

# **ULTIMATION**

## **Service Manual**

### **Section 4**

#### **Power Supply Service Information**

4.1	82E362 Card Description	Page 4-3
4.2	Test and Calibration	Page 4-4
4.3	Drawings	Page 4-5



## 4. Power Supply Service Information

Your system will be fitted with one or more SL569 Motor Fader PSUs (depending upon the size of your console), and with either the SL668 or the SL564 Moving Fader Analogue PSU. The SL564 and SL569 supplies both use proprietary PSU modules; the SL668 PSU circuitry is mostly contained on the 82E362 Card, which is described below.

### 4.1 82E362 Card Description (*SL668 PSU only*)

#### *Analogue Supply ( $\pm 15V$ )*

The positive and negative sections of the Analogue Power Supply Circuitry are similar. The description that follows is with reference to the positive section, with the equivalent components for the negative section shown in brackets.

Input supply to the card is via PL7. It feeds via a 5 Amp fuse FS1 (FS2) to regulators IC1-2 (IC3-4), wired in parallel. Capacitors C4 (C9) and C29 (C30) provide transient filtering on the regulator input. VR1 (VR2) and R14 (R15), if fitted, constitute the regulator output voltage setting network. Alternatively, remote voltage setting is from the 82E363 card via the four SET\_OUTPUT lines.

Link LK1 (LK2) is set at the factory to the position giving the higher (lower) output voltage at the relevant front panel test point. Regulator current-sharing is via R1-2 (R3-4).

Capacitor C6 (C10) improves ripple rejection, and diodes D4 (D5) and D7 (D8) provide discharge paths for C1 (C2) and C6 (C10) respectively, to protecting the regulator. Circuitry based around thyristor SCR1 (SCR2) forms a 'crowbar' circuit as over voltage protection.

The outputs from R1-2 (R3-4) feed to connectors PL8-9 via an 8 Amp series diode D1 (D2).

Additional circuitry, in the form of TR3 (TR2) and associated components, will shut down one half of the supply if the other half short-circuits. Normally, TR3 (TR2) is biased off via the current from the outputs of IC3-4 (IC1-2) through R9 (R10). If a short-circuit occurs on the output of IC3-4 (IC1-2), TR3 (TR2) will turn on, pulling the output of IC1-2 (IC3-4) to within 1.25 Volts of the 0V rail. When the fault has been cleared, normal operation resumes.

Note that links LK3-4 are supplied for test purposes only, and both must normally be inserted.

#### *Logic Supply (+5V)*

The logic input supply is via PL6. It feeds via a 5 Amp fuse FS3 to regulator IC5. Capacitors C12 and C31 provide transient filtering on the regulator input. VR3 and R20 constitute the regulator output voltage setting network. Alternatively, remote voltage setting is via the two SET\_OUTPUT lines. A separate 2A fused supply for the heatsink-mounted fan is provided via FS4 to PL4 Pins 12-13 and PL5.

Capacitor C13 improves ripple rejection, and diodes D6 and D9 provide discharge paths for C3 and C13 respectively, protecting the regulator from damage. Circuitry based around thyristor SCR3 forms a 'crowbar' circuit as voltage transient protection.

The output from IC5 feeds to the output connector PL4 via an 8 Amp series diode D1.

Additional circuitry, in the form of opto-isolator IC8, monostable IC7 and associated components, is provided to interrupt the logic supply if the CA computer fails. IC8 is driven via R21 from the CA 'watchdog' pulse signal CA\_MON. (*'If CA\_MON is flappy, the CA is happy, but if it is still, the CA is ill.'*) The output of IC8 triggers the first stage of IC7.

The first stage of IC7 is normally retriggered by the CA\_MON signal from IC8. If the CA computer fails, this retriggering will cease, and the second stage of IC7 will be triggered. TR4 will now briefly turn on, causing the output of IC5 to fall to within about 1.25 volts of the 0V line. This resets all of the faders into 'Non-CA mode' (i.e. Audio passes through the fader). TR1 will also turn on, energising the CA\_FAIL Relay RL1, thus linking the master fader send (PL2) back to the master fader return, and allowing manual mixing to continue.

The CA Failure Detection circuitry is all powered by a separate low power 5V regulator, IC6. Note that link LK5 must be fitted for the CA failure monitor circuitry to operate.

## **4.2 Test and Calibration**

### **4.2.1 $\pm 15V$ Rails and +5V Logic Rail**

With the console fully loaded, adjust the  $\pm 15V$  rails for  $15V \pm 0.1V$  measured on the power Molex on the fader bus card nearest the connector panel.

Similarly adjust the logic rail for  $5.0V \pm 5mV$

The table below shows the pin functions of the Molex connector.

