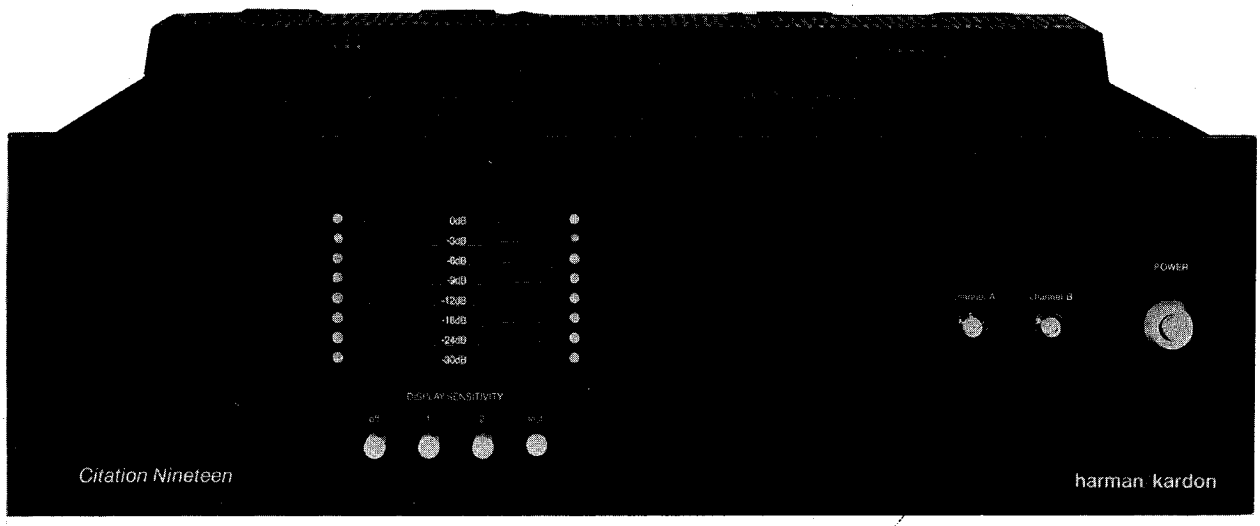
The Citation Nineteen

Professional Solid State Stereophonic Power Amplifier

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

TECHNICAL SPECIFICATIONS

Power Output:	100 watts min. rms per channel. Both channels driven into 8 ohms from 20Hz to 20kHz, with less than 0.08% THD.
Power Bandwidth:	From below 5Hz to beyond 65kHz at less than 0.08% THD into 8 ohms, both channels driven at 50 watts per channel.
Frequency Response:	From below 5Hz to beyond 50kHz, ±0.5dB at less than 0.08% THD, from below 5Hz to beyond 140kHz, −3dB at less than 0.08% THD.
Square Wave Rise Time:	Better than 2.0 microseconds.
Phase Shift:	Less than 10° at 20 kHz
Slew Rate:	Greater than 40 volts per microsecond.
Total Harmonic Distortion:	Less than 0.08% from 250 milliwatts to 100 watts RMS, both channels driven into 8 ohms from 20Hz to 20kHz.
Intermodulation Distortion:	Less than 0.08% from 15 milliwatts to 100 watts.
Hum and Noise:	Better than 100dB below 100 watts.
Damping Factor:	Greater than 125:1, at 8 ohms.
Input Impedance:	30 kilohms.
Input Sensitivity:	1.25 volts for 100 watts.
Dimensions:	16"W x 5-1/4"H x 14-3/4"D 406mm x 133mm x 375mm
Weight:	39 lbs (17.6 kg) This unit may be bridged to provide 220 watts from 20Hz to 20kHz, with less than 0.16% THD, into a single 16-ohm load.

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.

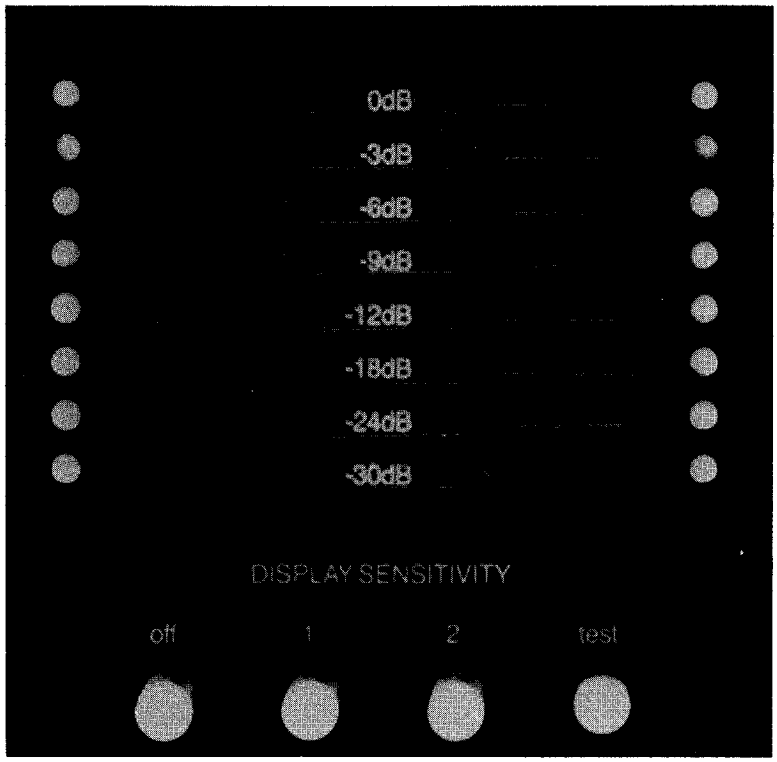
4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing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

LED DISPLAY



dB LEVEL AND LAMP COLOR		16 OHMS		8 OHMS		4 OHMS	
		POWER LEVEL (WATTS)		POWER LEVEL (WATTS)		POWER LEVEL (WATTS)	
		RANGE 1	RANGE 2	RANGE 1	RANGE 2	RANGE 1	RANGE 2
0dB	Red	50.0	2.5	100.0	5.0	200.0	10.0
-3dB	Red	25.0	1.25	50.0	2.5	100.0	5.0
-6dB	Yellow	12.5	0.625	25.0	1.25	50.0	2.5
-9dB	Yellow	6.25	0.313	12.5	0.625	25.0	1.25
-12dB	Green	3.125	0.156	6.25	0.313	12.5	0.625
-18dB	Green	0.781	0.039	1.562	0.078	3.125	0.156
-24dB	Green	0.195	0.010	0.391	0.020	0.781	0.039
-30dB	Green	0.049	0.002	0.098	0.005	0.195	0.010

