Eric Nelson

The Citation Seventeen S

Professional Solid State Stereophonic Preamplifier

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, 12dB per octave
High Cut:	−3dB at 8000Hz, 12 dB per octave
Volume Control Tracking:	±0.5dB, 0dB to −50dB attenuation
Turn-On Delay:	5 to 8 seconds

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 at tape output, 1000Hz
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:	17 lbs. (7.7 kg)

PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.

2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.

3. Replacement for output and driver transistors, if necessary, must be made from the same beta group as the original type.

4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.

5. When mounting a replacement power transistor, be sure that the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistor failure.

6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.

7. Fuses must be replaced with size and type indicated. Use of other types can expose components to destructive current levels.

PRINTED CIRCUIT BOARD REMOVAL PROCEDURE

Removing the P.C. boards requires the use of a card puller, Harman/Kardon part number 62333570. The use of pliers or any other tool to extract the board may result in the damaging of the copper foil on the underside of the boards.

To remove a P.C. board, grasp the top edge of the board with the puller, being careful not to disturb any board components. Remove the board with a slight side-to-side rocking action as you lift upwards.

To remove the Hi/Low Cut Filter board (assy no. 00100301A) first remove the three pushbutton knobs and the four mounting screws between the bracket and the front panel. To remove the power supply board (assy no. 00100201A) first remove the two mounting screws at the top of the board. Both boards may now be removed as described above.

When replacing a board, align it carefully in the edge guides making sure that the board connectors mate properly with the chassis connectors. Grasp the top edge of the board with the puller and push down with a side-to-side rocking action until the connectors are mated. Replace applicable mounting hardware and knobs where required.

PHONO ADJUSTMENT

INSTRUMENTS: Distortion Measurement System, Sound Tech 1700.

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

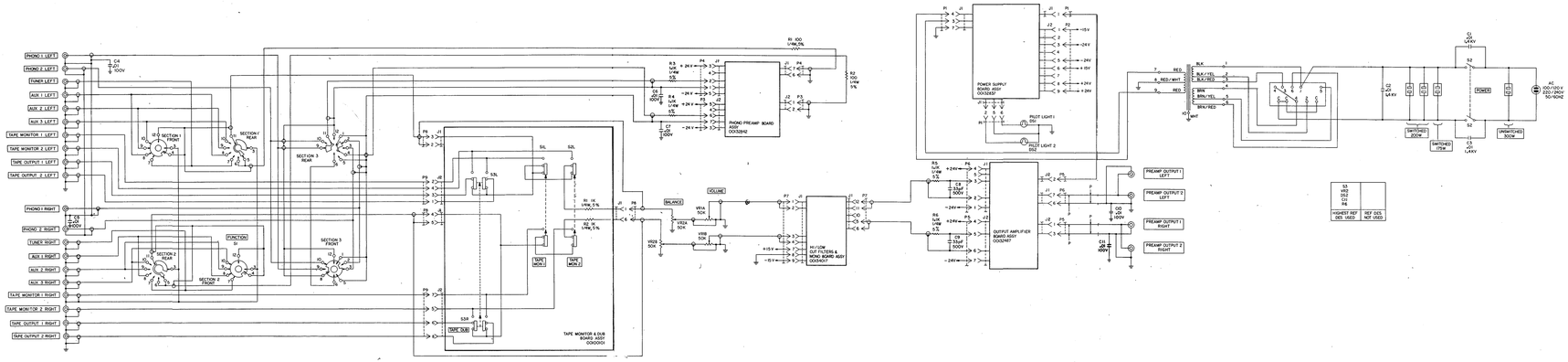
Step	INPUT	OUTPUT	ADJUST	ADJUST FOR
1	25 Hz	Left Tape Out 1 with 20k Ohm Load 5V RMS	VR1 on Phone Board	Least THD (0.006% maximum)
2	25 Hz Right Phono 1	Right Tape Out 1 with 20k Ohm Load 5V RMS	VR2 on Ohono Board	Least THD (0.006% maximum)

SCHEMATIC DIAGRAM — MODEL CITATION 17S
SYSTEM INTERCONNECTION

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL CAPACITOR VALUES ARE IN MICROFARADS.
2. ALL RESISTOR VALUES ARE IN OHMS, ±5%, 1/4 W.
3. MECHANICAL LINKAGE EXIST BETWEEN THE FOLLOWING COMPONENTS:
   S1 — SECTIONS 1, 2 & 3 FRONT AND REAR;
   S2; VR1A & VR1B; VR2A & VR2B.
4. CAUTION: WHEN ORDERING PARTS REFER TO PARTS LIST FOR H/K PART NUMBER, IF NOT AVAILABLE USE REF DESIGNATION AND ASSY OR LOCATION USED.
   I.E. R1 CHASSIS
   R1 PHONO PREAMP ASSY 00132842
5. ALL PUSHBUTTON SWITCHES SHOWN IN THE NON-DEPRESSED, OFF, POSITION.
6. FUNCTION SWITCH (SHOWN IN PHONO 1)

