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CALIBRATION AND SERVICING HANDBOOK

1061 1061A

datron

INSTRUMENTS

digital voltmeters

CALIBRATION AND SERVICING HANDBOOK

for

THE DATRON AUTOCAL 1061 and 1061A DIGITAL VOLTMETERS

(for operating procedures
refer to the User's Handbook)



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For any assistance contact your nearest Datron Sales and Service center.
Addresses can be found at the back of this handbook.

Due to our policy of continuously updating our products, this handbook may contain minor differences in specification, components and circuit design to the instrument actually supplied. Amendment sheets precisely matched to your instrument serial number are available on request.

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CONTENTS

Section	Title	Page
GENERAL DESCRIPTION		
INSTALLATION		
MEASUREMENT PROCEDURES		
SPECIFICATION AND SPECIFICATION VERIFICATION		
SYSTEMS APPLICATIONS		
		Refer to User's Handbook
1	CALIBRATION	1
1.1	INTRODUCTION	1
1.1.1	General	1
1.1.2	Essentials for Good Calibration	1
1.1.3	The 'AUTOCAL' Process	1
1.2	DC VOLTAGE CALIBRATION	2
1.3	OHMS CALIBRATION	4
1.4	AC VOLTAGE CALIBRATION – OPTION 10 ONLY	6
	– OPTION 12 ONLY	7A
1.5	DC CURRENT CALIBRATION	8
1.6	AC CURRENT CALIBRATION	9
1.7	'AUTOCAL' USING 'KEYBOARD'	10
1.8	'AUTOCAL' OVER THE BUS	11
2	MECHANICAL DESCRIPTION	13
2.1	GENERAL	13
2.2	FRONT PANEL	13
2.3	REAR PANEL	13
2.4	EXTERNAL CONSTRUCTION	13
2.5	INTERNAL CONSTRUCTION	13
3	TECHNICAL DESCRIPTION	15
3.1	INTRODUCTION	15
3.2	ANALOG ASSEMBLY	15
3.2.1	Analog Interface	15
3.2.1.1	Introduction	15
3.2.1.2	Power-On	15
3.2.1.3	General Interface Update Sequence	17
3.2.1.4	Test	17
3.2.2	DC Isolator Section	17
3.2.2.1	Preamplifier Scaling	17
3.2.2.2	Preamplifier	20
3.2.2.3	DC Bootstrap	20
3.2.2.4	Filtering	20
3.2.2.5	Input Current Compensation	21
3.2.2.6	Test	21
3.2.3	Analog to Digital Conversion (Analog Section)	21
3.2.3.1	General Principles	21
3.2.3.2	A-D Input Control	23
3.2.3.3	Reference Voltages and Control Logic Power Supply	23
3.2.3.4	High Speed Buffer	24
3.2.3.5	Integrator	24

Section	Title	Page
	3.2.3.6 1st Null Detector	25
	3.2.3.7 2nd Null Detector	25
	3.2.3.8 Reset Period	25
3.3	OPTION 10 AC ASSEMBLY	27
	3.3.1 General Principles	27
	3.3.2 Preamplifier and Scaling	27
	3.3.3 RMS Converter	28
	3.3.4 High Frequency Compensation	29
	3.3.5 Frequency Detection	29
	3.3.6 Test	29
A3.3	OPTION 12 AC ASSEMBLY	A27
	A3.3.1 General Principles	A27
	A3.3.2 Preamplifier and Scaling	A27
	A3.3.3 RMS Converter	A28
	A3.3.4 High Frequency Compensation	A29
	A3.3.5 Frequency Detection	A29
	A3.3.6 Test	A29
3.4	OHMS ASSEMBLY	30
	3.4.1 Low Drift Voltage Follower	30
	3.4.2 Constant Current Source	30
	3.4.3 Test	31
3.5	CURRENT ASSEMBLY	31
	3.5.1 Current Measurements	32
	3.5.2 Test	32
3.6	REAR INPUT/RATIO INPUT	32
	3.6.1 General	32
	3.6.2 Front Panel/Rear Panel Input	32
	3.6.3 Ratio	32
	3.6.4 Test	33
3.7	ANALOG OUTPUT	33
	3.7.1 General	33
	3.7.2 Description	33
3.8	DIGITAL ASSEMBLY	33
	3.8.1 Processor and Memory	33
	3.8.1.1 Software Overview	34
	3.8.1.2 The Two-Phase Clock	35
	3.8.1.3 RAM/ROM Circuit	36
	3.8.2 CMOS Address Decode and Input/Output Circuits	36
	3.8.3 Analog to Digital Conversion (Digital Section)	39
	3.8.3.1 General Principle	39
	3.8.3.2 Preset Procedure	39
	3.8.3.3 A-D Measurement Sequence	41
	3.8.3.4 Master Clock and Line Locking	41

Section	Title	Page
3.9	FRONT PCB ASSEMBLY	42
3.9.1	Analog Input Signals	42
3.9.2	Display Signals	42
3.9.3	Keyboard Data Encode	42
3.9.4	Keyboard LED Data Decode	43
3.10	DISPLAY DRIVER ASSEMBLY	45
3.10.1	Write Mode	45
3.10.2	Read Mode	45
3.11	IEEE DIGITAL INTERFACE	46
3.11.1	ROM Circuit	46
3.11.2	Interface Circuit	46
3.12	BCD DIGITAL INTERFACE	47
3.12.1	RAM/ROM Circuit	47
3.12.2	Interface Circuit	47
3.13	REAR (POWER SUPPLY) PCB ASSEMBLY	48
3.13.1	General	48
3.13.2	180V Supply	48
3.13.3	5V Supply	48
3.13.4	$\pm 15V$ Supply	48
3.14	SELF TEST SEQUENCE	48
4	INTERNAL ADJUSTMENT PROCEDURES	51
4.1	ALTERATION OF LINE VOLTAGE AND FREQUENCY	51
4.1.1	Changing Line Voltage	51
4.1.2	Changing Line Frequency	51
4.2	BATTERY REPLACEMENT	51
4.3	POST-REPAIR PROCEDURES	51
4.3.1	Basic DC Instrument	52
4.3.2	Ohms Assembly	53
4.3.3	AC Assembly (Option 10)	54
4.3.4	AC Assembly (Option 12)	55
APPENDIX 1	ANALOG DATA LINE 'F.E.T.' PATTERNS	57

Section	Title	Page
5	COMPONENT LISTS, BOARD LAYOUTS AND CIRCUIT DIAGRAMS	
	Interconnection Diagram	430291
	Front PCB Assembly . . . . .	.400294/430294
	Rear PCB Assembly . . . . .	.400295/430295
	Centre PCB Assembly . . . . .	.400296/430296
	Left Hand PCB Assembly . . . . .	.400297/430297
	Right Hand PCB Assembly . . . . .	.400298/430298
	Current Assembly . . . . .	.400304/430304
	Ratio/Rear Input . . . . .	.400307/430307
	Analog Output . . . . .	.400308/430308
	Analog Assembly . . . . .	.400328/430328
	Digital Assembly . . . . .	.400329/430329
	Display Driver Assembly . . . . .	.400330/430330
	Ohms Assembly . . . . .	.400331/430331
	BCD Interface Assembly . . . . .	.400332/430332
	Rear Input . . . . .	.400386/430386
	AC Assembly (Option 10). . . . .	.400402/430402
	IEEE Interface Assembly . . . . .	.400427/430427
	AC Assembly (Option 12). . . . .	.400552/430552
	IEEE 488 Option kit . . . . .	.440082/83/84

ILLUSTRATIONS AND TABLES

Figure	Title	Page
1.1	Zero Resistance Source Connections	4
2.1	Exploded View of Instrument	14
3.1	Printed Circuit Boards Block Diagram	15
3.2	Power-On Options Fitted Test	16
3.3	Analog Interface Sequence: Power-Up.	16
3.4	Analog Interface Data Line Timing Diagram (Power-Up).	16
3.5	Analog Interface Sequence: Ohms Select	17
3.6	General Form of Analog Interface Update Timing Diagram	18
3.7	Simplified Diagram of DC Isolator	18
3.8	Simplified Diagram of Isolator Switching	19
3.9	Preamplifier Gain Circuits	20
3.10	Simplified DC Isolator Filtering Circuit	21
3.11	Simplified Diagram of Bias Current Compensation.	21
3.12	Simplified Diagram of Analog Section of A-D Converter.	22
3.13	Timing Diagram For Analog Section of A-D Converter.	22
3.14	Multiplexer Control Line Signals	23
3.15	Positive Reference Circuitry	23
3.16	High Speed Buffer Circuitry	24
3.17	Integrator Circuit	24

Figure	Title	Page
3.18	1st Null Detector Circuitry	25
3.19	2nd Null Detector Circuitry.	25
3.20	Diagram of Averaging Process	26
3.21	Simplified Diagram of A-D During Reset Period	26
3.22	Simplified Diagram of AC Assembly	27
3.23	Simplified Diagram of the AC Preamplifier Scaling.	28
3.25	Block Diagram of RMS Conversion Technique	28
3.26	Simplified Diagram of AC High Frequency Compensation.	29
A3.22	Simplified Diagram of AC Assembly	A27
A3.23	Simplified Diagram of the AC Preamplifier Scaling.	A28
A3.24	Simplified Diagram of AC Filters	A29
A3.25	Block Diagram of RMS Conversion Technique	A28
A3.26	Simplified Diagram of AC High Frequency Compensation.	A29
3.27	Simplified Resistance Assembly	29
3.28	Simplified Diagram of Voltage Follower Circuit	30
3.29	Ohms Current Range Switching	30
3.30	Simplified Ω Current Switching	31
3.31	Use of Ohms Guard	31
3.32	Simplified Diagram of Current Assembly	32
3.33	Simplified Block Diagram of Digital Assembly	33
3.34	Job Scheduler.	34
3.35	Two-Phase Clock Generation	35
3.36	Timing Diagram of Stretched Two-Phase Clock.	36
3.37	Simplified Diagram of Memory Circuits.	37
3.38	Start Up and Non-Volatile RAM Protection	38
3.39	CMOS Address Decoding	38
3.40	Simplified Diagram of Digital Section of A-D Converter	39
3.41	Flowchart of A-D Digital Section.	40
3.42	A-D Analog Sequence Control Signals.	40
3.43	Command Delays	40
3.44	Line Locking Timing Diagram	42
3.45	CMOS Data Bus : Key Select Coding.	43
3.46	CMOS Data Bus : LED Select Coding	43
3.47	Display Driver Write Circuitry	44
3.48	Display Driver Read Mode Address States	44
3.49	Simplified Display Driver Read Circuitry	45
3.50	Simplified Diagram of IEEE Assembly	46
3.51	Simplified Diagram of BCD Interface Assembly	47
3.52	Line Transformer	48
3.53	Flowchart of Self Test Routine	49
4.1	Reference Selection Voltages.	53
4.2	Option 10 AC Assembly Output Selection Voltages	54
4.3	Option 12 AC Assembly Output Selection Voltages	55

SECTION 1

CALIBRATION

1.1 INTRODUCTION

1.1.1 General

The purpose of calibration is to take account of any long-term drifts in the components of the instrument and to restore the accuracy, traceable to a known standard.

The period between calibrations depends upon the accuracy performance required from the instrument and for guidance, guaranteed accuracies for 24 hours, 90 days and 1 year are quoted.

The calibration procedures presented in the following pages should cater for most calibration situations. If, however, a special problem arises, please contact our Customer Service Section.

1.1.2 The Essentials for Good Calibration

Temperature - So that the instrument can meet its specification over the quoted temperature range, the temperature environment should be stabilised at $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$. In addition, temperature gradients around the instrument should be considered, therefore calibrate the instrument in its normal operating position and allow plenty of room for ventilation.

Warm up - It is essential that the instrument has fully temperature stabilised if the best results from calibration are to be achieved. Therefore, at least a 2 hour warm-up period is recommended during which time the line supply or the covers should not be removed even for a short period. In addition, if the covers have been removed, make certain that they are correctly fitted and that the leaf contacts to the Earth and Guard Shields are in good shape.

Calibration Source - To perform a useful calibration the accuracy of the source should always be at least four times that of the instrument being calibrated. In most cases, examples of likely sources are given for each calibration function.

With some calibration sources, the output may take several seconds to settle to a final value, therefore unless a shorter settling time is assured, a period of 10 seconds is recommended before each calibration operation.

Guarding - It is preferable to arrange for the DVM to be calibrated with 'Local Guard' selected. Furthermore to arrange for the 'Lo' terminal of the DVM to remain at 'earth' throughout and let the calibration source float. If a 'Remote Guard' connection is necessary then examples are shown in the Operating Manual.

1.1.3 The 'AUTO CAL' Process

1.1.3.1 General

The Datron 'AUTO CAL' process means that complete calibration of AC, DC, Ohms and Current on every range can be carried out from the instrument's own front panel. In the process, an internal non-volatile memory stores calibration constants for each function and range as determined when the instrument takes a series of 16 readings of the applied calibration source. Internally, each of the readings is deviated by one sixteenth of a digit and when an average is taken, the instrument is able to resolve to better than one least significant digit displayed.

Access to the non-volatile memory is gained using a key inserted into the rear panel. When calibration is complete, the key is removed, therefore preventing accidental or unauthorised use of the calibration routine.

1.1.3.2 Procedure Outline

- Select the 'FUNCTION' and 'RANGE' to be calibrated and cancel any 'MODE' or 'COMPUTE' buttons.

Insert the key into the 'CALIBRATE ENABLE' keyswitch on the rear panel and turn to the 'CAL' position. (The 'cal' legend will be displayed on the front panel.)

If the instrument is fitted with Option 50 IEEE Bus, set the rear panel address switch to 31 i.e. all 1's.

- Connect the calibration source to the input terminals and operate the keys shown in the tables in the following pages. When a 'CALIBRATE' button is operated, its associated L.E.D. indicator will light and extinguish when the calibration operation is executed.

- When all calibration is complete turn the keyswitch to 'RUN' and remove the key.

1.1.3.3 The Five 'AUTO CAL' Keys

'Zero' - This takes account of offsets in the instrument and in the calibration source.

'Gain' - This sets a scaling factor for each range and function.

'Ib' - This nulls the input bias current of the DC voltage measurement circuits to around 10pA. Therefore it only has a significant effect on the low DC voltage ranges and high resistance Ohms ranges. It can be operated as often as required and independently of other calibration operations. It will be seen that successive operations of 'Ib' approach the final nulled value of current iteratively.

'AcHf' - This flattens the response of the A.C. amplifier used for AC voltage measurement. It should only be used when a full calibration i.e. 'Zero', 'Gain' and 'AcHf' is carried out. As with 'Ib' the calibration action is iterative and requires several operations of the key to complete.

'Lin' - This is an important calibration operation as it optimises the basic linearity of the internal measurement circuitry used for all ranges and functions. It must be used before any DC voltage or Ohms calibration is carried out.

1.1.3.4 'AUTOCAL' using 'KEYBOARD'

This is an extension of the 'AUTOCAL' process which is useful when using a calibration source set to a nominal value but with known errors. This means for example that calibration directly to a standard cell is possible. A full explanation of the procedure is covered in section 1.7.

1.1.3.5 'AUTOCAL' over the Bus

Each of the five calibration operations can be controlled using Option 50, the IEEE bus. This means that the instrument can be entirely calibrated remotely or under program control. As mentioned in the 'Procedure Outline' for a manual calibration, the rear panel address switch should be set to 31, i.e. all 1's. When a bus calibration is required the address switch must be set to the address number assigned to the DVM in the system. More details of calibration with the bus are included in section 1.8.

1.2 DC VOLTAGE CALIBRATION

1.2.1 General

The procedure in the table opposite is all that is necessary to completely 'AUTOCAL' the DC voltage function. Steps 1 and 2 affect the accuracy on all ranges and should therefore be carried out even if just one range is being calibrated.

On each range a 'Zero' and 'Gain' calibration is required for each polarity of input. The two 'Zero' calibrations are included to overcome a possible zero difference with the polarity setting of the DC calibration source.

If the 'DVM Reading After Calibration' is not in accordance with the table, repeat operations of the same 'CALIBRATE' key are permissible. Where no tolerance is shown in this column, only the exact reading quoted with an occasional least significant digit showing is to be expected.

1.1.3.6 'Error 4'

If during calibration 'Error 4' is displayed, this indicates that the Calibration Source deviates too far from the calibration span of the instrument. Under these circumstances, the calibration memory is not updated and the instrument goes into 'Hold' with the calibration button calibration key LED remains on.

In the case of 'Zero', 'Gain' or 'AcHf' the Calibration Source should be checked and the same 'CALIBRATE' key repressed. The 'Hold' mode may be released any time and the instrument will free run again. If 'Error 4' follows 'Ib' or 'Lin' or persistently appears following 'Zero', 'Gain' or 'AcHf' then an instrument failure may have occurred. Therefore either consult our Customer Service Section or the Servicing Section of this Handbook.

◀

1.2.2 Equipment Required

- 1M Ω 'Lin' Source. This is a 1M Ω 5% resistor in parallel with a 1nF capacitor, shielded to reduce noise interference.

- 10M Ω 'Ib' Source. This is a 10M Ω 5% resistor in parallel with a 1nF capacitor, shielded to reduce noise interference.



Datron products, number 400391 and 400392, are available as 'Lin' and 'Ib' sources and are recommended.

- A DC Calibration Source. e.g.: Datron 4000/4000A Autocal Standard.

1.2.3 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the 'Specification Verification' section of the User's Handbook will be useful; it provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

DC VOLTAGE CALIBRATION

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	Linearity	1M Ω Lin Source	DC,1 Filter[1]	'Lin'	<10 digits (<100 digits)	This calibration step may take around 30 seconds to complete
2	Input Bias Current	10M Ω Ib Source	DC,.1	'Ib'	<100 digits	Each subsequent operation of 'Ib' should approximately halve the DVM reading
3	10V Range Zero	+0.0000V	DC,10	'Zero'	$\pm 0.0000V$	
4	10V Positive Full Range	+10.0000V	DC,10	'Gain'	+10.0000V	
5	10V Range Zero	-0.0000V	DC,10	'Zero'	$\pm 0.0000V$	
6	10V Negative Full Range	-10.0000V	DC,10	'Gain'	-10.0000V	
7	1V Range Zero	+0.00000V	DC,1	'Zero'	$\pm .00000V$	
8	1V Positive Full Range	+1.00000V	DC,1	'Gain'	+1.00000V	
9	1V Range Zero	-0.00000V	DC,1	'Zero'	$\pm .00000V$	
10	1V Negative Full Range	-1.00000V	DC,1	'Gain'	-1.00000V	
11	.1V Range Zero	+0.000mV	DC,.1	'Zero'	$\pm 0.000mV$ ± 1 digit	Wait for the reading to stabilize before operating 'Zero'
12	.1V Positive Full Range	+100.000mV	DC,.1	'Gain'	+100.000V ± 1 digit	
13	.1V Range Zero	-0.000mV	DC,.1	'Zero'	$\pm 0.000mV$ ± 1 digit	Wait for the reading to stabilize before operating 'Zero'
14	.1V Negative Full Range	-100.000mV	DC,.1	'Gain'	-100.000V ± 1 digit	
15	100V Range Zero	+0.000V	DC,100	'Zero'	$\pm 0.000V$	
16	100V Positive Full Range	+100.000V	DC,100	'Gain'	+100.000V	
17	100V Range Zero	-0.000V	DC,100	'Zero'	$\pm 0.000V$	
18	100V Negative Full Range	-100.000V	DC,100	'Gain'	-100.000V	
19	1000V Range Zero	+0.00V	DC,1000	'Zero'	$\pm 0.00V$	
20	1000V Positive Full Range	+1000.00V	DC,1000	'Gain'	+1000.00V	 Lethal voltages present - increase calibration source in 100V steps if possible
21	1000V Range Zero	-0.00V	DC,1000	'Zero'	$\pm 0.00V$	
22	1000V Negative Full Range	-1000.00V	DC,1000	'Gain'	-1000.00V	 Lethal voltages present - increase calibration source in 100V steps if possible

[1] For 1061A, Input Filter increases resolution by 1 digit - 1061A tolerance given in brackets ().

1.3 OHMS CALIBRATION

1.3.1 General

The procedure in the table opposite is all that is necessary to completely 'AUTOCAL' the Ohms function. If just the Ohms or just one range of the Ohms is to be calibrated, then steps 1 and 2 in the DC Voltage Calibration table should be carried out first. Then on each Ohms range just a 'Zero' and 'Gain' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table, repeat operations of the same 'CALIBRATE' key is permissible to improve the reading. Where no tolerance is shown in this column, only the exact reading quoted with an occasional least significant digit showing is to be expected.

1.3.2 'Zero' Resistance Source

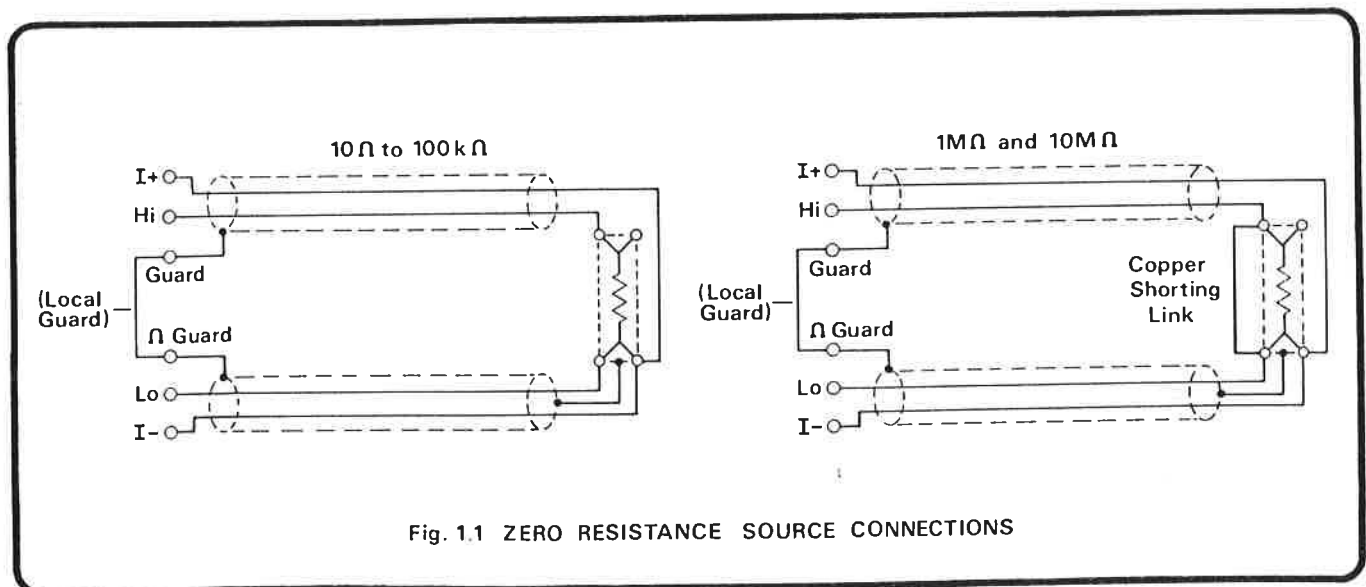
For accurate 'Zero' calibration on Ohms it is ESSENTIAL that a correctly connected zero source is used. Two arrangements are necessary as shown in Fig. 1.1; it can be seen that '4 wire Ω ' selection is recommended on all ranges.

1.3.3 Equipment Required

A set of resistance standards from 10Ω to $10M\Omega$ in decades; it is essential that 10Ω to $100k\Omega$ standards are 4 terminal devices. e.g. Datron 4000/4000A Autocal Standard with Option 20.

1.3.4 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the 'Specification Verification' section of the Operating Handbook will be useful. It provides tables for quick reference of accuracy on all ranges and functions in displayed digits.



OHMS CALIBRATION TABLE

Step	Calibration Operation	Calibration Source	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	10 Ω Range Zero	4 wire zero	k Ω , 4 wire, 10 Ω	'Zero'	$\pm 0.0000\Omega$ ± 1 digit	Wait for the reading to stabilize before operating 'Zero'
2	10 Ω Full Range	10 Ω [1] Standard Resistor	k Ω , 4 wire, 10 Ω	'Gain'	10.0000 Ω ± 1 digit	Wait for the reading to stabilize before operating 'Gain'
3	.1k Ω Range Zero	4 wire zero	k Ω , 4 wire, .1	'Zero'	$\pm 0.0000\Omega$	
4	.1k Ω Full Range	100 Ω [1] Standard Resistor	k Ω , 4 wire, .1	'Gain'	100.0000 Ω	
5	1k Ω Range Zero	4 wire zero	k Ω , 4 wire, 1	'Zero'	$\pm .00000k\Omega$	
6	1k Ω Full Range	1k Ω [1] Standard Resistor	k Ω , 4 wire, 1	'Gain'	1.00000k Ω	
7	10k Ω Range Zero	4 wire zero	k Ω , 4 wire, 10	'Zero'	$\pm 0.0000k\Omega$	
8	10k Ω Full Range	10k Ω [1] Standard Resistor	k Ω , 4 wire, 10	'Gain'	10.0000k Ω	
9	100k Ω Range Zero	4 wire zero	k Ω , 4 wire, 100	'Zero'	$\pm 0.000k\Omega$	
10	100k Ω Full Range	100k Ω [1] Standard Resistor	k Ω , 4 wire, 100	'Gain'	100.000k Ω	
11	1000k Ω Range Zero	4 wire zero	k Ω , 4 wire, 1000 Input Filter[2]	'Zero'	$\pm 0.00k\Omega$ ($\pm 0.000k\Omega$)	
12	1000k Ω Full Range	1000k Ω [1] Standard Resistor	k Ω , 4 wire, 1000 Input Filter[2]	'Gain'	1000.00k Ω ± 1 digit (1000.000k Ω) (± 10 digits)	
13	10M Ω Range Zero	4 wire zero	k Ω , 4 wire, 10M Ω Input Filter[2]	'Zero'	$\pm 0.0000M\Omega$ ($\pm 0.00000M\Omega$)	
14	10M Ω Full Range	10M Ω [1] Standard Resistor	k Ω , 4 wire, 10M Ω Input Filter[2]	'Gain'	10.0000M Ω ± 5 digits (10.00000M Ω) (± 50 digits)	

[1] - With Standard Resistor sources it may be useful to use the 'KEYBOARD' method of calibration - see section 1.7

[2] - For 1061A, Input filter increases resolution by 1 digit, so 1061A figures are given in brackets ().

1.4 AC VOLTAGE CALIBRATION – OPTION 10 ONLY

1.4.1 General

The procedure in the table opposite is all that is necessary to completely 'AUTOCAL' the AC voltage function. On each range just a 'Zero', 'Gain' and 'AChf' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table, repeat operation of the same 'CALIBRATE' key is permissible to improve the readings. This will be necessary with the AChf key.



1.4.2 Equipment Required

A copper shorting link and an AC calibration source e.g. Datron 4200 Autocal AC Standard.

1.4.3 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the 'Specification Verification' section of the Operating Handbook will be useful. It provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

AC VOLTAGE CALIBRATION TABLE (OPTION 10 ONLY)

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	DC coupled AC Zero	Copper Shorting link	AC,DC,.1	'Zero'	0.000mV ±3 digits	Set 'Local Guard'. Do not set 'Input filter'. Wait for reading to stabilize before operating 'Zero'
2	.1V Range Zero	Copper Shorting link	AC,.1	Check only	< 100 digits	
3	1V Range Zero	Copper Shorting link	AC,1	'Zero'	.00000V ±1 digit	
4	10V Range Zero	Copper Shorting link	AC,10	'Zero'	0.0000V ±1 digit	
5	100V Range Zero	Copper Shorting link	AC,100	'Zero'	0.000V ±1 digit	
6	1000V Range Zero	Copper Shorting link	AC,1000	'Zero'	0.00V ±1 digit	
7	10V Full Range LF	10V rms 500 Hz	AC,10 Input Filter	'Gain'	10.0000V ±1 digit	Select 'Input filter' for remaining steps
8	10V Full Range HF	10V rms 30 kHz	AC, 10 Input filter	'AcHf'	10.0000V ±5 digits	
9	1V Full Range LF	1V rms 500Hz	AC,1 Input filter	'Gain'	1.00000V ±1 digit	
10	1V Full Range HF	1V rms 30 kHz	AC,1 Input filter	'AcHf'	1.00000V ±5 digits	
11	.1V Full Range LF	.1V rms 500 Hz	AC,.1 Input filter	'Gain'	100.000mV ±2 digits	
12	.1V Full Range HF	.1V rms 30 kHz	AC,.1 Input filter	'AcHf'	100.000mV ±5 digits	
13	100V Full Range LF	100V rms 500 Hz	AC,100 Input filter	'Gain'	100.000V ±1 digit	
14	100V Full Range HF	100V rms 30 kHz	AC,100 Input filter	'AcHf'	100.000V ±5 digits	
15	1000V Full Range LF	1000V rms 500 Hz	AC,1000 Input filter	'Gain'	1000.00V ±1 digit	 Lethal voltage present. - increase calibration source in 100V steps if possible
16	1000V Full Range HF	1000V rms 20kHz	AC,1000 Input filter	'AcHf'	1000.00V ±5 digits	 Lethal voltage present - increase calibration source in 100V steps if possible. DO NOT EXCEED 25 kHz

1.4 AC VOLTAGE CALIBRATION – 1061A OPTION 12 ONLY

1.4.4 General

The procedure in the table opposite is all that is necessary to completely 'AUTO CAL' the AC voltage function. On each range just a 'Zero', 'Gain' and 'Achf' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table, repeat operation of the same 'CALIBRATE' key is permissible to improve the readings. This will be necessary with the Achf key.

Note: To reduce the effect of noise at low input levels, AC zero calibration is carried out at 0.1% Range; and for 100mV Range zero (steps 1 & 2 of the table), Guard is connected to Lo using a copper shorting link.



1.4.5 Equipment Required

A copper shorting link and an AC calibration source e.g. Datron 4200 Autocal AC Standard.

1.4.6 Checking Accuracy after 'AUTO CAL'

To check the accuracy after 'AUTO CAL' the 'Specification Verification' section of the User's Handbook can be employed. It describes the use of 'Spec' mode to verify the accuracy of the instrument, also providing a report sheet 'master copy' for compilation of permanent records.

AC VOLTAGE CALIBRATION TABLE (1061A OPTION 12 ONLY)

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	DC coupled AC Zero	0.100mV 500Hz (short Guard to Lo)	AC,DC,,1	'Zero'	0.100mV ±10 digits	Set 'Local Guard'. Do not set filter in. Wait for reading to stabilize before operating 'Zero'
2	.1V Range Zero	Short Hi to Lo to Guard	AC,,1	Check only	< 100 digits	
3	1V Range Zero	0.00100V 500Hz	AC,1	'Zero'	0.00100V ±1 digit	
4	10V Range Zero	0.0100V 500Hz	AC,10	'Zero'	0.010,0V ±1 digit	
5	100V Range Zero	0.100V 500Hz	AC,100	'Zero'	0.100V ±1 digit	
6	1000V Range Zero	1.00V 500Hz	AC,1000	'Zero'	1.00V ±1 digit	
7	10V Full Range LF	10V rms 500Hz	AC,10	'Gain'	10.000,0V ±1 digit	
8	10V Full Range HF	10V rms 30kHz	AC,10	'AcHf'	10.000,0V ±10 digits	
9	1V Full Range LF	1V rms 500Hz	AC,1	'Gain'	1.000,00V ±1 digit	
10	1V Full Range HF	1V rms 30kHz	AC,1	'AcHf'	1.000,00V ±10 digits	
11	.1V Full Range LF	.1V rms 500Hz	AC,,1	'Gain'	100.000mV ±2 digits	
12	.1V Full Range HF	.1V rms 30kHz	AC,,1	'AcHf'	100.000mV ±10 digits	
13	100V Full Range LF	100V rms 500Hz	AC,100	'Gain'	100.000V ±1 digit	
14	100V Full Range HF	100V rms 30kHz	AC,100	'AcHf'	100.000V ±10 digits	
15	1000V LF Range Gain	500V rms 500Hz	AC,1000	'KEYBOARD 500V' 'Gain'	500.00V ±1 digit	 Lethal voltage present - increase calibration source in 100v steps if possible
16	1000V HF Range Gain	500V rms 20kHz	AC,1000	'KEYBOARD 500V' 'AcHf'	500.00V ±15 digits	 Lethal voltage present - increase calibration source in 100V steps if possible. DO NOT EXCEED 25kHz

1.5 DC CURRENT CALIBRATION

(No DC Current facility if Option 12 is fitted)

1.5.1 General

The procedure in the table below shows all that is necessary to completely 'AUTOCAL' the DC Current function. If just the DC Current or just one range of DC Current is to be calibrated, then step 11 to 14 of the DC Voltage Calibration table should be carried out first. Then on each DC Current range just a 'Zero' and 'Gain' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table then repeat operation of the same 'CALIBRATE' key is permissible to improve the reading. Where no tolerance is shown in this column, only the exact reading quoted with an occasional least significant digit showing is to be expected.

1.5.2 Equipment Required

A DC Current calibration source. e.g. Datron 4000/4000A Autocal Standard with Option 20.

1.5.3 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the 'Specification Verification' section of the Operating Handbook will be useful. It provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

DC CURRENT CALIBRATION TABLE

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	.1mA Range Zero	0.000 μ A	DC,I,,1	'Zero'	$\pm 0.000\mu\text{A}$ ± 1 digit	Do not select 'Input filter'
2	.1mA Full Range	+100.000 μ A	DC,I,,1	'Gain'	+100.000 μ A ± 2 digits	
3	1mA Range Zero	0.00000mA	DC,I,1	'Zero'	$\pm .00000\text{mA}$ ± 1 digit	
4	1mA Full Range	+1.00000mA	DC,I,1	'Gain'	+1.00000mA ± 2 digits	
5	10mA Range Zero	0.0000mA	DC,I,10	'Zero'	$\pm 0.0000\text{mA}$ ± 1 digit	
6	10mA Full Range	+10.0000mA	DC,I,10	'Gain'	+10.0000mA	
7	100mA Range Zero	0.000mA	DC,I,100	'Zero'	$\pm 0.000\text{mA}$	
8	100mA Full Range	+100.000mA	DC,I,100	'Gain'	+100.000mA	
9	1000mA Range Zero	0.00mA	DC,I,1000	'Zero'	$\pm 0.00\text{mA}$	
10	1000mA Full Range	+1000.00mA	DC,I,1000	'Gain'	+1000.00mA	

1.6 AC CURRENT CALIBRATION

(In conjunction with Option 10 only)

1.6.1 General

The procedure in the table below shows all that is required to completely 'AUTO CAL' the AC Current function. If just the AC Current or just one range of AC Current is to be calibrated, then steps 1, 2, 11 & 12 of the Option 10 AC Voltage Calibration table must be carried out first. Then on each range just a 'Zero' and 'Gain' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table then repeat operations of the same 'CALIBRATE' key is permissible to improve the reading.

1.6.2 Equipment Required

An AC Current calibration source at 1kHz. e.g. Datron 4200 Autocal AC Standard with option 30.

1.6.3 Checking Accuracy after 'AUTO CAL'

To check the accuracy after 'AUTO CAL' the specification Verification section of the Operation Handbook will be useful. It provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

AC CURRENT CALIBRATION TABLE

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	DC coupled AC Zero	No connections to DVM input terminals	I,DC,AC,.1	'Zero'	0.000 μ A ± 5 digits	Do not select 'Input filter'
2	.1mA Range Zero	"	I,AC,.1	Check only	$< \pm 100$ digits	Cancel DC coupled
3	1mA Range Zero	"	I,DC,AC,1	'Zero'	.00000mA ± 5 digits	
4	10mA Range Zero	"	I,DC,AC,10	'Zero'	0.0000mA ± 5 digits	
5	100mA Range Zero	"	I,DC,AC,100	'Zero'	0.000mA ± 5 digits	
6	1000mA Range Zero	"	I,DC,AC,1000	'Zero'	0.00mA ± 5 digits	
7	.1mA Full Range	100 μ A, 1kHz	I,DC,AC,.1	'Gain'	100.000 μ A ± 10 digits	
8	1mA Full Range	1mA, 1 kHz	I,DC,AC,1	'Gain'	1.00000mA ± 10 digits	
9	10mA Full Range	10mA, 1 kHz	I,DC,AC,10	'Gain'	10,0000mA ± 10 digits	
10	100mA Full Range	100mA, 1 kHz	I,DC,AC,100	'Gain'	100,000mA ± 10 digits	
11	1000mA Full Range	1A, 1 kHz	I,DC,AC,1000	'Gain'	1000.00mA ± 10 digits	

1.7 CALIBRATION USING 'KEYBOARD'

1.7.1 General

The 'KEYBOARD' method of calibration is useful when a calibration source although set to a nominal value has known errors. In this situation the known value of the calibration source can be entered into the DVM before the 'AUTOCAL' process is executed. The process is functional during any calibration with a source of magnitude between 20% and 200% of the range selected, but it should be noted that for equal magnitude source errors, calibrating at the lower percentage end of range produces a higher percentage calibration error. The 'KEYBOARD' method operates for both the 'Gain' and 'AChf' calibration operations. An example using 'KEYBOARD' to calibrate directly against a Standard Cell is shown in the table below.


1.7.2 'KEYBOARD' with Negative Inputs

If the 'KEYBOARD' method is used on DC Voltage calibration with Negative polarity sources, it is important NOT to enter a negative sign with the keyed-in source value. The instrument itself can determine the polarity of the source and update the appropriate calibration memory location.

1.7.3 'KEYBOARD' Calibration Example

The example shown in the table below uses 'KEYBOARD' to calibrate the 1000V AC LF Range Gain at 500V (step 15 of the AC Voltage Calibration table for Option 12).

CALIBRATION EXAMPLE USING 'KEYBOARD'

Step	Calibration Operation	Calibration Source	DMM Setting	'CALIBRATE' Key	DMM Reading After Calibration	Remarks
1	1000V Range Zero	1.00V rms 500Hz	AC,1000	'Zero'	1.00V ±1 digit	
2	Set and Enter Source Value	500.00V rms 500Hz	'KEYBOARD' then 5,0,0,-,0,0	-	0 then +500.00	 Lethal voltage present. Increase Calibration Source in 100V steps if possible
3	1000V AC LF Range Gain Calibration	As above	-	'Gain'	500.00V ±1 digit	

1.8 'AUTOCAL' OVER THE BUS

All the calibration procedures covered in this manual can be carried out remotely using Option 50, the IEEE Bus.

Effectively, the five calibration keys are replaced by five Bus instructions and these are used instead of the 'CALIBRATE' keys listed in the Calibration tables on previous pages.

An example of calibration with the Bus is given in the table below. A complete program listing for the same calibration operation assuming an HP9825 controller is as follows:—

```

0: dim D$(15)          define 15 character string
                        variable
1: clr 728             send 'device clear' to DVM
                        (interface 7, address 28)
2: wrt 728,"F3R3Q1W1=" program to DC 1V, SRQ
                        Mode 1, Enable Cal.
3: 0→S
4: wrt 728,"G0="      program zero cal. trigger
  
```

```

5: oni 7,"srq"        jump to SRQ service routine
                        on interrupt
6: eir 7,128          enable SRQ interrupts from
                        interface 7
7: if bit ("01XXXXXX",S) check status byte S
                        obtained by service routine
                        prompt operator to apply
                        calibration source on com-
                        pleting zero cal
8: dsp "Apply 1V &
   CONTINUE"
9: 0→S;stp
10: wrt 728,"G1="     program gain cal. trigger
11: oni 7,"srq"
12: eir 7,128
13: if bit ("01XXXXXX",S)
   =0;jmp -1
14: wrt 728,"T0W0="  program to Internal Trigger,
                        Disable Cal. on completion
                        of gain cal.
                        program DVM to local state
15: lcl 728
16: stp
17: "srq":rds(728)→S SRQ service routine to read
                        status byte
18: red 728,D$
19: iret
   *7717
  
```

CALIBRATION EXAMPLE USING THE BUS

Step	Calibration Operation	Calibration Source	DVM Setting	Bus Controller Instruction	DVM Reading After Calibration	Remarks
1	Set DVM to known state	—	In Remote State	'Device Clear'	—	Program DVM to predetermined state A0C0DXE0F3M0N0 00P0Q0R6S0T5
2	Set DVM to DCV, 1V Range, and prepare for calibration	+0.00000V	Calibration key to 'CAL'	'F3R3Q1W1='	—	Program DVM to Function:DC V(F3) Range:1V (R3) SRQ Mode 1 (Q1) Enable Cal. (W1)
3	1V Range Zero	+0.00000V	In Remote State	'G0='	±.00000V	Program 'Zero' cal., SRQ indicates when calibration operation completed
4	1V Positive Full Range	+1.00000V	In Remote State	'G1='	+1.00000V	Program 'Gain' cal., SRQ indicates when calibration operation completed
5	Set DVM to Internal Trigger, Disable Cal.	—	In Remote State	'T0W0='	—	Program DVM to Internal Trigger (T0), Disable Cal. (W0)
6	—	—	In Local State, Calibration key to 'RUN'	'Local'	—	DVM in normal mode, free-running

SECTION 2

MECHANICAL DESCRIPTION

2.1 GENERAL

The 1061 has been designed to be either rack mounted in a standard 19" rack (3½" (2U) height required) or bench top/portable with integral tilt stand. An exploded view of the instrument is shown in Fig 2.1.

2.2 FRONT PANEL

The front panel incorporates the signal input terminals, range, function, mode, keyboard, compute and power switches and a numeric/legend gas discharge display.

2.3 REAR PANEL

The rear panel incorporates the mains supply, power input socket and fuses, digital and analog output sockets, rear and ratio signal input sockets, rear/front panel signal input selection switch, run/calibrate keyswitch, calibration interval (error) select switch and current option fuse.

2.4 EXTERNAL CONSTRUCTION

A screen printed key designation overlay adheres to the front panel retaining the polarising filter in front of the display. Both the front and rear panels are held together by two side extrusions running from front to rear. These side extrusions provide both slots for the handles or rack

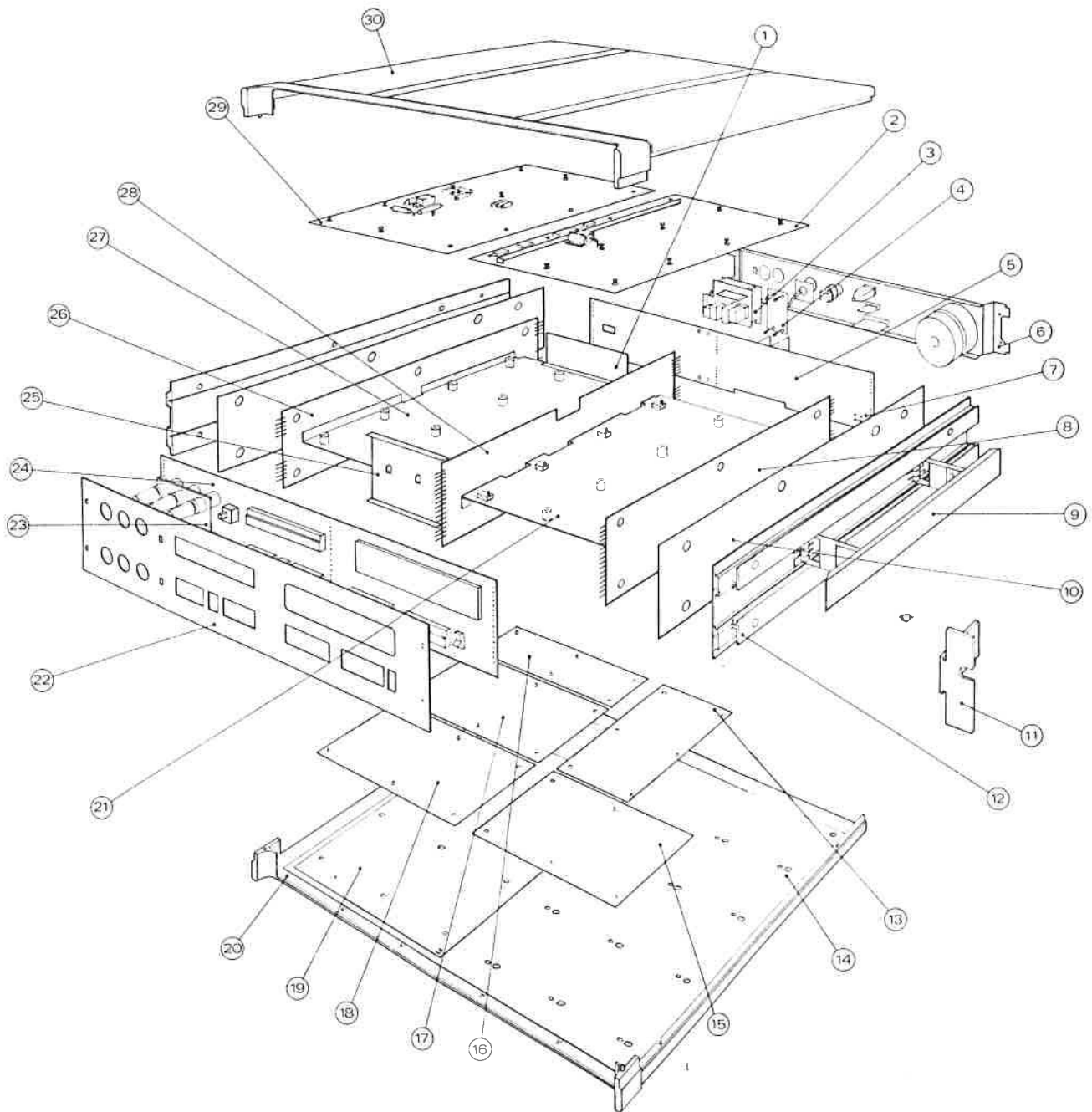
mounting 'ears' and locating points for the structural foam covers. The bottom cover is fitted with the tilt-stand, rubber feet and instruction card. Earth screening of the covers and guarding is provided by aluminium plates, heat-staked to the inside of the covers with electrical connections made by spring contacts.

2.5 INTERNAL CONSTRUCTION

An internal chassis is constructed from five printed circuit boards, held together by connectors at each corner and held rigid by two inner aluminium shields fixed horizontally on the instrument's centre line running from front to rear. Input terminals, switches and display are mounted on the front printed circuit board (pcb) and the power supply on the rear pcb. The two side and centre pcb's are used for interconnections between the main circuit boards.