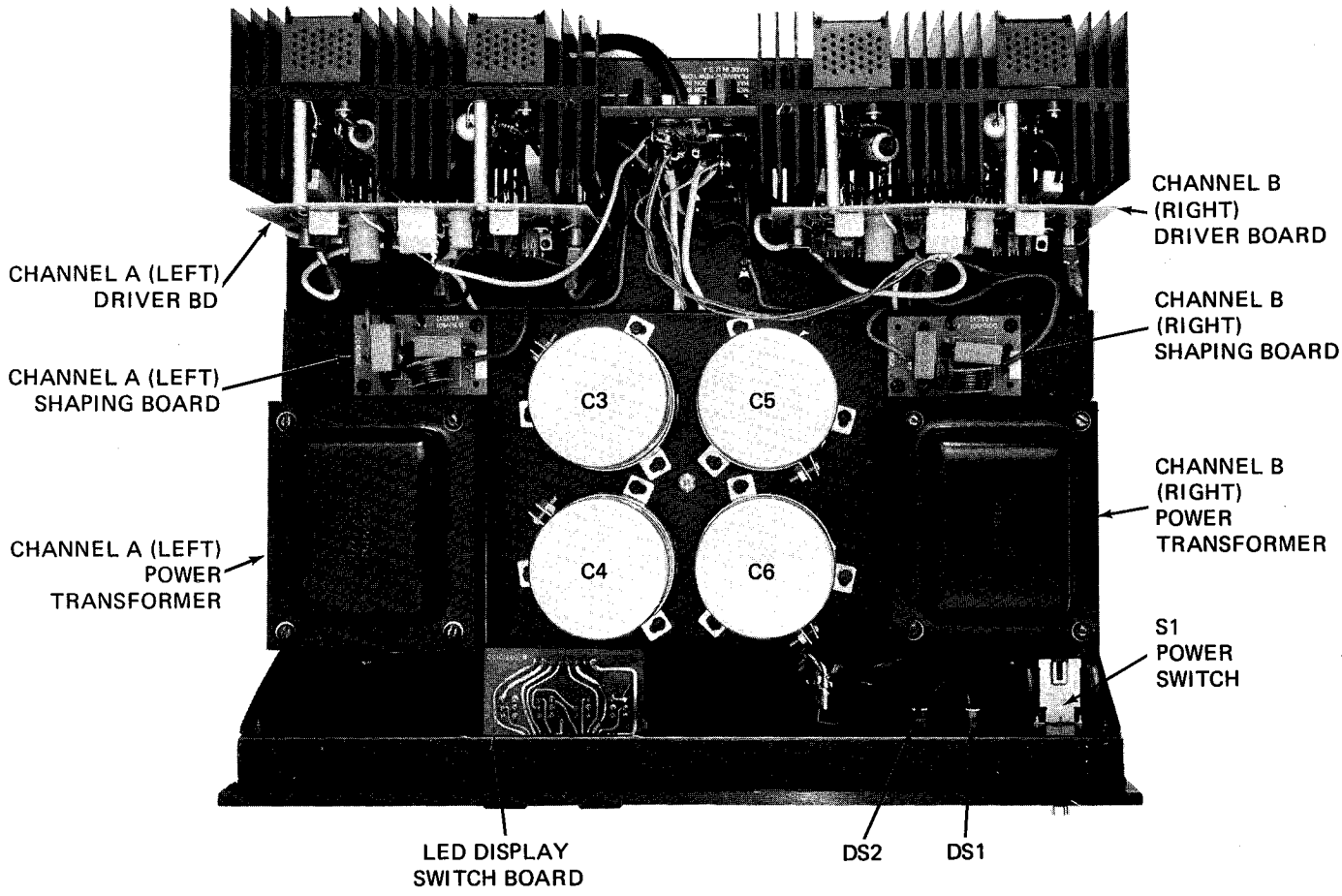
MECHANICAL PARTS LIST

REF. DES.	H/K PART NO.	DESCRIPTION
REAR PANEL		
S2	24534314	Switch, Slide, Stereo/Bridge
	65427001	Fuseholder W/Hardware
F1, 2	45024006*	Fuse, Slo-Blo, 2.5 Amp, 125V
	53034409	Line Cord
CHASSIS DECORATIVE		
	63034527	Front Panel, Dress (Black)
	63034039	Front Panel, Dress (Silver)
	60134050	Cover, Top
	60134051	Vent Panel
	60134043	Cover, Bottom
S1	25032217*	Switch, Pushbutton, Power DPST
	63232243	Knob, Pushbutton Power
	63033661	Panel, LED Dress
	00234604	Knob, Pushbutton, LED
DS1, 2	47633864*	Pilot, Light Assy, Red
HEATSINK ASSEMBLY		
Q1	~~42732284*~~	Transistor, ~~Power,~~ 2N3583
Q2	42732285*	Transistor, ~~Power,~~ 2N6211
Q3, 5	42734289*	Transistor, Power, NPN, MJ15003
Q4, 6	42734290*	Transistor, Power, PNP, MJ15004
Q7	00834625*	Transistor Assy, NPN, GP
CB1	45525206*	Circuit Breaker, Thermal
C1, 2	31530452	Capacitor, 1OUF, 250V
CR1, 2	41029089*	Diode, Silicon, 2A, 200V
R3-6	36915085	Resistor, WW, 0.5 OHM, 10W, 5%, NI
MISCELLANEOUS		
T1, 2	10134408	Transformer, Power
C3-6	31133949	Capacitor, Lytic, 10,000UF, 75V
CR1, 2	42134285	Rectifier, Bridge
	65431064	Plug, Speaker Convenience
MULTI-VOLTAGE		
T1	10133917A	Transformer, Power W/Switch Brkt, Channel A
T2	10133917B	Transformer, Power W/Switch Brkt, Channel B
F1, 2	45234420*	Fuse, Slo-Blo, 1.25A, 250V
	65427580	Voltage Selector, Connector Set

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.

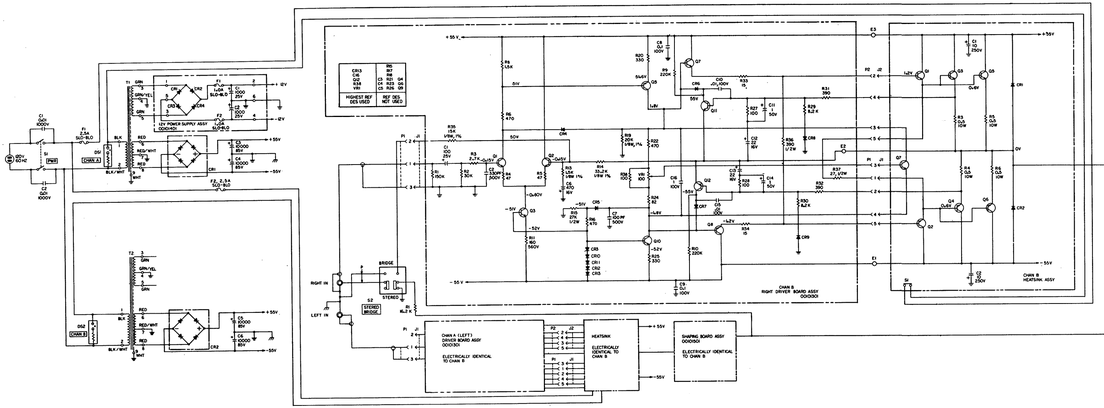
NOTE: To speed handling of your order be sure to include both the model and serial numbers, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a cash in advance basis. Harman/Kardon 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.

