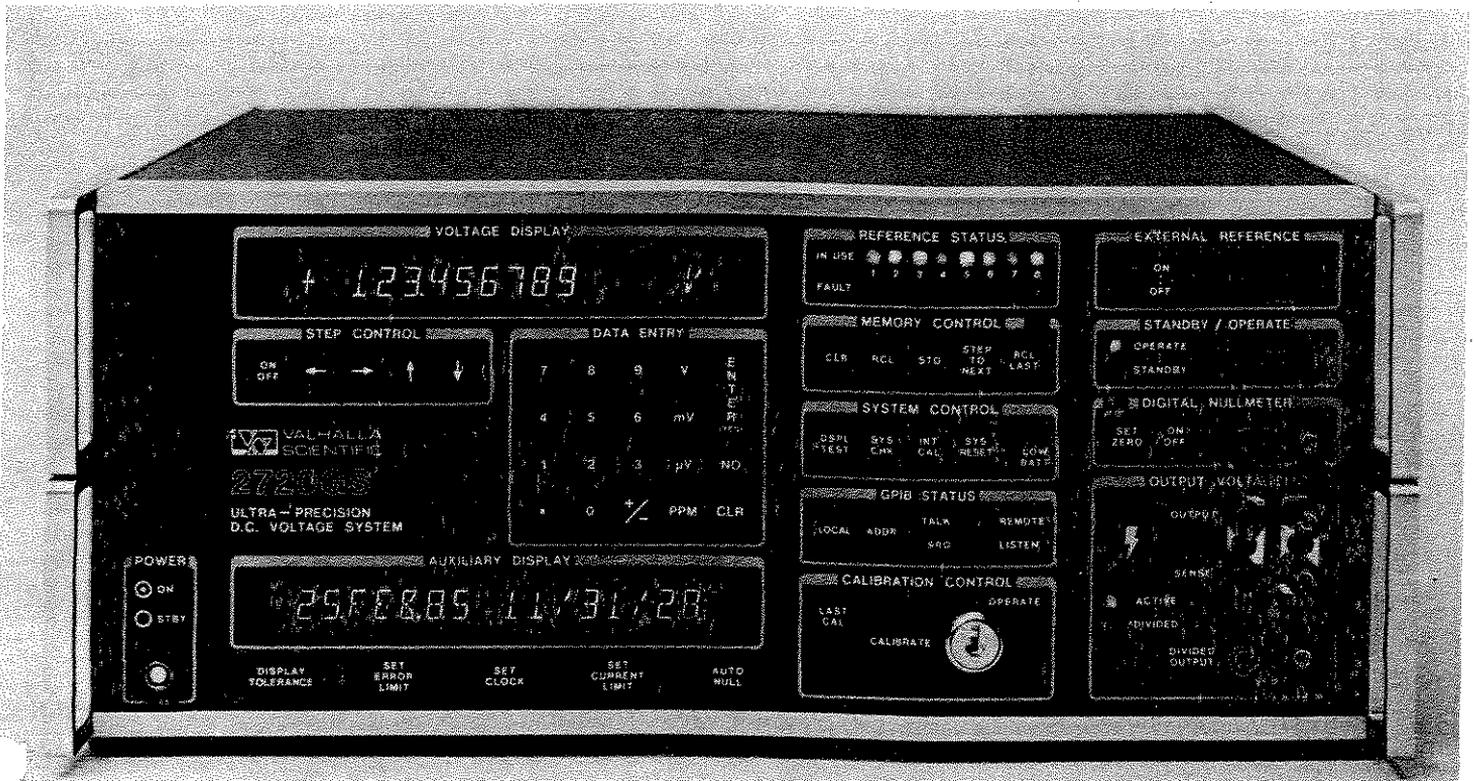


VOLUME 2

2720 GS ULTRA-PRECISION DC VOLTAGE SYSTEM --- OPERATION AND MAINTENANCE MANUAL



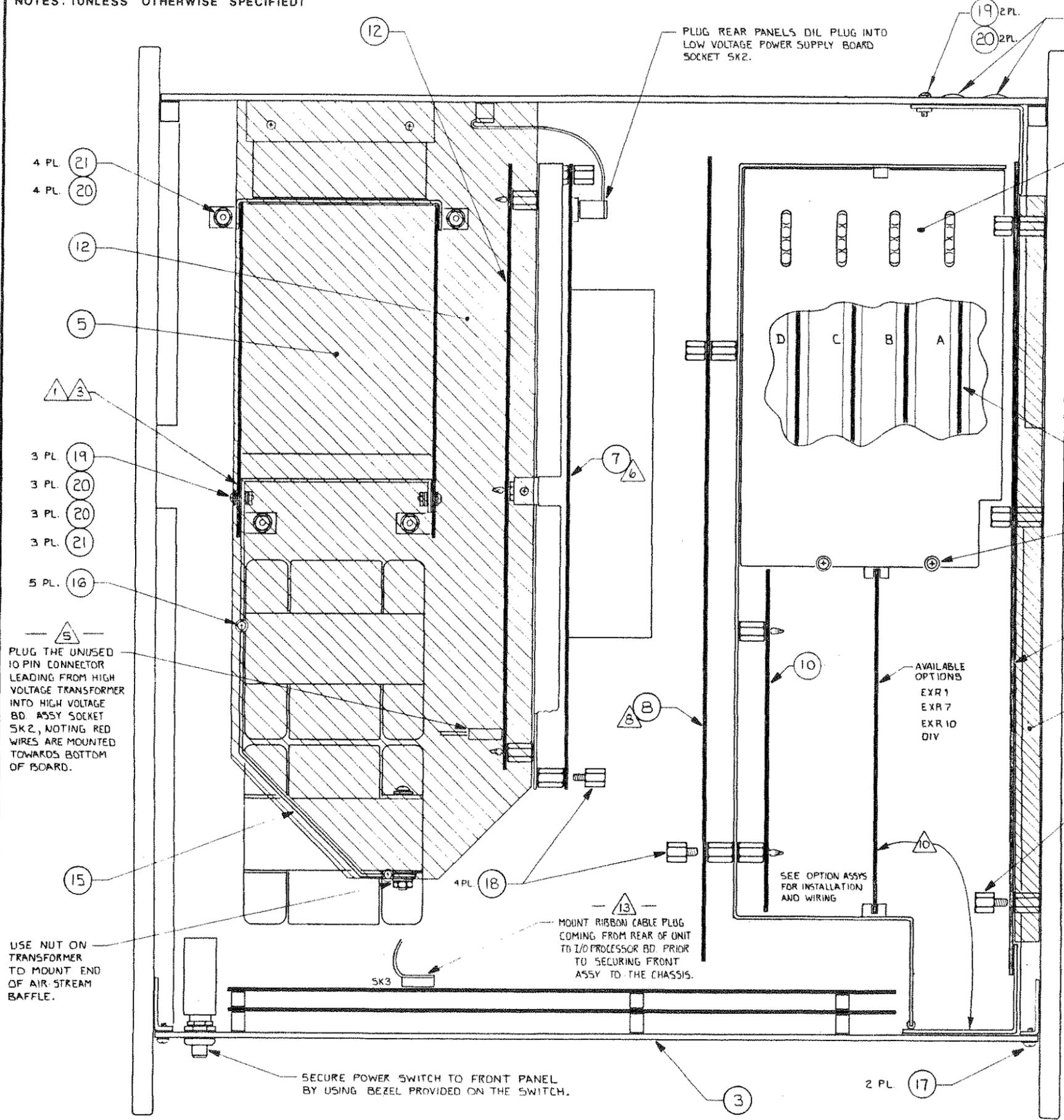
**VALHALLA
SCIENTIFIC**

9955 Mesa Rim Rd
San Diego, Ca 92121
Telex 181750

REVISED 07/18/85

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED	WPW 6-7-84	lt
542	B	ADD ORDER OF ASSY INSTR.	8-14-84	FWD
647	C	ADDED HOLE PLUGS.	RDN 1-7-85	JMA



PLUG REAR PANELS DIL PLUG INTO LOW VOLTAGE POWER SUPPLY BOARD SOCKET SK2.

4 PUT PLUGS IN HOLES WITHOUT BINDING POST. IT MAY BE NECESSARY TO SHAVE ONE SIDE OF THE PLUG, SO IT WILL FIT FLUSH WITH THE REAR PANEL.

14 WHEN INSTALLING COVER INSURE IT MOUNTS IN TABS AS SHOWN, ALSO ENSURE L.E.D.S ARE PROPERLY ALIGNED IN SLDT.S.

REFERENCE MODULE OPTIONS

OPTION	* REF. BDS.	LOCATIONS
HSR	4 BDS.	A,B,C,D
GS	3 BDS.	A,B,C
S4-4T	2 BDS.	A,B

ALL REFERENCE BDS ARE TO BE COMPLETELY SOAKED AND TAKEN FROM 2710 REFERENCE SYSTEM. ANY GRADE BOARD MAY BE USED IN OPTION S4-4T. GS OR HSR GRADE BOARDS MAY BE USED IN OPTION GS. ONLY HSR GRADE BOARDS MAY BE USED IN OPTION HSR. BOARDS MUST BE COMPLETELY INSERTED INTO CARD GUIDES.

9 SEE REFERENCE MODULE OPTIONS

5 PLUG THE UNUSED 10 PIN CONNECTOR LEADING FROM HIGH VOLTAGE TRANSFORMER INTO HIGH VOLTAGE BD ASSY SOCKET SK2, NOTING RED WIRES ARE MOUNTED TOWARDS BOTTOM OF BOARD.

USE NUT ON TRANSFORMER TO MOUNT END OF AIR STREAM BAFFLE.

13 MOUNT RIBBON CABLE PLUG COMING FROM REAR OF UNIT TO I/O PROCESSOR BD. PRIOR TO SECURING FRONT ASSY TO THE CHASSIS.

10 SEE OPTION ASSYS FOR INSTALLATION AND WIRING

AVAILABLE OPTIONS
EXR 1
EXR 7
EXR 10
DIV

SUGGESTED ORDER OF ASSEMBLY

- 1 MOUNT AIR BAFFLE TO AMPLIFIER ASSEMBLY.
- 2 DISASSEMBLE SIDERAILS FROM RIGHT SIDE OF UNIT (REMOVE REAR PANEL ASSEMBLY).
- 3 MOUNT AMPLIFIER ASSEMBLY AND AIR BAFFLE.
- 4 MOUNT HIGH-VOLTAGE POWER SUPPLY ASSEMBLY. RE-INSTALL RIGHT SIDE RAILS AND REAR PANEL.
- 5 PLUG TRANSFORMER INTO HIGH-VOLTAGE POWER SUPPLY ASSEMBLY.
- 6 MOUNT LOW-VOLTAGE POWER SUPPLY ASSEMBLY.
- 7 CONNECT REAR PANELS DIL PLUG TO CONNECTOR ON LOW-VOLTAGE POWER SUPPLY.
- 8 MOUNT MAIN MICROPROCESSOR ASSEMBLY.
- 9 INSTALL REFERENCE MODULES.
- 10 WIRE NULLMETER AND OUTPUT SYSTEM ASSEMBLIES TOGETHER.
- 11 PUT ON REFERENCE MODULE COVER.
- 12 PUT ON HIGH VOLTAGE COVER.
- 13 MOUNT FRONT ASSEMBLY BY FIRST CONNECTING RIBBON CABLE, THEN, SECURING FRONT ASSEMBLY.
- 14 MOUNT TOP BEZEL AND COVER.

3 SECURE POWER SWITCH TO FRONT PANEL BY USING BEZEL PROVIDED ON THE SWITCH.

DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON	TOLERANCES	MATERIAL	FINISH	DRAWN	CHECKED	APPR	STK NO	SCALE	CODE	IDENT	SIZE	DRAWING NO	REV
				X" = ± .30' .XX = ± .03 XXX = ± .010	SEE PARTS LIST		WPW	lt			1:1	53504	D	2720-400		
				BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES												



FINAL CHASSIS ASSY

NOTES: (UNLESS OTHERWISE SPECIFIED)

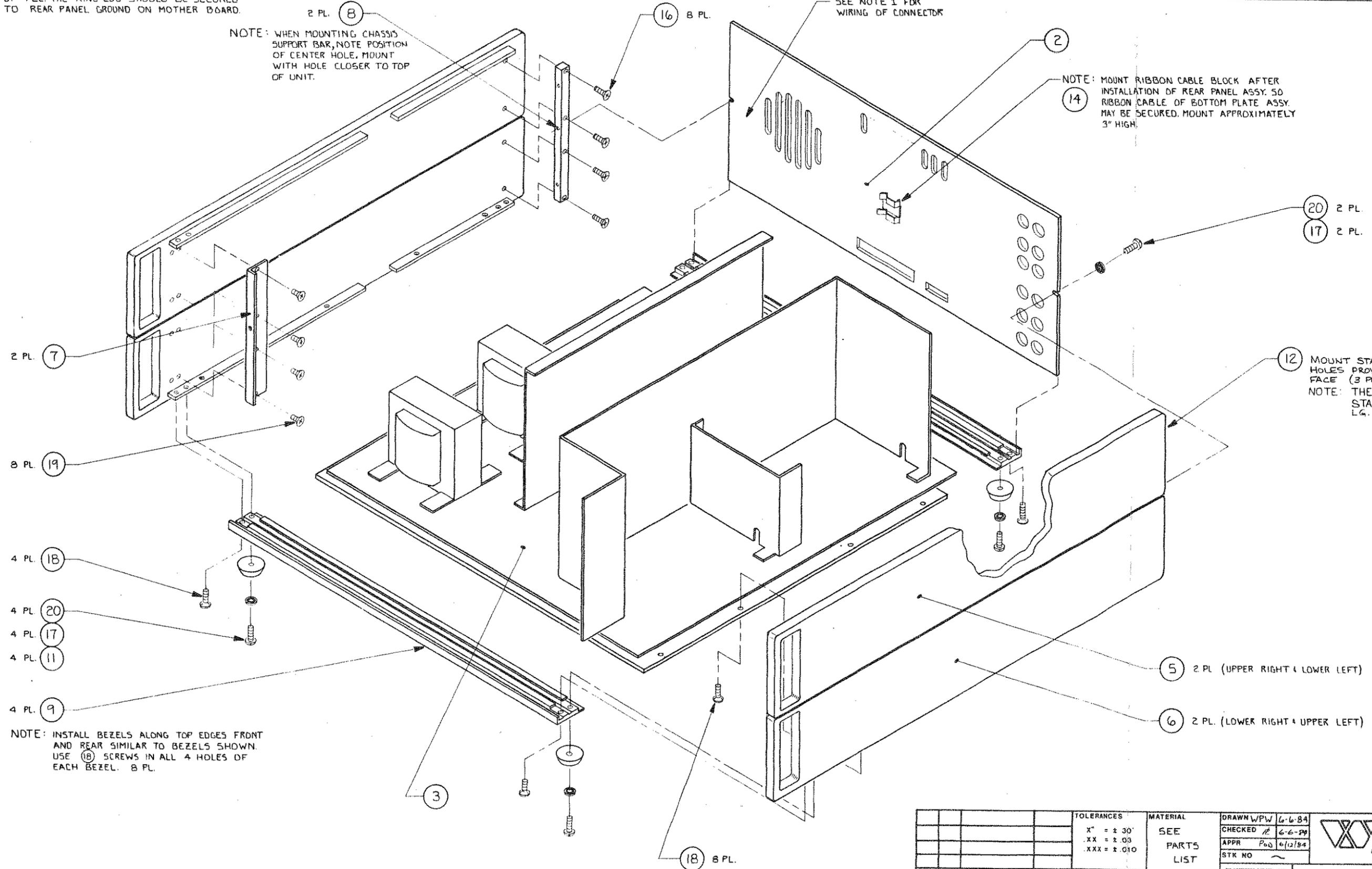
1. WHEN INSTALLING REAR PANEL ASSY CONNECT THE PANEL'S SOCKET TO PLC OF MOTHER BOARD MATCHING PIN 1 OF SOCKET TO PIN 1 OF PLC. THE RING LUG SHOULD BE SECURED TO REAR PANEL GROUND ON MOTHER BOARD.

NOTE: WHEN MOUNTING CHASSIS SUPPORT BAR, NOTE POSITION OF CENTER HOLE. MOUNT WITH HOLE CLOSER TO TOP OF UNIT.

SEE NOTE 1 FOR WIRING OF CONNECTOR

NOTE: MOUNT RIBBON CABLE BLOCK AFTER INSTALLATION OF REAR PANEL ASSY. SO RIBBON CABLE OF BOTTOM PLATE ASSY. MAY BE SECURED. MOUNT APPROXIMATELY 3" HIGH.

NOTE: MOUNT STANDOFFS INTO #8-32 HOLES PROVIDED ON THE INSIDE FACE (3 PLACES). NOTE: THESE ARE MODIFIED STANDOFFS WITH .20 LG. THREADS.

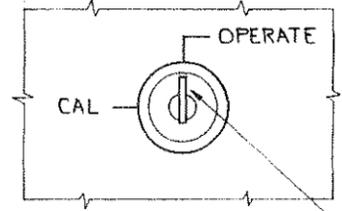


REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
470	A	RELEASED	WPW 6-6-84	PL
545	B	MODIFIED STANDOFF (.20 LG.)	RDN 12-10-84	PL
647	C	DELETED HOLE PLUGS.	RDN 1-7-84	PL

TOLERANCES		MATERIAL		DRAWN WPW 6-6-84		 Valhalla Scientific Inc. SAN DIEGO, CA
X" = ± .30		SEE PARTS LIST		CHECKED PL 6-6-84		
.XX = ± .03				APPR Poo 6/12/84		
XXX = ± .010		FINISH		STK NO		INITIAL CHASSIS ASSY.
BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES				SCALE 1:2		
DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON	84	✓	CODE IDENT 53504
					SIZE D	DRAWING NO 2720-404
					REV C	SHEET 1 OF 2

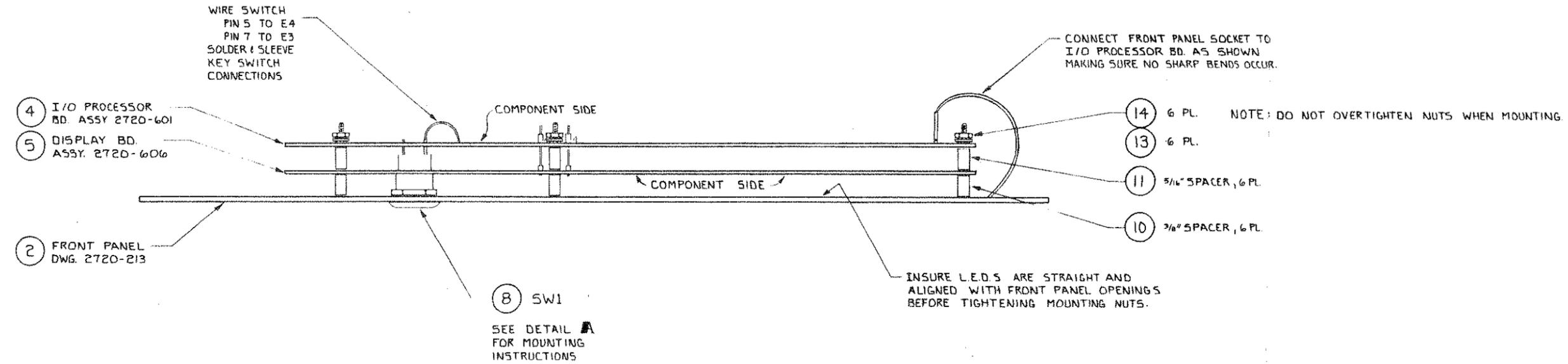
NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
424	A	RELEASED	4-27-84	WFW
633	B	DELETE REALTIME CLOCK BD. RDN	12-10-84	WFW



DETAIL A
SCALE: NONE

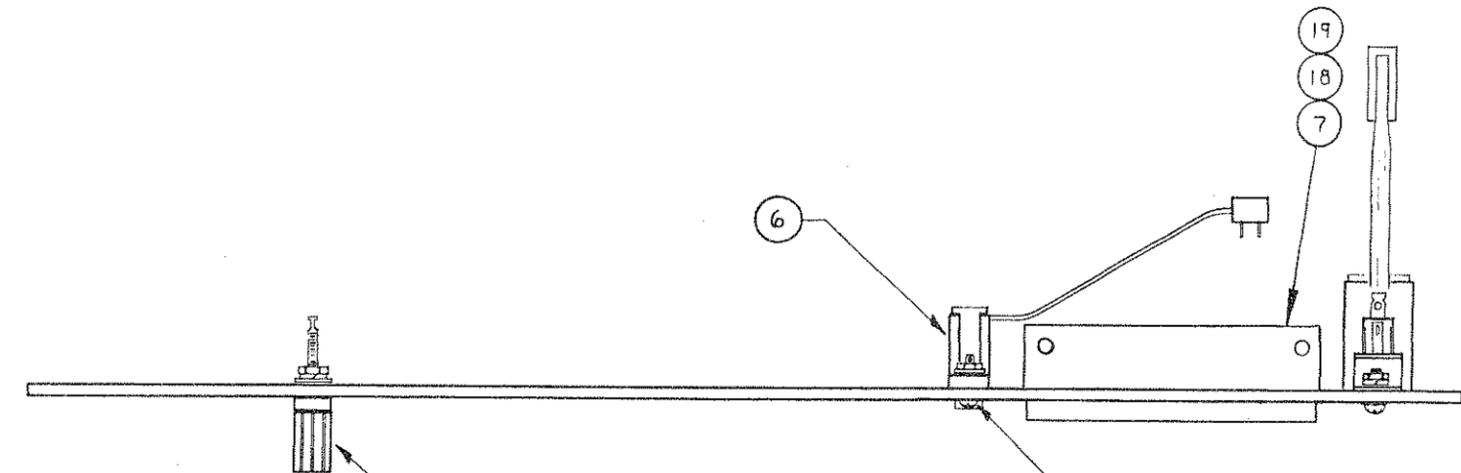
NOTE POSITION OF KEYHOLE
RELATIVE TO FRONT PANEL MARKS.
MOUNT SWITCH WITH NUT PROVIDED.
DO NOT OVERTIGHTEN NUT.