All the main circuit boards are mounted on the inner shields with hinges and quick release fasteners with flexible connections to allow operation in the 'hinged-up' position. The Analog output circuitry is fixed on to the rear pcb of the chassis and the Ratio/Rear Input circuitry on to the rear panel. The options are mechanically fitted and require no soldering.

The chassis is mounted on to the side extrusions with nylon screws, spacers and an insulation sheet to ensure that the 'electrical spacings' of the BSI, UL and VDE specifications are achieved.



- | | | |
|---|-------------------------------|----------------|
| 1. REAR GUARD SCREEN | 16. CURRENT ASSEMBLY (OPTION) | } See Note [1] |
| 2. DIGITAL ASSEMBLY | 17. AC ASSEMBLY (OPTION 10) | |
| 3. RATIO/REAR INPUT ASSEMBLY (OPTION) | 18. OHMS ASSEMBLY (OPTION) | |
| 4. ANALOG OUTPUT ASSEMBLY (OPTION) | 19. OUTER GUARD SCREEN | |
| 5. REAR (POWER SUPPLY) PCB ASSEMBLY | 20. BOTTOM COVER ASSEMBLY | |
| 6. REAR PANEL ASSEMBLY | 21. R.H. CENTRE GUARD SCREEN | |
| 7. POWER SUPPLY VOLTAGE SELECTION LINKS | 22. FRONT PANEL AND OVERLAY | |
| 8. R.H. PCB ASSEMBLY | 23. TERMINAL SUPPORT PLATE | |
| 9. HANDLE ASSEMBLY | 24. FRONT PCB ASSEMBLY | |
| 10. INSULATION SHEET | 25. FRONT GUARD SCREEN | |
| 11. RACK MOUNTING BRACKET | 26. L.H. PCB ASSEMBLY | |
| 12. SIDE EXTRUSION | 27. L.H. CENTRE GUARD SCREEN | |
| 13. DIGITAL INTERFACE ASSEMBLY (OPTION) | 28. CENTRE PCB ASSEMBLY | |
| 14. EARTH SCREEN | 29. ANALOG ASSEMBLY | |
| 15. DISPLAY DRIVER ASSEMBLY | 30. TOP COVER ASSEMBLY | |

FIG. 2.1 EXPLODED VIEW OF INSTRUMENT

[1] AC Assembly for 1061A Option 12 is fitted in place of AC Option 10 and Current Option 30 pcb assemblies

SECTION 3

TECHNICAL DESCRIPTION

3.1 INTRODUCTION

The internal circuits of the basic DC only instrument are divided between five printed circuit board assemblies (shown in bold outline in Fig. 3.1).

For the purpose of explanation, each assembly will be described separately and each assembly further subdivided according to the various functions involved.

3.2 ANALOG ASSEMBLY (Circuit Drawing No. 430328)

The Analog assembly is split into three distinct sections: (i) the Analog Interface, (ii) the DC Isolator and (iii) the Analog to Digital (A - D) Converter.

The Analog Interface receives data from the Digital assembly to control the selection, range scaling and other features of the analog circuitry. Messages between the Analog and Digital assemblies are passed via opto-isolators, electrically isolating one from the other.

The DC Isolator includes the preamplifier, range scaling circuits and bootstrapped supplies. The A - D section converts the scaled input signal to a time period proportional to the signal using a modified triple slope technique.

3.2.1 Analog Interface (430328 sheet 5)

3.2.1.1 Introduction

The Analog Interface provides electrical isolation between the Digital and Analog circuitry. Latched data from the microprocessor is passed through opto-isolators,

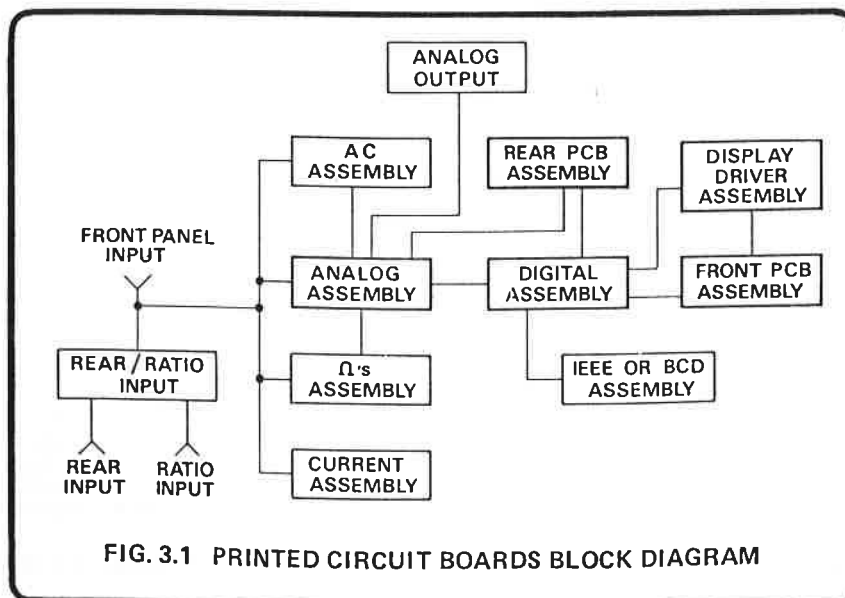
decoded and latched again on an analog assembly to select function, range, test, average and the D - A converter set up conditions. A line is also provided to instruct the microprocessor which options are present and if the AC assembly is measuring a signal above 5kHz.

3.2.1.2 Power-On

At power-on the A - D converter is placed into the RESET condition (See Section 3.2.3.8). The analog circuitry is then interrogated to discern which options (if any) are fitted. Finally the analog circuitry is placed into the DC, 1000V range until a different range or function is selected (See Fig. 3.3).

To determine which options are fitted the Digital assembly sends a series of messages across the isolation barrier, decodes them on the analog side and gates them with lines from the option assemblies to feed a signal back across the isolation barrier to the micro-processor.

Looking at the procedure, in more detail, the Analog Interface Data (ID) lines are all set to a logic '1' except one, which is set to a logic '0', depending on the option being interrogated (See Fig. 3.2). As an example we will check to see if the AC option is fitted. ID1 is set low, the rest of the ID lines set high and the Analog Interface Address lines, IA0 and IA1 set low. The opto-isolators *invert* all signals, thus M17-3 is low and M19 pins 10, 4 and 11 are high. If the AC option is *not* fitted M19-2 is driven low via R55 from M17-3, causing M19-3 to be high, producing a logic '0' (-15 volts) on M18-4. If the AC option *is* fitted a 33k Ω resistor on the AC assembly (R14) overrides R55 and a high is placed on M19-2. The effect is to produce a



Option checked	ID line low	Pin No. of M19 held low if Option incorporated
AC	ID 1	M19-3
Ω	ID 2	M19-11
I	ID 3	M19-4
RATIO	ID 4	M19-10

Fig. 3.2 POWER-ON OPTIONS FITTED TEST

high on M18-4, turning the opto-isolator M2-B on and thus COND. VAL (M2-8) is high, signalling to the Digital assembly that the AC option is fitted. Similarly, when the Ω , I or RATIO options are interrogated, the appropriate output of M19 is set low if the option is fitted causing the COND. VAL to be set high.

*Note: ID and IA lines
 logic '1' \equiv +5 volts logic '0' \equiv 0 volts
 AD lines
 logic '1' \equiv 0 volts logic '0' \equiv -15 volts

The next step in the power-up sequence as far as the analog circuits are concerned, is to be placed into the DC, 1000V range (See Fig. 3.3 Flowchart). Firstly, all assemblies are deselected by placing logic '1's on all the ID lines, then setting the IA0 and IA1 lines low (see Fig. 3.4), clocking the option selects latches (M20 Analog assembly, M5 AC assembly, M9 Ohms assembly, M1 Ratio assembly from M17-3. Both IA lines then return high.

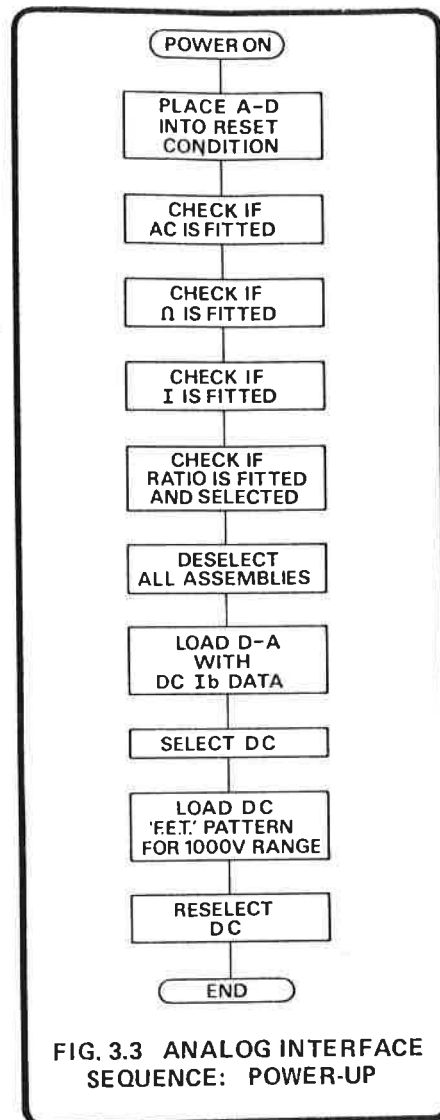


FIG. 3.3 ANALOG INTERFACE SEQUENCE: POWER-UP

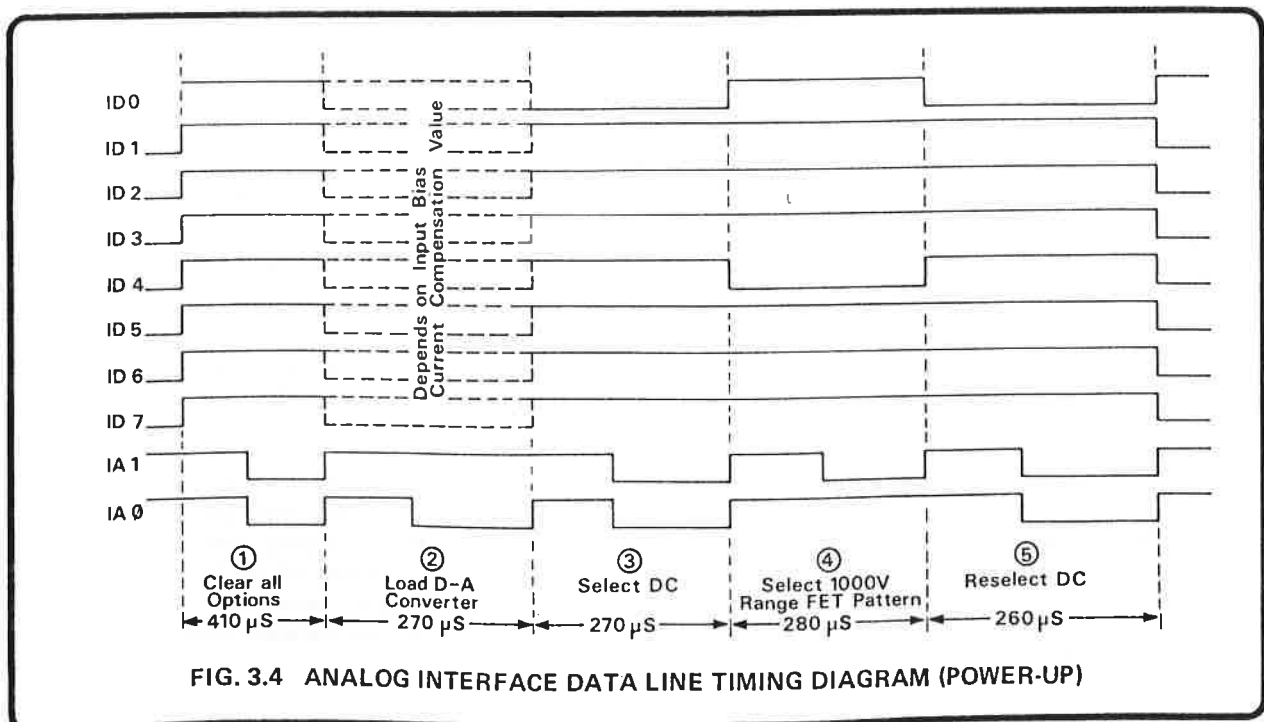


FIG. 3.4 ANALOG INTERFACE DATA LINE TIMING DIAGRAM (POWER-UP)

Secondly, the latches of the D - A converter (M13, M14) are set up with the input bias current (I_b) compensation data. The ID lines are set to the appropriate pattern and the information is clocked on to M13 and M14 by a delayed low to high edge from M17-4, originating from IA0 going low. The delay makes sure that the signal from M17-10 has disabled the "F.E.T." latch M21. Once again, the IA0 line returns to the resting state of logic '1'. Thirdly, the DC analog circuits are enabled by setting all the ID lines high except for ID0, then clocking M20 by a low to high edge from M16-6 caused by both IA lines going low. Once DC has been selected, the F.E.T. pattern latch is enabled from M12-1, and the penultimate step is to load this latch with 1000V range data from the ID lines (ID4 low, the rest high). This is executed by clocking the 'F.E.T.' latch from M17-4 once again, but this time being due to IA1 going low. The final step is to reselect DC as described above.

3.2.1.3 General Interface Update Sequence

Before the start of each reading, the analog interface undergoes a complete update. The series of events is the same as the power-up sequence for selection of function and range, as can be seen by comparing the two flowcharts (Figs. 3.3 and 3.5). When Ohms or Current is selected, the DC Isolator or AC assembly is also used in the measurement procedure as seen in the following table.

Type of Measurement	Circuits Selected	Use of D - A
DC Volts	Analog Assembly	Input Bias Current Compensation
AC Volts	AC Assembly	Frequency Compensation
AC + DC Volts	AC Assembly	Frequency Compensation
Resistance	Ohms Assembly and Analog Assembly	Input Bias Current Compensation
DC Current	Current Assembly and Analog Assembly	Input Bias Current Compensation
AC Current	Current Assembly and AC Assembly	Frequency Compensation
AC + DC Current	Current Assembly and AC Assembly	Frequency Compensation

The update sequence order is (i) Deselect all assemblies, (ii) Load D - A latches, (iii) Select AC assembly or DC Isolator, (iv) Load range pattern into DC or AC range latches, (v) Deselect DC or AC and select either the Ohms or Current assembly, (vi) Load range pattern into Ω 's or I range latches, (vii) Reselect circuits selected in (iii) and (iv).

Note: Steps (v) and (vi) are used only when I or Ω is selected.

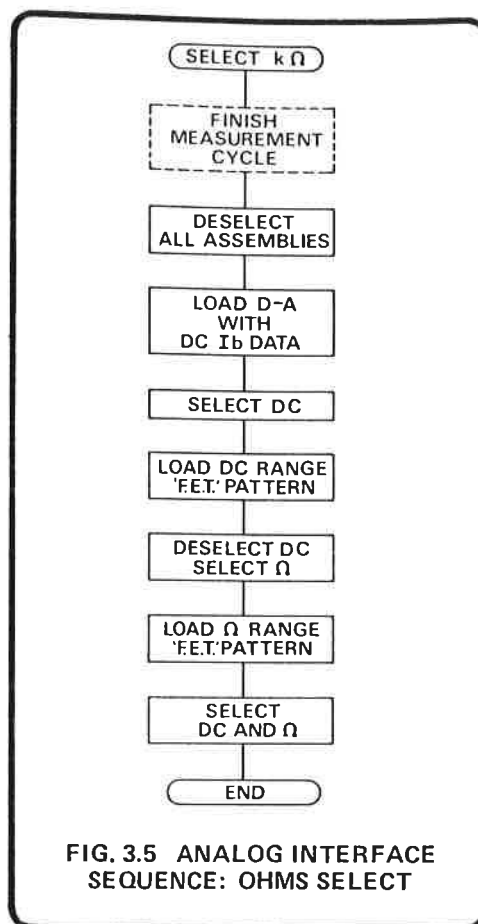


FIG. 3.5 ANALOG INTERFACE SEQUENCE: OHMS SELECT

Flowchart 3.5 gives the above sequence for an ohms update. The general form of the timing diagram for the above sequence is given in Fig. 3.6, the analog 'F.E.T.' patterns for each range of each function being given in Appendix 1.

3.2.1.4 Test

When TEST is selected, a logic '0' is placed on ID7 at stages (iii), (v) and (vii) in Fig. 3.6, i.e. each time a function measurement circuit is selected. Appendix 1 lists the 'F.E.T.' patterns of each assembly for each test measurement cycle.

3.2.2 DC Isolator Section

3.2.2.1 Pre-amplifier Scaling (430328 sheet 1)

Figure 3.8 shows the essential features of the isolator scaling circuit. For the purpose of explanation the same symbols are used, regardless of whether the switching is accomplished electronically (F.E.T.) or by means of relay contacts. In Fig. 3.8 all switches are shown in the 1V RANGE position.

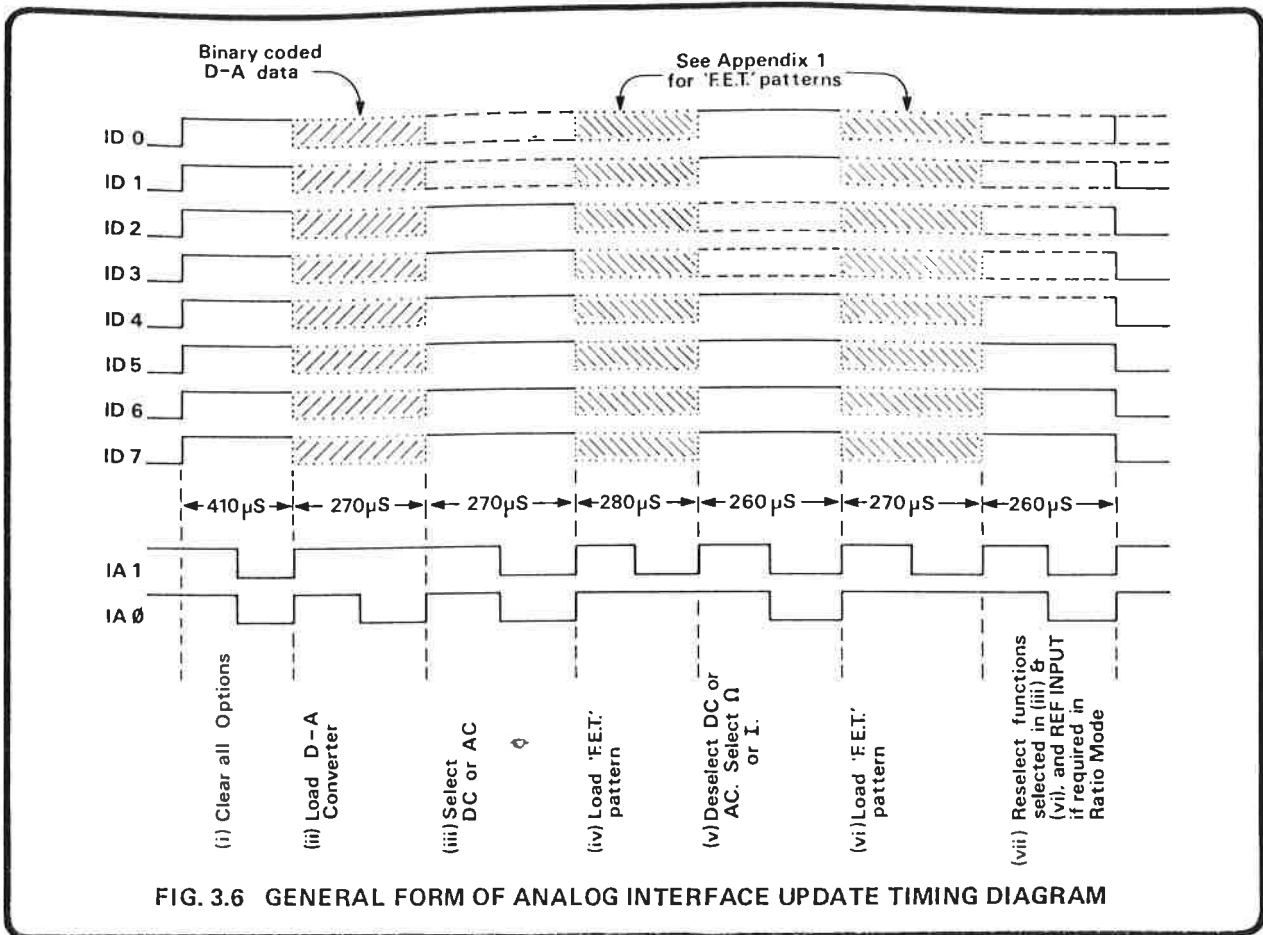


FIG. 3.6 GENERAL FORM OF ANALOG INTERFACE UPDATE TIMING DIAGRAM

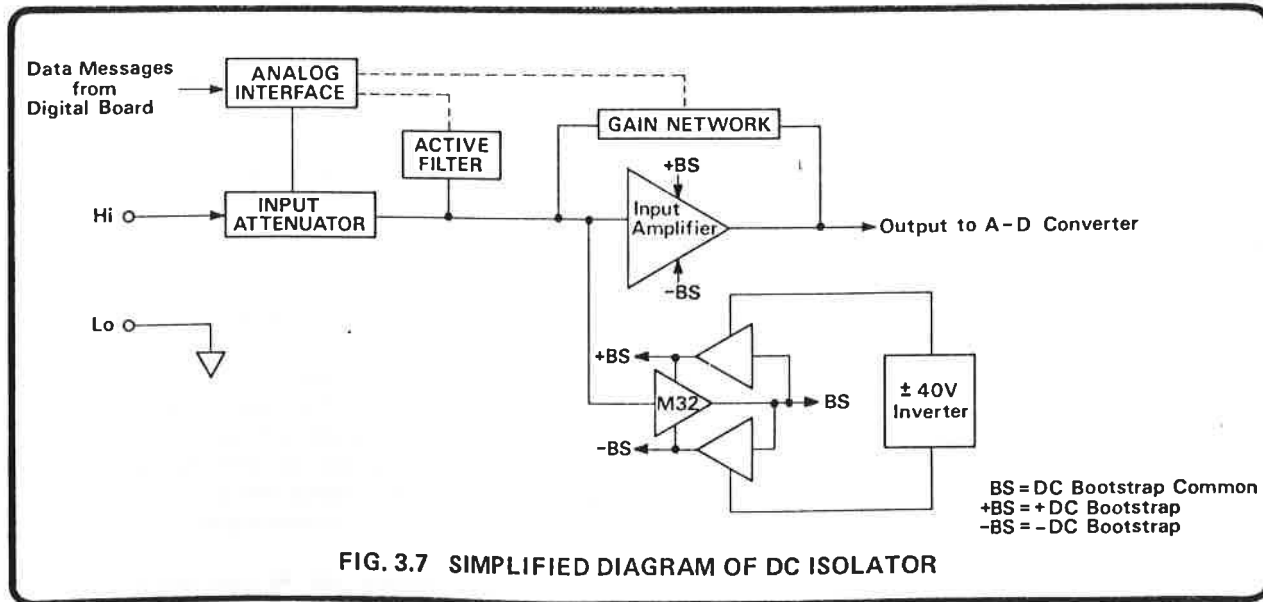


FIG. 3.7 SIMPLIFIED DIAGRAM OF DC ISOLATOR

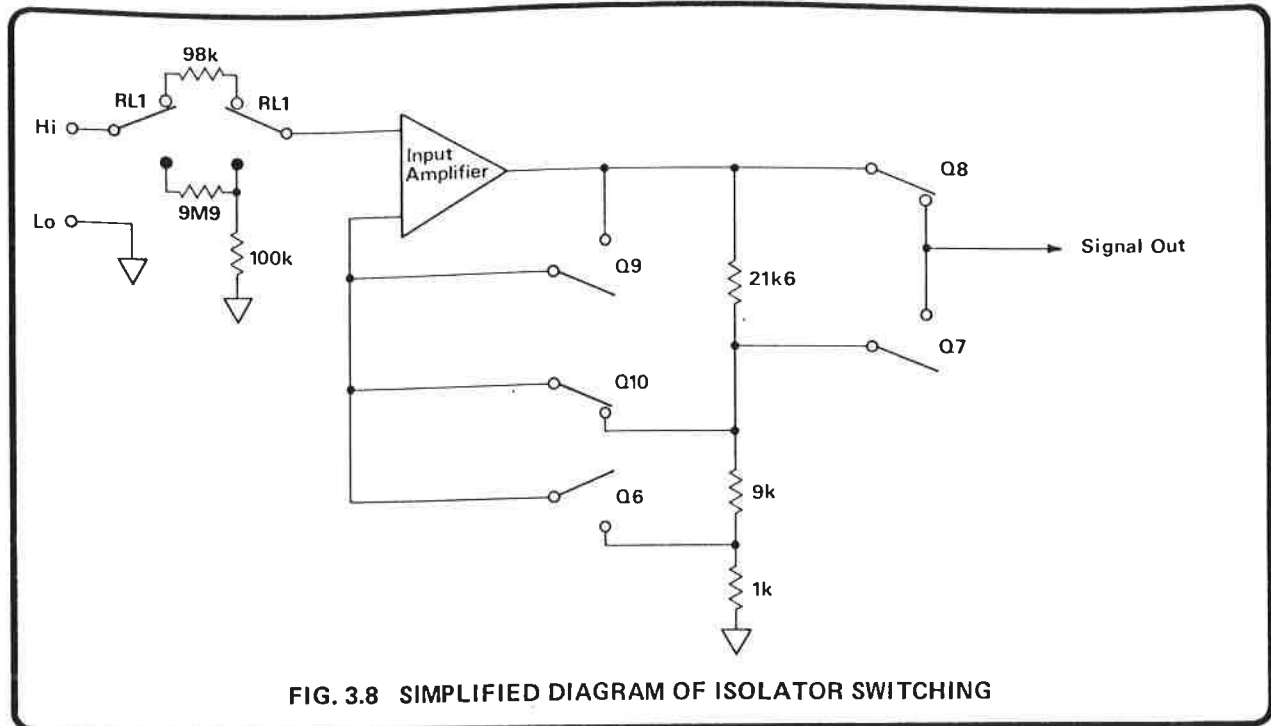


FIG. 3.8 SIMPLIFIED DIAGRAM OF ISOLATOR SWITCHING

The various switching combinations for the different ranges are as follows:—

Range	Gain	Q6	Q7	Q8	Q9	Q10	RL1
100mV	x31.6	ON	OFF	ON	OFF	OFF	ON
1V	x3.16	OFF	OFF	ON	OFF	ON	ON
10V	÷3.16	OFF	ON	OFF	ON	OFF	ON
100V	÷31.6	OFF	OFF	ON	OFF	ON	OFF
1000V	÷316	OFF	ON	OFF	ON	OFF	OFF
DC		OFF	OFF	OFF	ON	OFF	OFF

The configuration of the circuit for each range is shown in Fig. 3.9.

Reference should be made to circuit diagram number 430328, sheet 1, for the complete circuit. Sheet 2 gives tables of the coding on the input control lines (from the Analog Interface).

When the 100V or 1kV range is selected, a ÷100, 10MΩ input attenuator (R143, R156, R149, R148) is incorporated into the circuit. This is a matched set of resistors for low temperature coefficient. The selection of a lower range energizes relay RL1 (via Q33), causing resistor chain R119-R122 to be in series with the Hi input. Should an overload signal then be applied, the resistor chain limits the current and the power dissipation is such that 1000V can be applied continuously.

The amplifier end of the resistors is clamped by zener diodes D22, D23 and Q18, Q19 to low, thus the amplifier input can never exceed approximately ± 24 volts.

The output from the DC Isolator, test point (TL8) is approximately 3.16 volts ($\approx \sqrt{10}$) for a full range (100,000) input by the following methods (See Fig. 3.9):—

100mV Range Q6 and Q8 are turned on; all other F.E.T.'s are turned off and RL1 energised. Thus the output of the amplifier is connected to its inverting input via R108, R109, R110, R111 and Q6, an attenuator chain of ÷31.6, giving the amplifier an overall gain of X 31.6 Q8 connects the preamplifier directly to the output.

1V Range Q10 and Q8 are turned on, all other F.E.T.'s are turned off and RL1 energised. The output of the amplifier is connected to its inverting input via R108, R109, R110, R111 and Q10, an attenuator chain of ÷3.16, giving the amplifier an overall gain of X 3.16. Q8 connects the preamplifier directly to the output.

10 V Range Q9 and Q7 are turned on; all other F.E.T.'s are turned off and RL1 energised. Q9 causes the amplifier output to be directly connected to its inverting input, giving a gain of unity. The output of the amplifier is attenuated by 3.16 (R114, R115) before being passed to the output via Q7 instead of Q8.

100V and 1000V Ranges These two ranges select the 1V and 10V ranges respectively but a ÷100 attenuator (R149, R156, R143, R148) is inserted between Hi and the preamplifier input when RL1 is de-energised.

3.2.2.2 Preamplifier (430328 sheet 1)

The preamplifier is designed to present an input impedance of greater than $10,000M\Omega$ for signals up to ± 20 volts. It is also bootstrapped (tracking of both ground lines and supply voltages with input signal) being essential for correct operation of input bias compensation, temperature compensation and common mode rejection.

Q12 is a well matched monolithic NPN transistor pair exhibiting minimal voltage drift and low noise characteristics, the output being buffered by M31. To compensate for the current gain drift of Q12 (approx. $-1\%/^{\circ}C$), the change in the base-emitter voltage of one half of Q12 is sensed by M30. The drift compensation is linearised to $1\%/^{\circ}C$ by thermistor R218. Thus the input bias current is kept constant with temperature.

3.2.2.3 D.C. Bootstrap (430328 sheet 2)

Bootstrapped supplies are generated which track the input signal directly (BS), track the input signal with a positive offset of $+12V(+BS)$ and track the input signal with a negative offset of $-12(-BS)$.

M32 is the high impedance buffer which tracks the inverting input of the preamplifier. The offset of M32 is adjusted so that its input is within $100\mu V$ of the input of the preamplifier. M32 thus functions as the low impedance rail (BS) following the input signal.

Selection of DC(M20-3) enables the capacitive inverter driven from M33 to provide an unregulated $+42V(TL4)$ and $-42V(TL5)$ supply from the $\pm 15V$ supply.

The positive bootstrap supply (+BS) is generated as a current source comprising Q26 and the shunt regulator, Q27, referenced to D50. When the output voltage of the regulator is approximately 1.2 volts above D50 cathode, Q27 conducts current into R175. Since the current in R175 is controlled to be constant by Q30, referenced to D50, the current flowing through R174 is reduced. Hence the supply current, "mirrored" in R173, is reduced and the output voltage controlled.

The negative bootstrap supply (-BS) is generated in a similar manner. Thus bootstrapped supplies of approximately ± 12 volts are produced, tracking the input signal exactly.

3.2.2.4 Filtering (430328 sheet 1)

Selection of filter causes an active filter to be switched in by relay, RL2, (via Q32). The filter gives an attenuation of -34 dB at 50Hz. The essential components of the filter are shown in Fig. 3.10.

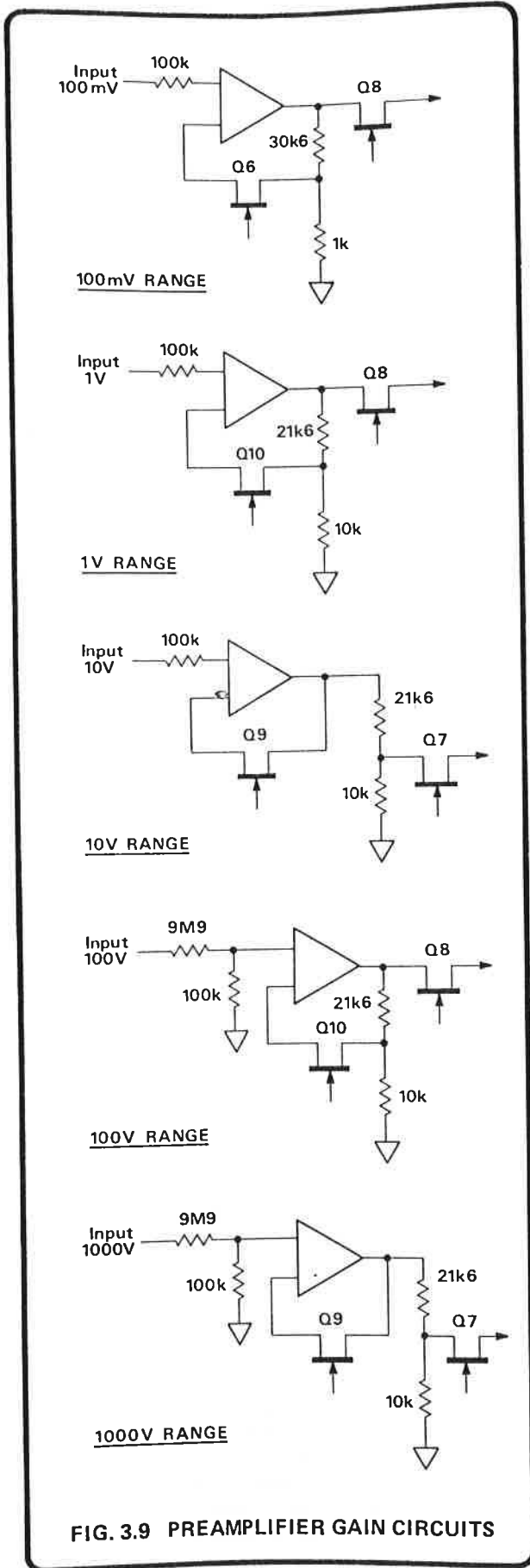


FIG. 3.9 PREAMPLIFIER GAIN CIRCUITS

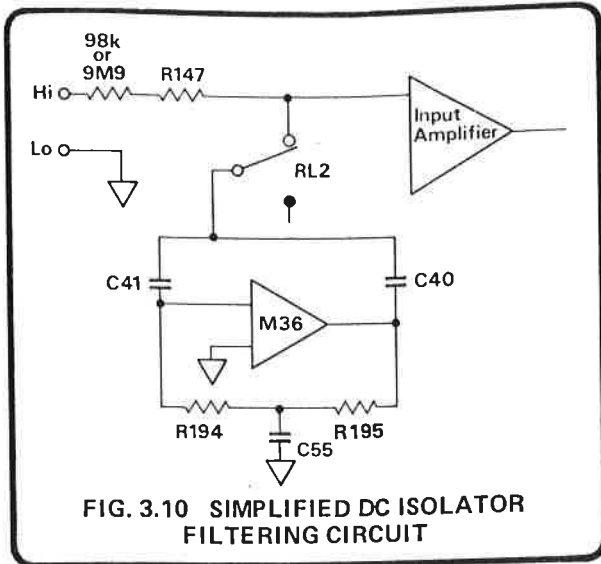


FIG. 3.10 SIMPLIFIED DC ISOLATOR FILTERING CIRCUIT

3.2.2.5 Input Current (I_b) Compensation (430328 sheets 1 and 5)

During the calibration cycle, the microprocessor notes and stores the zero error due to the bias current (measured in a known source resistor). When DC is selected, this information is recalled by the microprocessor, transferred across the isolation barrier and latched into M13 and M14, see Fig. 3.11.

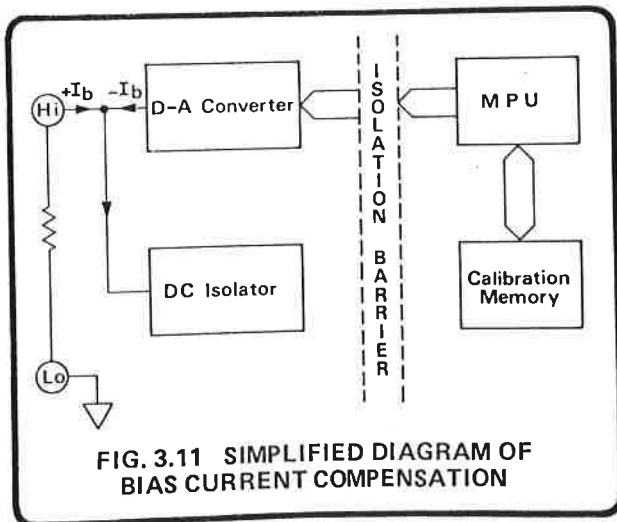


FIG. 3.11 SIMPLIFIED DIAGRAM OF BIAS CURRENT COMPENSATION

The output from the latches is applied to the binary resistor ladder network, AN2, providing a 255 step digital to analog conversion. The analog signal is applied to the inverting input of M3 so that the output drives current, through the diode, to control the current in the corresponding transistor of the opto-isolator, M23. The transistor of the opto-isolator sinks current to the -15V supply until the voltage across R198 is equal to the voltage applied to the inverting input of M3.

The other half of the opto-isolator acts as a current mirror, referenced to the bootstrap (BS) supply. Thus the input current correction is floated on the bootstrap supply, tracking the input signal is divided by R84 to R128 and R129 to null the bias current of the preamplifier.

3.2.2.6 Test (430328 sheets 1 and 5)

During the self-test routine, (actuated from the front panel or remotely programmed) the DC isolator is checked for correct operation. The circuitry is placed into the 0.1V range, as described in 3.2.1.3, except that relay RL1 is not energized, (i.e. the ÷ 100 attenuator is across the input amplifier). Filter is selected and F.E.T. Q5 'closed' via M20-5 causing a small signal to be injected into the feedback path of the input amplifier. Thus a signal of -3.125 volts is output from the DC Isolator (TP13). This signal is then measured and compared with a stored value. If the measured signal is within ±6% of the stored value, the test continues with a 1V range check and a 10V range check.

Range	Output signal from DC Isolator (TP13)
0.1V	- 3.125 volts
1V	- 0.2193 volts
10V	- 0.06932 volts

DC Isolator Output Test Voltages

3.2.3 Analog to Digital Conversion (Analog Section) (430328 sheets 3 and 4)

3.2.3.1 General Principles

Section 1 and Fig. 1.2 of the User's Handbook gives a very basic description of the principles of the integration involved. The technique used in the Autocal Voltmeter is a quadruple slope, the two extra slopes being towards the end of the signal and reference integration periods respectively.

Fig. 3.12 is a simplified diagram showing the essentials of the analog section of the A - D conversion and should be used with timing diagram Fig. 3.13 for full appreciation of the circuit operation.

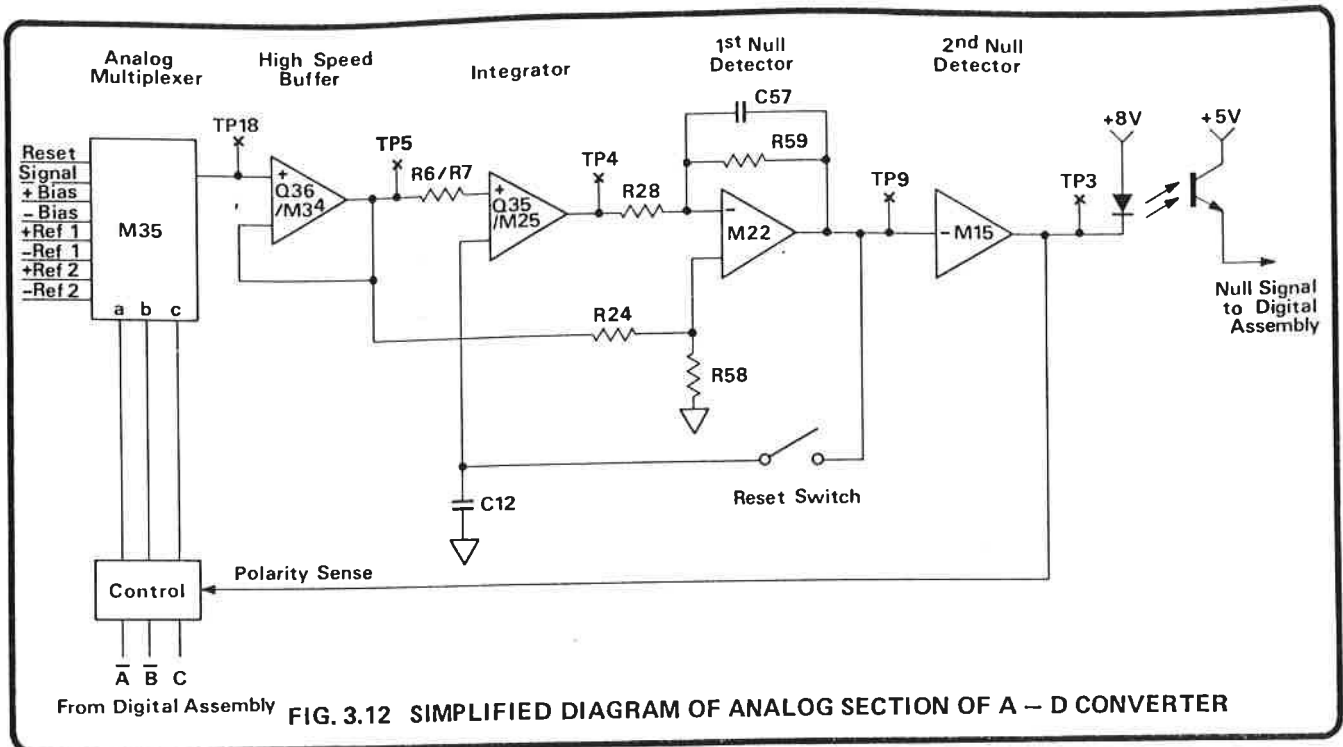


FIG. 3.12 SIMPLIFIED DIAGRAM OF ANALOG SECTION OF A – D CONVERTER

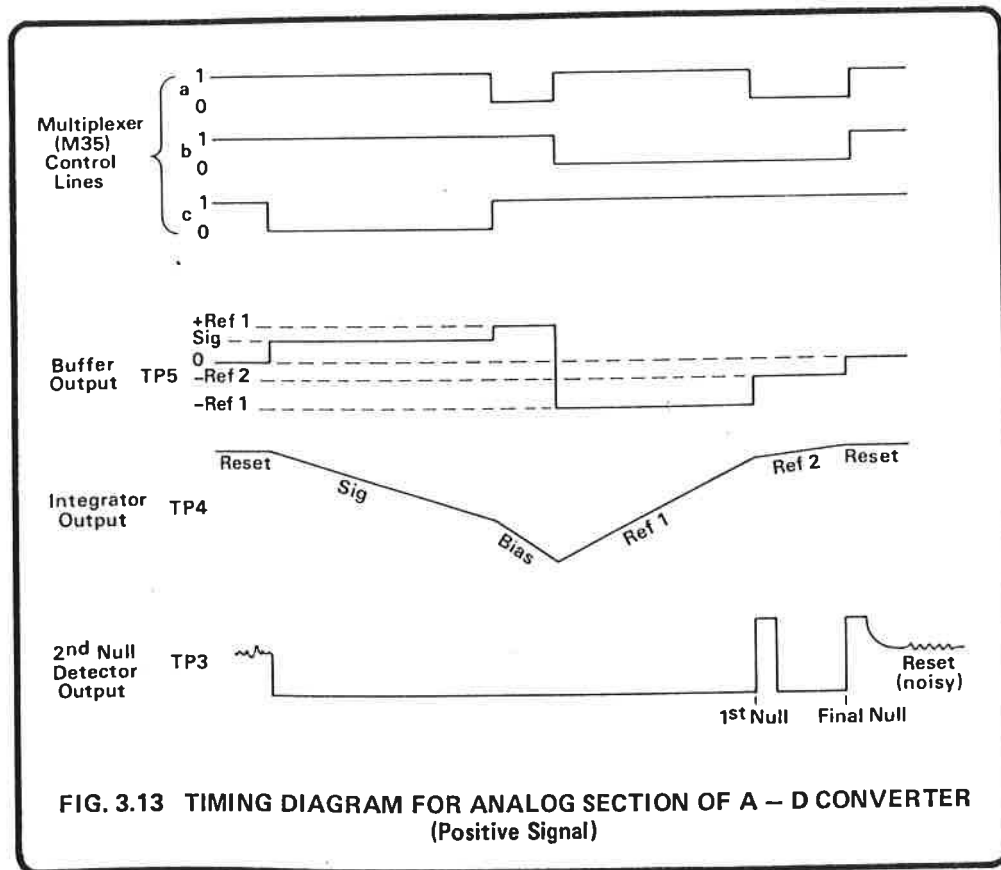


FIG. 3.13 TIMING DIAGRAM FOR ANALOG SECTION OF A – D CONVERTER (Positive Signal)

3.2.3.2 A - D Input Control

The analog signal from the DC Isolator is applied to the analog multiplexer (M35) and fed to the input of the buffer (Q36/M34). This in turn feeds the signal to the integrator comprising of Q35, M25 and C9.

Control of the multiplexer is derived from the Digital assembly via opto-isolators M4, M5 and M6. These signals control the sequence of events, allowing first the signal, then a bias voltage of the same polarity as the signal, followed by opposite polarity reference and reference ± 16 signals to the buffer and integrator. The multiplexer is then placed in a reset condition ready for the next measurement cycle. Fig. 3.14 gives the multiplexer control line sequence for both positive and negative signals.

