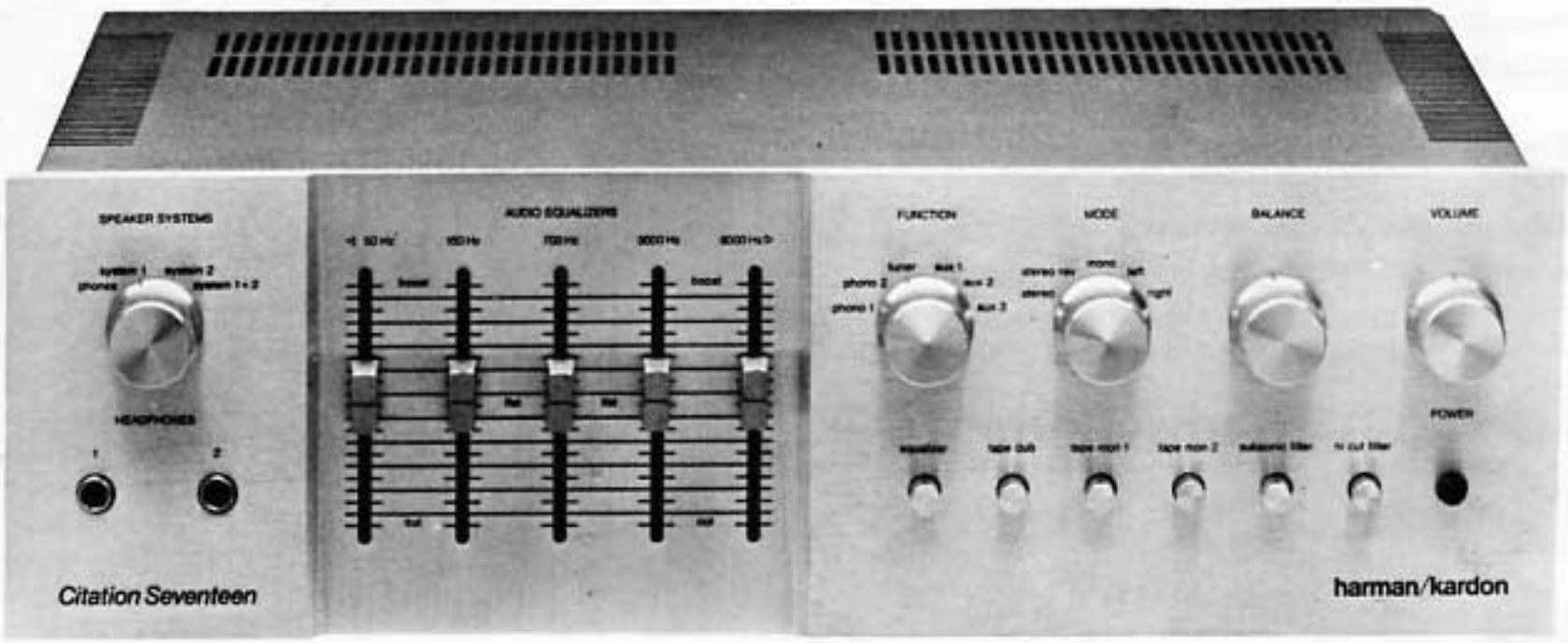
The Citation Seventeen

Professional Solid State Stereophonic Preamplifier/Audio Equalizer

Technical Manual



WARNING

These technical instructions are for use by qualified service personnel only. To avoid electric shock, do not perform any servicing other than that contained in the operating instructions unless qualified to do so.

harman/kardon

SPECIFICATIONS

Output Amplifier

Audio Output:	Up to 14 volts RMS into 2200 ohms or greater (in parallel with 1500 picofarads)
Frequency Response:	Below 5Hz to beyond 125,000Hz ± 0.5dB Below 3Hz to beyond 270,000Hz −3.0dB
Square Wave Rise Time:	Less than 1.3 microseconds at 20,000Hz 0dB attenuation
Square Wave Tilt:	Less than 5% at 20Hz
Total Harmonic Distortion:	Less than 0.001% at 2 volts RMS output
Intermodulation Distortion:	Less than 0.0025% at equivalent 2 volts RMS output
Output Impedance:	Less than 100 ohms
Load Impedance:	2200 ohms or greater
Signal to Noise Ratio:	92dB below 2 volts RMS (with 20,000Hz filter)
Input Sensitivity:	200 millivolts for 2 volts RMS output
Input Impedance:	20,000 ohms
Filters:	
Subsonic cut:	−3dB at 20Hz, 12 dB/octave
High cut:	−3dB at 8000Hz, 12 dB/octave
Volume Control Tracking:	±0.5dB, 0dB to −60dB attenuation

Phono Preamplifier

Equalization:	RIAA curve: ±0.25dB
Total Harmonic Distortion:	Less than 0.002%, 5 volts at tape output, 1000Hz
Intermodulation Distortion:	Less than 0.0025%, equivalent 5 volts at tape output, (RIAA inverter used)
Signal to Noise Ratio:	Better than 80dB below 10 millivolt input reference at 1000Hz
Input Sensitivity:	2.8 millivolts for 2 volts output, 1000Hz, at tape output
Input Impedance:	47,000 ohms ±5%, 80 picofarads
Overload:	Greater than 18 millivolts at 20Hz, 180 millivolts at 1000Hz and 1.8 volts at 20,000Hz

General

Power Consumption:	21 watts maximum, 105 to 129 volts AC, 60Hz
Dimensions:	16-1/6"W x 4-3/4"H x 12"D (406mm x 120mm x 305mm)
Weight:	20 lbs. (9.0kg)

CHASSIS PARTS LIST

REF. DES.	H/K PART NO.	DESCRIPTION
REAR PANEL		
	65416751	Receptacle, AC, Blk
	65427146	Receptacle, AC, Wht
	65410901	Fuse Holder, Buss No. HKP
F1	45033317	Fuse, Slo-Blo, 3AG, 0.2 Amp, 250V
FRONT PANEL		
S6, 7	25026151	Switch Pushbutton, 2PDT
S4, 5, 8, 9	25026152	Switch Pushbutton, 4PDT
S10	25032217	Power Switch, Push-type, DPST
S2	24033287	Switch, Function, 6 Position
VR1	22032993	Control, Volume
VR2	22026161	Control, Balance
VR3-7	22133914	Control, Slide, Audio Equalizers
S3	24025430	Switch, Mode
CHASSIS DECORATIVE		
	63233525	Knob, Slide-control
	63232894	Pushbutton, Power Red
	00233528	Subassy, Rotary Knob
MISCELLANEOUS		
	00233526	Subassy, Pushbutton Knob
T1	10132808	Transformer, Power
DS1, DS2	46532896	Lamp, Midget Grooved
	57526338	Cable, Speaker, 5 Terminal
MULTI-VOLTAGE RECEIVER		
T1	10133134	Transformer, Power
F1	45026404*	Fuse, Slo-Blo, 3AG, 0.25 Amp, 250V
F1	45033302*	Fuse, Slo-Blo, 3AG, 0.125 Amp, 250V
	65427580	Voltage Selector, Connector Set

NOTE TO WARRANTY STATIONS: Items marked by asterick (*) are recommended spare parts stock. Printed circuit board assembly numbers are shown for reference only. Harman/Kardon does not normally supply assembled printed circuit boards.

NOTE: To speed handling of your order be sure to include both the model and serial numbers, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a cash in advance basis. Harman/Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis. All parts should be ordered from Harman/Kardon, 55 Ames Court, Plainview, L.I., N.Y. 11803 Att: Parts Department.

EQUALIZER ADJUSTMENT

INSTRUMENTS: DC VTVM HP 410C or equivalent.

NOTE: Set Function Switch to PHONO 1.
Set Mode Switch to STEREO.
Set Balance Control to mid position.
Set Volume Control to min position.
All pushbuttons out except power.
All equalizers in flat position.