Pin	Function
1	+15V
2	0V
3	0V
4	-15V
5	0V Digital
6	+5V

### **4.2.2 Calibrating the 5V Reference**

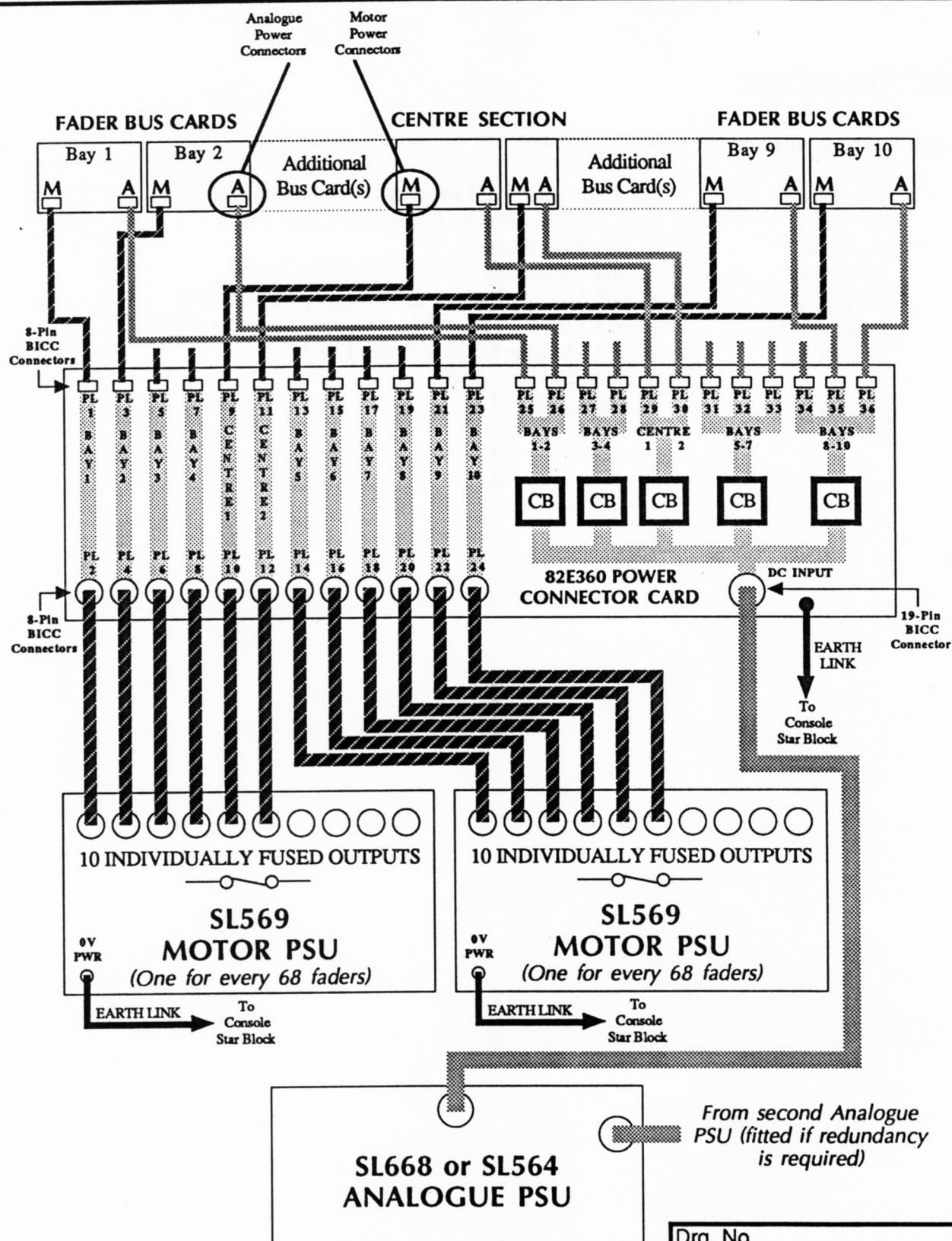
The master 5V reference for all faders is generated on the 82E358 Group Fader bus card.

Measuring between test points TP1 (+5V) and TP2 (0V) on the Group Fader bus card, adjust VR1 for  $5.0V \pm 1mV$ .

## 4.3 Drawings

Overleaf you will find the following drawings:

CM.MF.002	Moving Fader PSU Interconnection Diagram
T82360.71	Moving Fader Power Connector Sheet 1 of 1
53569092	SL569 Rear Panel
53569094	SL569 Final Assy.
T82E362.71	SL668 Moving Fader Power Supply Sheet 1 of 2
T82E362.72	SL668 Moving Fader Power Supply Sheet 2 of 2
T82E363.71	SL668 Monitor Display Sheet 1 of 1
	SL564 PSU Schematic
1523911	SL564 ±15V PSU
53466	SL564 5V PSU



Drg. No.

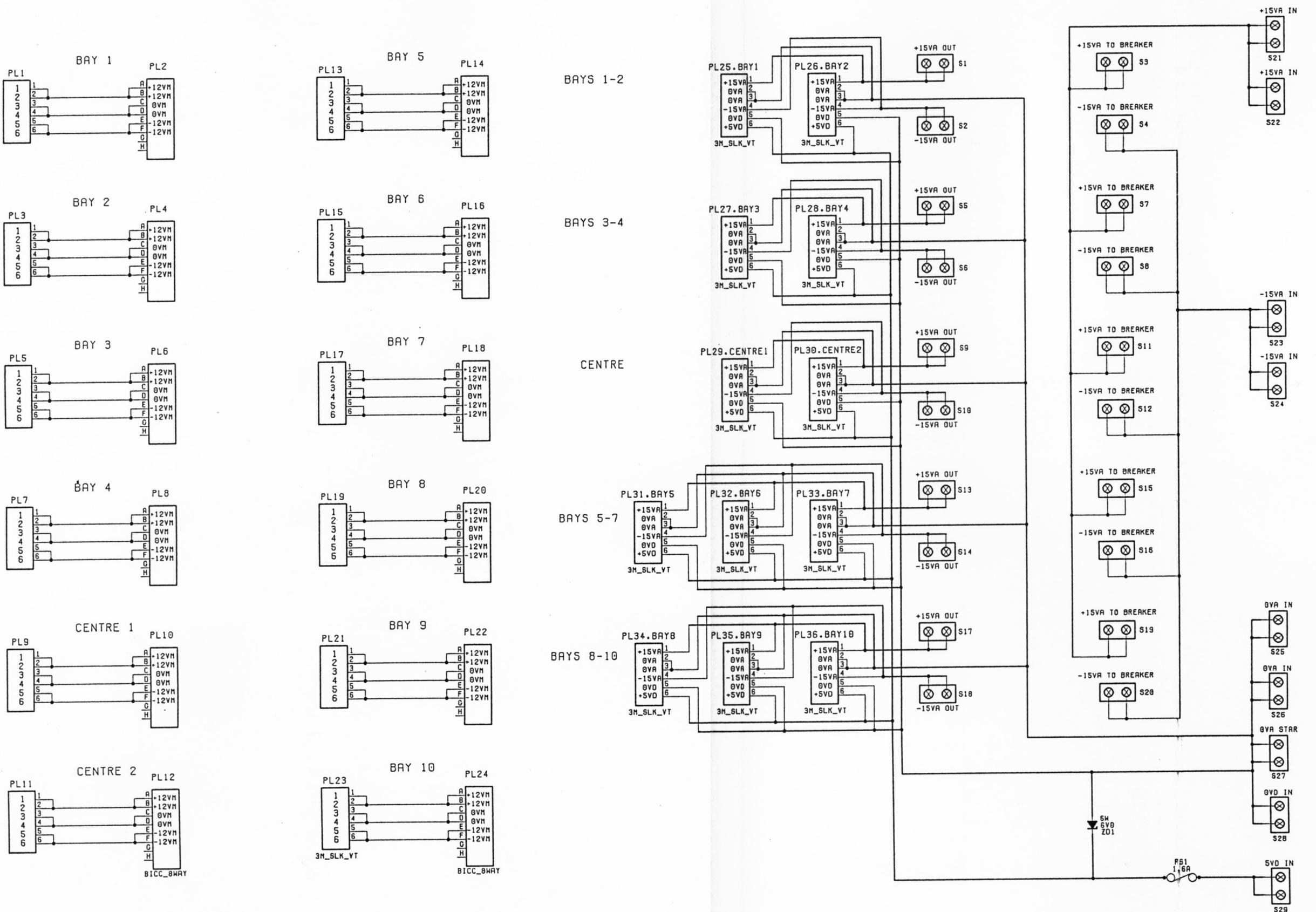
CM.MF.002

Title MOVING FADER PSU  
INTERCONNECTION DIAGRAM

Date

3 MAY 1991

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EV	ISS	DATE	DETAILS
0	A	27 MAR 91	NEW DRAWING BC MM

PCB ISSUE EF

**TLE MOVING FADER  
POWER CONNECTOR**

RG.NO.