DASH NO		QTY RECD	NEXT ASSEMBLY	USED ON	TOLERANCES X" = ± .30" .XX = ± .03 .XXX = ± .010	MATERIAL SEE PARTS LIST	FINISH ~	DRAWN WFW 4-25-84 CHECKED R 4-27-84 APPR WFW 4-27-84 STK NO	<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>	FRONT ASSY.
SCALE 1:1		CODE IDENT 53504	SIZE D	DRAWING NO 2720-401	REV B	SHEET 2 OF 2				

NOTES: (UNLESS OTHERWISE SPECIFIED)

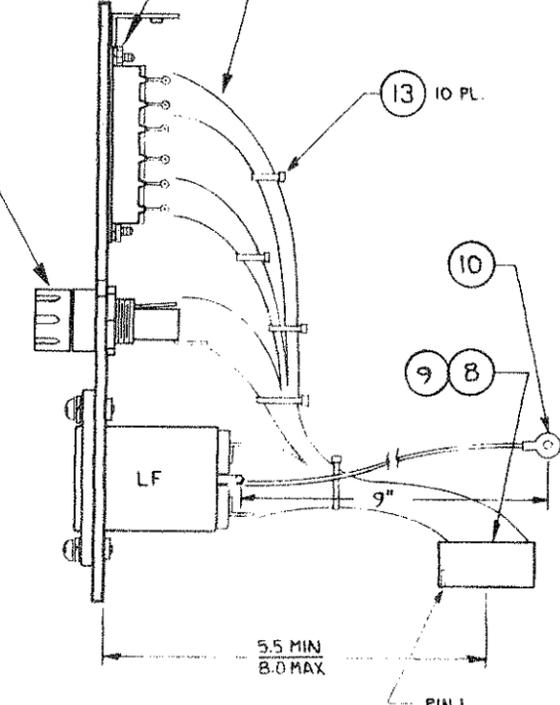
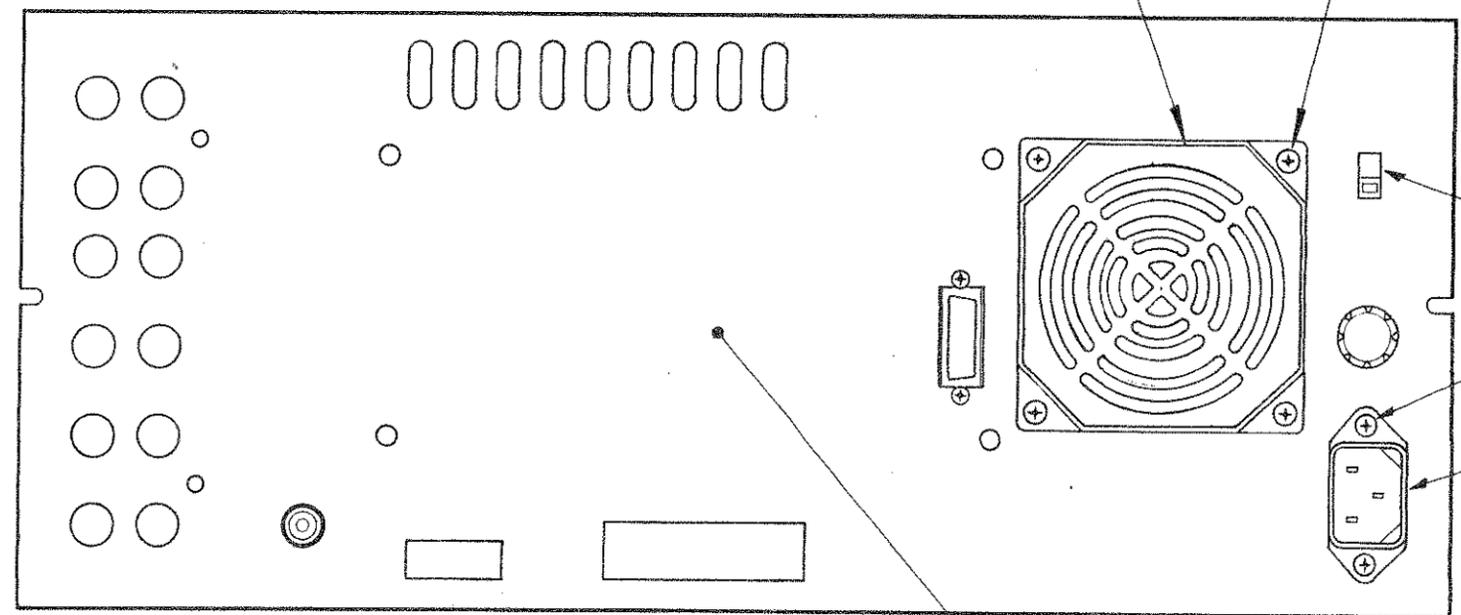
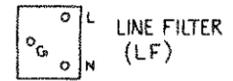
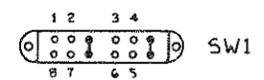
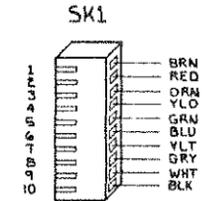
REVISIONS					
ECO	LTR	DESCRIPTION	DATE	APPROVED	
420	A	DWG. RELEASED	4-20-84	WPW	FDS
424	B	UPDATED PARTS LIST	6-6-84		R
535	C	UPDATED PARTS LIST	12-10-84	RDN	RJS



5 TO MOUNT BINDING POST USE NUT AND WASHERS SUPPLIED.

INSTALL FANGUARD WITH FILTER RETAINER ON OUTSIDE, SO FILTER IS ACCESSIBLE FOR REPLACEMENT.

NOTE POSITION OF WIRES LEADING TO CONNECTOR. TY-WRAPS TO BE USED WHERE NEEDED. FOR WIRING INFORMATION SEE WIRE TABLE.



WIRE TABLE

FROM	TERMINATION	TO	TERMINATION	AWG	COLOR
SK1-1	CT	SW1-2	S-S	18	BRN
SK1-2	CT	SW1-7	S-S	18	RED
SK1-3	CT	SW1-3	S-S	18	ORN
SK1-4	CT	SW1-5	S-S	18	YLO
SK1-5	CT	SW1-4	S-S	18	GRN
SK1-6	CT	SW1-6	S-S	18	BLU
SK1-7	CT	LF-N	S-S	18	VLT
SK1-8	CT	SW1-1	S-S	18	GRY
SK1-9	CT	FSL-2	S-S	18	WHT
SK1-10	CT	SW1-8	S-S	18	BLK
FSL-1	S-S	LF-L	S-S	16	BLK
LF-G	S-S	W SOLDER LOG	S-S	16	GRN

NOTE: CT → CRIMP TERMINAL
S-S → SOLDER + SLEEVE

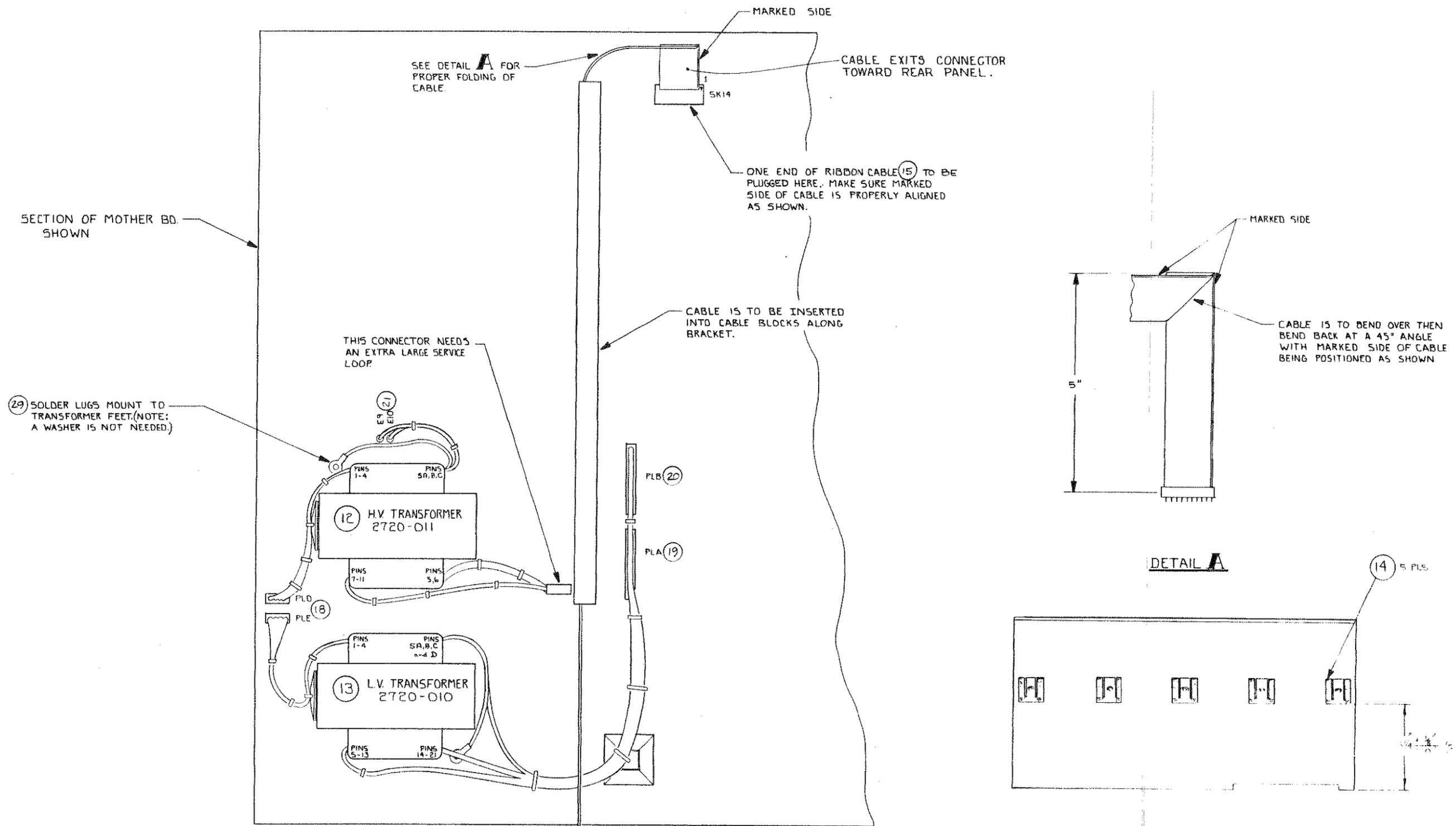


TOLERANCES		MATERIAL		DRAWN WPW 4-20-84	
X° = ± 30'	XX = ± .03	SEE PARTS LIST		CHECKED R 4-20-84	
XXX = ± .010				APPR 12-10-84	
BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES		FINISH		STK NO	
64 ✓		~		REAR PANEL ASSY	
DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON	SCALE NONE	CODE IDENT SIZE DRAWING NO
				SHEET 3 OF 3	53504 D 2720-402 C



NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. ALL WIRING MUST ALLOW FOR SERVICING LOOPS.

ECO		LTR		REVISIONS		DATE	APPROVED
				SEE SHT. 1			



DETAIL B
 SPACE 5 EA. ITEM (14) EVENLY ACROSS BRACKET POINTING UPWARD AS SHOWN.

DASH NO		QTY RECD	NEXT ASSEMBLY	USED ON	TOLERANCES X = ± .30 .XX = ± .03 .XXX = ± .010	MATERIAL	FINISH	DRAWN WPW 5-21-84	CHECKED R 5-25-84	APPR POW 6/1/84	STK NO	<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>
					BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES			<p>THE INFORMATION DISCLOSED UNDER THIS CONTROL IS THE PROPERTY OF VALHALLA SCIENTIFIC INC. AND IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.</p>		BOTTOM PLATE ASSY.		
SCALE 1:1		CODE IDENT 53504	SIZE D	DRAWING NO 2720-405	REV C							
SHEET 2 OF 4												

NOTES: (UNLESS OTHERWISE SPECIFIED)

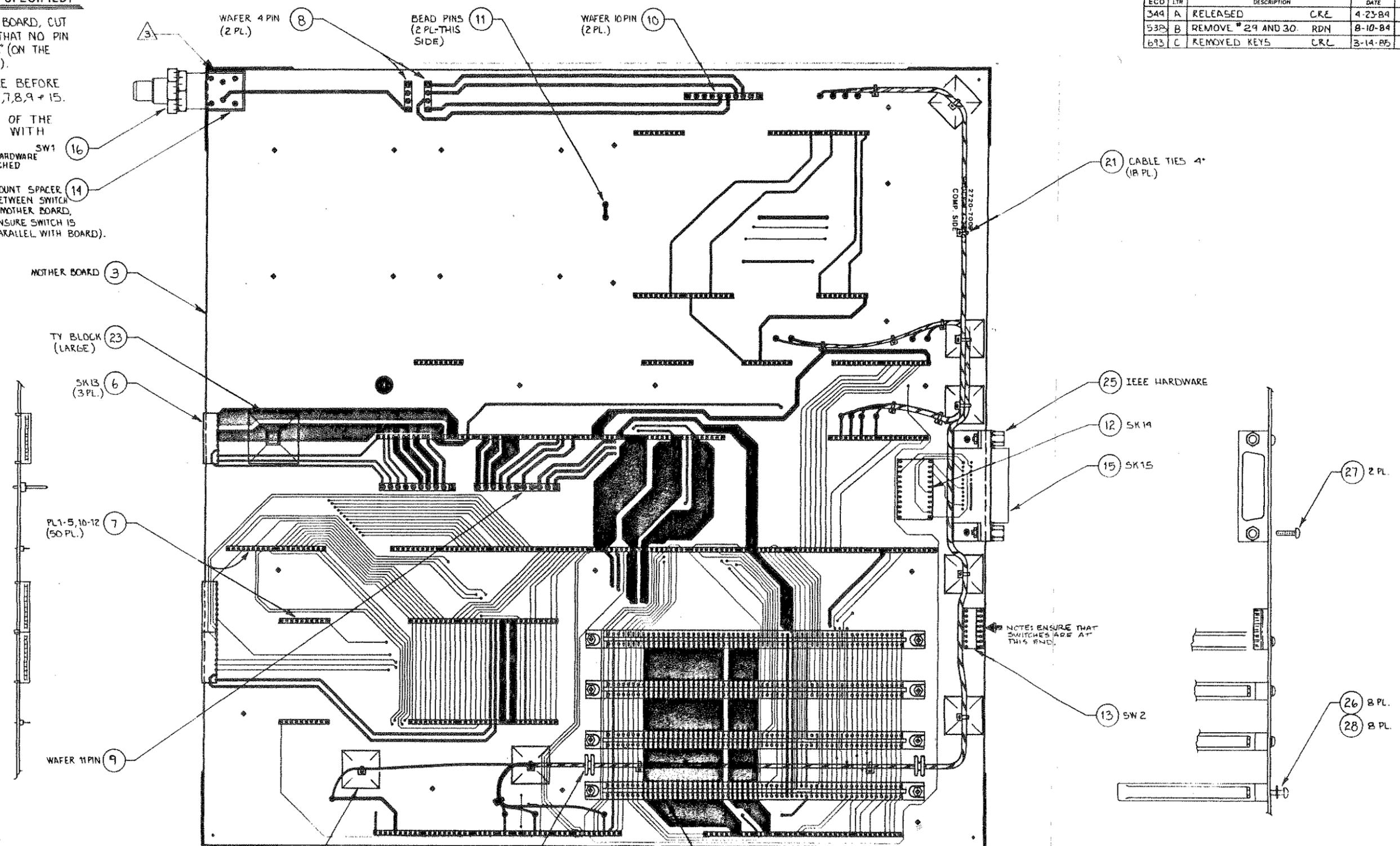
1. AFTER ASSEMBLING ENTIRE BOARD, CUT ALL PINS & WIRES BACK SO THAT NO PIN OR WIRE IS LONGER THAN 1/8" (ON THE SOLDER SIDE OF THE BOARD).
2. TIGHTEN DOWN ALL HARDWARE BEFORE SOLDERING THE PINS OF SK6,7,8,9 & 15.

3. CUT THE TOP PINS OFF OF THE POWER SWITCH AND COVER WITH ELECTRICAL TAPE.

SW1
LEAVE HARDWARE ATTACHED

MOUNT SPACER BETWEEN SWITCH & MOTHER BOARD. (ENSURE SWITCH IS PARALLEL WITH BOARD).

REVISIONS					
ECO	LTR	DESCRIPTION	DATE	APPROVED	
349	A	RELEASED	C.R.E.	4-23-84	FE
532	B	REMOVE # 29 AND 30.	R.D.N.	8-10-84	J.M.
693	C	REMOVED KEYS	C.R.L.	3-14-85	PatD



WIRE TABLE

USE TEFLON WIRE ONLY

FROM	TO	COLOR
E1	E11	RED
E2	E12	BLACK
E3	E13	WHITE
E4	E14	GREEN
E5	E15	RED
E6	E16	BLACK
E7	E17	WHITE
E8	E18	GREEN

(SLIGHTLY TWIST WIRE BUNDLES)

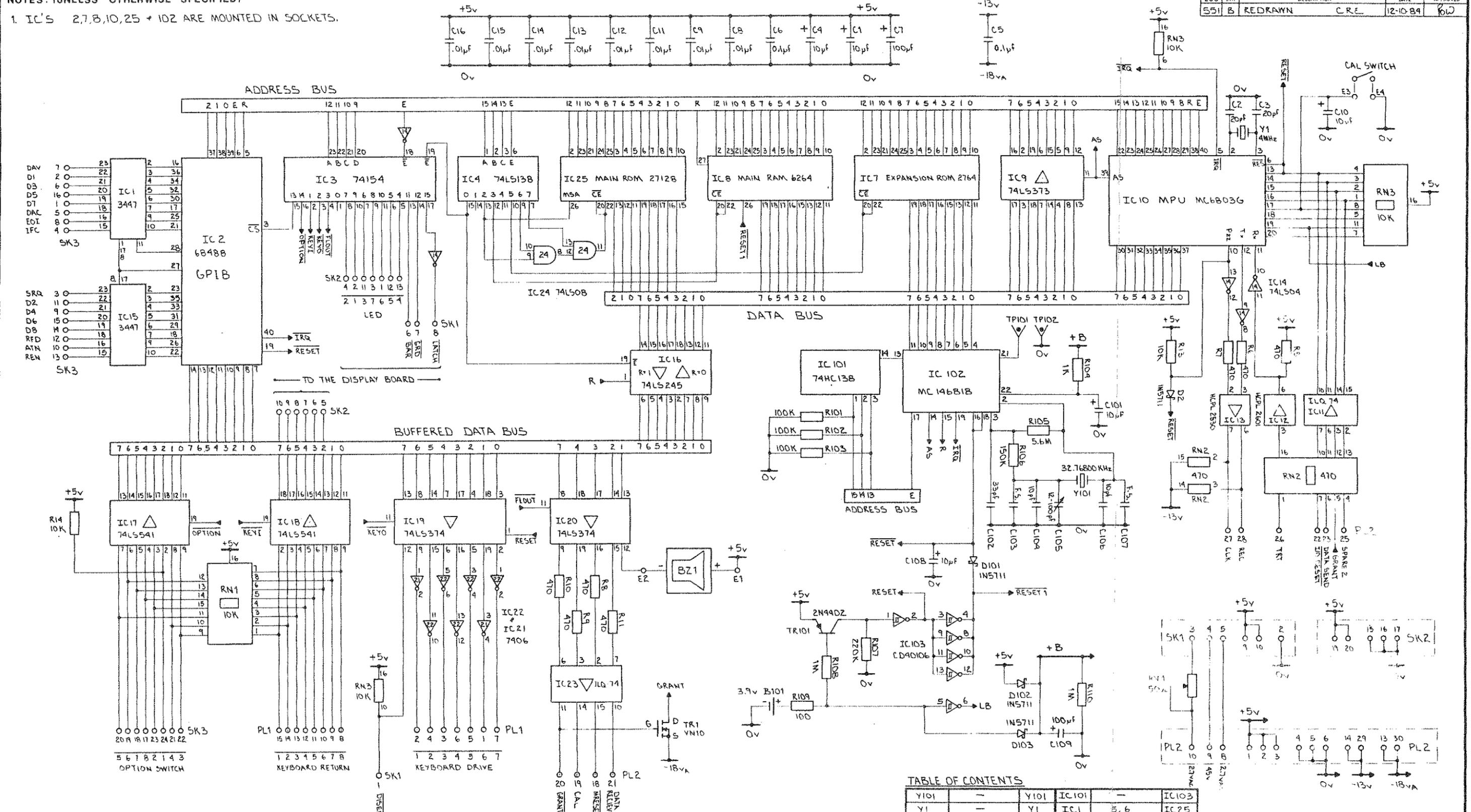
DASH NO		QTY REQD		NEXT ASSEMBLY		USED ON		TOLERANCES		MATERIAL		DRAWN C.R.E. 4-23-84		<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>			
1				2720				X = ± .30"		BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES		CHECKED E 4-24-84				<p>SCALE 1:1</p> <p>CODE IDENT 53504</p> <p>SIZE D</p> <p>DRAWING NO 2720-600</p> <p>REV C</p>	
								.XX = ± .03		FINISH		APPR 6-16-84					
								.XXX = ± .010				STK NO					

MOTHER BOARD ASSEMBLY

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. IC'S 2,7,8,10,25 + 102 ARE MOUNTED IN SOCKETS.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
551	B	REDRAWN	C.R.E.	12-10-84



IC #	+5v	0v
1	24	12,13,14
2	20	1,2
3	24	12
4	16	4,5,8
14	14	7
7	1,26,27,28	14

IC #	+5v	0v
9,17,18,20	20	1,10
10	4,7,9,21	1,8
15	1,24	11,12,13,14
16,19	20	10
21,22,24	14	7

IC #	+5v	0v
25	1,27,28	14

IC #	+B	0v
101	6,16	4,5,8
102	1,20,24	12
103	14	7
8	1,28	14

IC #	+5v	0v	-13v	-18v
11	-	9,12,13,16	1,4,5,8	-
12	7,8	5	2	-
13	1,4	-	8	5
23	1,4,5,8	-	-	9,12,13,16

TABLE OF CONTENTS

Y101	-	Y101	IC101	-	IC103
Y1	-	Y1	IC1	-	IC25
TP101	-	TP102	E1	-	E4
TR101	-	TR101	D101	-	D103
TR1	-	TR1	D2	1	D2
SK1	-	SK3	C101	-	C109
RN1,R	-	RN3,RV1	C1	-	C16
R101	-	R110	BZ1	-	BZ1
RS	1,2,3,4,12	R14	B101	-	B101
PL1	-	PL2	FIRST	NOT USED	LAST

Valhalla Scientific Inc. SAN DIEGO, CA

I/O PROCESSOR

CODE IDENT 53504 SIZE D DR'WING NO 2720-071

SHEET 1 OF 2

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

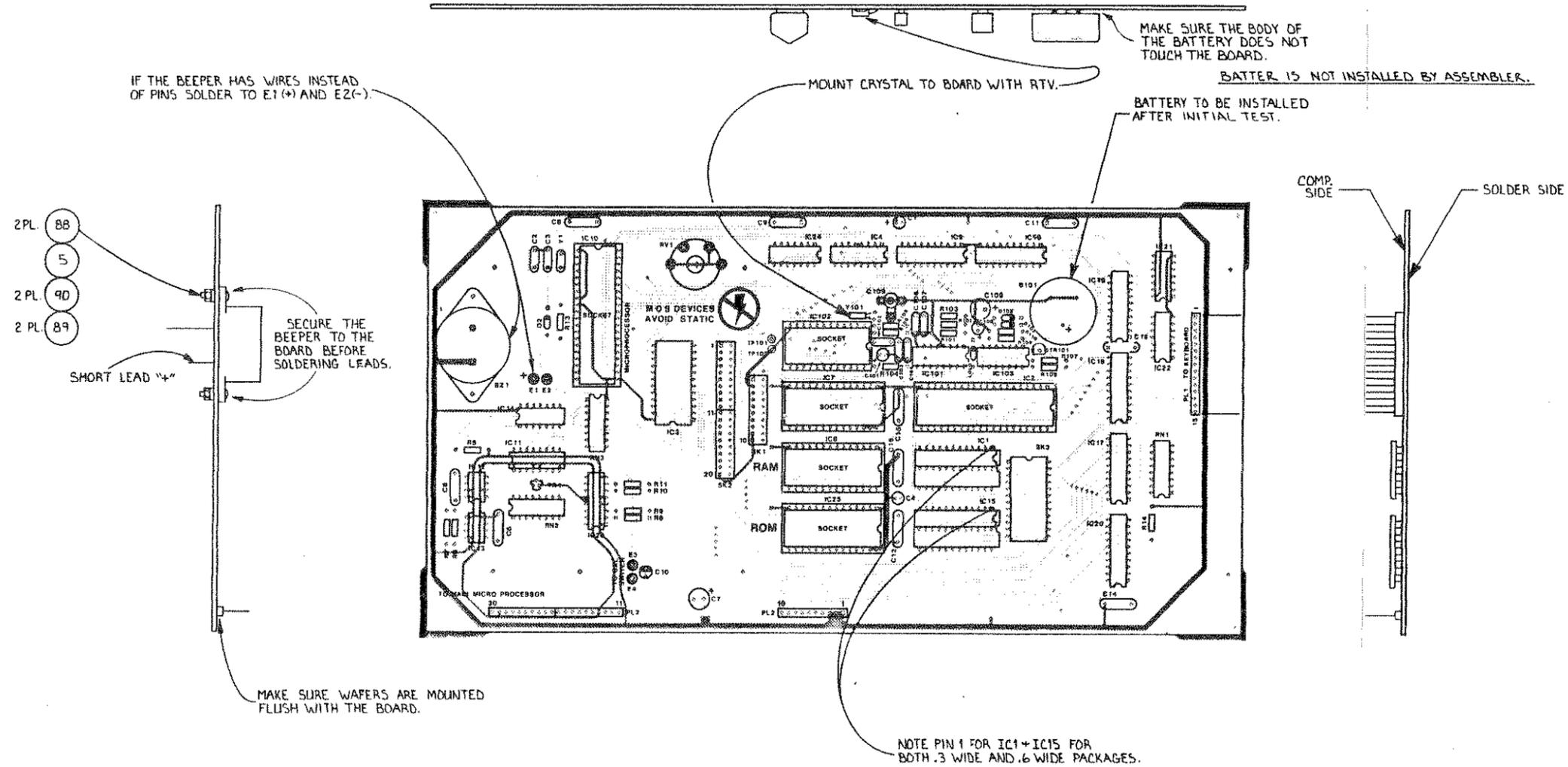
KEY BOARD TABLE

PINS ON PL 1	8 (D0)	9 (D1)	10 (D2)	11 (D3)	12 (D4)	13 (D5)	14 (D6)	15 (D7)
1 (D1)	ON/OFF EXT. REF.	RCL LAST	STEP TO NEXT	ENTER (TOP HALF)	STO (MEM)	RCL (MEM)	CLR (MEM)	V
2 (D6)	ON OFF	←	→	↑	↓/S	7	8	9
3 (D4)	S BELOW- EXT. REF. ON	SET ZERO	RESET	ENTER YES	INT CAL	SYS CHECK	DSPL TEST	mV
4 (D5)	ON/OFF NULL MTR	ADDR	LOCAL	S LOGO	S LEFT-4	4	5	6
5 (D2)	NO	S BELOW- ADDR	S BELOW- LOCAL	μV	S LEFT-1	1	2	3
6 (D3)	CLR	S RIGHT- LAST-CAL	LAST CAL	PPM	S LEFT-■	■	0	+/-
7 (D0)	ON STBY	S-BOTTOM RIGHT IN CAL. CONTR	S BELOW- LAST-CAL.	AUTO NULL	DISPLAY TOL	SET ERROR LIMIT	SET CLOCK	SET CURRENT LIMIT