Step	EQUALIZER	CONNECT METER TO	ADJUST	ADJUST FOR
1	All Flat	P6 – Pin 4	VR1 on Left Equalizer Board	Zero Volts DC ± 10 mV (on 15 mV range)
2	8 KHZ at Boost	P5 – Pin 3	VR2 on Left Equalizer Board	Zero Volts DC ± .5 mV
3	8 KHZ at Cut	P5 – Pin 3	VR3 on Left Equalizer Board	Zero Volts DC ± .5 mV
4	Flat	P8 – Pin 4	VR1 on Right Equalizer Board	Zero Volts DC ± 10 mV
5	8 KHZ at Boost	P7 – Pin 3	VR 2 on Right Equalizer Board	Zero Volts DC ± .5 mV
6	8 KHZ at Cut	P7 – Pin 3	VR3 on Right Equalizer Board	Zero Volts DC ± .5 mV

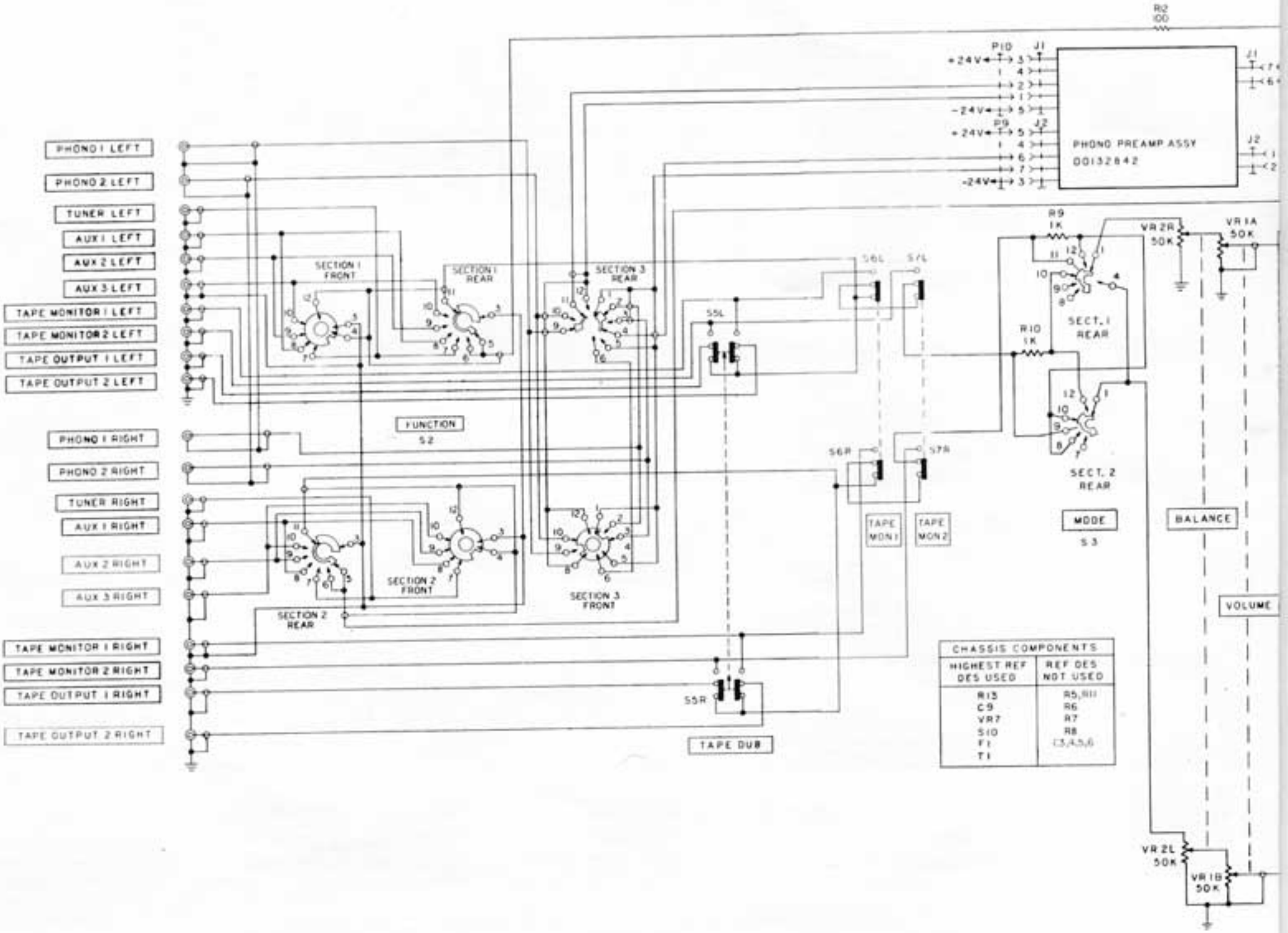
PHONO ADJUSTMENT

INSTRUMENTS: Distortion Measurement System, Sound Tech 1700.

NOTE: Set Function Switch to PHONO 1.
Set Mode Switch to STEREO.
Set Balance Control to mid position.
Set Volume Control to min position.
All pushbutton out except power.
All equalizers in flat position.

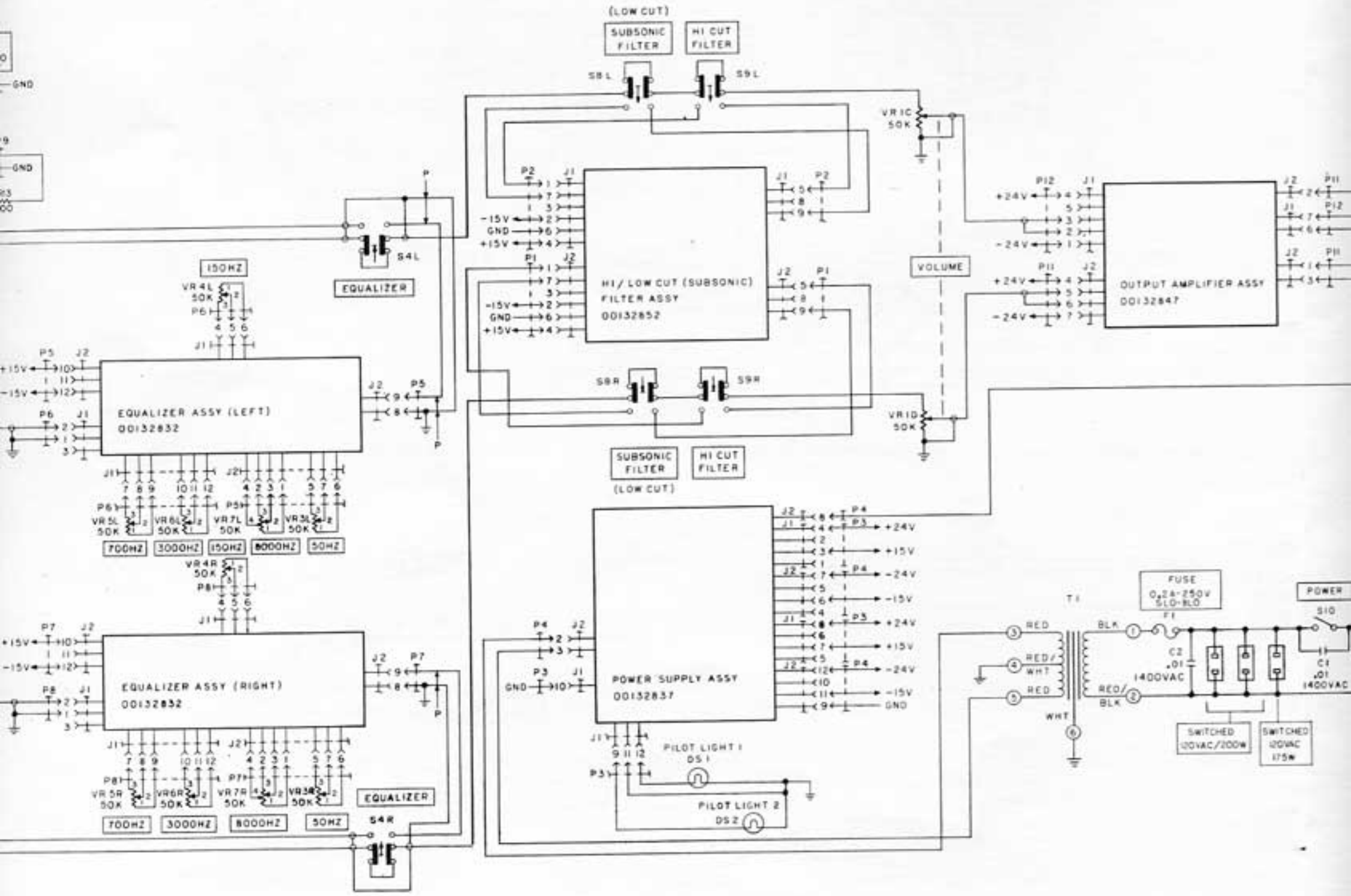
Step	INPUT	OUTPUT	ADJUST	ADJUST FOR
1	25 Hz Left Phono 1	Left Tape Out 1 with 20k Ohm Load 5V RMS	VR1 on Phone Board	Least THD (0.006% maximum)
2	25 Hz Right Phono 1	Right Tape Out 1 with 20k Ohm Load 5V RMS	VR2 on Phono Board	Least THD (0.006% maximum)

