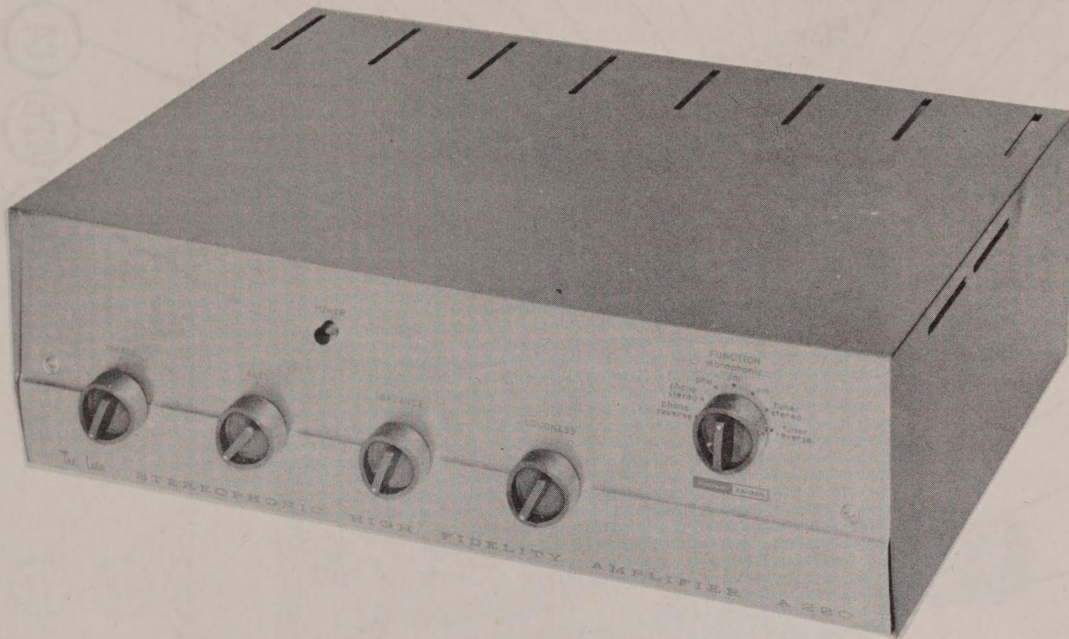


PHOTOFACT® Folder



HARMAN-KARDON
MODEL A-220

HARMAN-KARDON
MODEL A-220



HARMAN-KARDON
MODEL A-220

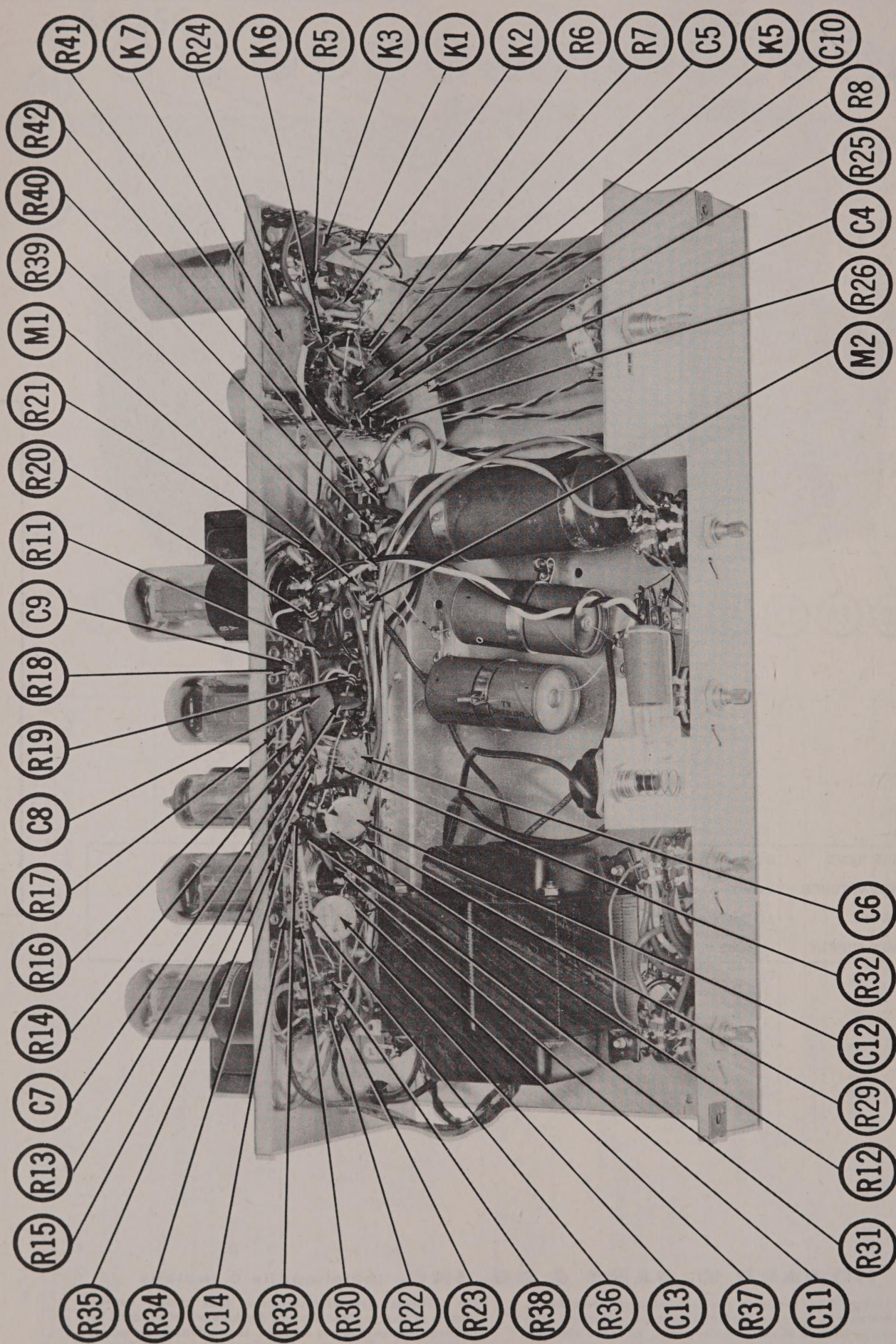
TRADE NAME	Harman-Kardon Model A-220 (The Lute)		
MANUFACTURER	Harman-Kardon, Inc., 520 Main Street, Westbury, L. I., N. Y.		
TYPE SET	AC Operated 8 Tube Stereo Audio Amplifier		
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles	RATING	78 Watts, .76 Amp. @ 117 Volts AC

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 JV998

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CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS TUBES

CBS			GENERAL ELECTRIC			RAYTHEON			SYLVANIA		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel Preamp.	ECC83/12AX7	V4	Left Channel Phase Inv.	ECC82/12A U7						
V2	Right Channel Preamp.	ECC83/12AX7	V5	Right Channel Phase Inv.	7408						
V3	Left Channel AF Amp.	ECC83/12AX7	V6	Left Channel Output	7408						
	Right Channel AF Amp.	ECC83/12AX7	V7	Right Channel Output	7408						
	Left Channel AF Amp.	ECC83/12AX7	V8	Right Channel Output	7408						

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CAP.	VOLT.	AEROVOX PART No.	HARMAN-KARDON PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	
C1	100	200	PRSI595	JE3083447	BRU0035	TCI285	
C2	100	200	PRSI595	JE3083447	BRU0035	TCI285	
C3A	50	350	PR4-450	JE3083402			
C3B	40	350					
C3C	20	350					
C3D	50	50					
C4	50	12	PRSI265		BBR50-25	TTI5X50	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