DASH NO		QTY REQD	NEXT ASSEMBLY	USED ON	TOLERANCES X = ± .30' .XX = ± .03 .XXX = ± .010	MATERIAL	FINISH	DRAWN RDN 12-11-64	CHECKED	APPR	STK NO	 Valhalla Scientific Inc. SAN DIEGO, CA
					BREAK ALL SHARP CORNERS AND EDGES MACH SURFACES			I/O PROCESSOR				
SCALE		CODE IDENT	SIZE	DRAWING NO	REV		SHEET 2 OF 2		53504	D	2720-071	1

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
551	D	INC. DESIGN CHANGE	DPM 3-1-85	Paw
	E	P/L CHG. ITEMS 9,10,11	DPM 4-4-85	Paw

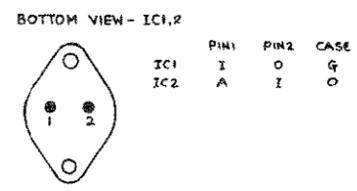
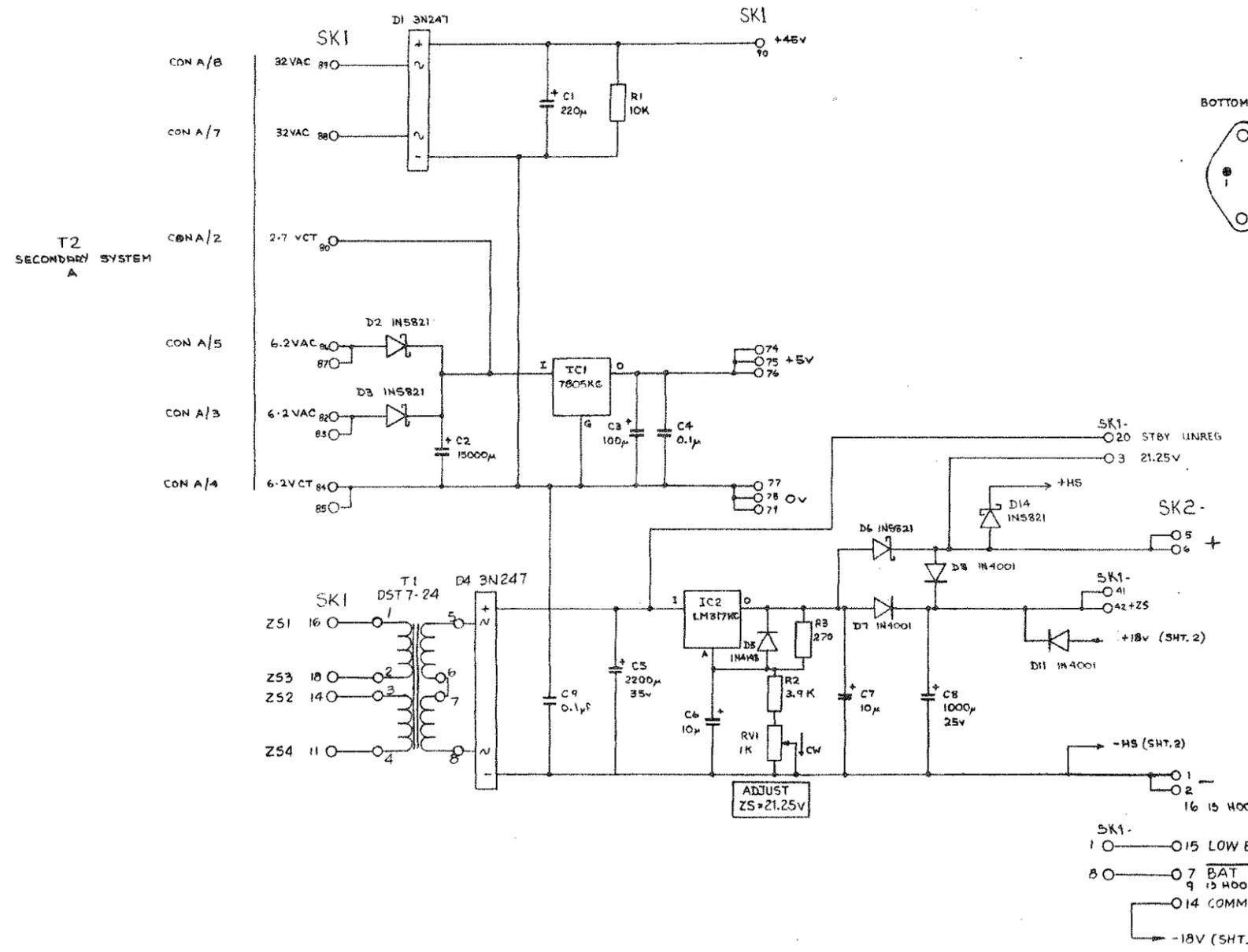


NOTE PIN 1 FOR IC1-IC15 FOR BOTH .3 WIDE AND .6 WIDE PACKAGES.

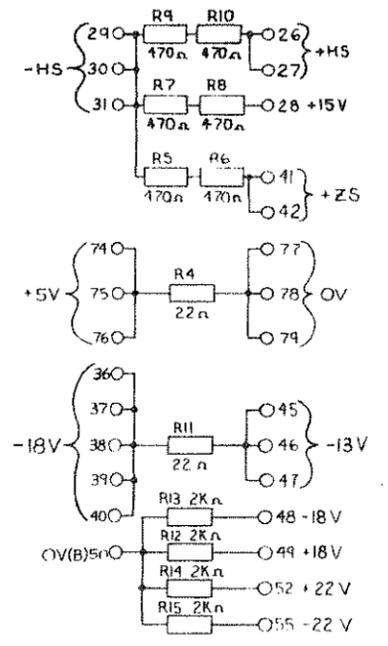
DASH NO		QTY REQD	NEXT ASSEMBLY	USED ON	TOLERANCES X = ± .30 .XX = ± .03 .XXX = ± .010	MATERIAL FINISH	DRAWN DPM 3-1-85 CHECKED E 3-1-85 APPR Paw 3-1-85 STK NO	 SAN DIEGO, CA	I/O PROCESSOR ASSY. DWG.	SCALE 1:1 SHEET 1 OF 5	CODE IDENT 53504 SIZE D	DRAWING NO 2720-601 REV E
				BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES 64 ✓			DRAWN DPM 3-1-85 CHECKED E 3-1-85 APPR Paw 3-1-85 STK NO			I/O PROCESSOR ASSY. DWG.	SCALE 1:1 SHEET 1 OF 5	CODE IDENT 53504 SIZE D

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. IC1,2 ARE MOUNTED ON HEATSINK.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
0332	A	RELEASE	SW 3-1-84	[Signature]
536	B		DPM 1-23-85	[Signature]



PARTIAL EXTENDER BOARD



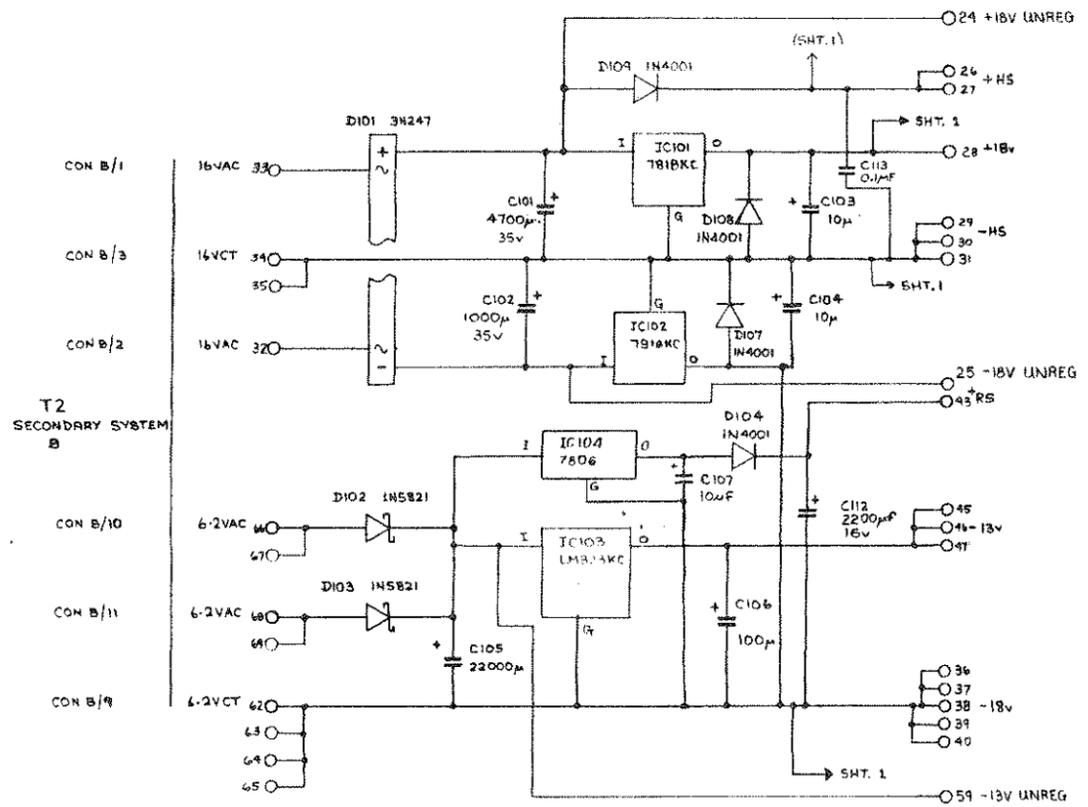
- SK1- 1 O - 15 LOW BAT
- 8 O - 7 BAT FIT
- 9 IS HOOKED UP ON OPTION BAT BOARD
- 14 COMMON
- 18V (SHT. 2)

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN POW	5-5-83
C1	C9-C12	C8	X = ± 30'		CHECKED POW	5-13-83
D1	D9, D10, D12, D13	D14	.XX = ± .03		APPR [Signature]	5-29-84
IC1	IC3, IC4	IC2	.XXX = ± .010		STK NO	
R1	R4-R6, R1A	R3	BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES	FINISH	POWER SUPPLY - LOW VOLTAGE	
RV1	-	RV1			SCALE	CODE IDENT
T1	-	T1			53504	SIZE D
					DRAWING NO	REV
					2720-072	B
					SHEET 1 OF 2	

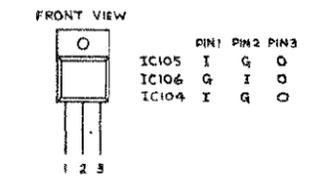


NOTES: (UNLESS OTHERWISE SPECIFIED)

1. IC101-103 ARE MOUNTED ON HEATSINK.

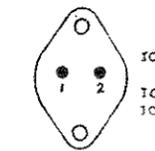


REFERENCE SUPPLIES

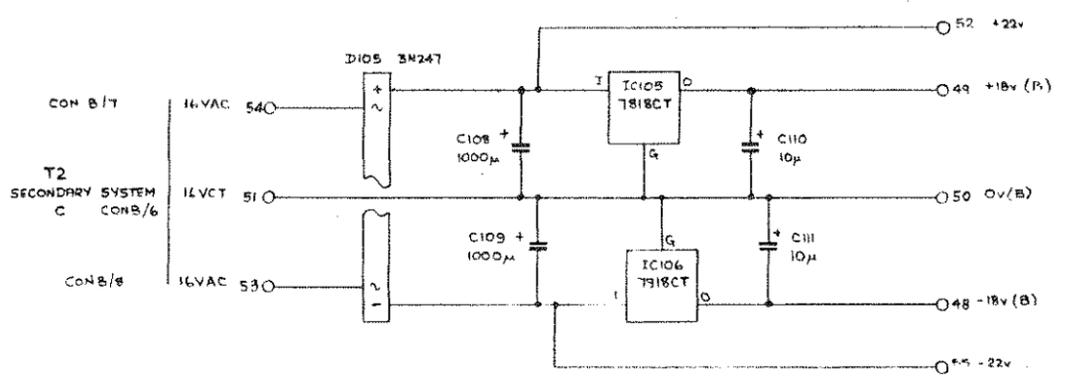


	PIN1	PIN2	PIN3
IC105	I	G	O
IC106	G	I	O
IC104	I	G	O

BOTTOM VIEW



	PIN1	PIN2	CASE
IC103	I	O	G
IC101	I	O	G
IC102	G	O	I



OUTPUT SYSTEM SUPPLIES

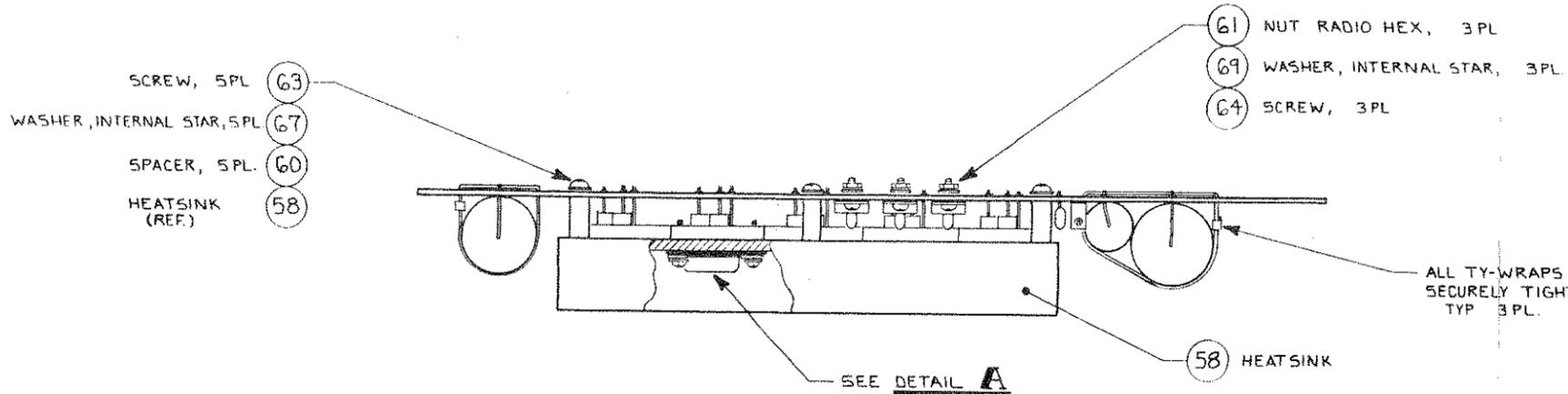
ECO		LTR		REVISIONS		DATE	APPROVED
				DESCRIPTION			
				SET SHEET #			

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN POW	5-5-83
C101	-	C112	X = ± .30'		CHECKED POW	5-13-83
D101	D106	D109	.XX = ± .03		APPR	5-29-84
IC101	-	IC106	.XXX = ± .010		STX NO	
			BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	FINISH	POWER SUPPLY - LOW VOLTAGE	
			64 ✓		SCALE	CODE IDENT
					2 OF 2	53504 D 2120-072
						REV B



NOTES: (UNLESS OTHERWISE SPECIFIED)

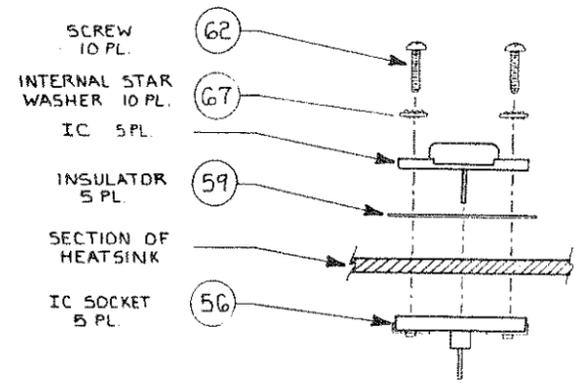
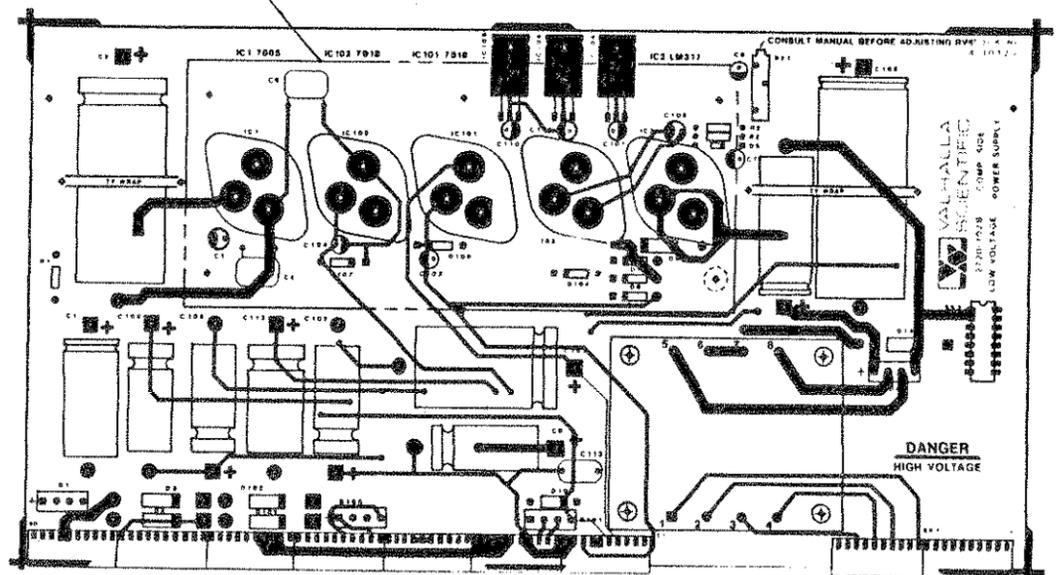
REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
332	A	RELEASED FROM PROTO	3-15-84	R
4169	B	UPDATED PARTS LIST	6-6-84	R
536	C	INCORPORATED DESIGN CHANGES	2-22-85	R



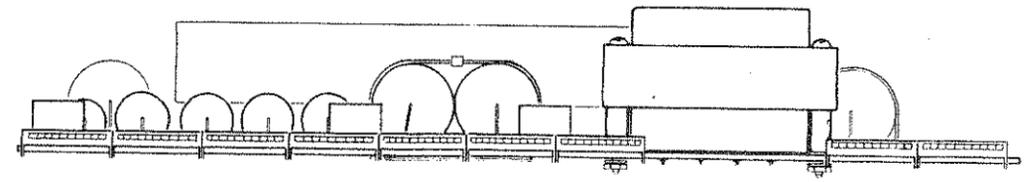
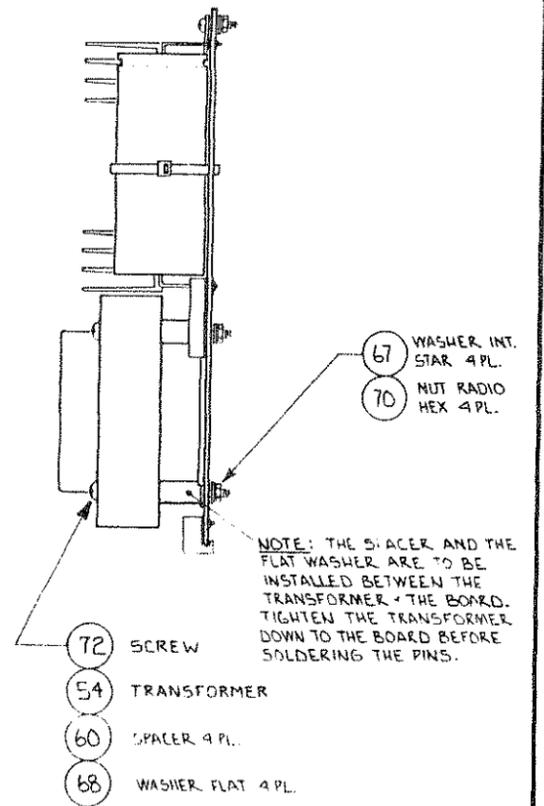
- SCREW, 5 PL (63)
- WASHER, INTERNAL STAR, 5 PL (67)
- SPACER, 5 PL (60)
- HEATSINK (REF.) (58)

SEE DETAIL A
 NOTE IC'S AND SOCKETS SHOULD BE MOUNTED TO HEATSINK BEFORE MOUNTING THEM TO BOARD.

HEATSINK NOT SHOWN IN THIS VIEW.



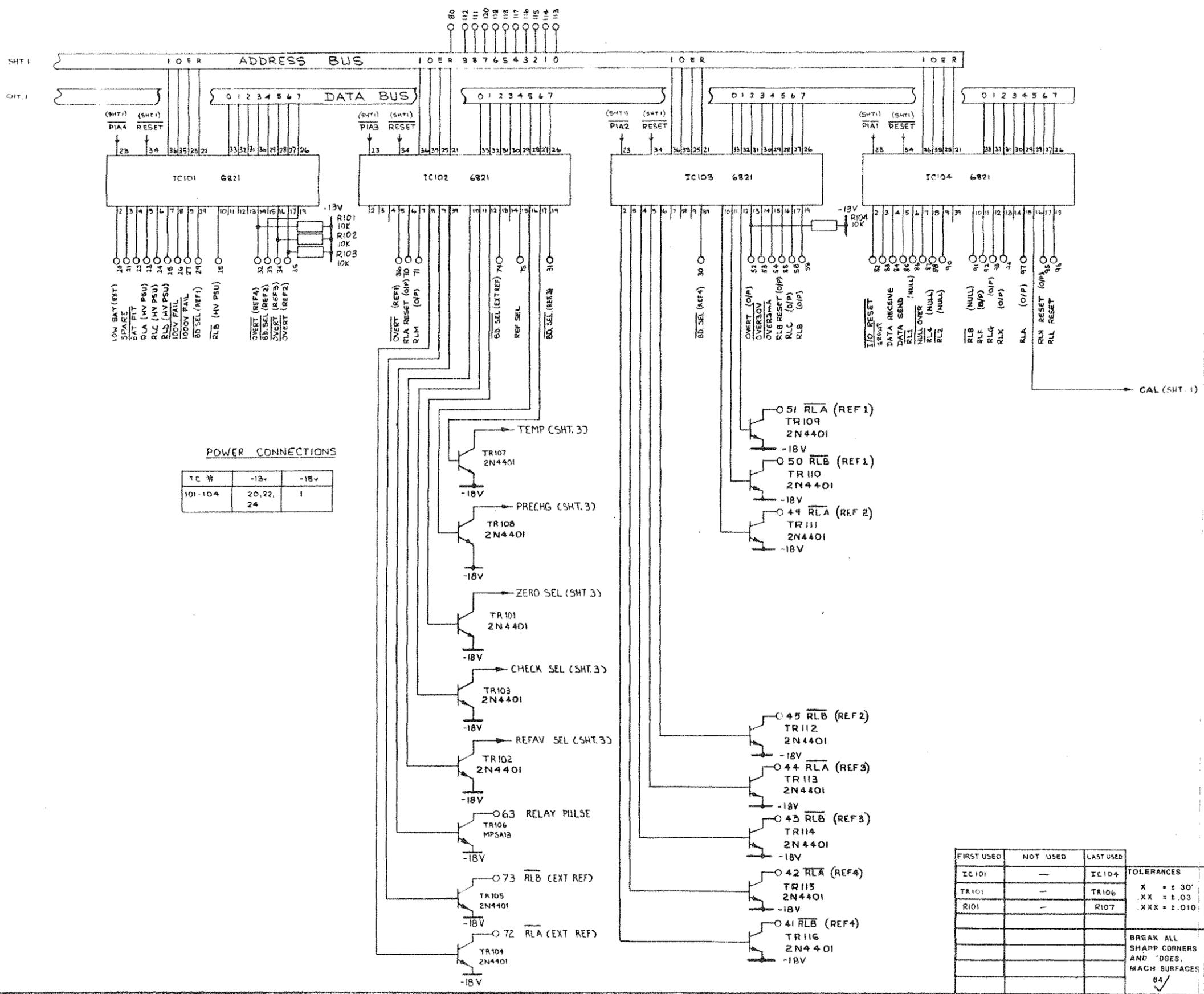
DETAIL A
 SCALE: NONE
 VIEW SHOWN IS PERPENDICULAR TO IC.
 NOTE ALL IC'S ON HEATSINK ARE MOUNTED THE SAME WAY.