SCHEMATIC DIAGRAM – MODEL CITATION 17
SYSTEM INTERCONNECTION



NOTES: UNLESS OTHER

1. ALL CAPACITOR V
2. ALL RESISTOR VA
3. ALL PUSHBUTTON OFF, POSITION.
4. MECHANICAL LIN COMPONENTS S1 & REAR, S3 SECTI S6L & S6R, S7L & S VR2L & VR2R, VR VR6L & VR6R, VR
5. WHEN ORDERING PART NO. IF NOT ASSY OR LOCATIO
   I.E. R1 CHAS
   R1 PHON



THERWISE SPECIFIED
TOR VALUES ARE IN MICROFARADS.
R VALUES ARE IN OHMS ±5%, 1/4W.
TTON SWITCHES SHOWN IN THE NON-DEPRESSED,
N.
L LINKAGE EXIST BETWEEN THE FOLLOWING
S S1 FRONT & S1 REAR, S2 SECTION 1, 2 & 3 FRONT
ECTION 1 FRONT & REAR, S4L & S4R, S5L & S5R,
'L & S7R, S8L & S8R, S9L & S9R, VR1A THRU VR1D,
R, VR3L & VR3R, VR4L & VR4R, VR5L & VR5R,
R, VR7L & VR7R.
RING PARTS REFER TO PARTS LIST FOR H/K
NOT AVAILABLE USE REF DESIGNATION AND
CATION USED
CHASSIS
PHONO PREAMP ASSY 00132842

6. SWITCH POSITIONS

FUNCTION SWITCH (SHOWN IN PHONO1)

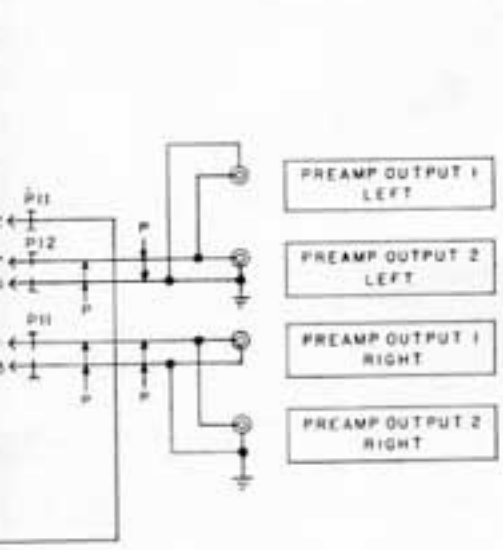
POSITION	FUNCTION
1	PHONO 1
2	PHONO 2
3	TUNER
4	AUX 1
5	AUX 2
6	AUX 3

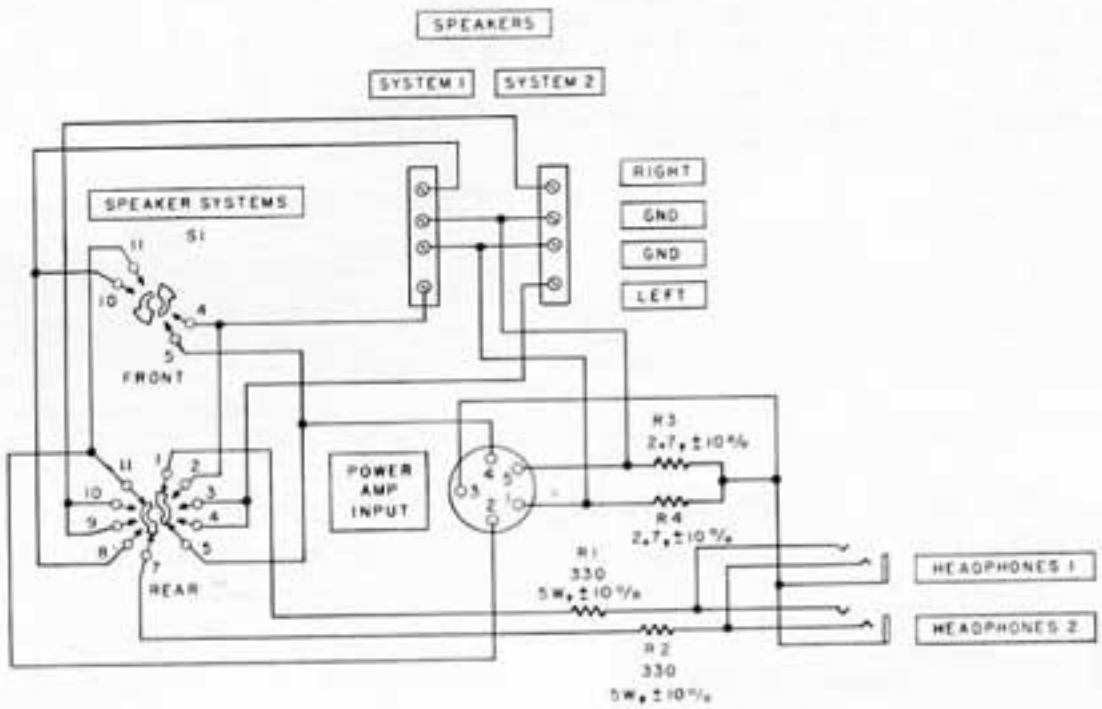
MODE SWITCH (SHOWN IN STEREO)

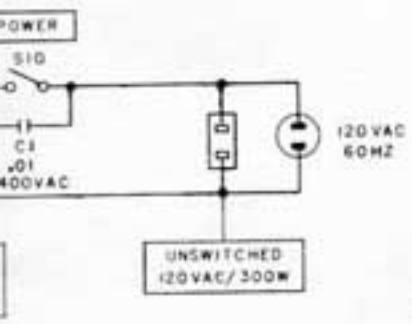
POSITION	FUNCTION
1	STEREO
2	STEREO REV
3	MONO
4	LEFT
5	RIGHT

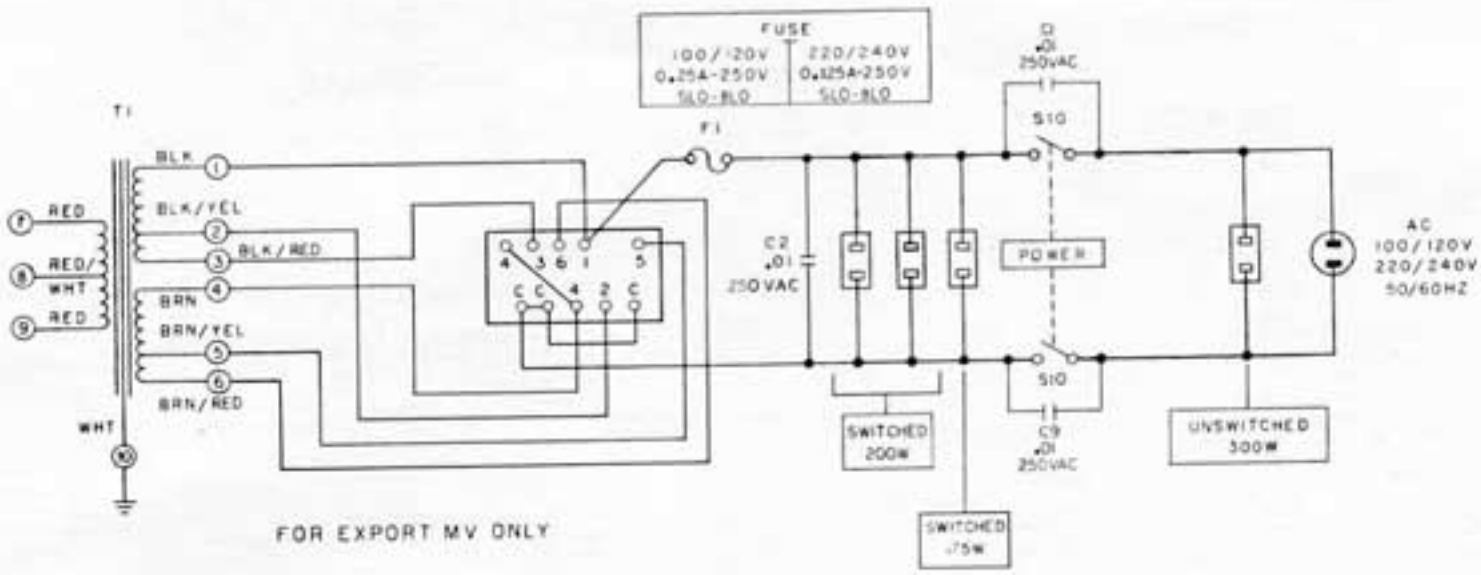
SPEAKER SYSTEMS (SHOWN IN PHONES)