STATE	a	b	c	STATE	a	b	c
RESET	1	1	1	RESET	1	1	1
SIG	1	1	0	SIG	1	1	0
+ BIAS	0	1	1	-BIAS	0	1	0
-REF 1	1	0	1	+REF 1	1	0	0
-REF 2	0	0	1	+REF 2	0	0	0
RESET	1	1	1	RESET	1	1	1

Positive signal Negative signal

Logic levels : (0 \equiv -8V, 1 \equiv +8V)

Fig 3.14 MULTIPLEXER CONTROL LINE SIGNALS

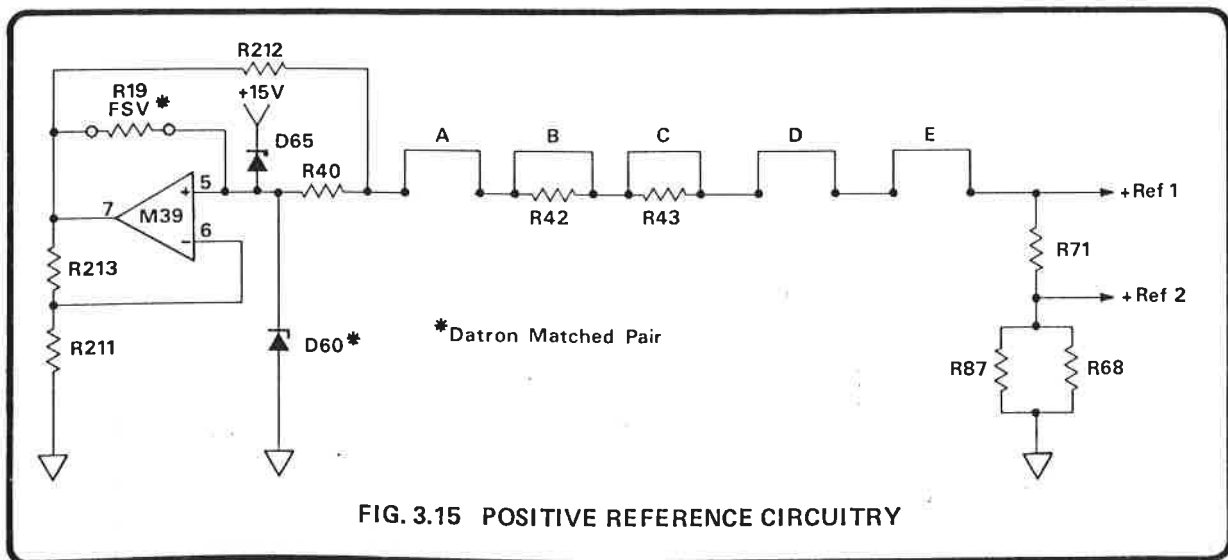
3.2.3.3 Reference Voltages and Control Logic Power Supply

REF 1 : The two halves of M39 in conjunction with zener diodes D60 and D59 form the positive and negative reference voltages respectively, D65 and D64 being 'start-up' diodes (see Fig. 3.15). The outputs of M39 (+11 and -11 volts) supply the defined current for the reference zeners via R212 and R38 respectively. R19 and R18 are selected by Datron so that each zener has zero voltage/temperature coefficient.

The resistor chains R42-R43 and R89-R90 are binary weighted values allowing the set up of the exact nominal REF 1 voltages, of $\pm 6.42V$, by cutting the appropriate links.

REF 2 : The second reference is 1/16th of REF 1. The positive and negative REF 1 voltages are divided by R71, R68 and R214, R70 respectively.

The power supplies for the logic circuits M35, M29, M27, M28 and opto-isolators M1, M4, M5 and M6 are also derived from M39 via zener diodes D61 and D62, giving supply voltages of ± 8 volts.



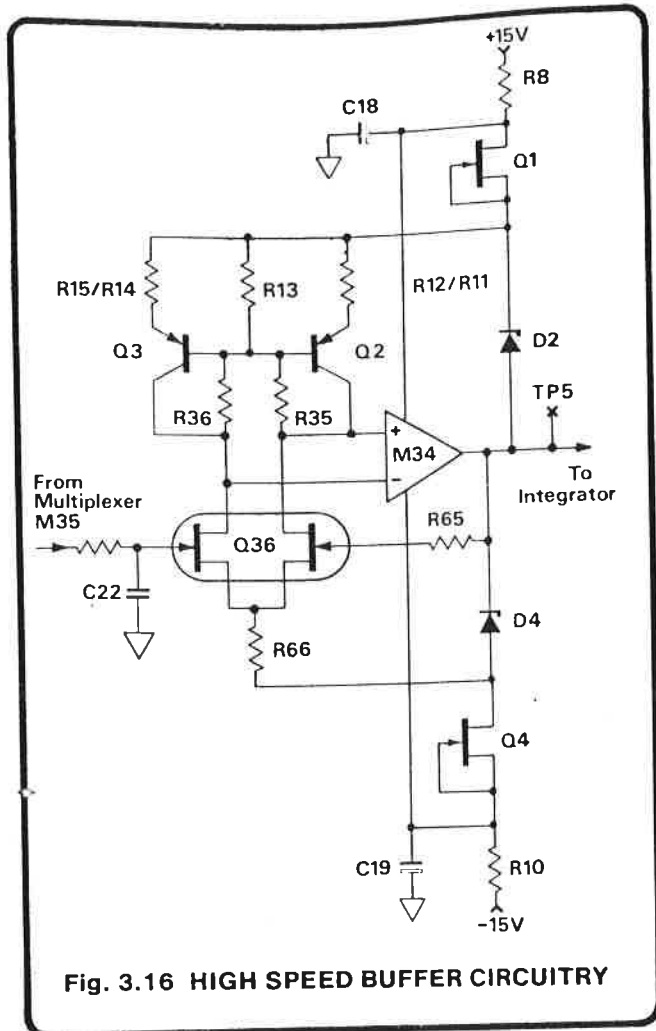


Fig. 3.16 HIGH SPEED BUFFER CIRCUITRY

3.2.3.4 High Speed Buffer

C22 slows the switching edges from the multiplexer M35 so that the buffer cannot slew-limit and thus lose the charge. The signals are fed to Q36, M34 which comprise a high speed buffer with high common mode rejection ratio (See Fig. 3.16). The common mode rejection is dependent on the power supplies of Q36 (from R66 and R11-R15) being bootstrapped to the output of the buffer, via D2 and D4. Thus the difference between input signal and power supply around the input stage is maintained constant whatever the input signal.

3.2.3.5 Integrator

The basic Integrator comprises R6, R7 and C9, with hybrid amplifier Q35 and M25. (See Fig. 3.17). Low-noise FET-pair Q35 also has low gate leakage, which maintains the effectiveness of 'sample-and-hold' components R34 and C12.

An inverted and attenuated version of the integrator output voltage is developed across R5. This is applied via R4 and C10 to compensate for the small amount of dielectric absorption in C9. The value of R5 is factory-selected to equalize readings of the same input, taken at differing read-rates (including 'one-shot' measurements).

C11 and R27 provide shorter term compensation, R23 being set to correct linearity at 10% of full range.

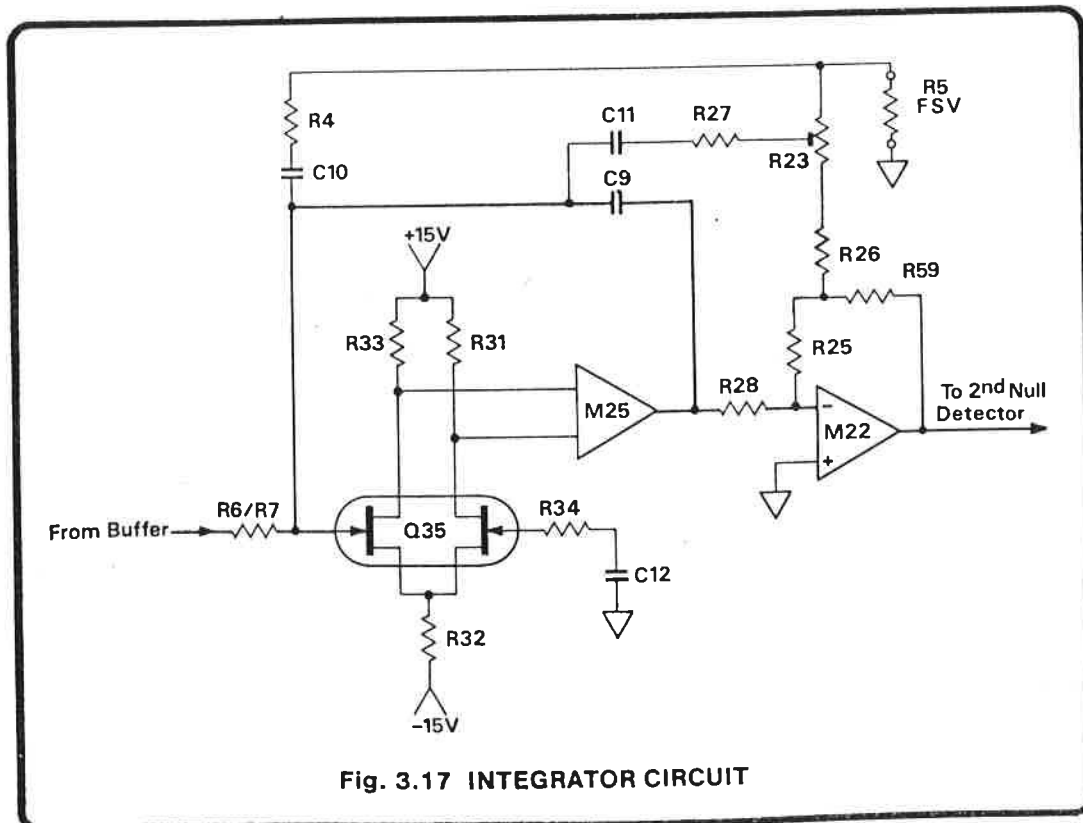


Fig. 3.17 INTEGRATOR CIRCUIT

3.2.3.6 1st Null Detector

The 1st null detector comprises a low noise amplifier, M22, an inverting configuration, where the dc gain is controlled by the ratio of R59 to R28 for small inputs. For larger inputs from the integrator the clamp diodes, D1 and D3, prevent the amplifier from saturating.

During REF 1 the non-inverting input is offset by approximately 10mV to determine the point at which REF 2 is applied (after counting is synchronised). In REF 2 the offset reduces by a factor of 16 giving the null reference point.

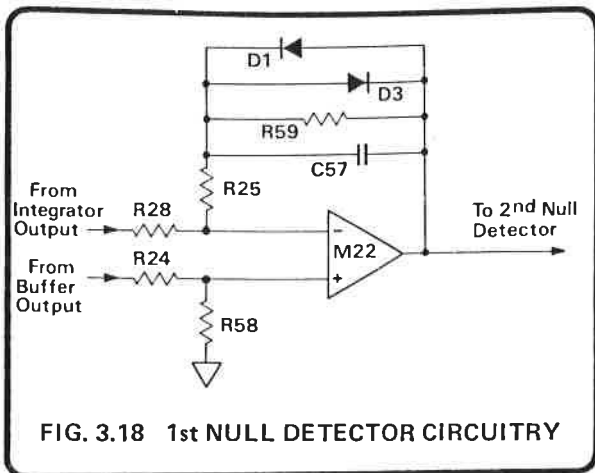


FIG. 3.18 1st NULL DETECTOR CIRCUITRY

3.2.3.7 2nd Null Detector

The signal from the 1st null detector is applied to M15 which boosts the voltage gain. The output provides a logic drive signal via opto-isolator M1, signalling the digital circuitry whenever a null condition changes, Fig. 3.19.

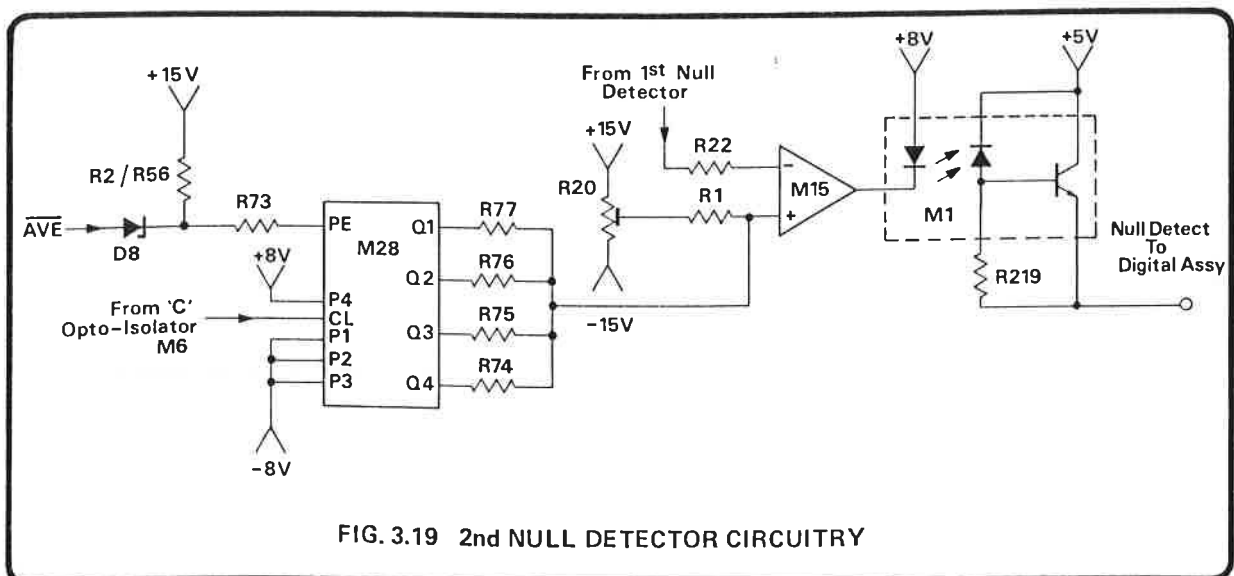


FIG. 3.19 2nd NULL DETECTOR CIRCUITRY

When in an averaging mode (Input Zero or CAL Zero selected; or for 1061A only, with 'Input Filter' and DC, AC Option 12, or Ohms selected) the second null detector is offset a small amount in a cycle of 16 steps (See Fig. 3.20). This offset is produced from the digital to analog converter M28, which is enabled by the level-shifted \overline{AVE} signal from M20-5, and clocked from M6, the C control opto-isolator.

3.2.3.8 Reset Period

At the end of a measurement cycle or in hold, the circuitry is placed into a reset condition. The control lines of the multiplexer M35 allows the 0 volts reference input, at pin 4, to be connected to its output. (See Fig. 3.21). At the same time the reset line (M27-3) is taken high turning on M26. This reset signal, applied to pins 5 and 12 of M26, allows the output of the 1st null detector to be fed back via R60 to a sample and hold capacitor C12 on the integrator.

Thus, with the input to the A - D converter at zero volts, the charge stored on C12 is the sum of all the offsets from the multiplexer, buffer, integrator and 1st null detector, allowing the 1st null detector to indicate the true zero crossing (null) point.

The reset signal applied to M26 pins 6 and 13 merely allows a lower impedance path between the buffer and the integrator to speed up the settling time as C9 is discharged to zero.

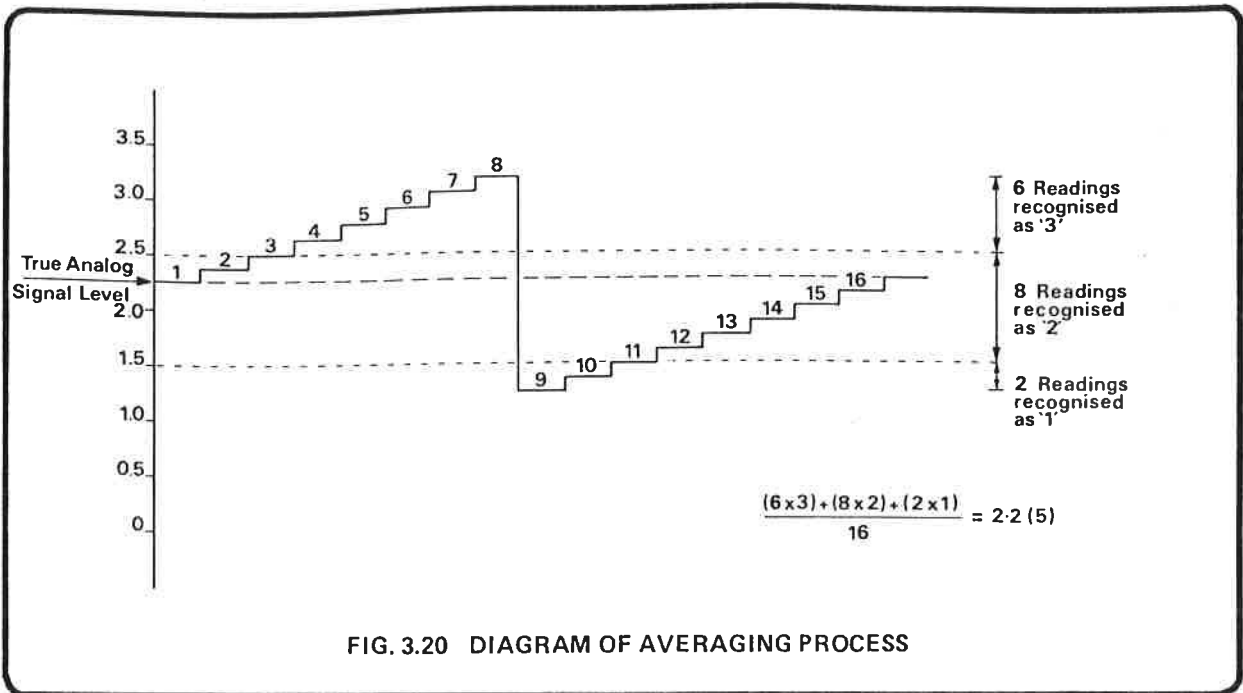


FIG. 3.20 DIAGRAM OF AVERAGING PROCESS

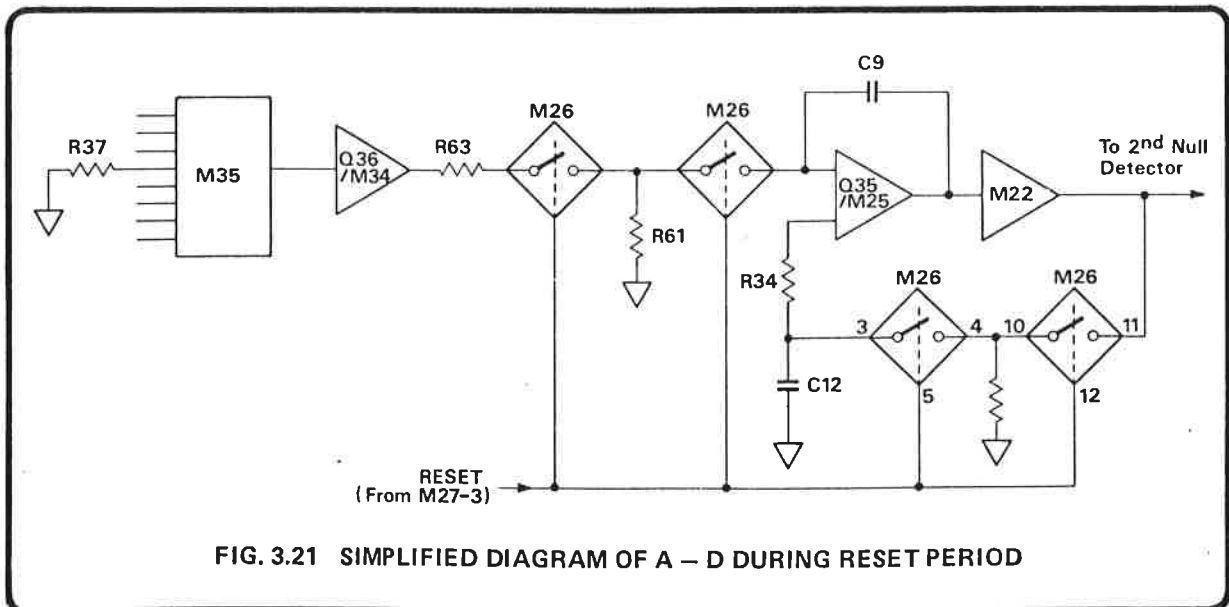


FIG. 3.21 SIMPLIFIED DIAGRAM OF A - D DURING RESET PERIOD

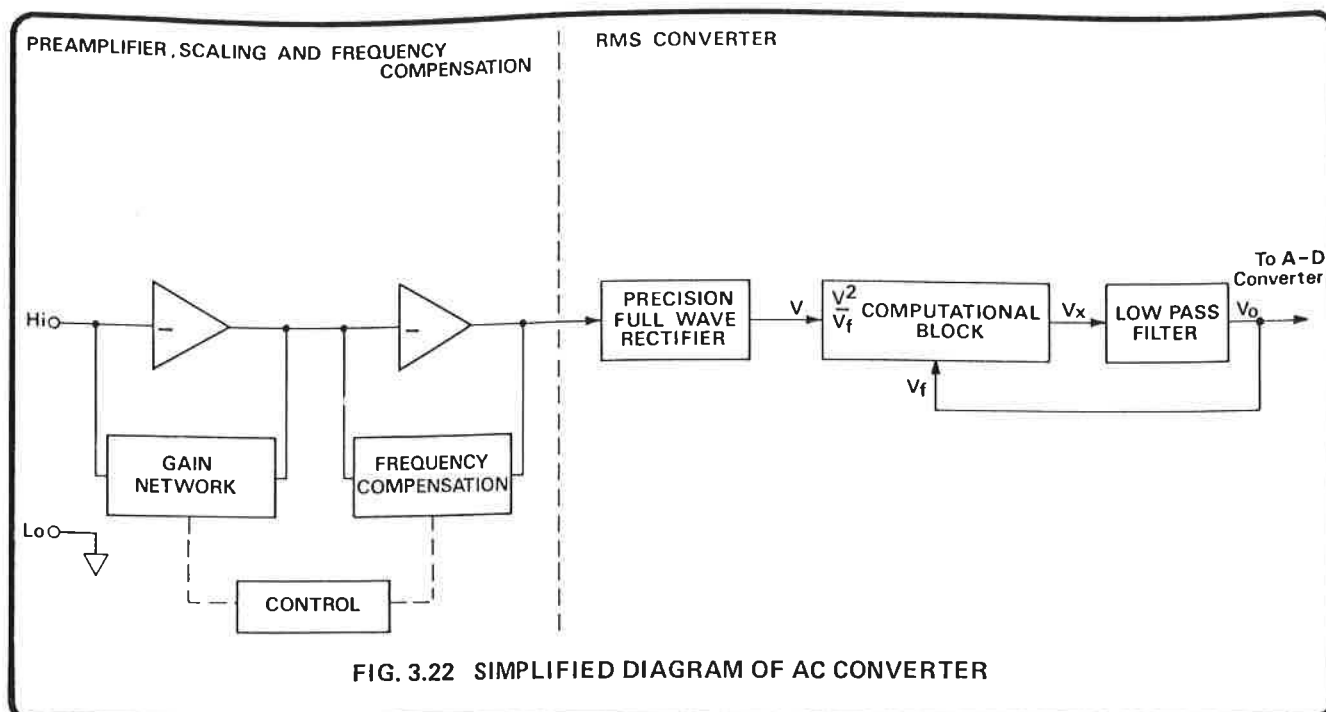


FIG. 3.22 SIMPLIFIED DIAGRAM OF AC CONVERTER

3.3 OPTION 10 AC ASSEMBLY (Circuit Drawing No. 430402) (For OPTION 12 see page A27)

3.3.1 General Principles

The preamplifier buffers and ranges the signal in order to present 0.9 volts full range to the AC to DC converter section.

Once converted to an equivalent DC signal, it is applied to the analog to digital converter on the main analog assembly.

The conversion technique is electronic true RMS sensing as shown in the simplified block diagram Fig. 3.22. The Datron RMS module can be best considered as a functional block consisting of circuitry which accepts two inputs, V and V_f , computes V^2/V_f and has an output of V_x which is then filtered so that all the AC components are removed. The output of the block is fed back to V_f , thus closing the loop around the whole circuitry.

Mathematically: $\overline{V_x} = V_o$

but $V_x = V^2/V_f$

$$\overline{V^2}/V_f = V_o, \text{ but } V_o = V_f$$

$$\overline{V^2} = V_o^2$$

i.e. $V_o = \sqrt{\overline{V^2}}$

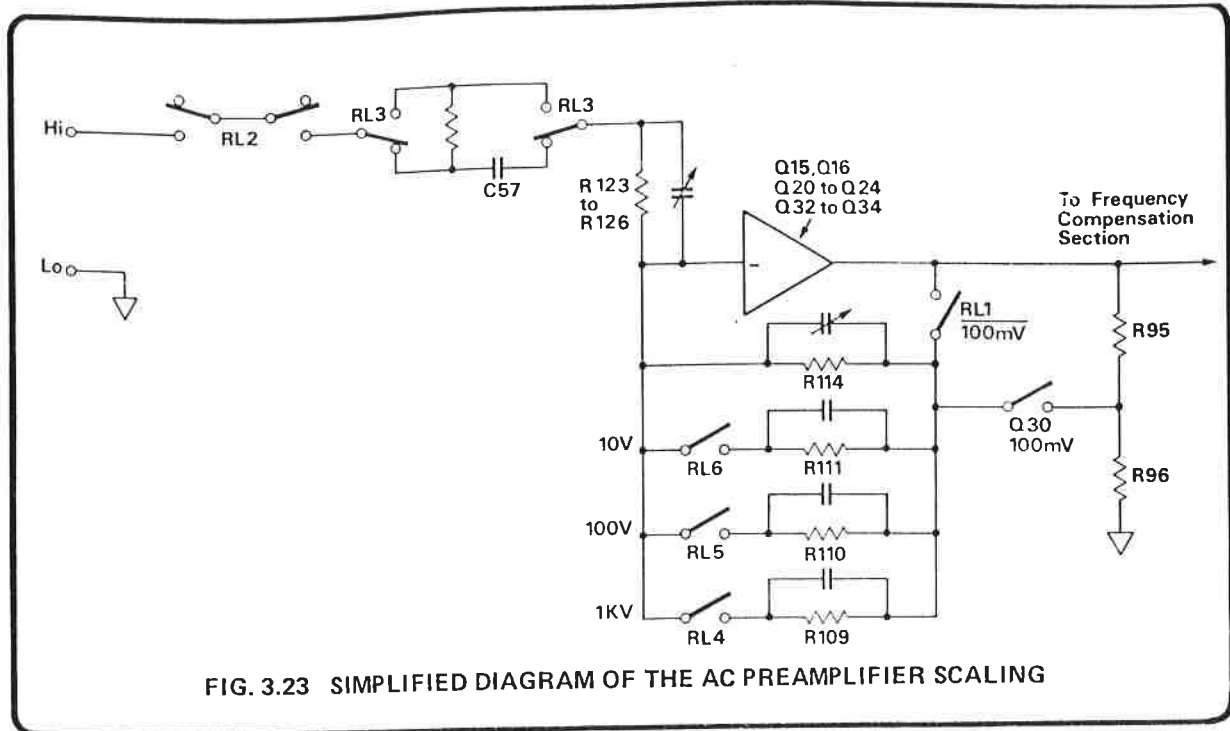
3.3.2 Preamplifier and Scaling (430402 sheet 1)

Relay RL2 is energised on selection of AC, directly connecting the Hi terminal to the input of the AC assembly. If DC and AC are selected together, the AC assembly becomes DC coupled by energising RL3, causing C57, the AC coupling capacitor, to be by-passed.

The signal is then fed to the switched gain inverting preamplifier whose full range output is 0.9 volts r.m.s. A simplified diagram of this arrangement is shown in Fig. 3.23. The frequency response is held flat, to within $\pm 1\%$, by controlling the gain defining component time constants, to a similar order of accuracy. Residual errors are removed by the frequency compensation stage. (See section 3.3.4).

The preamplifier has a stable DC path provided by a dual transistor pair Q33 and a fast AC path by dual F.E.T.'s Q32 and Q34. Further gain is provided by the following long-tail pair cascade of Q20, Q21, Q22 and Q23, which is loaded by a current mirror, Q24. Q15 and Q16 with bias components Q17 and Q18 form a conventional class AB output stage. R121 compensates for the bias current of Q33, while R112 trims the offset voltage to zero.

The unity gain frequency compensation amplifier consists of a stable DC path, provide by M11, and a fast AC path provided by Q25 to Q29. The bootstrap circuit of Q19 presents the varicap diode, D11, with a high impedance, thus ensuring that the varicap is not shunted to ground.



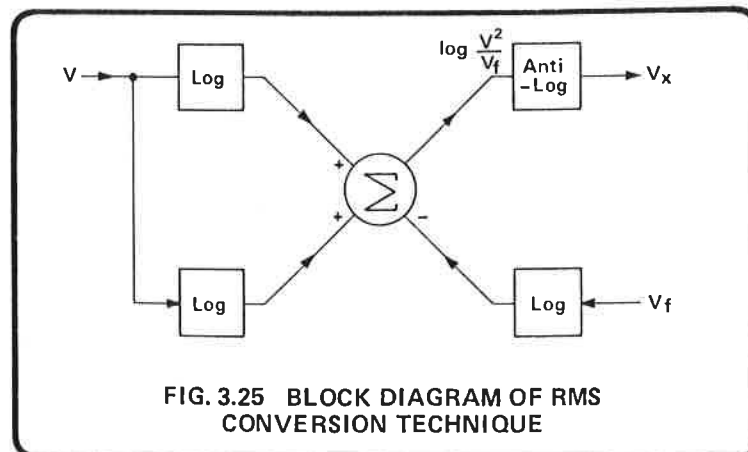
3.3.3 RMS Converter (430402 sheet 2)

The RMS converter takes the scaled AC signal from the preamplifier and converts it to an equivalent DC signal suitable for Analog-to-Digital conversion. The conversion technique is electronic true RMS sensing as shown in the simplified block diagram Fig. 3.25.

M8 and M9 form a summing type, full wave rectifier. The output of M8, a precision half-wave rectifier inverter, is summed with the non-inverted signal with a weighting of 2 : 1 at the input of M9. This forces a full-wave rectified current to flow in RMS module M6. Potentiometer R50 balances the rectifier to provide the same output for non-inverted or inverted asymmetric waveforms.

The output current from the RMS module passes into filter-buffer M1 and is converted to a nominal 5 volts for a full range signal. Q1 and Q2 switch in additional capacitors when FILTER is selected, to operate down to 45Hz. M2 is a voltage to current converter providing a feedback current to the RMS module proportional to the output voltage. R90 is the zero adjustment for the half wave rectifier M8 and R35 is the high crest factor gain adjustment. R75 is adjusted for optimum linearity.

The output of M1 (TP2) is fed to a resistor chain R1 - R7, to provide an output of 3.14 volts by the selection of resistors R2 - R5. Q3 is turned on when AC is selected and switches the output of the AC converter into the Analog-to-Digital Converter (Drawing No. 430328 sheets 3 and 4).

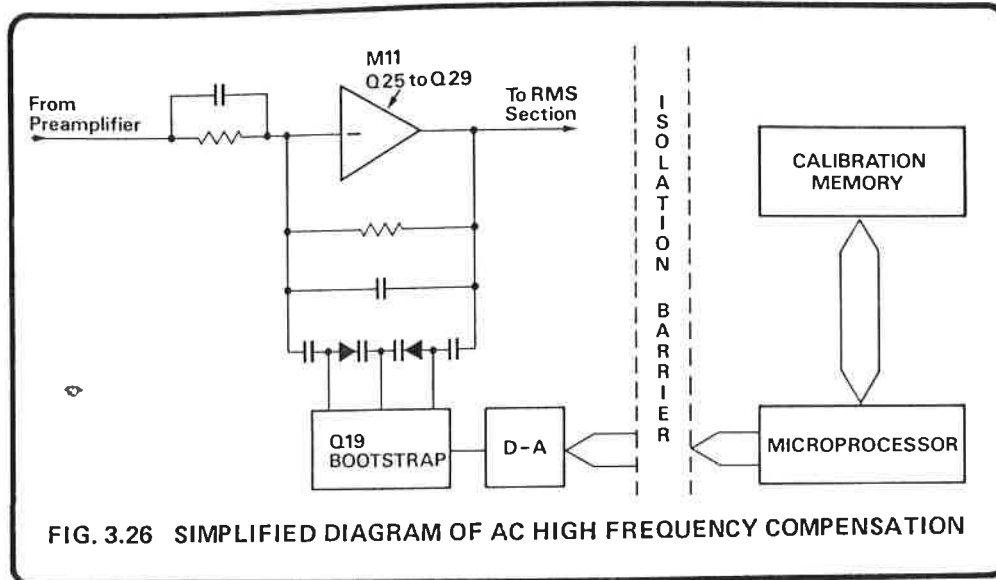


3.3.4 High Frequency Compensation

During the calibration cycle, the microprocessor notes and stores the high frequency (HF) error of each range. When AC volts is selected the compensation information for a particular range is recalled by the microprocessor, transferred across the isolation barrier and latched on to M13, M14 (Drawing No. 430328 sheet 5), see Fig. 3.26. As in the case of the Input Current Compensation (section 3.2.2.5), the output from the latches is applied to a digital-to-analog converter, AN2. The voltage produced is

fed to the AC converter via connector J1 pin 11 and applied to varicap D11. The varicap is thus adjusted to give the amplifier chain a flat frequency response.

The calibration is carried out at one H.F. frequency but since it flattens the AC amplifier response, the correction is valid for all specified frequencies. It should be noted that the calibration routine is iterative since the varicap is non-linear.



3.3.5 Frequency Detection (430402 sheet 2)

The signal frequency is monitored by M10 which is set so that a signal frequency greater than 5kHz causes a logic '1', (0 volts) on M10 - 4. This signal indicates to the Digital Board via M18, M2 (Drawing No. 430328 sheet 5) which one of the two sets of specifications should be used for calculating the measurement uncertainty when the Spec key is depressed.

3.3.6 Test

During the self-test routine (actuated from the front panel or remotely programmed) the AC assembly is checked for correct operation. The circuitry is placed into the .1V range as described in Section 3.2.1.3. Filter is selected and F.E.T. Q31 is 'closed' from M5 - 13 causing a signal of 0.08 volts DC to be injected into the preamplifier. Thus a signal of approximately 3.14 volts is output from the RMS section and applied to the A - D converter situated on the Analog assembly. This signal is then measured and compared with a stored value. If the measured signal is within $\pm 6\%$ of the stored value, the test continues with a 1V range check.

Range	Output from RMS section
.1	+3.14 volts
1	+0.314 volts

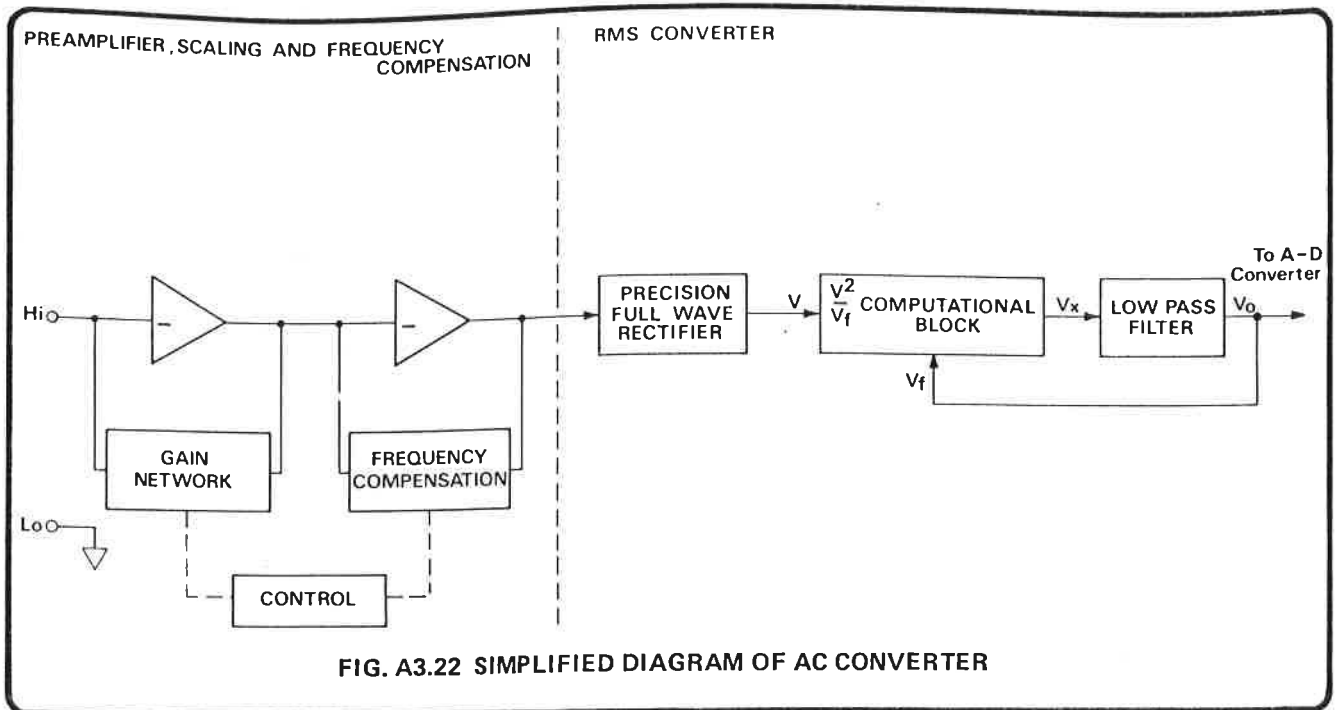


FIG. A3.22 SIMPLIFIED DIAGRAM OF AC CONVERTER

A3.3 OPTION 12 AC ASSEMBLY (Circuit Drawing No. 430552) (For OPTION 10 see page 27)

A3.3.1 General Principles

The preamplifier buffers and ranges the signal in order to present 0.9 volts full range to the AC to DC converter section.

Once converted to an equivalent DC signal, it is applied to the analog to digital converter on the main analog assembly.

The conversion technique is electronic true RMS sensing as shown in the simplified block diagram Fig. A3.22. The Datron RMS module can be best considered as functional block consisting of circuitry which accepts two inputs, V and V_f , computes V^2/V_f and has an output of V_x which is then filtered so that all the AC components are removed. The output of the block is fed back to V_f , thus closing the loop around the whole circuitry.

Mathematically: $\overline{V_x} = V_o$

but $V_x = V^2/V_f$

$$\overline{V^2}/V_f = V_o, \text{ but } V_o = V_f$$

$$\overline{V^2} = V_o^2$$

i.e. $V_o = \sqrt{\overline{V^2}}$

A3.3.2 Preamplifier and Scaling (430552 sheets 1 & 2)

When the AC option is selected, the AC preamplifier is connected in parallel with the 1000 Volt range of the DC isolator. The resultant impedance presented at the input terminals is a resistance of $1M\Omega$, shunted by $150pF$.

Relay RL2 is energized on selection of AC, directly connecting the Hi terminal to the input of the AC assembly. If DC and AC are selected together, the AC assembly becomes DC coupled by energizing RL3, causing C77, the AC coupling capacitor, to be by-passed.

The signal is then fed to the switched gain inverting preamplifier whose full range output is 0.9 volts r.m.s. A simplified diagram of this arrangement is shown in Fig. A3.23. The frequency response is held flat, to within $\pm 1\%$, by controlling the gain defining component time constants, to a similar order of accuracy. Residual errors are removed by the frequency compensation stage. (See section 3.3.4).

The main amplifier M22 responds to signals from DC to above 1MHz. Its input buffer Q36 reduces bias current errors. A chopper-stabilized amplifier M21 nulls the offset of Q36. Filter components R123 and C90 eliminate the effects of current 'kickback' from M21 to the main signal path. M22 output (Test link TLK) is fed directly to the unity gain frequency compensation stage.

C88 and C89 decouple R160 and R162 except on the 100mV range, when Q33 and Q34 are switched off to provide greater open loop gain. To ensure stability at the higher feedback levels required for the 10V, 100V, and 1000V ranges; C73 is switched in by Q32 to decouple M22 non-inverting input, further reducing the open loop gain.

The unity gain frequency-compensation amplifier includes a stable DC path M20, and a fast AC path Q28 and Q29. The capacitance of varicap D14 is determined by the bias voltage at J1-11. The bootstrap circuit of Q17/Q21 ensures that both halves of the varicap are subjected to the same AC signal, removing the non-linearity of the voltage-capacitance characteristic.

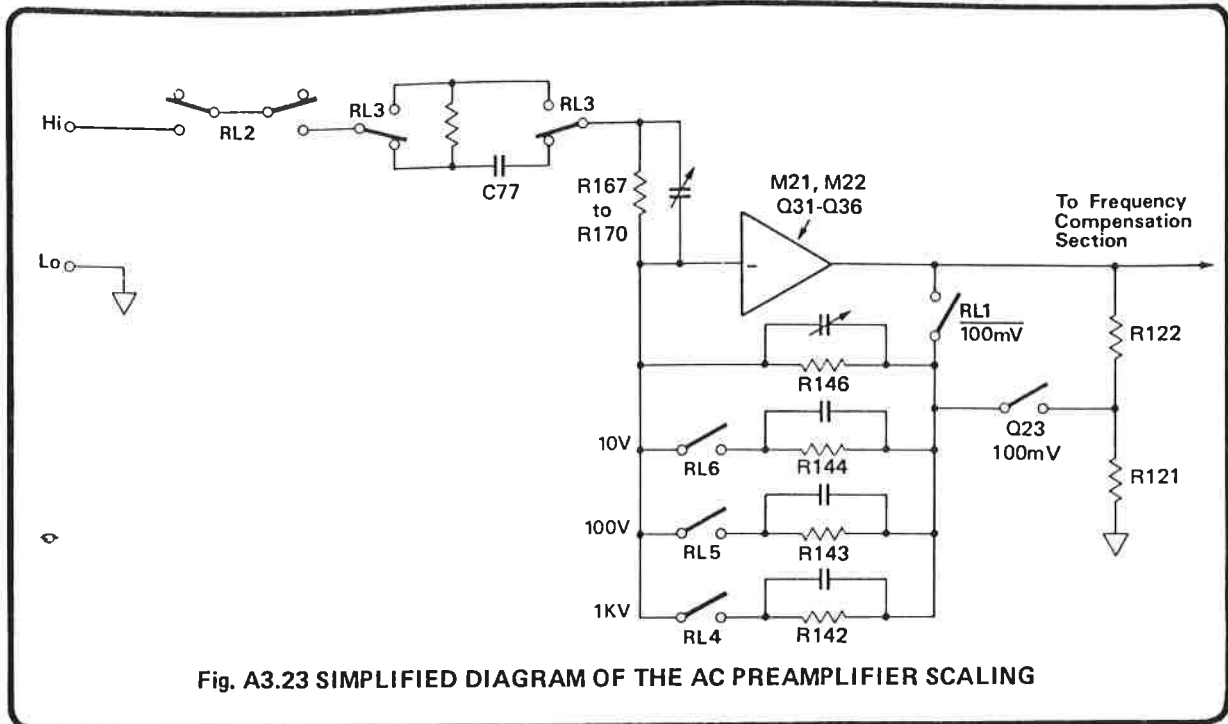


Fig. A3.23 SIMPLIFIED DIAGRAM OF THE AC PREAMPLIFIER SCALING

A3.3.3 RMS Converter (430552 Sheets 2 & 3)

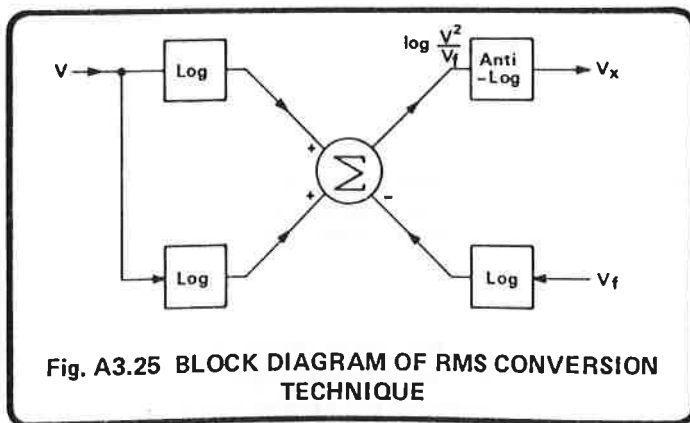


Fig. A3.25 BLOCK DIAGRAM OF RMS CONVERSION TECHNIQUE

The RMS converter takes the scaled AC signal and converts it to an equivalent DC signal suitable for Analog-to-Digital conversion. The technique used is Electronic True RMS Sensing as shown in the simplified block diagram Fig. A3.25.

M13 and M14 form a summing full-wave rectifier. The output of precision half-wave rectifier M13 is summed with the non-inverted signal at the input of M14, with a weighting of 2:1. This forces an accurately rectified full-wave current to flow in RMS module M11. Potentiometer R62 adjusts the rectifier symmetry to provide the same output for signals of either polarity.

The output current from the RMS module drives the low pass current-to-voltage converter M10/M13, which generates a nominal 0.5 Volts for a full range signal. (Note that M10, M9 and M4 are chopper-stabilized amplifiers to handle the low signal voltages).

M16 is the active element of a switched 3-pole Bessel filter. M15 and M17 switch the time constants, extending the overall low frequency response down to 10Hz (See Fig. A3.24), when 'Filter' is selected.

The high impedance output from the 3-pole filter is buffered by M9/M2, and the other half of M2 provides a bootstrap for M9 input. D26 and D16 prevent the voltage on TL A from exceeding the +5V power rail, providing overload protection.

The buffer output voltage (3.12V full range) is developed across R52-R56 and R70, referred to Output Common at M4 input. Log-feedback stage M4/M3 closes the 'Square-Root' loop, providing feedback current for the RMS computation in M11.

When the AC, or DC-coupled AC option is selected, Q3 connects the buffer output to the Analog-to-Digital converter. Test links TLC, D, E and F are selectively removed at manufacture to set the correct output level.

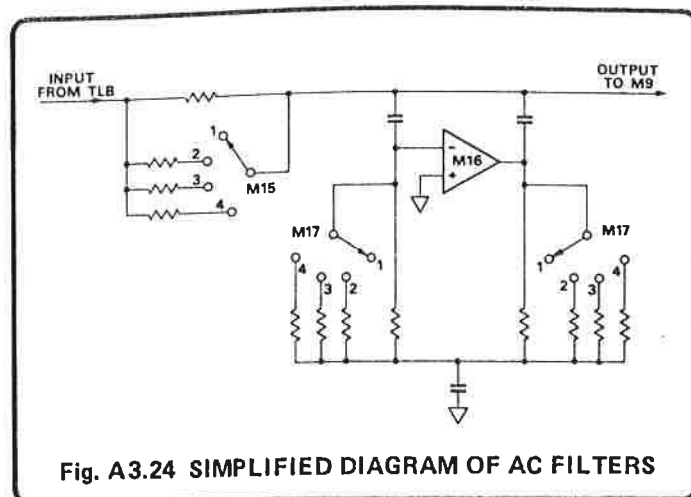


Fig. A3.24 SIMPLIFIED DIAGRAM OF AC FILTERS

A3.3.4 High Frequency Compensation

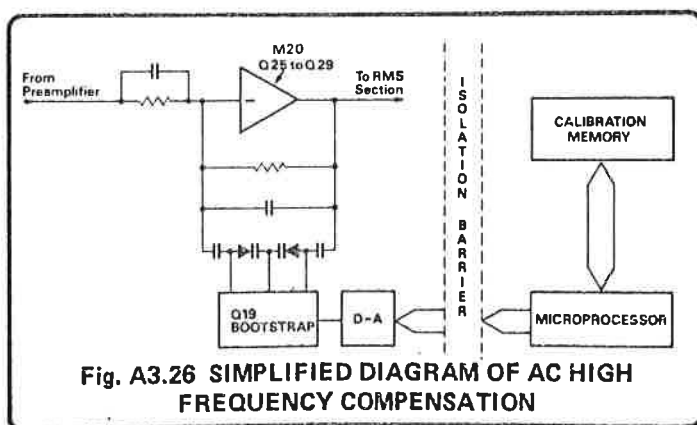


Fig. A3.26 SIMPLIFIED DIAGRAM OF AC HIGH FREQUENCY COMPENSATION

During the calibration cycle, the microprocessor notes and stores the high frequency (HF) error of each range. When AC volts is selected the compensation information for a particular range is recalled by the microprocessor, transferred across the isolation barrier and latched on to M13, M14 (Drawing No. 430328 sheet 5), see Fig. 3.26.

