Issue 1
15.4.76

DESIGNS DEPARTMENT TECHNICAL MEMORANDUM

No.9.117(75)

Modification of the Television Waveform Monitor from MN6/501 to MN6/510

.....
(J.E. HOLDER)
for Head of Designs Department

Work carried out by: M.G. Nutt

MGN/LAW

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from MN6/501 to MN6/510

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2. Modification kit
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Modification of the Television Waveform Monitor

from MN6/501 to MN6/510

1. Introduction

The purpose of this modification is to extend the useful life of the MN6/501 monitors. To this end, all valve circuits are being replaced with transistorised equivalents. The modified unit is expected to be more reliable and uses 45 W less power than the original, which (at 1975 prices) typically saves £1.50 p.a.

The modification kit is suitable for installation by Station Staff as all sub-units are supplied ready aligned. After the modification process all that will normally be needed are performance checks and two simple internal adjustments.

The unit after modification is re-coded MN6/510: each monitor should retain its old serial number.

2. Modification Kit AP1/515

A kit of parts, coded AP1/515, should be ordered by those who wish to carry out this modification. D 38208 A4 lists the component parts of this kit.

3. Tools Required

Drill with No. 30 bit.

Set of number punches (up to 0.125") 0.075" preferred.

Basic wireman's toolkit.

Digital ohmmeter (Advance DMM2 or similar) for item 4.7.

4. Modification Procedure

4.1 Reference letters or numbers given in parenthesis, e.g. (A) refer to items on D 38122 A1. Such numbers also refer to the Parts List D 38208 A4.

4.2 Remove and retain the seven front panel knobs. Remove the old valve processing chassis and send to redundant plant. Retain the fixing screws.

4.3 Note the serial number of the MN6/501 and punch the same number on the new identification label. Change labels.

4.4 Unsolder the connections to the EHT unit and remove it. Do not disconnect wiring from the paxolin tag panel (A) or capacitor C36(B). Retain the mounting clip and screw that hold C36, and the screws that hold the tag panel.

4.5 Remove the C.R.T.

4.6 Clean the monitor and the retained control knobs with detergent, rinse and dry thoroughly.

4.7 Measure the values of the resistors in the EHT chain, R85 to R94, and replace any out of tolerance. Fixed resistors 10%, variables 20%.

4.8 Check that the neutral mains fuse has been wired out to accord with present safety regulations.

4.9 The monitors have a square hole in the front panel which is no longer used. Blank this off by drilling two holes as shown on D 38203 A2. Fit the grey stove enamelled blanking plate (3) to the front panel with 6BA instrument headed screws, nuts, and lockwashers.

4.10 Fit the new EHT unit PS1/43 next. Remove the cover of this unit, and take out the three pieces of special fire resistant foam which form an acoustic screen.

4.11 Mount the tag panel (A) on the front of this unit with the original screws and spacers. Mount C36 (item B) on its clip at the rear of the EHT unit in the same position as it was before.

4.12 Wiring

4.12.1 Refer to D 38202 A3. Secure all wires to existing harness where appropriate.

4.12.2 Run a red wire from socket A pin 3 to the +12 V tag on the PS1/43, leading the wire through the grommet in the PS1/43.

4.12.3 Connect the EHT lead (using a sleeve) to the HV tag on the proprietary EHT module.

4.12.4 Connect a green wire from the earth tag on the PS1/43 to R94.

4.12.5 Change R97 (E) to 56 kΩ (item 13). Connect it with an orange wire to the HT supply tag.

4.12.6 Connect mains from T2 to socket A pins 9 and 12.

4.12.7 Mount the new tag panel on the side of T2 (see D 38122 A1). The earth connection should be re-fixed under one of the screws. Use this panel to mount R101, 0.5Ω (item 11) in series with the heater lead. The heater is at -3 kV and it it important that all other wires are bent so as to run well clear of the heater wiring.

4.12.8 Remove R100 from C37/C38. The new resistor 6.8 kΩ (item 12) is mounted on an existing tag panel and wired to MR8 and C38 as shown in D 38202 A2.

