Knob Scale)
Absence of the background hiss indicates that the regeneration control and/or the signal generator should be retarded.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.001MFD Shunted by 50KΩ	See Pre-alignment instructions.	10.7MC (400V Mod)	Point of Non-interference	Across voice coil	A1, A2 A3	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 7, 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.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

NATIONAL
MODEL HFS

CHASSIS—TOP VIEW

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		NATIONAL PART No.	STANDARD REPLACEMENT		
V1	Mixer	6AK5	6AK5	7BD	
V2	Oscillator	9002	9002	7TM	
V3	If Amp.	6SK7	6SK7	8BK	
V4	Detector	6SK7	6SK7	8N	
V5	Cath. Follower	6J5	6J5	6Q	
V6	AF Amp.	6J5	6J5	6Q	
V7	Power Output	6V6GT	6V6GT	7AC	
V8	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

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

ITEM No.	RATING CAP. VOLT	REPLACEMENT DATA				IDENTIFICATION CODES AND INSTALLATION NOTES
		NATIONAL PART No.	AEROVOX PART No.	CORNELL-DUBILER PART No.	SPRAGUE PART No.	
C1A	475		E450-8-8-B	UP	DI-3X8-450	Filter
C1B	475			11145C1		"
C2	10		PRSSO/10	BRIOS	M-10-50	Output Cath. Bypass
C3	50		PRSSO/10	BRIOS	M-10-50	AF Cath. Bypass
C4	100					Fixed Trimmer
C5	100					"
C6	47		1468-00005	SWQ5	M0.5-45	Ant. Coupling
C7	47		1468-00005	SWQ5	GP1K-50	RF Coupling
C8	50		1468-00005	SWQ5	GP1K-50	Mixer Screen Bypass
C9	50		1468-00005	SWQ5	GP1K-50	Mixer Plate Decoupling
C10	470		1468-00005	SWQ5	GP2K-500	Osc. Grid Cap.
C11	50		1468-00005	SWQ5	GP1K-50	Osc. Cath. Bypass
C12	6200		1467-006	1D3D6	GP2-335-0076	IF Cath. Bypass
C13	470		1468-0005	SWQ5	GP2K-500	IF Screen Bypass
C14	100		1468-0001	SWQ5	GP1K-100	IF Coupling
C15	47		1468-00005	SWQ5	GP1K-50	IF Coupling
C16	470		1468-0005	SWQ5	GP2K-500	RF Filter
C17	10000		1467-01	1D3S1	GP2-335-01	Det. Plate Bypass
C18	6200		1467-006	1D3D6	GP2-335-0015	IF Coupling
C19	3		1468-0005	SWQ5	NPOK-3	Cath. Follower Plate
C20	470		1468-0005	SWQ5	GP2K-500	Det. Plate Decoupling
C21	470		430-5	DYR6050	XMRS-5	Audio Coupling
C22	200		P488-1	GT4P1	ST-4-1	RF Bypass
C23	1		1467-01	1D3S1	GP2-335-01	
C24	10000					