The output from the latches is applied to a digital-to-analog converter, AN2. The voltage produced is fed to the AC converter via connector J1 pin 11 and applied to varicap D14. The varicap is thus adjusted to give the amplifier chain a flat frequency response.

The calibration is carried out at one H.F. frequency but since it flattens the AC amplifier response, the correction is valid for all specified frequencies. It should be noted that the calibration routine is iterative since the varicap is non-linear.

A3.3.5 Frequency Detection (430552 sheet 2)

The signal frequency is monitored by M10 which is set so that a signal frequency greater than 2kHz causes a logic '1', (0 volts) on M19-4. This signal indicates to the Digital Board via M18, M2 (Drawing No. 430328 sheet 5) which one of the two sets of specifications should be used for calculating the measurement uncertainty when the Spec key is depressed.

A3.3.6 Test

During the self-test routine (actuated from the front panel or remotely programmed) the AC assembly is checked for correct operation. The circuitry is placed into the .1V range as described in Section 3.2.1.3. F.E.T. Q31 is 'closed' from M7-13 causing a signal of 0.08 volts DC to be injected into the preamplifier. Thus a signal of approximately 3.14 volts is output from the RMS section and applied to the A - D converter situated on the Analog assembly. This signal is then measured and compared with a stored value. If the measured signal is within $\pm 6\%$ of the stored value, the test continues with a 1V range check.

Range	Output from RMS section
.1	+3.14 volts
1	+0.314 volts

3.4 OHMS ASSEMBLY (Circuit Drawing No. 430331)

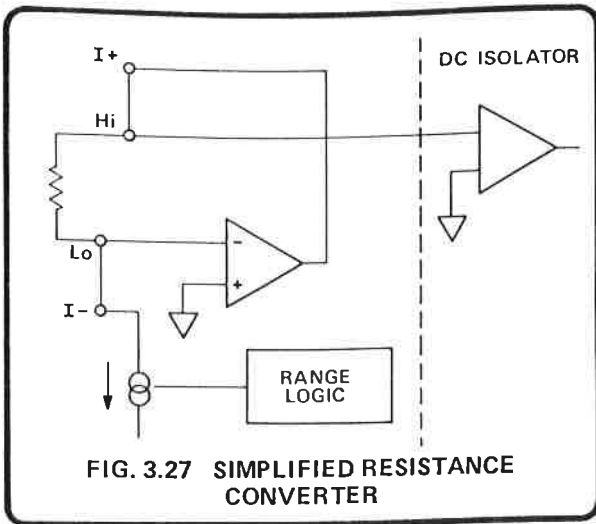


FIG. 3.27 SIMPLIFIED RESISTANCE CONVERTER

The instrument functions by measuring the voltage across an unknown resistance with a known constant current flowing in it. The converter can be split into two parts: a low drift voltage follower and a constant current source covering 6 decades from 100nA to 10mA (see Fig. 3.27).

It should be noted that when the Ohms assembly is fitted the DC Isolator Lo is no longer directly connected to the front/rear panel Lo terminal, but goes via RL1 on the Ohms assembly (connector link removed on side panel). Lo becomes an active terminal in resistance measurements.

3.4.1 Low Drift Voltage Follower

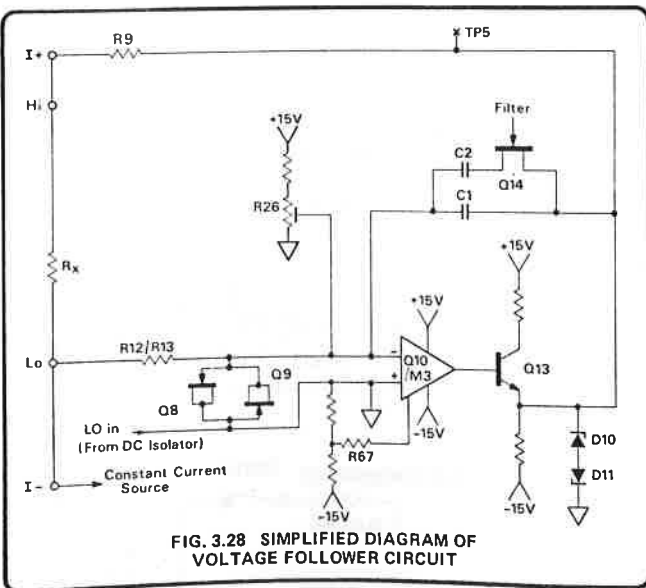


FIG. 3.28 SIMPLIFIED DIAGRAM OF VOLTAGE FOLLOWER CIRCUIT

When OHMS is selected, the front panel Lo terminal is connected to the -ve input of amplifier Q10/M3, the +ve input being referred to DC isolator Lo (this remains reference common). Q10/M3 together with output follower Q13, will thus apply a voltage at the I+ terminal via

RL1 such that the voltage at front panel Lo is at reference common plus any offset due to Q10/M3. This voltage offset drift is kept small for changes of temperature by compensating the input bias current of Q10 with the current in R67, which changes with temperature due to the voltage drift at Q10 emitters. Q10 input bias current is initially nulled by R26.

Thus if we consider 2-wire measurement, I+ is linked to Hi, I- is linked to Lo and the unknown resistance linked between Hi and Lo, with a constant current flowing from I+/Hi, through the unknown resistance (R_x) to Lo/I-. The Lo terminal is maintained at 0V. Therefore the Hi terminal (DC Isolator Input) is at I_{constant} × R_x volts above Lo. As long as the error is small referred to reference 0, the DVM will read the correct resistance.

Input protection is provided as follows:—

Voltage/Current applied to input terminals:

- I+ R9, D10, D11
- I- R2, D1, D2, Q25, R23
- Lo R12, R13, Q8, Q9

Open circuit voltage limit protection:

- I+ R15, R16, Q6, Q7
- I- R6, D7, D8, Q2, Q22

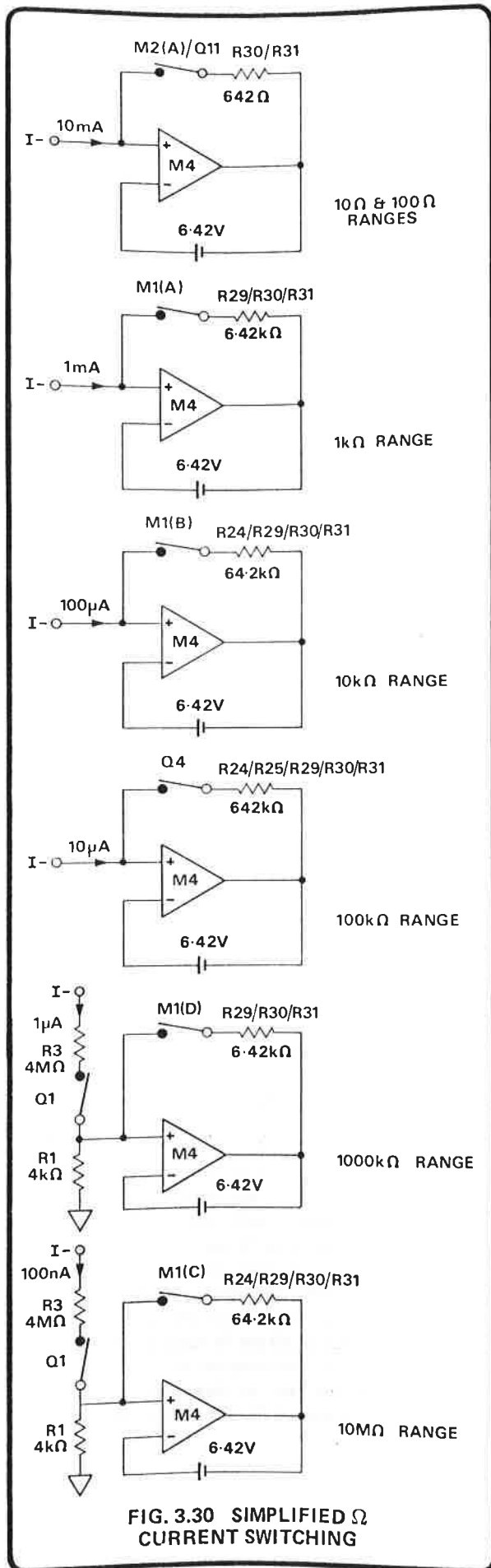
3.4.2 Constant Current Source

Seven decades of ohms ranges are provided by 6 ranges of current and 2 ranges of DC Isolator voltage gain (100mV range for 10Ω, 1V range otherwise). See Fig. 3.29.

When kΩ's is selected, Q17 (sheet 2) is turned on enabling astable M6 to produce a 200Hz signal to switch M5. Thus when gates B and C of M5 are open, C9 is charged up from the negative reference (originating from the analog section of the A - D converter). These gates then close and A and D open, sharing the charge with C8, the voltage across C8 equals the reference voltage (sheet 1).

Range	Current	F.E.T.'s/Switches turned on		
		Current Selector	Leakage path	
10Ω	10mA	Q11, M2(A)		
100Ω	10mA	Q11, M2(A)		
1kΩ	1mA	M1(A)		
10kΩ	100μA	M1(B)		
100kΩ	10μA	Q4		M2(B)
1MΩ	1μA	Q1, M1(D)		Q3, M2(C)
10MΩ	100nA	Q1, M1(C)		Q3, M2(C)

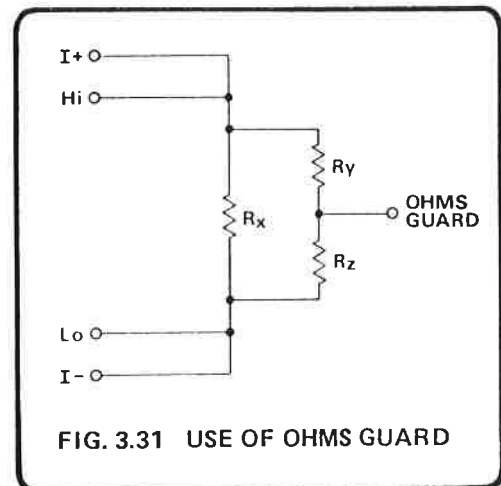
FIG. 3.29 OHMS CURRENT RANGE SWITCHING



The voltage developed across C8 causes M4 to sink current through resistor chain R24, R25, R29, R30, R31 until the voltage developed across the chain balances that across C8. Thus the current required for a particular range is selected by the value of the resistor chain switched by M1, M2 and Q4. Simplified diagram Fig. 3.30 shows the resistor chain and switching for each range. On the high resistance ranges leakage paths are provided by Q3, M2(B) and M2(C).

To produce good common mode rejection, M4 supplies are bootstrapped, the supply span being defined by a 12 volt zener, D17. The filtered bootstrap supplies (+ Ω BS and - Ω BS) power the astable (M6) and bilateral switch.

The use of ohms guard permits in-circuit measurement of resistors, provided shunt paths are greater than 250 Ω and a suitable tapping point is available. Consider Fig. 3.31. Guard is reference 0, Lo is actively maintained within microvolts of reference 0 (as previously explained). Thus there is no voltage across R_z and consequently no current in R_z. Voltage follower Q10/M3 will simply pass more current into R_y from the I+ terminal until the selected current for the particular range flows through R_x.

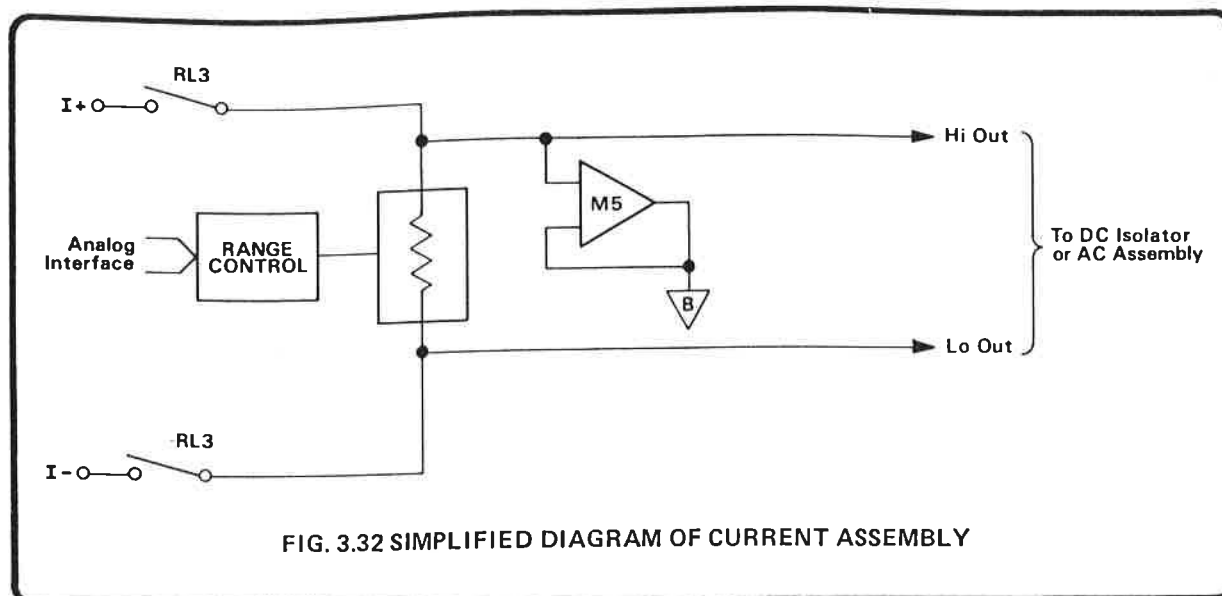


3.4.3 Test

During the self-test routine (actuated from the front panel or remotely programmed), the Ohms Converter is checked for correct operation. The circuitry is placed into the 10k Ω range as described in Section 3.2.1.3. Filter is selected and F.E.T. Q5 'closed' from M9-1 causing R8 (9.76k Ω) to be placed between I+ and I-. Thus with I+ and Hi, I- and Lo connected (2-wire if front panel input selected), the DC Isolator (which is also in the TEST mode) measures the voltage developed across the resistor (approx 1 volt). The resulting voltage output from the DC Isolator is applied to the A-D converter, measured and compared to the stored value. If the measured signal is within $\pm 6\%$ of the stored value, the test is complete.

3.5 CURRENT ASSEMBLY (Drawing No. 430304)

The Current assembly contains a set of selectable precision current shunts, the voltage developed across the shunt(s) being sampled by the DC or AC voltage measurement circuits.



3.5.1 Current Measurements

Precision current shunts of 0.1Ω , 1Ω , 9Ω , 90Ω and 900Ω connected in series provide an output of 100mV for a full range signal. To eliminate errors in measurement due to lead or contact resistance, all current shunts are 4-wire sensed i.e. a pair of current leads and a pair of voltage leads to the shunt(s) switched separately. The voltage developed across the shunt(s) is fed to the DC Isolator in DCI and the AC assembly in ACI or DCI + ACI. The latter, DC coupled mode, computing the RMS value of the DC and AC component of the input current. These circuits are placed in the '.1V range' amplifying the signal by 3.16. The output of buffer M5 is used to guard leakage paths on the current board.

Overload protection up to 2 amps is provided by diodes D13 – D16. An input greater than 2 amps causes the current fuse, located on the rear panel, to blow.

3.5.2 Test

During the self test routine, the Current assembly is checked for correct operation. The circuitry is placed into the $.1\text{mA}$ DC current range as described in Section 3.2.1.3 with the DC Isolator in the 100mV range. Filter is selected and F.E.T. Q9 closed from M4 – 10 allowing current to flow through R18 to the $100\mu\text{A}$ range shunts, from the +15V supply. Thus a voltage of approximately 0.3 volts is developed across the shunts and fed to the DC Isolator. This voltage combined with the effect of the voltage injected due to the DC Isolator being in Test (Section 3.2.2.6) causes the output of the DC Isolator to be approximately 5.75 volts. After measurement by the A-D converter, the value is compared to the stored value. If the measured signal is within 6% of the stored value, the test is complete.

3.6 REAR INPUT/RATIO INPUT (Circuit Drawing No. 430307).

3.6.1 General

The Rear Input/Ratio Input assembly contains the switching circuitry to enable one of the three analog signal sources to be connected to the measurement circuits of the DVM. When Rear Input is selected either remotely or on the rear panel of the instrument and the RATIO key is depressed, the switching circuitry, under microprocessor control, selects the ratio (reference) input then the rear (signal) input, taking one valid reading at each stage.

3.6.2 Front Panel/Rear Panel Input

When Front Input is selected, either remotely or on the rear panel, this causes the base of Q1 to be connected to 0 volts, turning on the transistor. Thus relays RL1 and RL2 are energised, causing the front signal input terminals to be connected to the measurement circuits. Should Rear Input be selected, relays RL1 and RL2 are de-energised, connecting the rear input to the measurement circuits.

3.6.3 Ratio

During the last part of the analog interface update sequence (see Fig. 3.6) M1-5 is taken high causing the flip-flop (M1) to be clocked high (0 volts) on pin 1. The signal is applied to Q2 energising the ratio mode input selector relays, RL3 and RL4. Thus the inputs to the 'Ratio Input' on the rear panel are connected to the measurement circuits. Once a valid reading has taken place, the 'Rear Input' lines are connected to the measurement circuits by leaving M1-5 low. This de-energises the relays as Q2 is turned off. Another reading is then taken and the ratio calculated.

3.6.4 Test

When TEST is selected, the ratio option is checked to see if it is fitted, by interrogating the AD4 line to see if it is held high.

3.7 ANALOG OUTPUT (Circuit Drawing No. 430308)

3.7.1 General

The Analog Output Board accepts the DC Isolator or AC Converter Output and converts it to a ± 1 volt DC full range output. This signal can then be used, for example, to drive X-Y plotters or strip chart recorders.

3.7.2 Description

The 3.16V full range signal from the DC Isolator or AC Converter is buffered by unity gain amplifier M2. The output is potentially divided by R7 and R8 so that 1 volt full range is presented to M1, another unity gain amplifier. Potentiometer R5 is adjusted to remove any offset caused by M1 and M2. Positive temperature coefficient thermistors R3, R4 and diodes D1, D2, protect the Analog Output circuitry from accidental input applied to the Analog Output external connector.

3.8 DIGITAL ASSEMBLY (Circuit Drawing No. 430329)

The Digital assembly contains the circuitry providing the general management of the instrument and the digital section of the A-D converter. Fig. 3.33 outlines the main portions and signal highways of this board.

3.8.1 Processor and Memory (430329 sheet 1)

A 6800 microprocessor (MPU) together with 16k bytes of memory controls the communication between the front panel, digital interface, display drivers, Digital and analog assemblies. The memory can be split into five main areas:—

- (1) Program Memory - needed to operate the whole instrument system.
- (2) Constant Data Memory - e.g. Self Test limits, Error read-out specifications and other fixed factors.
- (3) Non-volatile Calibration Memory - used to store all the calibration errors used for each reading and determined during the 'Auto-cal' cycle.
- (4) Operating Memory - used for scratch pad operations and storing.
- (5) Volatile Display Memory - volatile data such as Max-Min stores, Limit stores and computation stores.

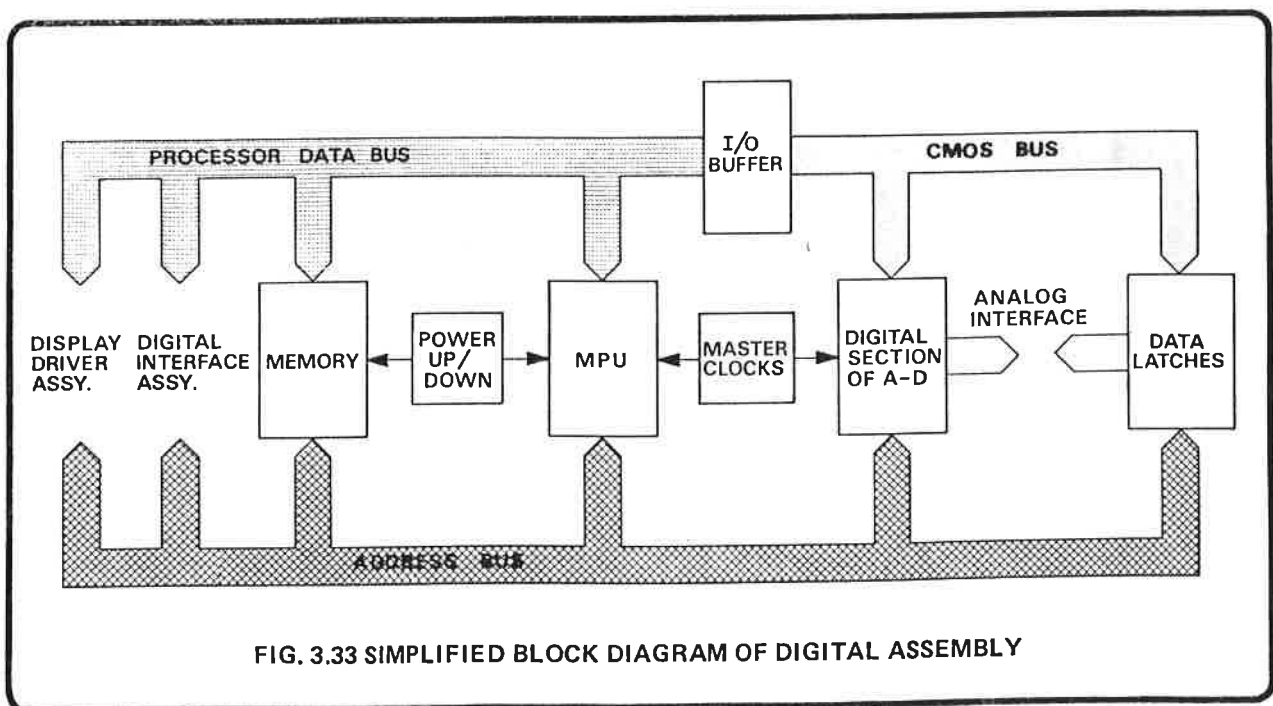


FIG. 3.33 SIMPLIFIED BLOCK DIAGRAM OF DIGITAL ASSEMBLY

3.8.1.1 Software Overview

The system uses the technique of a looping prioritised job scheduler (see Fig. 3.34). Each job driven from the scheduler is controlled by a flag in the system workspace which is set when the job is required to be run and cleared when completed. Priority of activation is ensured by making each job exit on completion, to the top of the schedule.

Program Modules: The program memory is split into a series of functional modules, each module corresponding fairly closely to a major functional area and hence to one of the jobs activated by the job scheduler, the larger ones being sub-divided, see Drawing No. 890043.

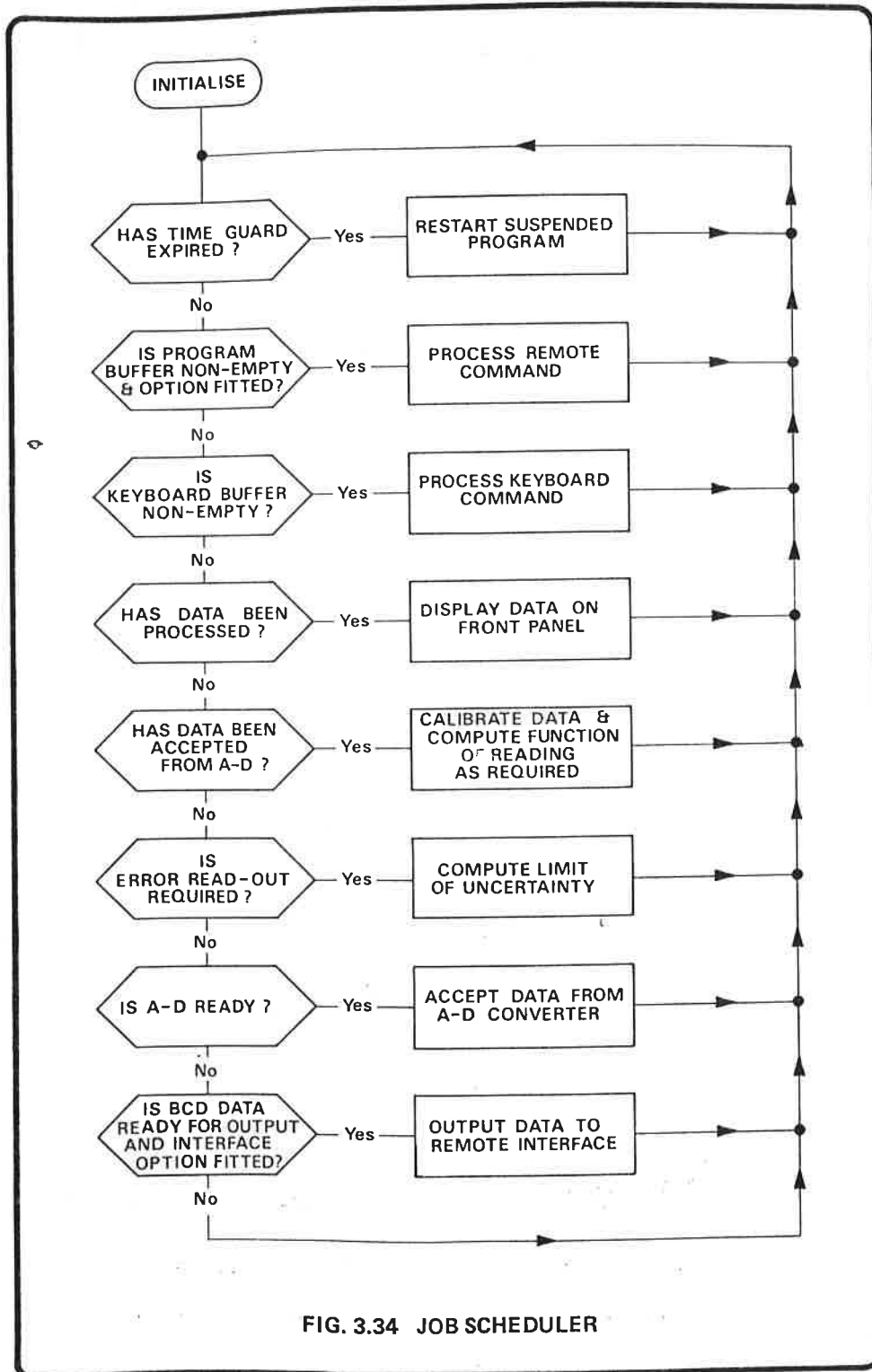
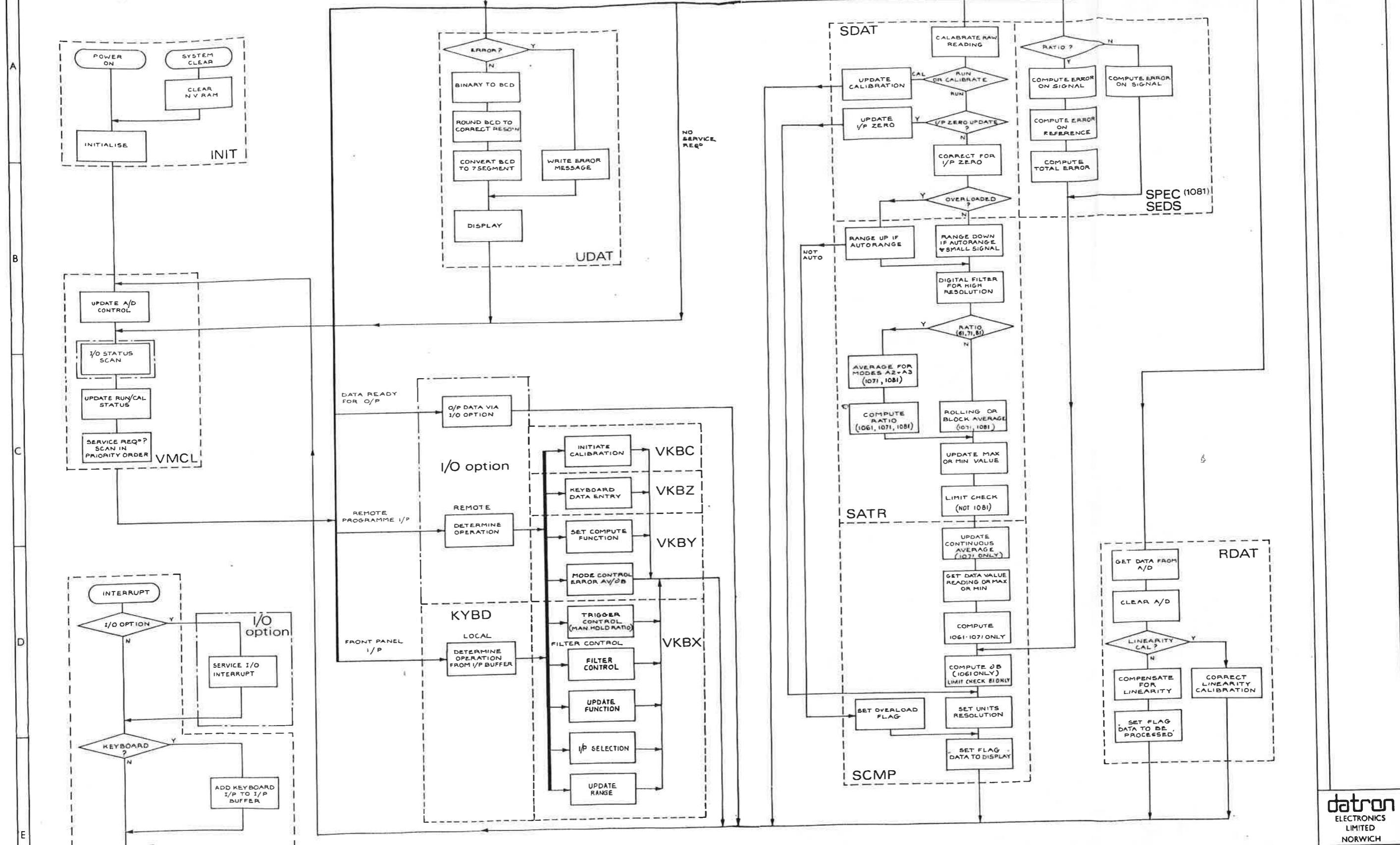


FIG. 3.34 JOB SCHEDULER

DRAWING No. 890043

CHANGES
155 FCO 1267
12 F & DIGIT MOD
AND GENERAL
UPDATE
UR 9.2.82



DRAWN JR	DATE 12-1-82	DIMENSIONS IN MILLIMETRES	TOLERANCES DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm ANGULAR ± 30°	MATERIAL	ASSY DRG & | PARTS LIST |	TITLE MASTER PROGRAM SOURCE	DRAWING No. 890043
CHECKED G.B.	DATE 9-2-82	SCALE	UNLESS OTHERWISE STATED FIRST ANGLE PROJECTION	FINISH	CIRCUIT DIAGRAM CHECK PROCEDURE CHECK LIST		SHEET 1 OF 27
APPR.	DATE	NOT TO BE SCALED					

datron
ELECTRONICS
LIMITED
NORWICH

Data Control: Data handled by the system consists of a stream of measurement information on which a number of operations are carried out. A second stream, asynchronous with the first, consists of commands derived from the front panel or digital interface, controlling both the measurement circuits and computation programs. Operations on the measurement stream basically consist of acquiring the raw data from the A-D converter, calibrating this data and carrying out any other computations, and converting and formatting the data for output. Note that a job consuming data is given higher priority than the one producing data for it, allowing a producer to place data into an empty buffer. The consumer is activated by a flag, set by the producer to indicate data ready in the buffer.

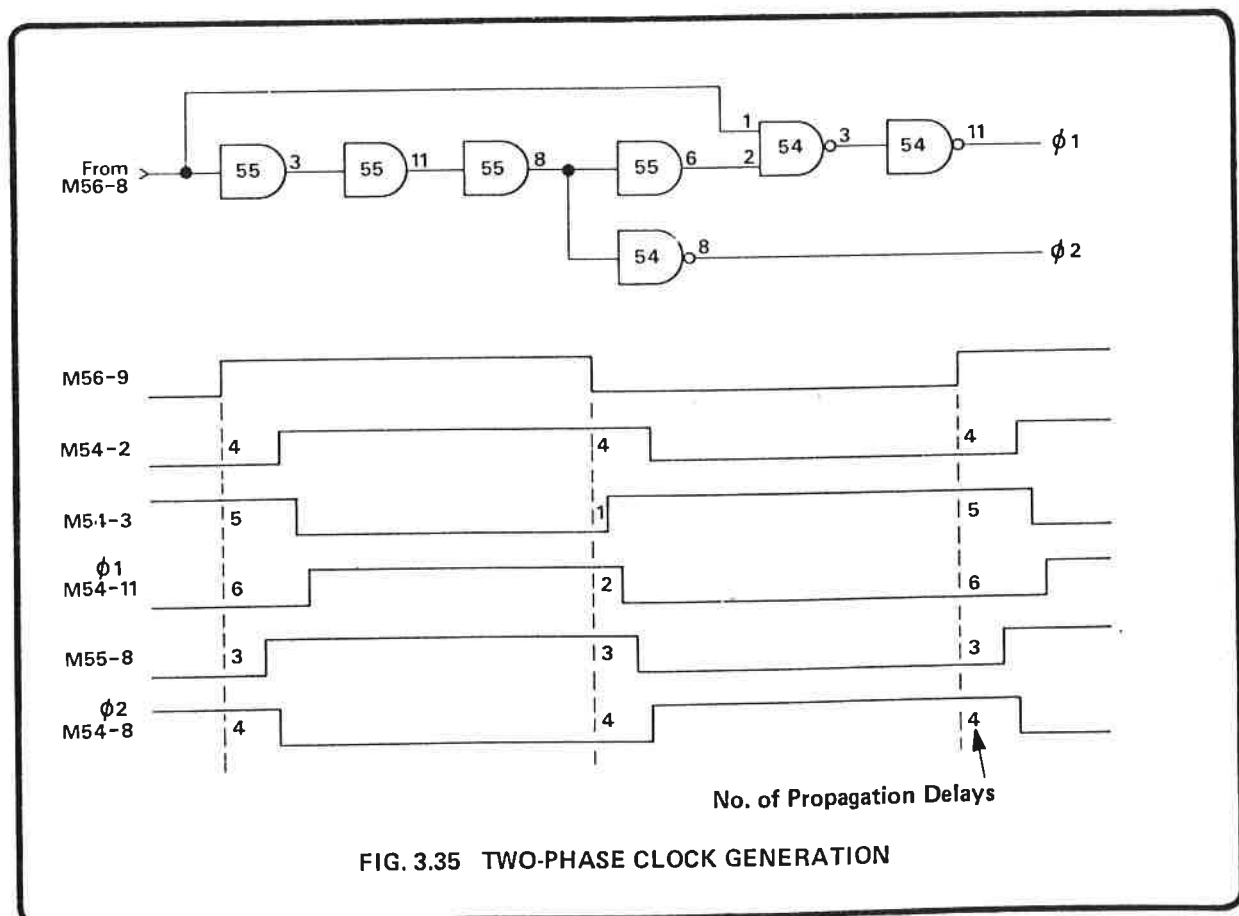
Process Control. Control of the instrument by the processor, initiated from the front panel or digital interface, is arranged by using a 'pipeline control' of the major system state and a 'first in/first out' buffer between the interrupt level routine receiving the control command and the main program implementing it. The major system state consists of the range, function, resolution, filter, ratio, autorange, etc., flags and the computation mode (reading, A-B, \div C, etc.). The pipeline comprises three levels. The top, level 1, reflects the state being programmed, the second, level 2, the state of the measurement circuits and the third, level 3, the measurement being processed. When a command is input, level 1 is updated (e.g. a new range is selected) and as soon as the measuring circuits are not converting an input signal, the state in level 1 is moved to level 2 causing the measurement circuits to update to the

new state. When an A-D conversion is complete, data is read from the A-D and the state transferred from level 2 to 3, providing information for the processing routines. Additionally, at this time, the level 1 to level 2 transfer is repeated and the measurement circuits again updated to allow for commands received while the conversion is in progress.

A second control mechanism used is to input all the commands via a 'first in/first out' buffer between the interrupt level routine receiving the command and the main program implementing it. Thus the processor under remote control is able to 'simultaneously' set up the requirements for the next reading, convert the current reading and process the last one.

3.8.1.2 The Two-Phase Clock

The 6800 requires a non-overlapping positive two-phase ($\phi 1$, $\phi 2$) clock. This is derived from the line-locked master clock signal (1.6MHz for 50Hz line, 1.9MHz for 60Hz - see sheet 4). The first half of M57 divides the master clock by two to 800kHz, producing antiphase squarewaves at pins 14 and 15. If data is not being transferred via the CMOS data bus; M57 (CMOS I/O) is at logic 0, M57-11 is at logic 1, so M56-8 follows M57-15. The circuit utilizes the propagation delays inherent in M54 and M55 (approx. 10ns per gate), to ensure that the positive-going segments of Phase 1 and Phase 2 clock waveforms do not overlap (as illustrated in Fig. 3-35). Q6 and Q7 drive the clock output at voltage levels demanded by the processor (0V and +5V).



To account for slower data transfer in CMOS devices, the clock frequency is again divided by two to 400kHz when the CMOS data bus is active. The decoded address 'CMOS I/O' at M57-7 is set to logic 1 during these transfers, so a 400kHz square wave appears at M57-11. The combined

effect of this and the 800kHz output from M57-15 is to 'stretch' the waveforms of the Phase 1 and 2 clock outputs (illustrated in Fig. 3.36). Thus Phase 2 remains at logic 1 for 1½ cycles of the normal 800kHz operation, allowing more time for CMOS transfers.

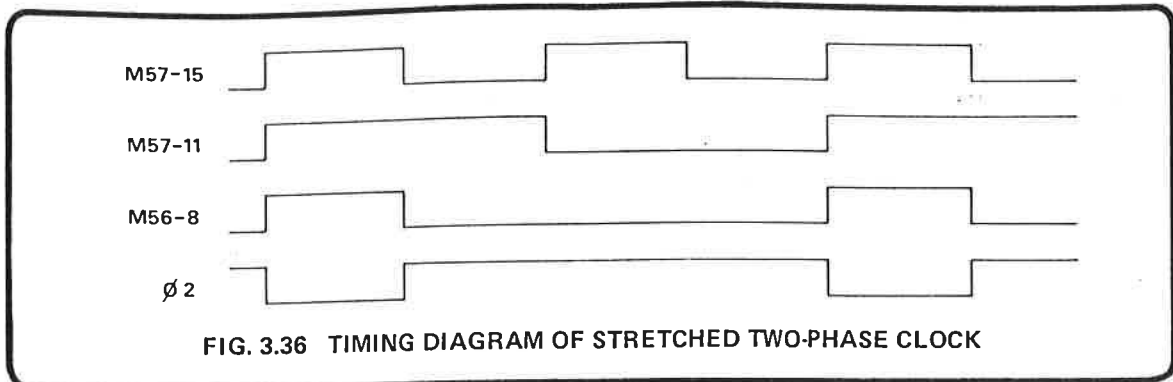


FIG. 3.36 TIMING DIAGRAM OF STRETCHED TWO-PHASE CLOCK

3.8.1.3 RAM/ROM Circuit

The 6800 uses 3 Read-Only Memory chips (ROMs) which contain the program necessary to run the instrument. Each ROM is able to store up to 4096, 8-bit 'bytes' of program information; grouped in program modules. The MPU accesses a byte by placing its address on the 16-bit Address Bus and driving the Valid Memory Address (VMA) line true (logic-1). The information held in that particular location is then sent back to the MPU via the Processor Data Bus.

The chip-select inputs for the RAM and ROM are decoded from a selection of high-order address bits. This selection determines the positions of the RAM and ROM in the memory map. For example: M30 is fed from A15.A13.A12 so that it covers the memory locations from #F000 to #FFFF (Note that since A14 is not decoded M30 also appears at #B000 to #BFFF).

The processor employs 1024 bytes of 8-bit wide Random Access Memory (RAM) made up from two 1024 x 4-bit RAMs (M31/M36). M31 and M36 are employed as operating memory for scratch pad operations and storing volatile data (e.g. Max, Min). The principal location of the RAM is from #0000 to #00FF. Since A8 and A9 are not decoded there are images starting at #0100, #0200, #0300.

A further 256 bytes of 8-bit wide RAM are made up from two 256 x 4-bit RAMs (M19/M20). M19 and M20 are backed up by a battery to provide the non-volatile 'Calibration' and 'Zero' memory. Three address bits A12, A14 and A15 are decoded by M33 (pin 8) to enable M19/M20, but M29 (pin 6) permits the memory contents to be changed only if CAL is selected, or if the ZERO section of the

memory is addressed (A7 and A6 both at logic-1).

The read/write control line R/\bar{W} from the 6800 is gated with a 'Master Clock $\div 2$ ' signal to provide correct timing, and the address decodes include gating with VMA02.

An instrument power up is detected by M60/M62 causing an initialization RESET signal to be fed to the MPU via Q16. (See Fig. 3.38).

During a power-up or power-down (+5V supply line $< +4.75V$) a signal from the supply-level detectors prevents RAMs M19 and M20 from being overwritten by holding the CS (chip select) lines low (< 0.2 volts) via Q14 for a period of approx. 25mS determined by R55/C32.

3.8.2 CMOS Address Decode and Input/Output Circuits (430329 sheet 2)

Information is transferred to and from CMOS devices via the CMOS Data Bus during periods when the signal CMOS I/O is at logic-1 (M33-6). CMOS I/O is addressed when A15.A14.A11 is true. This occurs when memory locations starting at #4100 (and its images) are selected. The transfer of data between the Processor Data Bus and the CMOS Data Bus takes place at 400kHz, the Read/Write lines selecting the direction of the information through the tri-state buffers M4, M5 and M6.

In order to address the various CMOS input/output devices, the address lines must be further decoded. M32 is a 1-of-10 decoder, providing 5 addressable drives; M16 is a dual 1-of-4 decoder addressing the front panel circuitry and the digital elements of the A-D converter. A summary of the decoded CMOS address signals is given in Fig. 3.39.