182360.71

HEET TUFT

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Rev	Date	Chkd	Details
A	07 04 89	JEv	NEW ASSY. ADDED.
B	18 04 89	JEv	ASSY. MODIFIED - BANANA CONNECTOR ADDED.

MODEL: SL569  
RATED INPUT: 100-120V/200-240V  
FUSED AT: 15A/7.5A  
MAX.VA: 1400  
FREQUENCY: 47-63Hz

CURRENT  
SENSE

AC INPUT

16 17 18 19

10 11 6 8 9 12

15 16 17 18

TO EARTH BOLT ON CHASSIS

TO PSU 1 WIRE

PIN 3 16/.2 RED x 400MM

PIN 4 16/.2 BLACK x 400MM

ITEMS 3 & 4 TO BE TWISTED TOGETHER

2 3 4

LOOM B (ITEM 21)

BICC's 1-10 WIRE

PIN E 32/.2 BLACK

PIN F 32/.2 BLACK

LOOM D (ITEM 23)

BICC's 1-10 WIRE

PIN C 32/.2 GREEN

PIN D 32/.2 GREEN

FUSED TERMINAL BLOCK 1

LOAD TERMINAL's 1-10

LOAD TERMINAL's 1-10

TERMINAL's 1-10

TERMINAL's 1-10

TERMINAL's 1-10

WIRE

32/.2 RED

32/.2 RED

LOAD TERMINAL's 1-10

LOAD TERMINAL's 1-10

LOAD TERMINAL's 1-10

LOAD TERMINAL's 1-10

TERMINAL's 1-10

TERMINAL's 1-10

FUSED TERMINAL BLOCK 2

LOAD TERMINAL's 1-10

TERMINAL's 1-10

WIRE

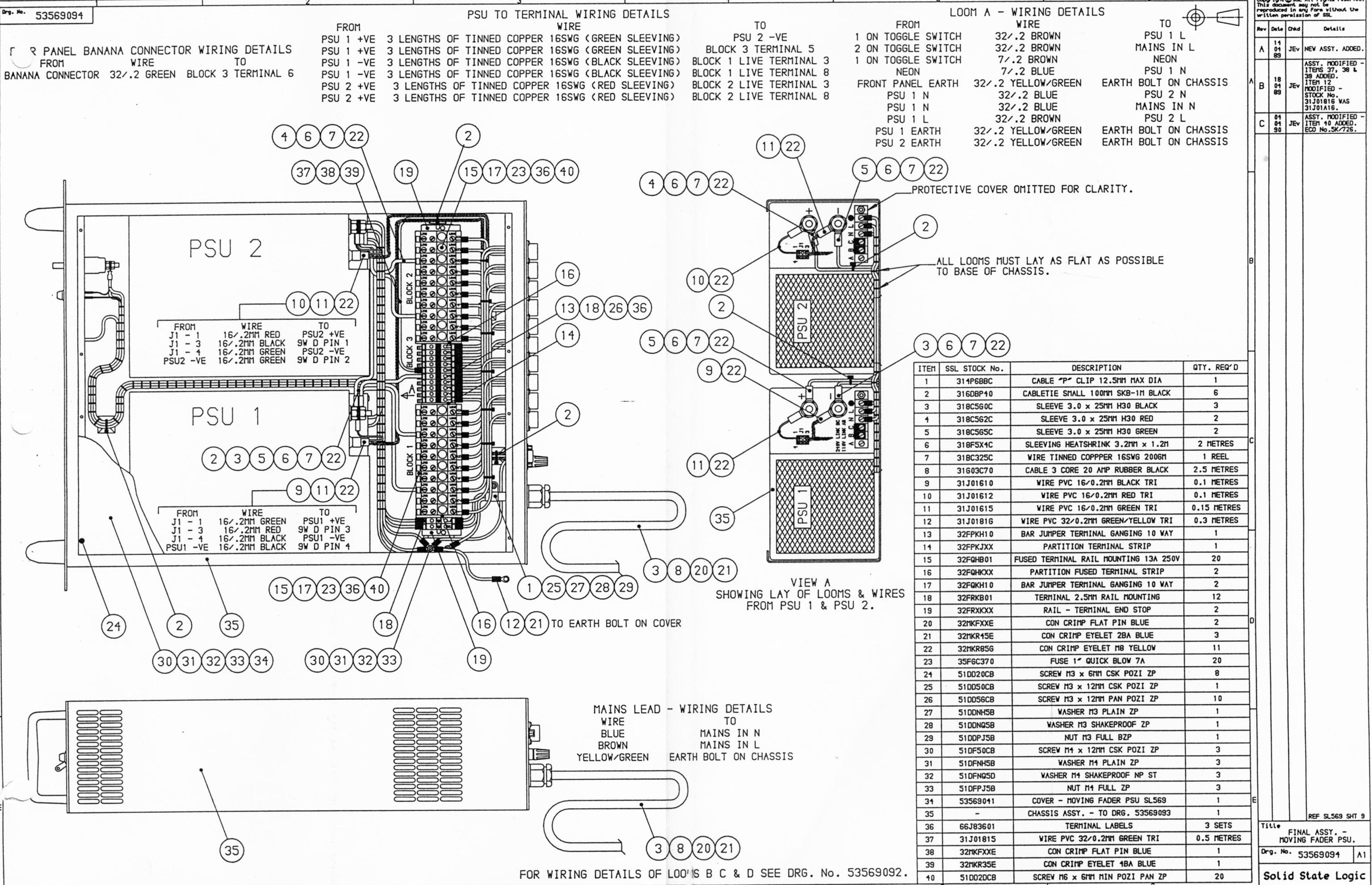
32/.2 RED

32/.2 RED

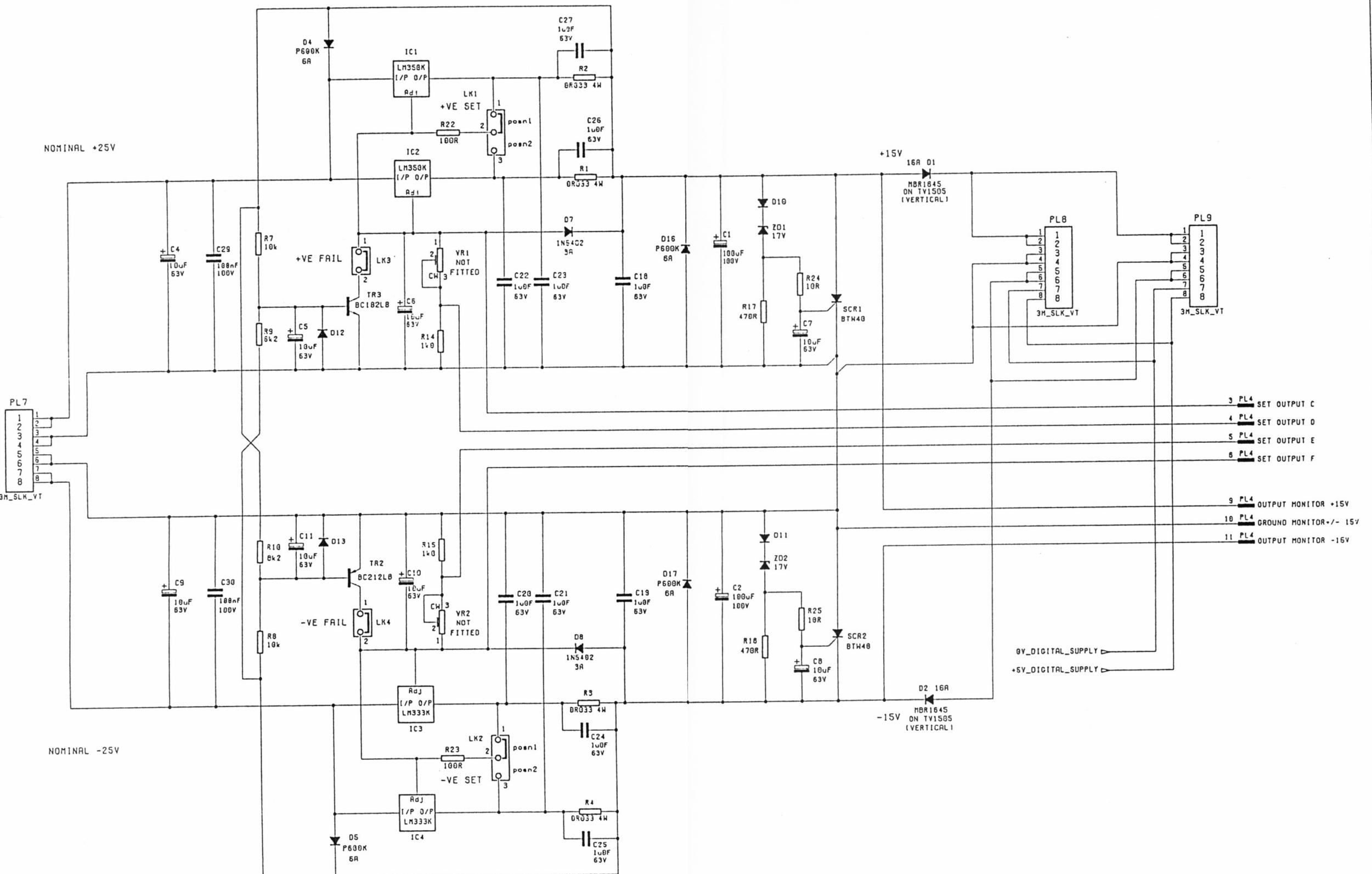
LOAD TERMINAL's 1-10

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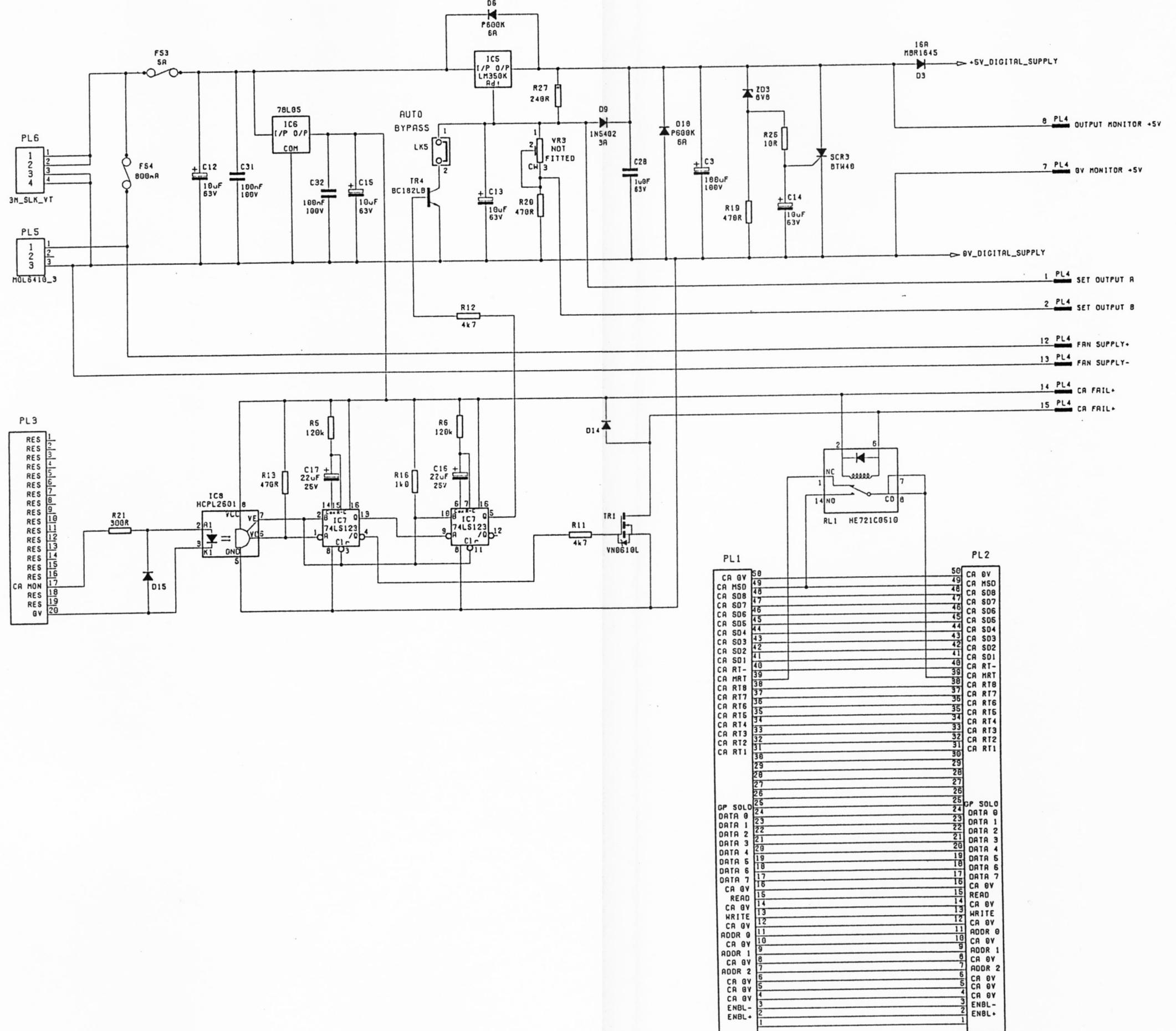
Rev	Date	Chkd	Details
A	14 04 89	JEv	NEW ASSY. ADDED.
B	18 04 89	JEv	ASST. MODIFIED - ITEMS 37, 38 & 39 ADDED. ITEM 12 MODIFIED - STOCK NO. 31J01816 WAS 31J01A16.
C	04 04 90	JEv	ASST. MODIFIED - ITEM 10 ADDED. ECO No.5K/726.