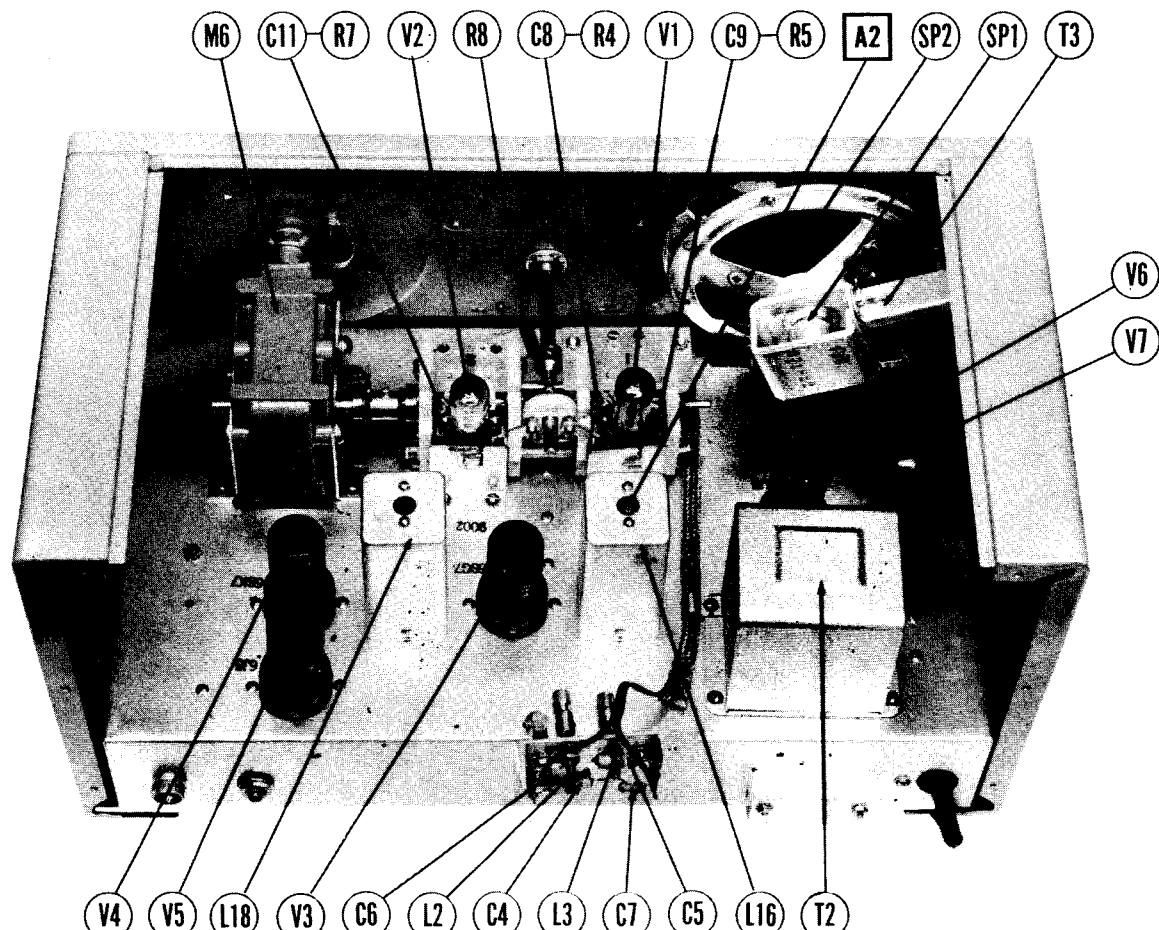
† Omit bypass section.
‡ Install mounting plate.

CONTROLS

ITEM No.	RATING RESIST. ANCE	WATTS	REPLACEMENT DATA		INSTALLATION NOTES
			NATIONAL PART No.	CLAROSTAT PART No.	
R1A	500K	2		M-60-Z	Audio Gain Control
R2A	50K	2		D13-133	Attach to R1A Per Instructions
R3	1000K	2		D11-123	Regeneration Control
				W-1000	Attach to R2A Per Instructions
				43-1000	Cathode Follower Output Control

RESISTORS

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA		IDENTIFICATION CODES
			NATIONAL PART No.	IRC PART No.	
R4	270K	1	BTS-270K	BTS-1 Meg.	Red-V1-V1. Mixer Grid
R5	1000K	1	BTS-1000	BTS-1000	Br.-Blk.-Grn. Mixer Screen Decoupling
R6	47K	1	BTS-47K	BTS-47K	Br.-Blk.-Red. Mixer Decoupling
R7	10K	1	BTS-10K	BTS-10K	Yl.-V1.-Or. Osc. Grid
R8	220K	1	BTS-220K	BTS-220K	Br.-Blk.-Or. Osc. Plate Decoupling
R9	220K	1	BTS-220K	BTS-220K	Red-Red-Br. IF Cathode
R10	22K	1	BTS-22K	BTS-22K	Red-Red-Or. IF Screen