TOLERANCES		MATERIAL		DRAWN WPW 3-15-84	
X° = ± .30°		SEE PARTS LISTS		CHECKED JMW 3/15/84	
.XX = ± .03				APPR R 3/15/84	
.XXX = ± .010				STK NO	
BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES		FINISH		Valhalla Scientific Inc. SAN DIEGO, CA	
1 2720- 2720				LOW VOLTAGE POWER SUPPLY ASSY.	
DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON	SCALE 1:1	CODE IDENT 53504
					SIZE D
					DRAWING NO 2720-602
					REV C
				SHEET 5 OF 5	

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
		SET SHEET #1		



FIRST USED	NOT USED	LAST USED
IC101	—	IC104
TR101	—	TR106
R101	—	R107

TOLERANCES
X = ± .30"
.XX = ± .03
.XXX = ± .010

MATERIAL
BREAK ALL SHARP CORNERS AND DGES. MACH SURFACES

DRAWN RDH 5-24-84
CHECKED PBL 5-20-84
APPR PBL 5-30-84
STK NO

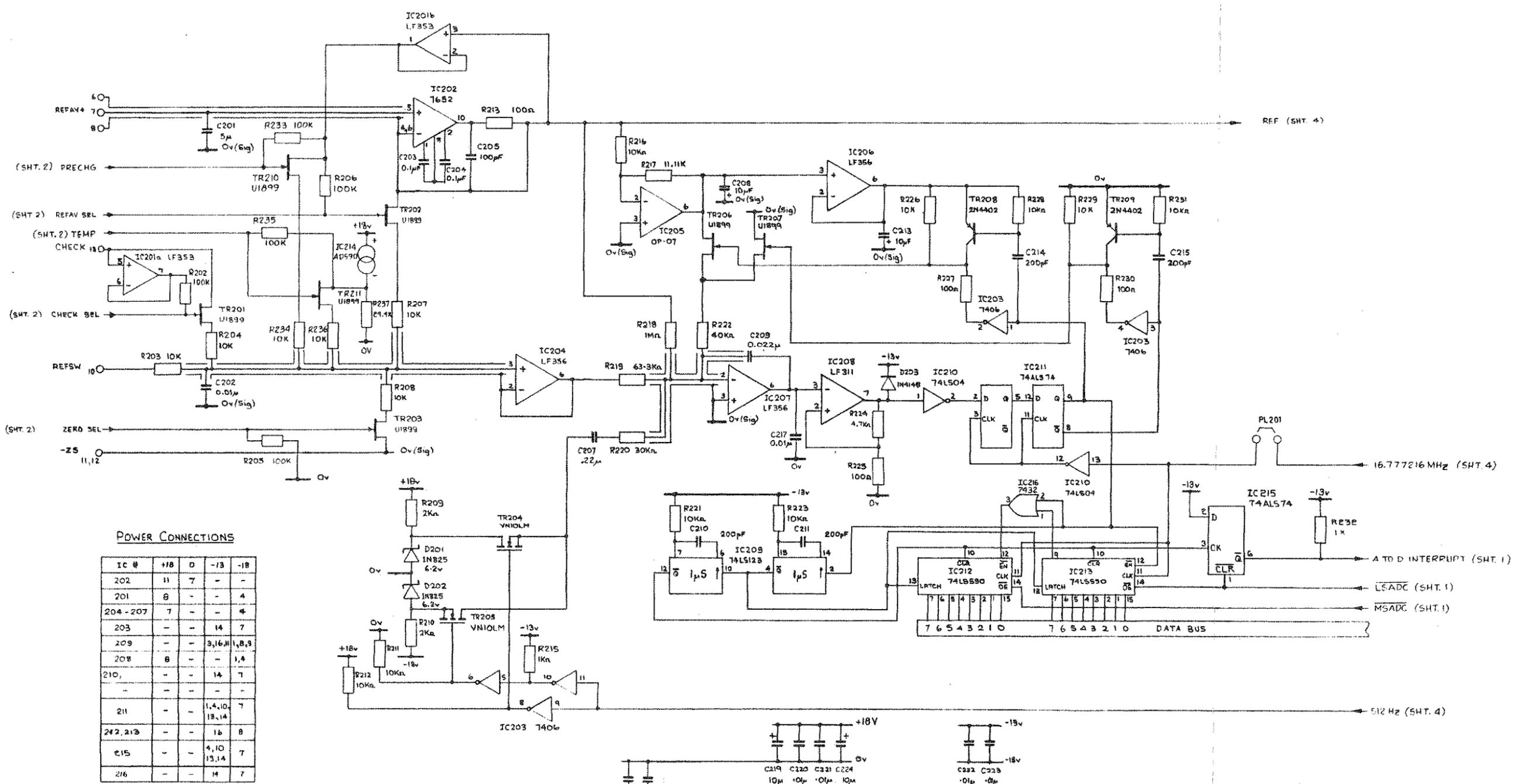
Valhalla Scientific Inc.
SAN DIEGO, CA

OUTPUT MICROPROCESSOR (INTERFACE)

SCALE	CODE IDENT	SIZE	DRAWING NO	REV
SHEET 2 OF 4	53504	D	2720-073	B

NOTES: (UNLESS OTHERWISE SPECIFIED)

ECO		LTR		REVISIONS		DATE	APPROVED



POWER CONNECTIONS

IC #	+18	0	-18	-18
202	11	7	-	-
201	8	-	-	4
204 - 207	7	-	-	4
203	-	-	14	7
209	-	-	3,16,11,18,14	7
208	8	-	-	1,4
210,	-	-	14	7
-	-	-	-	-
211	-	-	1,4,10,13,14	7
212, 213	-	-	16	8
215	-	-	4,10,13,14	7
216	-	-	14	7

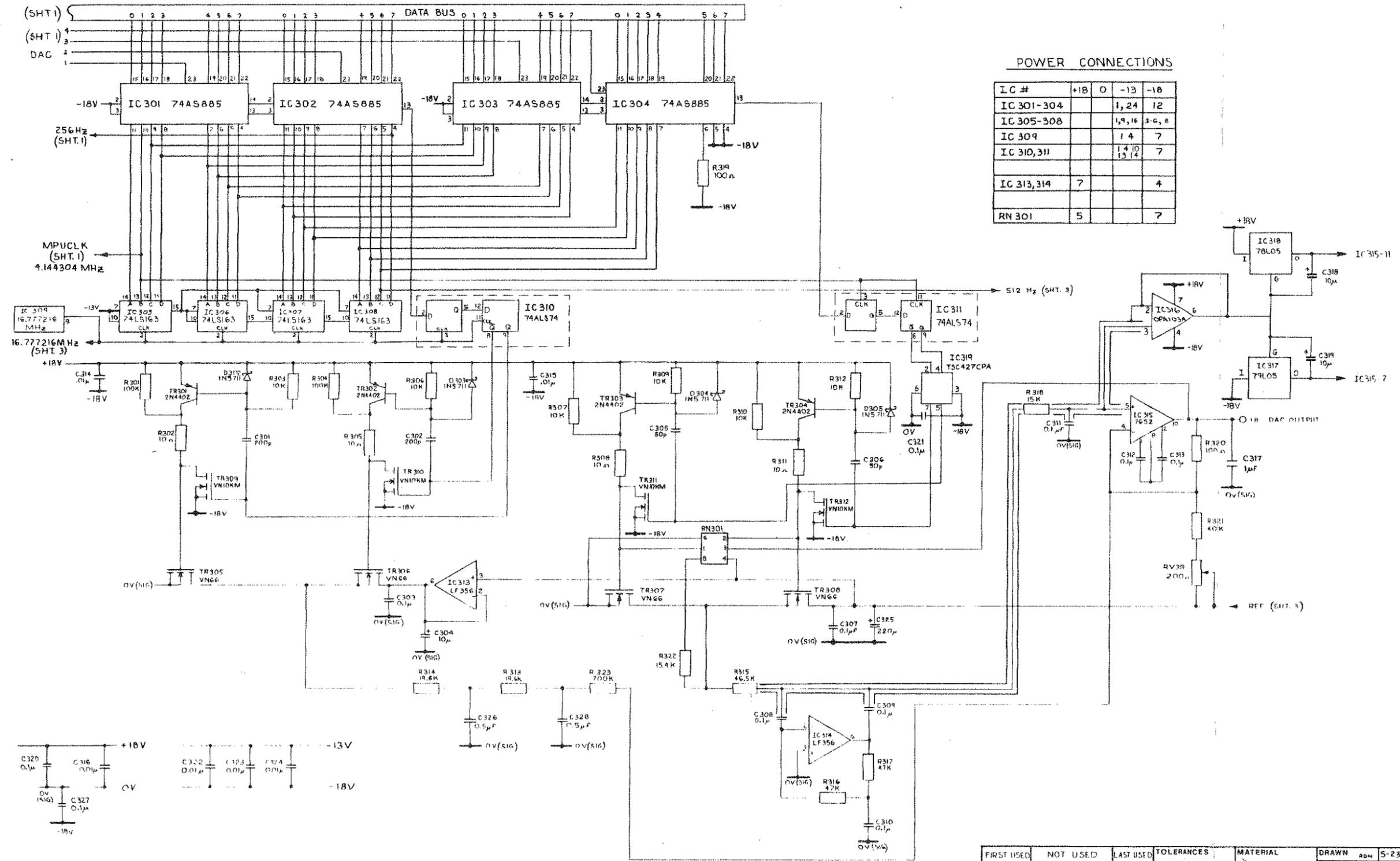
FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL
C 201	C206, 212, 217, 218	C223	X = ± 30' .XX = ± 0.03 .XXX = ± 0.010	
D 201	-	D 203		
IC 201	-	IC 215		
R 201	-	R 237	BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	FINISH
TR 201	-	TR 211		

DRAWN POW	5-6-83	<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>
CHECKED POW	5-13-83	
APPR ROL	5-29-84	
STK NO		REFERENCE GENERATOR
SCALE		CODE IDENT
SHEET 3 OF 4	53504	SIZE D
		DRAWING NO 2720-073
		REV E

NOTES: (UNLESS OTHERWISE SPECIFIED)

I, TR 307 AND 308 ARE MOUNTED ON BERYLLIA WASHERS.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
		REF SHEET #1		



POWER CONNECTIONS

IC #	+18	0	-13	-18
IC 301-304			1, 24	12
IC 305-308			1, 9, 16	3-6, 8
IC 309			1, 4	7
IC 310, 311			1, 4, 10, 13, 14	7
IC 313, 314			7	4
RN 301	5			7

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	FINISH
C 301	C 317-C 321	C 328	X = ± .30"		
D 301		D 305	.XX = ± .03		
			.XXX = ± .010		
IC 301		IC 315			
R 301		R 323			
RN 301		RN 301	BREAK ALL SHARP CORNERS AND EDGES.		
RV 301		RV 301	MACH SURFACES		
TR 301		TR 314	64		

Valhalla Scientific Inc.
 SAN DIEGO, CA

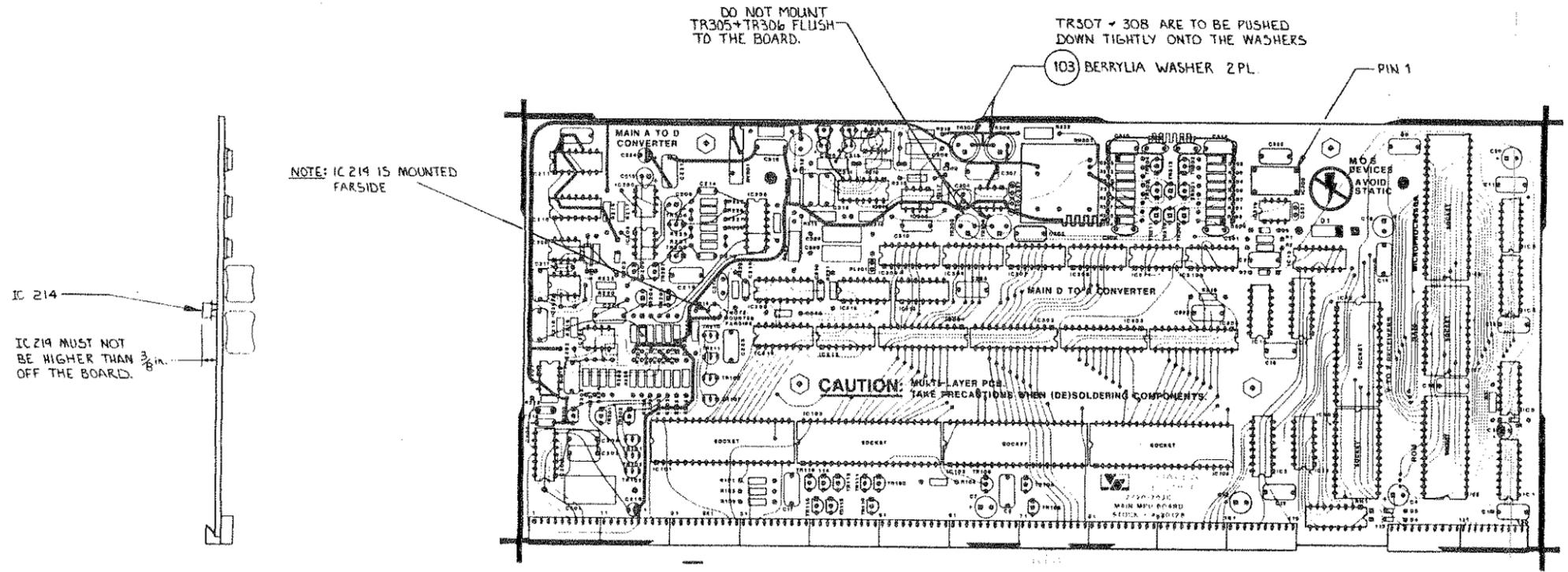
DIGITAL TO ANALOG CONVERTOR

DRAWN: RDH 5-23-84
 CHECKED: [Signature] 5-30-84
 APPR: RWD 5-30-84
 STK NO: _____

SCALE: _____ CODE IDENT: 53504 SIZE: D DRAWING NO: 2720-073 REV: B
 SHEET 4 OF 4

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS					
ECO	LTR	DESCRIPTION	DATE	APPROVED	
345	A	RELEASED	RDN	3-26-84	RL
469	B	UPDATE DRAWING	RDN	6-11-84	RL
539	C	INC. DESIGN CHANGE	DPM	3-1-85	PW



MOD. FOR REV. "A" BOARDS ONLY
 JUMPER PINS 1 & 2 TOGETHER ON IC12. (USE 30 AWG KYNAR ON BACK SIDE OF BOARD)

NOTE: REV "A" PCB'S ONLY

JUMPER AS FOLLOWS, ON CIRCUIT SIDE (OPPOSITE SHOWN) USING 30 AWG KYNAR. GLUE WIRE TO PCB WITH RTV AS REQUIRED:

- | | |
|-----------|-----------|
| IC 101-11 | IC 101-39 |
| IC 101-12 | IC 103-39 |
| IC 101-13 | IC 102-19 |
| IC 101-15 | IC 101-19 |
| IC 102-2 | IC 102-16 |
| IC 102-3 | IC 102-17 |
| IC 102-14 | IC 102-13 |
| IC 103-7 | IC 102-10 |
| IC 103-8 | IC 102-11 |
| IC 103-9 | IC 102-12 |

REV. A PCB'S ONLY

SHORT PIN 12 TO PIN 14 ON SKI USING 30 AWG KYNAR WIRE.

CAUTION: RN301, IC6 - IC13 ARE STATIC SENSITIVE DEVICES

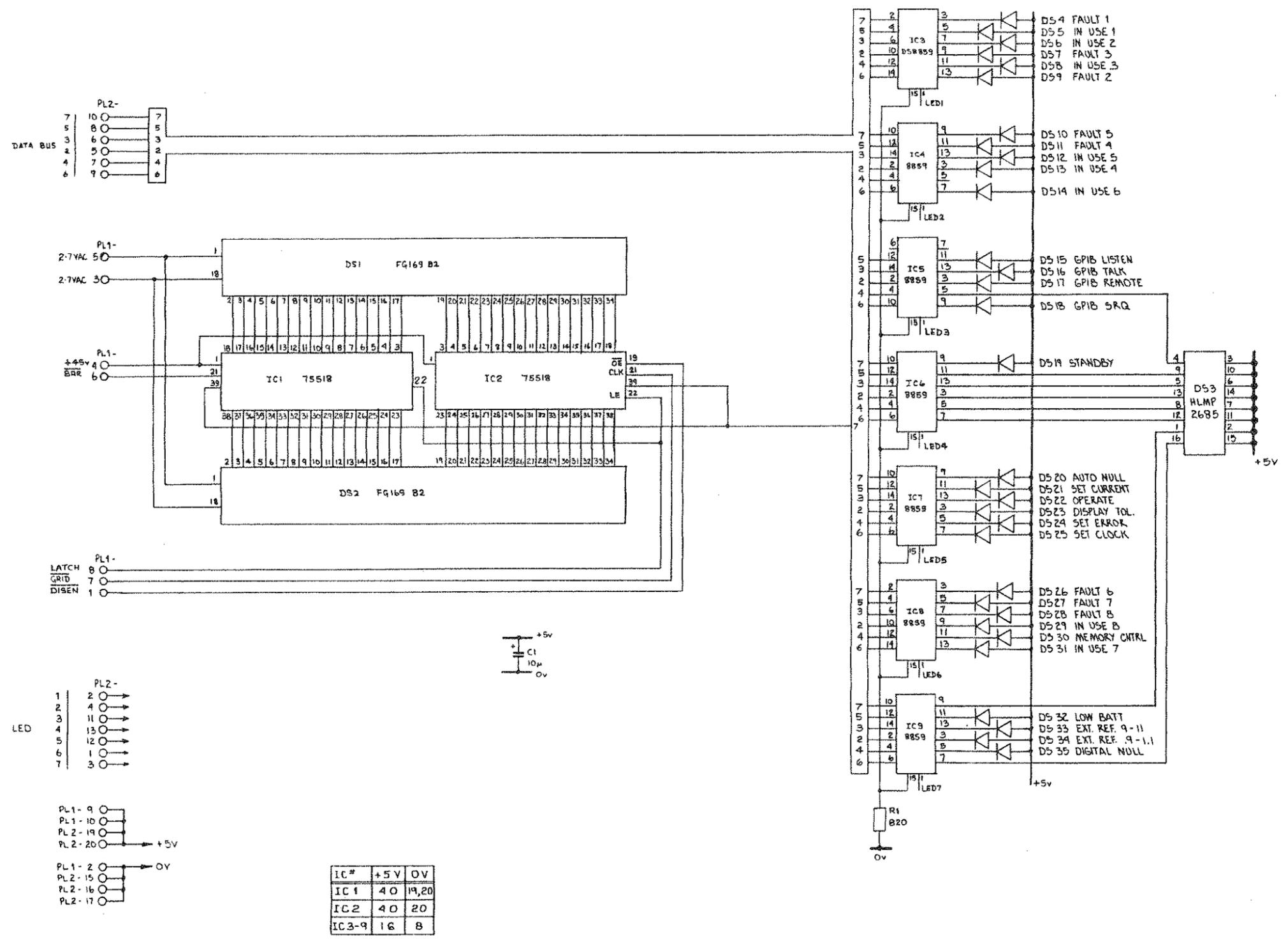
RN301, TR305 - TR308, IC6 - IC13 ARE TO BE THE LAST COMPONENTS INSTALLED INTO THE BOARD.

DASH NO		QTY REQD	NEXT ASSEMBLY	USED ON	TOLERANCES	MATERIAL	FINISH	DRAWN RDN 3-26-84	<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>	MAIN MICROPROCESSOR ASSEMBLY DRAWING				
					X = ± .30'	BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES 64 ✓	CHECKED [Signature] 3-27-84 APPR [Signature] 6/12/84 STK NO	SCALE 1=1			CODE IDENT 53504	SIZE D	DRAWING NO 2720-603	REV C
					.XX = ± .03							SHEET 6 OF 6		

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. ALL DIODES ARE L.E.D.'s.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
0330	A	RELEASED	SW 9-28-89	JCN



IC#	+5V	OV
IC1	40	19,20
IC2	40	20
IC3-9	16	8

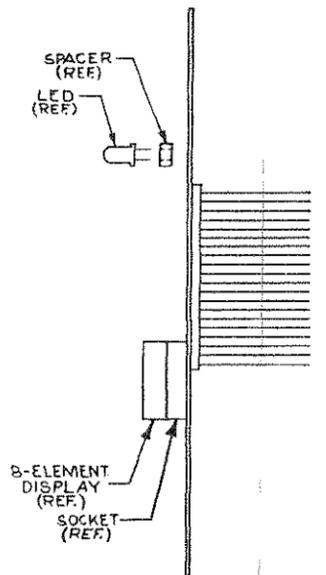
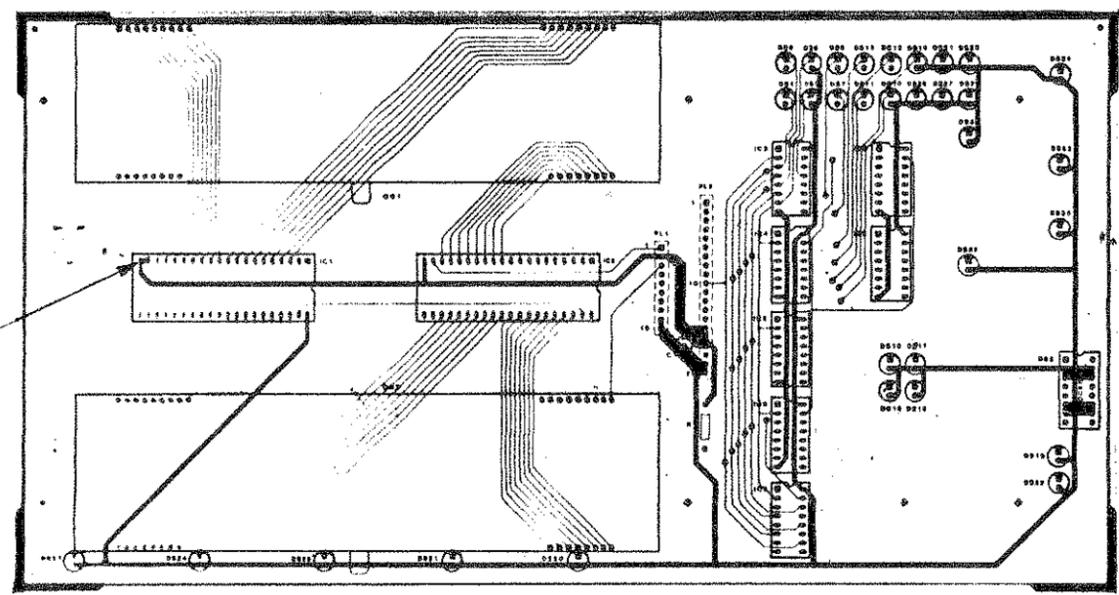
FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN POW	5-12-83
DS1	-	DS35	X = ± .30'		CHECKED POW	5-13-83
IC1	-	IC9	.XX = ± .03		APPR	9-21-83
R1	-	R1	.XXX = ± .010		STK NO	
C1	-	C1			 Valhalla Scientific Inc. SAN DIEGO, CA	
			BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	FINISH	DISPLAY	
			84 ✓		SCALE	CODE IDENT
					1 OF 1	53504
					SIZE	D 2720-076
					DRAWING NO	REV

NOTES: (UNLESS OTHERWISE SPECIFIED)

① INSURE ALL COMPONENTS ARE FLAT TO PCB AND FULLY INSERTED. NOT CROOKED.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
330	A	RELEASED	3-1-84	RE
550	B	MODIFIED P.C.B.	12-7-89	CRE

