Issue 1
1.7.82

Designs Department Manufacturing Information

No. 5.402(81)

Switched Mode Power Supplier PS4/8 and 8A

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(G.G. Johnstone)
for Head of Designs Department

Written By: M.T. Ellen

DDMI No. 5.402(81)
Title Sheet

VS

BBC

DS/SPA4

Issue 1
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Switched Mode Power Supplier PS4/8 and 8A

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BBC

DS/SPA4

Issue 1
1.3.82

Designs Department Manufacturing Information

No. 5.402(81)

Switched Mode Power Supplier PS4/8 and 8A

1. DESCRIPTION

This is an industry standard switched mode power supplier fitted with a front termination panel. Two different makes of power supplier are catered for: Gould (PS4/8) and Farnell (PS4/8A). Although they are 'standard' there are some mechanical differences and they are entirely different electrically. This Production Test Schedule does not deal with faults inside the main body of the power supplier, as faulty units should normally be returned to the manufacturer.

The termination panel provides four floating outputs wired in parallel, an LED to indicate the presence of the 28 volt output and a flying lead for mains input. A mains fuse is fitted on the power supplier and it may be changed by first removing the top cover immediately behind the front termination panel. The mains plug should also be fitted with a 5 amp fuse.

2. INFORMATION

2.1 Designed in RF Section (5), Designs Department

2.2 Designer and engineer responsible: M.T. Ellen

2.3 Handbook: part of DD Handbook No. 5.156(81)

2.4 No technical instruction available 1.4.81

2.5 Pre-production batch of 2 tested in Designs Department

3. MANUFACTURING PERFORMANCE SPECIFICATION

3.1 Input Requirements

Mains input (PLR)	170 to 265V ac

3.2 Output Requirements

Four parallel outputs (SKS)	28 ±0.05V dc with 5A load.

3.3 Performance

Regulation	Output should stay within ±0.05V for a load change of 0 to 5A and an input voltage range of 170 to 265V.

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Noise	
Mains Ripple	<20mV p-p
Switching Spikes	<50mV p-p (The method of measurement has a significant effect on the noise level indicated, see section 7.5 for details).
Current Limit	9 ±0.5A on short circuit.

4. WARNING

This unit contains voltages above 200V ac and dc.

The power supplier operates by rectifying the incoming mains, which is then chopped at about 30kHz and passed through an isolating step down transformer. So a large proportion of the circuit is at high voltage and not isolated from the mains input.

This Production Test Schedule does not call for the covers to be removed (apart from the top of the termination panel), so the main danger during testing is that something could fall through the perforated cover. Care should also be taken with the mains termination block, which only has a plastic cover.

5. TEST EQUIPMENT REQUIRED

Variac, 240V input and 170 to 265V output.

AVO

DVM, 0.05% accuracy.

Load resistor, 5.6Ω, 150 watts.

Oscilloscope, 50MHz bandwidth.

Test lead fitted with XLR-3 and BNC plugs.

6. INSPECTION CHECKS

6.1 Inspect the unit for any mechanical defects. Check that it has been manufactured correctly to D 49977 A1.

6.2 Inspect the unit for any wiring defects, in particular earth wiring. Check that it has been wired correctly to D 49974 A1 and D 49976 A1.

6.3 Check that a 5A fuse has been fitted in the mains plug.

6.4 Check that there are no defects that could make the unit unsafe, such as live conductors almost touching the top or bottom covers.

7. TEST PROCEDURE

7.1 To set the output voltage

7.1.1 Connect PLR to a Variac set to 240 ±5 volts. Connect 1SKS to a 5.6Ω load resistor (140 watts) and connect 2SKS to a DVM. Adjust the potentiometer on the internal front panel to set the voltage.

7.1.2 Set to 28 ±0.05 volts.

7.1.3 If this voltage cannot be obtained check the wiring and fuses. If no fault is found return the unit to the manufacturer, after first removing the termination panel.