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES	
	RESISTANCE	WATTS	NATIONAL PART No.	IRC PART No.		
R1	47K	1/4	BM-447	Y1-V1-Blk.	Det. Feedback	
R2	10 Meg.	1/4	BT5-10 Meg.	Br.-Blk.-Blue	Det. Grid Leak	
R3	5000K	1/4	BT5-4700	Grn.-Blk.-Red	Cathode Follower Plate	
R4	470K	1/4	BT5-470K	Y1-V1-Vl.	Cathode Follower Grid	
R5	330K	1/4	BT4-330	Or.-Or.-Br.	Cathode Follower Cathode	
R6	150K	1/4	BT4-150K	Br.-Grn.-Vl.	Voltage Dropping	
R7	470K	1/4	BT5-4700	Y1-V1-Red	AF Cathode	
R8	470K	1/4	BT5-4700	Y1-V1-Vl.	Output Grid	
R9	470K	1/4	BT-2470	Y1-V1-Br.	Output Cathode	
R10	100K	1/4	BT5-100K	Br.-Blk.-Vl.	AF Plate	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA		
	PRI.	SEC. 1	SEC. 2	SEC. 3	NATIONAL PART No.	STANCOR PART No.	MERIT PART No.
T1	115/230 VAC CT @ 117VAC @ .36A	430VAC CT @ 2A	5VAC @ 2A	6.5VAC @ 2.2A	Part of unit 5886		

TRANSFORMER (INTERSTAGE)

ITEM No.	RATING				REPLACEMENT DATA		
	TURN RATIO	DC RES.	PRI. SEC.	PRI. SEC.	NATIONAL PART No.	STANCOR PART No.	MERIT PART No.
T2	1 to 3	8.5K	15K	15K			A-2911 # # Drill new mtr. holes

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA		
	IMPEDANCE	DC RES.	PRI. SEC.	PRI. SEC.	NATIONAL PART No.	STANCOR PART No.	MERIT PART No.
T3	15K	3.5K	150K	1.8K		A-3877	RO-302 A-2930