4.12.9 Remove any wires that are not now connected at both ends.

4.13 Put the special fire resistant foam around the proprietary EHT sub-unit, fit the PS1/43 cover (see D 38206 A3) and screw the whole assembly to the chassis. Replace the CRT assembly.

4.14 Fit the new video processing unit UN26/517 (item 2) and re-fix the knobs.

5. Test Apparatus Required

Digital voltmeter 10 V - 300 V. Advance DMM2 or similar.
Non-Linearity Test Signal Generator, GE4M/520 or equivalent.
Source of Mixed Syncs 2 V p-p.
Source of Mixed Suppression 2 V p-p.
Source of Video Signal, Test Card or similar 1 V p-p.

6. Test Procedure

6.1 Connect the mains and video signal and switch on.

6.2 Check that +12 V and -12 V are produced by the UN26/517 and are within ± 0.3 V of nominal. Check that the voltage on Tag 1 is between 260 V and 300 V.

6.3 Obtain a normal waveform display on the screen. At normal working brightness, set the focus and pre-set astigmatism control (C) for the sharpest display.

6.4 Check all the front panel controls for correct operation. A minimum of 20% over - or underscan should be possible in either direction, and shifts should be at least ± 20% of normal display height or width.

6.5 Check the operation of the monitor on both internal and external syncs.

6.6 Using a Staircase input from the GE4M/520, adjust C39 for minimum fuzz on the horizontal lines in the display.

6.7 Set all controls to normal. Replace covers.

7. Administrative Procedure

Make sure all relevant records are amended to show that an MN6/501 has been modified to MN6/510, quoting the serial numbers.

Broadcast Television Technology Trust -- bttt.org.uk

D38209 A4

ISS 1

CHANGE 5/4/76

ITEM No.	No. OFF	DESCRIPTION	C'C'T REF.	BBC REF. OR DRG. No.
		DRAWING NUMBERS		
		PARTS LIST D38208 A4		
		DETAILS 1 - 3 D38201 A3		
		FURTHER INFORMATION REQUIRED IS IN		
		D.O. TECH. MEM. 9.117 (75)		
1	1	PS1/43, E.H.T. POWER SUPPLIER		
2	1	UN26/517, VIDEO PROCESSING UNIT		
3	1	COVER PLATE		D38201 A3 DET. 1
4	1	TAG BOARD INCLUDING 1 TAG,		
		ENFIELD AUTOMATIC L751/SP		D38201 A3 DET. 2
5	1	LABEL		D38201 A3 DET. 3
6				
7				
8				
9	1	SLEEVING, RED		1 - 19769 - 431
10	A/R	LACING TWINE		
		RESISTORS		
11	1	0.5Ω WIREWOUND 2 1/2W PAINTON TYPE MV1A	R101	
12	1	6.8KΩ WIREWOUND, PAINTON TYPE P301	R100	1 - 27053 - 466
13	1	56KΩ 0.4W METAL FILM MULLARD MR25	R97	1 - 26877 - 554
14				
15				
		SCREWS FOR FIXING ITEMS		
16	2	4BA x 3/8" CH HD M.S. Zn. P. 4		
17	2	6BA x 3/8" INST HD M.S. Cr. P. 3		
18				
		NUTS		
19	2	4BA HEX ORD M.S. Zn. P. 4		
20	2	6BA HEX ORD M.S. Zn. P. 3		
21				
		WASHERS		
22	2	4BA SMALL PLAIN M.S. Zn. P. 4		
23	2	6BA SHAKEPROOF St Zn. P. 3		
24				
		WIRES		
25	3'	PUF1/5M RED		
26	1'	PUF1/5M GREEN		
27	2'	PUF1/5M ORANGE		
28	1'	PUF1/5M BROWN		
29				
30				
31				