REV	ISS	DATE	DETAILS
0	A	7 MAY 91	NEW DRAWING BC MM
1	A	28 AUG 91	ECO 4K/833 MM INTRODUCE EF PCB



REV	ISS	DATE	DETAILS
0	A	7 MAY 91	NEW DRAWING BC MM
1	A	28 AUG 91	ECO 4K/833 MM INTRODUCE EF PCB



CR_BY	58	CA_BY	50
CR_HSD	49	CA_HSD	48
CA_SD8	48	CA_SD8	47
CA_SD7	47	CA_SD7	46
CA_SD6	46	CA_SD6	45
CA_SD5	45	CA_SD5	44
CA_SD4	44	CA_SD4	43
CA_SD3	43	CA_SD3	42
CA_SD2	42	CA_SD2	41
CA_SD1	41	CA_SD1	40
CA_RI-	40	CA_RT-	39
CA_MRT	39	CA_MRT	38
CA_RT8	38	CA_RT8	37
CA_RT7	37	CA_RT7	36
CA_RT6	36	CA_RT6	35
CA_RT5	35	CA_RT5	34
CA_RT4	34	CA_RT4	33
CA_RT3	33	CA_RT3	32
CA_RT2	32	CA_RT2	31
CA_RT1	31	CA_RT1	30
29	29	29	29
28	28	28	28
27	27	27	27
26	26	26	26
25	25	25	25
CP_SOLO	24	DATA 0	24
DATA 0	23	DATA 1	23
DATA 1	22	DATA 2	22
DATA 2	21	DATA 3	21
DATA 3	20	DATA 4	20
DATA 4	19	DATA 5	19
DATA 5	18	DATA 6	18
DATA 6	18	DATA 7	17
DATA 7	17	CA_BY	16
CA_BY	16	READ	15
READ	14	CA_BY	14
CA_BY	13	WRITE	13
WRITE	12	CA_BY	12
CA_BY	11	ADDR 0	11
ADDR 0	10	CA_BY	10
CA_BY	9	ADDR 1	9
ADDR 1	8	CA_BY	8
CA_BY	7	ADDR 2	7
ADDR 2	6	CA_BY	6
CA_BY	5	CA_BY	5
CA_BY	4	CA_BY	4
CA_BY	3	ENBL-	3
ENBL-	2	ENBL-	2
ENBL+	1	ENBL+	1

PCB ISSUE EF

USED ON SL668 A2

TITLE MOVING FADER  
POWER SUPPLY

DRG.NO. T82362.72

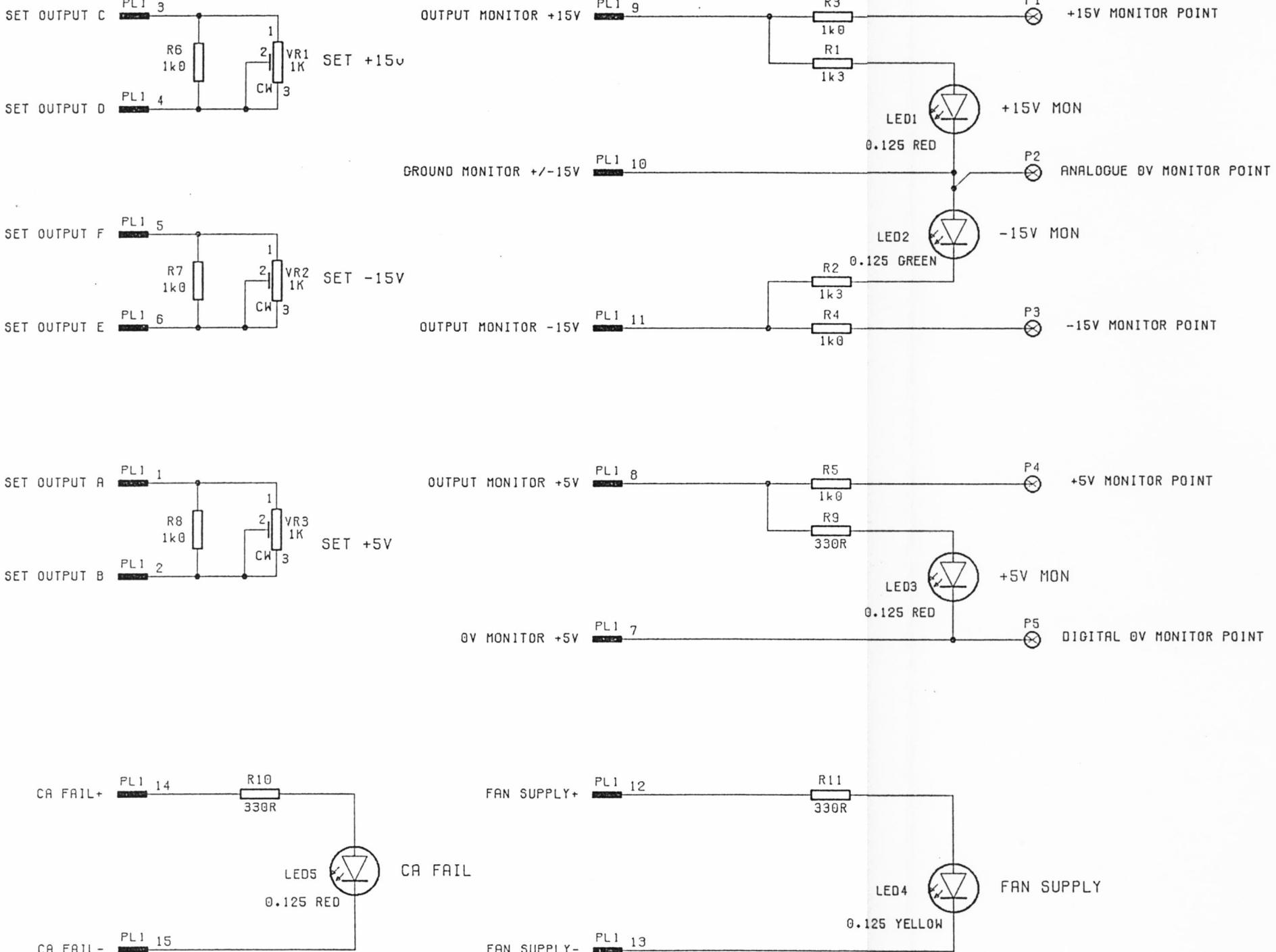
SHEET 2 OF 2

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1 2 3 4 5 6

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REV	ISS	DATE	DETAILS
0	A	25 APR 91	NEW DRAWING BC MM