7.2 To check regulation

7.2.1 Adjust the Variac over the range 170 to 265 volts, with and without the load resistor connected and measure the output voltage.

7.2.2 Check that the voltage does not change by more than 100mV.

7.2.3 If the regulation does not meet this specification check for loose or dry joints.

7.3 To check short circuit current

7.3.1 Connect an AVO (set to the 10A range) to 3SKS and measure the current, with the input set to 240 ±5V.

7.3.2 Short circuit current should be 9 ±0.5A and the output voltage should return to normal when the short is removed.

7.4 To check output isolation

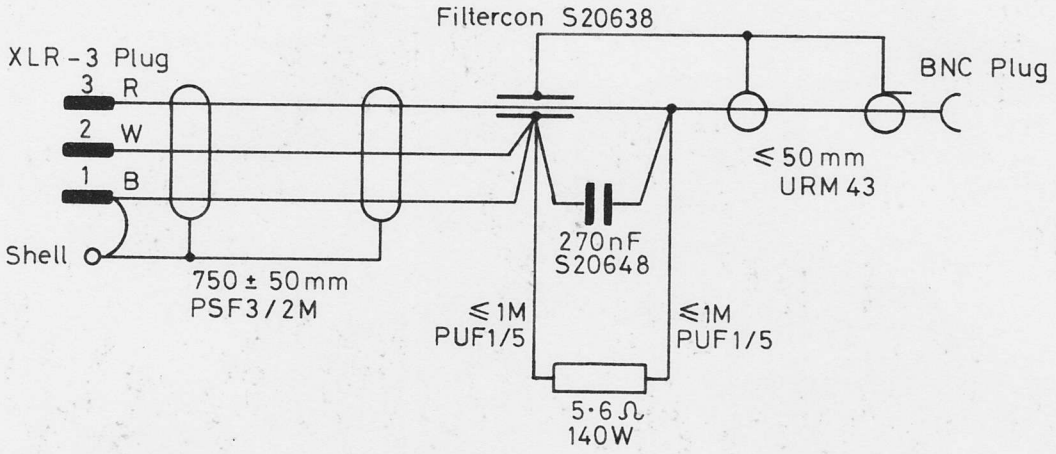
7.4.1 With PLR connected directly to the mains and 1SKS connected to a 5.6Ω load resistor measure the resistance between mains earth and 3SKS pin 1, then between mains earth and 3SKS pin 2.

7.4.2 The results should be 0.1Ω and 10MΩ respectively.

7.4.3 If the first result is wrong there is a wiring error, but if the second result is wrong there may be a wiring error or a faulty internal component.

7.5 To check noise output

7.5.1 The result of this measurement is critically dependent on the method used, so it is improtant that the test lead shown below should be used. This lead simulates the power supply lead in the transposer TM4M/503.



Connect the XLR-3 plug to 1SKS and the BNC plug to an ac coupled oscilloscope (B/W >20MHz). Measure the peak to peak voltage of the hum component plus the switching frequency component. Note that the switching frequency is 30kHz approximately, but ringing at higher frequencies may also be present.