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



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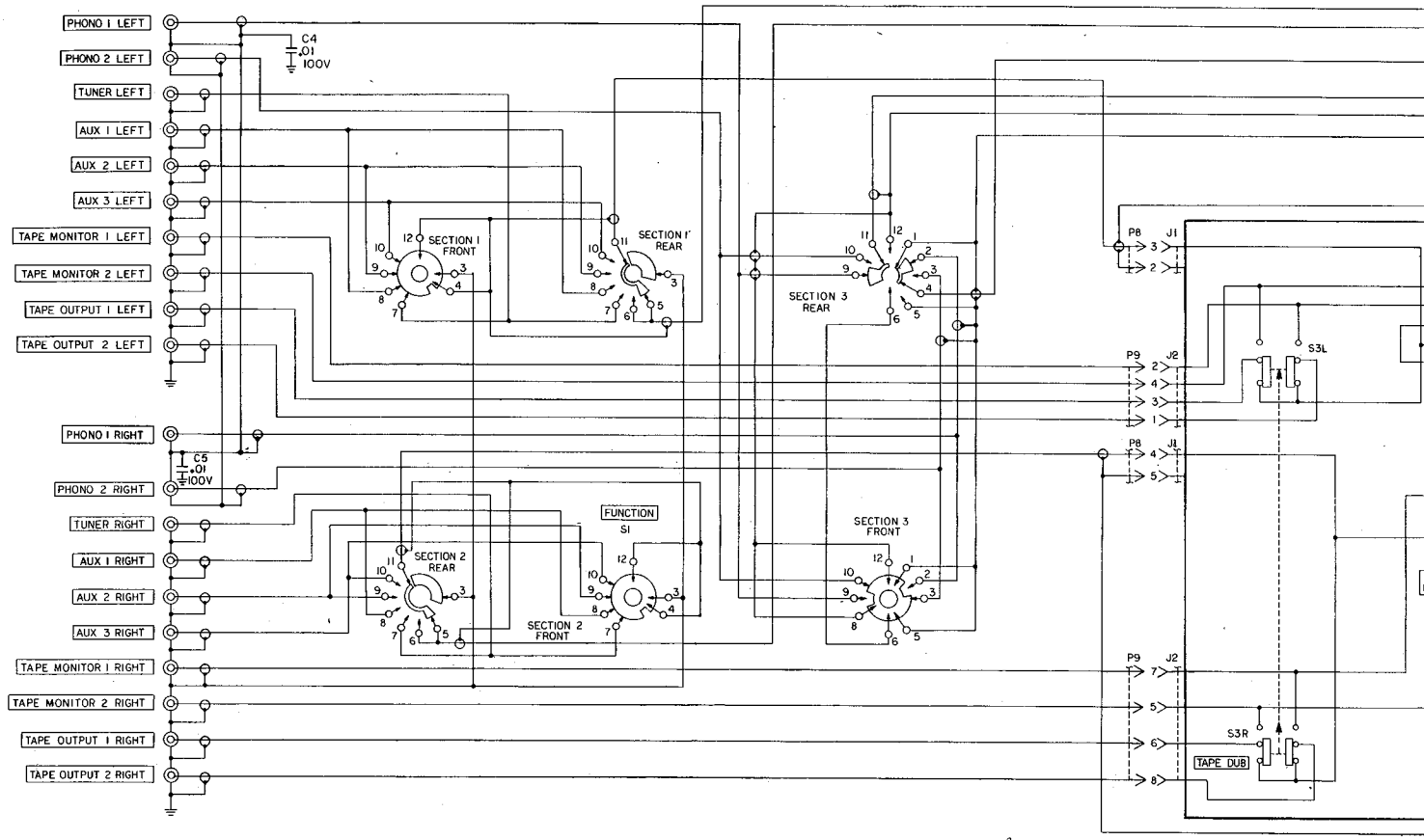
SYSTEM INTERCONNECTION



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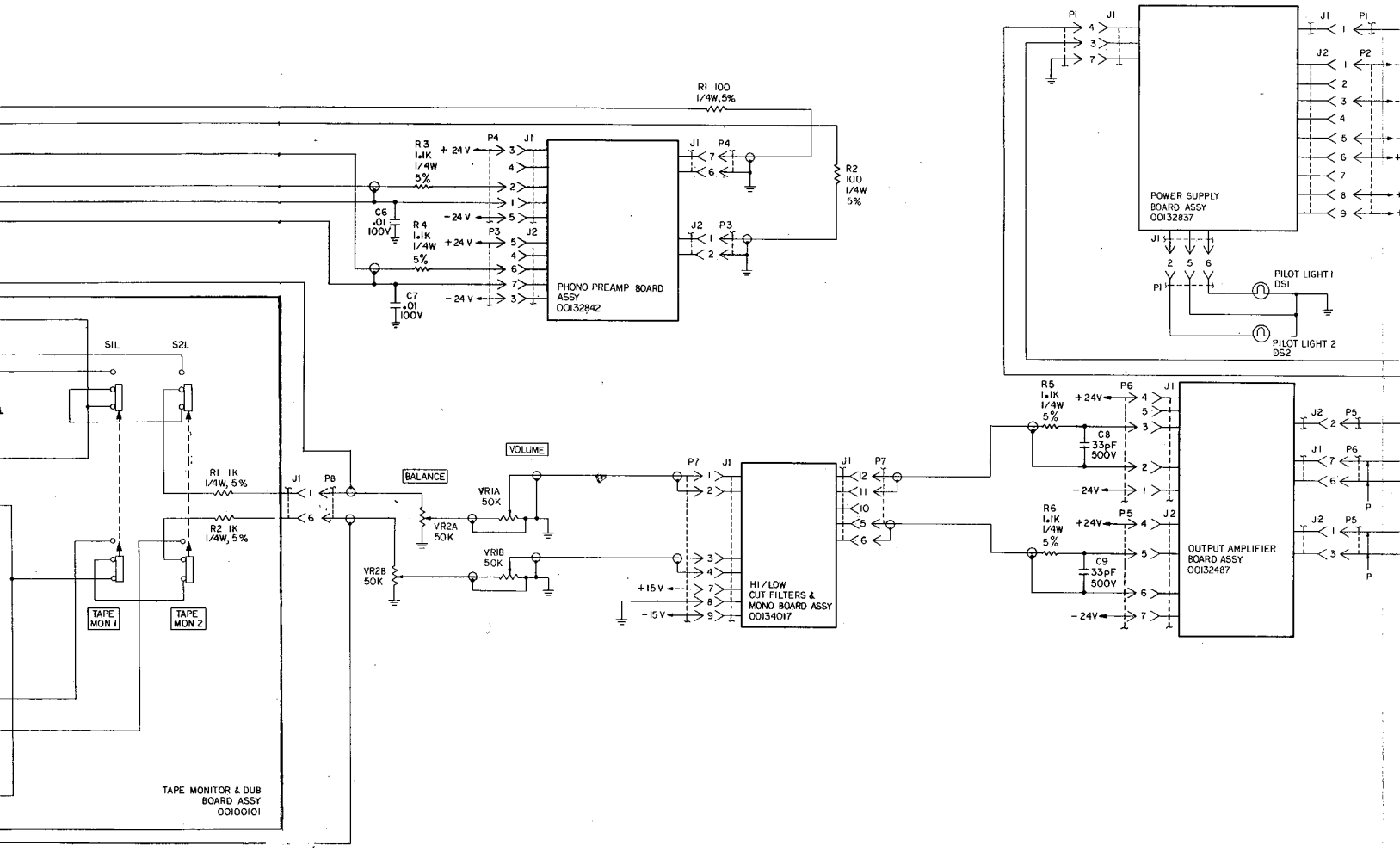