PCB ISSUE AB

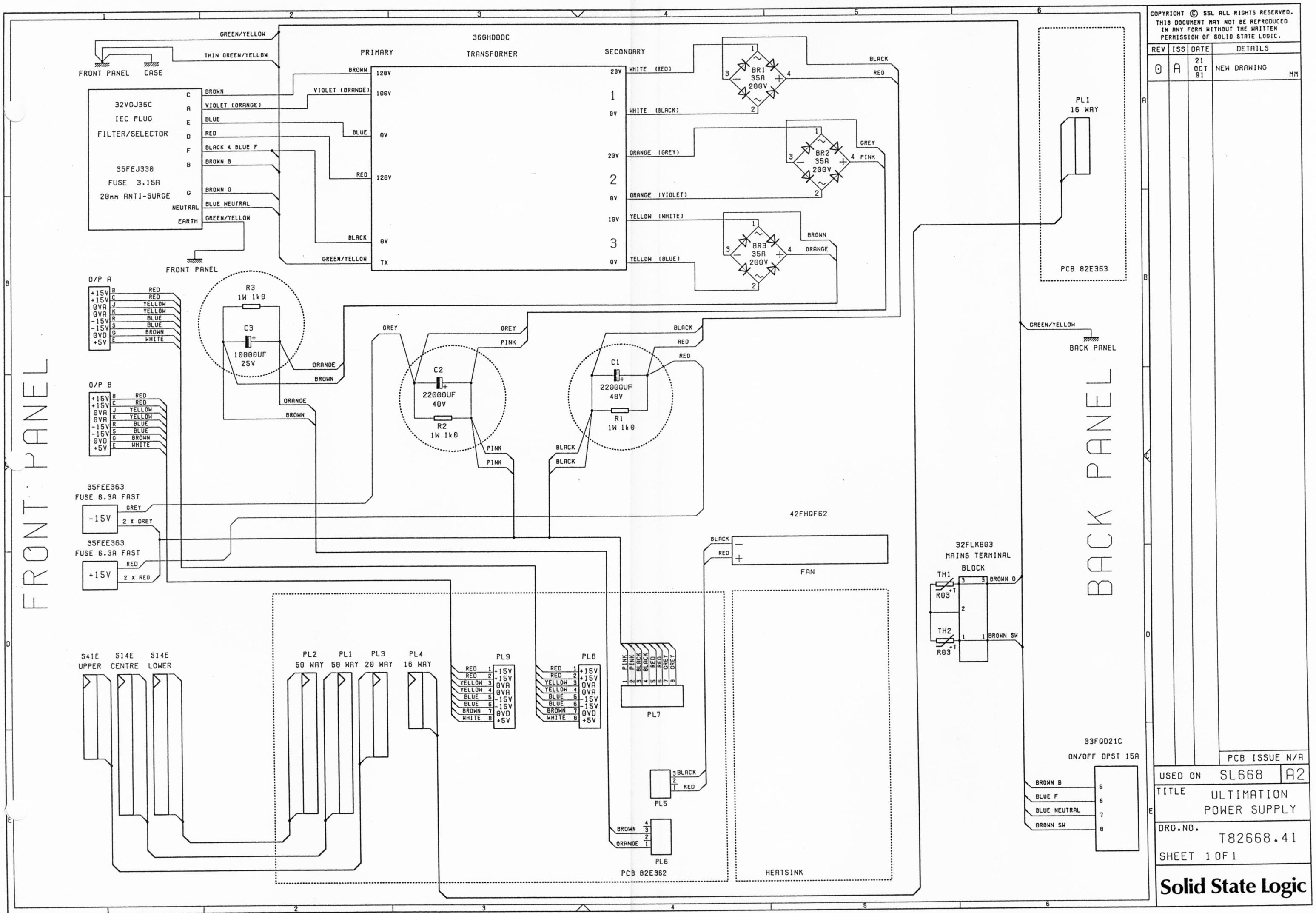
USED ON SL668 A3

TITLE MOVING FADER  
 MONITOR DISPLAY

DRG.NO. T82363.71  
 SHEET 1 OF 1

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1 2 3 4 5 6

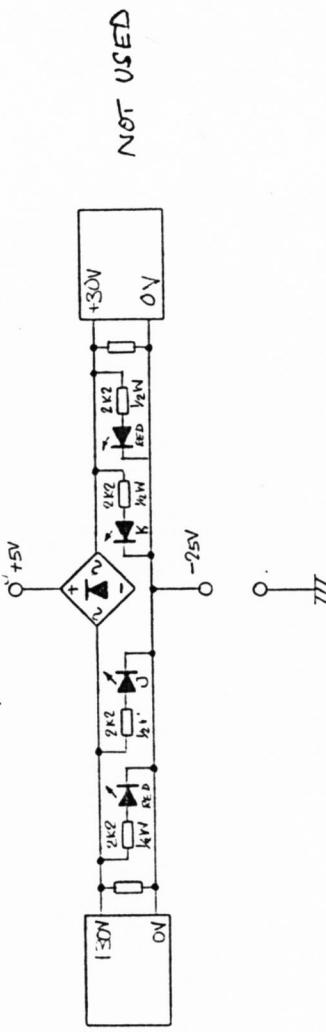
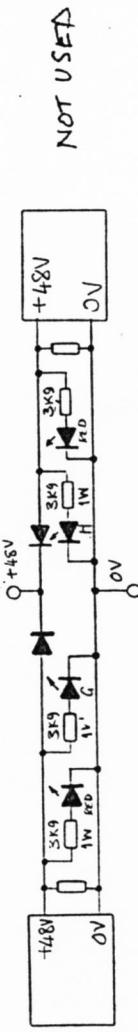
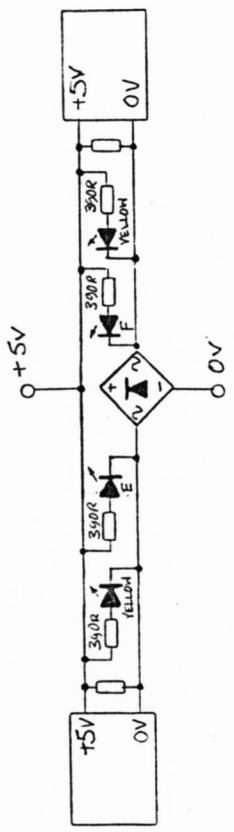
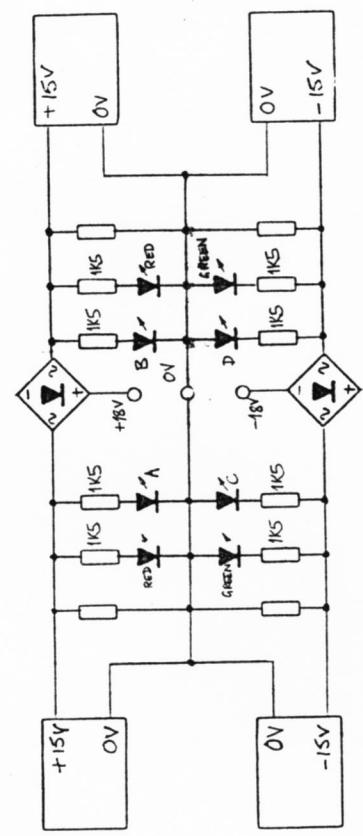