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				SPRAGUE PART No.
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELEMCO PART No.	
C5	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	4TM-P1
C6	20000		BPD-02	DD-203	BYB6S2	CCD-203	5HK-S20
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203	5HK-S20
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	5HK-S20
C9	47 N3300						
C10	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	4TM-P1
C11	20000		BPD-01	DD-203	BYB6S2	CCD-203	5HK-S20
C12	20000		BPD-01	DD-203	BYB6S2	CCD-203	5HK-S20
C13	20000		BPD-01	DD-203	BYB6S2	CCD-203	5HK-S20
C14	47 N3300						

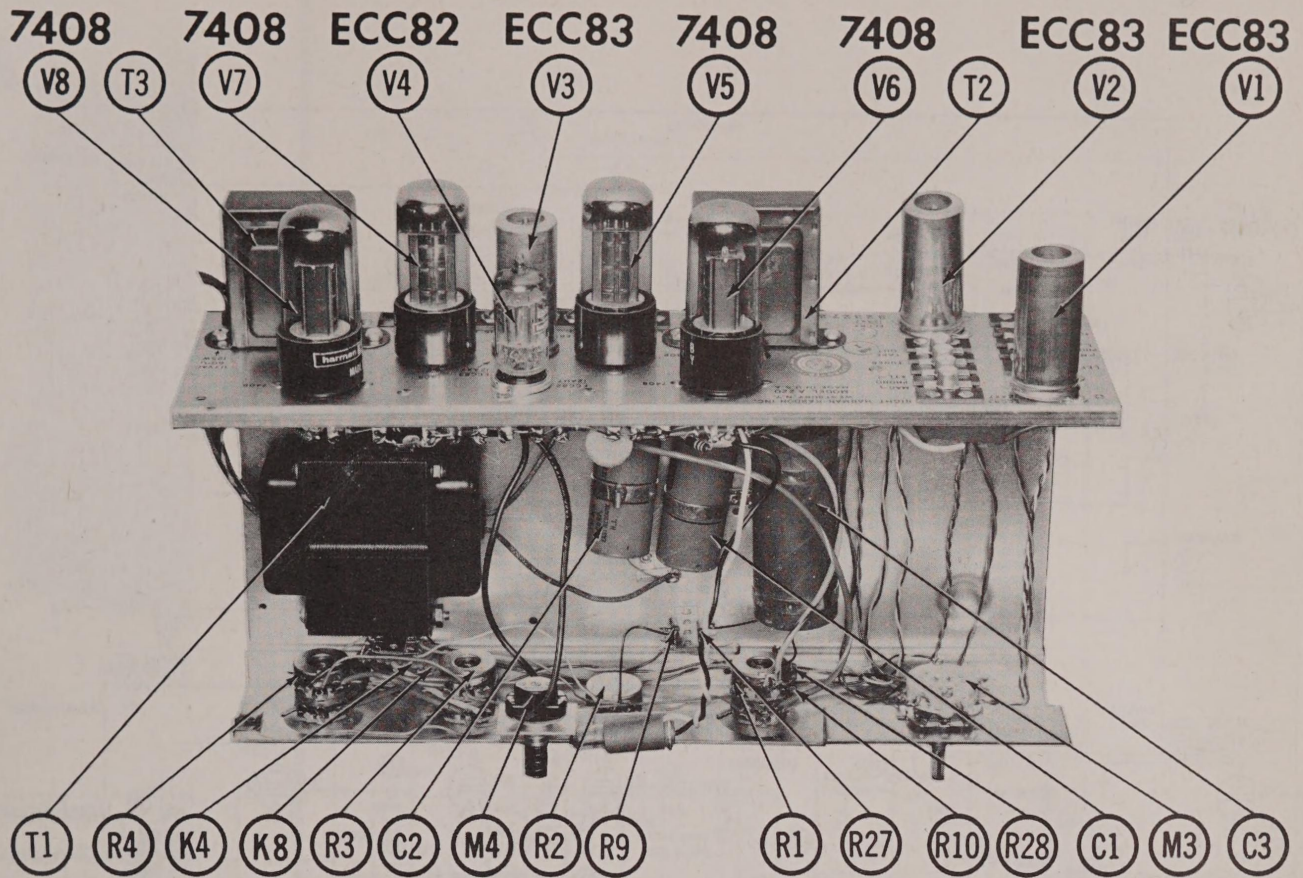
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	HARMAN-KARDON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	
R1A	Imeg *		RV3113436				
R2A	100K		RV3113608A	B-40	A47-100K-S	Q11-128	Loudness, Left Channel
R3A	500K		RVCOM3437	Not Req.	KSS-3	Not Req.	Loudness, Right Channel
R4A	500K		RVCOM3437	SR-60	AD47-500K-Z	FA55A	Balance, Note 1
	500K			Not Req.	KSS-3	Not Req.	
	500K			Not Req.	AD47-500K-Z	FA55A	Bass, Left Channel
	500K			SR-60	Not Req.	FA55A	Bass, Right Channel
	500K			Not Req.	KSS-3	Not Req.	Treble, Left Channel
	500K			Not Req.	KSS-3	Not Req.	Treble, Right Channel