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POSITION	FUNCTION
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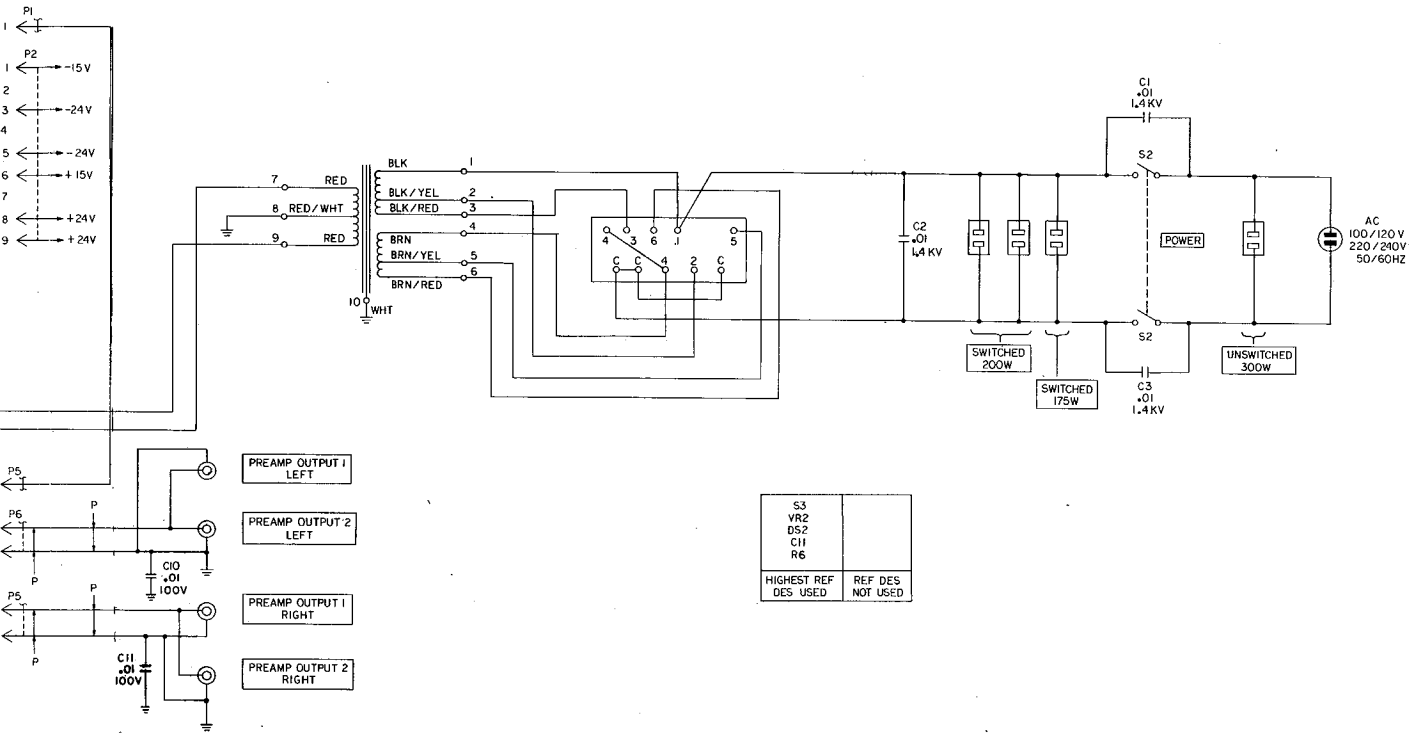
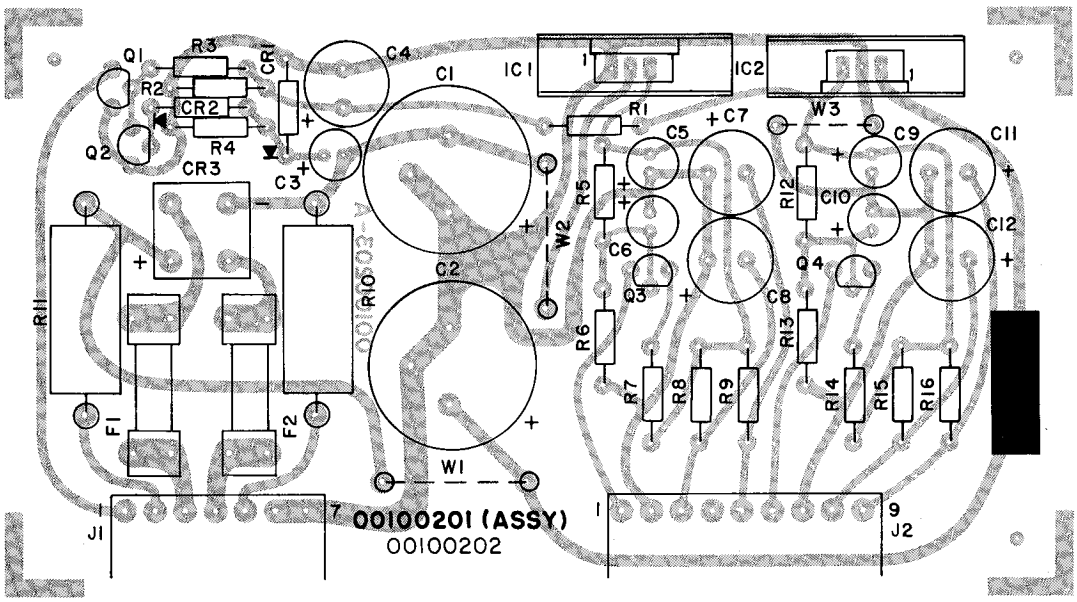
2	PHONO 2
3	TUNER
4	AUX 1
5	AUX 2
6	AUX 3