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Details

Rev. Date

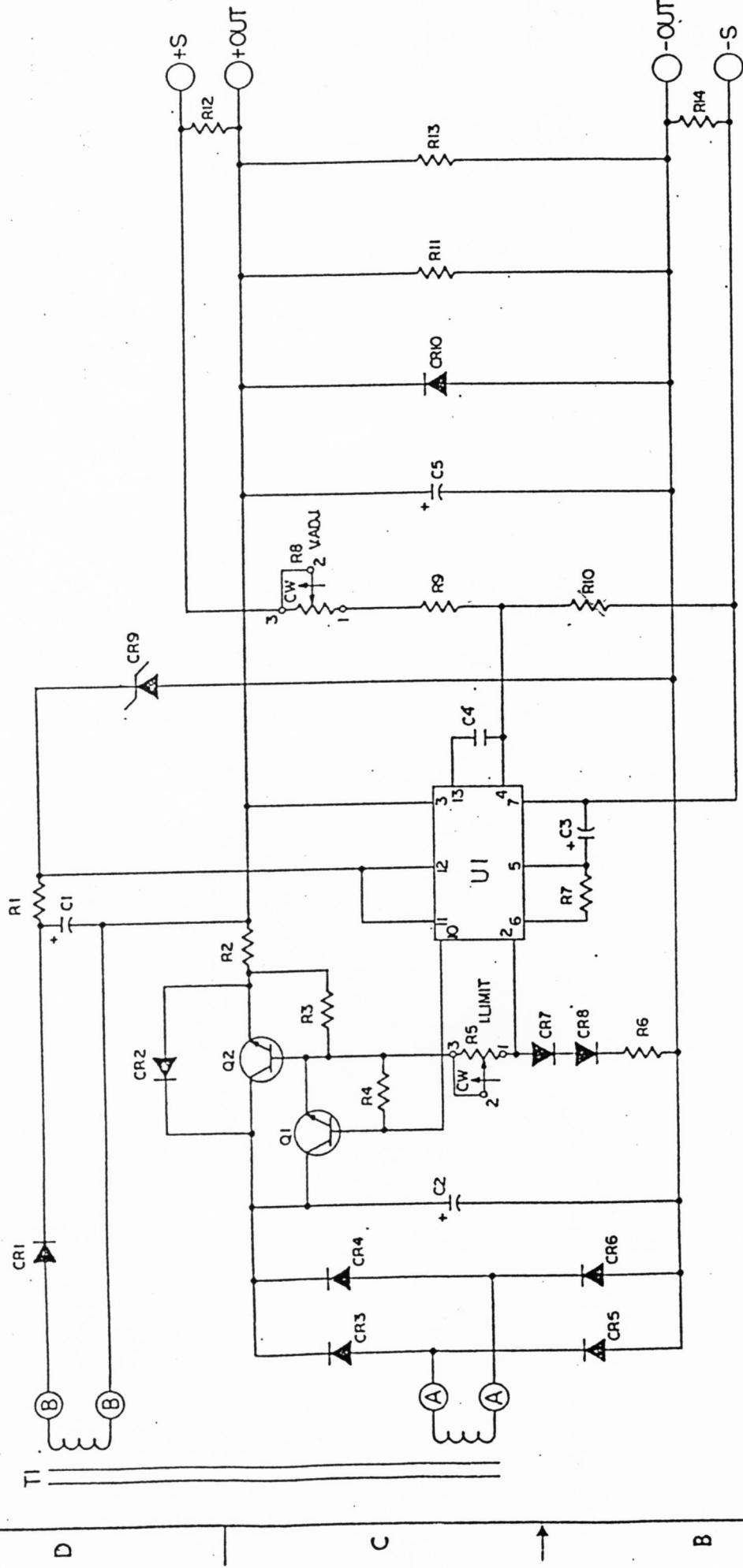


Title SL564  
PROVISIONAL P/S SCHEM  
Drg.No.

# Solid State Logic

Stonesfield • Oxford • England

ECO LTR	REVISIONS	DESCRIPTION	QTY	APPROVED
N/A	A	RELEASED FOR PRODUCTION	1000	✓



MAY 15 1985

FOR PARTS LIST SEE P/L 53466-1

PART OR IDENTIFICATION NO.		NOMENCLATURE		DRAWING NO.	POWER ONE SD PART NO.
ITEM	DESCRIPTION	ITEM	DESCRIPTION		
<b>PARTS LIST</b>					
TOLERANCE	MAX .020	ITEM	REFERENCE DESIGNATION	DATE	FILE
MIN -.010				1/1/85	10051584-8800
SCR	CR10	ITEM	REF ID		
	TI	ITEM	REF ID		
NOT USED					
MATERIAL					

### SCHEMATIC +5V PSU

- FOR PARTS LIST DASH NO. SEE APPROPRIATE MODEL NO., UNLESS OTHERWISE SPECIFIED

NOTES: UNLESS OTHERWISE SPECIFIED

REV A  
P/N 53466-1  
PRINT 1 OF 1  
CRAFT DRAWING

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SIZE	CODE IDENT NO.	DRAWING NO.	REV
C	54407	53466	A

LAST REFERENCE DESIGNATION USED	
C5	CR10
SCR	TI
NOT USED	
MATERIAL	

ITEM	REF ID	ITEM	REF ID
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12	13	13	13