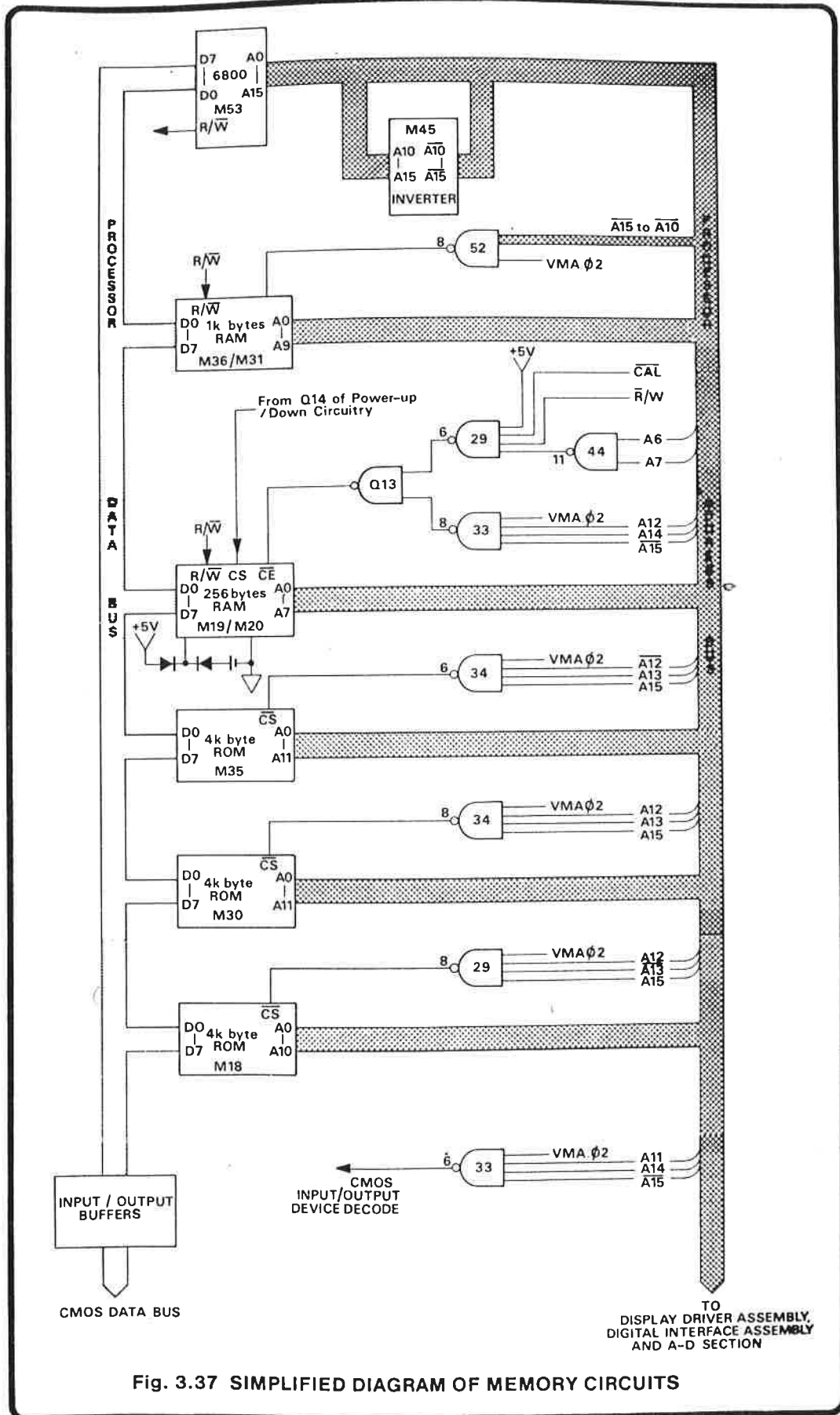


Fig. 3.37 SIMPLIFIED DIAGRAM OF MEMORY CIRCUITS

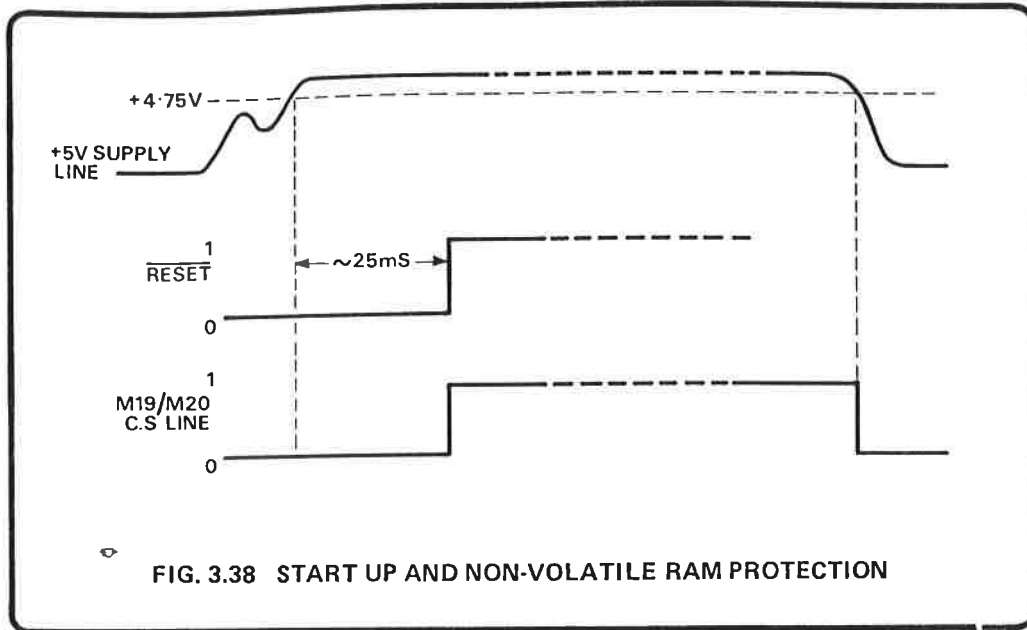


FIG. 3.38 START UP AND NON-VOLATILE RAM PROTECTION

A6	A5	A4	A2	A1	A0	SIGNAL	M32/M16 Pin No.	Operation
0	0	0	1	X	X	$\overline{\text{XKYBRD}}$	M32-2	Keyboard read/write
0	0	1	X	X	X		(M32-4)	Forces a MPU 'power up' sequence
1	0	0	X	X	X		(M32-11)	Triggers processor time guard (M43)
0	1	0	1	X	X	$\overline{\text{XADDT}}$	M32-6	A-D main counter output enable
0	1	1	X	X	X		(M32-9)	Analog interface address latch input enable
0	0	0	X	0	0	$\overline{\text{XKDSP0}}$	M16-7	} Addresses keyboard i.e.d. latches
0	0	0	X	0	1	$\overline{\text{XKDSP1}}$	M16-6	
0	0	0	X	1	0	$\overline{\text{XKDSP2}}$	M16-5	
0	0	0	X	1	1	$\overline{\text{XKDSP3}}$	M16-4	
0	1	0	X	0	0	$\overline{\text{XADSTA}}$	M16-9	A-D, and interrupt status output enable
0	1	0	X	0	1		M16-10	CAL INTERVAL switch output enable
0	1	0	X	1	0	$\overline{\text{XADCTL}}$	M16-11	A-D control latches, input enable
0	1	0	X	1	1	$\overline{\text{XADDLY}}$	M16-12	A-D delay counter input enable

FIG. 3.39 CMOS ADDRESS DECODING

3.8.3 Analog to Digital Conversion (Digital Section)

3.8.3.1 General Principle

Block diagram Fig. 3.40 outlines the essentials of the digital section and should be used with flowchart Fig. 3.41 in order to follow the operation of this section.

The function of this section of the circuitry is to generate the sequence that when transferred to the analog section, controls the sequence from RESET through the integration cycle and back to RESET. The circuitry controls the length of SIG and BIAS and counts during REF 1 and REF 2, the accumulated count being proportional to the length of the reference periods, which in turn is proportional to the measured input signal. At the end of each reading cycle the count is read by the MPU, processed and displayed.

The sequence is controlled by stepping M47 through Q0 to Q7. Each 'Q' output from M47 goes to logic-1 to activate its stage of the sequence; completion of one stage generates the 'Enable' for the next, via M46 switches,

as a logic-0 state at M47-13. Timing is synchronized by Master-Clock/2 positive-going edges at M47-14, when M47 is enabled.

3.8.3.2 Preset Procedure

As part of the initialisation routine (at switch on), M47 (used as the sequence controller), is reset from M37-11, causing M47-2 to be logic '1'. Thus the control lines \bar{A} , \bar{B} and \bar{C} put the analog section of the A-D into RESET (See Fig. 3.42). The Address Bus decoded signal \bar{XADDLY} is taken low, enabling the presetting of the delay counters M13 and M14 from the CMOS Data Bus, the amount of delay being determined by the selected range, function and filter state, see Fig. 3.43. The A-D control latches, M11 and M12 are then enabled by \bar{XADCTL} to (i) reset the command latch M1 (from M11-4), (ii) set the resolution of the main counter (M11-5 and 6), (iii) select trigger gate (M12-3, 4 or 5) and (iv) reset the data ready latch (M12-6).

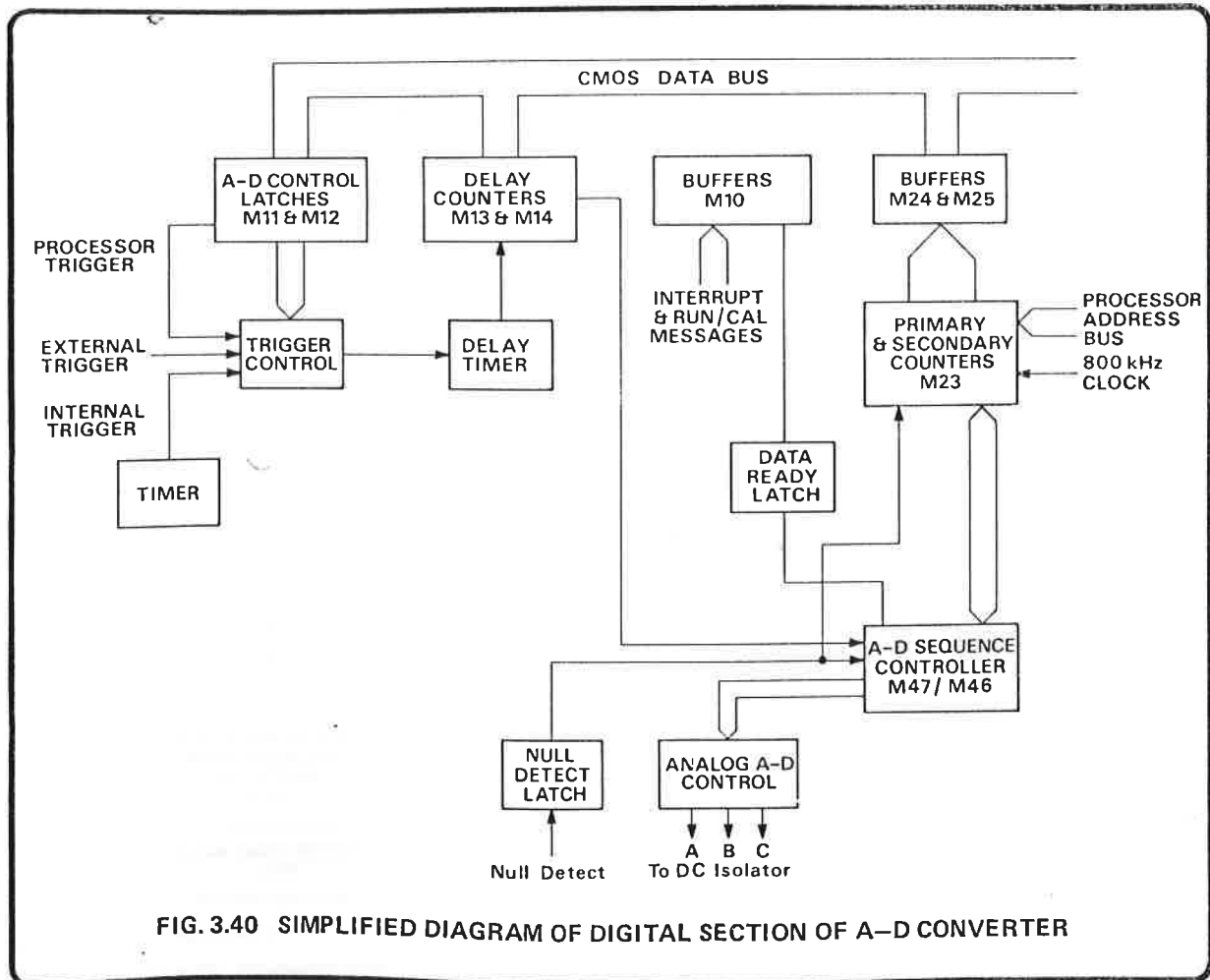


FIG. 3.40 SIMPLIFIED DIAGRAM OF DIGITAL SECTION OF A-D CONVERTER

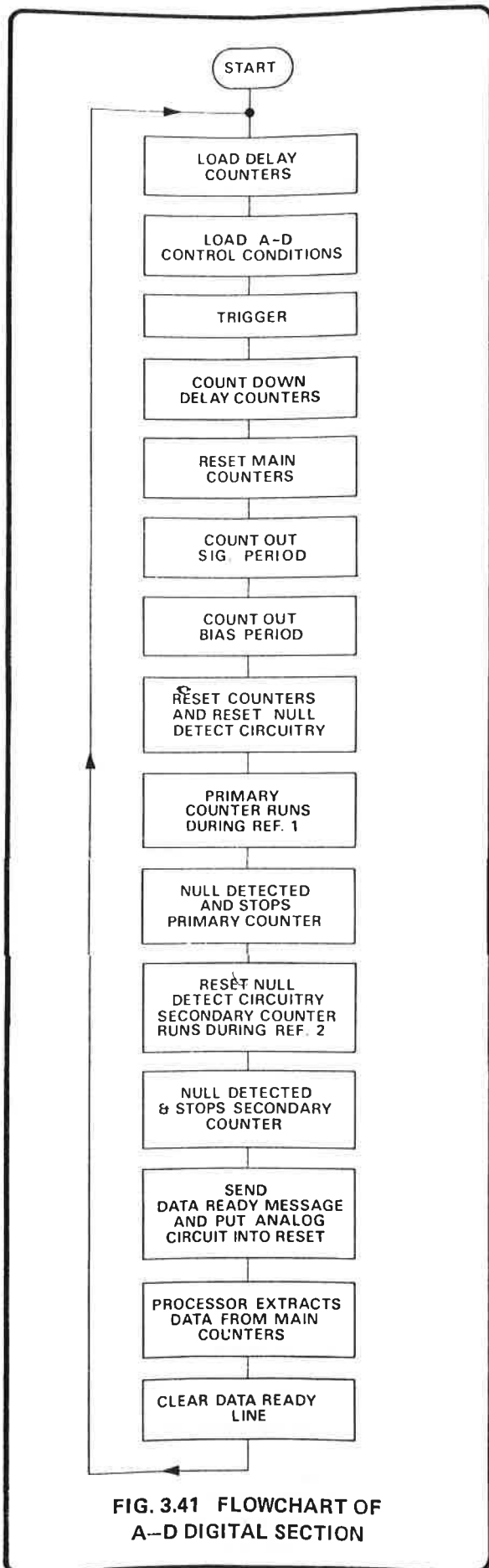


FIG. 3.41 FLOWCHART OF A-D DIGITAL SECTION

SIGNAL	\bar{A}	\bar{B}	C
RESET	1	1	0
SYNC	1	1	0
SIG	1	1	1
BIAS	0	1	1
WAIT	0	1	1
REF 1	1	0	1
REF 2	0	0	1
END	1	1	1

FIG. 3.42 A-D ANALOG SEQUENCE CONTROL SIGNALS

1061/A SELECTIONS		M13/M14 COUNT	
FUNCTION	RANGE	FILTER	FILTER
DCV	All Ranges	2	101
Option 12 ACV DCV + ACV	All Ranges	61	251
Option 10 ACV DCV + ACV ACI DCI + ACI	All Ranges	46	151
DCI	100 μ A-1mA	2	101
	10mA	3	
	100mA	5	
	1A	6	
kOhms	10 Ω -100k Ω	2	101
	1M Ω	4	121
	10M Ω	31	251

FIG. 3.43 COMMAND DELAYS

3.8.3.3 A-D Measurement Sequence

Trigger. The trigger, required to initiate the measurement sequence, is generated from one of three possible sources:

1. Internally generated 3/second trigger, from timer M61-7.
2. Externally generated trigger, from EXT TRIG on rear panel via M24-13.
3. A MPU derived trigger from M11-3 generated when auto-ranging, pressing MANUAL when HOLD selected, during calibration, an INPUT ZERO sequence or via the digital interface.

The trigger source is selected by the latched data on M12, enabling one of the three gates of M2.

Delay. The trigger pulse clocks the 'command latch' M1-11 causing the timer, M15, to output clock pulses (200Hz) to the delay counters (M13 and M14) after a delay of approx. 1.5mS set by C5, R8, R9, R11. The delay counters proceed to count down to zero, at which time the delay latch (M26) is clocked. Thus M26-14 becomes a logic '0', enabling the sequencer M47 (an octal counter) to proceed on to the next step via M46-2.

SYNC. The SYNC phase from the sequencer resets the counters of M23 and places the analog section of the A-D into SIG. The pulse is fed back to M47 via M46-3 to step on the sequencer.

SIG. During the time that the SIG line is at logic-1 (M47-3), the primary counter in M23 is enabled and counts out the signal period (20ms in normal mode, or 2.5ms superfast). When the counter times out, M23-23 goes to logic-0, enabling M47-13 via M23-14. The next Master-Clock/2 at M47-14 steps the sequence on to BIAS (M47-7 to logic-1, M47-3 reverts to logic-0).

BIAS. The BIAS signal (M47-7) is transferred to the analog section of the A-D by changing the state of the \bar{A} line (M38-9 to a logic '0'). BIAS also enables the secondary counter of M23 to count out the BIAS period (20 μ S). The signal indicating the end of this period is passed via M46-9 causing the sequencer to carry on to the next step. The BIAS signal also resets the 'delay latch' (M26) ready for the next measurement cycle, and the 'null detector' latch (M22A).

WAIT. The WAIT pulse resets the counter of M23 via M39-10, keeps the A line to the analog section low, clocks the polarity null detect latch M22(B) causing a logic '1' on pin 1 if the signal applied to the analog section of the A-D converter was positive (logic '0' if negative) and is fed back to enable the sequencer via M46-3.

REF 1. The high to low edge of WAIT causes the \bar{A} to change state and going into REF 1 makes \bar{B} a logic '0'. The analog side is then in the condition to start 'ramping down'. While REF 1 is high the primary counter of M23 is enabled (pin 3) and counts the period of REF 1.

REF 1 is ended when a null detector pulse is detected and latched on to M22. This causes the sequencer to step on once more from M46-3, the low to high edge from pin 4 disabling the primary counter.

REF 2. The REF 2 signal changes the state of the \bar{A} line (causing the analog section to ramp down at a slower rate), resets the 'null detect' latch and enables the secondary counter of M23 (Pin 13) to count the period of REF 2. If the secondary counter overflows, the primary counter is incremented from M23-16.

As in REF 1, a null detector pulse causes the counting period to end (M22-12) and increments the sequencer via M46-3 causing the \bar{A} and \bar{B} lines to change state.

END. The low to high edge from M47-10 is fed back to M47, via M48-6 giving a master reset. Thus the sequencer is placed into RESET.

RESET. The sequence pulse from M47-2 clocks the 'data ready' latch M1-3 placing a signal on to the CMOS Data Bus via tri-state buffer M10 indicating to the MPU that a reading is ready to be taken from the main counter M23. Data is extracted from the counters in three bytes (controlled by the A1 and A0 lines of the processor address bus) with the counter output buffers, M24 and M25 being enabled by XADDT, a decoded processor address.

The RESET signal is also passed to the analog section of the A-D by changing the state of the C line.

Once the data has been extracted from the main counter the set-up procedure is then repeated to await a further trigger.

3.8.3.4 Master Clock and Line Locking (430329 sheet 4)

To give improved rejection of line frequency related noise, the 1061 is linelocked. The line frequency is sampled and compared to the internal master clock. Synchronisation is achieved by adjusting the master clock frequency.

A sinusoidal line frequency signal from the 5V mains tap is converted to a square-wave (M25-13) and $\div 2$ (M26-1) before being fed to the comparator section of the ULA M23 (sheet 3). The MASTER CLOCK $\div 2$ signal is fed to ripple counter M27 which outputs a signal of twice the estimated line frequency, for line related periods, controlled by the ULA (M23-18). This signal is fed to M23-19 (via inverter M39) and after a further $\div 2$, is compared with the actual line frequency (see Fig 3.44).

The ULA determines whether the master clock is running too slow or too fast, producing a signal on pin 20 whose pulse-width is proportional to the difference. The output of pin 21 is a 25Hz square-wave which is fed to the up/down input of counters M41/50. Thus depending on the position and down period of the pulse, the count held is increased or decreased.

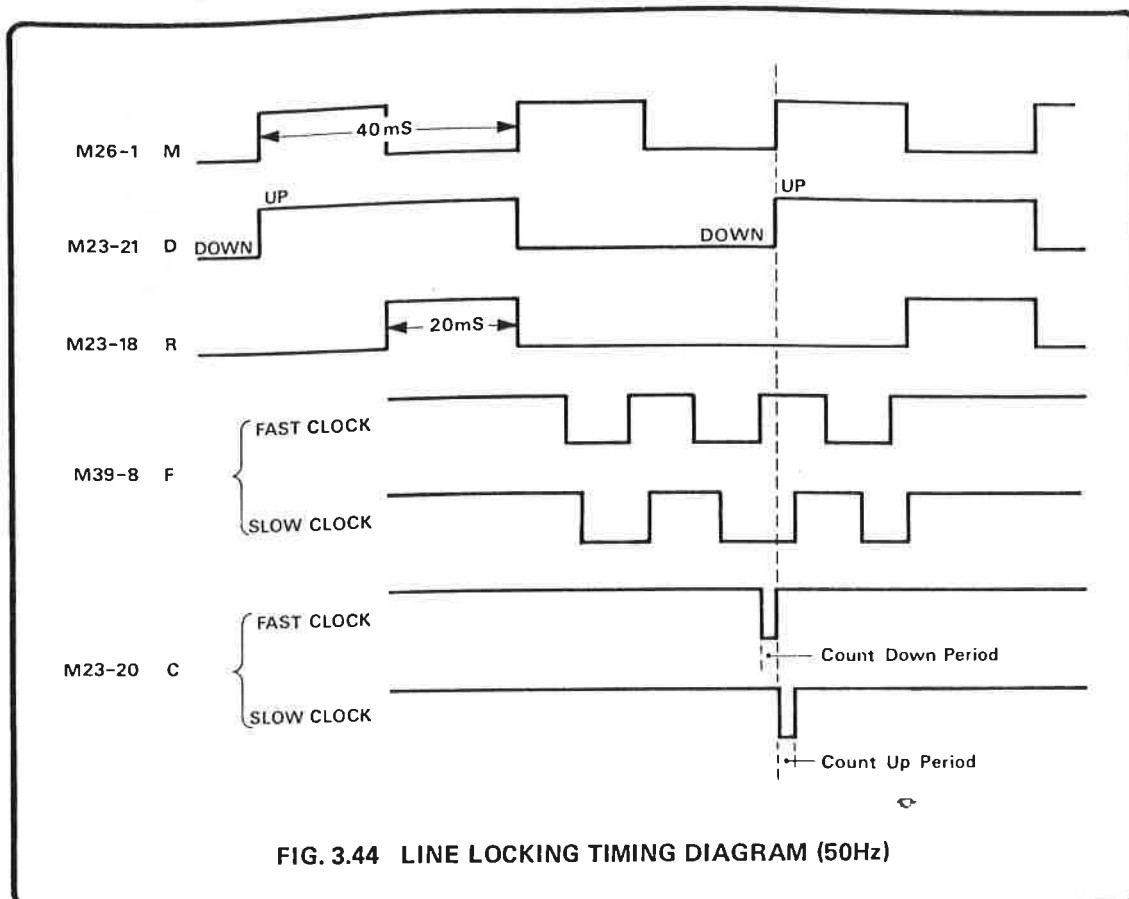


FIG. 3.44 LINE LOCKING TIMING DIAGRAM (50Hz)

Latches M42/51 are updated with this new count during the A-D RESET period and applies the count to resistor network AN4 which forms a D-A converter. Changing the voltage applied to varicap D9 alters its capacitance, thus adjusting the LC of the Colpitts oscillator. Therefore the frequency of the Master Clock is increased or decreased to be an exact multiple of the mains frequency.

3.9 FRONT PCB ASSEMBLY (Circuit Drawing No. 430294)

The Front pcb assembly accepts the measurement signals, digitally displays the value, provides manual control of the measurement circuits and data conditioning, and gives a visual status indication of the selectable instrument states.

3.9.1 Analog Input Signals (430294 sheet 2)

The Front pcb connects the terminals to the 2/4-wire Ohms and Local-Remote Guard switches. Thus in '2-wire': Hi is connected to I+, and Lo to I-, through thermistors R1 and R2. In 'Local': Guard is not directly linked to the front panel Lo terminal, as this becomes active in 4-wire Ohms. Instead, 'Local' links Guard to Ohms Guard, which is permanently connected to DC Isolator Lo.

Signals applied to the six front panel terminals are routed through to the Rear pcb (to the Rear Input/Ratio pcb or Rear Input pcb if Option 40 or 41 is fitted) via the Signal Cable assembly. Each of the terminal leads

passes through its own HF choke, all six inductors being wound in the same direction on the same core. This 'Common Mode' choke presents high impedance to transient common mode currents, but low impedance to normal mode differential input currents.

Two screened cables are used to transfer the signals to the rear: I+ and Hi are carried in one; I-, Lo and Ohms Guard in the other. Guard is carried via the cable screens, thus guarding the signals during transfer.

3.9.2 Display Signals (430294 sheet 1)

The front panel assembly routes the display signals from the Display Driver board to the gas discharge display.

3.9.3 Keyboard Data Encode (430294 sheet 1)

Selection of a front panel keyswitch causes one of the two 16-key encoders (M7 or M10) to send a data available message to M2 (a data latch) and to remember which key was pressed. The output of M2, (pin 1 or 13) signals the interrupt circuitry of the Digital Board (IRQK1 or IRQK2).

When the microprocessor accepts the interrupt and has located the source, the XKY BRD line to pin 13 of M7 and M10 is taken low, enabling the data outputs of the encoders to be placed on to the CMOS data bus (See Fig. 3.45 for the key select coding). This signal also resets M2 ready for the next key selection.

KEY	M7				KEY	M10			
	14	15	16	17		14	15	16	17
	CD7	CD6	CD5	CD4		CD3	CD2	CD1	CD0
100	0	0	0	0	HOLD	0	0	0	0
10	0	0	0	1	RATIO	0	0	0	1
1000	0	0	1	0	TEST	0	0	1	0
10M Ω	0	0	1	1	SPEC	0	0	1	1
1	0	1	0	0	(A-B)	0	1	0	0
.1	0	1	0	1	dB	0	1	0	1
10 Ω	0	1	1	0	\div C	0	1	1	0
AUTO	0	1	1	1	MAX	0	1	1	1
DC	1	0	0	0	MIN	1	0	0	0
k Ω	1	0	0	1	RESET	1	0	0	1
KEYBOARD	1	1	0	1	MAN	1	0	1	0
I	1	1	1	0	INPUT				
INPUT					FILTER	1	1	0	1
ZERO	1	1	1	1	AC	1	1	1	1

FIG. 3.45 CMOS DATA BUS : KEY SELECT CODING

3.9.4 Keyboard L.E.D. Data Decode (430294 sheet 1)

The XKY BRD signal is inverted by Q1, R7, C1, R6 partially enabling the L.E.D. data latches M4, M5, M6, M8, M9, M11 and M12 while information is not being extracted from the keyboard encoders. The data latches are divided into four sets, M6 and M4, M8 and M5, M12 and M11, M9 being fully enabled from the XKD SP0 - XKD SP3 lines respectively.

On initialisation or after a change of the instrument's selectable states, the L.E.D. data latches are updated by placing data on the CMOS Data Bus (See Fig. 3.46), firstly to M8 and M5 (enabled from XKD SP1) and 'clocking' from the CMOS CLK line (J2-6), secondly to M12 and M11, then M9 and finally M6 and M4.

The output of the L.E.D. latches provide the signals to the bases of the L.E.D. drive transistors, switching them on or off as required.

CMOS DATA LINE	M12/M11	M8/M5	M6/M4	M9
CDO	\div C	DC	AUTO	
CD1	dB	k Ω	10 Ω	
CD2	SPEC	INPUT ZERO	.1	
CD3	TEST	INPUT FILTER	1	
CD4	A-B	KEYBOARD	10	
CD5	MIN	I	100	MAN
CD6	MAX		1000	RATIO
CD7	RESET	AC	10M Ω	HOLD

FIG. 3.46 CMOS DATA BUS : LED-SELECT CODING

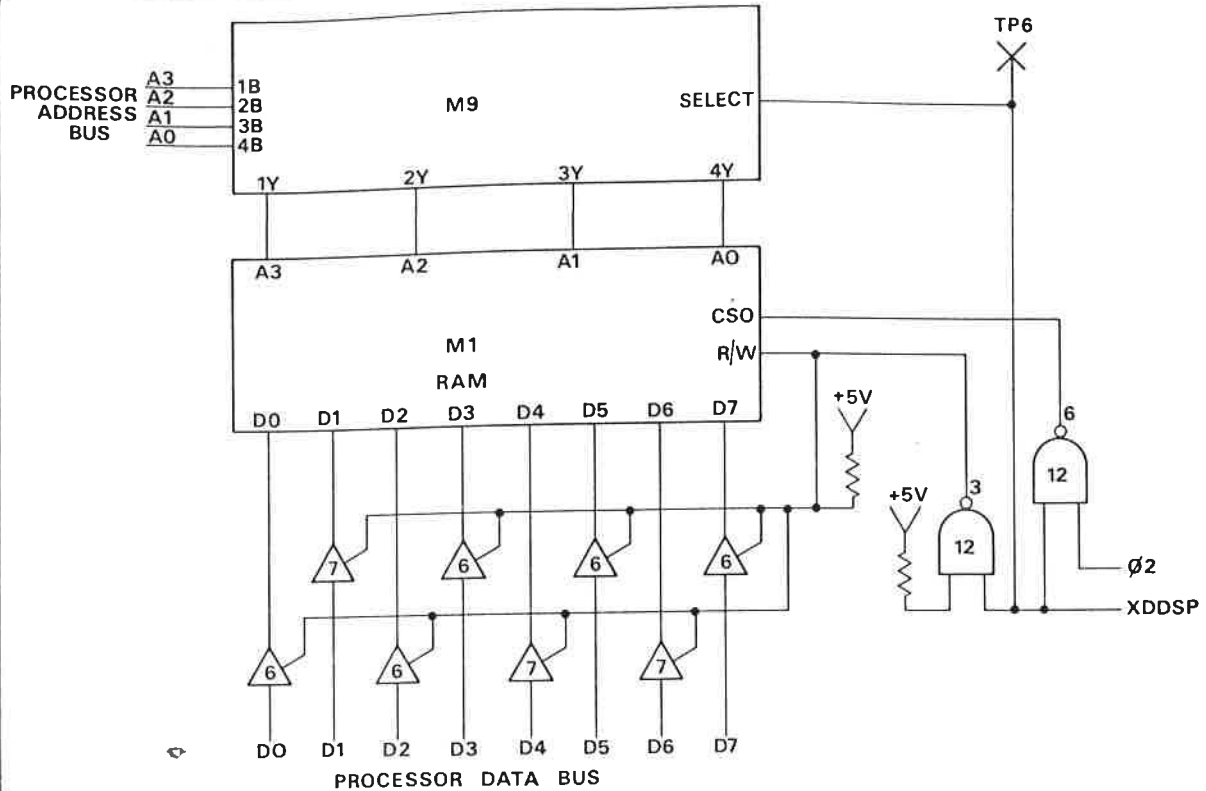
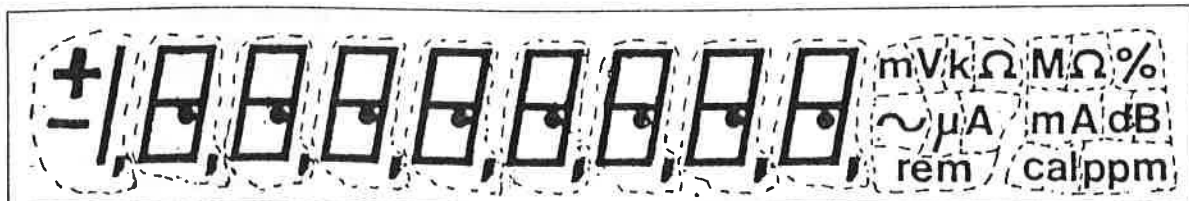


FIG. 3.47 DISPLAY DRIVER WRITE CIRCUITRY

COUNTER (M8)				RAM (M1)				Display block energised or operation implemented from M11
Q ₃	Q ₂	Q ₁	Q ₀	A ₃	A ₂	A ₁	A ₀	
0	0	0	0	0	0	0	0	1
0	0	0	1	0	0	1	0	3
0	0	1	0	0	1	0	0	5
0	0	1	1	0	1	1	0	7
0	1	0	0	1	0	0	0	9
0	1	0	1	1	0	1	0	11
0	1	1	0	1	1	0	0	
0	1	1	1	1	1	1	0	
1	0	0	0	0	0	0	1	2
1	0	0	1	0	0	1	1	4
1	0	1	0	0	1	0	1	6
1	0	1	1	0	1	1	1	8
1	1	0	0	1	0	0	1	10
1	1	0	1	1	0	1	1	Reset Counter



Block Number → 1 2 3 4 5 6 7 8 9 10 11

FIG. 3.48 DISPLAY DRIVER READ MODE ADDRESS STATES

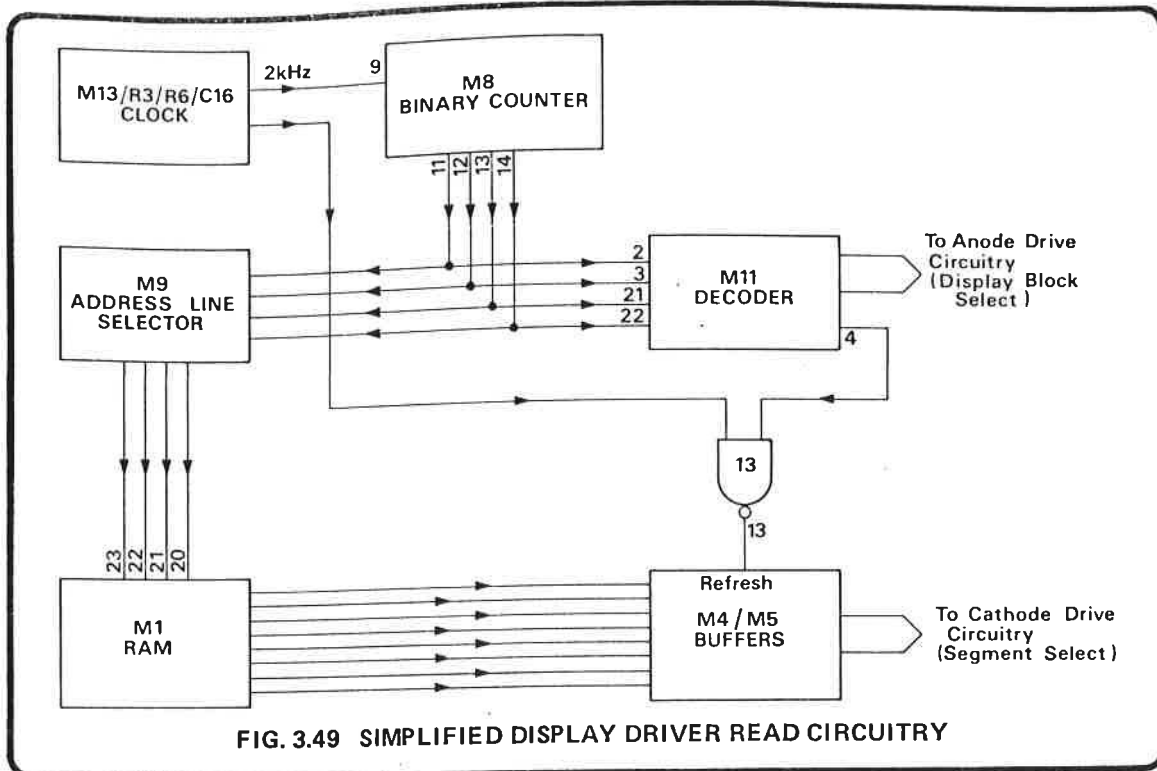


FIG. 3.49 SIMPLIFIED DISPLAY DRIVER READ CIRCUITRY

3.10 DISPLAY DRIVER ASSEMBLY (Circuit Drawing No. 430330).

Basically, the Display Driver assembly receives the display information from the microprocessor (running at 800kHz) and stores it in a Random Access Memory (RAM) digit by digit. This data is then read out at a slower frequency (2kHz), level shifted and output to the gas discharge display.

NOTE: In the following description, each bar, decimal point or legend is referred to as a display segment and each set of segments i.e. ± 1 , \square or a legend block, is referred to as a display block.

3.10.1 Write Mode

On completion of a reading or when certain modes are selected, (e.g. ERROR, keyboard entry), the processor indicates to the Display Driver Board that data is ready to be transferred by the signal XDDSP (TP6). This causes the RAM (M1) to be placed into its write mode and the quadruple 2-line to 1-line data selector, M9, to select the 'B' inputs which are connected to the processor address bus.

The signal XDDSP also causes the tri-state buffers M6 and M7 to become enabled, causing the data input lines of the RAM to be connected to the processor data bus. Thus under MPU control, the display data (± 1 , \square 's, decimal points and legends) is written into the RAM.

Once this transfer of data is complete the RAM becomes deselected, the buffers return to their third state inhibiting the data bus to the RAM and connects the 'A' inputs of M9 to the address lines of the RAM.

3.10.2 Read Mode

Discharge between adjacent display blocks is prevented by time multiplexing and sending information to alternate blocks. A particular display block is selected by driving its anode, and a particular segment by driving the segment cathode.

The free running clock M13, R3, R5, C16, produces a 2kHz signal (M13-9) to drive a 4-bit binary counter, M8, which provides the control of the address lines in the read mode (See Fig. 3.49). The display block selection is achieved by decoding these 4 lines into 16 bits using M11. The output lines of M11 are connected to the bases of transistors Q1-Q3, Q13-Q20 which act as anode switches. Note that when the address lines are in the state 0000 the output of M11 (pin 11) selects the anode to block 1, 0001 selects the anode to block 3 (M11-9), 0010 ... block 5, etc., thus the display blocks are selected alternately.

To select the appropriate segment data from the RAM to match the display block selection the address lines are given a left hand bit rotation, i.e. if the output of M8 is labelled DCBA, (2^3 , 2^2 , 2^1 , 2^0), the address input of M1 would be CBAD. (Fig. 3.48 gives the state of the address lines for each display block). The particular display block segment data is recalled by the RAM, buffered by M4 and M5, level shifted -180 volts by R8-R15, C4-C11 causing Q5-Q12 to drive the cathodes, D1-D10 acting as restoration diodes. Between the transfer of each set of segment data, M13-13 is taken high, causing the outputs of M4 and M5 to be a logic '0'. This produces a refresh period for capacitors C4-C11 to discharge from the -180V supply through the restoration diodes.

3.11 IEEE 488 STANDARD DIGITAL INTERFACE (Circuit Diagram No. 430427)

The IEEE Digital Interface assembly contains the extra memory circuitry required for the execution and decoding of interface functions, and for data input and output transfers. Simplified diagram Fig. 3.50 shows its essential features.

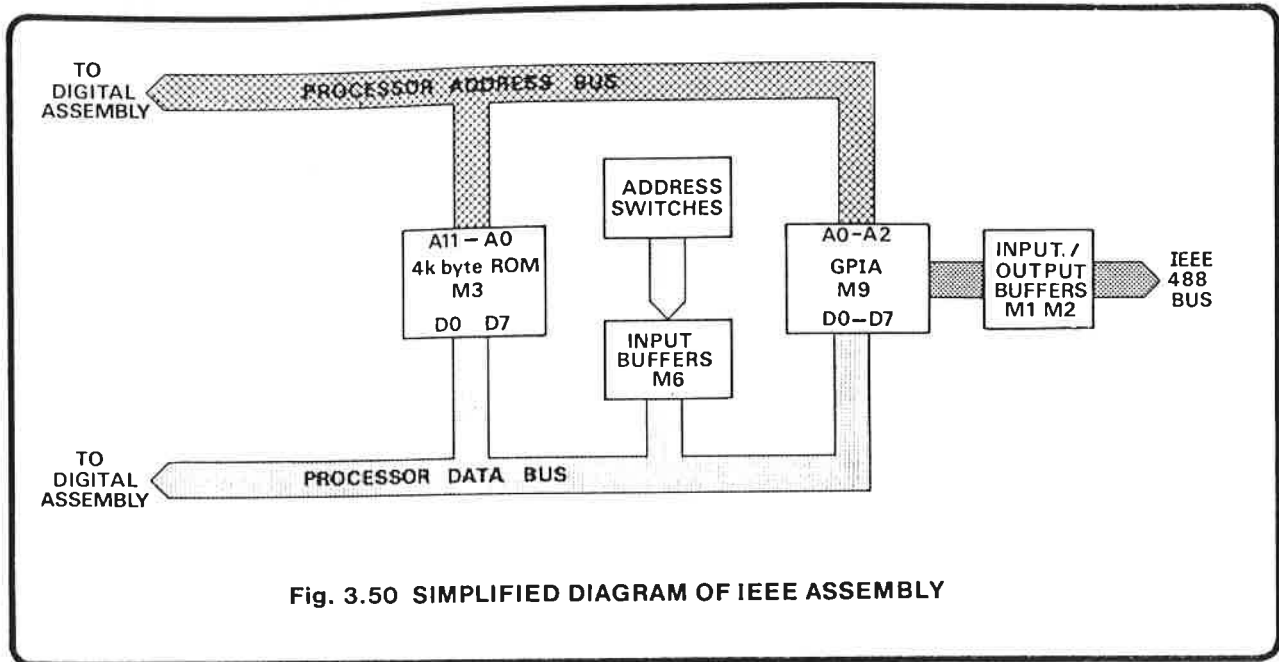


Fig. 3.50 SIMPLIFIED DIAGRAM OF IEEE ASSEMBLY

3.11.1 ROM Circuit

The IEEE Digital Interface assembly acts as an extension to the Digital assembly with connections to both the Processor Address and Data Buses. The board houses 4k bytes of program memory (M3) containing the sub-routines to control the instrument from the IEEE 488 Bus. The ROM receives the address information, with chip selection being made by decoding address lines A3-A11 with XIOBD and master clock $\phi 2$.

3.11.2 Interface Circuit

The General Purpose Interface Adaptor (GPIA), M9, provides the interface between the IEEE 488 Standard Instrument Bus and the 68000 microprocessor. The MPU can receive, process and send messages to the interface through the GPIA.

The GPIA is able to automatically handle the following interface protocol [1] :-

- Single address capability
- Source and acceptor handshake
- Talker and Listener states

Service Request
Parallel Poll
Device Clear
Device Trigger

With MPU it is also capable of:-
Programmable Interrupts
Storing the instrument's address
Control of the interface input/output buffers.

The GPIA is selected by decoding address lines A3-A11 with XIOBD. Address lines A0-A2 with the state of the MPU R/\bar{W} line select one of the 8 read only or 7 write-only registers in the GPIA, enabling the MPU to send or receive data over the interface.

The two signals $T/\bar{R}1$ and $T/\bar{R}2$ are used to control low power transceivers (formed from M1, 2) which drive the interface bus.

[1] For further information refer to 'Getting aboard the 488 Bus' published by Motorola.

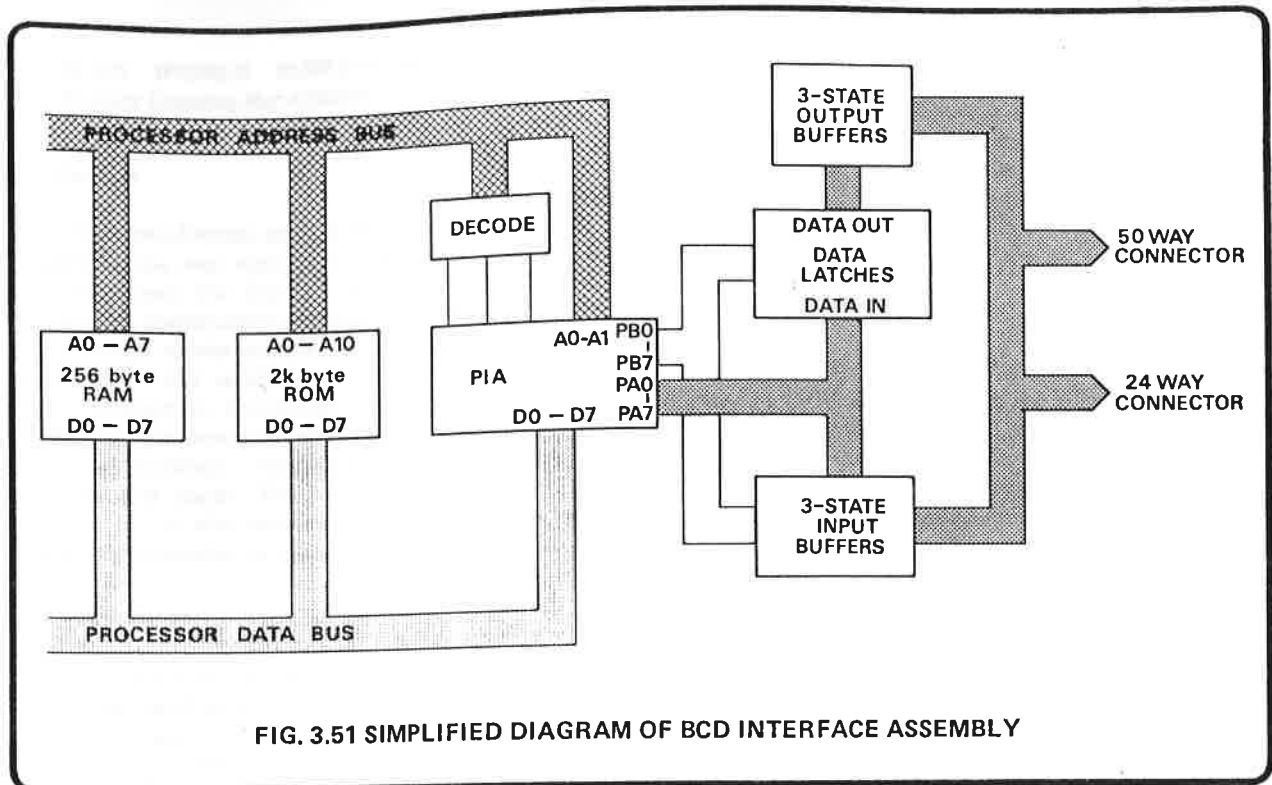


FIG. 3.51 SIMPLIFIED DIAGRAM OF BCD INTERFACE ASSEMBLY

3.12 BCD DIGITAL INTERFACE (Circuit Drawing No 430332)

The BCD Digital Interface assembly contains the extra memory and circuitry required for the execution and decoding of interface functions and to perform data output transfers. Simplified diagram, Fig 3.51 shows the essential features of this board.

3.12.1 RAM/ROM Circuit

The BCD Digital Interface assembly acts as an extension to the Digital assembly with connections to both the Processor Address and Data Buses. The board contains 2k bytes of program memory (M11) containing the sub-routines to control the instrument from the BCD Interface. Extra 'operating (scratch pad) memory' is provided by two 256x4 bit RAMS (M22, M23). Both the ROM and RAM's receive the address information, with chip selection being made by decoding address lines A8-A11 with XIOBD, R/W and Ø2.

3.12.2 Interface Circuit

The Peripheral Interface Adapter (PIA), M1, provides the means of interfacing the BCD input/output to the 6800 microprocessor. The PIA is selected by decoding address lines A9-A11 with XIOBD. Address lines A0 and A1 together with MPU data messages configure the six internal registers controlling data flow and external control signals.

Peripheral Data lines PBO-PB7 (M1 pins 10-17) are used as enable lines allowing data to be placed on the BCD Data Bus from the Remote Programming Input and control lines of the BCD Output (2 bytes) and allowing data to be placed into output latches M7-M10, M12-M16 (5 bytes).

The length of PRINT COMMAND is controlled by the timer M2, R1, C3.

3.13 REAR (POWER SUPPLY) PCB ASSEMBLY (Circuit Drawing No. 430295)

3.13.1 General

The line transformer and power supply components are situated at the rear right hand side of the instrument, when viewed from the front. Transformers T1 and T2 are of toroidal construction mounted one on top of the other and bolted to the rear panel. T1 has a split primary comprising two 115V windings, intended for either series or parallel connection depending on the line voltage. An earth screen is interposed between primary and secondary windings to minimise electrostatic coupling, and is grounded to line earth. The second transformer T2 is driven from T1. It also possesses an electrostatic screen, this time being connected to Guard.

3.13.2 180V Supply

The 180V supply is required for the gas discharge display. Bridge rectifier W1 and C6 convert the 200V AC from the secondary of T1, to DC. R6, D3, R4 and Q2 act as a constant current source being regulated by D4, R5 and Q1. The +5V line (TP2) is connected to the digital +5V line (TP3) on the Display Driver assembly.