S3 VR2 DS2 C11 R6	
HIGHEST REF DES USED	REF DES NOT USED

POWER SUPPLY
PC BOARD, SCHEMATIC



CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00100201A	PC BD Assy, Power Supply
CAPACITOR, LYTIC		
C1, 2	31834066	470 UF, 80V
C3	31833205	2.2 UF, 50V
C4	31832987	220 UF, 16V
C5, 6, 9, 10.	31833209	10 UF, 35V
C7, 8, 11, 12	31833232	100 UF, 35V
DIODE		
CR1	41629338*	Silicon, 1N914
CR2	41624214*	Stabistor
CR3	42132947*	Bridge, 1A, 100V
TRANSISTOR		
Q1, 2	43029832*	NPN, Darlington, MPS A13
Q4	43025972*	NPN, GP
Q3	43027722*	PNP, GP
INTEGRATED CIRCUIT		
IC1	43132955*	Voltage Regulator, Negative, uA79M24UC
IC2	43132954*	Voltage Regulator, Positive, uA78M24UC
MISCELLANEOUS		
	65434038	Fuse Clip
F1, 2	45234420J*	Fuse 5X20mm, 315mA 250V, Slo-Blow

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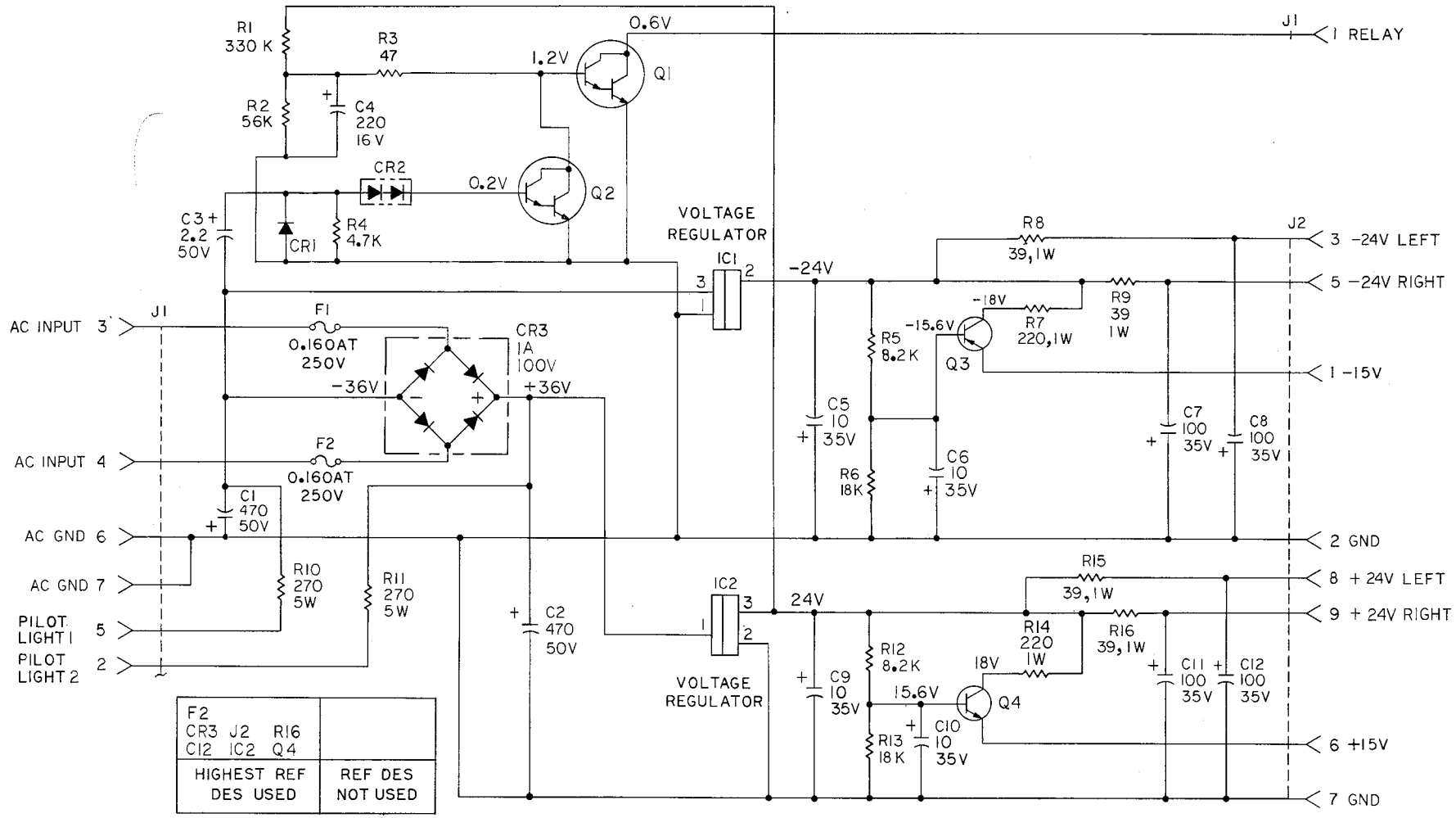
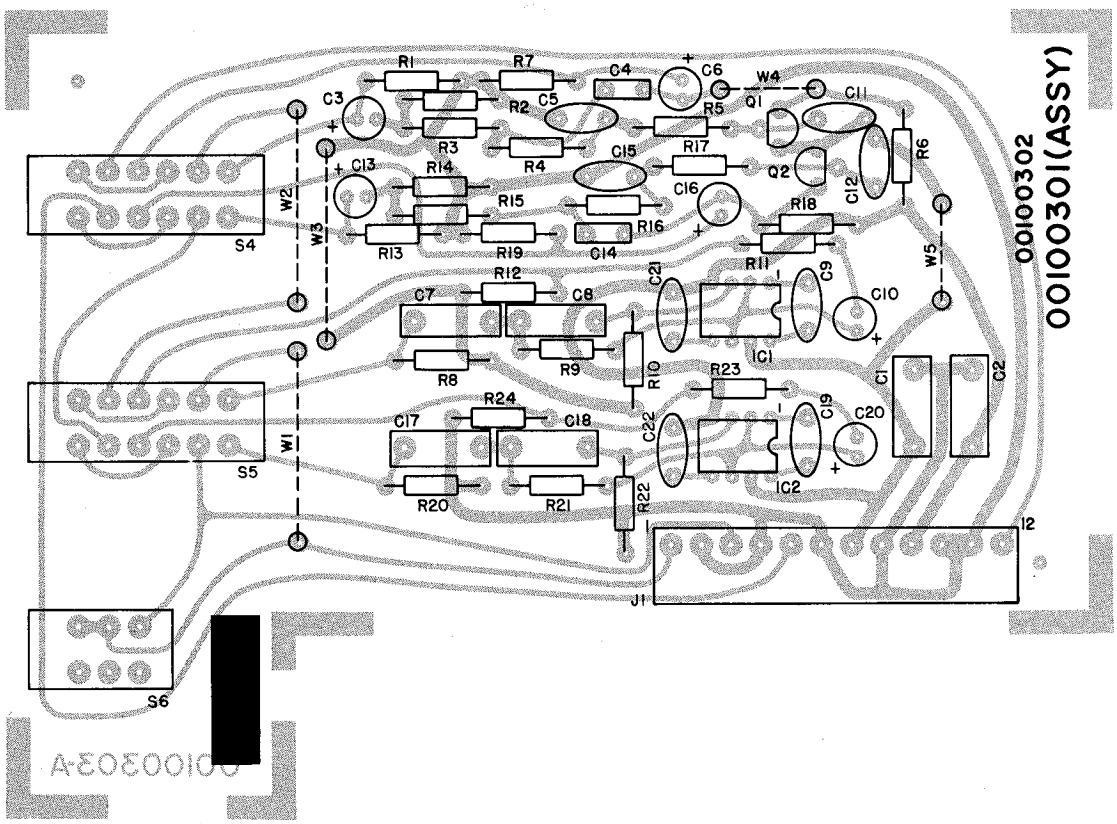
3. CAUTION: WHEN ORDERING PARTS REFER TO PARTS LIST FOR H/K PART NUMBER. IF H/K PART NUMBER IS NOT AVAILABLE USE REF DES AND ASSEMBLY USED ON. I.E. R1, POWER SUPPLY BD, ASSY NO. 00100201.