PARTS LIST

API/515

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BBC

BBC/PLA4

IL RF

API/515

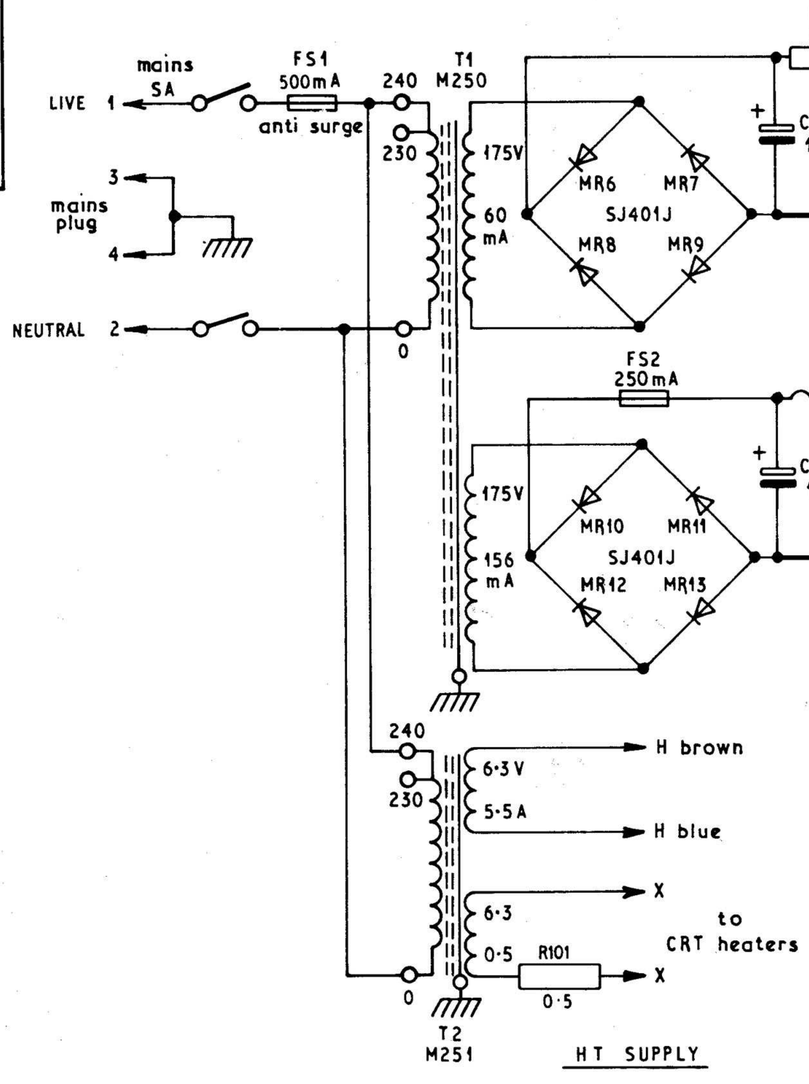
APPARATUS, MONITOR MODIFICATION - PARTS LIST

DRN.	MPF
TPD.	WAW
CKD.	
APPD.	M.G.N.