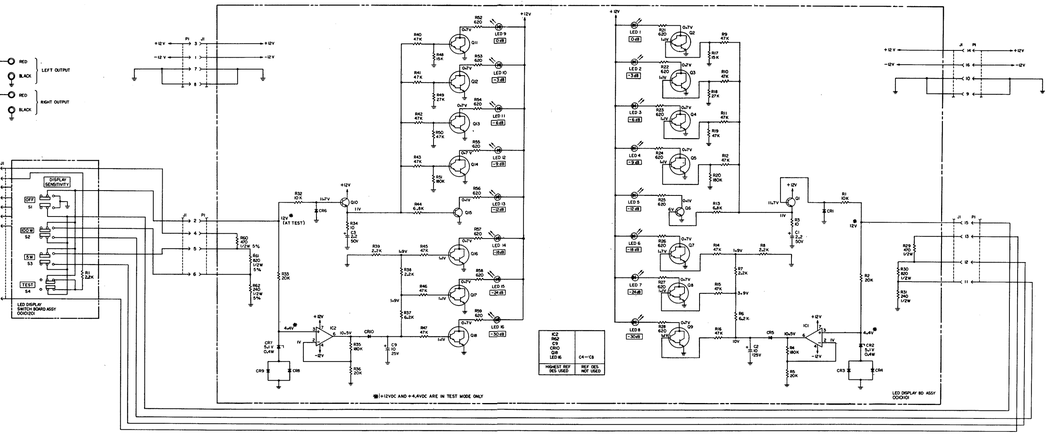
COMPONENT LOCATION – TOP VIEW



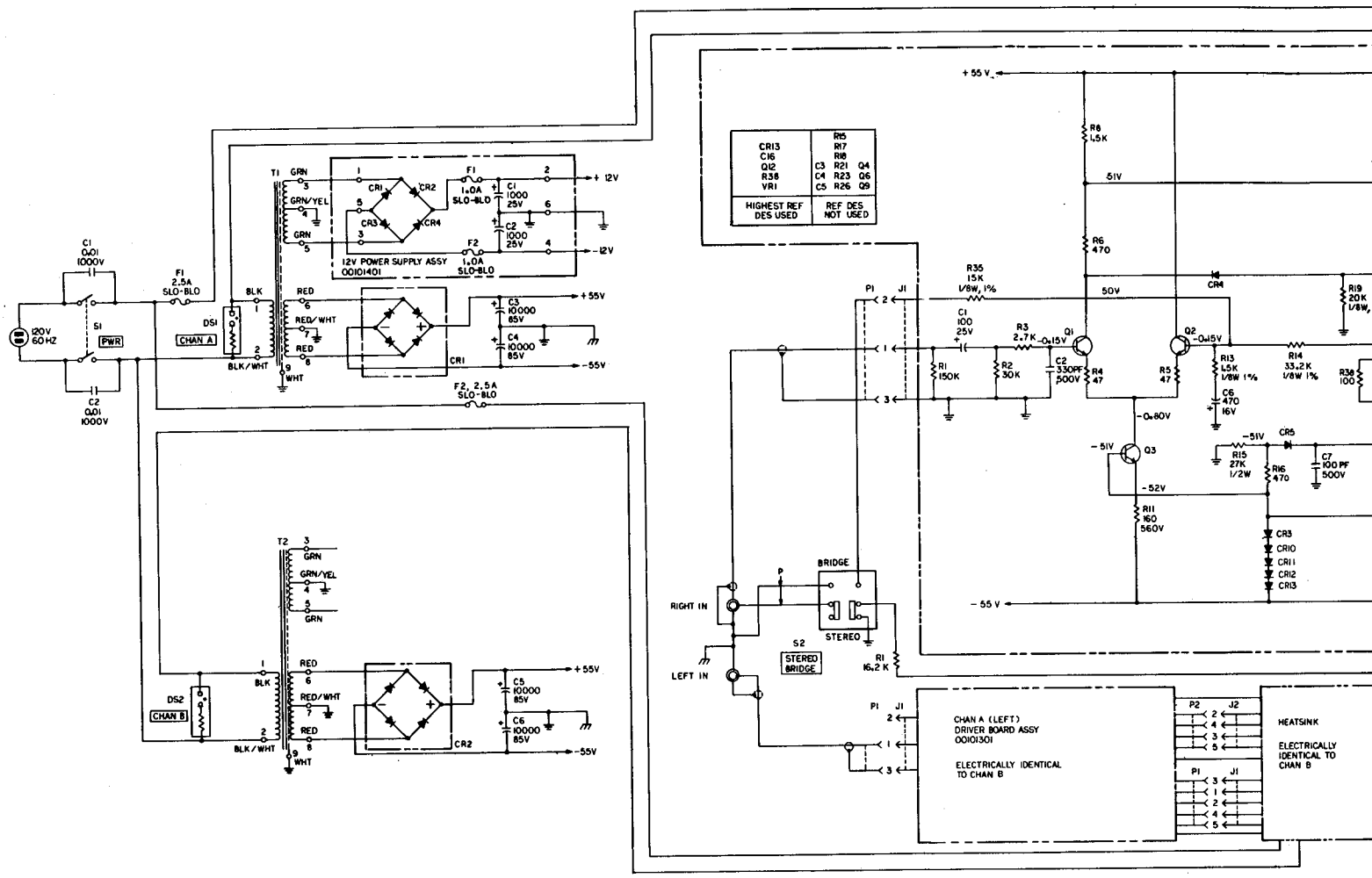
SCHEMATIC DIAGRAM — MODEL CITATION 19

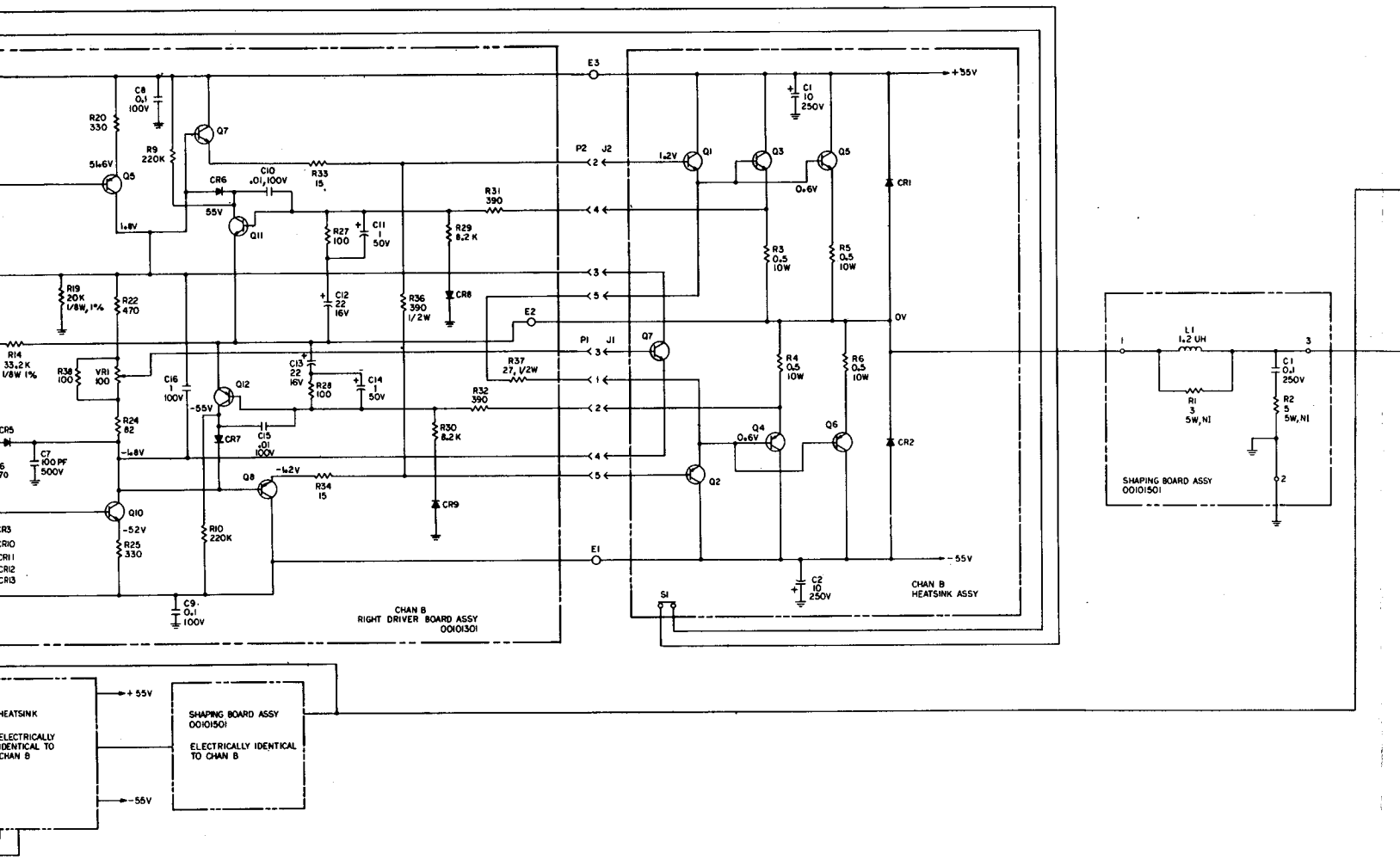
NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL CAPACITOR VALUES ARE IN MICROFARADS.
2. ALL RESISTOR VALUES ARE IN OHMS ±5%, 1/4W.
3. PUSHBUTTON SWITCH S4 ON THE LED DISPLAY SWITCH P.C. BOARD IS SHOWN IN THE TEST POSITION.
4. WHEN ORDERING PARTS, REFER TO PARTS LIST FOR H/K PART NO. IF NOT AVAILABLE, USE REFERENCE DESIGNATION AND ASSY OR LOCATION USED ON. I.E. R3, HEATSINK ASSY.