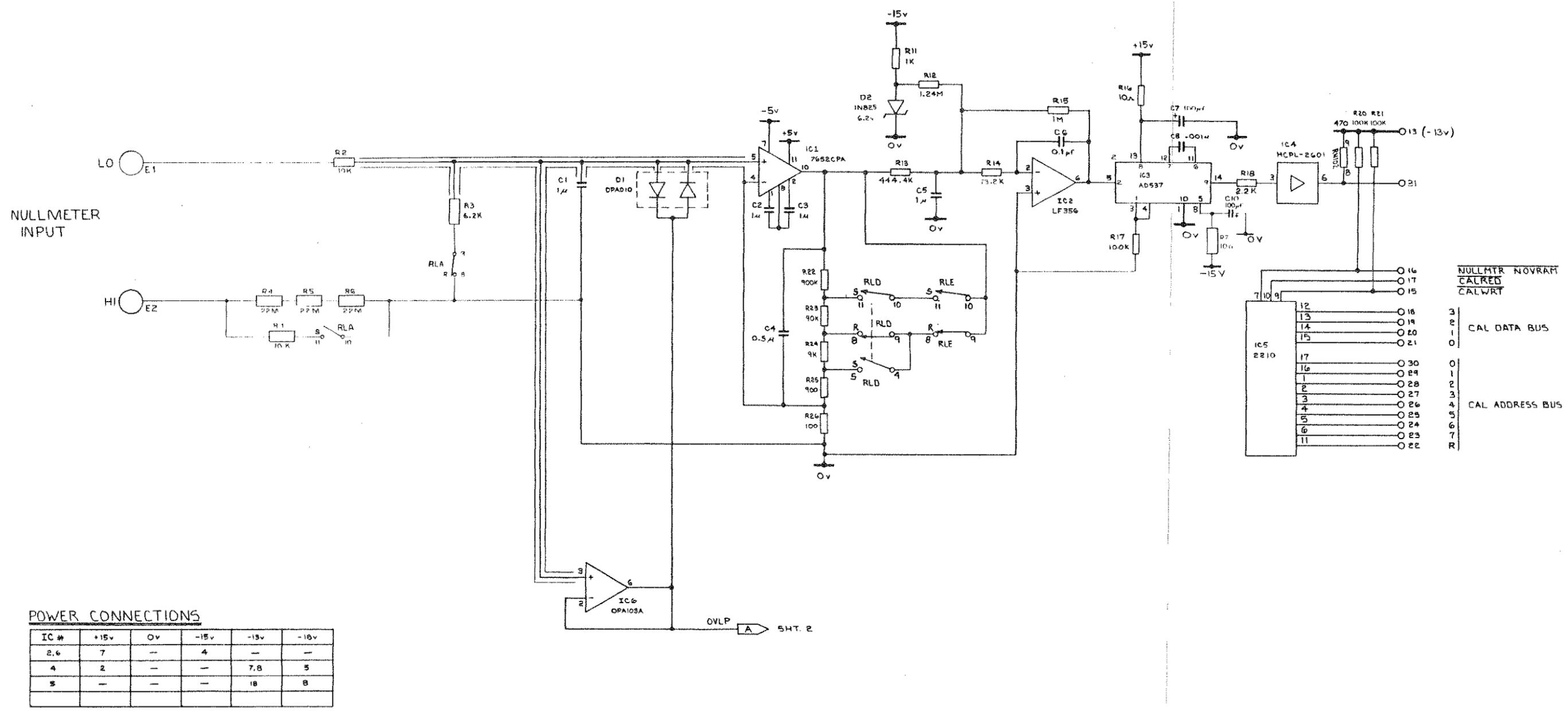
JUMPER PINS 19 AND 20 ON IC 1. ('A' REV. ONLY)



DASH NO		QTY REQD	NEXT ASSEMBLY	USED ON	TOLERANCES		MATERIAL		DRAWN RDN		3-1-84		 Valhalla Scientific Inc. SAN DIEGO, CA	
					X = ± .30 .XX = ± .03 .XXX = ± .010				CHECKED		3-1-84			
									APPR		3-1-84			
					BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES		FINISH		STK NO				2720 DISPLAY BOARD ASSY. DWG.	
					84				SCALE		1/1		CODE IDENT	
									SHEET		2 OF 2		53504	
									SIZE		D		DRAWING NO	
													2720-606	
													REV	
													B	

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
327	A	RELEASED	WPW 2-24-84	FW
527	B	UPDATED	RDN 1-23-85	RW
69B	C	CHANGED C4 TO 5uF • TRIZ TO MP5A13	3.25.85	POW



POWER CONNECTIONS

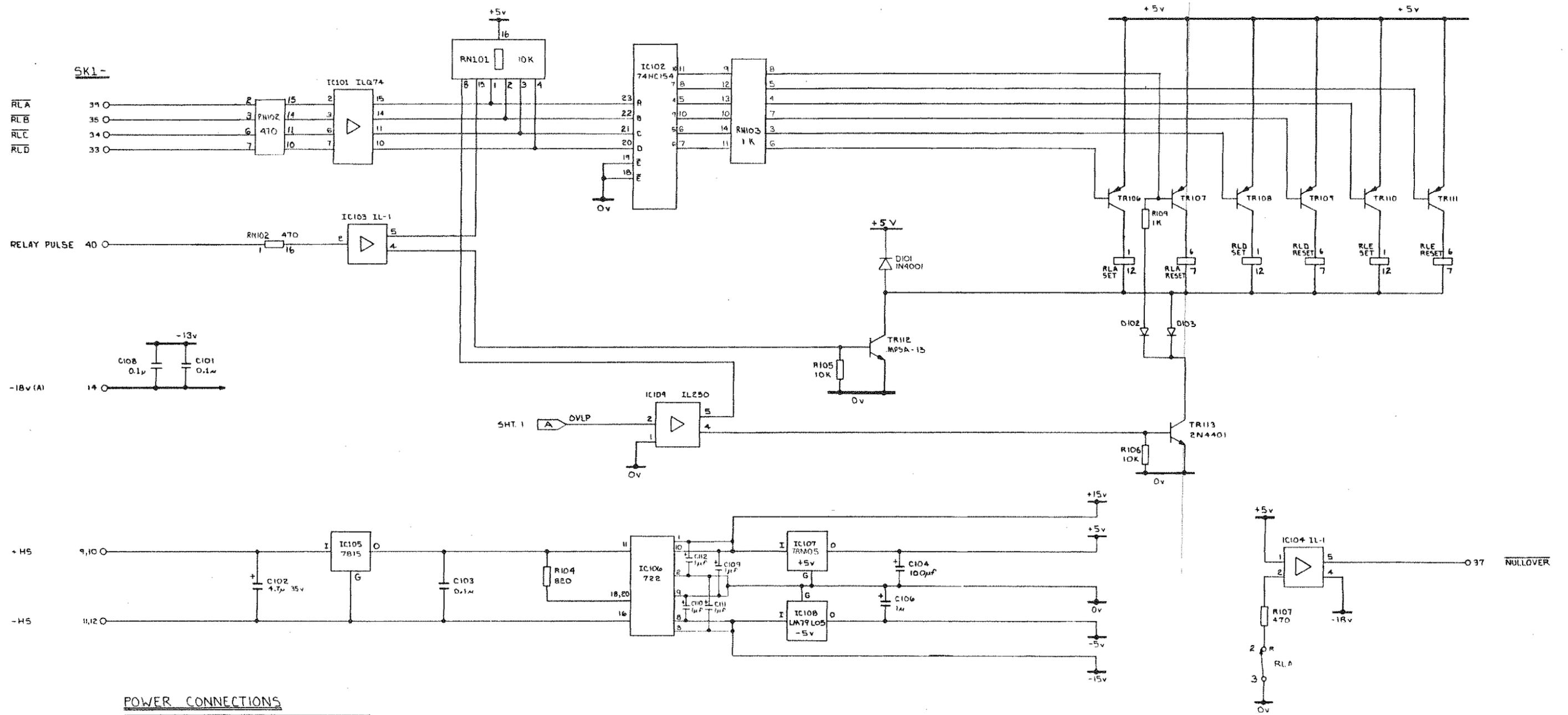
IC #	+15v	0v	-15v	-13v	-10v
2,6	7	--	4	--	--
4	2	--	--	7,8	5
5	--	--	--	18	8

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN WPW 2-24-84	<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>
C1	--	C8	X" = ± .30"	FINISH BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES.	CHECKED RW 3/1/85	
D1	--	D2	.XX = ± .03		APPR RW 3/1/85	
IC1	--	IC6	.XXX = ± .010		STK #	
R2	R7-10, R19	R26			SCALE ---	NULLMETER CODE IDENT 53504 SIZE D DRAWING NO 2720-077 REV
RLA	--	RLE			SHEET 1 OF 2	
--	--	--				

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. ALL UNMARKED TR's ARE 2N4402
2. ALL UNMARKED DIODES ARE 1N4148

REVISIONS			
ECO	LTR	DESCRIPTION	DATE
		- SEE SHT. 1.	



POWER CONNECTIONS

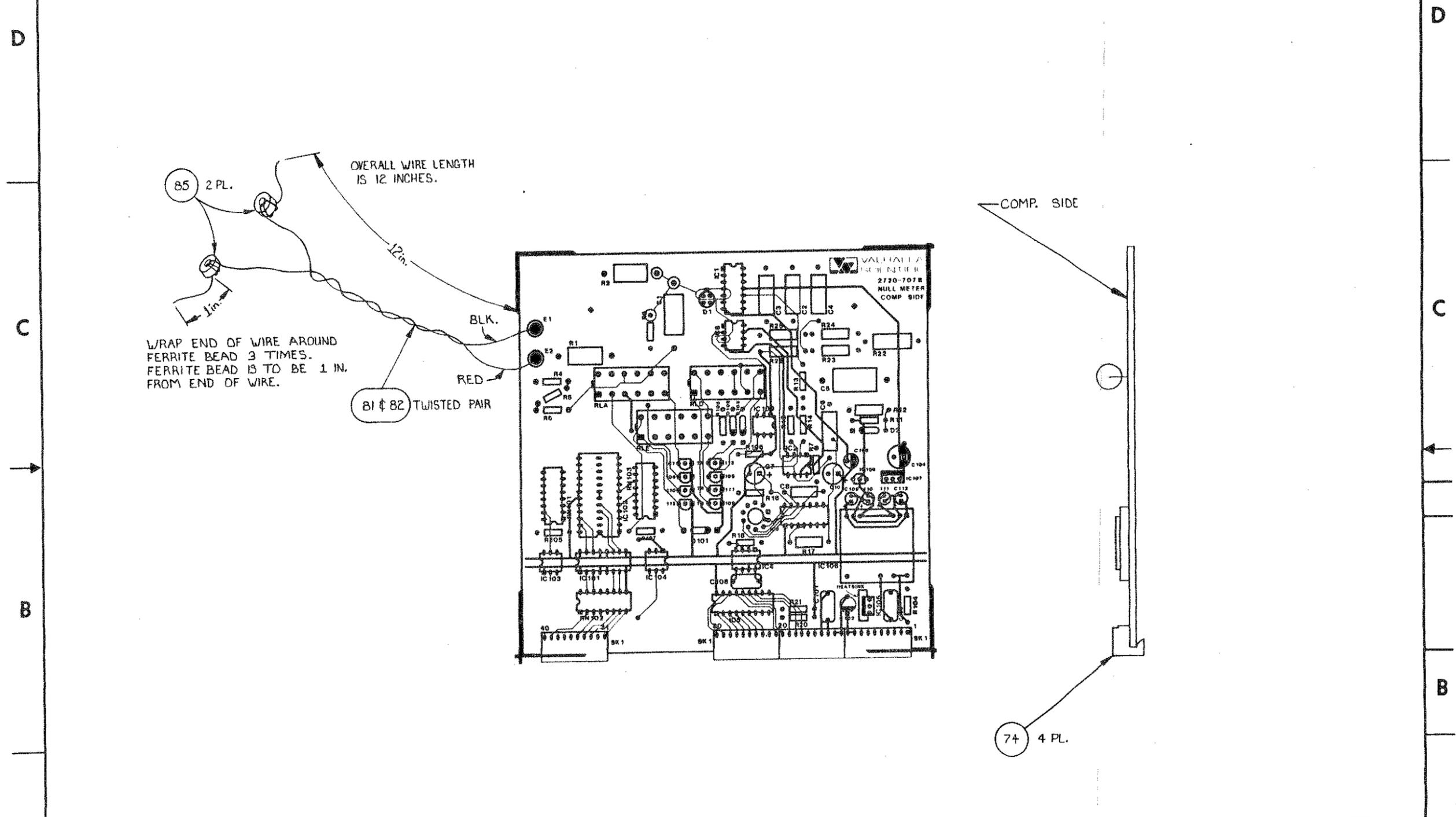
IC #	0v	-15v	-13v	+5
101	9,12,13,16	-	1,4,5,8	-
103	-	-	1	-
102	12	-	-	24

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN WPJ 2-24-84		
C101	-	C108	X = ± 30'	✓	CHECKED DW 3/1/85		
D101	-	D103	.XX = ± 03		APPR DW 3/1/85		
IC101	-	IC109	XXX = ± 010		STK NO		
R101	-	R108	BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	FINISH ✓	Valhalla Scientific Inc. SAN DIEGO, CA		
RN101	-	RN103				SCALE	CODE IDENT
TR101	-	TR113					
RLA	-	RLE				64	SHEET 2 OF 2



NULLMETER

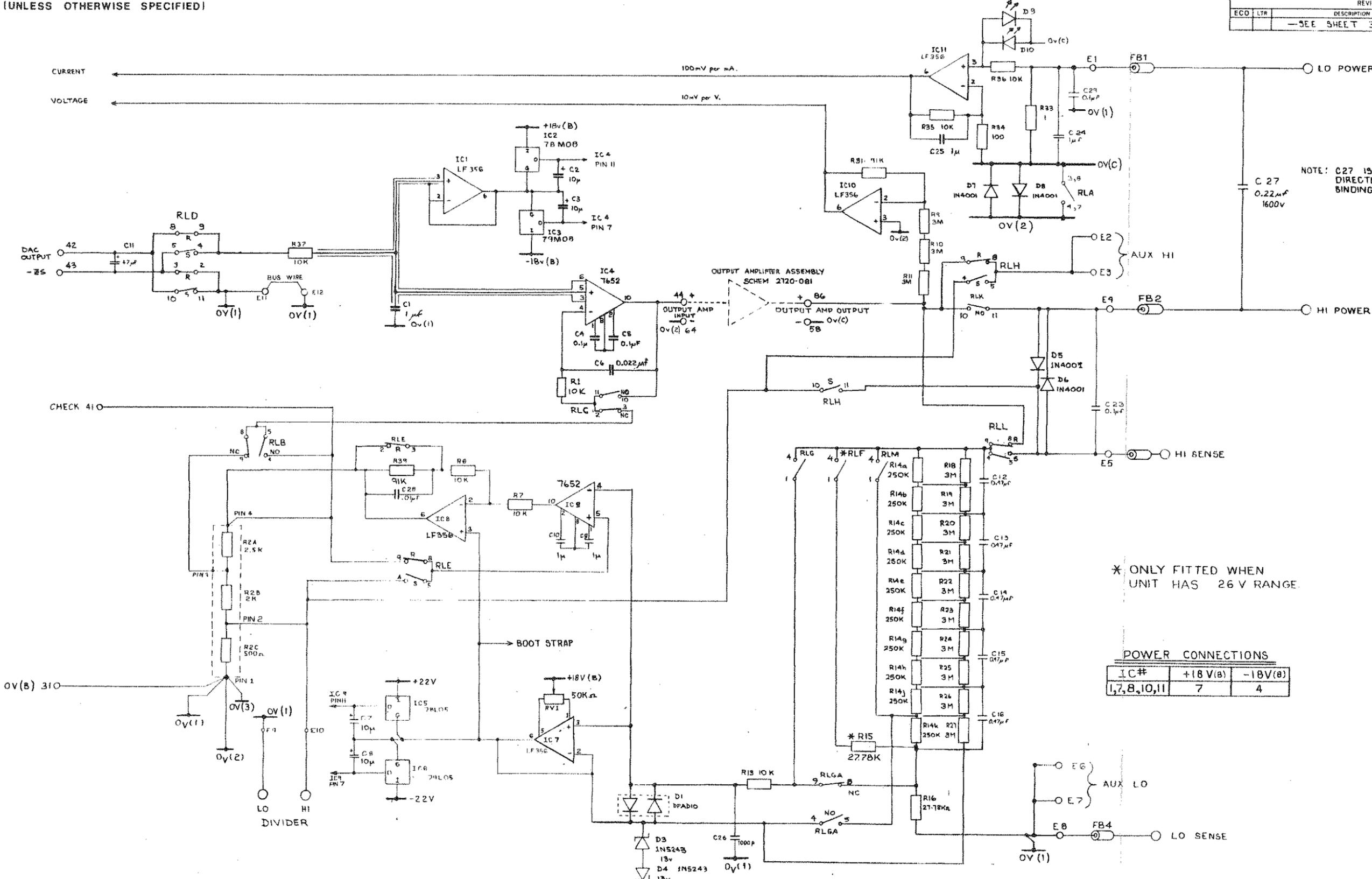
REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
527	B	UPDATED	DPM	1-25-85
69B	C	CHANGED C9 TO .5UF + TR11Z TO MP5A-13 CRL	3-25-85	DL



				TOLERANCES X = ± .30" XX = ± .03" XXX = ± .010"		MATERIAL 		DRAWN DPM 1-29-85 CHECKED JWA 3/1/85 APPR FOL 3/1/85 STK NO _____		 Valhalla Scientific Inc. SAN DIEGO, CA					
				BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES 64 ✓		FINISH 		<small>THE INFORMATION DISCLOSED HEREIN WAS OBTAINED BY AND IS THE PROPERTY OF VALHALLA SCIENTIFIC INC. AND EXCEPT FOR RIGHTS EXPRESSLY GRANTED TO THE UNITED STATES GOVERNMENT VALHALLA SCIENTIFIC INC. RESERVES ALL RIGHTS. SEE PROGRAMS FOR DESIGN MANUFACTURING USE AND ALL RIGHTS RESERVED.</small>		NULL METER ASSY.					
DASH NO QTY REQD NEXT ASSEMBLY USED ON						SCALE 1:1 SHEET 1 OF 5		CODE IDENT 53504		SIZE C		DRAWING NO 2720-607		REV C	

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS			
ECO	LTR	DESCRIPTION	DATE
		- SEE SHEET 3 -	



* ONLY FITTED WHEN UNIT HAS 26 V RANGE.

POWER CONNECTIONS

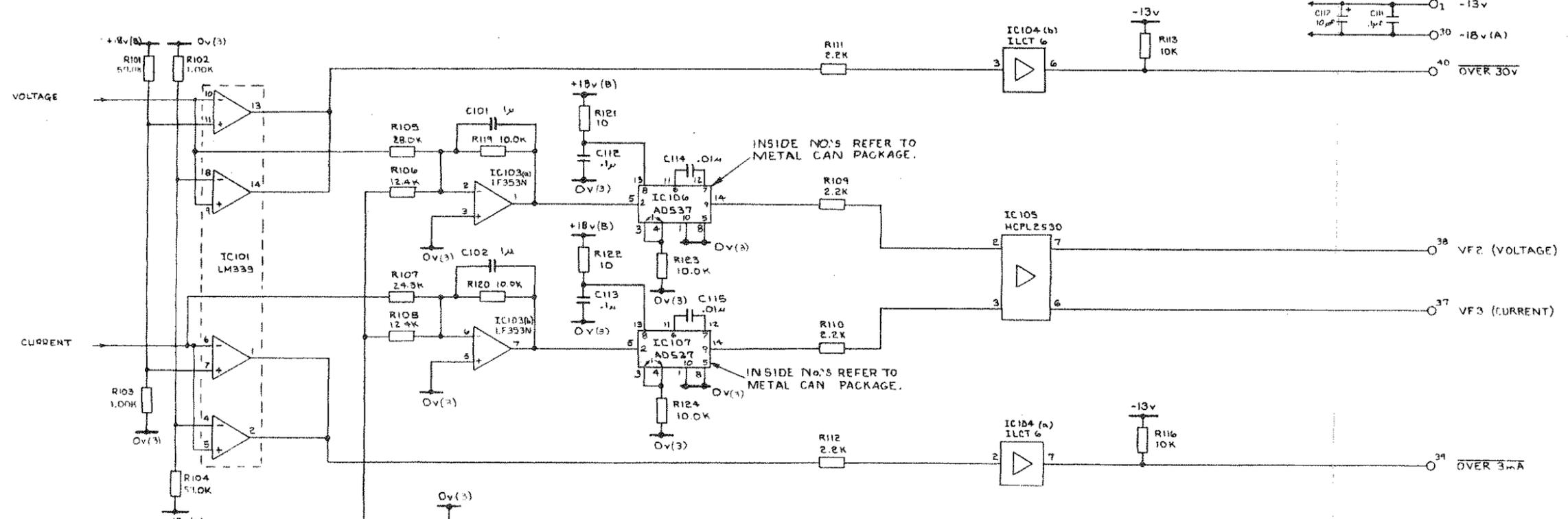
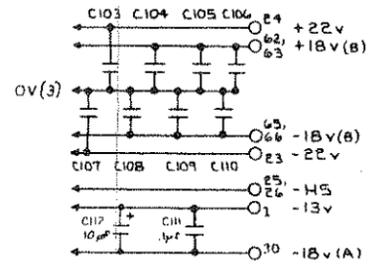
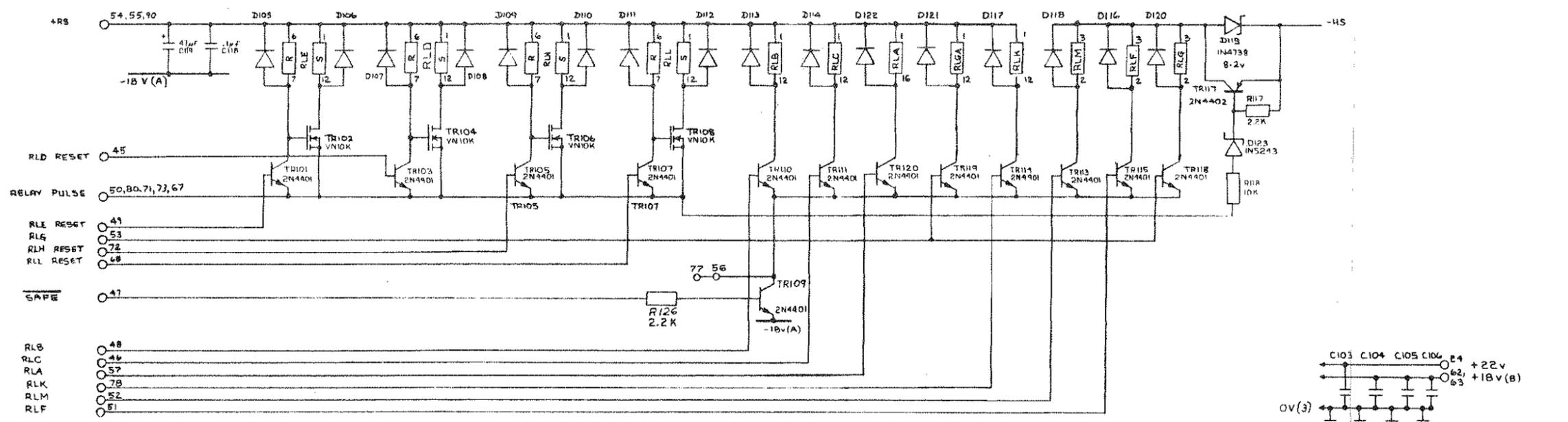
IC#	+18V(B)	-18V(B)
1,7,8,10,11	7	4

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN POW	5-8 83
C1	C23	C25	X = ±.00"		CHECKED POW	5-16 83
D1	D2	D10	XX = ±.03		APPR RLD	5-29 84
IC1	-	IC11	XXX = ±.010		STK NO	
R1	R5,8,30,9-11,228,32	R36	BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES	FINISH		
RLA	RLI,J	RLM			OUTPUT SYSTEM	
FB1	-	FB6			SCALE	
					CODE IDENT	SIZE
					53504	D
					DRAWING NO	REV
					2720-079	C
					SHEET	1 OF 3

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. ALL DIODES ARE 1N4148
2. ALL C's ARE 0.01μF.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
		-SEE SHT. 3-		



POWER CONNECTIONS
 IC101 PIN 3- +18V(B) PIN 12- -18V(B)
 IC103 PIN 8- +18V(B) PIN 4- -18V(B)
 IC104 PIN 1,4- OV(3); PINS 8- -18V(A)
 IC105 PIN 1,4- +18V(B) PIN 8- -13V; PINS 5- -18V(A)