POSITION	FUNCTION
1	PHONES
2	SYSTEM 1
3	SYSTEM 2
4	SYSTEMS 1 & 2







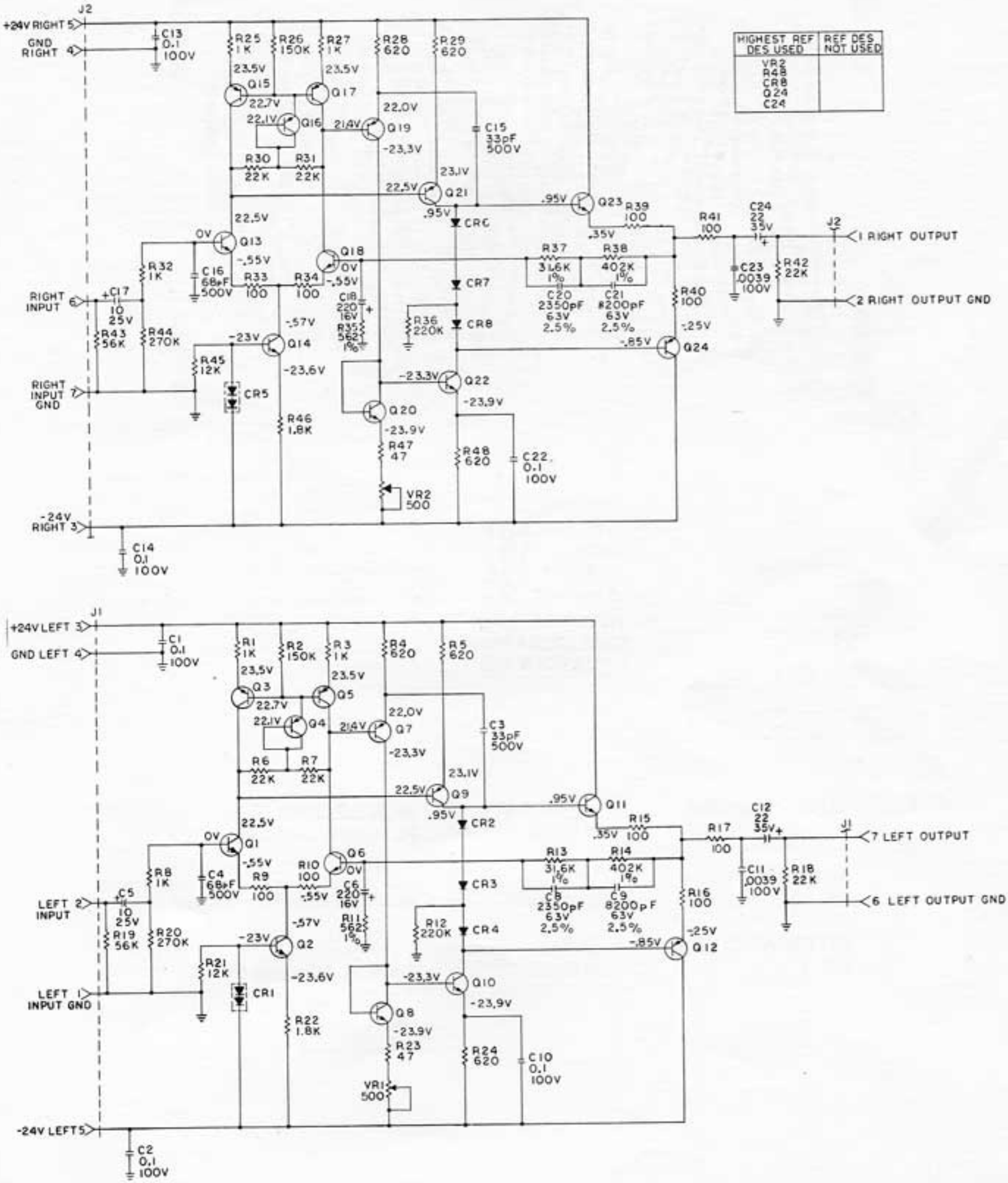


FOR EXPORT MV ONLY

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL CAPACITOR VALUES ARE IN MICROFARADS.
2. ALL RESISTOR VALUES ARE IN OHMS, ±5%, 1/4W.
3. CAUTION: WHEN ORDERING PARTS REFER TO PARTS LIST FOR H/K PART NUMBER. IF H/K PART NUMBER IS NOT AVAILABLE USE REF DES AND ASSEMBLY USED ON. I.E. R1 PHONO PREAMP BD ASSY NO. 00132842