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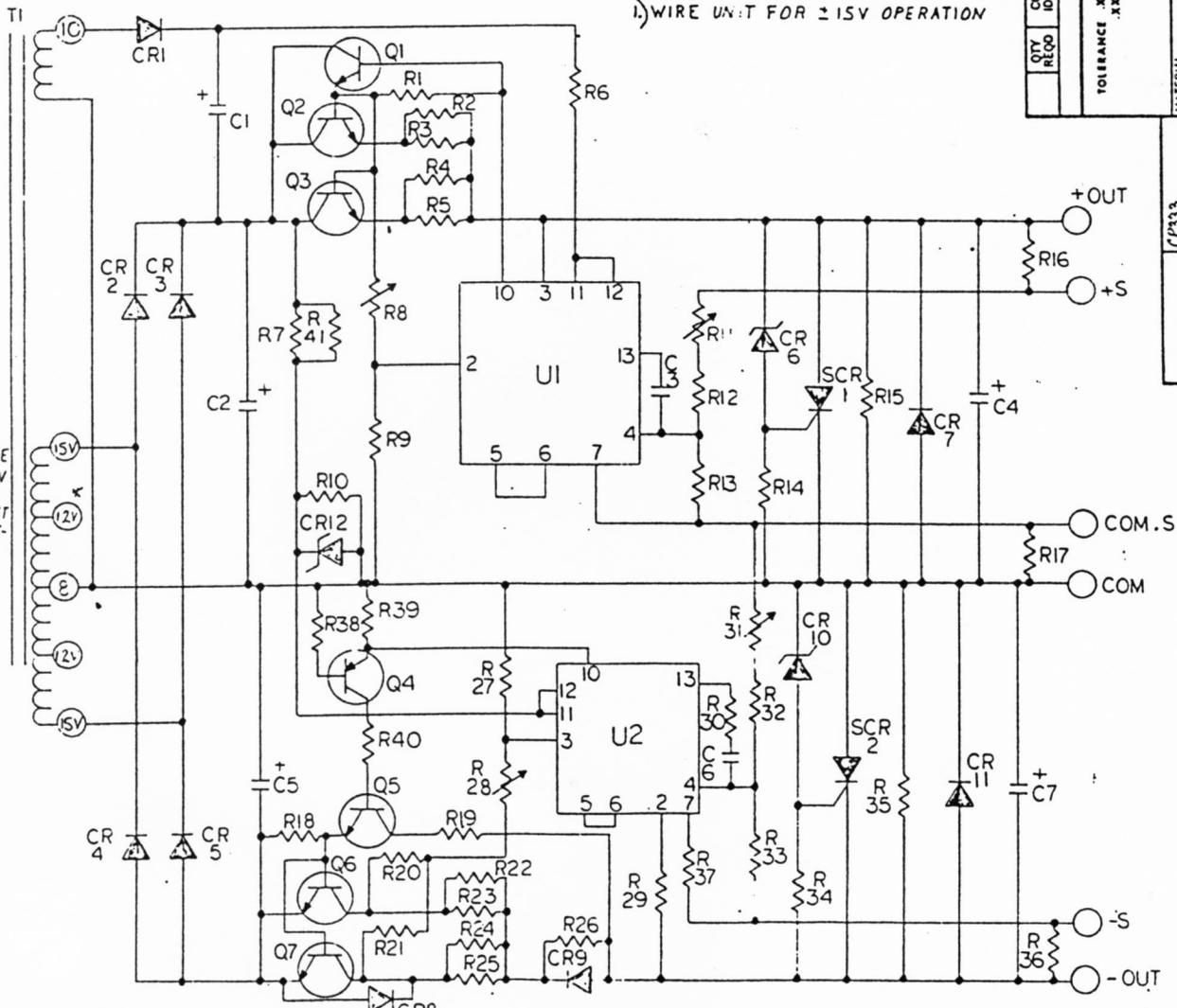
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REF DES	DATE APPROVED	STD P/N	DESCRIPTION
C1, 4, 7	3/2/78	101-10109	CAPACITOR ALUM ELECT
C2, 5	20.000/35	103-10029	CAPACITOR ALUM ELECT
C3	.003/100	104-10092	CAPACITOR MYLAR
C6	.01/100	104-10095	CAPACITOR MYLAR
CR1, 8	IN4003	111-10251	DIODE 1A 200V
CR2, 3, 4, 5, 7	MR75C	111-10256	1 22A 50V
CR6, 10			
CR7, 11	3A	111-10252	3A 100V
CR12	IN965	112-10009	DIODE, ZENER, 15V
SCR1, SCR2			SCR
Q1	2N659	171-10261	TRANSISTOR
Q2, 3, 6, 7	2N3055	171-10262	
Q4	2N2907A	172-10248	
Q5	2N6551	172-10249	TRANSISTOR
U1, U2	LM723	130-10287	I.C. VOLTAGE REGULATOR
R26	.56Ω	158-10052	RESISTOR 2W 10% BWH
R2, 3, 4, 5	.39Ω	158-10051	RESISTOR 2W 10% BWH
R22, 23, 24, 25	.37Ω	158-10051	2W 10% BWH
R1, 18	4.7K	151-10381	1/2W 5% CF
R6, 39, 40, 29, 30	330Ω	151-10353	
R7, 38	.1K	151-10365	
R10, 14, 34, 41			
R15, 35	750Ω	151-10362	
R19, 37, 20, 21	2.7Ω	151-10305	5% CF
R10, 32	1KΩ	152-10515	2% MF
R13, 33	2KΩ	152-10512	RESISTOR 1/2W 2% MF
R8, 11, 28, 31	1.5K	155-10025	METER
R16, 17, 36	6.8Ω	151-10313	RESISTOR 1/2W 5% CF
PCB	15229	505-15229	P.C. BOARD
T1	15240	082-15240	TRANSFORMER
CHASSIS	11071	412-11071	CHASSIS
R9	10KΩ	151-10339	RESISTOR 1/2W 5% CF
R27	20KΩ	151-10396	RESISTOR 1/2W 5% CF

PRODUCT NOTES:  
1) WIRE UNIT FOR ±15V OPERATION



REVISIONS		DESCRIPTION	NONENCLATURE OR DESCRIPTION	
DATE	CODE IDENT	PART OR IDENTIFYING NO.	LIST	SHEET OF
APPROVALS	DATE	CONTRACT NO.	APPROVALS	APPROVED
DRAWN BY: D. DOORMAN	1-11-78	111-10251	DRWNL. DOORMAN	1-11-78
CHECKED BY: J. L. COOPER	1-12-78	111-10256	CHECKD. J. L. COOPER	1-12-78
INITIALS: J. L. COOPER	1-12-78	171-10261	INITIALS: J. L. COOPER	1-12-78
APPROVED: J. L. COOPER	1-12-78	171-10262	APPROVED: J. L. COOPER	1-12-78
TOLERANCE XXX-030 XXX-010		FINISH	DO NOT SCALE DRAWING	
MATERIAL: C1P333		APPLICATION	USED ON	
NEXT ASSY		APPLICATION	USED ON	

SIZE CODE IDENT	DRAWING NO.
C 54407	1523911

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