3.13.3 5V Supply

All the logic circuitry to the right of the central printed circuit board is powered from the supply gener-

ated from the two 8.8 volt 750mA secondary windings on transformer T1. The centre tap (digital common) is linked directly to line ground via LK6. The output of rectifying diodes D1 and D2 is smoothed by C7 and C8 before being fed to regulator M1. This regulator is capable of 1 amp output and has foldback current limiting and thermal shut-down, to provide short circuit protection.

3.13.4 ±15V Supply

The output of the third secondary winding of transformer T1 (10V AC) is input to the primary of T2. The two 19.25V outputs are connected in series, with the centre tap connected to analog common. The output of bridge rectifier W2 is fed to voltage regulators M2 and M3 (wired in series), to produce positive and negative 15 volt supplies to power the analog circuitry. These regulators also include foldback current limiting and thermal shut-down, to provide short-circuit protection.

3.14 SELF TEST SEQUENCE

Selection of the TEST key places the instrument into a test routine, checking the display and basic measuring circuits. A flowchart for the routine is given in Fig. 3.53. The analog circuitry conditions for each test are given in the last subsection of the circuit description for the particular board, and the range 'F.E.T.' patterns in Appendix I-8.

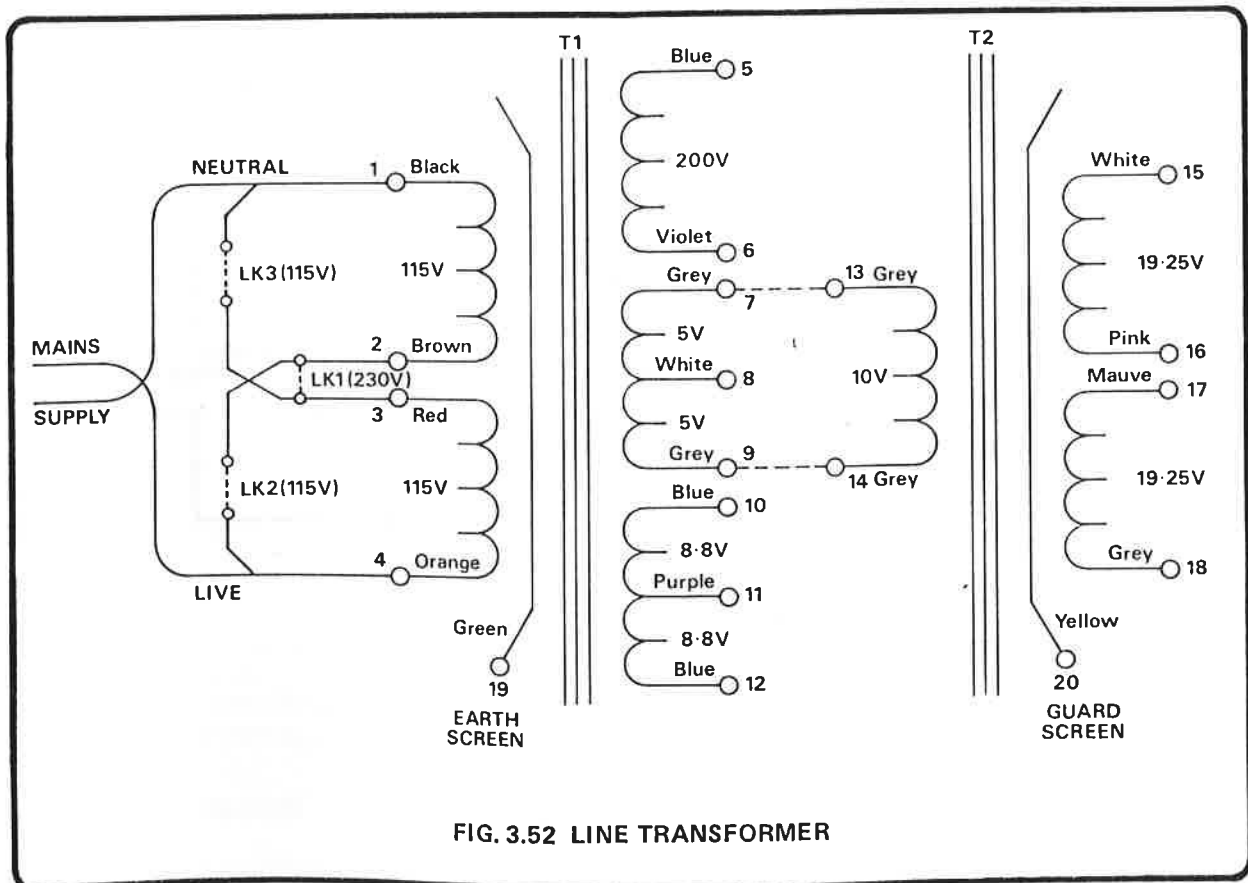


FIG. 3.52 LINE TRANSFORMER

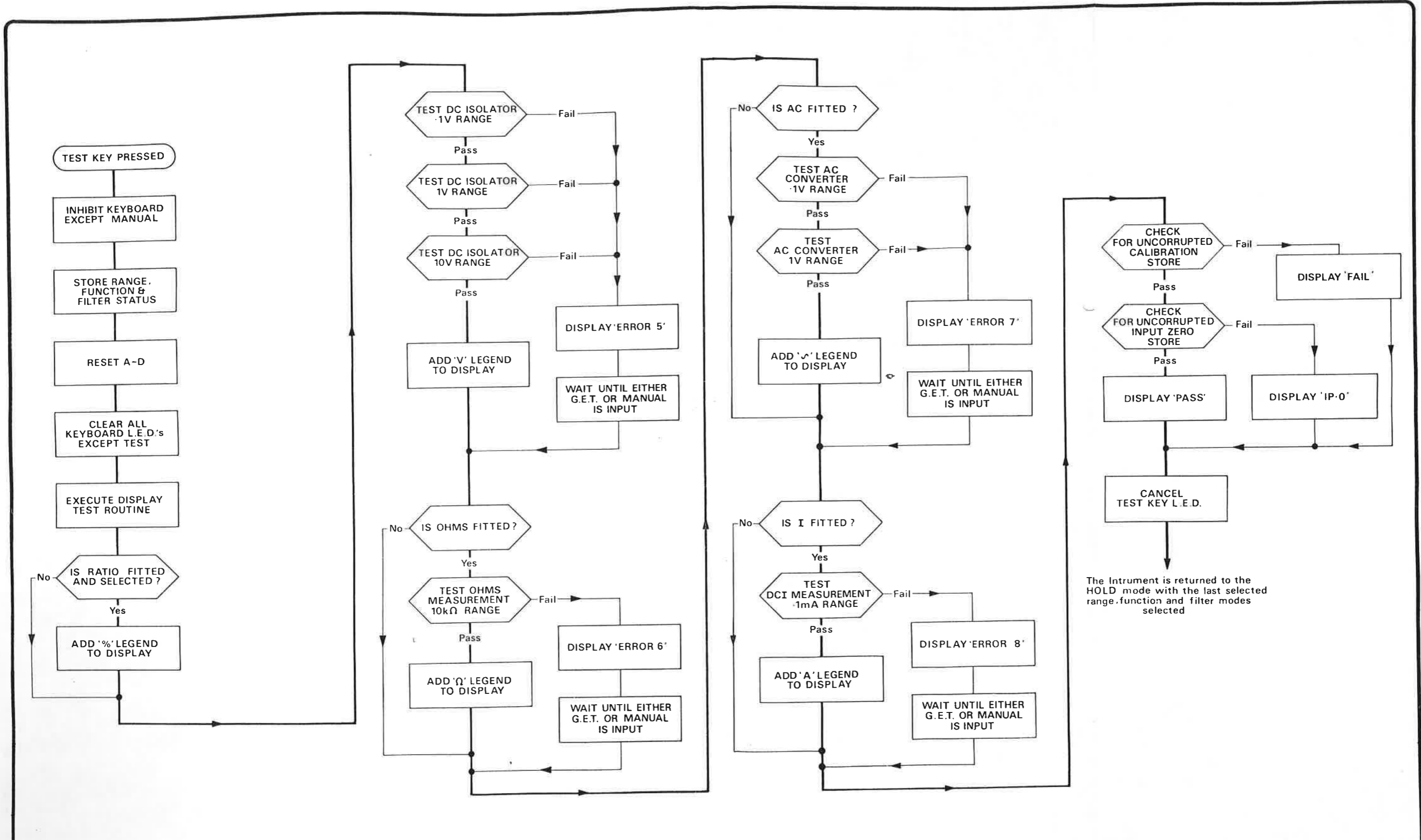


FIG. 3.53 FLOWCHART OF SELF-TEST ROUTINE

The Instrument is returned to the HOLD mode with the last selected range, function and filter modes selected

SECTION 4

INTERNAL ADJUSTMENT PROCEDURES

4.1 ALTERATION OF LINE VOLTAGE AND LINE FREQUENCY

The instrument is set to 50Hz, 205V to 255V supplies unless Option 80, 81 or 82 is specified. This information is carried on the instrument identification label located on the rear panel. Alteration to a different line voltage/line frequency may necessitate an instrument recalibration.

4.1.1 Changing Line Voltage

1. Disconnect power and all signal input/output leads.
2. Remove the lower cover.
3. Locate the link(s) connecting the split primary on the printed circuit board in front of the toroidal line transformer, Fig. 2.1 and Drawing No 400295.
4. 115V Operation:— Remove LK1 (link 1) and fit LK2 and LK3^[1].
- 230V Operation:— Remove links LK2 and LK3, and fit LK1^[1].
5. Amend instrument identification label.
6. Replace lower cover.
7. Replace power fuses with 160mA anti-surge (230V) or 500mA anti-surge (115V).
8. Carry out the Specification Verification tests (Section 8, User's Handbook) and recalibrate if necessary.

4.1.2 Changing Line Frequency

1. Disconnect power and all signal input/output leads.
2. Remove the top cover.
3. 400Hz Operation:— Remove link LK5 and fit LK7^[1] on the Digital assembly, (Drawing No. 400329).
- 50/60Hz Operation:— remove link LK7 and fit LK5^[1] on the Digital assembly (Drawing No. 400329).
4. Place instrument into HOLD. Adjust L2 (Digital assembly) so that TP7 is $1.05V \pm 0.03V$ with respect to Digital Common (TP28).

NOTE: This signal contains about 200mV peak-to-peak high frequency noise.

5. Amend instrument identification label.
6. Replace the top cover.
7. Carry out the Specification Verification tests (Section 8, User's Handbook) and recalibrate if necessary.

[1] Links should be 22 SWG TIN.Cu wire with silicone rubber sleeving.

4.2 BATTERY REPLACEMENT

The battery should be replaced on or before the date indicated on the rear panel instrument identification label. To retain the calibration memory, the instrument must be powered-up during replacement. Therefore great care must be taken due to voltages up to 260 volts being present inside the instrument.

1. Remove top cover and locate battery on the Digital assembly (see Fig. 2.1).
2. Power-up instrument.
3. Desolder battery at end of tags and remove from clip.
4. Replace with new battery, (Datron Part No. 920049) positive terminal to resistor.
5. Replace top cover.
6. Amend instrument identification label (Current date + 5 years).
7. Carry out the Specification Verification tests (Section 8, User's Handbook) and recalibrate if necessary.

4.3 POST-REPAIR PROCEDURES

Apart from the RMS Module (which is available only from Datron), all integrated circuits and semiconductor devices are standard manufacturers' products, and special selection is unnecessary. During manufacture certain resistors are selected in value (FSV = Factory Selected Value) to accommodate circuit component tolerances, or to bring the desired setting of a preset control to the middle of its adjustment range.

The thermal tracking of the DC Preamplifier is particularly important, to ensure a low order of zero drift with variations of temperature. This rather time consuming procedure is carried out initially during manufacture, and need only be repeated following replacement of Q12 or any component associated with the temperature compensation circuitry.

NOTE: A routine calibration as detailed in Section 1 should be carried out after completion of the following procedures.

CAUTION : Up to 260 volts is present inside the instrument. Personal contact with these points may result in injury.

4.3.1 Basic DC Instrument

Equipment Requirements:

4½ digit Digital Voltmeter e.g. Datron 1041
 Variable 5V, 1 amp DC supply
 5mV/division Oscilloscope e.g. Telequipment D83
 1MΩ5% resistor in parallel with 10nF capacitor
 10MΩ5% resistor in parallel with 10nF capacitor
 DC Voltage Calibrator, e.g. Datron 4000/4000A
 Autocal Standard.

Procedure:

Power Supplies

1. Turn instrument on and allow 5 minutes warm-up period.
2. Connect DVM Hi to TP8 and Lo to TP28 on the Digital assembly. Adjust R2 on the Rear (Power Supply) pcb assembly to give $+5.100V \pm 25mV$.
3. Connect DVM Hi to TP1 and Lo to TP20 on the Analog assembly. Adjust R7 on the Rear (Power Supply) pcb assembly to give $+15.000V \pm 15mV$.
4. Connect DVM Hi to TP2 and Lo to TP20 on the Analog assembly. Adjust R12 on the Rear (Power Supply) pcb assembly to give $-15.000V \pm 15mV$.

Digital Assembly

5. Switch the instrument off and disconnect the power lead.
6. Isolate the Digital Board by removing the connectors along the centre panel (J1-J5).
7. Connect variable 5V supply and DVM Hi's to TP8, Lo's to TP28. Reduce supply to $4.750V \pm 10mV$.
8. Set R83 fully clockwise. Connect oscilloscope Lo to TP28 and monitor M53 pin 40. Turn R83 anti-clockwise until TP30 undergoes a high to low transition (or begins to pulse low).
9. Remove variable supply and reconnect items disconnected in steps 5 and 6. Disconnect the oscilloscope. Switch on the instrument.
10. Connect DVM Hi to battery positive terminal, Low to TP28. Check battery voltage is >2.5 volts.
11. Disconnect DVM and connect oscilloscope Hi to TP25, Lo to TP28. Adjust scope trigger until the trace is triggered by the first pulse of each reading burst. Adjust R11 so that the pulses occur every $5ms \pm 0.5ms$.
12. Place instrument into HOLD. Connect oscilloscope Hi to TP7. Adjust L2 to give a stable $+1.05 \pm 0.03V$. NOTE: This signal contains about 200mV peak to peak high frequency noise.

13. Insert calibration key into keyswitch on the back panel and turn, placing the instrument into CAL mode.
NOTE: The display CAL legend will be lit.
14. Short together pins 'D' and 'E' on Digital assembly.
NOTE: All the calibration store correction factors are now reset to zero.
15. Turn the calibration key back to RUN mode.

Analog Assembly (DC Isolator Section)

16. Centralize R150 and R160.
17. Select 0.1V range DC with FILTER out. Apply a 10MΩ resistor between instrument Hi and Lo. Connect DVM Hi to TL8, Lo to TP20. Adjust FSV R152 with a metal film resistor (50ppm/°C) for a reading of $< 10mV$, using R159 for 'fine' adjustments. Do not solder in R152.
18. Apply a short circuit across the input terminals and adjust R150 for a reading of $< 50\mu V$ at TP13.
19. Connect DVM Hi to TP33 and adjust R160 for a reading of $< 20\mu V$.
20. Repeat steps 17 to 19 until readings are within specified limits.

NOTE: The following step is only required after the replacement of Q12 or any component associated with the temperature compensation circuitry.

21. (i) Re-apply 10MΩ resistor across the input terminals. Note the reading on the front panel display (=A).
- (ii) Note the ambient temperature (=X°C).
- (iii) Place the instrument in a temperature controlled oven at approx 50°C without top cover and with power 'on'.
- (iv) Leave the instrument for at least 1 hour then note the reading on the display (=B) and the temperature of the oven (=Y°C).
- (v) Compute $(B-A)/(Y-X) = \text{Drift}/^{\circ}C$.
- (vi) Remove instrument from oven and allow to stabilize, with power 'on' to ambient for one hour.
- (vii) If the drift was $< 10 \text{ digits}/^{\circ}C$ proceed to (x).
- (viii) For drifts in excess of $10 \text{ digits}/^{\circ}C$ R151 must be adjusted. If the drift was positive turn R151 clockwise, if negative turn R151 anti-clockwise.
- (ix) Repeat from (i).
- (x) Lock R151 with a clean soldering iron.
- (xi) Repeat steps 17 to 20.
22. Solder in R152, with instrument turned off.

Analog Assembly (A-D Converter)

23. Select 100V range and apply short circuit between Hi and Lo. Connect DVM Hi to TP7, Lo to TP20. If reading is $+6.42V \pm 0.03V$ proceed to step 25.
24. Switch off instrument and make positive reference links B & C, if cut i.e. the links alongside TP7. Switch on instrument and measure voltages on TP7 once again. Consult Fig. 4.1 and cut links as indicated. Repeat step 23.

Voltage on TP7 or TP8	TL'B'	TL'C'
6.42	—	—
6.47	—	✓
6.525	✓	—
6.58	✓	✓

Select voltage closest to measured value and cut links

FIG 4.1 REFERENCE SELECTION VOLTAGES

25. Connect DVM Hi to TP8. If reading is $-6.42V \pm 0.03V$ proceed to step 27.
26. Switch off instrument and make negative reference links A to C, if cut i.e. the links alongside TP8. Switch on instrument and measure voltage on TP8 once again. Consult Fig 4.1 and cut links as indicated. Repeat Step 25.
27. Select HOLD. Connect DVM Hi to TP9. Select correct resistance value for FSV R11 or R15 to give a reading of $0V \pm 1mV$. Solder in resistor.
28. Deselect HOLD and disconnect DVM. Select 1000V range and apply $+19mV$. Connect oscilloscope Lo to TP21, Hi to TP5. Adjust R20 for noisy waveform at zero point.
29. Remove oscilloscope. Replace covers but do not replace screws. Select 1V, DC, filter out and apply $1M\Omega$ across input terminals. Turn rear panel key-switch to CAL mode and select LIN.
30. Select .1V range and apply $10M\Omega$ across input terminals. Select Ib. Repeat until display reads less than 50 digits.
31. Select 10V range, FILTER and apply short copper link across input terminals. Select ZERO.
32. Apply +10 volts and select GAIN. Repeat until display reads $+10.0000 \pm \frac{1}{2}$ digit.

33. Apply +19 volts. If the display reads within the limits $+18.9999$ to $+19.0001$, proceed to step 35.
34. Calculate $E = (19 - \text{displayed reading})/2$. Re-apply +10 volts and adjust R23 for a displayed reading of $10 - E$. Repeat steps 32-34 until both readings are within the limits indicated.
35. Turn rear panel keyswitch to RUN mode.

The basic DC only instrument set-up procedure is complete.

4.3.2 Ohms Assembly

Equipment Required:

- 5½ digit DVM, e.g. Datron 1065, or 1061.
- 10 Megohm 5% resistor in parallel with a 10nF capacitor, e.g. Datron Part No. 400392.
- Copper shorting links, and a short wire link.

Procedure.

1. Select 10 kilohm range, 4-wire. Connect I- to Ohms Guard, I+ to Hi, and 10 Megohm resistor between Hi and Lo.
2. Connect DVM Hi to TP4, Lo to TP1 and adjust R26 (bias current) for a reading of $Zero \pm 300\mu V$.
3. Disconnect the 10 Megohm resistor, and connect a copper shorting link in its place between Hi and Lo.
4. Transfer DVM Hi from TP4 to TP14, and adjust R27 (Q10 offset) for $Zero \pm 2\mu V$.
N.B. Ensure that the DVM used for measurement is correctly zeroed!
5. Repeat steps 1-4 until the readings are within the specified limits.
6. Connect Lo to Ohms Guard. Connect a shorting link between TP1 and TP3.
7. Transfer DVM Hi from TP14 to TP13, and check that the reading is $zero \pm 50\mu V$.
If reading $> +50\mu V$, reselect FSV resistor R40 to bring the reading within limits.
If reading $< -50\mu V$, reselect FSV resistor R39 to bring the reading within limits.
NB R39 and R40 must each be at least 100 kilohms.
8. Remove the link from TP1 and TP3. Disconnect the DVM leads, and the connections from the front panel.

The basic Ohms set-up procedure is now complete.

4.3.3 OPTION 10 AC Assembly

Equipment Required:

- 5mV/Div oscilloscope. e.g. Telequipment D83.
- 5½ digit DVM with Ohms. e.g. Datron 1065, 1061.
- DC calibrator. e.g. Datron 4000 or 4000A.
- AC calibrator. e.g. Datron 4200.
- Asymmetric signal, 1V RMS, Crest Factor 5:1 ±0.02%, reversible polarity.

Procedure

1. Select AC 1000V range and HOLD. Short Hi to Lo. Connect DVM Hi to TL7, Lo to TP8 and note reading. Select 1V range and adjust R121 (bias current) to give same reading ±10µV.
2. Select 100mV range, AC + DC and adjust R112 (offset adjust) for an indication of zero ±50µV on the DVM.
3. Repeat steps 1. and 2. until readings are within the specified limits.
4. Select 10V range and HOLD. Connect oscilloscope Hi to TP5, Lo to TP8 and adjust R90 (rectifier zero) for maximum noise about zero. Remove the oscilloscope.
5. Connect DVM Hi to TP2, Lo to TP8 and adjust R75 (linearity) for an indication on the DVM of 1.8mV ±10%.
6. Select AC, 1V range, FILTER and apply 1V 500Hz. Connect DVM Hi to TL5, Lo to TP8. If reading is +3.157V ±0.01V proceed to step 8.
7. Disconnect input signal and switch off instrument, Make links TL1 to TL4 if cut. Switch on instrument, reselect AC, 1V range, FILTER and reapply 1V, 500Hz. Measure voltage on TL5. Consult Fig. 4.2 and cut links as indicated. Check voltage on TL5 is 3.157V ±0.01V. Remove the DVM.
8. Deselect HOLD and short circuit instrument Hi and Lo. Turn rear panel key switch to CAL mode and select ZERO. Repeat for all ranges.
9. Select 1V range. Apply 1 volt (d.c.) and note reading on display. Apply -1 volt (d.c.) and adjust R50 (d.c. turnover) for same display indication ±10 digits.
10. This part of the procedure must be performed with the high frequency compensation voltage, at J1-11/ R57, at -5V ±0.2V.
 - a. Select AC 100V range, FILTER and apply 100V, 500Hz. Select GAIN. Apply 100V, 50kHz and adjust C62 for a display of 100.000V ±20 digits.

- b. Apply 100V, 100kHz note error and adjust C61 to double the displayed error in the same direction.
- c. Repeat a. and b. until 50kHz and 100kHz displays are within ±20 digits.
- d. Select 1V range and apply 1 volt, 500 Hz. Select GAIN. Apply 1V 50kHz and adjust C63 for a display of 1.00000V ±20 digits.

11. Apply 1 volt 5:1 crest factor signal. Adjust R35 (crest factor) for a display of 1.00000V ±30 digits.
12. Open circuit input. Turn rear panel key switch to RUN. Select TEST and check for a display of PASS. Turn rear panel key switch to CAL.
13. Select 10V range and apply 10V, 50kHz. Check display is 10.0000V ±1200 digits. Check that the display can be calibrated to 10.0000 ±20 digits by less than 5 presses of the AC HF key.
14. Select 100mV range and apply 100mV 50kHz. Check display is 100.000mV ±500 digits. Check that display can be calibrated to 100.000mV ±20 digits by less than 5 presses of the AC HF key.
15. Select 1000V range and apply 1000V, 500Hz. Select GAIN.
16. Apply 1000V, 25kHz and check display is 1000.00V ±1200 digits. Check that display can be calibrated to 1000.00V ±20 digits by less than 5 presses of the AC HF key. Remove 1000V and turn rear panel key switch to RUN.

The basic AC set-up procedure is complete.

Voltage on TL5	TL1	TL2	TL3	TL4
3.157	-	-	-	✓
3.178	-	-	✓	-
3.198	-	-	✓	-
3.218	-	✓	✓	✓
3.239	-	✓	-	✓
3.259	-	✓	-	✓
3.280	-	✓	✓	✓
3.300	-	✓	✓	✓
3.320	✓	-	-	✓
3.340	✓	-	-	✓
3.360	✓	-	✓	✓
3.380	✓	-	✓	✓
3.400	✓	✓	-	✓
3.420	✓	✓	-	✓
3.440	✓	✓	✓	-
3.460	✓	✓	✓	✓

Select voltage closest to measured value and cut links

FIG 4.2 OPTION 10 AC ASSEMBLY OUTPUT SELECTION VOLTAGES

4.3.4 OPTION 12 AC Assembly

Equipment Required:

5mV/Div oscilloscope. e.g. Telequipment D83.
 5½ digit DVM with Ohms. e.g. Datron 1065, 1061.
 DC calibrator. e.g. Datron 4000 or 4000A.
 AC calibrator. e.g. Datron 4200.
 Asymmetric signal, 1V RMS, Crest Factor 5:1 ±0.02%,
 reversible polarity.

CAUTION

The following procedures should commence with the HF Autocal voltage close to the center of its span. To check this, select the 100V AC range and measure the DC voltage at J1-11 with respect to TP8. If it is between +4V and +6V, it is NOT necessary to clear the calibration stores. If outside these limits, the cal stores should be cleared as described in para 4.3.1 operations (13), (14) and (15).

CLEARING THE CAL STORES ENTAILS A FULL 'AUTOCAL' OF THE INSTRUMENT!

Before proceeding; ensure that at least the Analog Assembly LIN and I_B Autocalibrations have been carried out.

AC Preamplifier Zero

1. Read and comply with the CAUTION above.
2. Apply short circuit input. Select AC + DC, 100mV range and HOLD.
3. Connect DVM Lo to TP8, Hi to Test link K (TLK). Adjust R148 (bias current) for a reading of zero, ±140μV.
4. Select 100mV range AC, and check that the reading is zero, ±140μV. It may be necessary to re-adjust R148 to obtain this value. If so, recheck operation 3.
5. Select each range in turn, and check that the DVM reading is within ±70μV of zero (except 100mV range: ±140μV).

Set up RMS Converter

6. Select 10V range. Adjust R119 (Rectifier zero) for the most negative (or least positive) reading on the display.
7. Connect DVM to TLH. Adjust R101 (linearity) for a reading of +1.1mV±10%.
8. Select 100mV range. Check that the DVM reading is between 0.8mV and 1.8mV.

9. Select 1V range and apply 1V, 500Hz, with the DVM still connected to TLH. Remake links TLC-TLF. Then after recording the TLH voltage, refer to Fig. 4.2 and cut the links (✓) as appropriate to give a DVM reading of 3.157V ±0.010V.

TLH Voltage	Cut Test Links				Gain*
	C	D	E	F	
2.887 - 2.904	✓	✓	✓	✓	1.090
2.904 - 2.920	✓	✓	✓	x	1.084
2.920 - 2.937	✓	✓	x	✓	1.078
2.937 - 2.954	✓	✓	x	x	1.072
2.954 - 2.973	✓	x	✓	✓	1.065
2.973 - 2.988	✓	x	✓	x	1.059
2.988 - 3.004	✓	x	x	✓	1.054
3.004 - 3.021	✓	x	x	x	1.048
3.021 - 3.038	x	✓	✓	✓	1.042
3.038 - 3.055	x	✓	✓	x	1.036
3.055 - 3.071	x	✓	x	✓	1.031
3.071 - 3.090	x	✓	x	x	1.025
3.090 - 3.110	x	x	✓	✓	1.018
3.110 - 3.128	x	x	✓	x	1.012
3.128 - 3.147	x	x	x	✓	1.006
3.147 - 3.167	x	x	x	x	1.000

*Increase in TLH voltage when links are cut.

FIG. 4.3 OPTION 12 AC ASSEMBLY
OUTPUT SELECTION VOLTAGES

Check Spec Readout Frequency Flags

10. Select HOLD. Connect DVM to TP6. Adjust the applied frequency and note that TP6 changes logic state at a frequency between 1.8kHz and 2.2kHz. Disconnect the DVM.

Set Range 'Zeros'

11. Deselect HOLD, and apply 500Hz at 0.1% FR input to each range in turn. Perform ZERO autocal on each range, using the instrument display to check that each range calibrates to 100 digits ±3 digits. Disconnect the input.
12. Apply a short circuit to the input, short Guard to Lo and select each range in turn. Check that the reading on each range is zero ±10 digits on the display (except 100mV range ±30 digits). Remove the shorts.

Set up DC-DC Turnover

13. Select 1V range, AC + DC. Apply 1V 500Hz and perform GAIN autocal.
14. Apply +1V DC and note the displayed reading.
15. Apply -1V DC and adjust R62 (DC turnover) for the same reading as in operation (14). (± 3 digits).
16. Repeat (13) to (15) until all readings are the same to within ± 20 digits.

Set up Coarse Frequency Response

17. Select 100V range, AC; apply 100V, 500Hz and perform GAIN autocal. Apply 100V, 50kHz and adjust C82 for a display reading of 100.000V ± 20 digits. (If necessary change C81 to a value which permits this adjustment).
18. Apply 100V, 100kHz and note the reading error. Adjust C79 to give 5 times the error in the same direction.
19. Repeat (17) and (18) until the 50kHz and 100kHz readings are separated by less than 20 digits.
20. Select 1V range, AC; apply 1V, 500Hz and perform GAIN autocal. Apply 1V, 50kHz and adjust C84 for a display reading of 1.00000V ± 20 digits. (If necessary change C85 to a value which permits this adjustment).

Set up Crest Factor

21. Apply 1VRMS, +ve 5:1 Crest Factor signal. Adjust R61 (crest factor) for a display reading of 1.00000V ± 30 digits.
22. Apply 1VRMS, -ve 5:1 Crest Factor signal. Check that display reading is 1.00000V ± 30 digits.
23. Apply 1V, 500Hz, and perform GAIN Autocal. Repeat (21), (22) and (23) until crest factor readings are within limits.

Linearity Checks

24. Select 1V range, AC + DC. Apply 1V DC and perform GAIN Autocal.
25. Apply 1.9V DC and adjust R27 value (Factory Selected Value - FSV) for a display reading of 1.90000V ± 6 digits (reducing R27 increases reading).
26. Repeat (24) and (25) until both correct.
27. Select 1V range AC. Apply in turn 1V, 100mV, 10mV, at 500Hz and check that display reading is correct to within ± 10 digits of the input voltage.
28. Apply open circuit input, set CAL/RUN switch to RUN; press 'Test' and check for a display of 'PASS'.

Output Buffer Check

29. Select 1V range, AC + DC, no filter. Apply 1V DC and set CAL switch to RUN. Use the 'A-B' computation mode to null out the reading: press STORE, B, then (A-B).
30. Select filter, and leave to settle for at least 30 seconds. Check that the displayed reading is within ± 50 digits of zero.
31. Repeat (28).

The AC set-up procedure is now complete.

APPENDIX 1

ANALOG DATA LINE 'F.E.T.' PATTERNS

DC Voltage

Range		DC Isolator							
		AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1	100mV	0	0	0	0	0	1	1	X
2	100mV	0	0	0	0	0	1	1	X
3	1V	0	0	0	0	1	1	1	X
4	10V	0	0	0	0	1	0	1	X
5	100V	0	0	0	0	1	1	0	X
6	1000V	0	0	0	0	1	0	0	X
7	1000V	0	0	0	0	1	0	0	X

AC Voltage

Range		AC assembly							
		AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1	100mV	0	0	1	0	0	0	1	X
2	100mV	0	0	1	0	0	0	1	X
3	1V	0	0	1	0	0	0	0	X
4	10V	0	0	0	1	0	0	0	X
5	100V	0	0	0	0	1	0	0	X
6	1000V	0	0	0	0	0	1	0	X
7	1000V	0	0	0	0	0	1	0	X

DC Coupled AC Voltage

Range		AC assembly							
		AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1	100mV	0	1	1	0	0	0	1	X
2	100mV	0	1	1	0	0	0	1	X
3	1V	0	1	1	0	0	0	0	X
4	10V	0	1	0	1	0	0	0	X
5	100V	0	1	0	0	1	0	0	X
6	1000V	0	1	0	0	0	1	0	X
7	1000V	0	1	0	0	0	1	0	X

Ohms

Range	DC Isolator								Ohms assembly							
	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1 10 Ω	0	0	0	0	0	1	1	X	0	0	0	0	0	0	1	X
2 100 Ω	0	0	0	0	1	1	1	X	0	0	0	0	0	0	1	X
3 1k Ω	0	0	0	0	1	1	1	X	0	0	0	0	0	1	0	X
4 10k Ω	0	0	0	0	1	1	1	X	1	0	0	0	0	0	0	X
5 100k Ω	0	0	0	0	1	1	1	X	0	0	0	0	1	0	0	X
6 1M Ω	0	0	0	0	1	1	1	X	0	0	1	1	0	0	0	X
7 10M Ω	0	0	0	0	1	1	1	X	0	1	0	1	0	0	0	X

DC Current

Range	DC Isolator								Current assembly							
	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1 100 μ A	0	0	0	0	0	1	1	X	0	1	0	0	0	0	1	X
2 100 μ A	0	0	0	0	0	1	1	X	0	1	0	0	0	0	1	X
3 1mA	0	0	0	0	0	1	1	X	1	0	0	0	0	0	1	X
4 10mA	0	0	0	0	0	1	1	X	1	1	1	0	0	0	1	X
5 100mA	0	0	0	0	0	1	1	X	1	1	0	1	0	0	1	X
6 1A	0	0	0	0	0	1	1	X	1	1	0	0	1	0	1	X
7 1A	0	0	0	0	0	1	1	X	1	1	0	0	1	0	1	X

AC Current

Range	AC assembly								Current assembly							
	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1 100 μ A	0	0	1	0	0	0	1	X	0	1	0	0	0	1	0	X
2 100 μ A	0	0	1	0	0	0	1	X	0	1	0	0	0	1	0	X
3 1mA	0	0	1	0	0	0	1	X	1	0	0	0	0	1	0	X
4 10mA	0	0	1	0	0	0	1	X	1	1	1	0	0	1	0	X
5 100mA	0	0	1	0	0	0	1	X	1	1	0	1	0	1	0	X
6 1A	0	0	1	0	0	0	1	X	1	1	0	0	1	1	0	X
7 1A	0	0	1	0	0	0	1	X	1	1	0	0	1	1	0	X

DC Coupled AC Current

Range	AC assembly								Current assembly							
	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1 100 μ A	0	1	1	0	0	0	1	X	0	1	0	0	0	1	0	X
2 100 μ A	0	1	1	0	0	0	1	X	0	1	0	0	0	1	0	X
3 1mA	0	1	1	0	0	0	1	X	1	0	0	0	0	1	0	X
4 10mA	0	1	1	0	0	0	1	X	1	1	1	0	0	1	0	X
5 100mA	0	1	1	0	0	0	1	X	1	1	0	1	0	1	0	X
6 1A	0	1	1	0	0	0	1	X	1	1	0	0	1	1	0	X
7 1A	0	1	1	0	0	0	1	X	1	1	0	0	1	1	0	X

TEST

Function Tested	Range Checked	DC Isolator								Option assembly							
		AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
DC	.1	0	0	0	0	0	1	0	1								
	1	0	0	0	0	1	1	0	1								
	10	0	0	0	0	1	0	0	1								
k Ω	10	0	0	0	0	1	1	1	1	Ohms assembly							
										0	1	0	1	0	0	0	1
AC	.1	Not used								AC assembly							
	1									0	1	1	0	0	0	1	0
I	.1									I assembly							
										0	1	0	0	0	0	1	1

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1	090001	P.T.C. THERMISTOR	MULLARD	YA 8650	2
R2	090001	P.T.C. THERMISTOR	MULLARD	YA 8650	-
R3	000151	150Ω 1/4 W CARBON	MULLARD	CR25	8
R4	000151	150Ω " " "	"	"	-
R5	000151	150Ω " " "	"	"	-
R6	000102	1K 1/4 W. CARBON	"	CR25	2
R7	000104	100K 1/4 W. CARBON	MULLARD	CR25	1
R8	000151	150Ω 1/4 W. CARBON	MULLARD	CR25	-
R9	000151	150Ω " " "	"	"	-
R10	000151	150Ω " " "	"	"	-
R11	000151	150Ω " " "	"	"	-
R12	000151	150Ω " " "	"	"	-
R13	000102	1K " " "	"	"	-
R14	000472	4K7 " " "	"	"	1
AN1	090032	150R x7 2% NETWORK	BECKMAN	764 - 1 - R150	2
AN2	090032	" " " "	"	"	-
C1	102101	100PF CER DISC	ERIE	801	1
C2	150002	10μF 20% 16V DIP TANT	UNION CARBIDE	K10E16	2
C3	150016	1.0μF 20% 35V "	UNION CARBIDE	K10E35	2
C4	101103	0.01μF 250V CER DISC	ERIE	801	3

NOTES CIRCUIT DIAG 430294
 CHECK PROC. 460294
 CHECK LIST 470294
 SEE SHEET 2 FOR LATEST ISSUE

11	12	13							
1661	1815	1823							
10.9.84	10.1.85	23.1.85							
MD	MD	MD							
			6	7	8	9	10		
ISS	C	D	1	2	3	4	5	6	7
ECO	-	-	RELEASED	ECO 778	BIG 788	B67	888	1111	1213
DATE	-	17-8-78	29-9-78	6-12-78	25-3-79	11-JUN-79	26-OCT-78	21-4-80	11-6-81
CHKD	-	MD	MD	MD	MD	MD	MD	MD	MD

DATE	28-4-78	datron ELECTRONICS LTD
DRAWN	B.J.	
CHECKED	<i>[Signature]</i>	TITLE
APPROVED		1061/1071/1081
DATE		FRONT P.C.B. ASSY
		DRAWING NUMBER
		400294
		SHEET
		2 OF 6

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C5	101103	0.01μF 250V CER DISC	ERIE	801	-
C6	150016	1.0μF 20% 35V DIP TANT	UNION CARBIDE	K10E35	-
C7	101103	0.01μF 250V CER DISC	ERIE	801	-
C8	150002	10μF 20% 16V DIP TANT	UNION CARBIDE	K10E16	-
C9	104023	2μF 20% 1KV CER DISC	ITT	HD16K102N2M5-SSIK0D5C	1
C10		NOT USED			
C11	150006	4μF 20% 16V DIP TANT	UNION CARBIDE	K4R7E16	1
Q1	240001	Si NPN	NATIONAL	BC184K	6
Q2	240001	Si NPN	NATIONAL	BC184K	-
Q3	240001	" "	"	"	-
Q4	240001	" "	"	"	-
Q5	240001	" "	"	"	-
Q6	240001	" "	"	"	-
M1	290042	GP. HIGH CURRENT TRANS ARRAY	R.C.A.	CA3081P	3
M2	280011	DUAL D FUP. FLOP	MOTOROLA	MC14013 BCP	1
M3	290042	GP. HIGH CURRENT TRANS ARRAY	R.C.A.	CA3081P	-
M4	280015	QUAD LATCH	MOTOROLA	MC14076	7

NOTES.
 SEE SHEET 2 FOR LATEST ISSUE

ISS									
ECO									
DATE									
CHKD									

DATE		datron ELECTRONICS LTD
DRAWN	B.J.	
CHECKED	<i>[Signature]</i>	TITLE
APPROVED		1061/71/81
DATE		FRONT P.C.B. ASSY
		DRAWING NUMBER
		400294
		SHEET
		3 OF 6

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
M5	280015	QUAD LATCH	MOTOROLA	MC14076	-
M6	280015	" "	"	"	-
M7	280067	16WAY. KEYBOARD ENCODER	NATIONAL	MM74C922	2
M8	280015	QUAD LATCH	MOTOROLA	MC14076	-
M9	280015	QUAD LATCH	"	"	-
M10	280067	16WAY. KEYBOARD ENCODER.	NATIONAL	MM74C922	-
M11	280015	QUAD LATCH	MOTOROLA	MC14076	-
M12	280015	" "	"	"	-
M13	290042	6P. HIGH CURRENT TRANS ARRAY	RCA	CA3081P	-
S1	700019	SLIDE SWITCH	SIEMENS	C-42315-A60-A1	2
S2	700019	" "	"	"	-
S3	700061	KEYBOARD SWITCH. RED. LED	SCHADOW	SRL-RED LED	24
S4	700061	" " " "	"	" " "	-
S5	700061	" " " "	"	" " "	-
S6	700061	" " " "	"	" " "	-
S7	700061	" " " "	"	" " "	-
S8	700061	" " " "	"	" " "	-
S9	700061	" " " "	"	" " "	-
S10	700062	KEYBOARD SWITCH. GREEN LED	SCHADOW	SRL-GREEN LED	2

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																				
E.C.O.																				
DATE																				
CHKD																				

DATE		datron ELECTRONICS LTD		
DRAWN	B.J		TITLE	1061/71/81
CHECKED	<i>AKB</i>		FRONT. P.C.B. ASSY	
APPROVED			DRAWING NUMBER	400294
DATE			4 SHEET OF 6	

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
S11	700061	KEYBOARD SWITCH. RED. LED	SCHADOW	SRL-RED LED	-
S12	700061	" " " "	"	" " "	-
S13	700061	" " " "	"	" " "	-
S14	700061	" " " "	"	" " "	-
S15	700061	" " " "	"	" " "	-
S16	700061	" " " "	"	" " "	-
S17	700061	" " " "	"	" " "	-
S18	700061	" " " "	"	" " "	-
S19	700061	" " " "	"	" " "	-
S20	700061	" " " "	"	" " "	-
S21	700061	" " " "	"	" " "	-
S22	700061	" " " "	"	" " "	-
S23	700061	" " " "	"	" " "	-
S24	700061	" " " "	"	" " "	-
S25	700061	" " " "	"	" " "	-
S26	700061	" " " "	"	" " "	-
S27	700061	" " " "	"	" " "	-
S28	700062	KEYBOARD SWITCH. GREEN LED	SCHADOW	SRL-GREEN LED	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																				
E.C.O.																				
DATE																				
CHKD																				

DATE		datron ELECTRONICS LTD		
DRAWN	B.J		TITLE	1061/71/81
CHECKED	<i>AKB</i>		FRONT. P.C.B. ASSY	
APPROVED			DRAWING NUMBER	400294
DATE			5 SHEET OF 6	

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	400573	SIGNAL CABLE ASSY			1
	450451-2	RMIO INSULATOR.			1
	410090-7	PRINTED CIRCUIT BOARD			1
	450179-1	TERMINAL PLATE.			1
	605060	IC. SOCKET 14 WAY	AUGAT	314-AG-39D	1
	605061	IC. SOCKET 16 WAY	AUGAT	316-AG-39D	10
	605062	IC. SOCKET 18 WAY	AUGAT	318-AG-39D	2
	630099	MASKING TAPE	3M		A/R
	630024	INSULATING BEADS			8
	800017	8 1/2 DIGIT DISPLAY	DALE		1
	920015	Low E.M.F. TERM. BLK/BLK	CLIFF	TPI - SPECIAL	1
	920041	" " " " BLK/RED	CLIFF	" "	1
	920042	Not Low E.M.F. TERM BLK/WH	"	TPI	1
	920043	" " " " BLK/BRN	"	"	1
	920044	" " " " BLK/BLUE	"	"	1
	920045	" " " " BLK/YELLOW	"	"	1
	630029	DOUBLE SIDED PRESSURE SENSITIVE TAPE. 3M		TYPE 4032	290mm
	420080-1	WARNING LABEL			1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																			
ECD																			
DATE																			
CHKD																			

DATE		datron ELECTRONICS LTD	
DRAWN	B.T.P.	TITLE	1061/71/81
CHECKED	<i>[Signature]</i>	FRONT. P.C.B. ASSY.	
APPROVED		DRAWING NUMBER	400294
DATE		SHEET OF 6	

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1		NOT USED			-
R2	066200	20R POT 3/8 SQ VERT. CERMET	BECKMAN	72XW	1
R3	000221	220R. 5% 1/4W CARBON	MULLARD	CR25	1
R4	014320	432R 1% M.F.	HOLCO	H.8	1
R5	000102	1K 5% 1/4W CARBON	MULLARD	CR25	2
R6	0011B4	180K 5% 1/2W CARBON	MULLARD	CR37	1
R7	066102	1K 3/8" RIGHT ANGLED CER. POT.	BECKMAN	72XW	1
R8	014021	4K02 1% 1/8W M.F.	HOLCO	H.8.	1
R9	019091	9K09 1% 1/8W M.F.	HOLCO	H.8.	1
R10	012001	2K 1% 1/8W M.F.	HOLCO	H.8.	1
R11	011302	13K 1% 1/8W M.F.	HOLCO	H.8.	1
R12	066501	500R 3/8" RIGHT ANGLED CER. POT.	BECKMAN	72XW	1
R13	000102	1K 5% 1/4W CARBON.	MULLARD	CR25	-
L1	370001	10μH 0-852 R.F. CHOKE.	PLESSEY	58/10/0011/10	3
L2	370001	10μH " " "	"	"	-
L3	370001	10μH " " "	"	"	-
C1	NOT USED				-
C2	NOT USED.				-
C3	NOT USED.				-

NOTES. CIRCUIT DIAG. 430295.
CHECK PROC. 460295.
CHECK LIST 470295.
SEE SHEET 2 FOR LATEST ISSUE

ISS	C	D	1	2	3	4	5	6	7	8	9	10	
E.C.D.	-	-	RELEASED	ECO 783	ECO BIG	15.29.1688	15.9.83	20.8.84	108.091	1441	1452	1470	1517
DATE	-	22.8.78	29.9.78	8.12.78	25.3.79	6. JUN 79	31.10.79	21.4.80	11.2.83	16.2.83	1.6.83	16.8.83	
CHKD	-	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	

DATE	2-5-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE 1061/1071/1081	
CHECKED	PH.	REAR P.C.B. ASSY.	
APPROVED		DRAWING NUMBER	400295
DATE		SHEET	2 OF 6