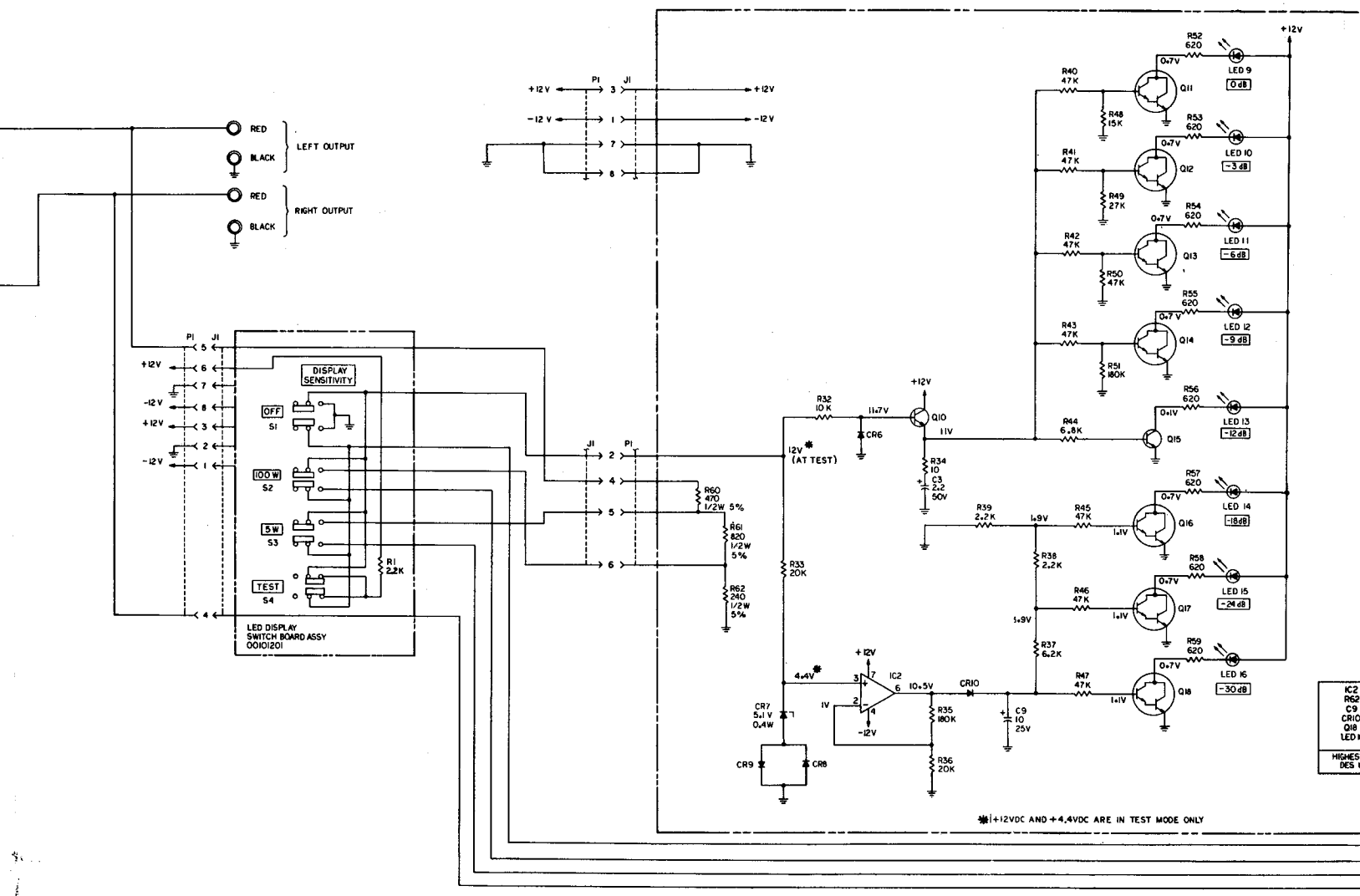




SCHEMATIC DIAGRAM – MODEL CITATION 19




E3
+55V
C8 0.1 100V
R20 330
Q7
C1 10 250V
P2 J2
R9 220K
5.6V
Q5
CR6
C10 .01, 100V
R33 15
1.2V
Q1
Q3
Q5
0.6V
CR1
55V
Q11
R31 390
R27 100
C11 1 50V
R29 8.2K
4.8V
R3 0.5 10W
R5 0.5 10W
R19 20K 1/8W, 1%
R22 470
C12 22 16V
R36 390 1/2W
CR8
E2
0V
P1 J1
Q7
R14 33.2K 1/8W 1%
R38 100
VR1 100
C13 22 16V
R37 27, 1/2W
R4 0.5 10W
R6 0.5 10W
C16 1 100V
Q12
R28 100
C14 1 50V
-5.5V
R32 390
R24 82
CR7
C15 .01 100V
R30 8.2K
Q4
0.6V
Q6
CR2
C7 100 PF 500V
-4.8V
Q8
-4.2V
R34 15
Q2
Q10
CR9
-5.2V
R25 330
R10 220K
E1
-55V
C9 0.1 100V
C2 10 250V
CHAN B RIGHT DRIVER BOARD ASSY 00101301
S1
CHAN B HEATSINK ASSY
L1 1.2 UH
R1 3 5W, NI
C1 0.1 250V
R2 5 5W, NI
SHAPING BOARD ASSY 00101501
+55V
SHAPING BOARD ASSY 00101501
ELECTRICALLY IDENTICAL TO CHAN B
-55V


RED
BLACK
LEFT OUTPUT
RED
BLACK
RIGHT OUTPUT
P1
J1
+12 V
-12 V
DISPLAY SENSITIVITY
OFF
S1
100 W
S2
5 W
S3
TEST
S4
R1
2.2K
LED DISPLAY
SWITCH BOARD ASSY
0010120I
R60
470
1/2W 5%
R61
820
1/2W
5%
R62
240
1/2W
5%
12V
(AT TEST)
R32
10 K
11.7V
CR6
Q10
11V
R34
10
C3
2.2
50V
R33
20K
R39
2.2K
1.9V
R38
2.2K
5.9V
R37
6.2K
4.4V
IC2
10.5V
CR10
1V
CR7
5.1 V
0.4W
CR9
CR8
R35
180K
R36
20K
C9
10
25V
R52
620
LED 9
0 dB
Q11
R40
47K
R48
15K
R53
620
LED 10
-3 dB
Q12
R41
47K
R49
27K
R54
620
LED 11
-6 dB
Q13
R42
47K
R50
47K
R55
620
LED 12
-9 dB
Q14
R43
47K
R51
180K
R56
620
LED 13
-12 dB
Q15
R44
6.8K
R57
620
LED 14
-18 dB
Q16
R45
47K
R58
620
LED 15
-24 dB
Q17
R46
47K
R59
620
LED 16
-30 dB
Q18
R47
47K
1.1V
0.7V
0.1V
+12V
-12V
*|+12VDC AND +4.4VDC ARE IN TEST MODE ONLY