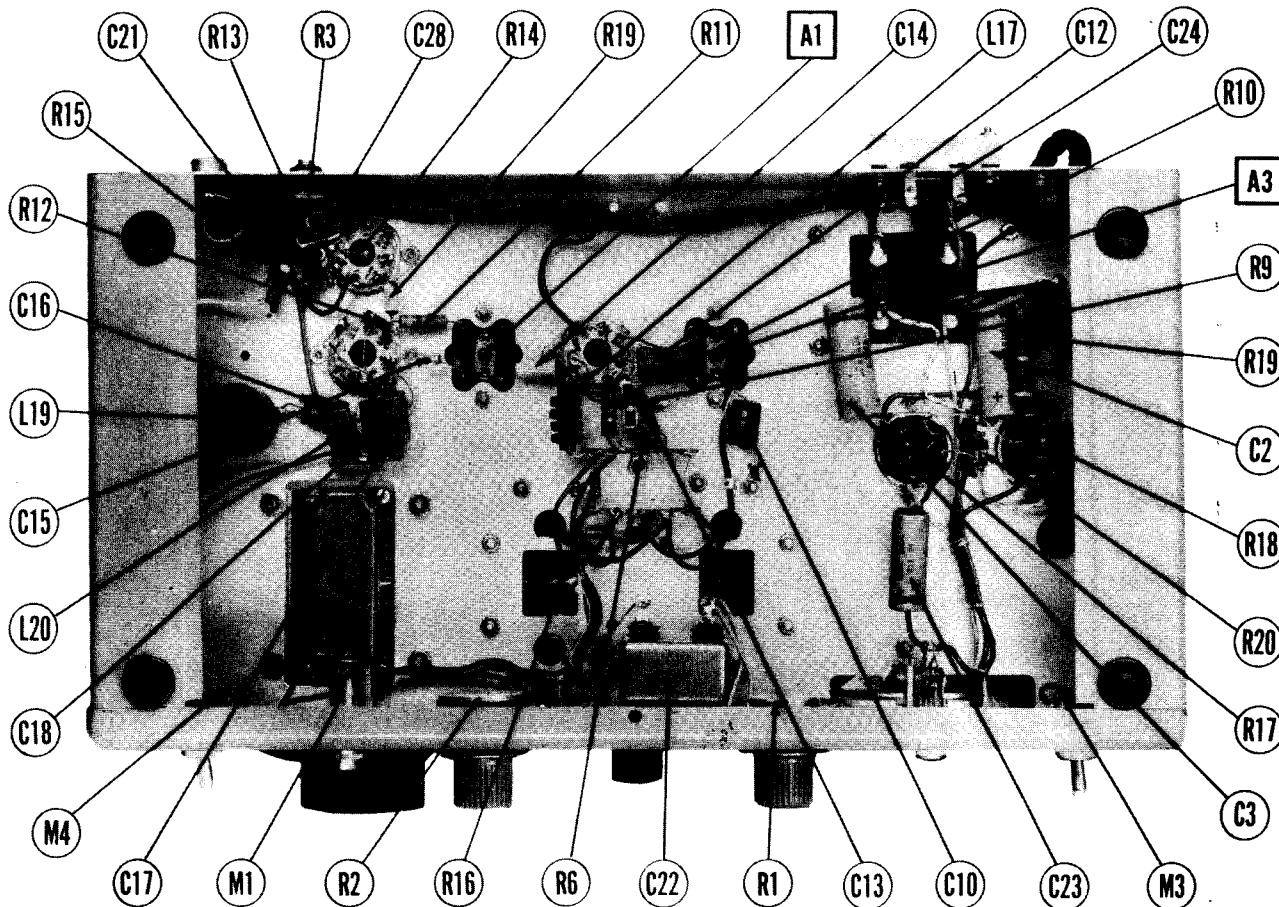
SPEAKER

ITEM No.	RATINGS				REPLACEMENT DATA		
	FIELD	V. C. I.F.	PM	3.5K	NATIONAL PART No.	JENSEN PART No.	QUAM PART No.
SP1	COONE DIA.	V. C. DIA.	4 3/4"	9/16"		ST-105 MOD. PG-X* 5A1	
SP2							

FILTER CHOKE

ITEM No.	RATINGS				REPLACEMENT DATA		
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE TO CURRENT (1000 oh)	Part of	NATIONAL PART No.	STANCOR PART No.	MERIT PART No.
L1	.040A	920K Tapped	17Henry	Part of			

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

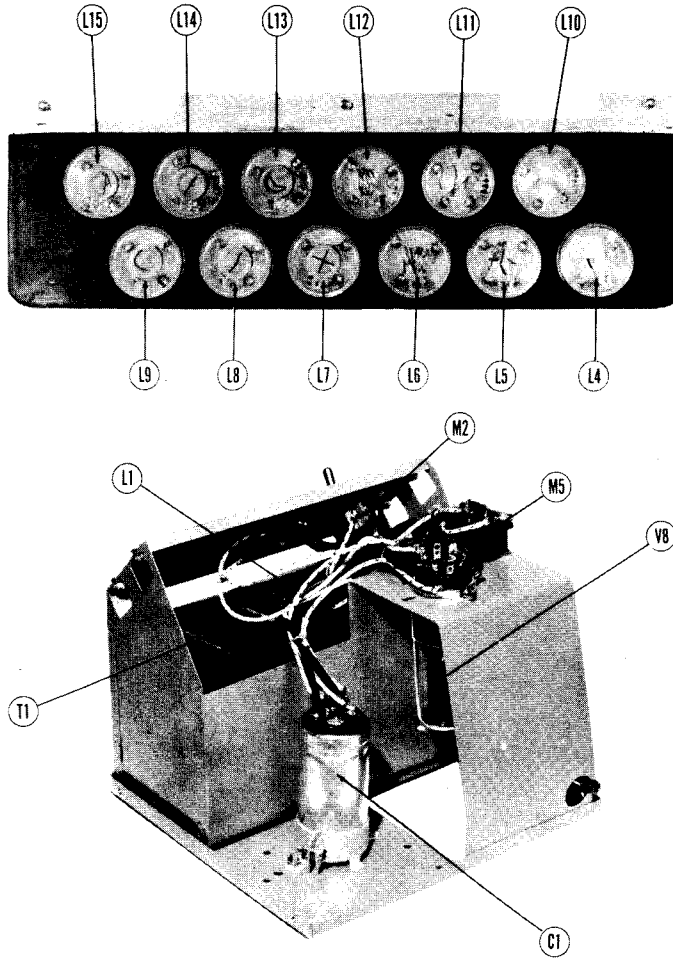
ITEM No.	USE	DC RES.		REPLACEMENT DATA	
		PRI.	SEC.	NATIONAL PART No.	WEISSNER PART No.
L2	IF Trap	.12			
L3	IF Trap	.12			
L4	Mixer Grid	00	00		Band A
L5	Mixer Grid	00	00		Band B
L6	Mixer Grid	00	00		Band C
L7	Mixer Grid	00	00		Band D
L8	Mixer Grid	00	00		Band E
L9	Mixer Grid	00	00		Band F
L10	Osc. Coil	00CT			Band A Osc. Padder is 125MFF
L11	Osc. Coil	00CT			Band B Osc. Padder is 116MFF
L12	Osc. Coil	00			Band C Osc. Padder is 95MFF
L13	Osc. Coil	00			Band D Osc. Padder is 75MFF
L14	Osc. Coil	00			Band E Osc. Padder is 75MFF
L15	Osc. Coil	00			Band F Osc. Padder is 76MFF
L16	Input IF	00	00	SA3697	
L17	IF Plate	400			
L18	Output IF	.10			
L19	RF Choke	10000		SA4384	
L20	RF Choke	180			