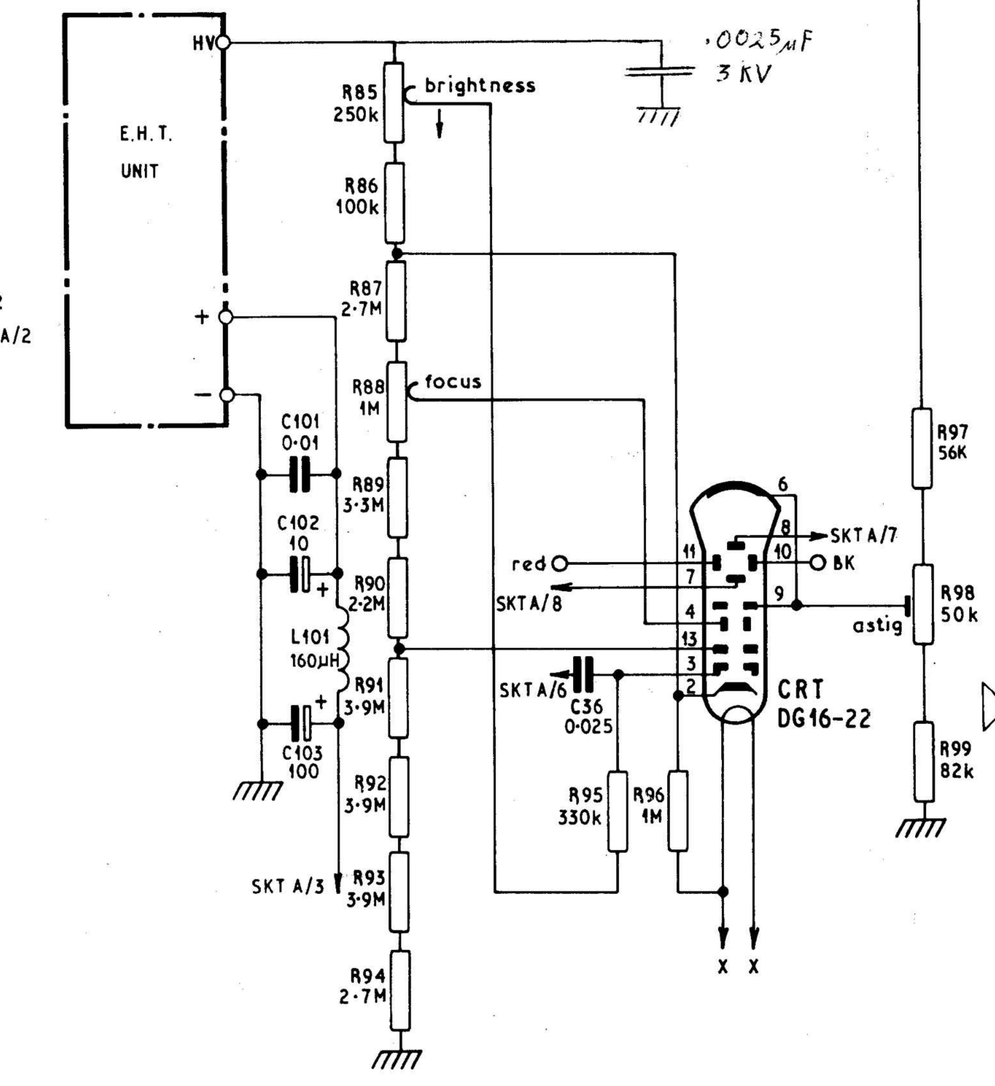
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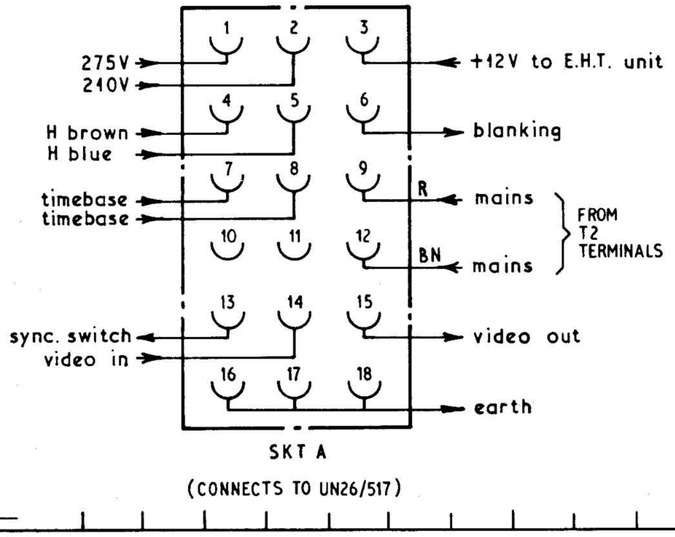
D38208 A4