NOTES: UNLESS OTHERWISE SPECIFIED

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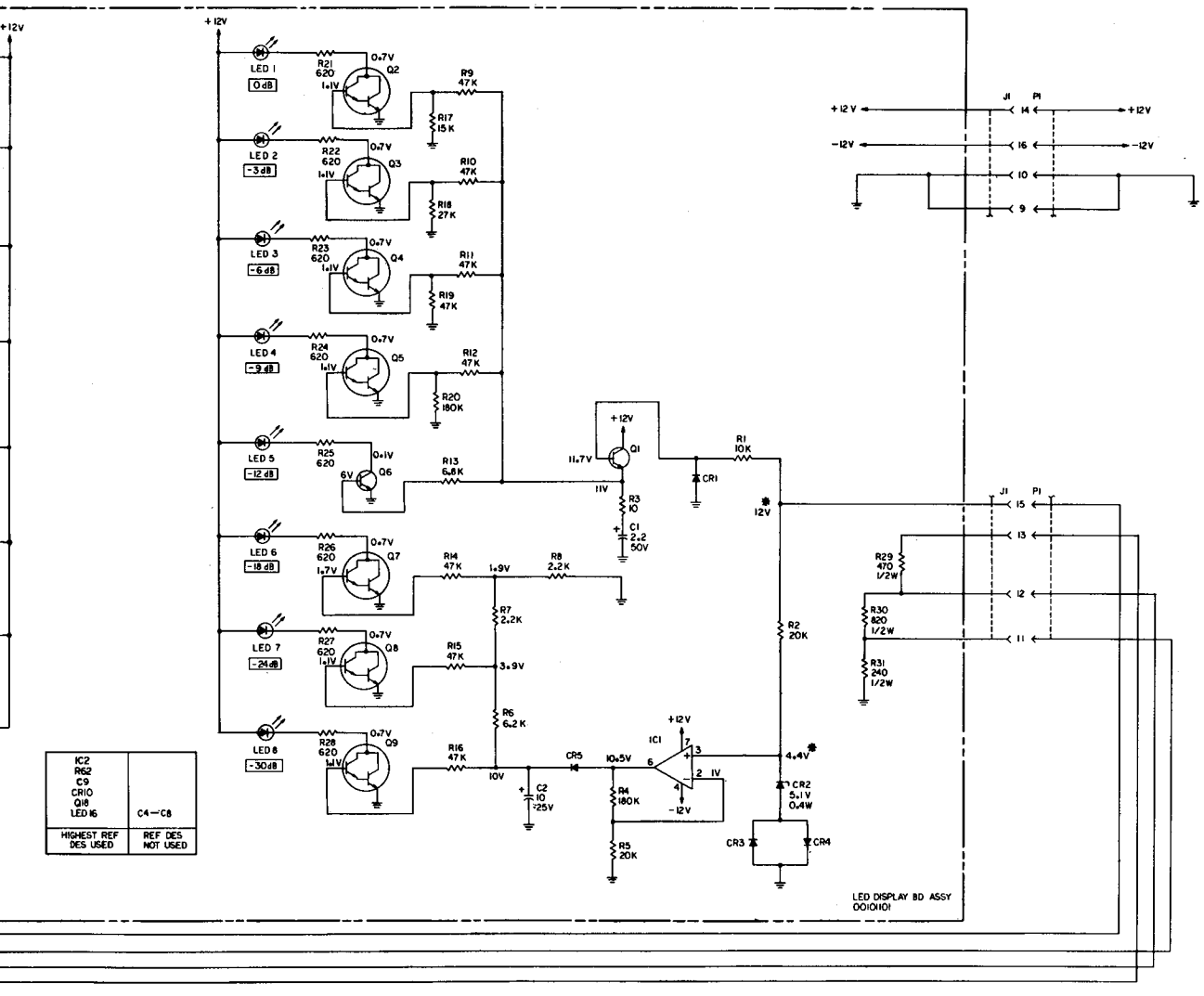
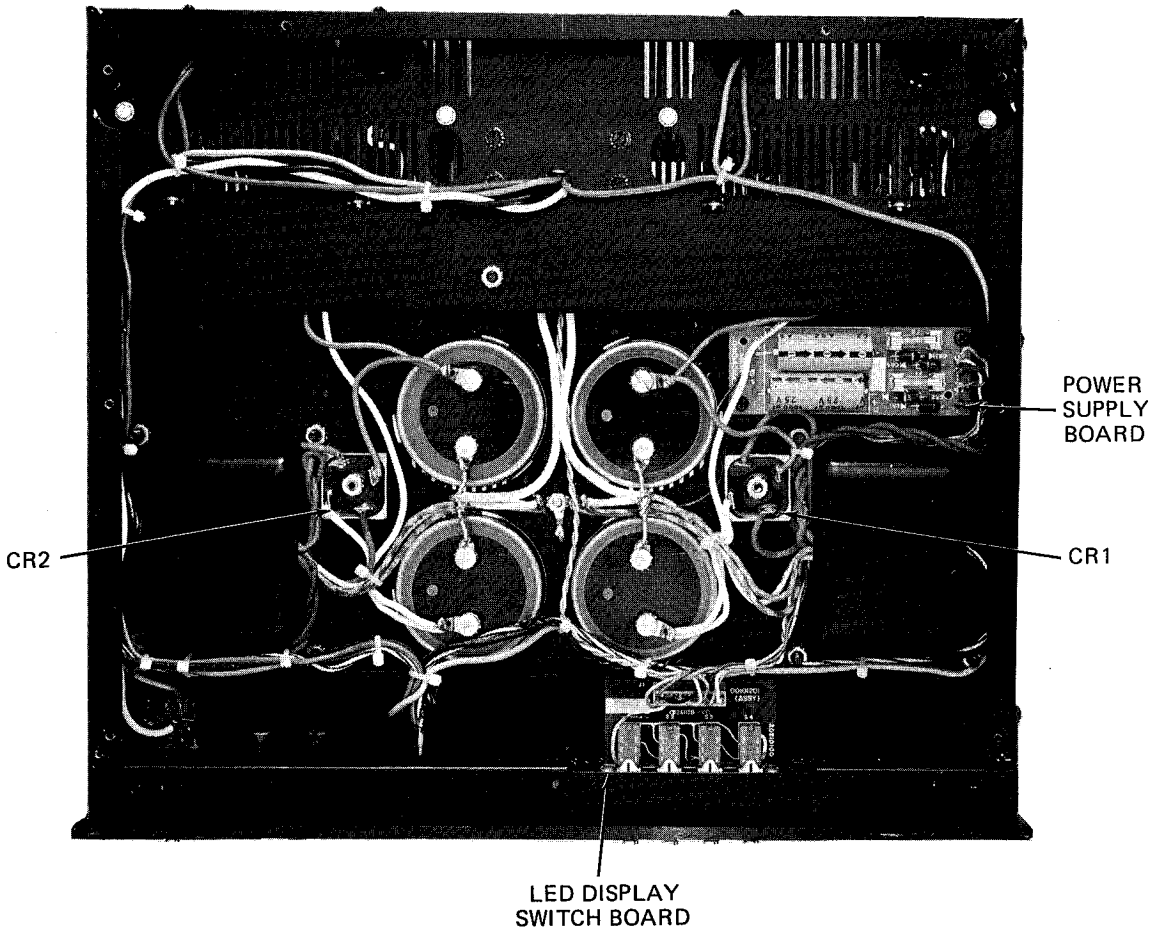
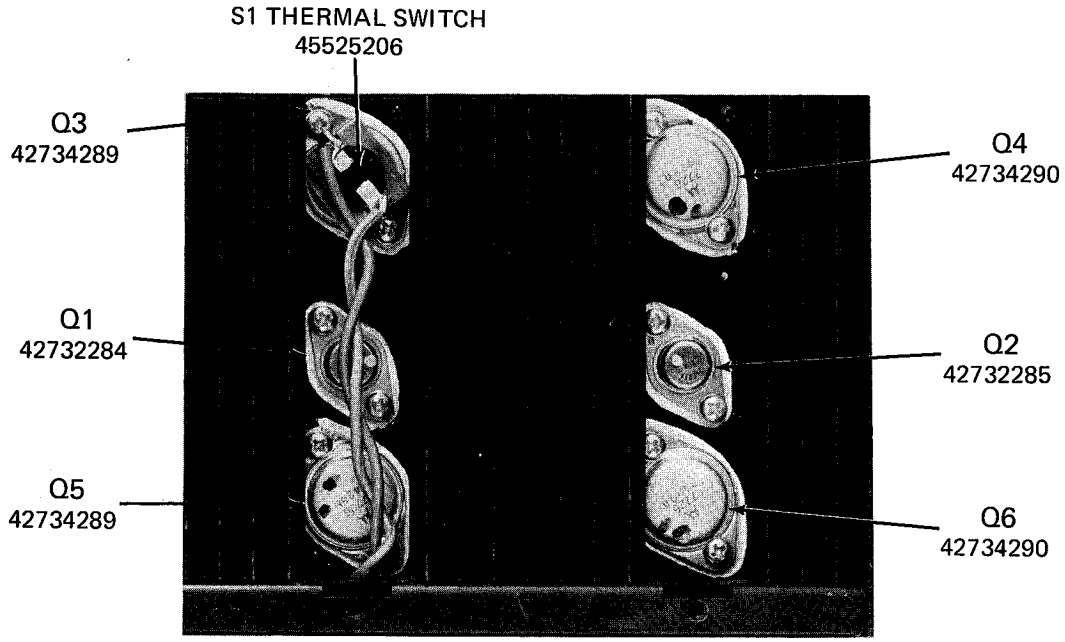