HIGHEST REF DES USED	REF DES NOT USED
VR2 R48 CR8 Q24 C24	



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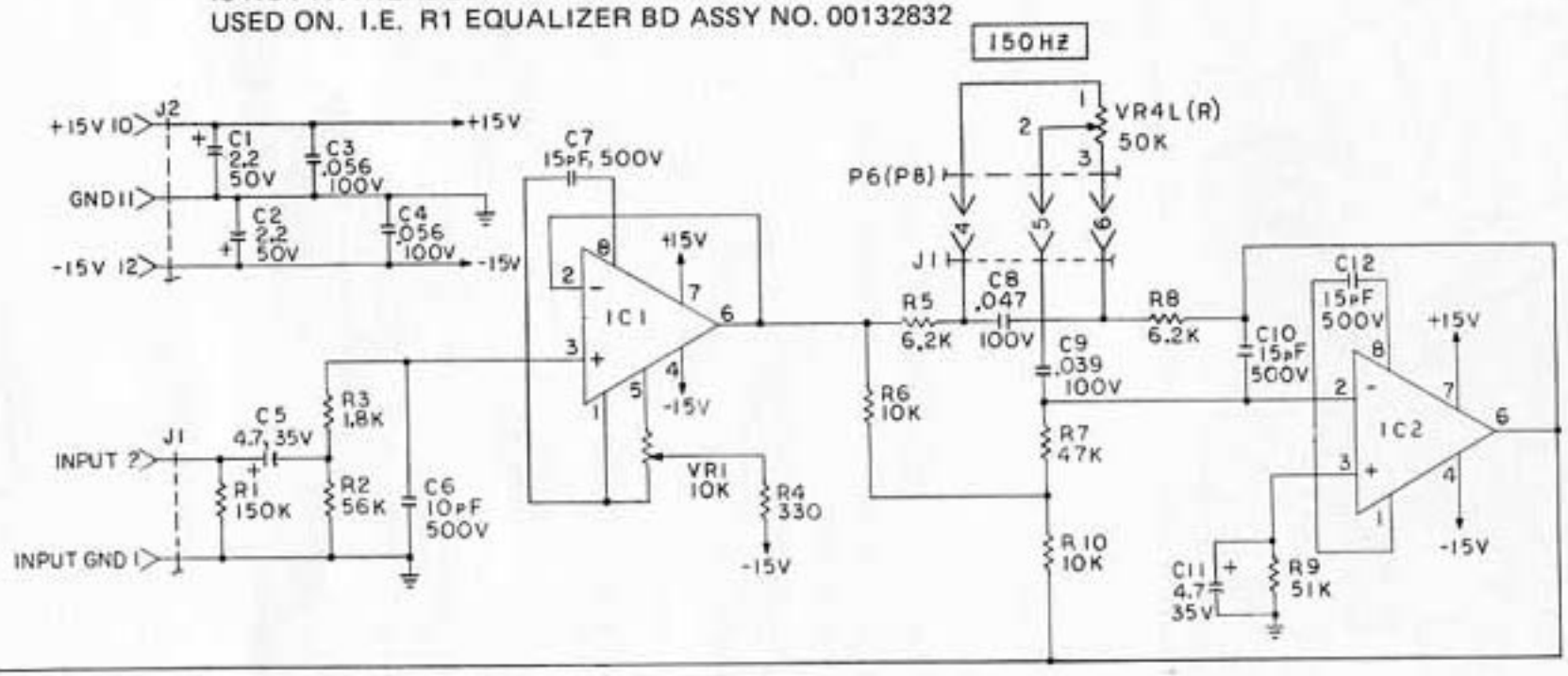
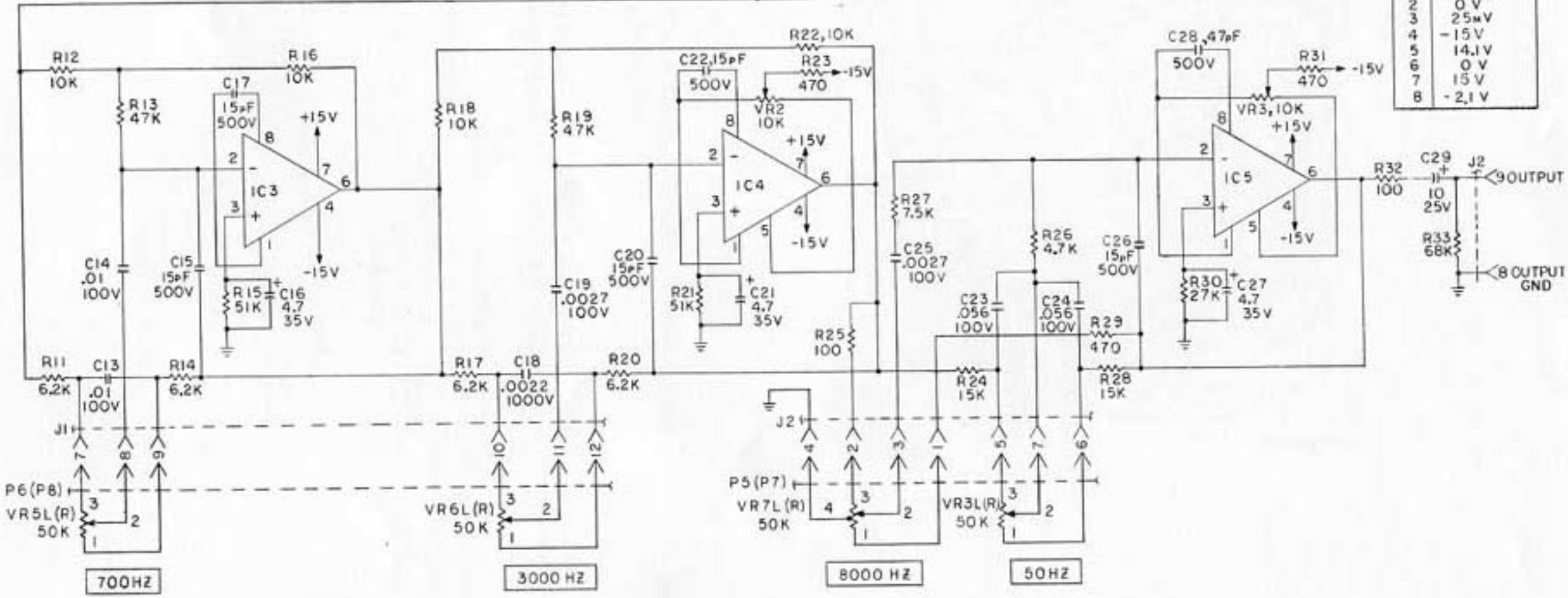


HIGHEST REF DES USED	REF DES NOT USED
C29 IC5 R33 VR3	

D.C. VOLTAGE CHART	
IC1 THRU IC5	
PIN	VOLTAGE
1	14.2V
2	0 V
3	25mV
4	-15V
5	14.1V
6	0 V
7	15 V
8	-2.1 V



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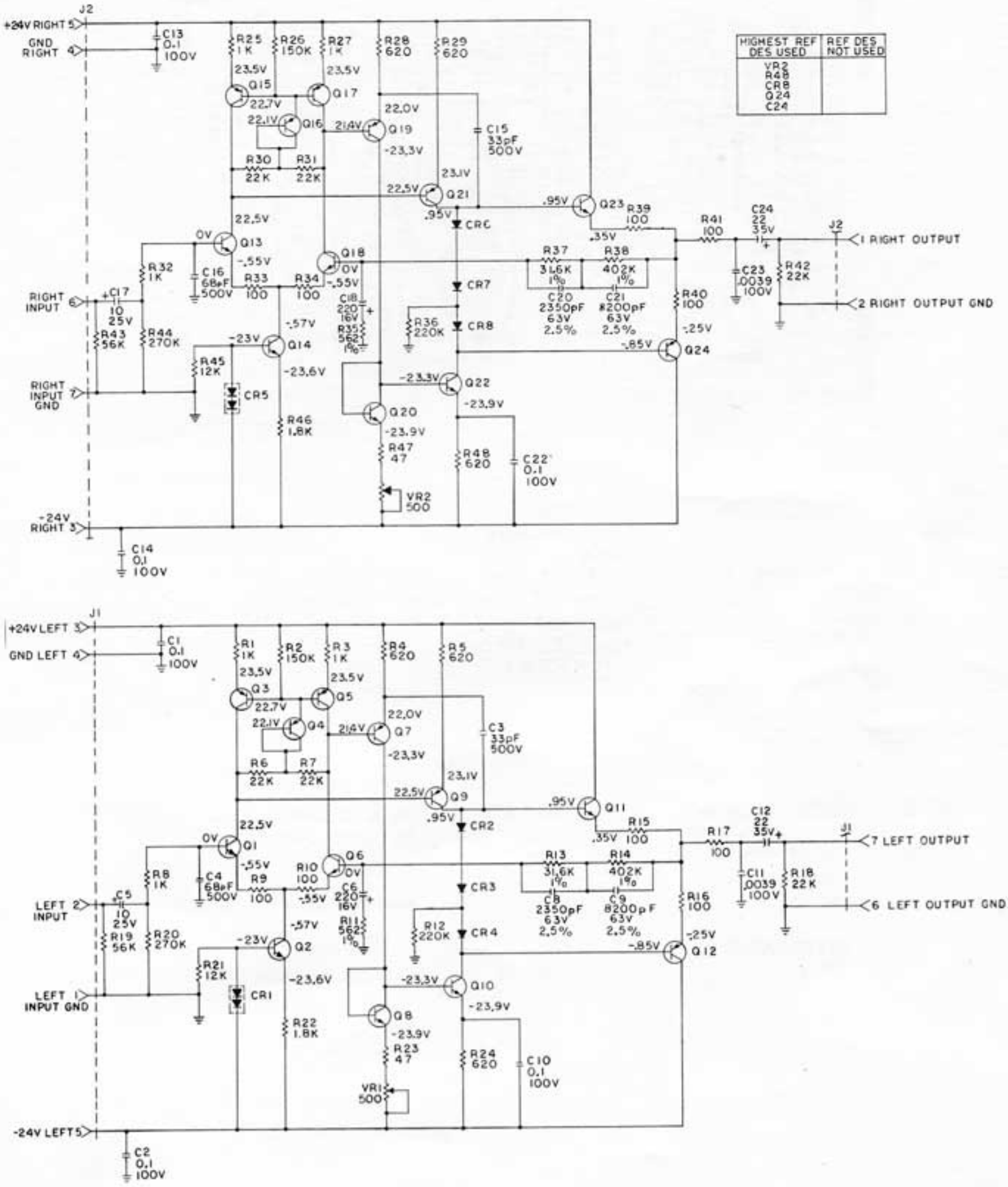
HIGHEST REF DES USED	REF DES NOT USED
VR2 R48 CR8 Q24 C24	