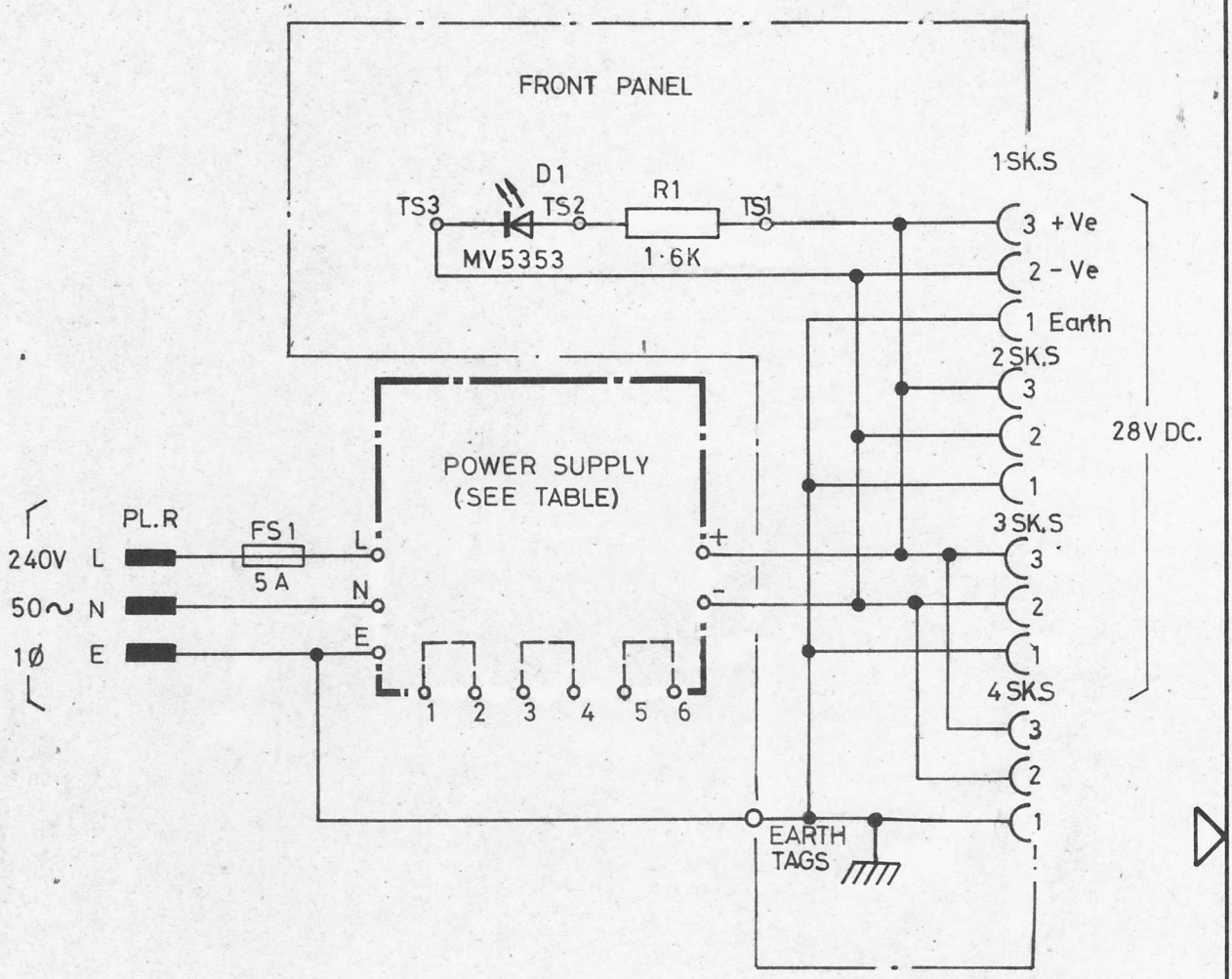
7.5.2 The peak to peak voltage should be less than 50mV.

D49974 A4

ORIGINAL FRAME SIZE 190mm x 277mm

THIRD ANGLE PROJECTION

All dimensions in millimetres unless otherwise stated :
Normal tolerances :
no decimal place ± 1 mm unless otherwise stated
one decimal place ± 0·3 mm
two decimal places ± 0·1 mm



POWER SUPPLY		
CODE	MAKE	TYPE
PS4/8	GOULD	MG-10B-V1010/P 28V,D.C. 7A
PS4/8 A	FARNELL	G24-10 MODIFIED TO 28V, 7A.
PS4/8 B	COUTANT	SOL 8/24 MODIFIED TO 28V, 7A

PARTS LIST D49975A4 D49988A4 D49989A4

SCALE 0

ISS	CHANGE	
1	30-6-81	
2		REVISED TO CS/13005 F.H.L. 11-12-81

PS4/8, / 8A,
SWITCHED MODE POWER SUPPLY. CIRCUIT

DRN. MR.
TCD.
CKD.
APPD

DESIGNS DEPARTMENT

D 49974 A4

BBC

DS/A4

D49975A4

SHT. 1 OF 2 SHTS.