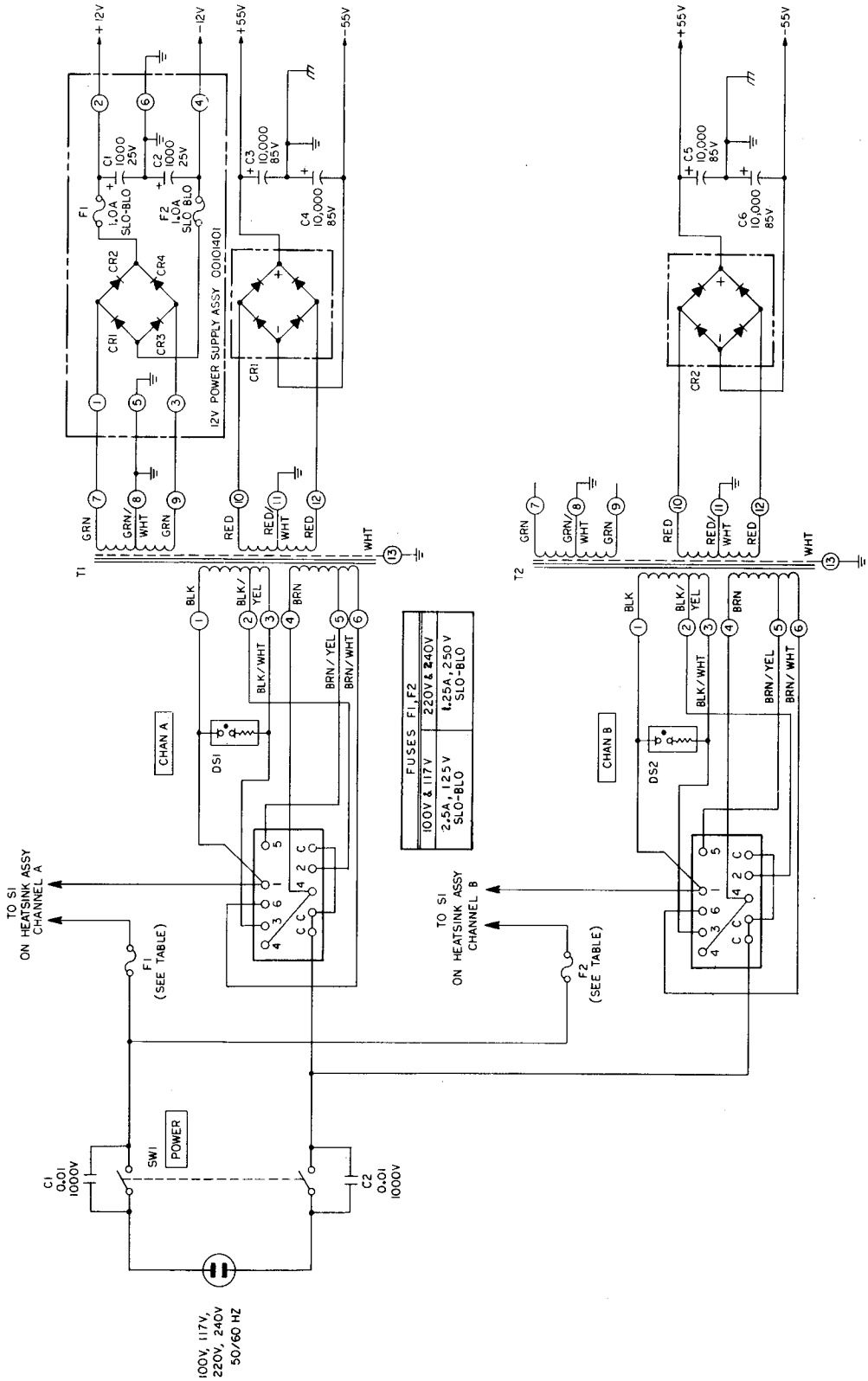
COMPONENT LOCATION – BOTTOM VIEW



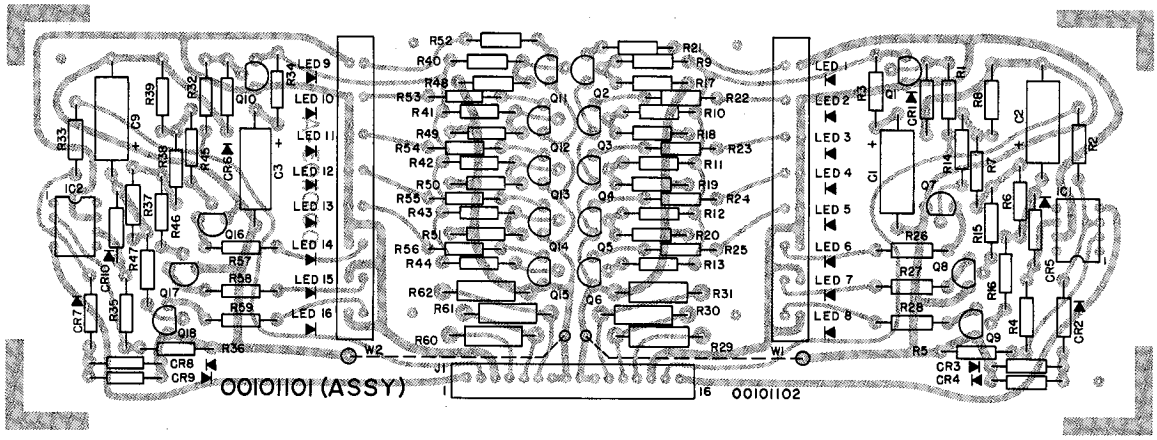
REAR VIEW – HEATSINK



SCHEMATIC DIAGRAM – MULTI VOLTAGE

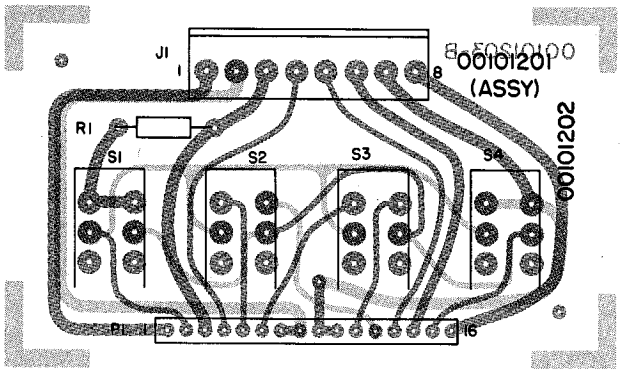


LED DISPLAY PC BOARD



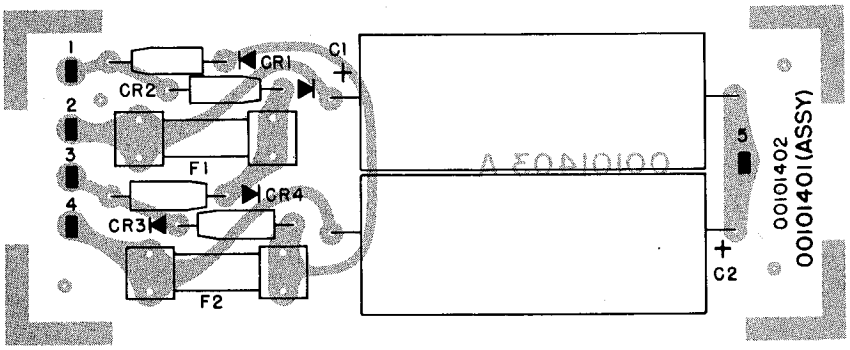
CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00101101	P.C Board Assy, LED Display
DIODE		
CR1, CR3-6, CR8-10	41629338*	1N914
CR2, 7	42030498*	Zener, 5.1V
TRANSISTOR		
Q1, 6, 10, 15	43025972*	NPN GP
Q2-5, Q7-9, Q11-14, Q16-18	43029832*	NPN MPSA13
INTEGRATED CIRCUIT		
1C1, 2	43130636*	OP Amp MC1741C
LAMP, SOLID STATE		
LED 1, 2, 9, 10	46734541A*	LED, Red
LED, 3, 4, 11, 12	46734541B*	LED, Yellow
LED 5-8, LED 13-16	46734541*	LED, Green

LED DISPLAY SWITCH PC BOARD



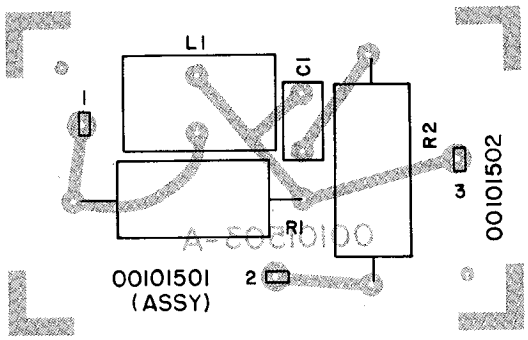
CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00101201	P.C. Board Assy, LED Display Switch
S1-S4	25034009	Switch Assy, Pushbutton, Display Sensitivity

12V POWER SUPPLY PC BOARD



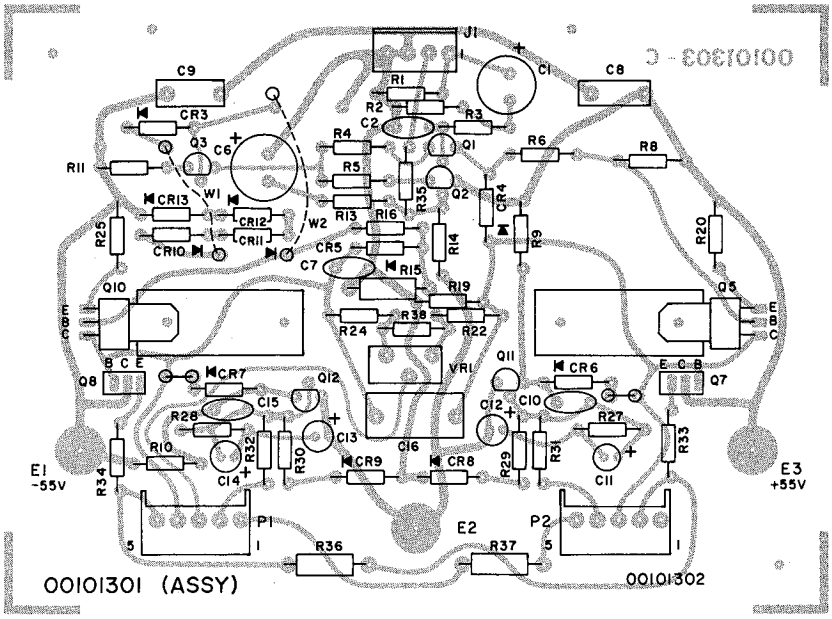
CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00101401	P.C. Board Assy, 12V Power Supply
CAPACITOR, LYTIC		
C1, 2	31521625	1000UF, 25V
DIODE		
CR1-4	41029089*	Power, 2A, 200V
FUSE		
F1, 2	45032889*	1.0A, 250V, 5X20 MM

SHAPING PC BOARD



CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00101501	P.C. Board Assy, Shaping