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN POW	5-9-83
C101	-	C111	X = ± 30'		CHECKED POW	5-16-83
D105	-	D122	.XX = ± .03		APPR PCD	5-24-84
IC101	-	IC105	.XXX = ± .010		STK NO	
RLQ	RLI, J	RLM				

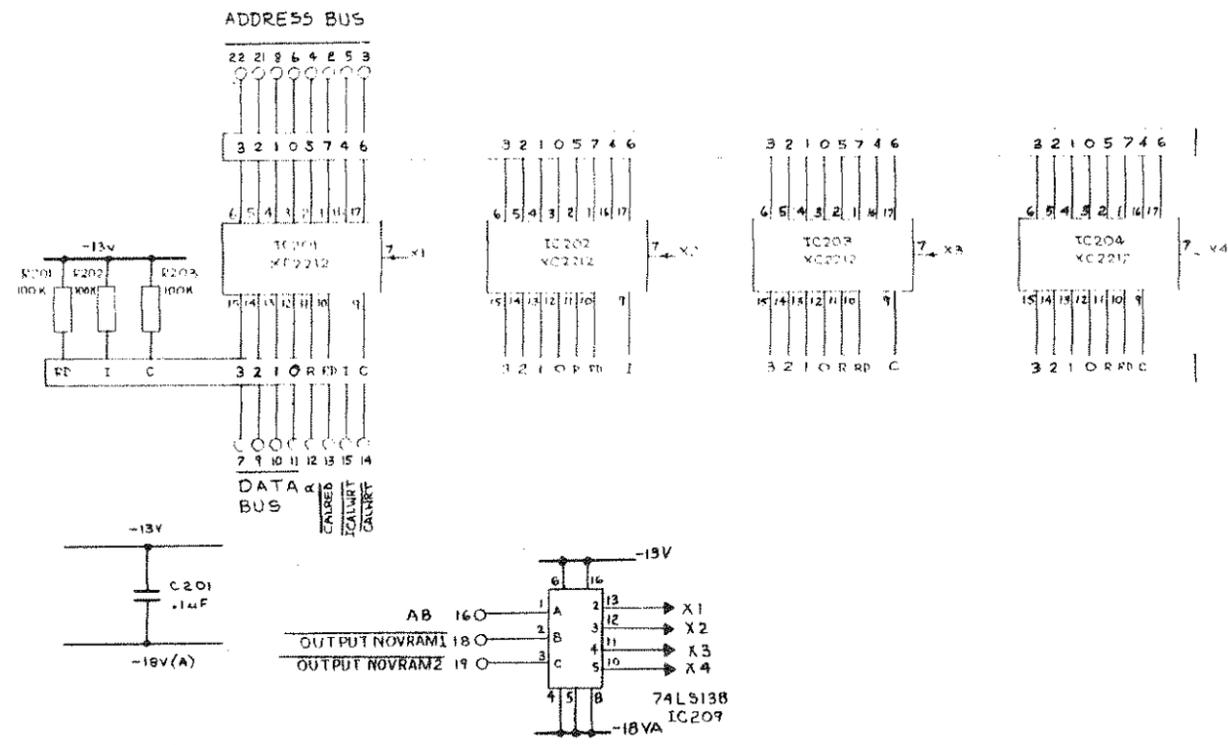


OUTPUT SYSTEM LOGIC			
SCALE	CODE IDENT	SIZE	DRAWING NO
SHEET 2 OF 3	53504	D	2720 079
			REV C

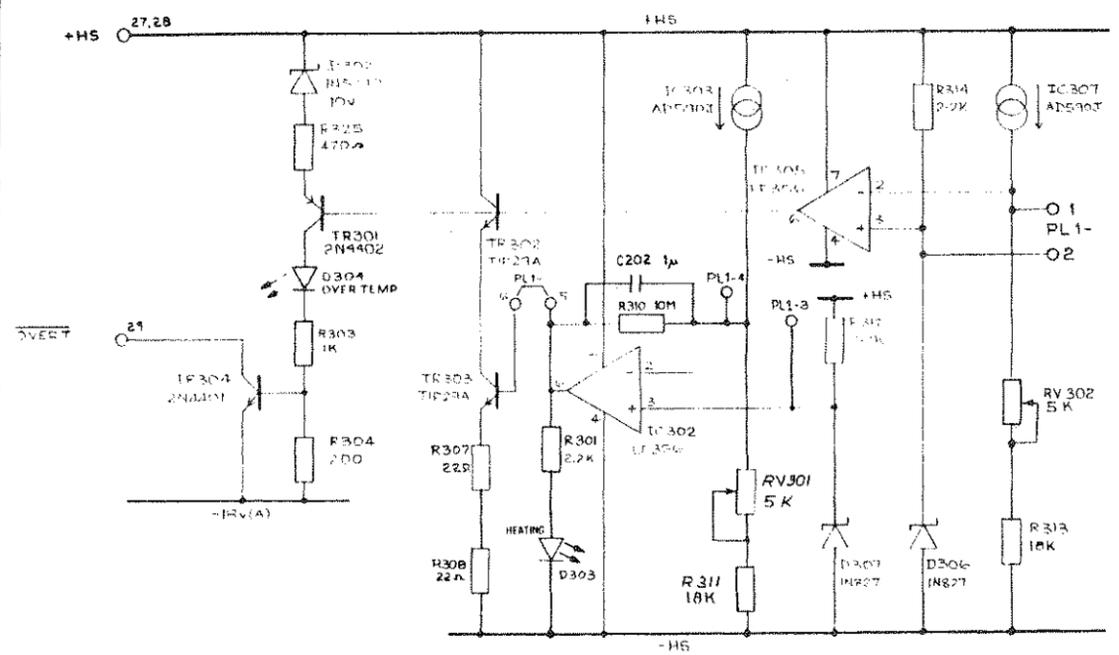
NOTES: UNLESS OTHERWISE SPECIFIED

1. IC201-204 ARE MOUNTED IN SOCKETS.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
	A			
547	B	UPDATED.	RDN 1-4-85	JWA
675	C		DPM 2-25-85	JW



	-13v	-18v(A)
IC201-204	18	8



NOTE:
 ADJUST RV301 FOR -.5V BETWEEN PL1 PIN 4(+) AND PL1 PIN 3(-) WITH THE OVEN OFF.
 ADJUST RV302 FOR -.8V BETWEEN PL1 PIN 1(+) AND PL1 PIN 2(-) WITH THE OVEN OFF.
 TO TURN OFF THE OVEN REMOVE THE SHORTING PLUG FROM PL1 PINS 5+6.

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN	CHECKED	APPR	STK NO
C201	-	C201	X = ±.30' .XI = ±.03 .XXX = ±.010		PWJ	PWJ	PWJ	
D301	D304, D305	D307						
IC201	IC205, 206, 304, 310, 301, 306	IC207						
R201	R204, 300, 302, 305, R304, 301, 315-324	R325*	BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	FINISH				
RV301	-	RV301						
TR301	-	TR304						

Valhalla Scientific Inc.
SAN DIEGO, CA

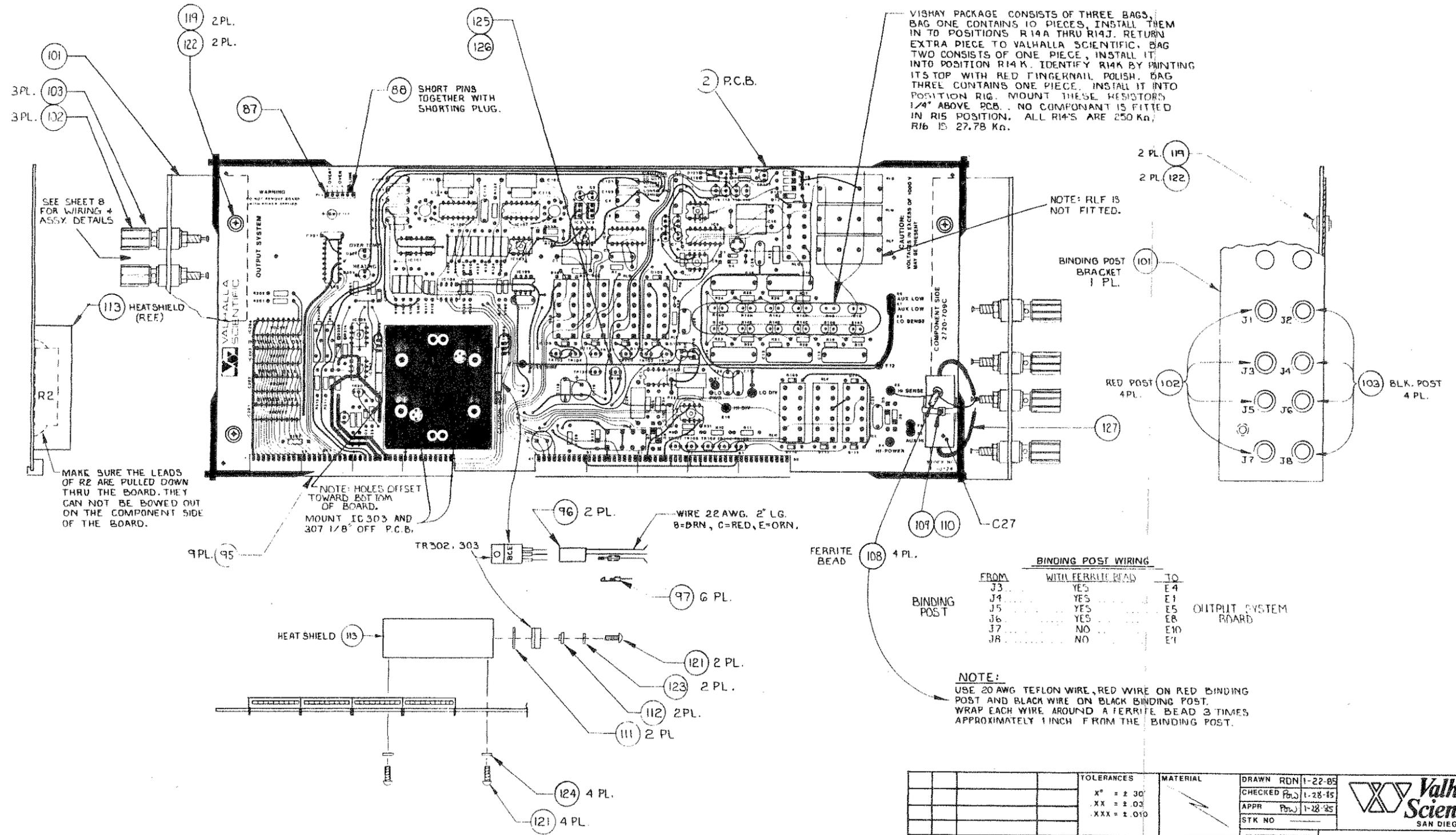
OUTPUT SYSTEM

SCALE: _____ CODE IDENT: 53504 SIZE: D DRAWING NO: 2720-079 REV: C

SHEET 3 OF 3

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
547	B	UPDATED	RDN 1-22-85	FBL
675	C	INCORPORATED DESIGN CHANGES	1-28-85	FBL



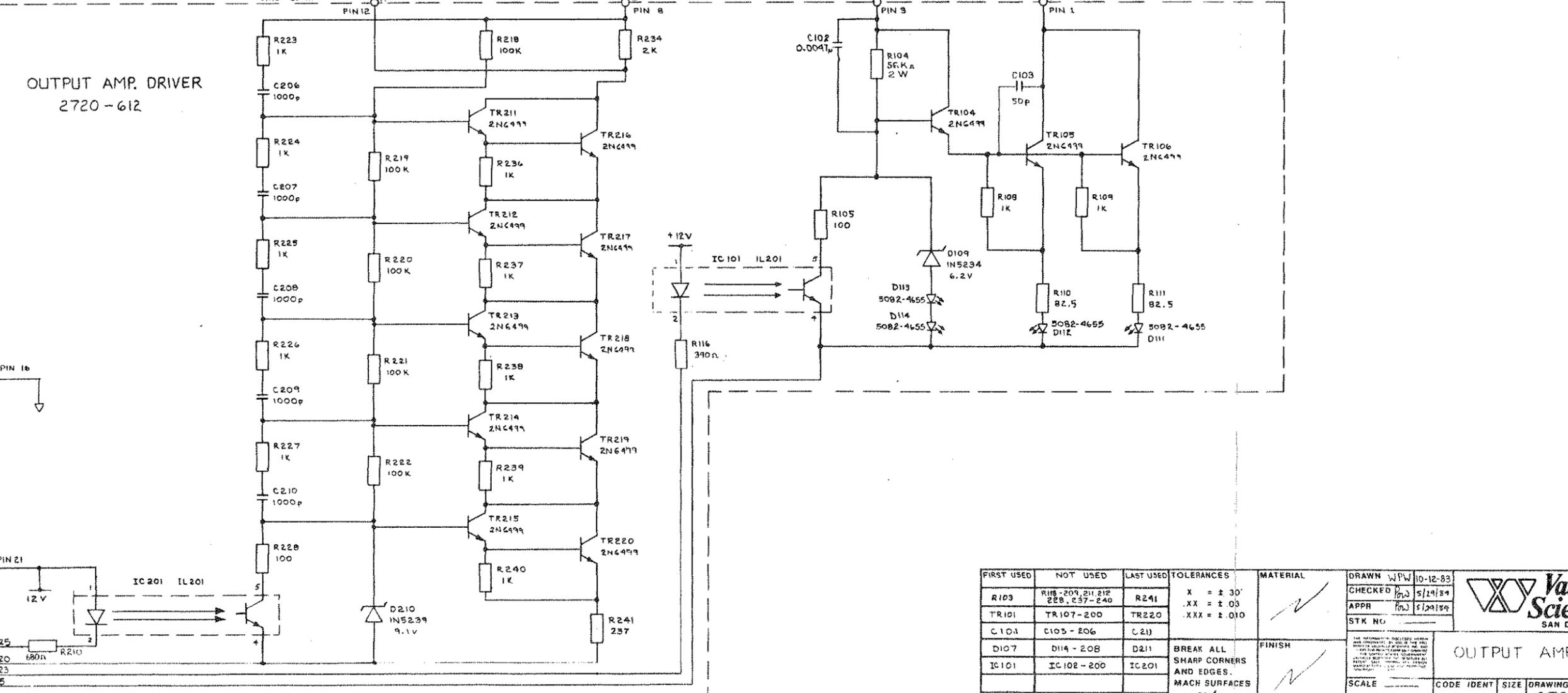
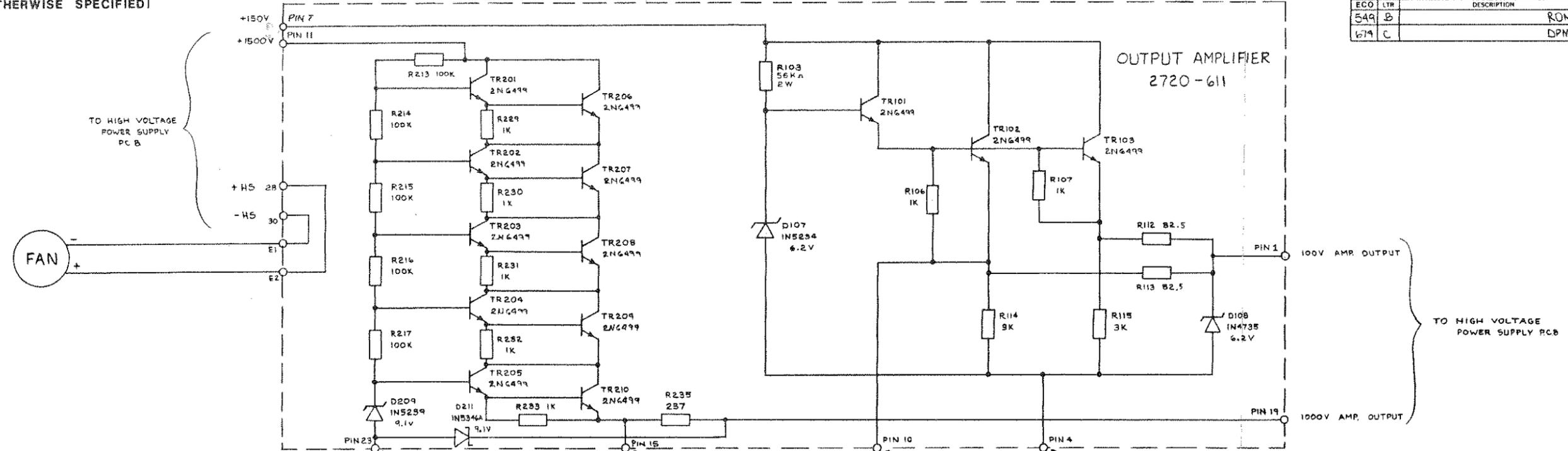
BINDING POST WIRING

FROM	WITH FERRITE BEAD	TO
J3	YES	E4
J4	YES	E1
J5	YES	E5
J6	YES	E8
J7	NO	E10
J8	NO	E1

DRAWN RDN 1-22-85		CHECKED FBL 1-28-85		APPR FBL 1-28-85		STK NO	
TOLERANCES		MATERIAL		FINISH		BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	
X" = ± .30		VALHALLA SCIENTIFIC INC. SAN DIEGO, CA		SCALE 1:1		CODE IDENT 53504	
XX = ± .03		OUTPUT SYSTEM P.C.B. ASSY.		SIZE D		DRAWING NO 2720-609	
XXX = ± .010		DASH NO		SHEET 7 OF 8		REV C	
QTY RECD		NEXT ASSEMBLY		USED ON		83	

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
549	B		1-25-85	JM
679	C	RON	2-21-85	WJ



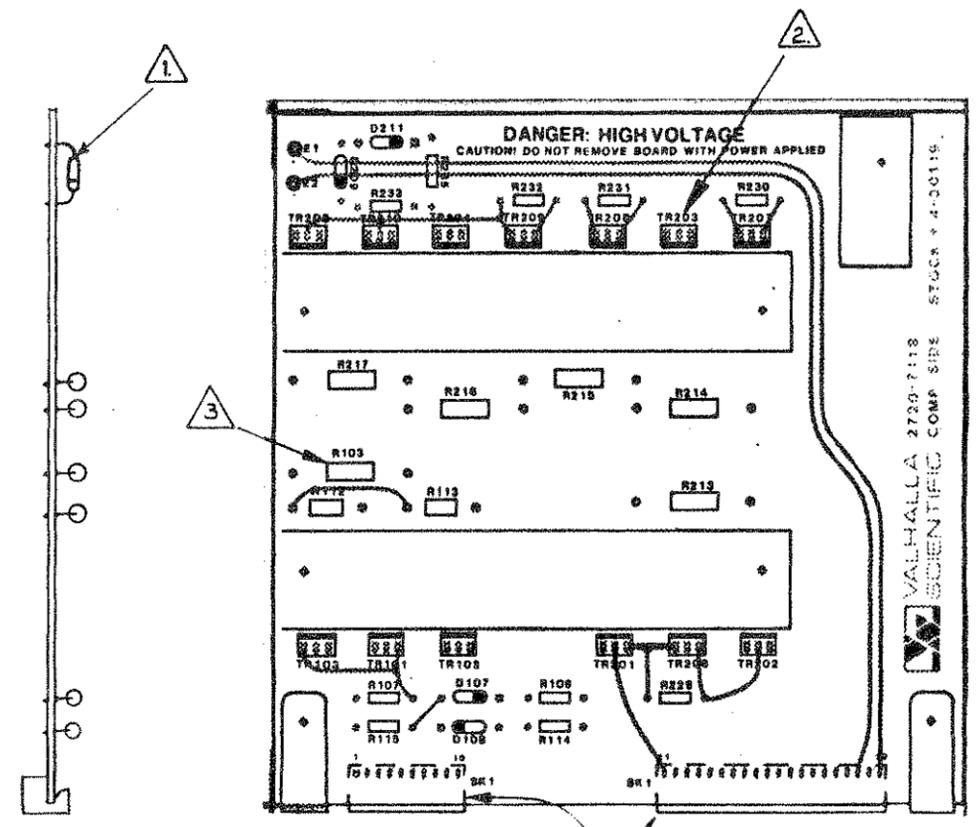
FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL
R103	R103-209, 211, 212, 228, 237-240	R241	X = ± 30%	
TR101	TR107-200	TR220	.XX = ± 0.03	
C104	C103-206	C211	.XXX = ± 0.10	
D107	D114-208	D211	BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	
IC101	IC102-200	IC201		

DRAWN	W/PW	10-12-83	<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>
CHECKED	W/PW	5/29/84	
APPR	W/PW	5/29/84	
STK NO			
<p>OUTPUT AMPLIFIER</p>			
SCALE	CODE IDENT	SIZE	DRAWING NO
	53504	D	2720-081
SHEET	1 OF 1	REV	C

NOTES:

- 1. ALL COMPONENTS ARE MOUNTED 1/8 INCH OFF P.C. BOARD.
- 2. TRANSISTORS ARE NOT MOUNTED ON THIS ASSEMBLY
- 3. FOR "A" REVISION BOARD ONLY!
USE A 47KΩ, 2W IN SERIES WITH A 10KΩ RINGC.1002F FOR R103.