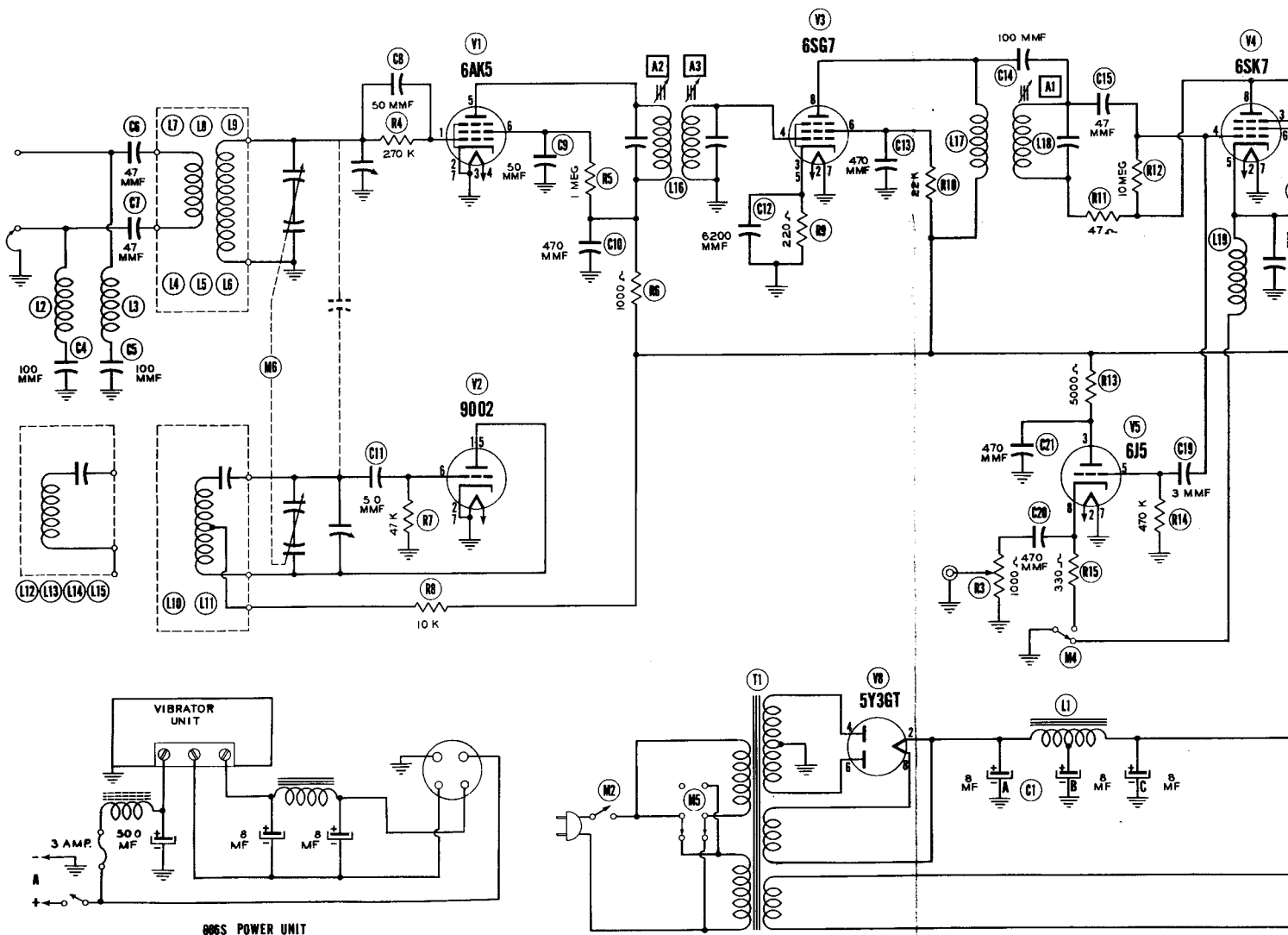
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	REPLACEMENT DATA		NOTES
				NATIONAL PART No.	BEAD COLOR	
M1	Bayonet	6-8V	0.15A	Brown		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	NATIONAL PART No.	NOTES
M2	Switch		
M3	Switch		
M4	Switch		
M5	Switch		Power
M6	Tuning Gang		Internal-External 115-230V