F2 CR3 J2 R16 C12 IC2 Q4	
HIGHEST REF DES USED	REF DES NOT USED

HI/LOW CUT FILTER
PC BOARD, SCHEMATIC



CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00100301A	PC BD Assy Hi/Low Cut Filter
TRANSISTOR		
Q1, 2	43033781*	NPN, Low Noise (GE D38S7)
INTEGRATED CIRCUIT		
IC1, 2	43132893*	OP Amp, CA3100S (See Note)
SWITCH		
S4, 5, 6	25034002A	Switch Assy, 3 Position

NOTE: HI/LOW CUT FILTER BOARDS SUBSTITUTING H/K PART NO. 43134588A (IC1 AND IC2) FOR H/K PART NO. 4312893 WILL HAVE C9, 19, 21 AND 22 DELETED.

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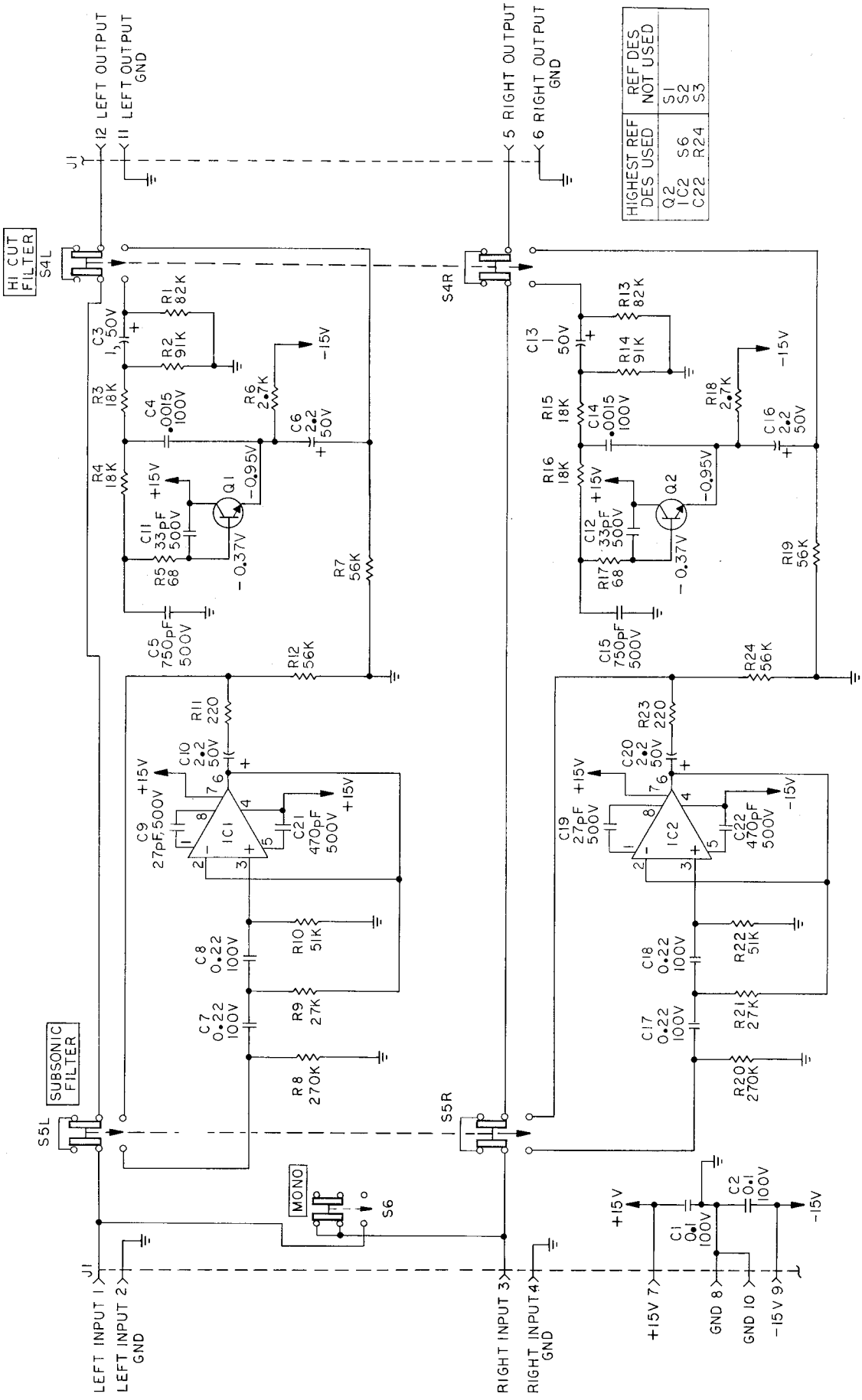
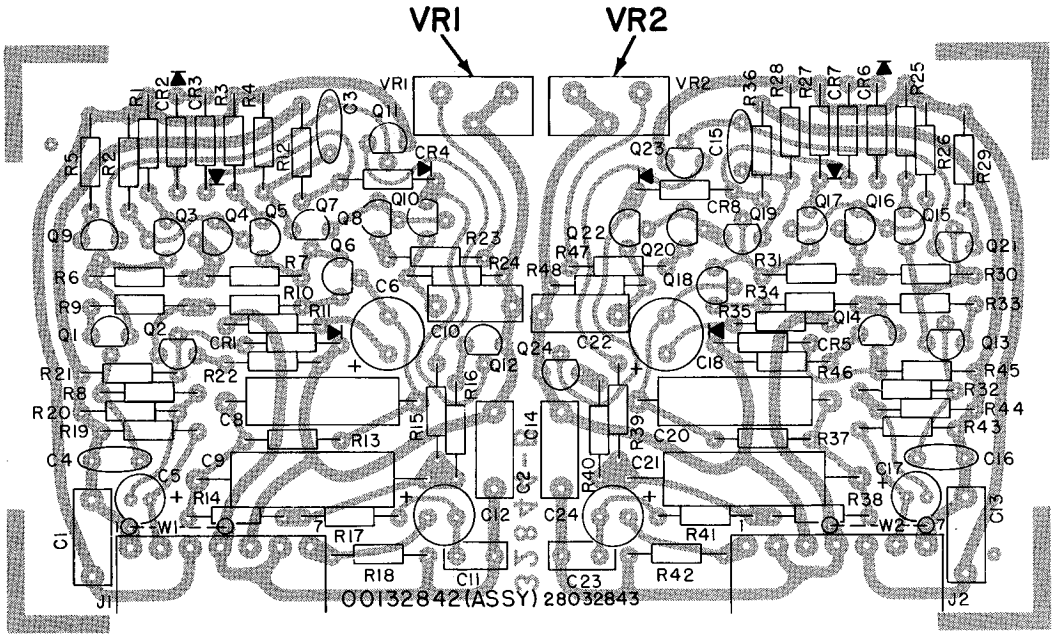