REVISIONS					
ECO	LTR	DESCRIPTION	DATE	APPROVED	
	A	RELEASED	RDN	5-29-84	RW
465	B	WRONG DRAWING# ON P/L	RDN	5-31-84	R
46A	C	UPDATED PARTS LIST		6-6-84	R
599	D	UPDATED	RDN	1-23-84	JM
671	E	P/L CHANGE - CORRECT LINE 14	DPM	2-20-85	RD



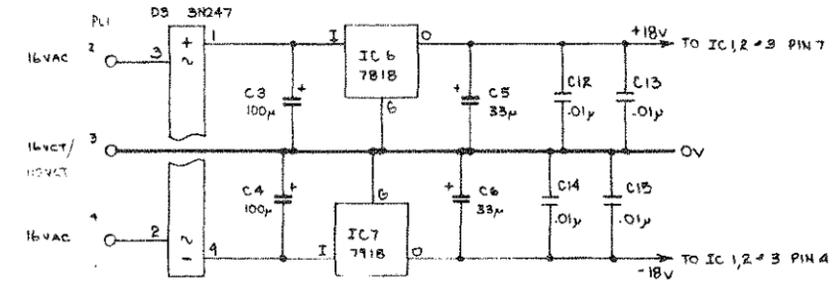
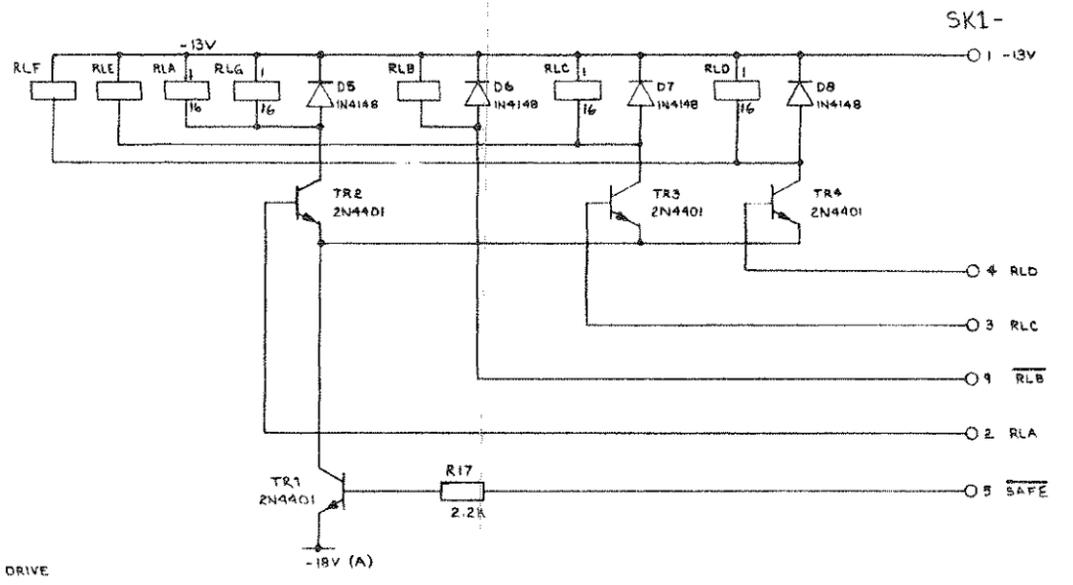
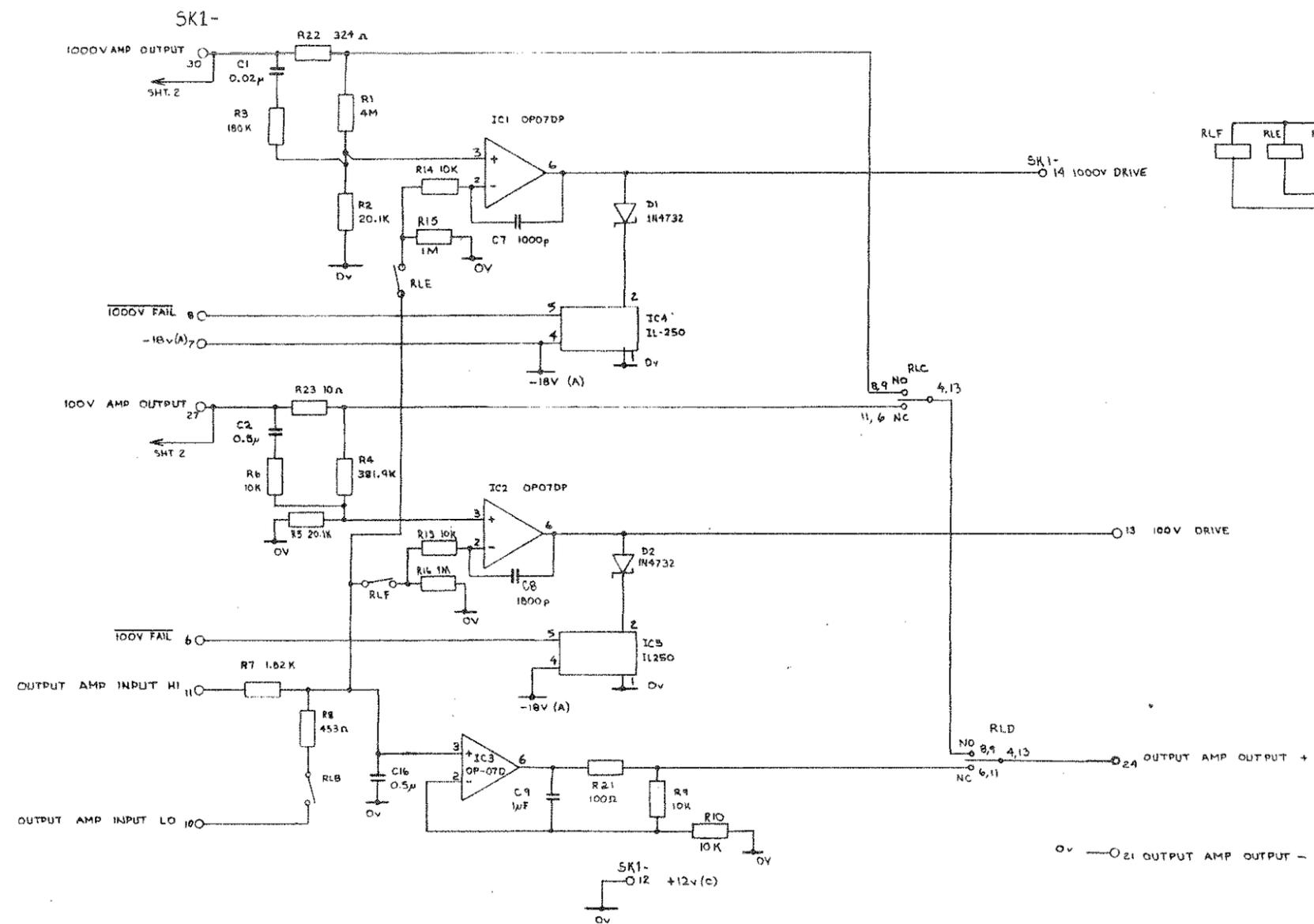
CONNECTORS ARE TO BE MOUNTED ON FAR SIDE OF BOARD.

COMPONENT SIDE SHOWN

		TOLERANCES		MATERIAL		DRAWN RDN 5-29-84		 Valhalla Scientific Inc. SAN DIEGO, CA			
		X = ± 30'		BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES 64 ✓		CHECKED R 5-29-84				THE INFORMATION DISCLOSED HEREIN IS UNCLASSIFIED AND IS THE PROPERTY OF VALHALLA SCIENTIFIC INC. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.	
		XX = ± 03				APPR RW 5/29/84					
		XXX = ± 010				STK NO		OUTPUT AMPLIFIER ASSEMBLY			
- 1		2720-403 2720						CODE IDENT 53504			
DASH NO		QTY REQD		NEXT ASSEMBLY		USED ON		DRAWING NO 2720-611			
								REV E			
								SHEET 1 OF 2			

NOTES: (UNLESS OTHERWISE SPECIFIED)

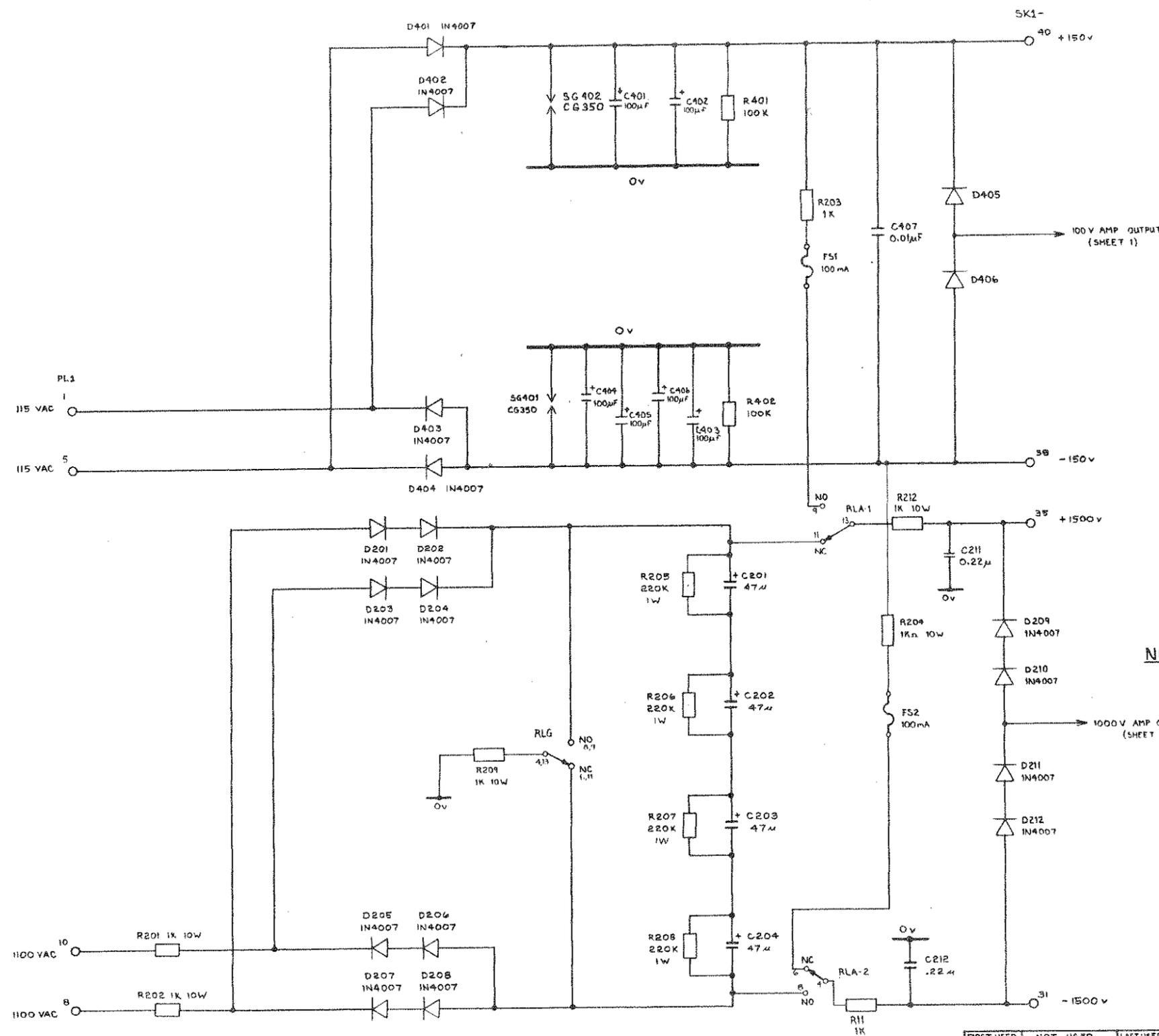
REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
537	B	INC. DESIGN CHANGE	DPM 2-26-85	δW



FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN POW	5-16-83
R1	-	R20	X = ± 30'		CHECKED POW	6-16-83
C1	-	C15	.XX = ± 03		APPR POW	5-29-84
D1	-	D7	.XXX = ± 010		STK NO	
IC1	-	ICB		FINISH	Valhalla Scientific Inc. SAN DIEGO, CA	
RLA	-	RLF	BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES		HIGH VOLTAGE POWER SUPPLY	
			94		SCALE	CODE IDENT
					SHEET 1 OF 2	53504
						SIZE D
						DRAWING NO 2720-083
						REV B

NOTES: (UNLESS OTHERWISE SPECIFIED)

REVISIONS			
ECO	LTR	DESCRIPTION	DATE
		SEE SHT. 1	



NOTE:
1. RLA-1 & RLA-2 COILS ARE SHOWN ON SHT 1.

FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL
C201	C205-210, 213-400	C404	X* = ± 30' XX = ± 03 XXX = ± 010	
D201	D209-400	D406		
R201	R209, 213-400	R40E		
RLA		RLA	BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES	FINISH

Valhalla Scientific Inc.
SAN DIEGO, CA

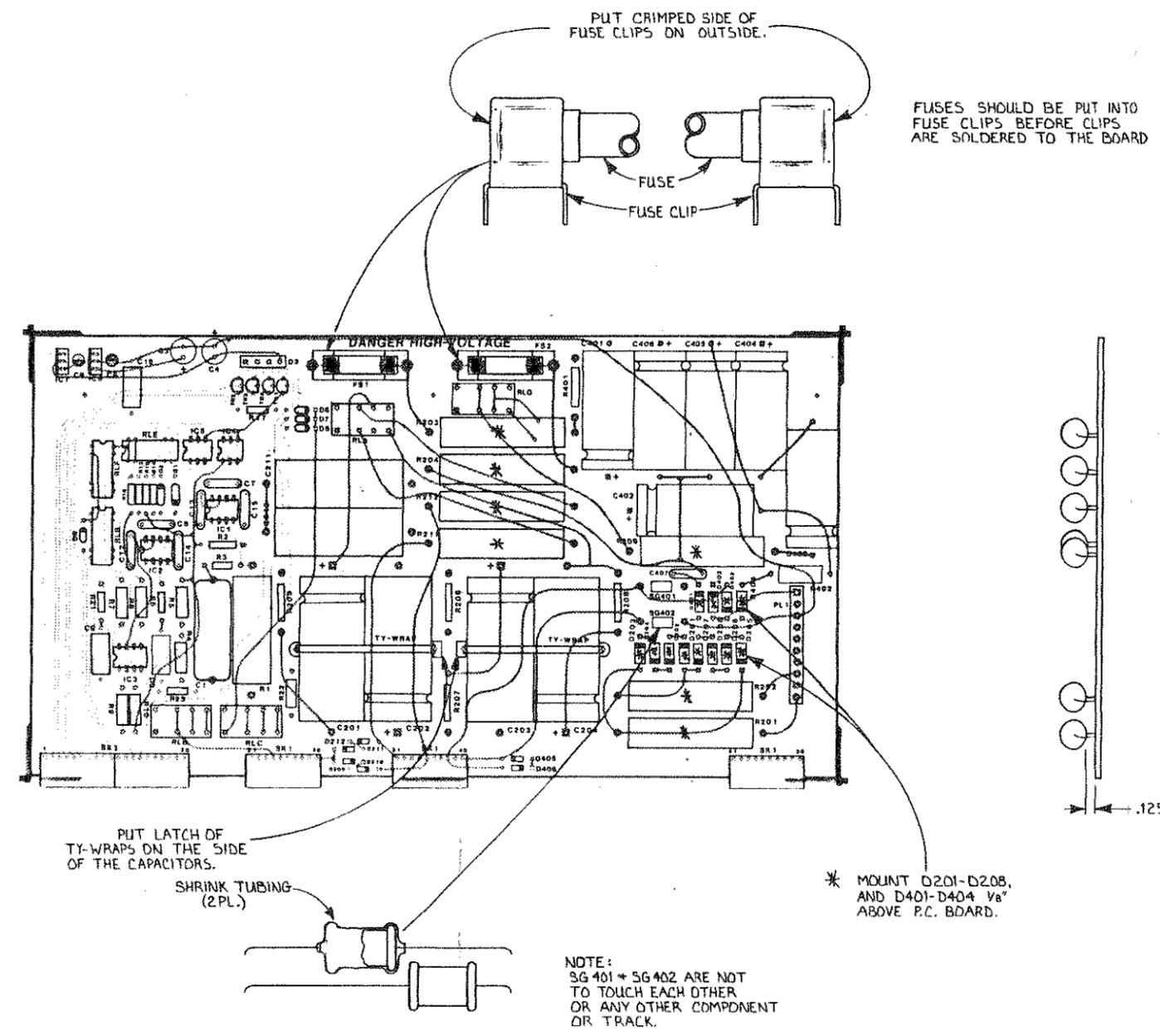
HIGH VOLTAGE POWER SUPPLY

DRAWN W.P.L.	10-24-83
CHECKED P.L.S.	5-29-84
APPR P.M.	5-29-84
STK NO	
SCALE	
CODE IDENT	53504
SIZE	D
DRAWING NO	2720-083
REV	B

SHEET 2 OF 2

NOTES: (UNLESS OTHERWISE SPECIFIED)

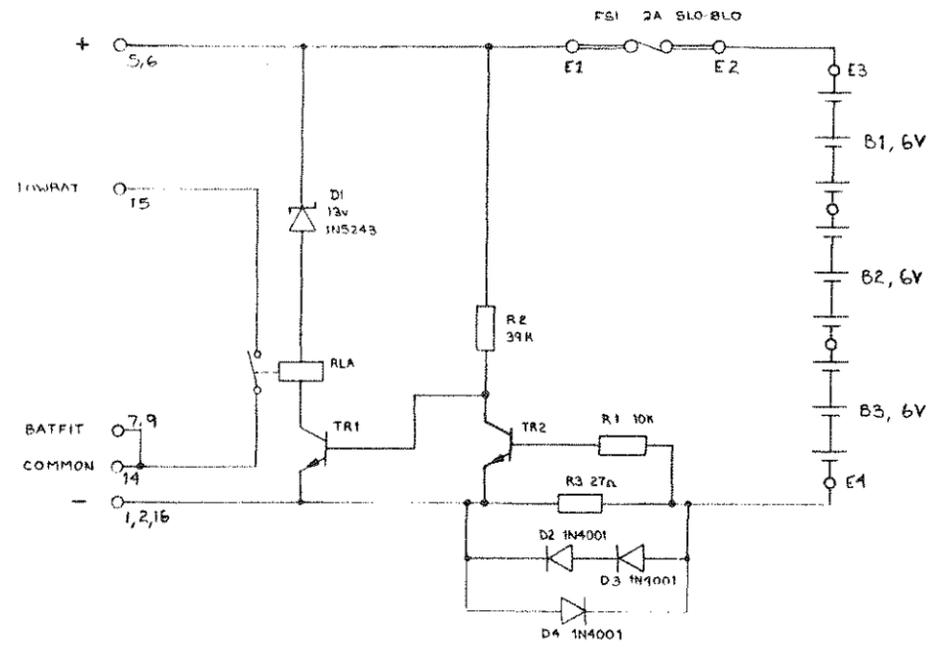
REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
537	C	INCORPORATED MODS./ REDRAWN DPM	3-1-85	DGM



DASH NO		QTY REQD	NEXT ASSEMBLY	USED ON	TOLERANCES X = ± .30' .XX = ± .03 .XXX = ± .010	MATERIAL	FINISH	DRAWN DPM 3-1-85 CHECKED SW 3-1-85 APPR DGM 3-1-85 STK NO	 Valhalla Scientific Inc. SAN DIEGO, CA		
					BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	64	SCALE 1:1	CODE IDENT 53504	SIZE D	DRAWING NO 2720-613	REV C
					HIGH VOLTAGE POWER SUPPLY ASSY. DWG						
					SHEET 1 OF 4						

NOTES: (UNLESS OTHERWISE SPECIFIED)

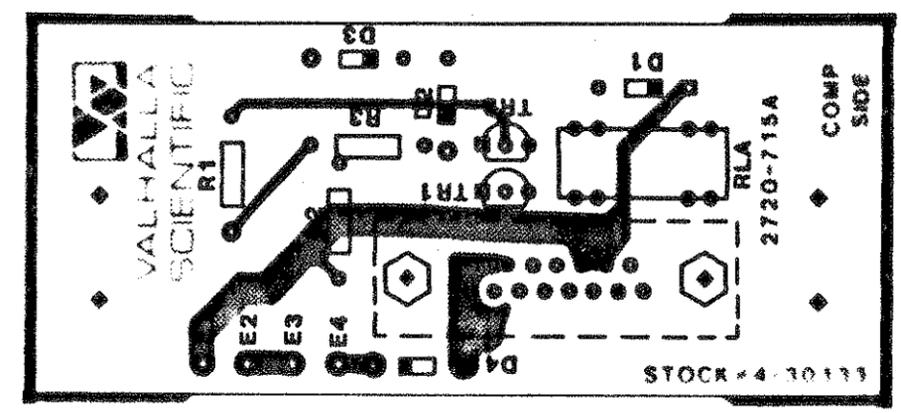
REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
676	A	RELEASED	RDN 2-28-85	PWD



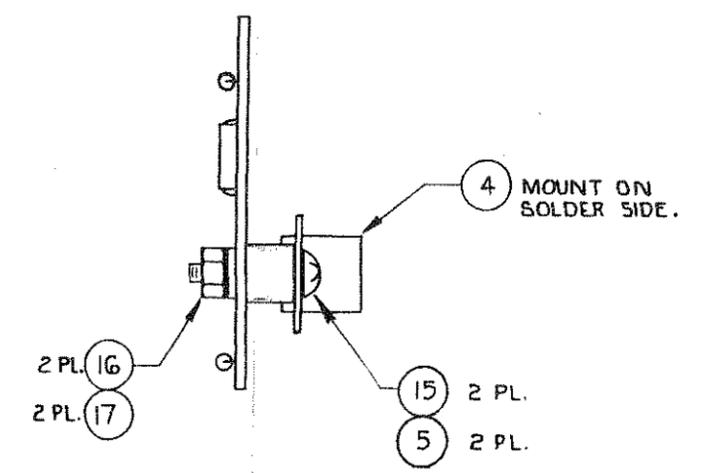
TOLERANCES		MATERIAL		DRAWN P.W. 8-31-83		 Valhalla Scientific Inc. SAN DIEGO, CA	
X = ± .30'		✓		CHECKED P.W. 8-31-83			
.XX = ± .03				APPR P.W. 8-31-83			
.XXX = ± .010		FINISH		STK NO			
BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES		✓		"2720" OPTION "BAT"			
04 ✓				SCALE NONE			
DASH NO	QTY RECD	NEXT ASSEMBLY	USED ON	CODE IDENT	SIZE	DRAWING NO	RFV
				53504	D	2720-085	A

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
676	C	REDESIGNED	RDN 3-1-85	JM

COMP. SIDE SHOWN



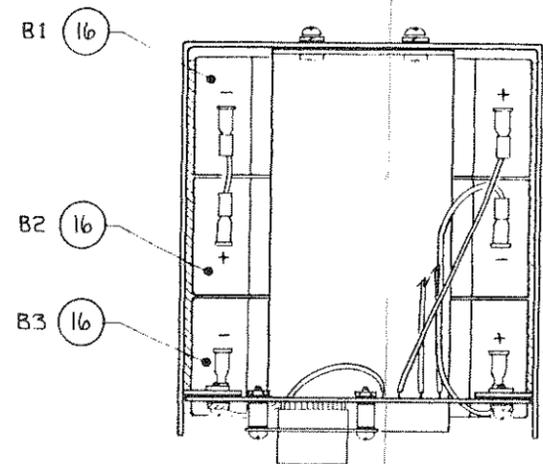
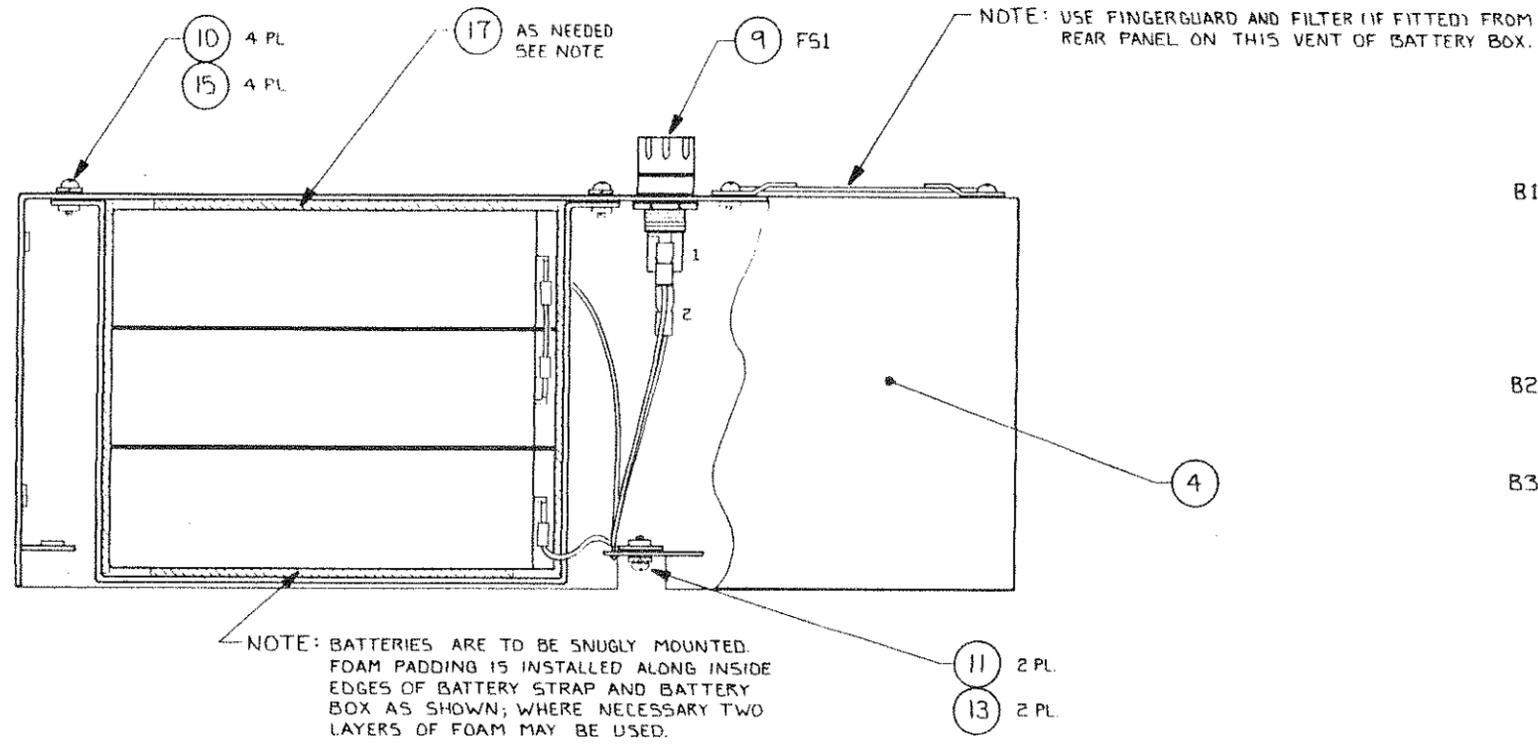
SECURE CONNECTOR BEFORE SOLDERING



				TOLERANCES X = ± .30' .XX = ± .03 .XXX = ± .010		MATERIAL 		DRAWN RDN 3-1-85 CHECKED BW 3-1-85 APPR BW 3-1-85 STK NO		 Valhalla Scientific Inc. SAN DIEGO, CA	
				BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES 64 ✓		FINISH 		THE INFORMATION DISCLOSED HEREIN WAS OBTAINED BY AND IS THE PROPERTY OF VALHALLA SCIENTIFIC INC. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE EXPRESS WRITTEN PERMISSION OF VALHALLA SCIENTIFIC INC. VALHALLA SCIENTIFIC INC. RESERVES ALL PATENT, TRADE SECRET, AND PROPRIETARY DESIGN RIGHTS THEREIN.		OPTION "BAT" P.C.B. ASSEMBLY	
DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON	SCALE 1:1	CODE IDENT 53504	SIZE C	DRAWING NO 2720-615	REV C			
				SHEET 1 OF 2							

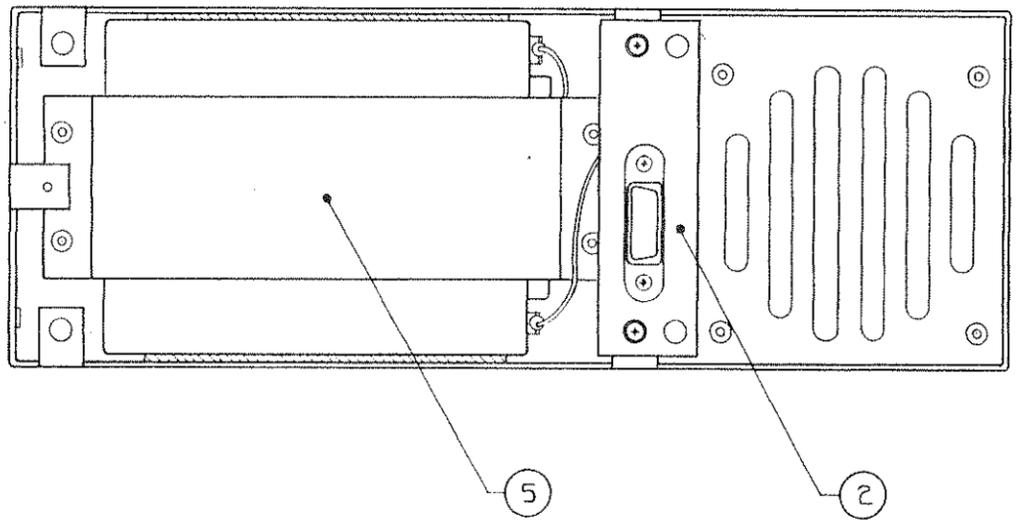
NOTES: (UNLESS OTHERWISE SPECIFIED)
 1 USE HOLE PLUGS IN UNUSED HOLES OF BATTERY BOX.