IF=10.7 MC

VOLTAGE READINGS

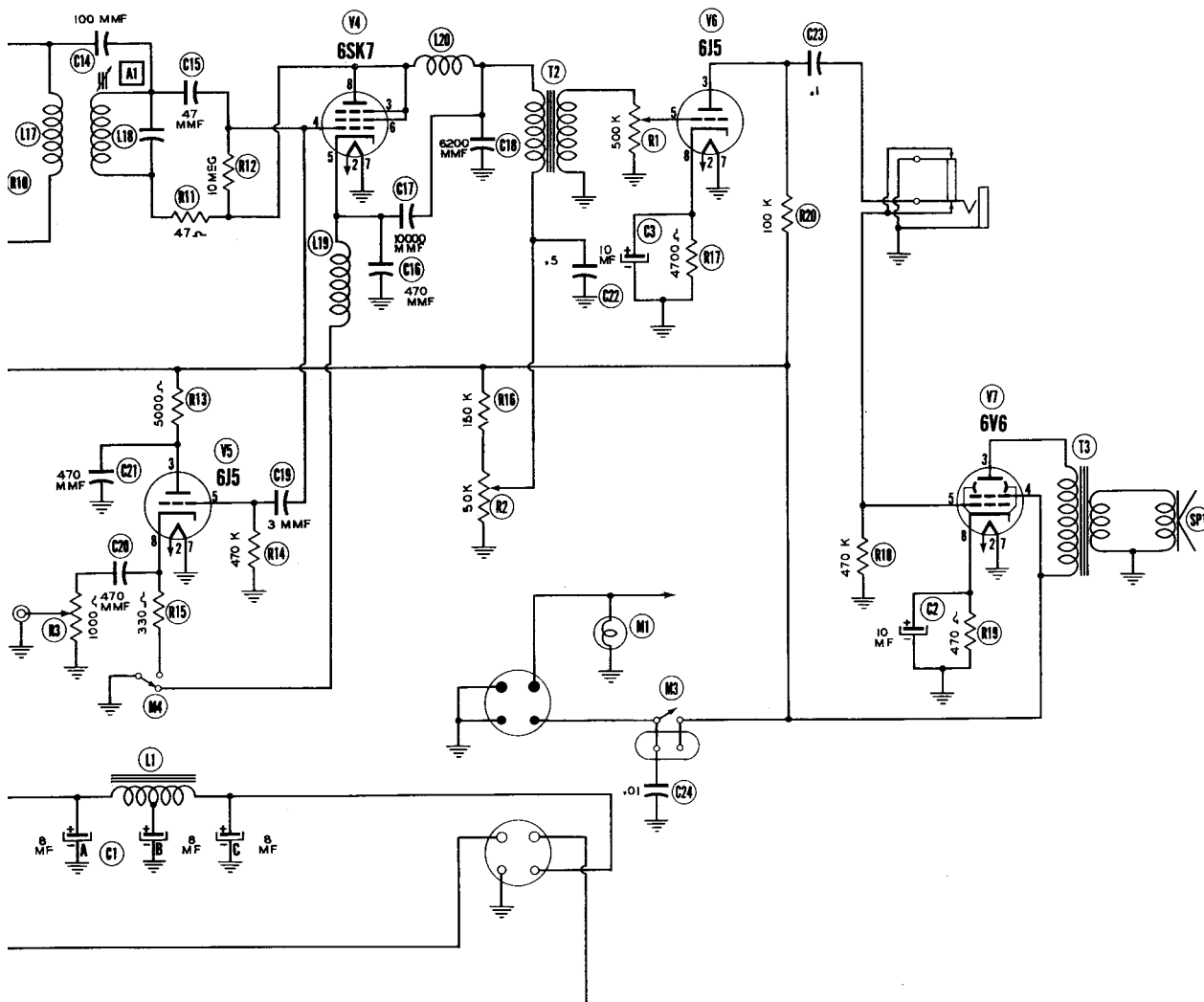
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6AK5	- .5VDC	0V	0V	6.3VAC	175VDC	28VDC	0V	
V 2	9002	135VDC	0V	0V	6.3VAC	135VDC	5-9.8VDC	0V	
V 3	6SG7	0V	6.3VAC	2VDC	0V	2VDC	125VDC	0V	175VDC
V 4	6SK7	0V	6.3VAC	10VDC	.1VDC	.3VDC	10VDC	0V	10VDC
V 5	6J5	0V	0V	130VDC	0V	0V	6.3VAC	2.6VDC	
V 6	6J5	0V	0V	95VDC	0V	0V	6.3VAC	4VDC	
V 7	6V6GT	0V	6.3VAC	165VDC	180VDC	0V	0V	0V	11VDC
V 8	5Y3GT	0V	220VDC	0V	210VAC	0V	210VAC	0V	220VDC