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C4		NOT USED			-
C5	101103	0.01μF 250V CER DISC	ERIE	801	3
C6	180026	10μF 350V ELECT	ITT	EN12/12 10/550	1
C7	180004	4700μF 16V AL ELECT	WIMA	PRINTILYT	1
C8	104026	47nF +50% 50V CER DISC	SIEMENS	B37449	1
C9	150003	47μF 20% 6V3 DIP. TANT	UNION CARBIDE	K47E6V3	1
C10	150021	22μF 20% 25V DIP. TANT	UNION CARBIDE	K22E25	2
C11	150021	" " " "	"	"	-
C12	101103	0.01μF 250V CER. DISC.	ERIE	801	2
C13	180025	1000μF 35V ELECT.	WIMA	PRINTILYT	-
C14	101103	0.01μF 250V CER DISC	ERIE	801	-
C15	180025	1000μF 35V ELECT	WIMA	PRINTILYT	1
C16	102102	1nF 10% 500V CER DISC	ITT	CD10.	1
D1	200022	Si RECTIFIER 3A 400V	MOTOROLA	BY252	2
D2	200022	" " "	"	"	-
D3	210068	6V8 400mW ZENER	MULLARD	BZY88C6V8	1
D4	213004	180V 500mW ZENER	MOTOROLA	1N5279B	1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS												
E.C.D.												
DATE												
CHKD												

DATE	2-5-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE 1061/171/81	
CHECKED	PH.	REAR P.C.B. ASSY.	
APPROVED		DRAWING NUMBER	400295
DATE		SHEET	3 OF 6

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
Q1	240018	300V. N.P.N. TRANSISTOR	MOTOROLA	MJE 340	2
Q2	240018	" " "	"	"	-
M1	260068	5V 1/2A REGULATOR	NATIONAL	LM309K/ALUM	1
M2	260024	POSITIVE VOLTAGE REGULATOR	FAIRCHILD	UA78 MGUIC	1
M3	260023	NEGATIVE VOLTAGE REGULATOR	FAIRCHILD	UA79 MGUIC	1
W1	209014	1A5 400V BRIDGE RECT	MICRO-ELECTRONICS	W004	1
W2	209003	100V.15A BRIDGE RECT	MICRO-ELECTRONICS	W001	1
J1					
J2	620003	SOLDER PCB TERMINAL WLG	HARWIN	H2105A	5
J3	604033	4 WAY FLAT GOLD WAFER PIN	MOLEX	22-27-2041/GOLD	17
J4	604033	" " " " " "	"	" " " "	-
J5	604033	" " " " " "	"	" " " "	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																			
E C O																			
DATE																			
CHKD																			

DATE	2-5-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	1061/71/81
CHECKED	M.K.H.	REAR P.C.B. ASSY.	
APPROVED		DRAWING NUMBER	400295
DATE		SHEET	4 OF 6

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
J6	604033	4WAY FLAT GOLD WAFER PIN	MOLEX	22-27-2041/GOLD	-
J7	604033	" " " " " "	"	"	-
J8					
J9	604033	4 WAY FLAT GOLD WAFER PIN	MOLEX	22-27-2041/GOLD.	-
J10	604033	" " " " " "	"	"	-
J11	604033	" " " " " "	"	"	-
J12	604033	" " " " " "	"	"	-
J13	604033	" " " " " "	"	"	-
J14					
	410091-5A	PRINTED CIRCUIT BOARD			1
	450180-2	HEATSINK 5V	ADVANCE		1
	450183-1	HEATSINK 15V	ADVANCE		3
	540002	22SWG TIN CU WIRE			A/R
	512999	7/2 PIPE WIRE WHITE		BSG210 TYPE C	A/R
	611037	SCREW M3x8mm. NYLON HEX HD.	NYLON # ALLOYS		8
	613005	WASHER M3 INT/SHAKEPROOF.ST.	GKN DISTRIBUTORS		4
	613017	WASHER M3 FLAT NYLON	NYLON # ALLOYS.		8
	615002	NUT. M3 FULL HEX STEEL	GKN	ZINC PLATED	4
	615008	NUT. M3 FULL HEX NYLON	GKN		2

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																			
E C O																			
DATE																			
CHKD																			

DATE	2-5-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	1061/71/81
CHECKED	M.K.H.	REAR P.C.B. ASSY	
APPROVED		DRAWING NUMBER	400295
DATE		SHEET	5 OF 6

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	611016	SCREW M3 x 2mm STEEL PD2- PAN ZINC PL	GKN		6
	618007	MELNEX WASHERS 12.7X16.5X0.05mm	JERMYN.	J26-5001	2
	620007	TEST POINT TERMINAL	MICROVAR	C 30	9
	618001	INSULATING BUSH	JERMYN	A1218	2
	618009	INSULATING PAD SIL T03	WARTH	3223-07FR-06	1
	590004	SLEEVE - PTFE	HELLERMANN ELECTRIC	FE 10	A/R.
	900004	SILICONE RUBBER COMPOUND	RS.	554-119.	A/R
	490080-1	WARNING LABEL			2
	613029	M3 CRINKLE WASHER SS			2
	613009	4 BA SOLDER TAG BRASS	TINPL.		2
	590001	SLEEVE MAX. CABLE ϕ 3.0	HELLERMANN ELECTRIC	H15x20mm BLACK HELSYN	3
	590006	HEATSHRINK SLEEVE ϕ 2.4 INT	RS OR HELLERMANN ELECTRIC	399-495 OR LVR24	20mm
	630024	STEATITE BEAD 16 SWG	PARK ROYAL PORCELAIN	N ^o 2	2

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS											
ECO											
DATE											
CHKD											

DATE	2-5-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	1061/71/81
CHECKED	HM		REAR P.C.B ASSY
APPROVED		DRAWING NUMBER	400295
DATE		SHEET	6 OF 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
J2	572115 /C	16WAY RIBBON CABLE ASSY	DATRON		1
J3	604035	ACCT. RIGHT ANGLED WAFER .GOLD	MOLEX	22-12-2041	5
J4	604035	" " " " " "	"	"	-
J6	604035	" " " " " "	"	"	-
	410092-5A	P.C.B.			1
J1 & J5	604036	STRIP OF 10 AMP PINS	AMP	163740-8	4
	630023	SCOTCHFLEX ADHESIVE CLIP	3M	CLIP 706	1
	630099	25mm MASKING TAPE	3M	SCOTCH N.230	A/R
	620007	TEST POINT TERMINAL	MICROVAR	C 30	2
R1	000473	47K 5% 1/4W CARBON	MULLARD	CR25	2
R2	000473	47K " " " "	"	"	-
D1	200002	Si RECTIFIER 1A 50V	FAIRCHILD	IN4001	2
D2	200002	" " " " " "	"	"	-

NOTES CIRCUIT DIAGRAM . 430296
CHECK PROC. . 460296.
CHECK LIST . 470296.
SEE SHEET 2 FOR LATEST ISSUE

DATE	2-5-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	1061/71/81
CHECKED	<i>[Signature]</i>	CENTRE P.C.B. ASSY	
APPROVED		DRAWING NUMBER	400296
DATE		SHEET	2 OF 2

ISS	C	D	1	2	3	4	5	6	7	8
RELEASED			ECO 784	ECO 849	ECO 904	992	1000	1102	1217	
DATE		25-8-78	29-9-78	6-12-78	4-5-79	11-6-79	25-10-79	18-1-80	14-4-80	18-8-81
CHND		MD		MD	MD	MP	MP	MD	MD	MP

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
J2	604035	RIGHT ANGLED WAFER PIN .GOLD	MOLEX	22-12-2041	12
J3	604035	" " " " " "	"	"	-
J4	604035	" " " " " "	"	"	-
J5	604035	" " " " " "	"	"	-
J6	604035	" " " " " "	"	"	-
	410093-4	PONDED CIRCUIT BOARD			1
	510111	7/0-2 BROWN WIRE			120mm
J1 & J7	604036	STRIP OF 10 AMP PINS	AMP	163740-8	2
	605053	12 WAY POLARISED SOCKET	MOLEX	22-01-2125	2
	605057	GOLD CRIMP PINS	MOLEX	4809-GL	7
	606004	PLASTIC POLARISING PEG	MOLEX	4161-1	4
	540002	22 S.W.G. TIN CU WIRE			A/R
	590001	SLEEVE MAX CABLE Ø3.0	HELLERMANN ELECTRIC	HIS X 20mm BLK HELSYN	1

NOTES CIRCUIT DIAGRAM . 430297.
CHECK PROC. . 460297.
CHECK LIST . 470297.
SEE SHEET 2 FOR LATEST ISSUE

DATE	28-4-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	1061/71/81
CHECKED	<i>[Signature]</i>	L.H. PCB ASSEMBLY	
APPROVED		DRAWING NUMBER	400297
DATE		SHEET	2 OF 2

ISS	C	D	1	2	3	4	5	6	7	8
RELEASED			ECO 7	ECO 7						
DATE		24-8-78	29-9-78	11-6-79						
CHND		MD		MD						

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R1	000334	330K 5% 1/4W CARBON	MULLARD	CR25	2
R2	000334	" " " "	"	"	-
	410094-C/A	P.C.B.			1
	540002	22SWG TIN. CU. WIRE			A/R
J2	574270/C	24WAY RIBBON CABLE ASSY	DATRON		1
J1 & J3	604036	STRIP OF 10AMP PINS	AMP	163740-8	4
	590001	SLEEVE MAX CABLE Ø 3.0	HELLERMANN ELECTRIC	H15x20mm BLK. HELSYN	2
	630099	25mm MASKING TAPE	3M	SCOTCH N.230	A/R

NOTES CIRCUIT DIAGRAM - 430298
CHECK PROC. - 460298
CHECK LIST - 470298

SEE SHEET 7 FOR LATEST ISSUE

	C	D	1 ^c	2	3	4	5	6
ISSU	-	-	RELEASED	EC0850	0867/504	943	1217	1474
DATE	-	24-8-78	29-9-78	4-5-79	11-6-79	10-9-79	18-8-81	3-6-83
CHNG	-	MD	MD	MD	MD	MD	MD	

DATE	28-4-78	datron ELECTRONICS LTD	
BY	B.J.	1061/71/81	
APPROV	<i>[Signature]</i>	R.H. PCB ASSEMBLY	
DATE		400298	SHEET 2 OF 2

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D1	200001	75mA. 75V. G.P. SL DIODE.	FAIRCHILD.	IN414B.	5
D2	200008	200mA. 125V. LL. SL DIODE.	FAIRCHILD.	IN458A.	3
D3	200008	200mA. 125V. LL. SL DIODE.	FAIRCHILD.	IN458A.	-
D4	200008	200mA. 125V. LL. SL DIODE.	FAIRCHILD.	IN458A.	-
D5	200001	75mA. 75V. G.P. SL DIODE.	FAIRCHILD.	IN414B.	-
D6	200001	75mA. 75V. G.P. SL DIODE.	FAIRCHILD.	IN414B.	-
D7	200001	75mA. 75V. G.P. SL DIODE.	FAIRCHILD.	IN414B.	-
D8	200001	75mA. 75V. G.P. SL DIODE.	FAIRCHILD.	IN414B.	-
D9		NOT USED			
D10		NOT USED			
D11	220020	FET DIODE 100 pA I _r .	TELEDYNE.	PAD100	2
D12	220020	FET DIODE 100 pA I _r .	TELEDYNE.	PAD100	-
D13	200022	3A. 400V. G.P. SL DIODE.	MOTOROLA	BY252	4
D14	200022	3A. 400V. G.P. SL DIODE.	MOTOROLA	BY252	-
D15	200022	3A. 400V. G.P. SL DIODE.	MOTOROLA	BY252	-
D16	200022	3A. 400V. G.P. SL DIODE.	MOTOROLA	BY262	-

NOTES

SEE SHEET 2 FOR LATEST ISSUE

ISS																				
E.C.O.																				
DATE																				
CHKD																				

DATE 17 JULY 79	datron ELECTRONICS LTD
DRAWN W.G. SMITH	
CHECKED	TITLE CURRENT P.C.B
APPROVED	DRAWING NUMBER 400304
DATE	4 SHEET OF 7

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
Q1		NOT USED			
Q2	250001	SI P.N.P. TRANSISTOR.	NATIONAL.	BC214/ TO18	2
Q3		NOT USED			
Q4	250001	SI P.N.P. TRANSISTOR.	NATIONAL.	BC214/ TO18	-
Q5		NOT USED			
Q6		NOT USED			
Q7	230003	N-CHAN J FET.	TELEDYNE.	U1B99 JF	1
Q8	230035	N-CHAN J FET.	TELEDYNE.	U1B97 JF	2
Q9	230002	N-CHAN J FET.	TELEDYNE.	U1B94 JF	1
Q10	230035	N-CHAN J FET.	TELEDYNE.	U1B97 JF	-
M1	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	2
M2	280011	DUAL D FLIP FLOP	MOTOROLA	MC14013 BCP	1
M3	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M4	270059	7x DARLINGTON DRIVER	SPRAGUE/ EXAR	ULN2004A/ XR2204CP	1
M5	260027	714 OP AMP	FAIRCHILD	UA 714 HC.	1

NOTES

SEE SHEET 2 FOR LATEST ISSUE

ISS																				
E.C.O.																				
DATE																				
CHKD																				

DATE 17 JULY 79	datron ELECTRONICS LTD
DRAWN W.G. SMITH	
CHECKED	TITLE CURRENT P.C.B
APPROVED	DRAWING NUMBER 400304
DATE	5 SHEET OF 7

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
ANI		NOT USED			
RL1	* 330017	RELAY REED LOW THERMAL.	OMRON	G2E 182PH	2
RL2	* 330017	RELAY REED LOW THERMAL.	OMRON	G2E 182PH	-
RL3	330019	RELAY 4P2W 7V HOLD-IN	P&B	SEE DRAWING	1
RL4	330018	RELAY 2P2W 7V HOLD-IN	P&B	SEE DRAWING	1
	400379/1	MOLEX TERMINAL/WIRE ASSY	DATRON		1
	410104-EA	PRINTED CIRCUIT BOARD			1
	452112	RELAY BRACKET			2
	540008	7/2 PTFE INSULATED WHITE WIRE		TVEPC	BOTOM TOTAL
	620007	TEST POINT TERMINAL	MICROVAR	C30	5
	590001	SLEEVE BLACK	HELLERMAN ELECTRIC	H16x20mm HELYSYN	10
	605056	CRIMP TERMINAL	MOLEX	4809-TL	3
J1	571095/c	16 WAY AP/3M RIBBON CABLE	DATRON		1
	605060	14 WAY D.I.L. SOCKET	ASTRALUX OR JERMYN	1CL-143-S3T	1
	605061	16 WAY D.I.L. SOCKET	ASTRALUX OR JERMYN	1CL-163-S6T	3
	605051	4 WAY POLARISED SOCKET	MOLEX	(22-01-2045) 6471-4-1	1
J3	605052	8 WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-8-1	1
J2	605053	12 WAY POLARISED SOCKET	MOLEX	(22-0-2125) 6471-12-1	1
	605057	CRIMP TERMINAL	MOLEX	4809-GL	8

NOTES * ALTERNATIVE 330014 OR 330013

DATE: 17 JULY 79

DRAWN: W.G. SMITH

CHECKED:

APPROVED:

TITLE: CURRENT P.C.B.

DRAWING NUMBER: 400304

SHEET OF 7

datron ELECTRONICS LTD

TITLE: CURRENT P.C.B.

DRAWING NUMBER: 400304

SHEET OF 7

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	611004	SCREW M3x6 POSI PAN			2
	613005	WASHER M3 INT/SHAKEPROOF			2
	615002	NUT M3 FULL HEX			2
	615005	NUT 3-4B UNC FULL HEX			2
	613014	WASHER M2.5 INT SHAKEPROOF			2
	617010	NYLATCH PLUNGER	C. J. FOX & SON	HN3P-32-4-1	4
	617011	NYLATCH GROMMET	C. J. FOX & SON	HN3G	4
	620003	SOLDER P.C.B TERMINAL LUG	HARWIN	H2105A	13
	630024	STANDARD STEATITE INSUL BEAD	PARK ROYAL PORCELAIN CO.	TYPE N° 2 (16SWG)	24
	920082	FUSE HOLDER. 20mm P/MTG	BELLING & LEE	L2002	1
	920071	FUSE 1.6A QUICK ACTING 20mm	BESWICK	9501-1.6-F-250V	1
	590004	SLEEVE - PTFE	HELLERMANN ELECTRIC	FE10	A/R
	590055	SLEEVE Ø1.0 SIL. RUBBER	" "	H15 CONT. BLACK	30mm

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

DATE: 17 JULY 79

DRAWN: W.G. SMITH

CHECKED:

APPROVED:

TITLE: CURRENT P.C.B.

DRAWING NUMBER: 400304

SHEET OF 7

datron ELECTRONICS LTD

TITLE: CURRENT P.C.B.

DRAWING NUMBER: 400304

SHEET OF 7

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1	000123	12K 5% 1/4W CARBON	MULLARD	CR25	3
R2	000332	3K3	"	"	6
R3	000332	3K3	"	"	-
R4	000103	10K	"	"	6
R5	000123	12K	"	"	-
R6	000222	2K2	"	"	2
R7	000222	2K2	"	"	-
R8	000123	12K	"	"	-
R9	000333	33K	"	"	1
R10	000562	5K6	"	"	1
R11	000103	10K	"	"	-
R12	000105	1M	"	"	1
R13	000332	3k3	"	"	-
R14	000103	10k	"	"	-
R15	000332	3k3	"	"	-
R16	000332	3k3	"	"	-
R17	000681	680R	"	"	2
R18	000681	680R	"	"	-
R19	000332	3k3	"	"	-
R20	000103	10k	"	"	-
R21	000103	10K	"	"	-
R22	000103	10k	"	"	-

15

1	2	3	4	5	6	7	8	9
RELEASED 26-3-75	902/887	972	981	1021	1085	1166	1199	1329
MD	MD	MD	MD	MD	MD	MD	MD	MD

5-3-79
B.J.
MD

datron ELECTRONICS LTD
REAR INPUT / RATIO ASSY.
DRAWING NUMBER 400307. SHEET 3 OF 8

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C1	150022	2u2F 20% 35V DIP. TANT	UNION CARBIDE	K2R2E35	2
C2	150022	2u2F 20% 35V DIP. TANT	UNION CARBIDE	K2R2E35	-
C3	150020	10uF 20% 25V DIP. TANT	UNION CARBIDE	K10E25	2
C4	150020	10uF 20% 25V DIP. TANT	UNION CARBIDE	K10E25	-
C5	102101	100uF 10% 500V CER DISC	ITT	CD10	1
C6	110013	100nF 20% 250V POLYESTER	MULLARD	C280AEP100K	1
C7	150014	680nF 20% 35V DIP. TANT	UNION CARBIDE	KR68E35	2
C8	150014	680nF 20% 35V DIP. TANT	UNION CARBIDE	KR68E35	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	E.C.O.	DATE	CHKD						

DATE 23.9.80	datron ELECTRONICS LTD TITLE REAR INPUT/RATIO 1061/1071 DRAWING NUMBER 400307 SHEET 4 OF 8
DRAWN JL	
CHECKED	
APPROVED	
DATE	

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D1	200001	75mA 75V GP. SI DIODE	FAIRCHILD	1N4148	8
D2	200001	" " " " " "	"	"	-
D3	200001	" " " " " "	"	"	-
D4	200001	" " " " " "	"	"	-
D5	200001	" " " " " "	"	"	-
D6	200001	" " " " " "	"	"	-
D7	200001	" " " " " "	"	"	-
D8	200001	" " " " " "	"	"	-
Q1	240001	SI NPN TRANSISTOR	NATIONAL	BC184/TO18	4
Q2	240001	" " " " " "	"	"	-
Q3	250001	SI PNP TRANSISTOR	NATIONAL	BC214/TO18	2
Q4	250001	" " " " " "	"	"	-
Q5	240001	SI NPN TRANSISTOR	NATIONAL	BC184/TO18	-
Q6	240001	" " " " " "	"	"	-
M1	280011	DUAL D FLIP-FLOP	MOTOROLA	MC14013 BCP	1
J1	604036	CON. PIN STRIP OF 10, HORIZ. TYPE	AMP	163740-B	2
J2, J3	605052	8 WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-B-1	2

NOTES

SEE SHEET 8 FOR LATEST ISSUE

5-3-79
DRAWN B.J.
CHECKED MD

datron ELECTRONICS LTD
REAR INPUT / RATIO ASSY.
DRAWING NUMBER 400307 5 8

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
J4 & J6	604036	FLAT WAFER PIN (4WAY GOLD)	MOLEX	22-27-2041 / GOLD	3
J5	605051	4WAY POLARISED SOCKET	MOLEX	22-01-2045	1
	400379/4	WIRE / TERMINAL ASSY.	HOLDEN CORDS		6
	400379/5	" " " " " "	"		4
RL1 & RL4	330018	RELAY 2P2W 7V HOLD-IN	P&B	SEE DRAWING	2
RL2 & RL3	330019	RELAY 4P2W 7V HOLD-IN	P&B	SEE DRAWING	2
	410106-5	COMPONENT PCB			1
	410132-4	RELAY PCB			1
	450185-1	SOCKET PLATE			1
	450241-1	RELAY BRACKET			1
	540002	22SWG TINNED COPPER WIRE			A/R
	540008	7/2 PTFE INS. WHITE WIRE			140mm

NOTES

SEE SHEET 8 FOR LATEST ISSUE

DATE 5-3-79
DRAWN B.J.
CHECKED MD

datron ELECTRONICS LTD
TITLE REAR INPUT / RATIO ASSY
DRAWING NUMBER 400307 6 OF 8

ISS									
E.C.O.									
DATE									
CHKD.									

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	590001	SLEEVE MAYCABLE ϕ 3-D _{min}	HELLERMANN ELECTRIC	H15 X 20 _{min} BLK HELSYN	25
	590004	SLEEVE - PTFE	" "	FE10	A/R
	602007	RELAY SOCKET 2POLE PCB MOUNT	POTTER & BRUMFIELD	27E 212	1
	602008	RELAY SOCKET 4POLE PCB MOUNT	" "	27E 213	1
J10, J11	604008	7WAY PLUG PANEL MOUNT	PVE CONNECTORS	M7P	2
	605009	7 WAY SOCKET	PVE CONNECTOR	M7S	2
	605060	14 WAY DIL SOCKET	ASTRALUX OR JERMYN	ICU-246-54T OR A23-2023Y	1
	605057	CRIMP TERMINAL	MOLEX	14008-GL	2
	606001	LOCKING HOOD	PVE CONNECTORS	MHN	2
	606002	NUT	PVE CONNECTORS	MN	2
	606003	WASHER	" "	MLW	2
	611004	SCREW M3X6 _{min} STEEL POZI-PAN. ZINC PLATED	GKN		7
	611007	SCREW M3X6 _{min} STEEL POZI-CSK. ZINC PLATED	GKN		7
	611016	" M3XB _{min} " " PAN " " "	" "		4
	612020	STANDOFF NYLON M3X19 TRANSPIILLAR. W.K. ELECTRONICS	TPI/G.S/19/MS/I/I		5

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS	
ECD	
DATE	
CHKD	

DATE 5-3-79	datron ELECTRONICS LTD
DRAWN BJ	TITLE REAR INPUT / RATIO ASSY
CHECKED MD	DRAWING NUMBER 400307
APPROVED	SHEET OF 7 OF 8

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	613005	WASHER M3 INT/SHAKEPROOF ST.	GKN DISTRIBUTORS	ZINC PLATED	13
	615001	NUT B8A FULL HEX STEEL		ZINC PLATED	2
	615002	" M3 " " "		" "	2
	630005	CLIP FOR P#B RIO 2POLE RELAY	POTTER & BRUMFIELD	20C249	1
	630028	CLIP FOR P#B RIO 4POLE RELAY	" "	20C250	1
	700069	DPDT SLIDE SWITCH	WAYCOM	5-5022C003-0 + 3/4 TRIGGER & STYLE 2/C PCB MOUNT, CONTACTS.	1

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS	
ECD	
DATE	
CHKD	

DATE 5-3-79	datron ELECTRONICS LTD
DRAWN BJ	TITLE REAR INPUT / RATIO ASSY
CHECKED MD	DRAWING NUMBER 400307
APPROVED	SHEET OF 8 OF 8

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1	000102	1K0 5% 1/4W CARBON	MULLARD	CR25	1
R2	0006B2	6KB " " "	"	"	1
R3	080001	PTC THERMISTOR	MULLARD	VAB650	2
R4	080001	" " "	"	"	-
R5	066102	1K0 3/8 SQ VERTICAL POT	BECKMAN	72XW	1
R6	000104	100K 5% 1/4W CARBON	MULLARD	CR25	1
R7	070128	21K51 0.1% WIRE WOUND	MANN	MX 125	1
R8	070066	10K 0.1% WIRE WOUND	MANN	MX 125	1
C1	101103	0.01μF 250V CER DISC	ITT	CD10K31N00JS 5550030	2
C2	101103	0.01μF " " "	"	"	-
C3 *	102330	33 pF 500V CER DISC	ITT	CD10PG 33 P0JS 5550030	1 *
C4	102330	33 pF " " "	"	"	1
C5	110013	0.1μF 20% 250V POLYESTER	MULLARD	C280AE/P100K	1

NOTES * ONLY REQUIRED WHEN MI ALTERNATIVE (TYPE 101) IS USED.
 CCT DIAG. 430308
 CHECK PROC 460308. CHECK LIST 470308
 SEE SHEET 2 FOR LATEST ISSUE

ISS	1	2	3							
E.C.O.	RELEASED	907	945							
DATE	27.12.78	20.6.79	10.9.79							
CHKD	MD	MD	SI							

DATE	22-11-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	
CHECKED	MD	ANALOGUE OUTPUT PCB ASSY.	
APPROVED		DRAWING NUMBER	400308
DATE		SHEET	2 OF 4

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D1	213001	10V 5W ZENER	MOTOROLA	1N5347	2
D2	213001	10V " "	"	"	-
M1 *	260002	OP AMP	FAIRCHILD	μA741C	1 *
M2	260026	OP AMP	NATIONAL	LM212H	1
	400379/4	WIRE / TERMINAL ASSY	HOLDEN CORPS.		5
	410107-3	P.C.B.			1
	450186 -1	SOCKET PLATE.			1
	510600	7/2 PVC INSUL (BLACK) WIRE			50mm
	510222	7/2 PVC INSUL (RED) WIRE			50mm
	590001	SLEEVE MAX CABLE φ 3.0	HELLERMANN ELECTRIC	H15X20mm BLACK HELSW	2
	605007	5 WAY SOCKET	PVE CONNECTORS	M55	1
V1	605052	B WAY POLARISED SOCKET	MOLEX	(22-01-20B5)6471-B-1	1

NOTES * MI ALTERNATIVE 260025 (LM101).

SEE SHEET 2 FOR LATEST ISSUE

ISS										
E.C.O.										
DATE										
CHKD.										


DATE	22-11-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	
CHECKED		ANALOGUE OUTPUT PCB ASSY	
APPROVED		DRAWING NUMBER	400308
DATE		SHEET	3 OF 4

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	606001	LOCKING HOOD	PYE CONNECTORS	MHN	1
	606002	NUT	" "	MN	1
	606003	WASHER	" "	MLW	1
	612019	STANDOFF LOCKING TYPE 7/8	NYLON: RICHCO	LCBS-14R	4
	620003	SOLDER PCB TERMINAL LUG	HARWIN	H2105A	2
	630024	INSULATING BEADS, STEATITE.		(TYPE NO2)	8
	620007	TEST POINT TERMINAL	MICROVAR	C30	5
	* 604006	5 WAY PLUG	PYE CONNECTORS.	MSP.	1
	* 611016	SCREW POSI-PAN M3x8			4
	* 613005	SHAKE-PROOF WASHER M3			4

NOTES * FITTED AT FINAL ASSEMBLY.

SEE SHEET 2 FOR LATEST ISSUE

ISS	<input checked="" type="checkbox"/>																		
I C O																			
DATE																			
CHKD																			

DATE	28-11-78	
DRAWN	B.J.	
CHECKED		
APPROVED		
TITLE	ANALOGUE OUTPUT PCB ASSY.	
DRAWING NUMBER	400308	SHEET OF 4

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1	000104	100K 5% 1/4W CARBON	MULLARD	CR25	15
R2	000101	100R " " "	"	"	4
R3	000101	100R " " "	"	"	-
R4	000105	1M 10% " " "	"	"	11
R5	000822	8K2 " " "	MULLARD	CR25	3
R6	011302	13K0 1% 50ppm MF	HOLCO	HBC	2
R7	011302	13K0 " " "	"	"	-
R8	000101	100R 5% 1/4W CARBON	MULLARD	CR25	-
R9		NOT USED			
R10	000101	100R 5% 1/4W CARBON	"	"	-
R11		FSV		CR25	-
R12	000472	4K7 " " "	"	"	12
R13	000104	100k " " "	"	"	-
R14	000472	4K7 " " "	"	"	-
R15		FSV		CR25	-
R16	050038	6K34 1% 15ppm MF	ACI	EE-0-100-C4	2
R17	050037	4K75 1% 15ppm MF	ACI	EE-0-100-C4	2
R18		PART OF KIT WITH D59			
R19		PART OF KIT WITH D60			
R20	063203	20K POT CERMET -	BECKMAN	72P	1
R21	000104	100K 5% 1/4W CARBON	MULLARD	CR25	-
R22	000102	1K " " "	"	"	8
R23	063504	500K POT CERMET	BECKMAN	72P	2

NOTES	CIRCUIT DIAGRAM = 450328	18	19	20	21	22	23	24	DATE	datron ELECTRONICS LTD
	CHECK PROCEDURE = 460328	1244 1248	1245 73	1282	1460	1512	1645/1649	1659	12-7-78	
	CHECK LIST = 470328	2 11 81	4 1 82	23 7 82	25 5 83	17 8 83	12 6 84	3 9 84	DRAWN	TITLE 1061 ANALOGUE PCB ASSEMBLY.
SEE SHEET 2 FOR LATEST ISSUE		MD	MD	MD	MD	MD	MD	MD	BJ	
ISS	10	11	12	12	14	15	16	17	CHECKED	DRAWING NUMBER 400328
ECO	1000	1098.1107	1128.1050.117	1144.1166	1114.1182.1184.	1182.1191.1190.1193.1192	1217	1217	2x1		SHEET OF 24
DATE	28-10-78	18 1 80	27 2 80	15 4 80	2 6 80	23 9 80	5 1 81	8 8 80	APPROVED	
CHKD	MD	MD	MD	MD	MD	MD	MD	MD	DATE	

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R24	000824	820K 5% 1/4W CARBON	MULLARD	CR25	2
R25	000122	1K2 5% 1/4W CARBON	MULLARD	CR25	1
R26	000185	1M8 10% 1/4W CARBON	"	"	1
R27	000275	2M7 5% 1/4W CARBON	"	"	3
R28	000222	2K2 5% 1/4W CARBON	"	"	7
R29	000100	10R " " "	"	"	8
R30	000100	10R " " "	"	"	-
R31	000473	47K " " "	"	"	3
R32	000393	39K " " "	"	"	1
R33	000473	47K " " "	"	"	-
R34	000102	1K " " "	"	"	-
R35	000104	100k " " "	"	"	-
R36	000104	100k " " "	"	"	-
R37	000562	5K6 " " "	"	"	3
R38	050034	825R 1% 15ppm MF	ACI	EE0-100 C4	2
R39	050053	64R2 1% 1/10W 15ppm MF	"	EE-0-10-64R2-F-C4	2
R40	050053	64R2 1% 1/10W 15ppm MF	"	EE-0-10-64R2-F-C4	-
R41		NOT USED			-
R42	050031	196R 1% 15ppm MF	ACI	EE 0-100 C4	2
R43	019768	97R6 1% 50ppm MF	HOLCO	HBC	2
R44		NOT USED			
R45		NOT USED			
R46	000182	1K8 5% 1/4W CARBON	MULLARD	CR25	1

NOTES	SEE SHEET 2 FOR LATEST ISSUE	DATE	12-7-78	datron ELECTRONICS LTD
ISS		DRAWN	BJ		TITLE 1061 ANALOGUE PCB ASSEMBLY.
ECO		CHECKED		DRAWING NUMBER 400328
DATE		APPROVED			3 SHEET OF 24
CHKD		DATE		

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R47	000100	10R 5% 1/4W CARBON	MULLARD	CR25	-
R48	000103	10K " " "	"	"	12
R49	000103	10K " " "	"	"	-
R50	000103	10K " " "	"	"	-
R51	000100	10R " " "	"	"	-
R52	000334	330K " " "	"	"	4
R53	000334	330K " " "	"	"	-
R54	000334	330K " " "	"	"	-
R55	000334	330K " " "	"	"	-
R56	000104	100K " " "	"	"	-
R57	000221	220R " " "	"	"	3
R58	000821	820R " " "	"	"	1
R59	000563	56K " " "	"	"	6
R60	000222	2K2 " " "	"	"	-
R61	000105	1M0 10% 1/4W CARBON	"	"	-
R62	000105	1M0 " " "	"	"	-
R63	000221	220R 5% 1/4W CARBON	"	"	-
R64		NOT USED			
R65	000102	1K 5% 1/4W CARBON	"	"	-
R66	000183	18K " " "	"	"	1
R67	000562	56K " " "	"	"	-
R68	018060	806R 1% 50ppm MF	HOLCO	HB	2
R69	000114	110K 5% 1/4W CARBON	MULLARD	CR25	2

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS														
E C O														
DATE														
CHKD														

DATE	12-7-78	datron ELECTRONICS LTD
DRAWN	B.J.	
CHECKED		TITLE
APPROVED		1061 ANALOGUE PCB ASSEMBLY.
DATE		DRAWING NUMBER
		40032B
		SHEET
		4 OF 24

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R70	018060	806R 1% 50 ppm MF	HOLCO	HB	-
R71	070115	12K0 1% 10ppm WW	MANN	MX125	2
R72	000472	4K7 5% 1/4W CARBON	MULLARD	CR25	-
R73	000103	10K " " "	"	"	-
R74	000275	2M7 " " "	"	"	-
R75	000565	56G " " "	"	"	1
R76	000106	10M 10% 1/4W CARBON.	"	"	2
R77	000226	22M " " "	ALLEN BRADLEY	CB2261	1
R78	000473	47K 5% 1/4W CARBON	MULLARD	CR25	-
R79	000392	3K9 " " "	"	"	2
R80	000104	100K " " "	"	"	-
R81	000472	4K7 " " "	"	"	-
R82	000472	4K7 " " "	"	"	-
R83	000472	4K7 " " "	"	"	-
R84	011378	13R7 1% 1/8W MF	HOLCO	HB	1
R85		NOT USED			
R86	000472	4K7 5% 1/4W CARBON	MULLARD	CR25	-
R87	000114	110K " " "	"	"	-
R88		NOT-USED			
R89	050031	196R 1% ppm MF	ACI	EE 0-100-C4	-
R90	019768	97R6 1% 50ppm MF	HOLCO	HBC	-
R91		NOT USED			
R92		NOT USED			

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS														
E C O														
DATE														
CHKD														

DATE	12-7-78	datron ELECTRONICS LTD
DRAWN	B.J.	
CHECKED		TITLE
APPROVED		1061 ANALOGUE PCB ASSEMBLY.
DATE		DRAWING NUMBER
		40032B
		SHEET
		5 OF 24

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R139	000336	33M 10% 1/4W CARBON	ALLEN-BRADLEY	CB3361	1
R140	090049	18M MATCHED PAIR	HOLCO		1 PAIR
R141	090049	18M " "	"		
R142	000272	2K7 5% 1/4W CARBON	MULLARD	CR25	1
R143	090039	3M3, 10M INPUT ATTEN. SET	MANN		1 SET.
R144:	000100	10R 5% 1/4W CARBON	MULLARD	CR25	-
R145	000100	10R " " "	"	"	-
R146	000222	2K2 " " "	"	"	-
R147	000752	7K5 " " "	"	"	1
R148	090039	100K, 10M INPUT ATTEN. SET.	MANN		-
R149	090039	3M3, " " " "	"		-
R150	063204	200K POT CERMET	BECKMAN	72P	1
R151	063205	2M POT CERMET	"	"	1
R152	011000	100R 1% MF (DO NOT SOLDER)	HOLCO	H8C	1
R153	011822	18K2 1% 1/8W MF	HOLCO	H8	1
R154	000103	10K 5% 1/4W CARBON	MULLARD	CR25	-
R155	000221	220R " " "	"	"	-
R156	090039	3M3, 10M INPUT ATTEN. SET	MANN		-
R157	000103	10K 5% 1/4W CARBON	MULLARD	CR25	-
R158	000332	3K3 " " "	"	"	1
R159	063103	10K POT CERMET	BECKMAN	72P	1
R160	063504	500K " " "	"	"	-
R161	000104	100K 5% 1/4W CARBON	MULLARD	CR25	-

NOTES:

SEE SHEET 2 FOR LATEST ISSUE

ISS										
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DATE	12-7-78	datron ELECTRONICS LTD	TITLE 1061 ANALOGUE PCB ASSEMBLY.				
DRAWN	B.J.						
CHECKED							
APPROVED							
DATE		DRAWING NUMBER	400328	SHEET	8	OF	24

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R162	000392	3K9 5% 1/4W CARBON	MULLARD	CR25	-
R163	000107	100M 10% 1/4W CARBON	ALLEN-BRADLEY	CB1071	1
R164	000104	100K 5% 1/4W CARBON	MULLARD	CR25	-
R165	000104	100K " " "	"	"	-
R166	000563	56K 5% " " "	"	"	-
R167	000562	56K " " "	"	"	-
R168	000563	56K " " "	"	"	-
R169	000563	56K " " "	"	"	-
R170	000564	560K " " "	"	"	2
R171	000564	560K " " "	"	"	-
R172	000335	3M3 10% 1/4W CARBON	MULLARD	CR25	1
R173	000680	68R 5% " " "	"	"	2
R174	000152	1K5 " " "	"	"	2
R175	000822	8K2 " " "	"	"	-
R176	000680	68R " " "	"	"	-
R177	000152	1K5 " " "	"	"	-
R178	000822	8K2 " " "	"	"	-
R179	440067	PART OF KIT	DATRON.		1
R180	440067	" " "	"		-
R181	440067	" " "	"		-
R182	000472	4K7 5% 1/4W CARBON	MULLARD	CR25	-
R183	000472	4K7 5% " " "	"	"	-
R184	000270	27R " " "	"	"	2

NOTES:

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ISS										
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DATE	12-7-78	datron ELECTRONICS LTD	TITLE 1061 ANALOGUE PCB ASSEMBLY.				
DRAWN	B.J.						
CHECKED							
APPROVED							
DATE		DRAWING NUMBER	400328	SHEET	9	OF	24

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R185	000270	27R 5% 1/4W CARBON	MULLARD	CR25	-
R186	000104	100K " " "	"	"	-
R187	000222	2K2 " " "	"	"	-
R188	000103	10K " " "	"	"	-
R189	000103	10K " " "	"	"	-
R190	000561	560R " " "	"	"	2
R191	000561	560R " " "	"	"	-
R192	000155	1M5 " " "	"	"	1
R193	000104	100K " " "	"	"	-
R194	011213	121K 1% 1/8W MF	HOLCO	H8	-
R195	015112	51K1 " " "	"	"	1
R196	000223	22K 5% 1/4W CARBON	MULLARD	CR25	-
R197	000222	2K2 " " "	"	"	-
R198	011002	10K 1% 1/8W MF	HOLCO	H8	1
R199	008007	10R 5% 0.2W CARBON	MULLARD	CR16	2
R200	008007	10R " " "	"	"	-
R201	000824	820K 5% 1/4W CARBON	MULLARD	CR25	-
R202	000103	10K " " "	"	"	-
R203	000104	100K " " "	"	"	-
R204	000105	1M " " "	"	"	-
R205	000105	1M " " "	"	"	-
R206	000563	56K " " "	"	"	-
R207	000103	10K " " "	"	"	-

NOTES.

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ISS																				
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DATE	12-7-78	datron ELECTRONICS LTD TITLE 1061 ANALOGUE PCB ASSEMBLY. DRAWING NUMBER 400328 SHEET 10 of 24
DRAWN	BJ	
CHECKED		
APPROVED		
DATE		

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R208	000333	33K 5% 1/4W CARBON	MULLARD	CR25	1
R209	000563	56K " " "	"	"	-
R210	000103	10K " " "	"	"	-
R211	050038	6K34 1% 15ppm MF	ACI	EE-0.100 C4	-
R212	050034	825R 1% 15ppm MF	ACI	EE-0.100 C4	-
R213	050037	4K75 1% 15ppm MF	ACI	EE-0.100 C4	-
R214	070115	12K0 1% 10ppm WW	MANN	MX125	-
R215	000271	270R 5% 1/4W CARBON	MULLARD	CR25	-
R216	000271	270R 5% 1/4W CARBON	MULLARD	CR25	-
R217		NOT USED			-
R218	050063	P.T.C. THERMISTOR	TEXAS	TSP102 K	1
R219	000224	220K 5% 1/4W CARBON	MULLARD	CR25	3
R220	000124	120K " " "	"	"	-
R221	000224	220K " " "	"	"	-
R222	000224	220K " " "	"	"	-
R223					
R224	012212	22K1 1% 1/8W 50ppm MF	HOLCO	H8C	2
R225	012212	22K1 1% 1/8W 50ppm MF	HOLCO	H8C	-
R226	000223	22K 5% 1/4W CARBON	MULLARD	CR25	-
R227	000471	470R 5% 1/4W CARBON	MULLARD	CR25	1
R228		NOT USED			-
R229		NOT USED			-
R230		NOT USED			-

NOTES.

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ISS																				
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DATE	12-7-78	datron ELECTRONICS LTD TITLE 1061 ANALOGUE PCB ASSEMBLY. DRAWING NUMBER 400328 SHEET 11 of 24
DRAWN	BJ	
CHECKED		
APPROVED		
DATE		

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R231	000104	100K 5% 1/4W CARBON	MULLARD	CR25	-
R232		NOT USED			-
R233	000102	1K 5% 1/4W CARBON	MULLARD	CR25	-
R234	000102	1K 5% 1/4W CARBON	MULLARD	CR25	-
R235	000102	1K 5% 1/4W CARBON	MULLARD	CR25	-
R236	016192	61k9 1% 1/8W 50ppm MF	HOLCO	H8C	2
R237	016192	61k9 1% 1/8W 50ppm MF	HOLCO	H8C	-
R238	000104	100K 5% 1/4W CARBON	MULLARD	CR25	-
R239	000102	1K 5% 1/4W CARBON	MULLARD	CR25	-
R240	000472	4k7 5% 1/4W CARBON	MULLARD	CR25	-
R241	000331	330R 5% 1/4W CARBON	MULLARD	CR25	1
R242	000103	10K 5% 1/3W CARBON	MULLARD	CR25	-
AN 1	090050	3K3 SIL NETWORK	BECKMAN	764-1-R3-3K	1
AN 2	090042	R-2R LADDER NETWORK	ERIE		1
C1	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E 25	12
C2	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E 25	-
C3	104017	0.5pF 500V CER DISC	ERIE	B31	1

NOTES.

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ISS											
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DATE	29-10-79	datron ELECTRONICS LTD	
DRAWN	B. JACKSON	TITLE	1061 ANALOGUE PCB ASSY.
CHECKED		APPROVED	
DATE		DRAWING NUMBER	40032B
		SHEET	12 OF 24

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C4	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C5	102471	470pF 500V CER DISC	ERIE	B01	3
C6	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C7	150020	10μF " " " "	" " " "	" " " "	-
C8	102150	15pF 500V CER DISC	ERIE	B01	1
C9	140016	0.47μF 400V POLYPROP	RIFA	PHE412 HFK	1
C10	110015	0.015μF 63V POLYESTER	WIMA	FKS2	1
C11	120026	680pF 20% 100V POLYCARB	WIMA	FKC2 MIN	1
C12	120004	680nF 10% 63V POLYCARB	ASHCROFT	A2B6811B	1
C13	102101	100pF 500V CER DISC	ERIE	B01	3
C14	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C15	150020	10μF " " " "	" " " "	" " " "	-
C16	102101	100pF 500V CER DISC	ERIE	B01	-
C17	102100	10pF 500V CER DISC	ERIE	B01	1
C18	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C19	150020	10μF " " " "	" " " "	" " " "	-
C20	102470	47pF 500V CER DISC	ERIE	B01	4
C21	102470	47pF 500V CER DISC	ERIE	B01	-
C22	102101	100pF 500V CER DISC	"	"	6
C23	101103	0.01μF 250V CER DISC	"	"	-
C24	101103	0.01μF 250V CER DISC	"	"	-
C25	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C26	102471	470pF 500V CER DISC	ERIE	B01	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

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DATE	12-7-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	1061 ANALOGUE PCB ASSEMBLY.
CHECKED		APPROVED	
DATE		DRAWING NUMBER	40032B
		SHEET	13 OF 24

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C27	101103	0.01μF 250V CER DISC	ERIE	801	-
C28	102470	47pF 500V " "	"	"	-
C29	102470	47pF 500V " "	"	"	-
C30		NOT USED			
C31	130073	1nF 5% 160V POLYSTYRENE	SUFLEX	HSC1000/S-10/100	1
C32	101103	0.01μF 250V CER DISC	ERIE	801	-
C33	110013	0.1μF 10% 250V POLYESTER	MULLARD	C280AE/P100K	3
C34	101103	0.01μF 250V CER DISC	ERIE	801	-
C35	120016	2n2F 20% 100V POLYCARB	WIMA	FKC 2MIN.	1
C36	102471	470pF 500V CER DISC	"	"	-
C37	110013	0.1μF 10% 250V POLYESTER	MULLARD	C280 AE/P100K	-
C38	102102	1nF 10% 500V CER DISC	ITT	CD10	2
C39	440067	PART OF KIT	DATRON.		-
C40	440067	" " "	"		-
C41	440067	" " "	"		-
C42	110013	0.1μF 10% 250V POLYESTER	MULLARD	C280AE/P100K	-
C43	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C44	150020	10μF " " "	"	"	-
C45	180006	47μF 25V AL.ELECT	MULLARD	016-16479	2
C46	180006	47μF 25V " " "	"	"	-
C47	180022	33μF 40V " " "	"	016-17339	2
C48	180022	33μF 40V " " "	"	"	-
C49	180024	10μF 63V AL.ELECT	MULLARD	016-18109	2

NOTES.