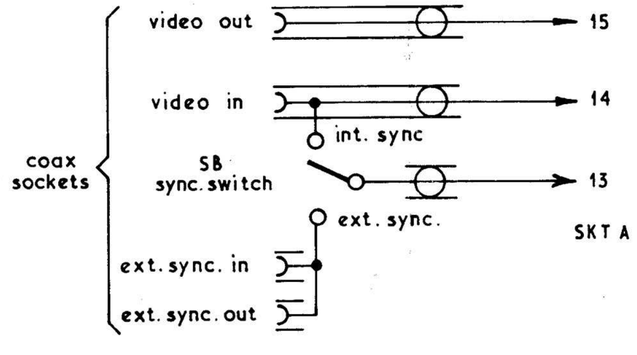
D38120 A3



HT SUPPLY







Original Frame Size 277mm × 400mm

BBC DS/A3

CHANGE	ISS
6/4/76	1

THIRD ANGLE PROJECTION

All dimensions in millimetres unless otherwise stated:

Normal tolerances

no decimal place:–	±1 mm
one decimal place:–	±0.3mm
two decimal places:–	±0.1mm

unless otherwise stated

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WAVEFORM MONITOR MN6/510 CIRCUIT (SUPPLIES)

DRN.	TCD.	CKD.	APPD.
	K. HILL		M.G.N.

DESIGNS DEPT.

D38120 A3

SCALE :—

S & H LTD L3148

D38202 A2

R85 R88 R95 R98 R97

R84 R87 R89 R90 R91 R92 R93 R94

HV + − C101 L101 C102 C103 C36

TO CRT BASE PIN 3 R(4)

PLIF1/5M

PS1/43 E.H.T. UNIT. (TAG BOARD SWUNG UP 90° FOR CLARITY.)

TO CRT BASE R(7)

TO CRT BASE R(10)

MOUNTING PLATE (UNDER SIDE)

C39 C37 C40 C38

PLIF1/5M

MR6 MR8 MR10 MR12 MR7 MR9 MR11 MR13 R100

T1

NEW TAG BOARD ITEM 5.

T2

6·3v 0·5A

6·3v 5·5A

R101

BN

TO CRT BASE PIN 1 BN(4)

TO CRT BASE PIN M B(4)

ES. 240v 230v 0v

PLIF1/5M

SKT. A.

PLIF1/5M

NOTES:-

1. WIRING TO BE IN ACCORDANCE WITH DRG EA10137 NOTES 1,2,5,7,8,9. AND DRG EA10139 NOTE 1.
2. WIRES MARKED THUS * TO USE ORIGINAL WIRES IN CABLEFORM.

THIS DRG TO BE USED IN CONJUNCTION WITH MN6/501 WIRING DRG EK10833.

SCALE

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Original Frame Size 400mm · 574mm	BBC DS/A2
CHANGE	ISS
6/4/76	1

THIRD ANGLE PROJECTION

All dimensions in millimetres unless otherwise stated.