		REVISIONS		
ECO	LTR	DESCRIPTION	DATE	APPROVED
44P	A	RELEASED	WPW 5-11-84	P
44P	B	UPDATED PARTS LIST	R 6-16-84	R

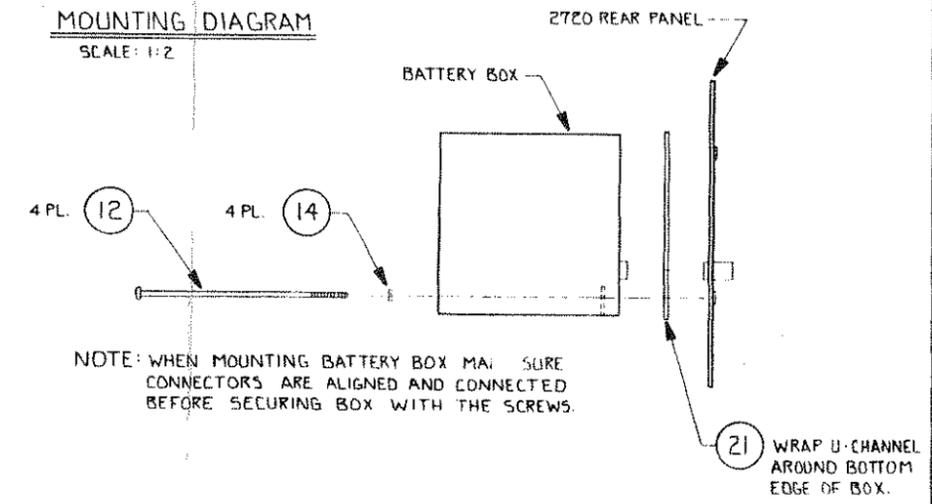


WIRE TAB

FROM	TERMINATION	TO	TERMINATION
E1	SOLDER	F51-2	SOLDER SLEEVE
E2	SOLDER	F51-1	SOLDER SLEEVE
E3	SOLDER	B1+	CRIMP TERMINAL
E4	SOLDER	B3-	CRIMP TERMINAL
B1-	CRIMP TERMINAL	B2+	CRIMP TERMINAL
B2-	CRIMP TERMINAL	B3+	CRIMP TERMINAL



MOUNTING DIAGRAM
SCALE: 1:2

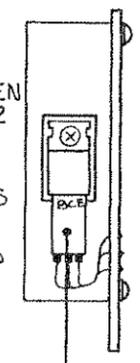
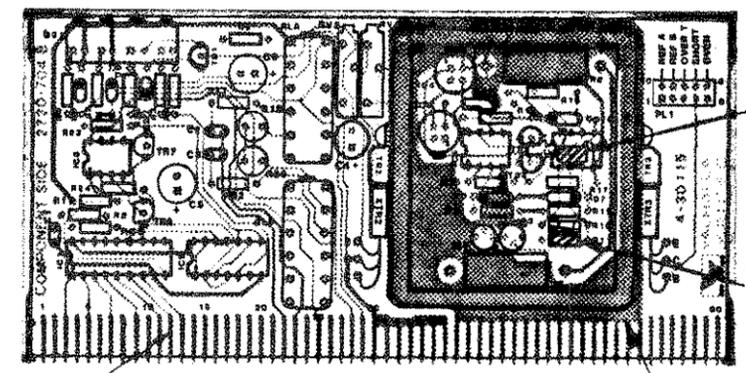
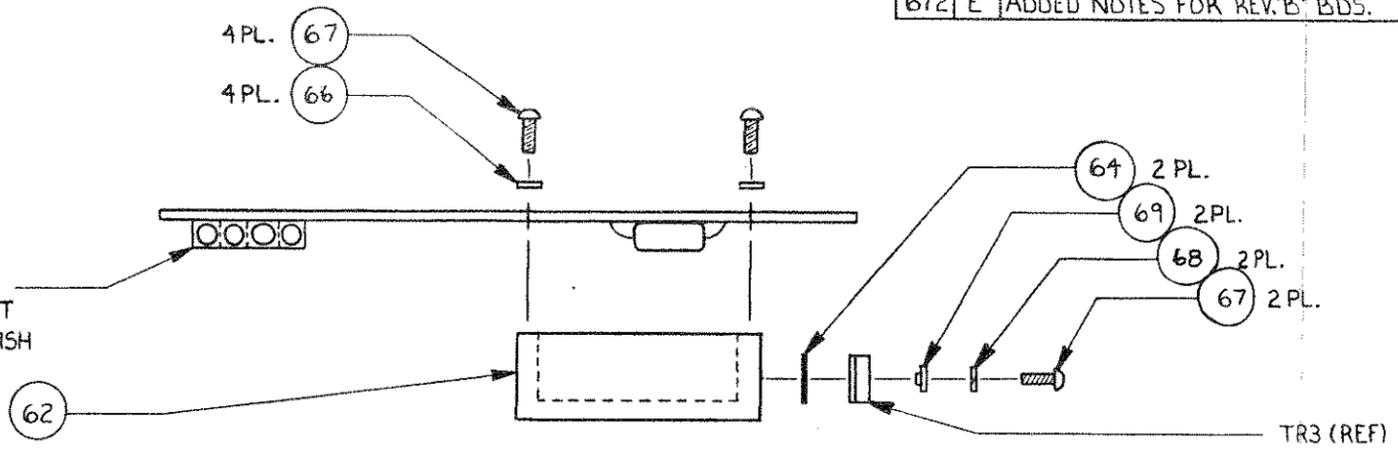


			TOLERANCES	MATERIAL	DRAWN WPW 5-11-84	<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>
			X ^o = ± .30'	SEE PARTS LIST	CHECKED PL 5-14-84	
			.XX = ± .03		APPR R 5-14-84	
			.XXX = ± .010		STK NO	
			BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES	FINISH		OPTION "BAT" ASSY.
			64 ✓		SCALE 1:1	CODE IDENT SIZE DRAWING NO
DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON			53504 D 2720-407
					SHEET 1 OF 2	REV B

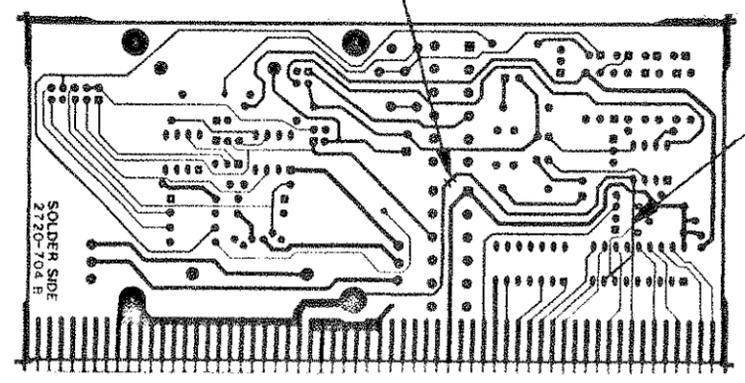
NOTES:

- 1. NO COMPONENTS CAN PROTRUDE MORE THAN .75 FROM PCB.
- 2. COMPONENTS INSIDE ITEM (62) (HEAT SHIELD) TO BE AS CLOSE TO PCB AS POSSIBLE.

IF SINGLE HOUSINGS ARE USED, ENSURE UNIFORM ALIGNMENT AND POSITION (FLUSH TO PCB)



REVISION "B" BOARDS ONLY
CUT TRACK ON THE PCB IN THIS AREA



MAKE SURE THAT GOLD FINGERS ARE FREE OF SOLDER AFTER BOARD IS COMPLETELY ASSEMBLED.

SEE NOTE 2

REVISION "B" BOARDS ONLY
JUMPER PIN 4 OF IC6 TO PIN 8 OF IC1 USING KYNAR WIRE.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
341	D	UPDATED / REDRAWN	DPM 1-25-85	FD
672	E	ADDED NOTES FOR REV. B BDS.	DPM 2-20-85	FD

				<p>TOLERANCES</p> <p>X = ± .30'</p> <p>.XX = ± .03</p> <p>.XXX = ± .010</p>	<p>MATERIAL</p>	<p>DRAWN DPM 1-25-85</p> <p>CHECKED JWM 1/28/85</p> <p>APPR FDW 1/28/85</p> <p>STK NO</p>	<p>Valhalla Scientific Inc. SAN DIEGO, CA</p>					
				<p>BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES</p> <p>64 ✓</p>	<p>FINISH</p>	<p>2720 REFERENCE PCB ASSEMBLY</p>		<p>SCALE 1:1</p>	<p>CODE IDENT 53504</p>	<p>SIZE C</p>	<p>DRAWING NO 7720-604</p>	<p>REV E</p>
DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON									

D
C
B
A

D
C
B
A

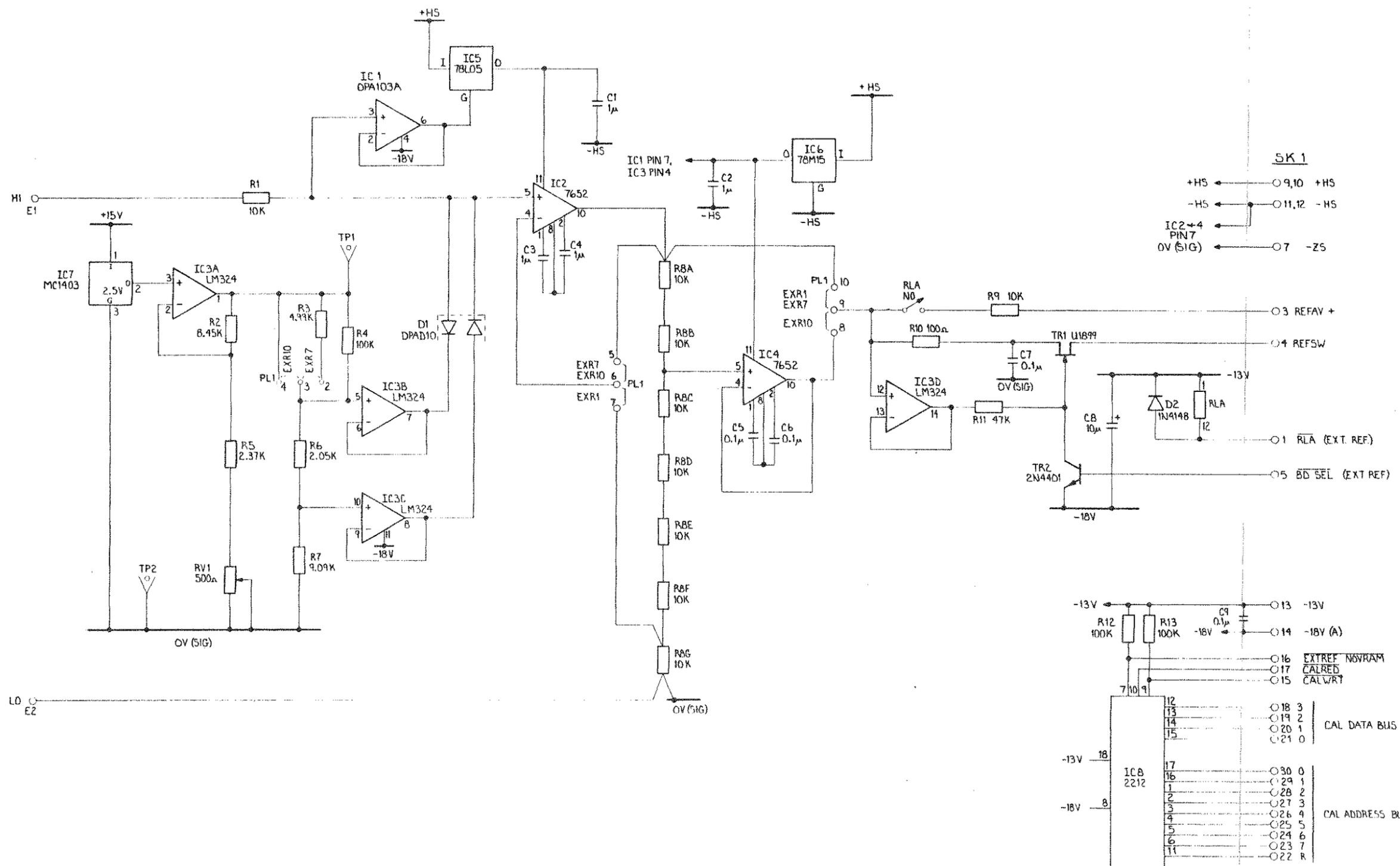
4 3 2 1

4 3 2 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. R8 NOT FITTED ON EXR 7.
2. IC4 C5 AND C6 FITTED ON EXR 10 ONLY.
3. ADJUST RV1 FOR +11.00 VOLTS BETWEEN TP1 & TP2.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
351	A	RELEASED	5-20-85	



FIRST USED	NOT USED	LAST USED	TOLERANCES	MATERIAL	DRAWN DPM	4-18-85
C1	-	C9	X = ± 30'		CHECKED	
D1	-	D2	.XX = ± .03		APPR	
IC1	-	IC8	.XXX = ± .010		STK NO	
R1	-	R13				
RV1	-	RV1	BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES	FINISH		
TR1	-	TR2	64 ✓			
RLA	-	RLA				



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SAN DIEGO, CA

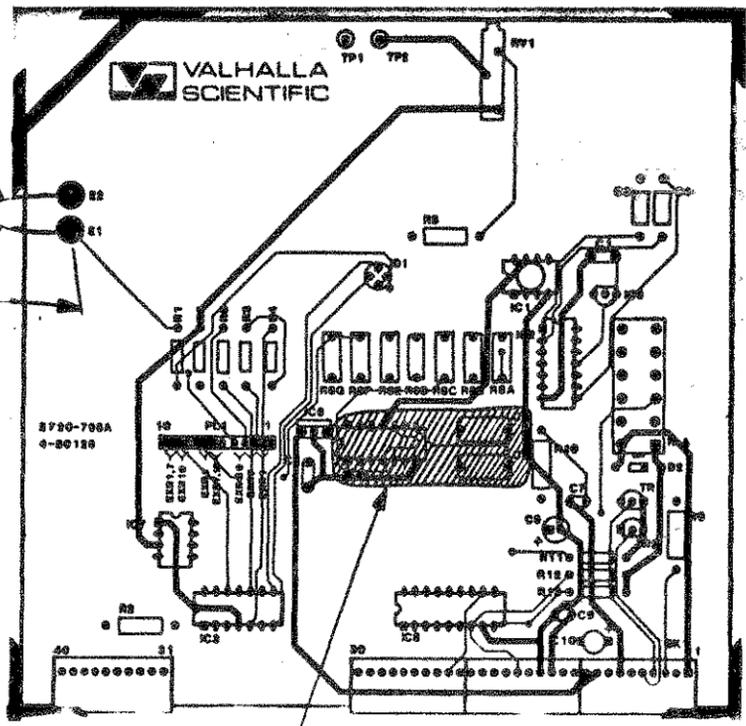
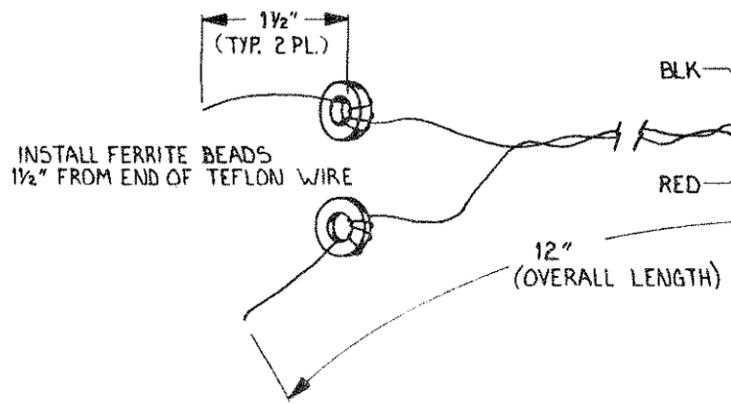
OPTION EXR

SCALE	CODE IDENT	SIZE	DRAWING NO	REV
	53504	D	2720-075	A

NOTES:

1. RB IS A MATCHED SET OF SEVEN RESISTORS. ONE OF THESE RESISTORS IS SEPERATE FROM THE OTHER SIX. THIS SINGLE RESISTOR SHOULD BE INSTALLED IN THE RBG LOCATION, THE OTHERS IN THE RBA-F LOCATIONS.
2. RBA-G SHOULD BE MOUNTED 1/4" ABOVE PCB.
3. INSTALL SHORTING LINKS BETWEEN PL1 PINS 1+2, 6+7 AND 9+10.
4. IC4, C5 AND C6 ARE NOT FITTED.

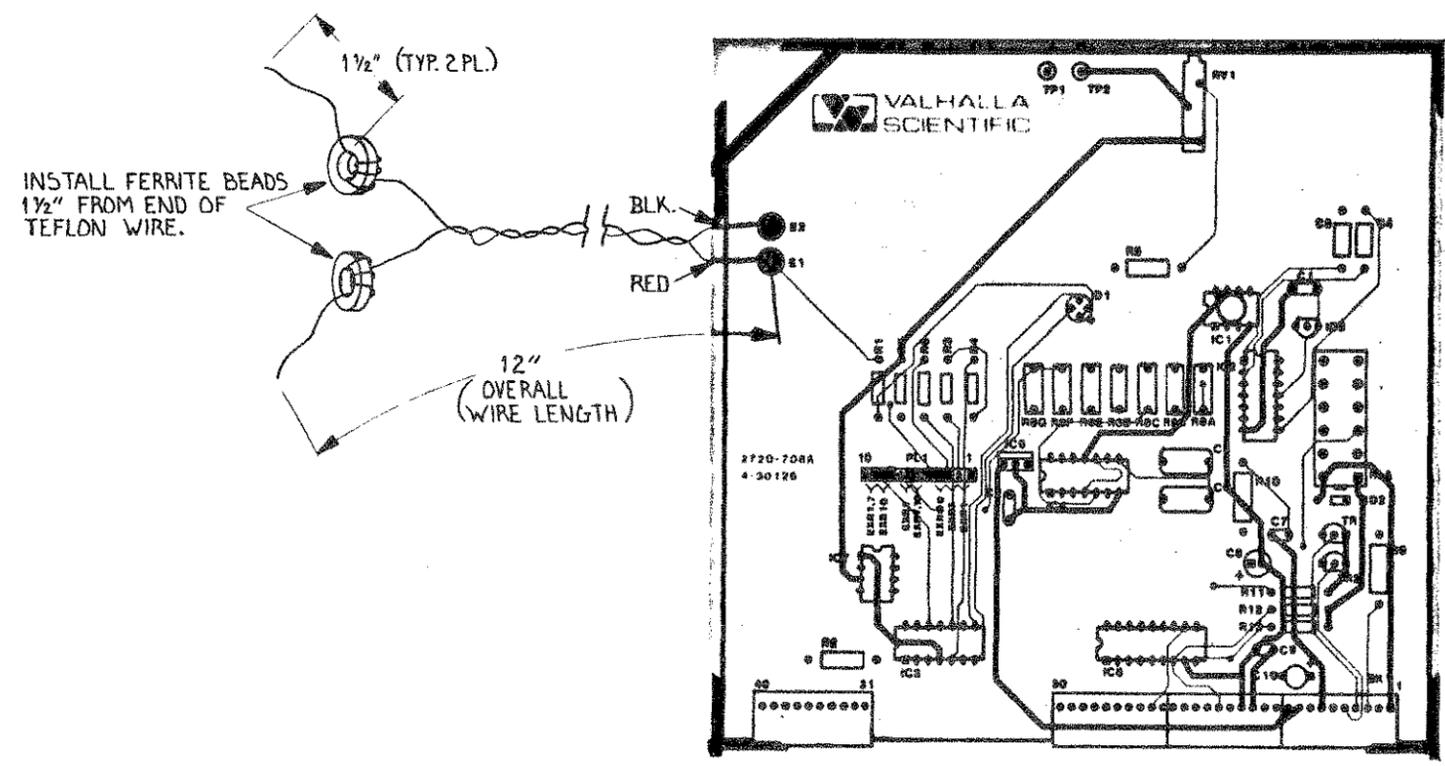
REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
351	A	RELEASED	DPM 6-7-85	Pow



				TOLERANCES X = ± .30' .XX = ± .03 .XXX = ± .010		MATERIAL 		DRAWN <i>(DPM)</i> 6/6/85 CHECKED <i>(DPM)</i> 6/11/85 APPR <i>(DPM)</i> 6/11/85 STK NO.		 Valhalla Scientific Inc. SAN DIEGO, CA	
				BREAK ALL SHARP CORNERS AND EDGES. MACH SURFACES 64 ✓		FINISH 		THE INFORMATION DISCLOSED HEREIN IS UNCLASSIFIED BY AND IS THE PROPERTY OF VALHALLA SCIENTIFIC INC. AND IS LOANED TO THE UNITED STATES GOVERNMENT BY THE UNITED STATES GOVERNMENT. VALHALLA SCIENTIFIC INC. RETAINS ALL RIGHTS. THIS PROPRIETARY DESIGN IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.		OPTION EXR 1	
DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON	SCALE 1:1		CODE IDENT 53504	SIZE C	DRAWING NO 2720-605	REV A	SHEET 3 OF 3	

- NOTES:**
1. R8 IS A MATCHED SET OF SEVEN RESISTORS. ONE OF THESE RESISTORS IS SEPERATE FROM THE OTHER SIX. THIS SINGLE RESISTOR SHOULD BE INSTALLED IN THE R8G LOCATION, THE OTHERS IN THE R8A-F LOCATIONS.
 2. R8A-G SHOULD BE MOUNTED 1/4" ABOVE PCB.
 3. INSTALL SHORTING LINKS BETWEEN PL1, PINS 3+4, PINS 5+6 AND PINS 8+9.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED
351	A	RELEASED	DPM	6-7-85



DASH NO	QTY REQD	NEXT ASSEMBLY	USED ON	TOLERANCES	MATERIAL	FINISH	DRAWN	CHECKED	APPR	STK NO	Valhalla Scientific Inc. SAN DIEGO, CA				
				X = ± .30' .XX = ± .03 .XXX = ± .010			6/5/85	6/11/85	6/11/85		OPTION EXR 10				
				BREAK ALL SHARP CORNERS AND EDGES, MACH SURFACES							SCALE 1:1	CODE IDENT 53504	SIZE C	DRAWING NO 2720-608	REV A
				84 ✓							SHEET 3 OF 3				