ISS.	CHANGE	
1	30 - 6 - 81	I.H. 6/7/81
1A		
2.		PAR.
3		F. HILL

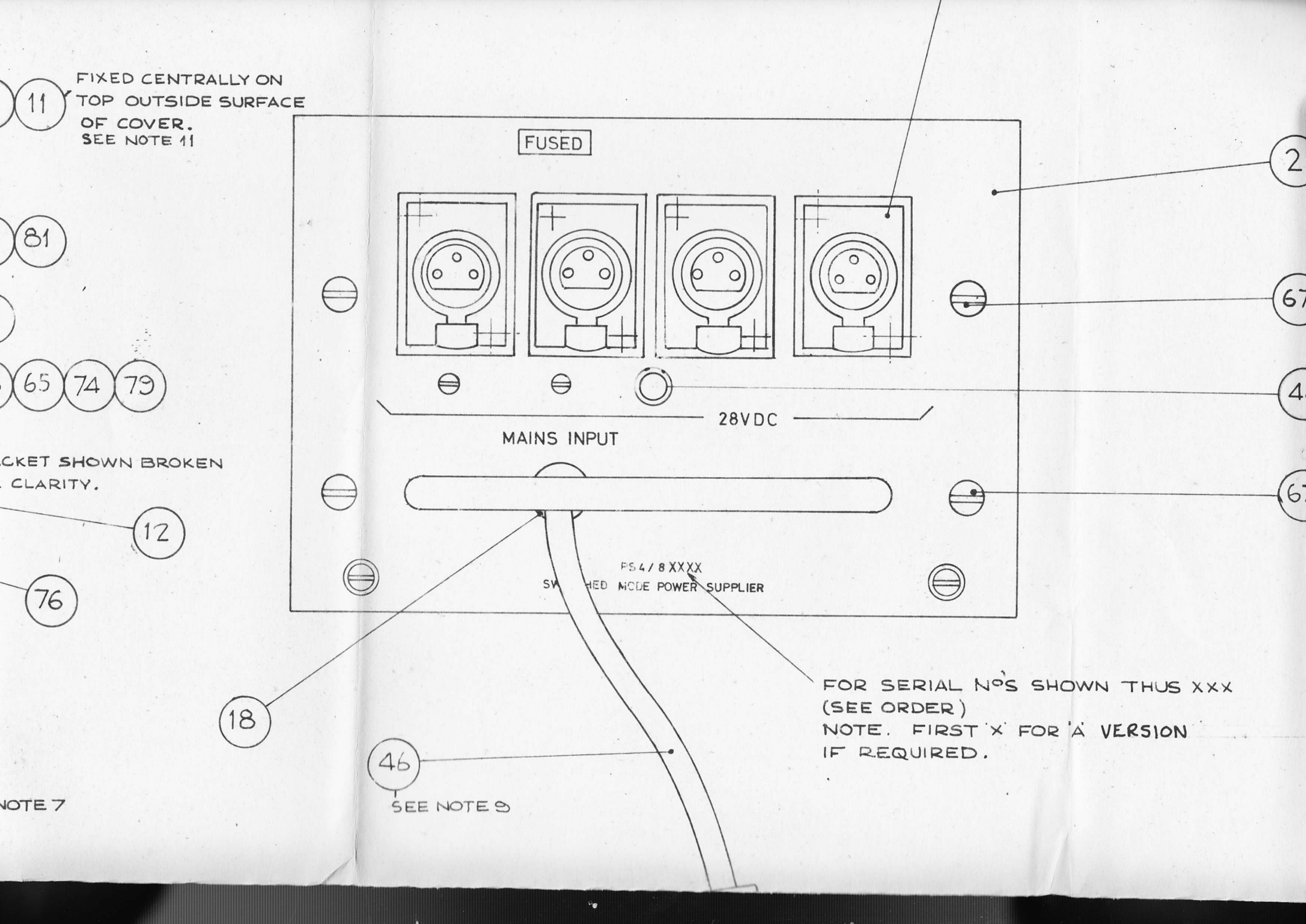
ITEM No.	No. OFF		DESCRIPTION	C'C'T REF.	BBC REF. OR DRG. No.
			CIRCUIT D49974A4		
			PARTS LIST D49975A4		
			ASSEMBLY D49976A1		
			DETAILS D49977A1		
			LEGEND D49978A2		
			FURTHER INFORMATION REQUIRED FOR MANUFACTURE		
			UNIT ASSEMBLY INFORMATION EA10484		
			D49984A4-CP		
			SPEC. ED/PS4/8		
1	1	*	POWER SUPPLY GOULD TYPE		- 0426486
			MG 24-10B-V101 O/P 28V DC. 7A		
2	1		FRONT PANEL, LEGEND TO D49978A2		D49977A1 DET. 1
3					
4	1		COVER (TOP)		D49977A1 DET. 2
5	1		COVER (BOT).		" " 4
6					
7	1		BRACKET (L.H.)		D49977A1 DET. 5
8	1		BRACKET (R.H.)		" " 8
9					
10	1	*	LABEL (DANGER) 0437717		D49984A4-CP
11	1	*	LABEL, N°101, PVC, RED FLASH, SELF ADHESIVE		59001 - 0257370
12	1	*	HANDLE (COMPLETE WITH M5 SCREW & WASHER)		00000-0264661
13					
14	4	*	SOCKET, FIXED XLR - 3 WAY		27733-0236165
15					
16	1	*	PLUG, MAINS, 13 AMP, FUSED		24315-0223118
17					
18	1	*	SNAP BUSH HEYCO PT. N°. 2043 (BLACK)		00014-0428866
19					
20					
21	1	*	FUSE 5A.	FS.1	22443-0221645
22					
23	2	*	THUMBSCREW		52245-0326656
24					
25	2	*	SHAKEPROOF WASHER		52245-0400310
26					
27	2	*	NYLON WASHER, SPLIT.		52245-040102X
28					
29	1	*	CLAMPS, CABLE, SLING TYPE, 7·9 I/D (5/16")		19095-0052521
30					
31	2	*	PILLAR M4 x 20 TAPPED, HEX.		58286-0403548
32					
33	1	*	TAG STRIP, POST TYPE		28820-0239262
34					
35	3		TAG SOLDER 8 BA S/E		
36	4		TAG SOLDER 6 BA S/E		
37	8		TAG SOLDER, 2 BA S/E		