* Taps @ 300K and 600K.
Note 1. Some versions may use Part #RV3113435.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		Harman-Kardon PART No.	Hallidorsen PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI.	SEC.								
T2	7500Ω	16Ω Tap	FT3083445-B							
	CT	@ 8Ω	①							
T3	7500Ω	16Ω Tap	FT3083445-B							
	CT	@ 8Ω	①							

① Alternate Part #FT-3083445.

RECTIFIERS

ITEM No.	RATING		Harman-Kardon PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
	CURRENT (Measured)							
M1	.160A		Z3083444 *	5E4 *	RE504 *	40K *	SR500 *	* Silicon Type
M2	.160A		Z3083444 *	5E4 *	RE504 *	40K *	SR500 *	

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M3	Switch	ER313480	Function/Mode
M4	Switch	EP313479	Off-On, Pushbutton Type

CABINETS & CABINET PARTS

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

NAME	PART NO.	DESCRIPTION
Knobs	PCOM3468	Treble, Bass, Balance, Loudness, Function

WIRING DATA

General-use Unshielded Hook-up Wire Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

RESISTORS

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

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R5	22K		R18	68K		R31	1meg	
R6	1meg		R19	470K		R32	18K	
R7	100K		R20	470K		R33	2700Ω	
R8	1000Ω		R21	2200Ω		R34	15K	
R9	68K		R22	33Ω		R35	220Ω	
R10	27K		R23	33Ω		R36	68K	
R11	100K 1W		R24	22K		R37	470K	
R12	330K		R25	1meg		R38	470K	
R13	1meg		R26	100K		R39	10Ω	
R14	18K		R27	68K		R40	1000Ω 1W	
R15	2700Ω		R28	27K		R41	1000Ω 1W	
R16	15K		R29	330K		R42	6800Ω	
R17	220Ω		R30	100K 1W				