PHONO PREAMP
PC BOARD, SCHEMATIC



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
C8, C20	30632963	2350 µF 63V

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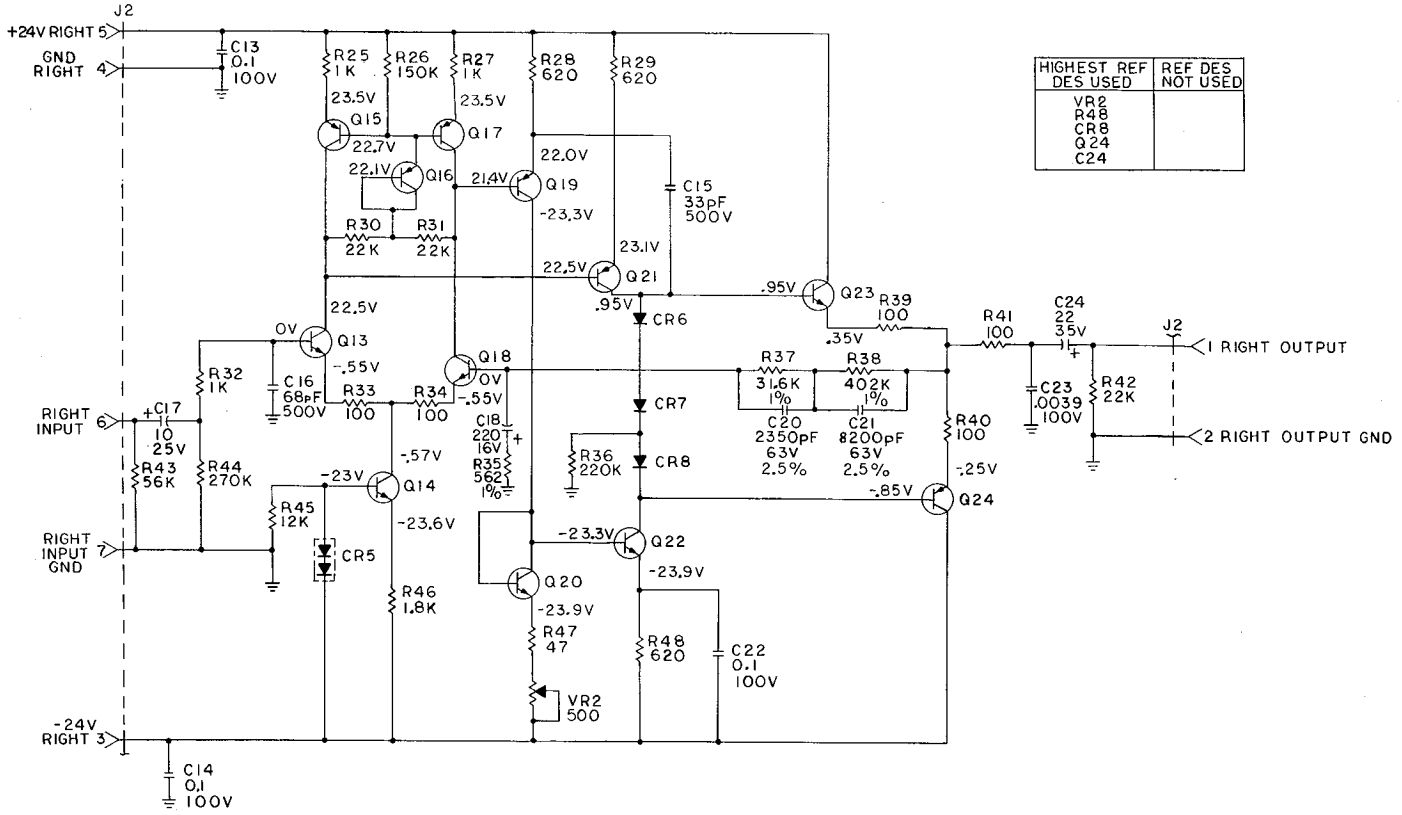
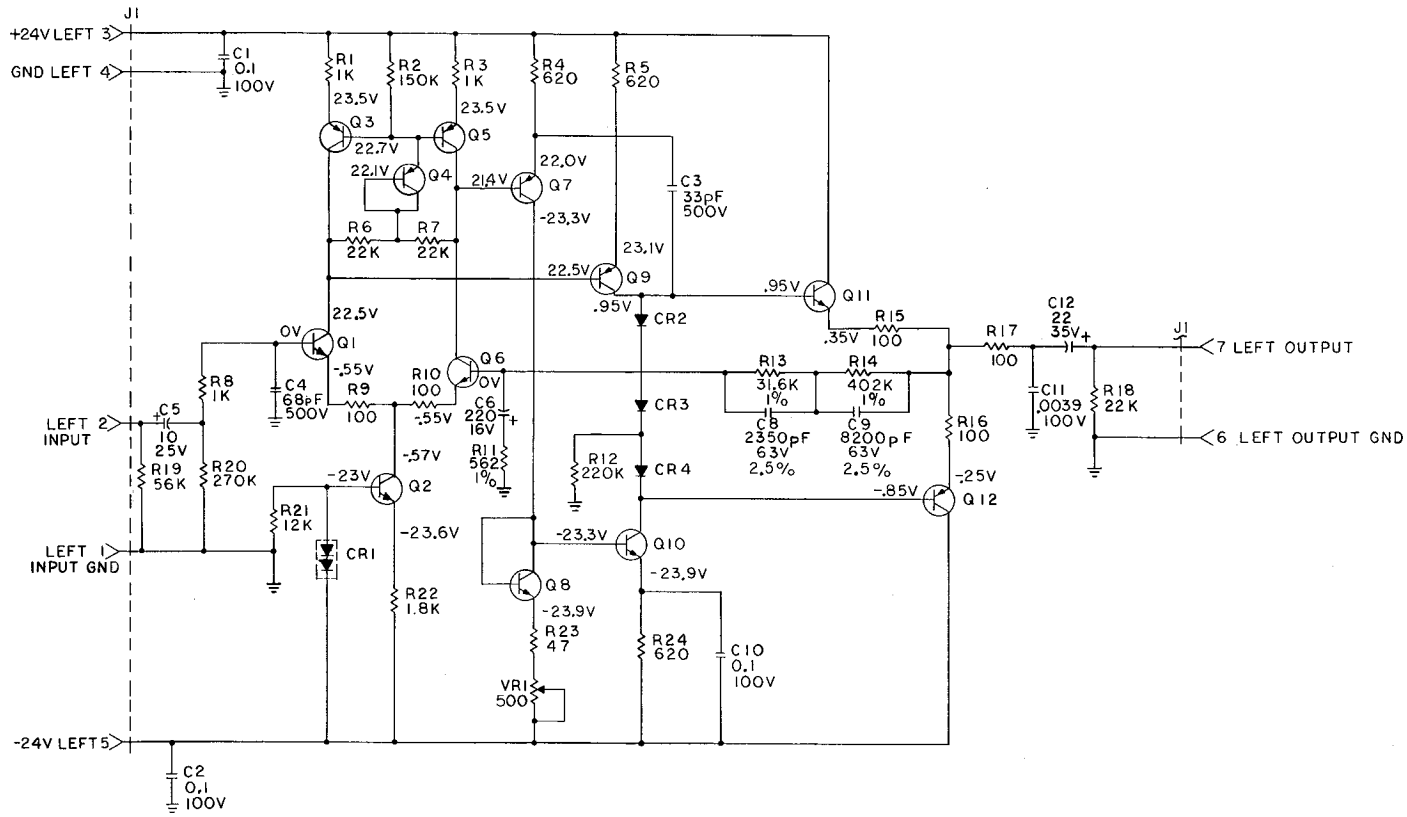
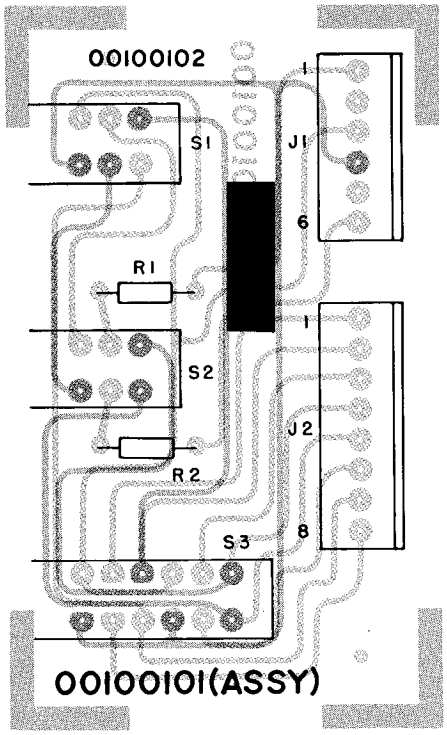
HIGHEST REF DES USED	REF DES NOT USED
VR2 R48 CR8 Q24 C24	