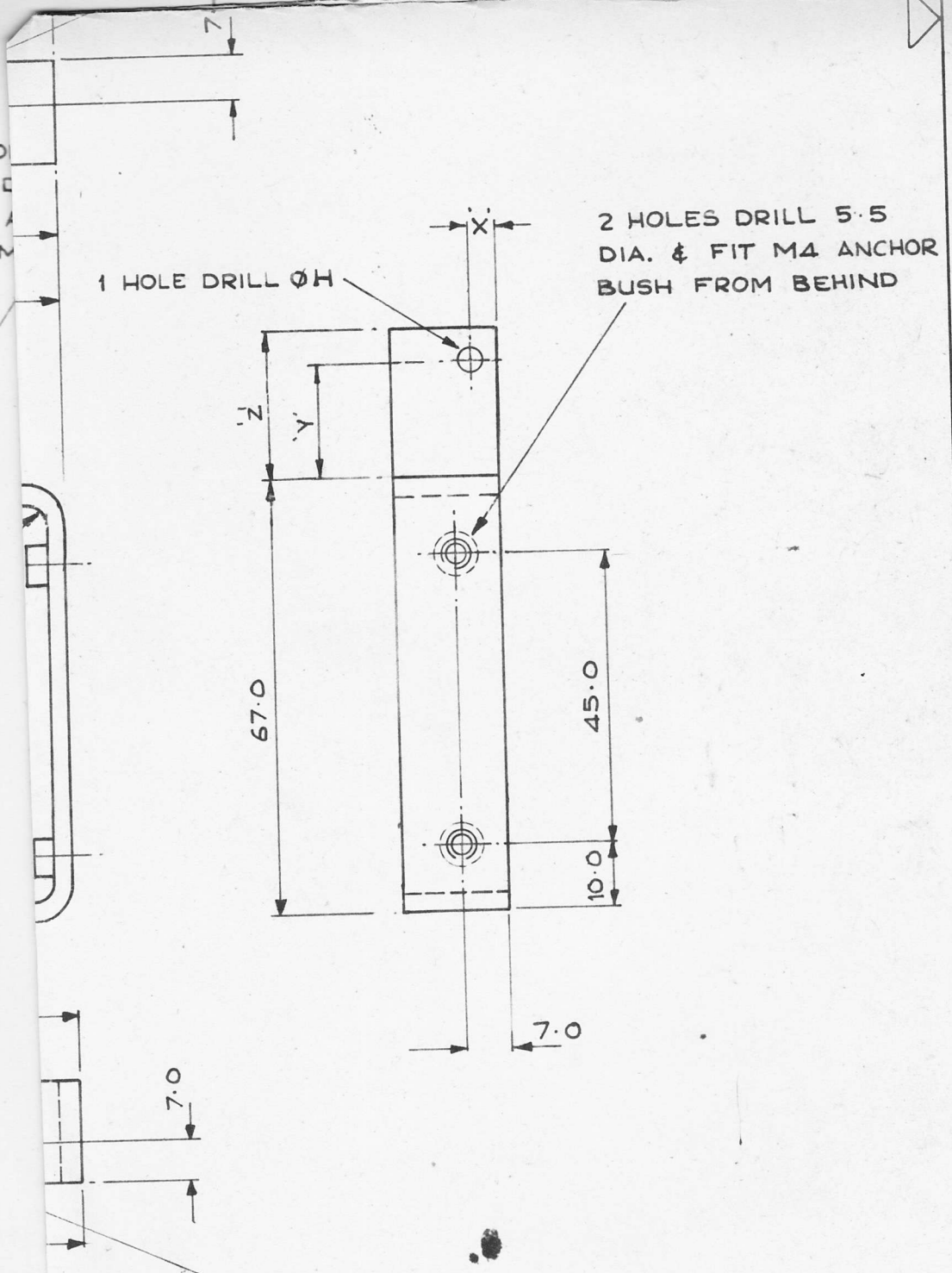
PS4/8
SWITCHED MODE POWER SUPPLIER
PARTS LIST