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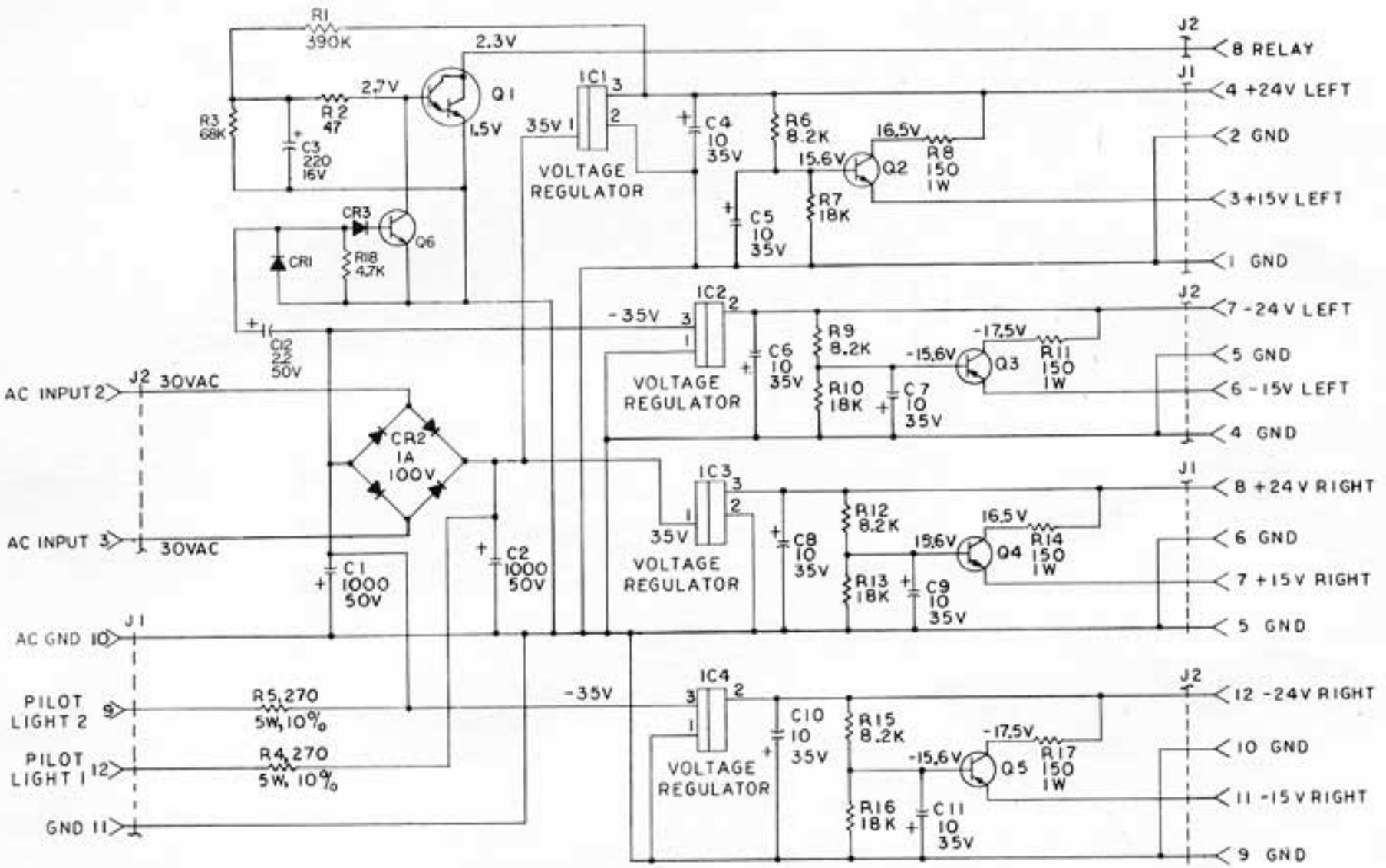
2. ALL RESISTOR VALUES ARE IN OHMS, ±5%, 1/4W.
3. CAUTION: WHEN ORDERING PARTS REFER TO PARTS LIST FOR H/K PART NUMBER. IF H/K PART NUMBER IS NOT AVAILABLE USE REF DES AND ASSEMBLY USED ON. I.E. R1 POWER SUPPLY BD ASSY NO. 00132837



HIGHEST REF DES USED	REF DES NOT USED
R18 Q6 IC4 CR3 C12	

NOTES: UNLESS OTHERWISE SPECIFIED

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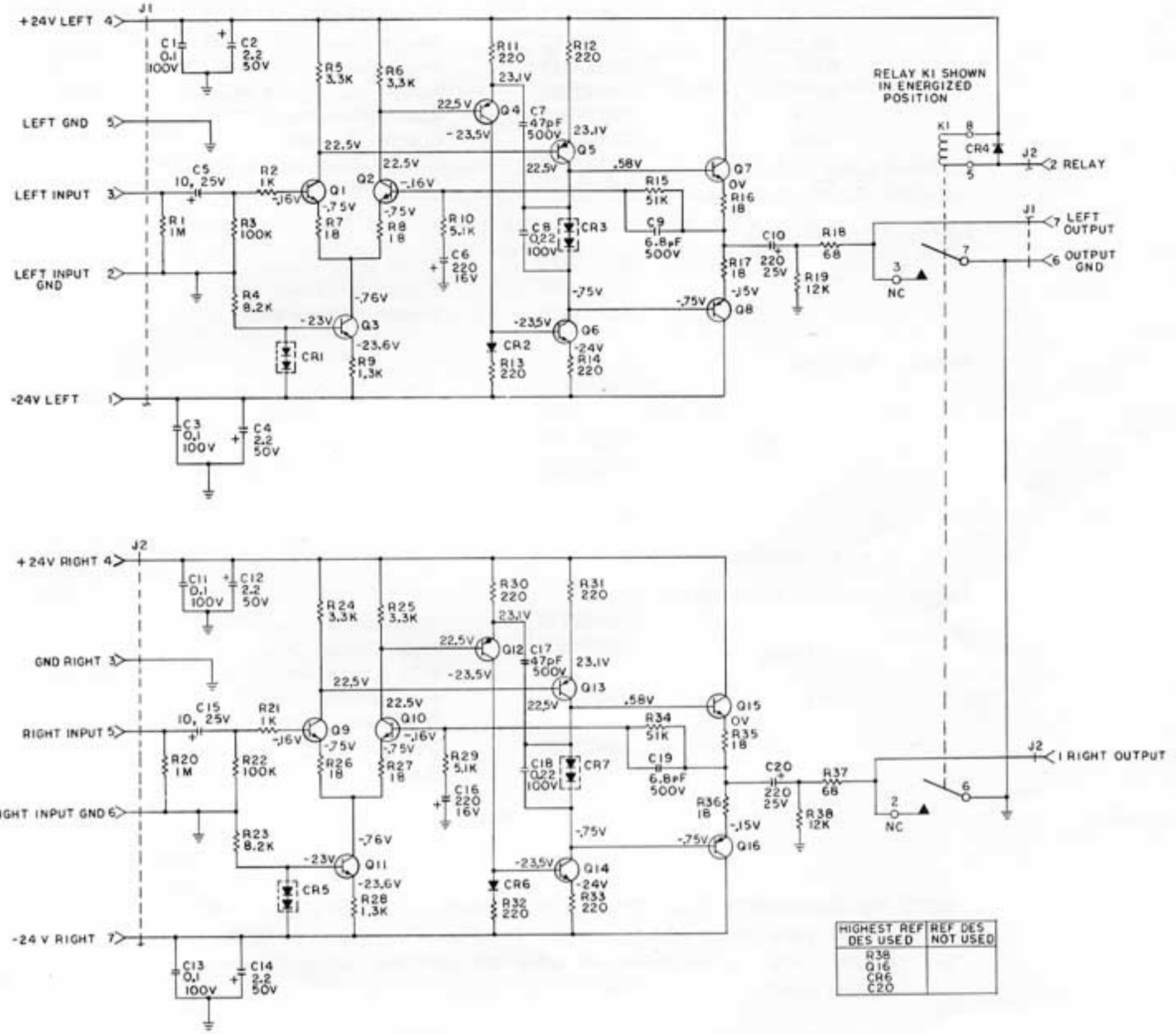
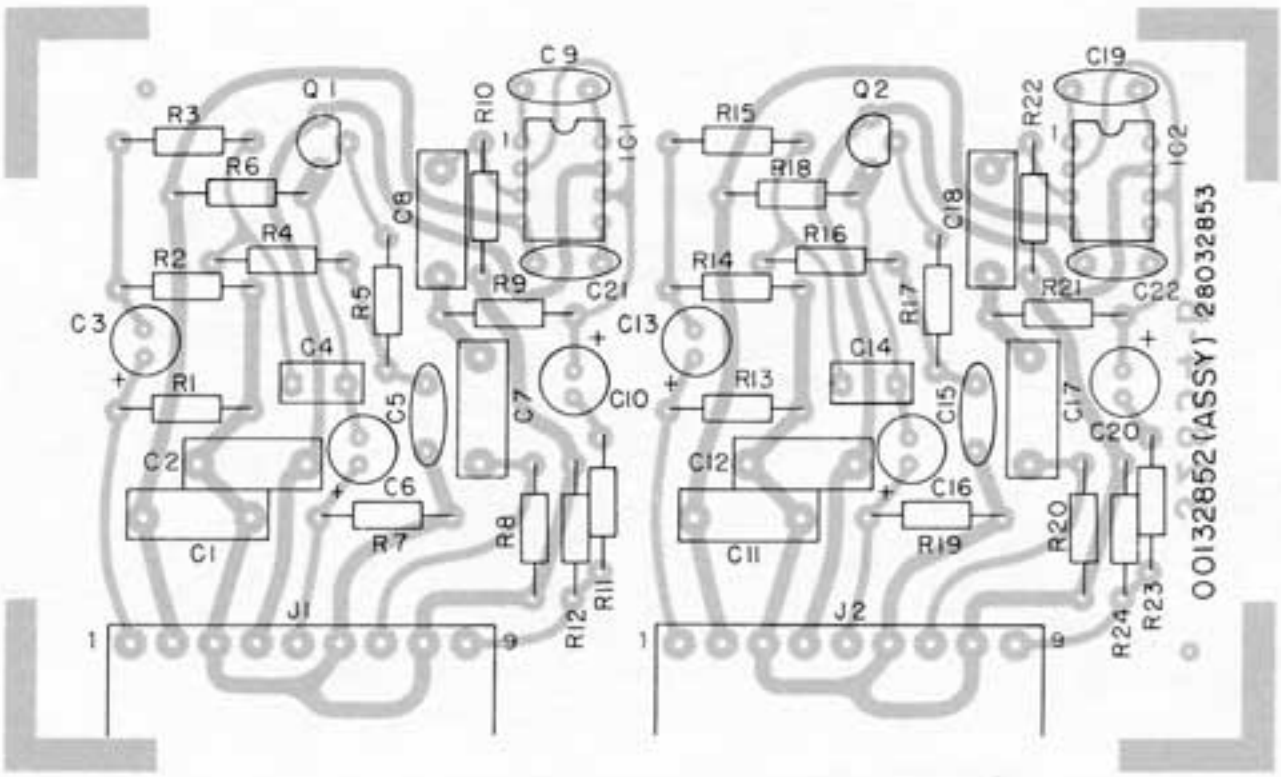
2. ALL RESISTOR VALUES ARE IN OHMS, ±5%, 1/4W.
3. CAUTION: WHEN ORDERING PARTS REFER TO PARTS LIST FOR H/K PART NUMBER. IF H/K PART NUMBER IS NOT AVAILABLE USE REF DES AND ASSEMBLY USED ON. I.E. R1 OUTPUT AMP BD ASSY NO. 00132847