† TAKEN WITH VACUUM TUBE VOLTMETER.

Item	Tube	Pin 1	Pin 2
V 1	6AK5	270KΩ	0Ω
V 2	9002	*10KΩ	0Ω
V 3	6SG7	0Ω	.2Ω
V 4	6SK7	0Ω	.2Ω
V 5	6J5	0Ω	0Ω
V 6	6J5	0Ω	0Ω
V 7	6V6GT	0Ω	.2Ω
V 8	5Y3GT	Inf.	90KΩ

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of $\pm 10\%$ in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



$f = 10.7 \text{ MC}$

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6AK5	270K Ω	0 Ω	0 Ω	.2 Ω	*2K Ω	1 Meg.	0 Ω	
V 2	9002	*10K Ω	0 Ω	0 Ω	.2 Ω	*10K Ω	65K Ω	0 Ω	
V 3	6SQ7	0 Ω	.2 Ω	230 Ω	0 Ω	230 Ω	23K Ω	0 Ω	*950 Ω
V 4	6SK7	0 Ω	.2 Ω	52K Ω	10 Meg.	1000 Ω	52K Ω	0 Ω	52K Ω
V 5	6J5	0 Ω	0 Ω	*6K Ω	Inf.	540K Ω	Inf.	.2 Ω	380 Ω
V 6	6J5	0 Ω	0 Ω	*100K Ω	Inf.	8K Ω	0 Ω	.2 Ω	4.7K Ω
V 7	6V6GT	0 Ω	.2 Ω	*1500 Ω	*900 Ω	470K Ω	Inf.	0 Ω	470 Ω
V 8	5Y3GT	Inf.	90K Ω	Inf.	260 Ω	Inf.	260 Ω	Inf.	90K Ω

* Measured from pin 8 of V8

IN OF THE MANUFACTURER OF THIS
POSSIBLE TO BRING YOU THIS SERVICE

its are at 20,000 ohms per volt; AC Voltages
per volt.
shown as bottom views.
n socket pin to common negative.
at 117 volts for voltage readings.
omponent values makes possible a variation of
resistance readings.
mum, no signal applied for voltage measure-