INDUCTOR		
L1	12034542A*	0.92UH
RESISTOR, WIREWOUND		
R1	36713075*	3 OHM, 5W, 5%, NON-INDUCTIVE
R2	36715075*	5 OHM, 5W, 5%, NON-INDUCTIVE

DRIVER PC BOARD



CIRCUIT REF NO.	H/K PART NO.	DESCRIPTION
	00101301	P.C. Board Assy, Driver
CAPACITOR, LYTIC		
C11, 14	31833204	1UF, 50V
C12, 13	31833275	22UF, 16V
C1	31833231	100UF, 25V
C6	31833251	470 UF, 16V
DIODE		
CR3, CR8-13	41629338*	Silicon, Signal 1N914
CR4-7	41634616A*	Fairchild FDH400
TRANSISTOR		
Q1, 2	43034773A*	NPN, GE 16Q10
Q3	43034618A*	NPN, 92PU07
Q4, 5	43030407*	PNP MPSU60
Q7	43030408*	NPN MJE340
Q8	43030409*	PNP MJE350
Q10	43030406*	NPN MPSU10
Q11	43034293*	NPN, 2N5551
Q12	43034434*	PNP, 2N5401
RESISTOR, METAL FILM		
R13	37111523	1.5K ohm, 1/8W, 1%
R35	35111533	15K ohm, 1/8W, 1% Dale M200
R19	3712033	20K ohm, 1/8W, 1%
R14	37134299	33.2K ohm, 1/8W, 1%
RESISTOR, VARIABLE		
VR1	21632967	100 ohm

There is only one adjustment, the idle current pot VR1. This adjustment is to be made with no signal and no load. It should be set for 70 millivolts D.C. across the two 0.5 ohm emitter resistors R3 and R4 when the set is warmed up.

Connect a floating voltmeter between the emitter pins of Q5 and Q6 which are accessible when the top cover is removed. Do not use a grounded meter and be careful not to short the meter probe to chassis or other parts of the circuit.