HIGHEST REF DES USED	REF DES NOT USED
R38 Q16 CR6 C20	

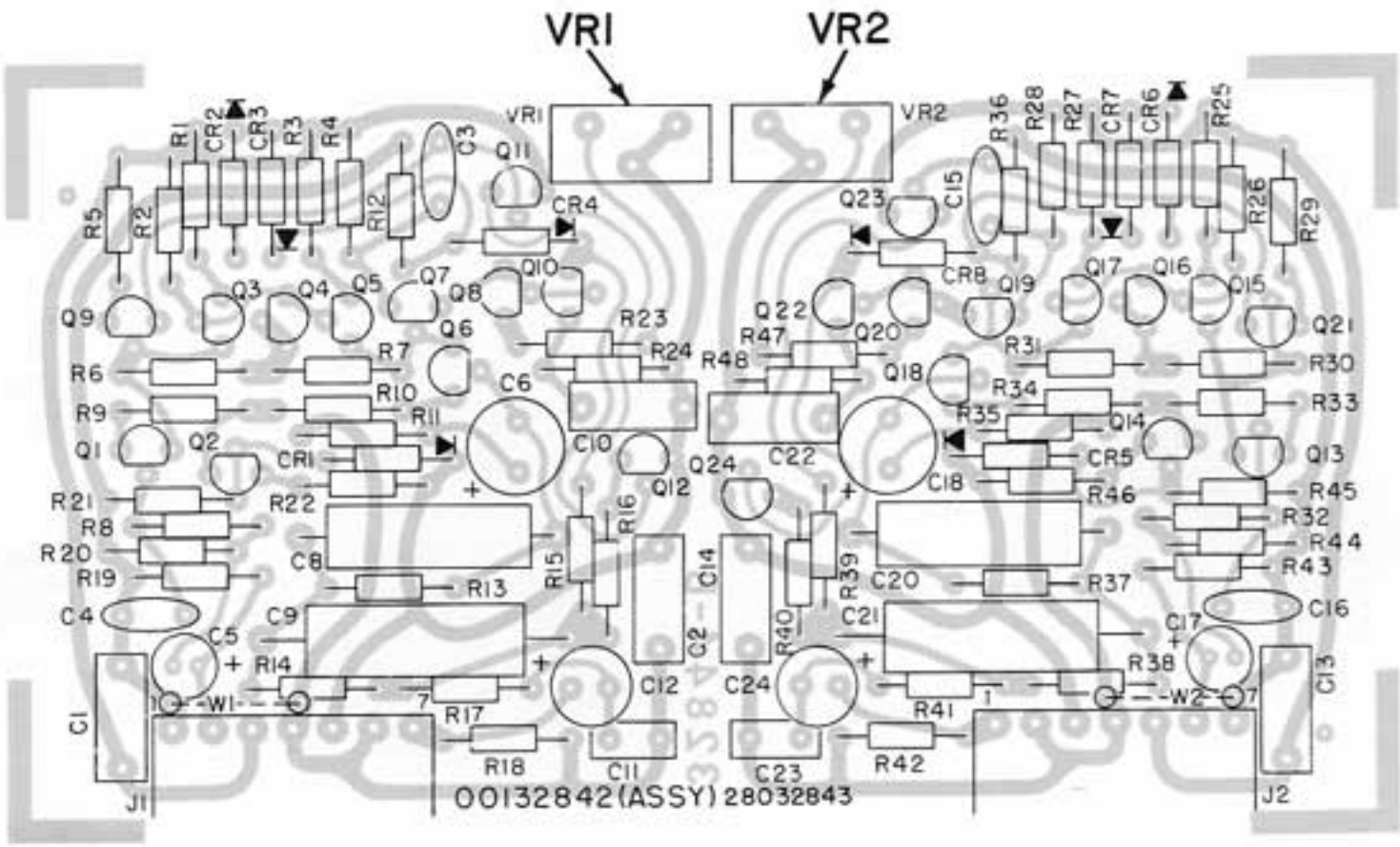
HI/LOW CUT (SUBSONIC)
PC BOARD, SCHEMATIC