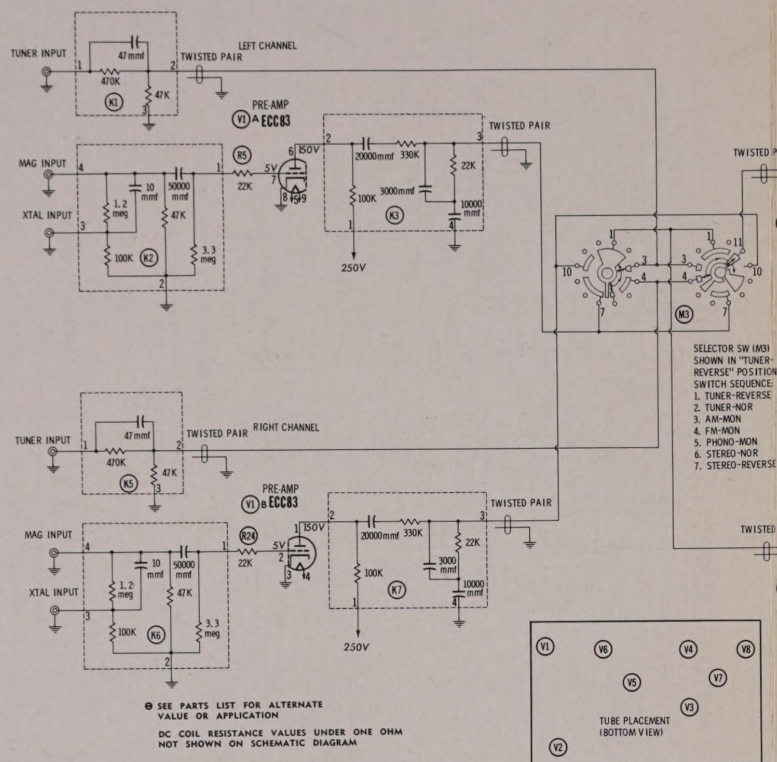
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA
K1	Tuner Input Comp.	47mmf, 47K, 470K	PCCOM3639	TC-34
K2	Phono Input Comp.	10mmf, 50000mmf, 47K, 100K, 1.2meg 3.3meg	PCCOM3638	TC-33
K3	Preamp. Plate	3000mmf, 10000mmf, 20000mmf, 22K, 100K, 330K	PCCOM3637	
K4	Tone Comp.	750mmf, 3000mmf, 3400mmf, 15000mmf, 27K, 120K	PC2492902	TC-22
K5	Tuner Input Comp.	47mmf, 47K, 470K	PCCOM3639	TC-34
K6	Phono Input Comp.	10mmf, 50000mmf, 47K, 100K, 1.2meg, 3.3meg	PCCOM3638	TC-33
K7	Preamp. Plate	3000mmf, 10000mmf, 20000mmf, 22K, 100K, 330K	PCCOM3637	
K8	Tone Comp.	750mmf, 3000mmf, 3400mmf, 15000mmf, 27K, 120K	PC2492902	TC-22

TRANSFORMER (POWER)

ITEM No.	RATING		Harman-Kardon PART No.	Hallidorsen PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1							
T1	117V @ .76A	120V @ .600A	FT3083446-C①						

① Alternate Part #FT3083446



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 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 of component values makes possible a variation of $\pm 15\%$ in voltage and resistance readings.
6. All controls at minimum; proper output load connected.

RESISTANCE READINGS									
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	6ECC83 12AX7	110K	3.3meg	0 Ω	12 Ω	0 Ω	110K	3.3meg	0 Ω
V2	6ECC83 12AX7	110K	1meg	1000 Ω	12 Ω	24 Ω	110K	1meg	1000 Ω
V3	6ECC83 12AX7	1330K	0 Ω	220 Ω	42 Ω	42 Ω	1330K	0 Ω	220 Ω
V4	6ECC82 12AU7	120K	1meg	18K	42 Ω	42 Ω	120K	1meg	18K
V5	6V408	NC	42 Ω	1210 Ω	1200 Ω	470K	TP	42 Ω	24 Ω
V6	6V408	TP	42 Ω	1260 Ω	1200 Ω	470K	TP	42 Ω	24 Ω
V7	6V408	NC	42 Ω	1210 Ω	1200 Ω	470K	TP	42 Ω	24 Ω
V8	6V408	NC	42 Ω	1260 Ω	1200 Ω	470K	TP	42 Ω	24 Ω

† MEASURED FROM OUTPUT OF M.I.
NC NO CONNECTION

TP TIE POINT