Normal tolerances

no decimal place	±1 mm
one decimal place	±0.3mm
two decimal places	±0.1mm

unless otherwise stated

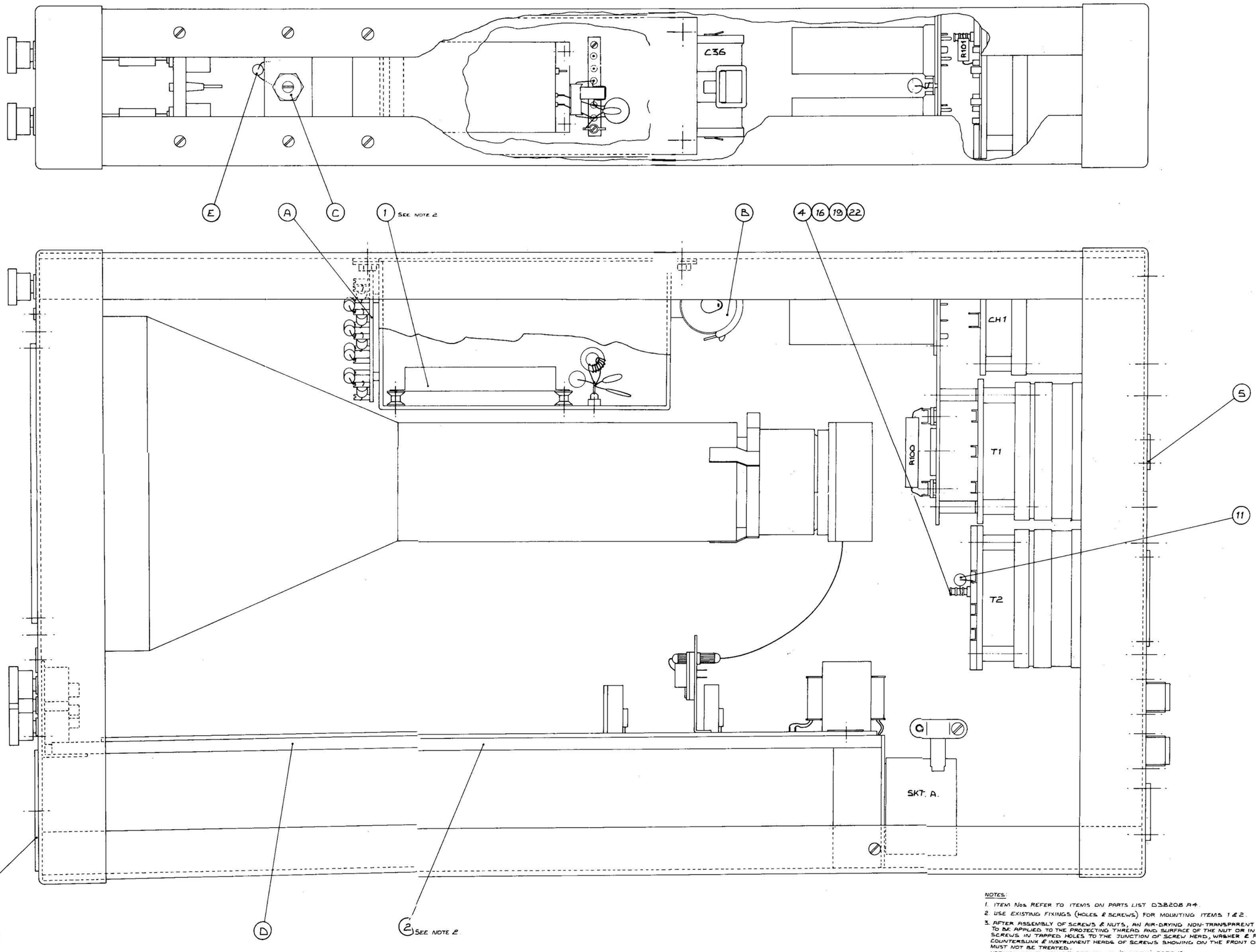
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MN6/510 WIRING

DRN.	TCD.	CKD.	APPD.
MPF			M.G.N.

DESIGNS DEPT.

D38202 A2



D38122 A1.

NOTES:

1. ITEM Nos REFER TO ITEMS ON PARTS LIST D38208 A4.
2. USE EXISTING FIXINGS (HOLES & SCREWS) FOR MOUNTING ITEMS 1 & 2.
3. AFTER ASSEMBLY OF SCREWS & NUTS, AN AIR-DRYING NON-TRANSPARENT VARNISH IS TO BE APPLIED TO THE PROJECTING THREAD AND SURFACE OF THE NUT OR IN THE CASE OF SCREWS IN TAPPED HOLES TO THE JUNCTION OF SCREW HEAD, WASHER & ARTICLE. COUNTERSUNK & INSTRUMENT HEADS OF SCREWS SHOWING ON THE FRONT OF PANEL MUST NOT BE TREATED.
   VARNISH MUST NOT BE APPLIED TO 'POSIDRIV' SCREWS.
4. METAL PARTS IN CONTACT MUST MAKE GOOD ELECTRICAL CONNECTION WITH EACH OTHER AND WHERE NECESSARY COUNTERSUNK FIXING HOLES SHOULD HAVE PAINT OR OTHER FINISH REMOVED.