BBC
DS/PLA4

PS4/8
SWITCHED MODE POWER SUPPLIER
PARTS LIST

DRN.	CRW	DESIGNS DEPARTMENT
TPD.		
CKD.		D49975A4
APPD.		SHT 1 OF 2 SHTS


11
FIXED CENTRALLY ON TOP OUTSIDE SURFACE OF COVER. SEE NOTE 11
81
65
74
79
CKET SHOWN BROKEN CLARITY.
12
76
NOTE 7
FUSED
28VDC
MAINS INPUT
PS4/8XXXX
SW HED MODE POWER SUPPLIER
2
67
4
67
18
46
SEE NOTE 9
FOR SERIAL Nos SHOWN THUS XXX (SEE ORDER)
NOTE. FIRST 'X' FOR 'A' VERSION IF REQUIRED.



D49977A1

SCALE

D49

THIRD AN
PROJECT

D49977A1

PS4/8A

DETAILS 1-10

BBC

DS/A1/1

This d
of the
may n
third p
permis

res unless otherwise stated :
± 1 mm unless
± 0·3 mm otherwise
± 0·1 mm stated

DRN.	C RW	DESIGNS DEPARTMENT
TCD.		
CKD.	M.T.E.	D49977A1
APPD.		

S & H LTD L5743A