ALTERNATE PIN CONFIGURATION FOR IC1 & IC2

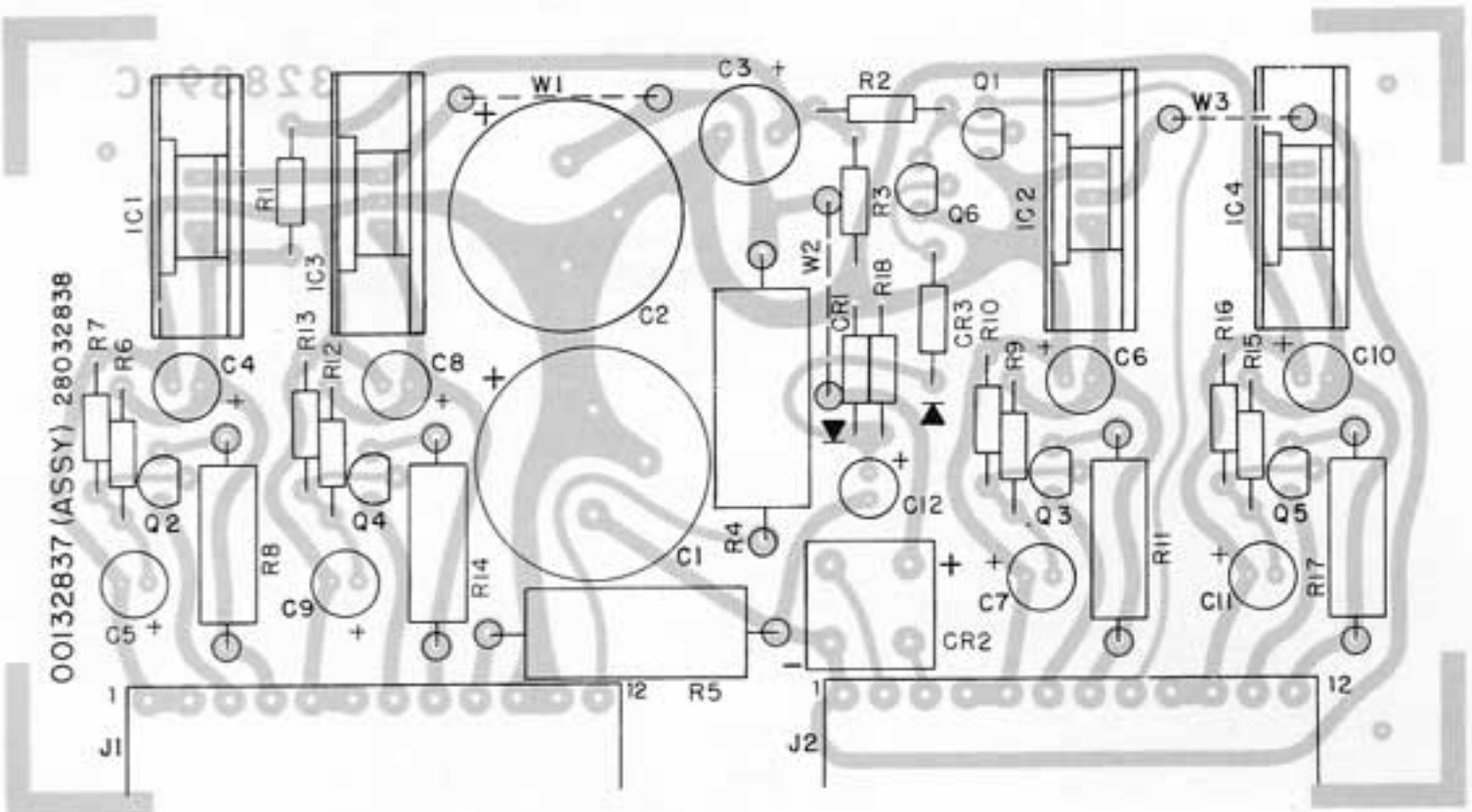
CIRCUIT REF. NO.	H/K PART NO.	DESCRIPTION
	00132852	PC Bd Assy, Hi/Low Cut
TRANSISTOR		
Q1, 2	43032931*	NPN Low Noise (GE D32S7)
INTEGRATED CIRCUIT		
IC1, 2	43132893*	Op Amp, RCA CA3100S

PHONO PREAMP
PC BOARD, SCHEMATIC



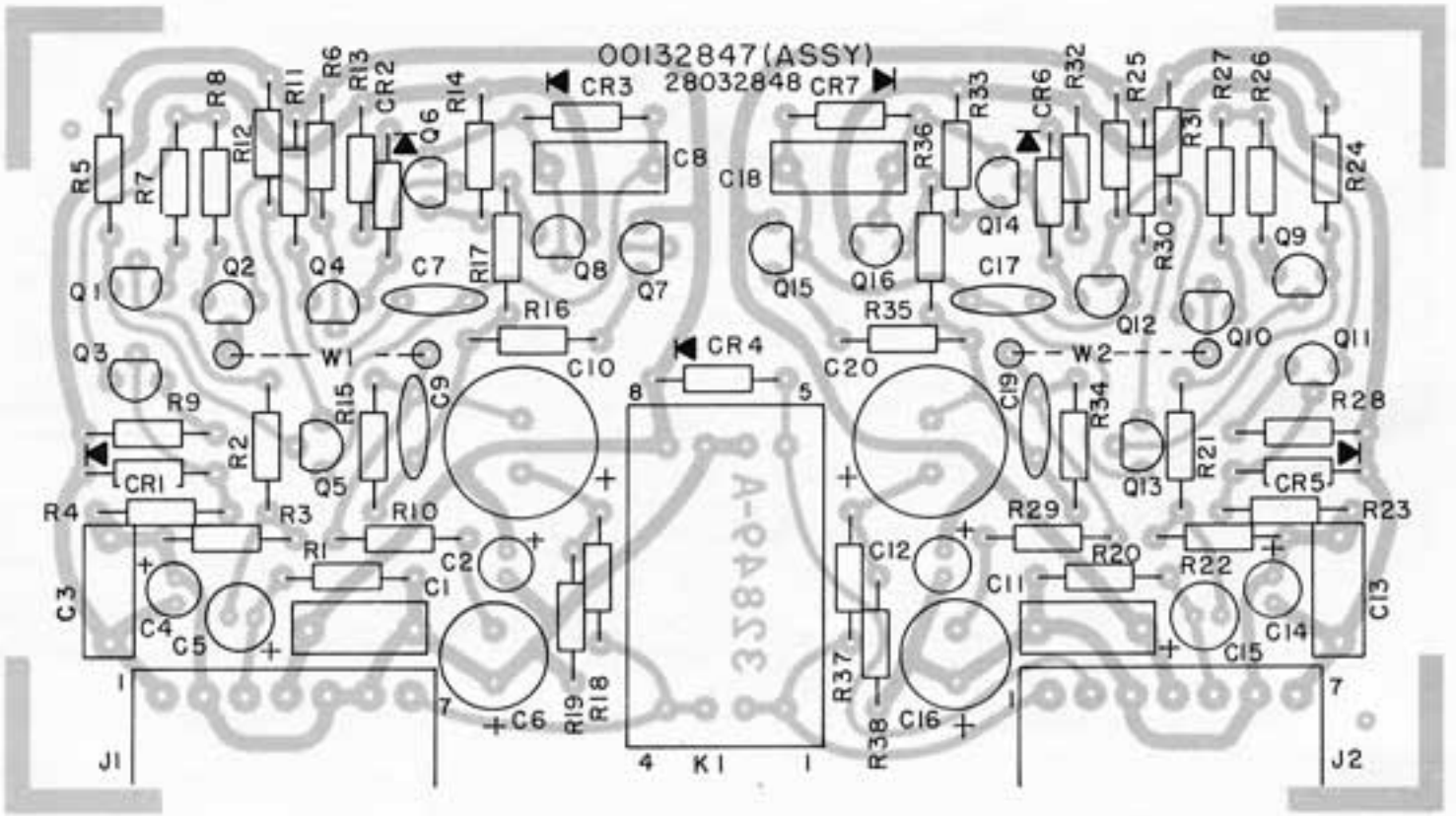
CIRCUIT REF. NO.	H/K PART NO.	DESCRIPTION
	00132842	PC Bd Assy, Phono Preamp
DIODE		
CR1, 5	41624214*	Stabistor
CR2, 3, 4, 6, 7, 8	41629338*	1N914
TRANSISTOR		
Q1, 6, 13, 18	43033781*	NPN Low Noise (GE D38S7)
Q2, 8, 10, 11, 14, 20, 22, 23	43025972*	NPN GP
Q3, 4, 5, 7, 9, 12, 15, 16, 17, 19, 21 24	43027722*	PNP GP
RESISTOR, FIXED, FILM, PRECISION		
R11, 35	37233128	562 Ohm, 1/4W, ±1%
R13, 37	37232960	31.6K Ohm, 1/4W, ±1%
R14, 38	37232961	402K Ohm, 1/4W, ±1%
RESISTOR, VARIABLE		
VR1, 2	21632967	100 Ohm, PIHER PT15 LB

POWER SUPPLY
PC BOARD, SCHEMATIC



CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00132837	PC Bd Assy, Power Supply
DIODE		
CR1, 3	41629338*	1N914
CR2	42132947*	Bridge, 1 Amp, 100V
TRANSISTOR		
Q1	43029832*	NPN MPSA13
Q2, 4, 6	43025972*	NPN GP
Q3, 5	43027722*	PNP GP
INTEGRATED CIRCUIT		
IC1, 3	43132954*	Voltage Regulator, Pos, μA78M24UC
IC2, 4	43132955*	Voltage Regulator, Neg. μA79M24AUC

OUTPUT AMPLIFIER
PC BOARD, SCHEMATIC



CIRCUIT REF. NO.	H/K PART NO.	DESCRIPTION
	00132847	PC Bd Assy, Output Amp
DIODE		
CR1, 3, 5, 7	41624214*	Stabistor
CR2, 4, 6	41629338*	1N914
TRANSISTOR		
Q1, 2, 3, 6, 7 9, 10, 11, 14, 15	43025972*	NPN GP
Q4, 5, 8, 12, 13, 16	43027722*	PNP GP
RELAY		
K1	13033083	Reed, 2-pole