WIRING DIAGRAM D38202 A3

Original Frame Size	BBC
574mm × 821mm	DS/A1

CHANGE	ISS
6/4/76	1
20/4/76 ITEM 'E' ADDED.	2

THIRD ANGLE PROJECTION

All dimensions in millimetres unless otherwise stated:

Normal tolerances	
no decimal place:	±1 mm
one decimal place:	±0.3mm
two decimal places:	±0.1mm
unless otherwise stated	

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MN6/510 ASSEMBLY

DRN.	TCD	CKD	APPD.
MPF			M.G.N.

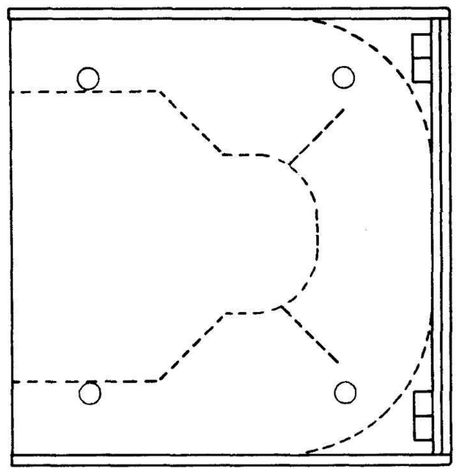
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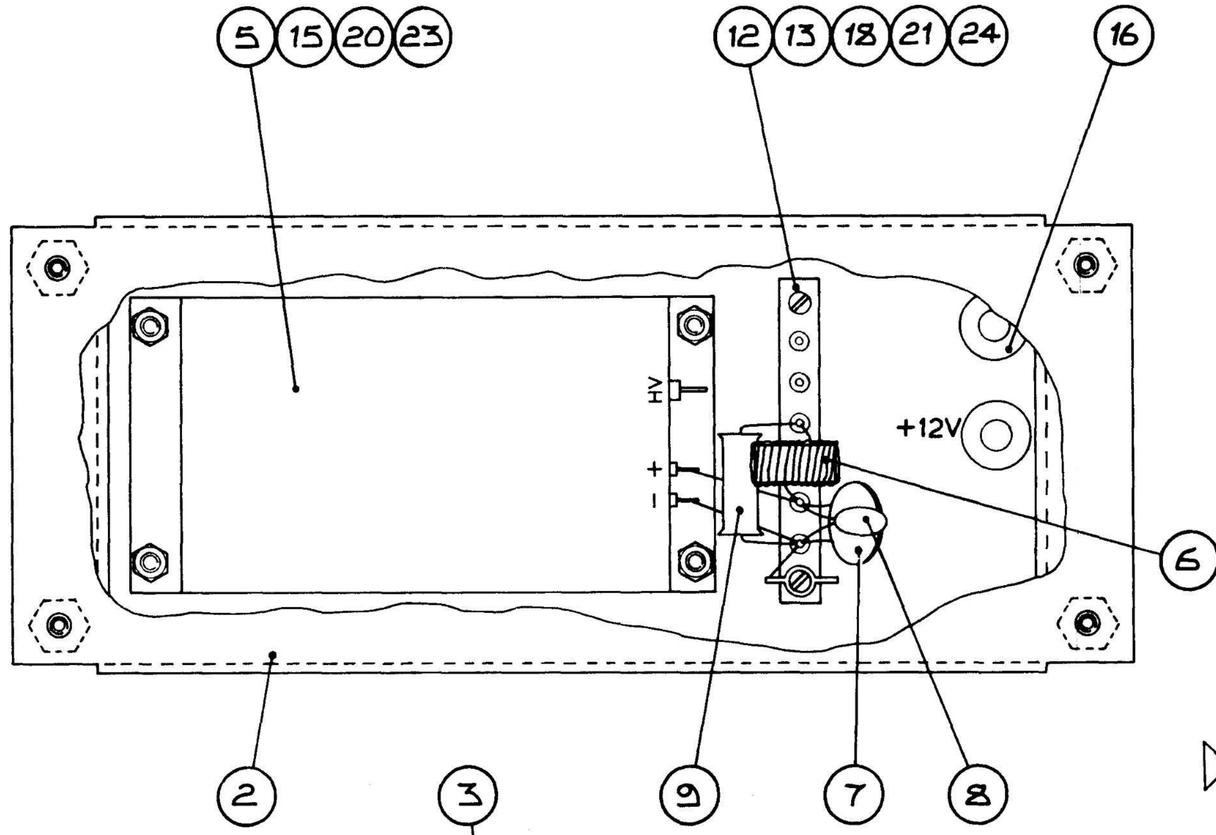
D38122 A1