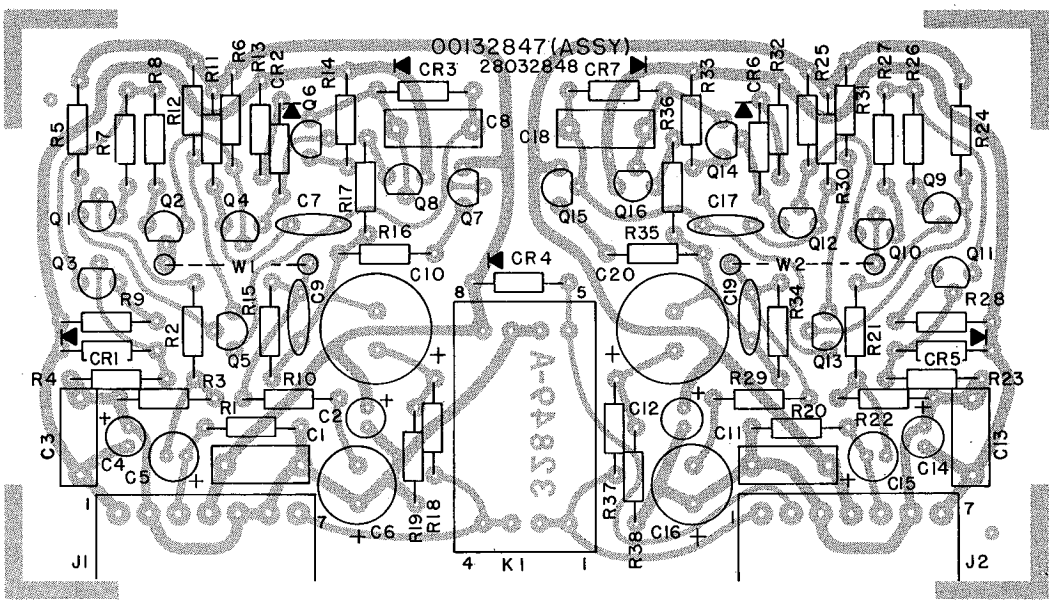


TAPE MONITOR SWITCH
PC BOARD, SCHEMATIC



CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00100101A	P.C. Bd Assy Tape Monitor Switch
SWITCH		
S1, 2, 3	25034003A	Switch Assy, 3 Position, Tape Mon 1, Mon 2, Dub

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

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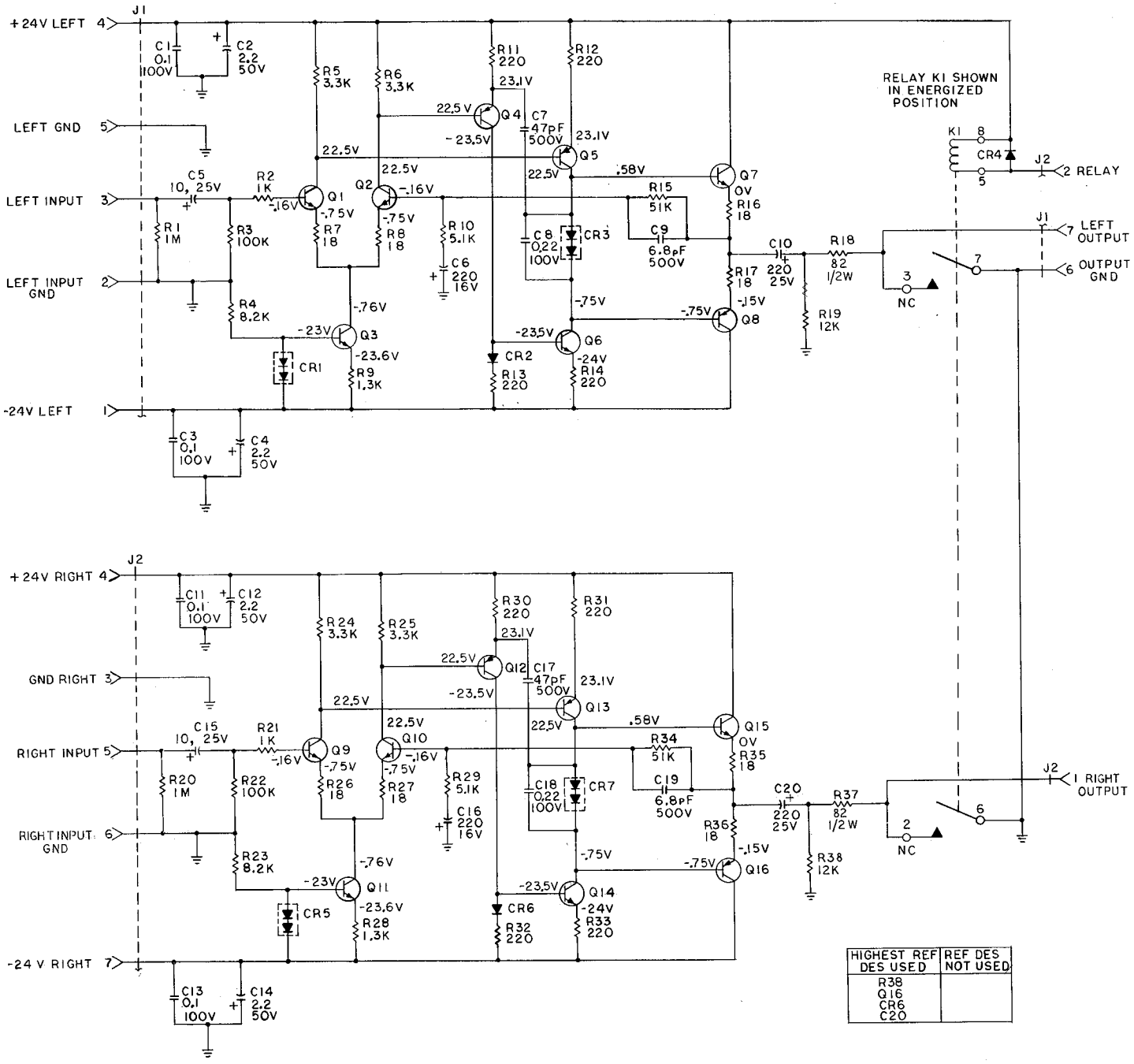

HIGHEST REF DES USED	REF DES NOT USED
R38 Q16 CR6 C20	

CHASSIS PARTS LIST

CIRCUIT REF NO	H/K PART NO	DESCRIPTION
CHASSIS		
T1	10133961A	Transformer
	65427580	Voltage Selector, Connector Set
S1	24033287	Switch, Function
REAR PANEL		
	65416751	Receptacle, AC, Blk
	65427146	Receptacle, AC, Wht
	00234536A	Terminal, Gnd
FRONT PANEL		
S2	25032217	Switch, Power
VR1	22033996A	Control, Volume
VR2	22026161	Control, Balance
DS1, 2	46534137A*	Lamp, Midget, Screw
CHASSIS, DECORATIVE		
	00234575A	Escutcheon (silver) w/washer inserts
	00234400A	Escutcheon (black) w/washer inserts
	60133308	Bottom Plate
	60132886	Cover, Top
	62011692	Foot, Rubber
	00233528	Knob, Balance & Function
	00233992A	Knob, Volume
	00233983A	Knob, Tape Mon 1 & 2, Dub
	00233982A	Knob, Hi/Low Filter, Mono

NOTE TO WARRANTY STATIONS: Items marked by asterisk (*) 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.