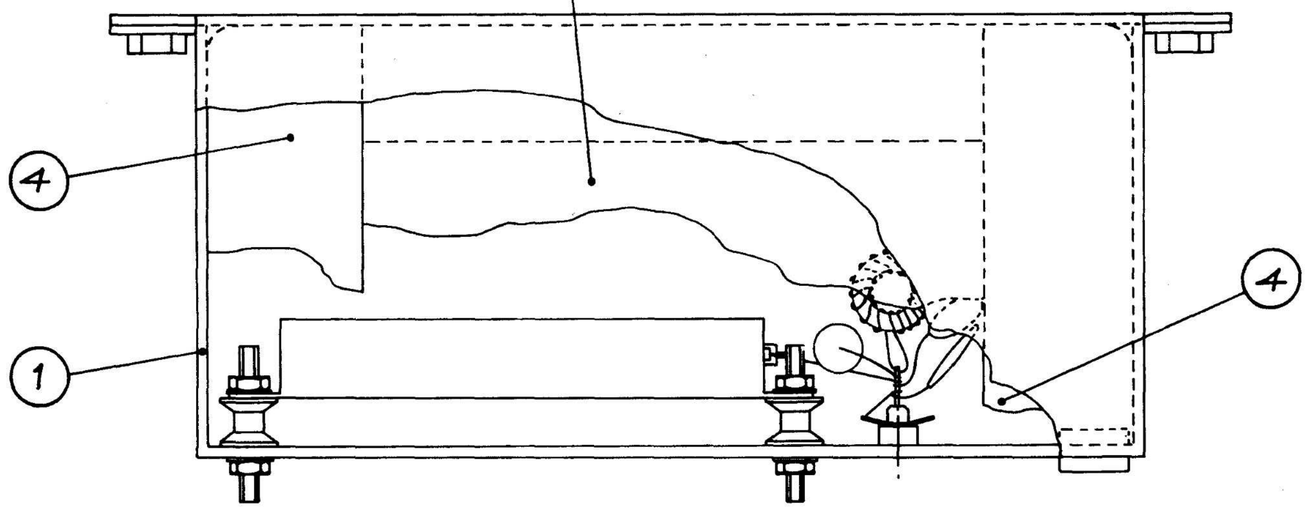
SCALE :-

S & H LTD L3158

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NOTES :

WIRING TO BE IN ACCORDANCE WITH DRG EA10137 NOTES 2,8,9. & DRG EA10139 NOTE 1.

ASSEMBLY TO BE IN ACCORDANCE WITH DRG EA10484 NOTES 1,5,6,7.

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SCALE :—

S & H LTD L3698

Original Frame Size 277mm × 400mm

BBC DS/A3

CHANGE	ISS
5/4/76	1

THIRD ANGLE PROJECTION

DIMENSIONAL TOLERANCES :-
FRACTIONS ± ·010"
DECIMALS ± ·005"

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PS1/43 ASSEMBLY

DRN.	TCD.	CKD.	APPD.
MPF			M.G.N.

DESIGNS DEPT.

D38206 A3