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DATE	12-7-78	datron ELECTRONICS LTD TITLE 1061 ANALOGUE PCB ASSEMBLY DRAWING NUMBER 400328	SHEET 14 of 24
DRAWN	BJ		
CHECKED			
APPROVED			
DATE			

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C50	180024	10μF 63V AL.ELECT	MULLARD	016-18109	-
C51	101103	0.01μF 250V CER DISC	ERIE	801	-
C52	110017	0.022μF 10% 250V POLYESTER	MULLARD	C280AE/P22K	1
C53	102332	3n3F 500V CER DISC	ERIE	801	2
C54	102332	3n3F " " "	"	"	-
C55	440067	PART OF KIT.	DATRON.		-
C56	150016	1μF 20% 35V DIPTANT	UNION CARBIDE	K10E35	1
C57	130013	18pF ±1pF 160V POLYSTYRENE	SUFLEX	HS	1
C58	110027	3300pF 20% 100V POLYESTER	WIMA	FKS2-MIN	1
C59		NOT USED			-
C60	102222	2n2F 500V CER DISC	ERIE	801	1
C61		NOT USED			
C62		NOT USED			
C63		NOT USED			
C64	102102	1nF 10% 500V CER DISC	ITT	CD10	-
D1	200008	Si LOW LEAKAGE	FAIRCHILD	IN458A	25
D2	210056	CSV6 400mW ZENER	MULLARD	BZY 88C	2
D3	200008	Si LOW LEAKAGE	FAIRCHILD	IN458A	-
D4	210056	CSV6 400mW ZENER	MULLARD	BZY 88C	-
D5	200001	Si GEN. PURPOSE	FAIRCHILD	IN414B	19
D6	200008	Si LOW LEAKAGE	FAIRCHILD	IN458A	-

NOTES.

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DATE	12-7-78	datron ELECTRONICS LTD TITLE 1061 ANALOGUE PCB ASSEMBLY DRAWING NUMBER 400328	SHEET 15 of 24
DRAWN	BJ		
CHECKED			
APPROVED			
DATE			

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1	000103	10k 5% 1/4W CARBON	MULLARD	CR25	21
R2	000103	10k " " "	"	"	-
R3	000103	10k " " "	"	"	-
R4	000103	10k " " "	"	"	-
R5	000103	10k " " "	"	"	9
R6	000102	1k " " "	"	"	-
R7	000103	10k " " "	"	"	8
R8	000472	4k7 " " "	"	"	-
R9	000102	1k " " "	"	"	3
R10	000684	680k " " "	"	"	1
R11	063204	200k POT CERMET	BECKMAN	72P	-
R12	000103	10k 5% 1/4W CARBON	MULLARD	CR25	-
R13	000102	1k " " "	"	"	-
R14		NOT USED			-
R15	000472	4k7 5% 1/4W CARBON	"	"	3
R16	000332	3k3 " " "	"	"	2
R17	000683	68k " " "	"	"	7
R18	000222	2k2 " " "	"	"	1
R19	000393	39k " " "	"	"	14
R20	000104	100k			-
R21	000104	100k			-
R22	000104	100k " " "	"	"	-
R23	000221	220R " " "	"	"	2

NOTES. CIRCUIT DIAGRAM = 430329
CHECK PROCEDURE = 460329
CHECK LIST = 470329
SEE SHEET 2 FOR LATEST ISSUE

ISS	16	17	18	19	20	21	22	23	24	25	26	27
E.C.O	11.47	11.88	12.14	12.41	12.43.51.53	13.69	14.31	14.61	15.19	15.59	15.42.15.88	16.05
DATE	25.9.80	6.1.81	11.6.81	4.11.81	2.12.81	9.9.82	16.12.82	25.5.83	18.8.83	11.11.83	27.2.84	6.4.84
CHGD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD

DATE	26.6.78	datron ELECTRONICS LTD TITLE 1061 DIGITAL PCB. ASSY. DRAWING NUMBER 400329	2 of 16
DRAWN	JL		
CHECKED	P.R.R.		
APPROVED			

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R24	000102	1k 5% 1/4W CARBON	MULLARD	CR25	-
R25	000332	3k3 " " "	"	"	-
R26	000103	10k " " "	"	"	-
R27	000102	1k " " "	"	"	-
R28	000682	6k8 " " "	"	"	1
R29	000104	100k " " "	"	"	-
R30		NOT USED			-
R31	000472	4k7 " " "	"	"	-
R32	000472	4k7 " " "	"	"	-
R33	000222	2k2 " " "	"	"	-
R34	000104	100k " " "	"	"	-
R35	000104	100k " " "	"	"	-
R36	000104	100k " " "	"	"	1
R37	000106	10M 10% " " "	"	"	-
R38	000104	100k 5% " " "	"	"	-
R39	000103	10k " " "	"	"	-
R40	000103	10k " " "	"	"	-
R41	000332	3k3 " " "	"	"	-
R42	000103	10k " " "	"	"	-
R43	000104	100k " " "	"	"	-
R44	000103	10k " " "	"	"	-
R45	000364	360k " " "	"	"	1
R46	000472	4k7 " " "	"	"	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

DATE		datron ELECTRONICS LTD TITLE 1061 DIGITAL PCB. ASSY. DRAWING NUMBER 400329	3 of 16
DRAWN	JL		
CHECKED	P.R.R.		
APPROVED			

ISS												
E.C.O												
DATE												
CHGD												

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R47	000103	10k 5% 1/4W CARBON	MULLARD	CR25	—
R48	000104	100k " " "	"	"	—
R49	000103	10k " " "	"	"	—
R50	000104	100k " " "	"	"	1
R51	000562	5k6 " " "	"	"	1
R52	000224	220k " " "	"	"	1
R53	000123	12k " " "	"	"	1
R54	000105	1M " " "	"	"	—
R55	000684	680k " " "	"	"	1
R56	000823	82k " " "	"	"	—
R57		NOT USED			2
R58	000100	10R " " "	"	"	2
R59	000220	22R " " "	"	"	—
R60	000220	22R " " "	"	"	—
R61	000100	10R " " "	"	"	—
R62		NOT USED			—
R63	000222	2k2 5% 1/4W CARBON	MULLARD	CR25	—
R64	000222	2k2 " " "	"	"	—
R65	000103	10k " " "	"	"	—
R66	000103	10k " " "	"	"	1
R67	000271	270R " " "	"	"	—
R68	000103	10k " " "	"	"	1
R69	000561	560R " " "	"	"	—

NOTES.

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ISS																					
E.C.O.																					
DATE																					
CHKD																					

DATE		datron ELECTRONICS LTD	
DRAWN	IL	TITLE	1061 DIGITAL PCB. ASSY.
CHECKED	P.R.Z.	DRAWING NUMBER	400329
APPROVED		SHEET	4 OF 16
DATE			

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R70	000222	2k2 5% 1/4W CARBON	MULLARD	CR25	—
R71	000102	1k " " "	"	"	—
R72	000221	220R " " "	"	"	—
R73	000102	1k " " "	"	"	1
R74	000124	120k " " "	"	"	1
R75	000471	470R " " "	"	"	1
R76	000824	820k " " "	"	"	—
R77		NOT USED			—
R78		NOT USED			—
R79	000472	4k7 " " "	"	"	—
R80	000683	68k " " "	"	"	—
R81	000183	18k " " "	"	"	1
R82	000334	330k " " "	"	"	1
R83	063202	2K POT CERMET	BECKMAN	72 P	1
R84	000223	22k 5% 1/4W CARBON	MULLARD	CR25	—
R85	000472	4k7 " " "	"	"	—
R86		NOT USED			—
R87	000104	100k " " "	"	"	—
R88	000103	10k " " "	"	"	—
R89	000103	10k " " "	"	"	—
R90		NOT USED			1
R91	012002	20k0 1% 1/4W 50ppm MF	HOLCO	H8C	1
R92	015231	5k23 " " "	"	"	1

NOTES.

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ISS																					
E.C.O.																					
DATE																					
CHKD																					

DATE		datron ELECTRONICS LTD	
DRAWN	IL	TITLE	1061 DIGITAL PCB. ASSY.
CHECKED	P.R.Z.	DRAWING NUMBER	400329
APPROVED		SHEET	5 OF 16
DATE			

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C24	130016	130pF 2 1/2% 25V POLYSTYRENE	SUFLEX	HSQ130/2 1/2-7/25	1
C25	102471	470pF 500V CER DISC	ERIE	801	2
C26	150016	1uF 20% 35V DIP TANT	UNION CARBIDE	K10E16	-
C27	150002	10uF " 16V " "	" "	K10E16	-
C28	102220	22pF 500V CER DISC	ERIE	801	3
C29	150016	1uF 20% 35V DIP TANT	UNION CARBIDE	K10E16	-
C30	150002	10uF 20% 16V " "	" "	K10E16	-
C31	110005	.01uF 10% 250V POLYESTER	MULLARD	C280AE/PIOK	2
C32	110003	.068uF			1
C33	150014	.68uF 20% 35V DIP TANT	UNION CARBIDE	K10E16	1
C34	101103	.01uF 250V CER DISC	ERIE	801	-
C35	150002	10uF 20% 16V DIP TANT	UNION CARBIDE	K10E16	-
C36	101103	.01uF 250V CER DISC	ERIE	801	-
C37	102220	22pF 500V CER DISC		"	-
C38	102221	220pF 500V " "	"	"	-
C39	101103	.01uF 250V " "	"	"	-
C40	110005	10nF 20% 250V POLYESTER	MULLARD	C280AE/PIOK	-
C41	110027	3n3F 20% 100V POLYESTER	WIMA	FKS2MIN	1
C42	102471	470pF 500V CER DISC	ERIE	801	-
C43	102101	100pF 500V CER DISC.	"	801	-
C44	150002	10uF 20% 16V DIP TANT	UNION CARBIDE	K10E16	-
C45	150016	1uF 20% 35V " "	" "	K10E16	-
C46	102220	22pF 500V CER DISC	ERIE	801	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	E.C.O.	DATE	CHKD

DATE	datron ELECTRONICS LTD
DRAWN JL	
CHECKED P.R. PL	TITLE
APPROVED	1061 DIGITAL PCB. ASSY.
DATE	DRAWING NUMBER
	400329
	SHEET 8 OF 16

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C47	150004	100uF 20% 6V3 DIP TANT	UNION CARBIDE	K100E6V3	1
C48		NOT USED			-
C49	101103	.01uF 250V CER DISC	ITT	CD10	-
C50	102101	100pF 500V CER DISC	ITT	801	-
C51	102101	100pF 500V CER DISC	ITT	801	-
C52		NOT USED			-
C53	102221	220pF 500V CER DISC	ERIE	801	-
C54	130008	68pF 5% 160V POLYSTYRENE	SUFLEX	HS	1
C55	150016	1uF 20% 35V DIP TANT	UNION CARBIDE	K10E16	-
C56	104025	100nF ±20% 50V CER DISC	SIEMENS	B37449	2
C57	104025	100nF ±20% 50V CER DISC	SIEMENS	B37449	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	E.C.O.	DATE	CHKD

DATE	datron ELECTRONICS LTD
DRAWN JL	
CHECKED	TITLE
APPROVED	1061 DIGITAL PCB. ASSY.
DATE	DRAWING NUMBER
	400329
	SHEET 9 OF 16

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
MI	280011	DUAL D FLIP-FLOP	MOTOROLA	MC14013 BCP	2
M2	280022	QUAD BILATERAL SWITCH	"	MC14016BCP	1
M3	280024	TRI-STATE HEX NON-INV. BUFFER	"	MC14503BCP	7
M4	280024	" " " " " "	"	"	-
M5	280024	" " " " " "	"	"	-
M6	280024	" " " " " "	"	"	-
M7	280015	QUAD LATCH	"	MC14076 BCP	5
M8	280015	" "	"	"	-
M9	280015	" "	"	"	-
M10	280024	TRI-STATE HEX. NON-INV BUFFER	"	MC14503 BCP	-
M11	280015	QUAD LATCH	"	MC14076 BCP	-
M12	280015	" "	"	"	-
M13	280044	BINARY UP/DOWN COUNTER	"	MC14516 BCP	4
M14	280044	" " " " " "	"	"	-
M15	290003	TIMER - ASTABLE	SIGNETICS	NE 555V	3
M16	270058	DUAL 1-of-4 DECODER	NATIONAL	74LS155	1
M17	270048	QUAD 2 1/P NAND GATE	NATIONAL	74LS00	2
M18	290113-19	4k x 8 EPROM-SEE PROG. SPEC.		TMS 2532JL/PROGRAMMED	1
M19	280066-1	256 X 4 STATIC RAM	SEE DRAWING		2

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																				
ECD																				
DATE																				
CHKD																				

DATE		datron ELECTRONICS LTD	
DRAWN	IL		TITLE
CHECKED	P.R. 80		1061 DIGITAL PCB. ASSY.
APPROVED			DRAWING NUMBER
DATE		400329	SHEET OF 16

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
M20	280066-1	256 X 4 STATIC RAM	SEE DRG		-
M21	270064	QUAD TRISTATE BUFFER	NATIONAL	DM 74LS125N	1
M22	280011	DUAL D FLIP-FLOP	"	MC14013BCP	-
M23	270053-3	A-D CHIP	FERRANTI	ULA 2035H	1
M24	280024	TRI-STATE HEX. NON-INV. BUFFER	MOTOROLA	MC14503 BCP	-
M25	280024	" " " " " "	"	"	-
M26	280006	DUAL J-K FLIP-FLOP	"	MC14027 BCP	1
M27	280004	14BIT BINARY COUNTER	"	MC14020BCP	1
M28	270051	DUAL 4 1/P AND GATE	NATIONAL	74LS21	2
M29	270055	DUAL 4 1/P NAND GATE	"	74LS20	2
M30	290057-19	4k x 8 EPROM-SEE PROG. SPEC.		TMS 2532 JL/PROGRAM'D	1
M31	280096	1K x 4BIT STATIC CMOS RAM	SEE DRAWING		2
M32	270069	BCD DECIMAL DECODER LS	NATIONAL	DM 74LS42N	1
M33	270051	DUAL 4 1/P AND GATE	"	74LS21	-
M34	270055	DUAL 4 1/P NAND GATE	"	74LS20	-
M35	290056-19	4k x 8 EPROM-SEE PROG. SPEC.		TMS 2532 JL/PROGRAM'D	1
M36	280096	1K x 4BIT STATIC CMOS RAM	SEE DRAWING		-
M37	280025	QUAD BILATERAL SWITCH	MOTOROLA	MC14066BCP	2
M38	280071	TRIPLE 3 1/P NOR GATE	MULLARD	HEF 4025 P	2
M39	280017	HEX INVERTER	MOTOROLA	MC14069 BCP	1
M40	280083	QUAD 2 1/P NOR GATE	MULLARD	HEF 4001 BP	1
M41	280044	BINARY UP/DOWN COUNTER	MOTOROLA	MC14516 BCP	-
M42	280003	QUAD LATCH	"	MC14042 BCP	2

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																				
ECD																				
DATE																				
CHKD																				

DATE		datron ELECTRONICS LTD	
DRAWN	IL		TITLE
CHECKED	P.R. 80		1061 DIGITAL PCB. ASSY.
APPROVED			DRAWING NUMBER
DATE		400329	SHEET OF 16

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
M43	290003	TIMER - ASTABLE	SIGNETICS	NE 555V	-
M44	270048	QUAD 2 1/P NAND GATE	NATIONAL	74LS00	-
M45	270050	HEX INVERTER	"	74LS04	1
M46	280025	QUAD BILATERAL SWITCH	MOTOROLA	MC14066BCP	-
M47	280070	DIVIDE-BY-8 COUNTER/DIVIDER	MULLARD	HEF 4022P	1
M48	280071	TRIPLE 3 1/P NOR GATE	"	HEF 4025P	-
M49	280023	QUAD 2 1/P NOR GATE	MOTOROLA	MC14001 BCP	1
M50	280044	BINARY UP/DOWN COUNTER	"	MC14516 BCP	-
M51	280003	QUAD LATCH	"	MC14042 BCP	-
M52	270056	8 1/P NAND GATE	NATIONAL	74LS30	1
M53	280061	MICRO PROCESSOR CHIP	MOTOROLA	MC6800L	1
M54	270023	QUAD 2 1/P NAND GATE	NATIONAL	7437	1
M55	270054	QUAD 2 1/P AND GATE	"	74LS08	2
M56	270054	" " " "	"	"	-
M57	270057	DUAL JK FLIP-FLOP	"	74LS76	1
M58	280009	HEX INVERTER/BUFFER	MOTOROLA	MC14049	2
M59	280009	HEX INVERTER/BUFFER	MOTOROLA	MC14049	-
M60, M62	260031	VOLTAGE DETECTOR	INTERSIL	ICL8211	2
M61	290003	TIMER - ASTABLE	SIGNETICS	NE 555V	-
S1		NOT USED			-
S2		NOT USED			-
S3		NOT USED			-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	E C O	DATE	CHKD

DATE	datron ELECTRONICS LTD	
DRAWN IL.	TITLE	1061 DIGITAL PCB ASSY.
CHECKED P.R.ZE.		
APPROVED	DRAWING NUMBER	400329 14 SHEET OF 16
DATE		

1W 114

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
L1	370003	1000μH 40R R.F. CHOKE	SIGMA	SC10/1000	1
L2	370002	100μH .40R " "	TOKO	YXRS 18576	1
	590004	SLEEVE - PTFE	HELLERMAN ELECTRIC	FE10	A/R
TP1- TP33, LINKS	540002	22 SWG. BTC WIRE			A/R
	920048	BUS STRIP	MEKTRON	M823 14.7.3F	1
	590055	SLEEVE φ1.0 SIL. RUBBER	HELLERMAN ELECTRIC	HIS CONT. BLACK	10mm
	630098	COMPONENT CLIP	RICHCO	KKU-8	1
	606005	CLIP FOR 605002	ANTIFERRENCE	RC74	3
J1, J2, J4	605002	16 WAY D.I.L. LOW PROFILE SKT.	JERMYN OR ANTIFERRENCE	A23-2001/Y OR ICN-163-S3	3
	605065	28 WAY D.I.L. " " "	AUGAT	328-AG-39D	1
	605060	14 WAY D.I.L. SOCKET	ASTRALUX OR JERMYN	ICL 143-S3T	22
	605061	16 WAY D.I.L. SOCKET	" "	ICL 163-S6T	29
	605050	40 WAY D.I.L. SOCKET	AUGAT	340-AG-39D	1
	605063	22 WAY D.I.L. SOCKET	AUGAT	322-AG-39D	2
	605064	24 WAY D.I.L. SOCKET	"	324-AG-39D	3
	605062	18 WAY D.I.L. SOCKET	"	318-AG39D	2
JL3	604037	PROGRAMMING CLASS 160 PLUG	"	8136-4756-8	1
	605059	8 WAY D.I.L. SOCKET	ASTRALUX	ICL-083-S6T	1
J5	605052	8 WAY POLARISED SOCKET	"	22-01-2085	1
J3	605102	24 WAY D.I.L. SOCKET. GOLD	CA	CA-24-S-10SD	1
	410096-11B	PCB			1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	E C O	DATE	CHKD

DATE	datron ELECTRONICS LTD	
DRAWN IL.	TITLE	1061 DIGITAL PCB ASSY.
CHECKED P.R.ZE.		
APPROVED	DRAWING NUMBER	400329 15 SHEET OF 16
DATE		

1W 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1	000472	4k7 5% 1/4W CARBON	MULLARD	CR25	3
R2	000103	10k " " "	"	"	2
R3	000183	18k " " "	"	"	1
R4	000103	10k " " "	"	"	-
R5	000104	100k " " "	"	"	1
R6		NOT USED			-
R7		NOT USED			-
R8	000102	1k 5% 1/4W CARBON	MULLARD	CR25	19
R9	000102	1k " " "	"	"	-
R10	000102	1k " " "	"	"	-
R11	000102	1k " " "	"	"	-
R12	000102	1k " " "	"	"	-
R13	000102	1k " " "	"	"	-
R14	000102	1k " " "	"	"	-
R15	000102	1k " " "	"	"	-
R16		NOT USED			-
R17		NOT USED			-
R18	000102	1k " " "	"	"	-
R19	000102	1k " " "	"	"	-
R20	000102	1k " " "	"	"	-
R21		NOT USED			-
R22	000272	2k7 5% 1/4W CARBON	"	"	5
R23	000472	4k7 " " "	"	"	-

NOTES. CIRCUIT DIAGRAM = 430330
CHECK PROCEDURE = 460330
CHECK LIST = 470330

SEE SHEET 2 FOR LATEST ISSUE

DATE	2.5.78	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	1061 DISPLAY DRIVER PCB. ASSY.
CHECKED	MAP	DRAWING NUMBER	400330
APPROVED		SHEET	2 OF 7
DATE			

ISS	C	1	2	3	4	5	6	7	8	9
ECO	-	-	789	822	854	904	000104	12.17	12.53	15.88
DATE	2.5.78	29.9.78	17 Nov 78	20 FEB 79	10 MAY 79	21.6.79	3-1-80	17.8.81	2-12.81	1-3-83
CHKD	-	PH	M SD	A Z	NO	NO	A	NO	NO	NO

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R24	000272	2k7 5% 1/4W CARBON	MULLARD	CR25	-
R25	000272	2k7 " " "	"	"	-
R26	000272	2k7 " " "	"	"	-
R27	000182	1k8 " " "	"	"	1
R28	000222	2k2 " " "	"	"	1
R29	000272	2k7 " " "	"	"	-
R30	000102	1k " " "	"	"	-
R31	000102	1k " " "	"	"	-
R32	000102	1k " " "	"	"	-
R33	000102	1k " " "	"	"	-
R34	000102	1k " " "	"	"	-
R35	000102	1k " " "	"	"	-
R36	000102	1k " " "	"	"	-
R37	000102	1k " " "	"	"	-
R38	000472	4k7 " " "	"	"	-
R39	000393	39k " " "	"	"	1
R40		NOT USED			-
R41	000563	56K 5% 1/4W CARBON	MULLARD	CR25	1
C1	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	3
C2		NOT USED			-
C3		NOT USED			-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

DATE		datron ELECTRONICS LTD	
DRAWN		TITLE	1061 DISPLAY DRIVER PCB. ASSY.
CHECKED		DRAWING NUMBER	400330
APPROVED		SHEET	3 OF 7
DATE			

ISS	C	1	2	3	4	5	6	7	8	9
ECO										
DATE										
CHKD										

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C4	110013	0.1µF 20% 250V POLYESTER	MULLARD	C280AE/PIOK	8
C5	110013	" " " "	"	"	-
C6	110013	" " " "	"	"	-
C7	110013	" " " "	"	"	-
C8	110013	" " " "	"	"	-
C9	110013	" " " "	"	"	-
C10	110013	" " " "	"	"	-
C11	110013	" " " "	"	"	-
C12		NOT USED			-
C13	110005	0.01µF 20% 250V "	"	C280AE/PIOK	3
C14	150020	10µF 20% 25V. DIP. TANT	UNION CARBIDE	K10E25	-
C15	110005	0.01µF 20% 250V POLYESTER	MULLARD	C280AE/PIOK	-
C16	110005	0.01µF 20% 250V POLYESTER	MULLARD	K10E25	-
C17	150020	10µF 20% 25V. DIP. TANT	UNION CARBIDE	JF10-1006 250AA	1
C18	180019	10µF 20% 250V AL ELECT	I.T.T.		-
					-
D1		NOT USED			-
D2		NOT USED			-
D3		NOT USED			-
D4	200001	DIODE SI GP.	FAIRCHILD	IN4148	8
D5	200001	" " "	"	"	-
D6	200001	" " "	"	"	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS															
E.C.O.															
DATE															
CHRD															

DATE	datron ELECTRONICS LTD		
DRAWN	TITLE 1061 DISPLAY DRIVER PCB. ASSY.		
CHECKED	DRAWING NUMBER 400330 SHEET 4 OF 7		
APPROVED			
DATE			

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D7	200001	DIODE SI GP.	FAIRCHILD	IN4148	-
D8	200001	" " "	"	"	-
D9	200001	" " "	"	"	-
D10	200001	" " "	"	"	-
D11	200001	" " "	"	"	-
D12	213005	DIODE ZENER 75V. 1/2W	MOTOROLA	BZX79C75	1.
					-
Q1	250009	SI PNP TRANSISTOR	NATIONAL	2N5401	11
Q2	250009	" " "	"	"	-
Q3	250009	" " "	"	"	-
Q4		NOT USED			-
Q5	240009	SI NPN TRANSISTOR	"	MPS 101	8
Q6	240009	" " "	"	"	-
Q7	240009	" " "	"	"	-
Q8	240009	" " "	"	"	-
Q9	240009	" " "	"	"	-
Q10	240009	" " "	"	"	-
Q11	240009	" " "	"	"	-
Q12	240009	" " "	"	"	-
Q13	250009	" PNP	"	2N5401	-
Q14	250009	" " "	"	"	-
Q15	250009	" " "	"	"	-
Q16	250009	" " "	"	"	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS															
E.C.O.															
DATE															
CHRD															

DATE	datron ELECTRONICS LTD		
DRAWN	TITLE 1061 DISPLAY DRIVER PCB. ASSY.		
CHECKED	DRAWING NUMBER 400330 SHEET 5 OF 7		
APPROVED			
DATE			

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1		NOT USED			
R2	090001	P.T.C. THERMISTOR	MULLARD	VAB650	2
R3	090044	4M0 1% MF	ACI	"	(1SET) ^{#3} _{#24}
R4		3K94 1% MF	ACI		-
R5	000106	10M 5% 1/4W CARBON	MULLARD	CR25	5
R6	000392	3K9 " " "	"	"	2
R7	000106	10M " " "	"	"	-
R8	019761	9K76 1% 50ppm M.F.	HOLCO	H8	1
R9	090001	P.T.C. THERMISTOR	MULLARD	VAB650	-
R10		NOT USED			-
R11	000106	10M 5% 1/4W CARBON	MULLARD	CR25	-
R12	000563	56K " " "	"	"	2
R13	000563	56K " " "	"	"	-
R14	000104	100K " " "	"	"	6
R15	000243	24K " " "	"	"	1
R16	000682	6K8 " " "	"	"	1
R17	000103	10K " " "	"	"	3
R18	000107	100M " " "	"	"	1
R19	000104	100K " " "	"	"	-
R20	041505	15M 1% 100ppm CF	ALLEN BRADLEY	CC	2
R21	041505	15M " " "	"	"	-
R22	000222	2K2.5% 1/4W CARBON	MULLARD	CR25	2
R23	000391	390R " " "	"	"	1

NOTES:

SEE SHEET 2 FOR LATEST ISSUE

REV	1	2	3	4	5	6	7	8	9	10	11	12
DATE	5-12-78	27-2-79	4-5-79	20-6-79	15-7-79	25-10-79	3-1-80	6-FEB-80	18-4-80	3-6-80	20-6-80	12-12-80
CHKD												

DATE	10-10-78	datron ELECTRONICS LTD TITLE 1061 OHMS PCB ASSY. DRAWING NUMBER 400331	SHEET OF 12
DRAWN	B.V.		
CHECKED	D.C.		
APPROVED			

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R24	070093	57K77 0.1% WIREWOUND.	MANN		1
R25	070094	57K77 0.1% WIREWOUND.	MANN		1
R26	063204	200K POT CERMET	BECKMANN	72 P	2
R27	063204	200K " " "	"	"	-
R28	000106	10M 5% 1/4W CARBON	MULLARD	CR25	4
R29	070092	5K777 0.1% WIREWOUND	MANN		1
R30	070091	1K2839 0.1% WIREWOUND	MANN		2
R31	070091	1K2835 0.1% " "	"		-
R32	000332	3K3 5% 1/4W CARBON	MULLARD	CR25	1
R33	000154	150K 5% 1/4W CARBON	MULLARD	CR25	1
R34	000561	560R " " "	"	"	1
R35	000106	10M 5% 1/4W CARBON	MULLARD	CR25	-
R36	041005	10M 1% 100ppm CF	ALLEN BRADLEY	CC	1
R37	090049	18M MATCHED PAIR	HOLCO		1 PAIR
R38		18M)			-
R39		F.S.V			-
R40		F.S.V			-
R41	000473	47K 5% 1/4W CARBON	MULLARD	CR25	3
R42	000624	620K " " "	"	"	1
R43	000473	47K " " "	"	"	-
R44	000102	1K " " "	"	"	2
R45	000102	1K " " "	"	"	-
R46	000562	5K6 " " "	"	"	2

NOTES:

SEE SHEET 2 FOR LATEST ISSUE

REV												
DATE												
CHKD												

DATE	10-10-78	datron ELECTRONICS LTD TITLE 1061 OHMS PCB ASSY. DRAWING NUMBER 400331	SHEET OF 12
DRAWN	B.V.		
CHECKED			
APPROVED			

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R47	000473	47K 5% 1/4W CARBON	MULLARD	CR25	1
R48	000433	43K " " "	"	"	1
R49	000392	3K9 " " "	"	"	1
R50	000562	5K6 " " "	"	"	1
R51	000105	1M " " "	"	"	1
R52	000104	100K " " "	"	"	1
R53	000273	27K " " "	"	"	2
R54	000104	100K " " "	"	"	1
R55	000105	1M " " "	"	"	1
R56	000824	820K " " "	"	"	1
R57	000104	100K " " "	"	"	1
R58	000273	27K " " "	"	"	1
R59	000104	100K " " "	"	"	1
R60	000123	12K " " "	"	"	1
R61	000334	330K " " "	"	"	1
R62	000222	22K " " "	"	"	1
R63	000223	22K " " "	"	"	2
R64	000333	33K " " "	"	"	1
R65	000821	820R " " "	"	"	1
R66	000105	1M " " "	"	"	1
R67	000474	470K " " "	"	"	1
R68	000124	120K " " "	"	"	1
R69	000103	10K " " "	"	"	1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS														
ECD														
DATE														
CHKD														

DATE	10-10-78	datron ELECTRONICS LTD	
DRAWN	B J.		TITLE
CHECKED			1061 OHMS PCB ASSY
APPROVED			DRAWING NUMBER
DATE		400331	SHEET
			4 of 12

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R70	000221	220R 5% 1/4W CARBON	MULLARD	CR25	1
R71	000103	10k 5% 1/4W CARBON	MULLARD	CR25	1
R72	000333	33k 5% 1/4W CARBON	MULLARD	CR25	1
R73	000823	82k 5% 1/4W CARBON	MULLARD	CR25	1
R74	000106	10M 5% 1/4W CARBON	MULLARD	CR25	1
ANI	090017	100k x 7 2% NETWORK	BECKMAN	764-1-R100k	1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS														
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DATE	3.6.80	datron ELECTRONICS LTD	
DRAWN	JL.		TITLE
CHECKED			1061 OHMS PCB ASSY
APPROVED			DRAWING NUMBER
DATE		400331	SHEET
			5 of 12

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C1	120028	4700pF 20% 100V POLYCARB	WIMA	FKC-2 MIN	1
C2	120026	680pF 20% 100V POLYCARB	WIMA	FKC-2 MIN	1
C3	102470	47pF 500V CER DISC	ERIE	801	2
C4	102470	47pF 500V CER DISC	ERIE	801	-
C5	102222	2n2f 500V CER DISC	ERIE	801	1
C6	101103	.01µF 250V CER DISC	ERIE	801	4
C7	120022	1n5F 20% 100V POLYCARB	WIMA	FKC2 MIN	1
C8	120014	2.2µF 10% G3V POLYCARB	ASHCROFT	A2B22Z1B.	2
C9	120014	2.2µF " " "	"	"	-
C10	110013	0.1µF 10% 250V POLYESTER	MULLARD	C2B0AE/P100K	2
C11	150001	22µF 20% 16V DIP TANT	UNION CARBIDE	K22E1G	2
C12	101103	.01µF 250V CER DISC	ERIE	801	-
C13	150001	22µF 20% 16V DIP TANT	UNION CARBIDE	K22E1G	-
C14	101103	.01µF 250V CER DISC	ERIE	801	-
C15	102100	10pF 500V CER DISC	"	"	2
C16	102100	10pF " " " "	"	"	-
C17	102102	1nF " " " "	"	"	1
C18	120021	0.47µF 10% G3V POLYCARB	ASHCROFT	A2B4711B	1
C19	150014	680pF 20% 35V DIP TANT	UNION CARBIDE	KR6B35	1
C20	150016	1µF 20% 35V DIP TANT	UNION CARBIDE	K1R0E35	1
C21	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	2
C22	101103	.01µF 250V CER DISC	ERIE	801	-
C23	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	E.C.O.	DATE	CHKD.

DATE	10-10-78	datron ELECTRONICS LTD
DRAWN	B.J.	
CHECKED		TITLE
APPROVED		1061 OHMS PCB ASSY.
DATE		DRAWING NUMBER
		400331
		SHEET
		6 OF 12

1W 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C24	102101	100pF 10% 500V Cer Disc	I.T.T	CD 10	3
C25	102101	100pF " " " "	"	"	-
C26	102101	100pF " " " "	"	"	-
C27	110013	100nF 20% 250V POLYESTER	MULLARD	C2B0AE/P100K	-
C28	104025	100nF ±30% 50V CER DISC	SIEMENS	B37445	1
D1	213001	10V 5W ZENER	MOTOROLA	1N5347	4
D2	213001	10V " "	"	"	-
D3		NOT USED			
D4		NOT USED			
D5		NOT USED			
D6		NOT USED			
D7	210027	2V7 400mW ZENER	MULLARD	BZY88C2V7	1
D8	200001	Si G.P.	FAIRCHILD	1N4148	11
D9		NOT USED			
D10	213001	10V 5W ZENER	MOTOROLA	1N5347	-
D11	213001	10V " "	"	"	-
D12	200001	Si G.P.	FAIRCHILD	1N4148	-
D13		NOT USED			
D14	20000B	Si LOW LEAKAGE	FAIRCHILD	1N458A	3
D15	20000B	Si " "	"	"	-
D16	210075	7V5 400mW ZENER	MULLARD	BZY88C7V5	1
D17	210120	12V 400mW ZENER	"	BZY88C12	1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	E.C.O.	DATE	CHKD.

DATE	10-10-78	datron ELECTRONICS LTD
DRAWN	B.J.	
CHECKED		TITLE
APPROVED		1061 OHMS PCB ASSY.
DATE		DRAWING NUMBER
		400331
		SHEET
		7 OF 12

1W 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D18	200001	Si G.P.	FAIRCHILD	IN414B	-
D19	200001	Si "	"	"	-
D20	200001	Si "	"	"	-
D21	200001	Si "	"	"	-
D22	200001	Si "	"	"	-
D23	200001	Si "	"	"	-
D24		NOT USED			-
D25	200001	Si "	"	"	-
D26	200001	Si "	"	"	-
D27	200001	Si GP.	"	"	-
D28	200008	Si Low LEAKAGE	"	IN458A	-
Q1	230027	N-CHAN J FET SELECTED	TELEDYNE	U3114E.	7
Q2	230027	" " "	"	"	-
Q3	230027	" " "	"	"	-
Q4	230027	" " "	"	"	-
Q5	250002	N-CHAN J FET	SILICONIX	U1994E	6
Q6	230027	N-CHAN J FET SELECTED	TELEDYNE	U3114E	-
Q7	230027	" " "	"	"	-
Q8	230002	N-CHAN J FET	SILICONIX	U1994E.	-
Q9	230002	" " "	"	"	-
Q10	240017	Si NPN SUPERMATCH PAIR	NATIONAL	LM394	1
Q11	230029	N-CHAN J FET	SILICONIX	J309	4

NOTES.										DATE	datron ELECTRONICS LTD	
SEE SHEET 2 FOR LATEST ISSUE										10-10-78	TITLE	
ISS										DRAWN	B.J.	1061 OHMS PCB ASSY.
E C D										CHECKED		
DATE										APPROVED		
CHKD										DATE		DRAWING NUMBER 400331 SHEET OF 12

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
Q12		NOT USED			
Q13	240012	Si NPN	NATIONAL	2N3053	1
Q14	230027	N-CHAN J FET	TELEDYNE	U3114E	-
Q15	250001	Si PNP	NATIONAL	BC 214	2
Q16	250011	Si PNP	NATIONAL	BC 327	1
Q17	240001	Si NPN	NATIONAL	BC 184	2
Q18	240001	Si NPN	NATIONAL	BC 184	-
Q19	250001	Si PNP	NATIONAL	BC 214	-
Q20	230002	N-CHAN J FET	SILICONIX	U1994E	-
Q21	230029	N-CHAN J FET.	SILICONIX	J309	-
Q22	230029	N-CHAN J FET.	SILICONIX	J309	-
Q23	230002	" "	"	U1994E	-
Q24	230002	" "	"	"	-
Q25	230029.	" "	"	J309	-

NOTES.										DATE	datron ELECTRONICS LTD	
SEE SHEET 2 FOR LATEST ISSUE										10-10-78	TITLE	
ISS										DRAWN	B.J.	1061 OHMS P.C.B. ASSY.
E C D										CHECKED		
DATE										APPROVED		
CHKD										DATE		DRAWING NUMBER 400331 SHEET OF 12

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	G11004	SCREW M3X6mm STEEL POZIPAN ZINC PLATED .GKN.			1
	G13005	WASHER M3 INT/SHAKEPROOF GKN DISTRIBUTORS		ZINC PLATED	2
	G15002	NUT M3 FULL HEX STEEL		ZINC PLATED	1
	G15005	NUT 3-4BUNC FULL HEX STEEL		" "	1
	G17010	NYLATCH PLUNGER HN3P	ORDER FROM C.J.FOX & SONS.	HN3P-32-4-1	4
	G17011	NYLATCH GROMMET HN3G		HN3G-32-1	4
	G18002	T05 MOUNTING PAD	JERMYN	T0518-0040	1
	G20003	SOLDER PCB TERMINAL LUG	HARWIN	H2105A	8
	G30024	STANDARD STEATITE INSUL BEAD	PARK ROYAL PORCELAIN Co	TYPE No 2 (16 SWG)	8
	G20007	TEST TERMINAL	MICROVAR	C 30	11

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

REV.																			
E.C.O.																			
DATE																			
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DATE	10-10-78	datron ELECTRONICS LTD	
DRAWN	B.J.	TITLE	1061 OHMS PCB ASSY.
CHECKED			
APPROVED		DRAWING NUMBER	400331
DATE		SHEET	12 of 12

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1	000103	10k 5% 1/4W CARBON	MULLARD	CR25	1
R2	000104	100k 5% 1/4W CARBON	MULLARD	CR25	4
R3	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R4	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R5	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
ANI	090017	100k x7 2% NETWORK	BECKMAN	764-1- R100K	2
AN2	090017	100k x7 2% NETWORK	BECKMAN	764-1- R100K	-
C1	150002	10uF 20% 16 V DIP. TANT.	UNION CARBIDE	K10E16	1
C2	150005	2u2F 20% 16V DIP. TANT.	UNION CARBIDE	K2R2E16	1
C3	150008	470nF 20% 35V DIP. TANT.	UNION CARBIDE	KR47E35	1
C4	110005	10nF 20% 250V POLYESTER	MULLARD	C280 AE P10K	1
C5	150016	1uF 20% 35V DIP. TANT.	UNION CARBIDE	K1R0E35	5
C6	150016	1uF 20% 35V DIP. TANT.	UNION CARBIDE	K1R0E35	-
C7	150016	1uF 20% 35V DIP. TANT.	UNION CARBIDE	K1R0E35	-
C8	150016	1uF 20% 35V DIP. TANT.	UNION CARBIDE	K1R0E35	-
C9	150016	1uF 20% 35V DIP. TANT.	UNION CARBIDE	K1R0E35	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	1	2	3	4	5	6	7	8	9	10	11
ECO	RELEASED	1078	1093	1137	1165	1198	1217	1246	1253	1403	1592
DATE	1.2.80	22.2.80	26.3.80	28.7.80	16.12.80	25.2.81	18.8.81	4.11.81	3.12.81	24.11.82	2.5.84
CHKD	MD	A.J.	A.J.	AP	MD	MB	MD	MD	MD	MD	MD

DATE	1.2.80	datron ELECTRONICS LTD
DRAWN	IL	
CHECKED	MD	TITLE
APPROVED		1061
DATE		BCD/PROG. PCB. ASSY.
		DRAWING NUMBER
		400332
		SHEET
		2 OF 4

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D1	200001	75mA 75V GP. SI. DIODE	FAIRCHILD	1N4148	1
M1	280081	PERIPHERAL INTERFACE ADAPTOR	MOTOROLA	MC6821P	1
M2	290003	555 TIMER	FAIRCHILD	uA555TC	1
M3	270050	HEX INVERTOR LS	NATIONAL	DM74LS04N	2
M4	270048	QUAD 2 I/P NAND LS	NATIONAL	DM74LS00N	1
M5	270051	DUAL 4 I/P AND LS	NATIONAL	DM74LS21N	1
M6	270050	HEX INVERTOR LS	NATIONAL	DM74LS04N	-
M7	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	9
M8	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M9	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M10	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M11	290080-19	2716 EPROM PROGRAMMED	DATRON	IB2716 (290080-155)	1
M12	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M13	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M14	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M15	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M16	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	-
M17	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	9
M18	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	-
M19	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	-
M20	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	-
M21	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	1	2	3	4	5	6	7	8	9	10	11
ECO											
DATE											
CHKD											

DATE	1.2.80	datron ELECTRONICS LTD
DRAWN	IL	
CHECKED		TITLE
APPROVED		1061
DATE		BCD/PROG. PCB. ASSY.
		DRAWING NUMBER
		400332
		SHEET
		3 OF 4

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
M22	280066	256 X 4 BIT STATIC CMOS RAM	SEE DRAWING		2
M23	280066	256 X 4 BIT STATIC CMOS RAM	SEE DRAWING		-
M24	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC 14503 BCP	-
M25	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC 14503 BCP	-
M26	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC 14503 BCP	-
M27	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC 14503 BCP	-
	620007	TEST POINT TERMINAL	MICROVAR	C 30	9
J3	605051	4 WAY POLARISED SOCKET	MOLEX	(22-01-2045) 6471-4-1	1
J1, J2	605102	24 WAY DIL. SOCKET GOLD	CA	CA 24S 10SD	2
	605064	24 WAY DIL. SOCKET	AUGAT	324-AG39D	1
	605060	14 WAY DIL. SOCKET	ASTRALUX or JERMYN	ICL 143 S3T	4
	605061	16 WAY DIL. SOCKET	ASTRALUX or JERMYN	ICL 163-56T	18
J5	573120/C	24WAYAP/3M RIBBON CABLE	DATRON		1
	605050	40 WAY DIL. SOCKET	AUGAT	340-AG39D	1
	605059	8 WAY DIL. SOCKET	ASTRALUX	ICL-083-56T	1
	605063	22 WAY DIL. SOCKET	AUGAT	322-AG39D	2
J4	605002	16 WAY DIL. SOCKET	ASTRALUX	ICN-163-S3G	1
	606005	SOCKET CLIP	ASTRALUX	RC-74	1
	605056	CRIMP TERMINAL	MOLEX	4809-TL	1
	400379/1	WIRE/TERMINAL ASSY			3
	410100-4A	PCB			1

NOTES.

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DATE 1. 2. 80	datron ELECTRONICS LTD
DRAWN ll	TITLE 1061 BCD/PROG. PCB. ASSY.
CHECKED	DRAWING NUMBER 400332
APPROVED	SHEET 4 of 4
DATE	

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D1	200001	75mA 75V GP SI DIODE	FAIRCHILD	IN414B	5
D2		NOT USED			-
D3	200001	75mA 75V GP SI DIODE	FAIRCHILD	IN414B	-
D4		NOT USED			-
D5	200001	75mA 75V GP SI DIODE	FAIRCHILD	IN414B	-
D6	200001	75mA 75V GP SI DIODE	FAIRCHILD	IN414B	-
D7	200001	75mA 75V GP SI DIODE	FAIRCHILD	IN414B	-
Q1	240001	SI NPN TRANSISTOR	NATIONAL	BC184/TO18	2
Q2		NOT USED			-
Q3	250001	SI PNP TRANSISTOR	NATIONAL	BC214/TO18	1
Q4		NOT USED			-
Q5		NOT USED			-
Q6	240001	SI NPN TRANSISTOR	NATIONAL	BC184/TO18	-
M1	280011	DUAL D FLIP-FLOP	MOTOROLA	MC14013 BCP	1
J1	604036	CON. PIN STRIP OF 10 HORIZ. TYPE	AMP	163740-B	2
J2, J3	605052	8WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-B-1	2

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS																			
E.C.D.																			
DATE																			
CHKD																			

DATE 17 MAY 79	datron ELECTRONICS LTD
DRAWN W.G. SMITH	TITLE REAR INPUT ASSY.
CHECKED MSD	1061/71
APPROVED	DRAWING NUMBER 400386
DATE 17 MAY 79	SHEET 5 OF 8

AW 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
J4 & J6	604033	FLAT WAFER PIN (4 WAY GOLD)	MOLEX	22-27-2041/GOLD	3
J5	605051	4WAY POLARISED SOCKET	MOLEX	22-01-2045	1
	400379/4	WIRE/TERMINAL ASSY	HOLDEN CORDS		6
	400379/5	WIRE/TERMINAL ASSY	HOLDEN CORDS		4
RL1	330018	RELAY 2P2W 7v HOLD-IN	P&B	SEE DRAWING	1
RL2	330019	RELAY 4P2W 7v HOLD-IN	P&B	SEE DRAWING	1
RL3 & RL4		NOT USED			
	410106-E	COMPONENT P.C.B.			1
	410132-4	RELAY P.C.B.			1
	450257-1	SOCKET PLATE			1
	450241-1	RELAY BRACKET			1
	540002	22SWG TINNED COPPER WIRE			A/R
	540008	7/2 PTFE INS. WHITE WIRE			140mm

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS																			
E.C.D.																			
DATE																			
CHKD																			

DATE 17 MAY 79	datron ELECTRONICS LTD
DRAWN W.G. SMITH	TITLE REAR INPUT ASSY.
CHECKED MSD	1061/71
APPROVED	DRAWING NUMBER 400386
DATE 17 MAY 79	SHEET 6 OF 8

AW 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	590001	SLEEVE, MAX CABLE Ø 3.0mm	HELLERMAN ELECTRIC	H15x20mm BLK HELSYN	17
	590004	SLEEVE - PTFE	HELLERMAN ELECTRIC	FE10	30mm.
J11	604008	7 WAY PLUG PANEL MTG	PYE CONNECTORS	M7P	1
	605009	7 WAY SOCKET	PYE CONNECTORS	M7S	1
	605057	CRIMP TERMINAL	MOLEX	4809-GL	2
	606001	LOCKING HOOD	PYE CONNECTORS	MHN	1
	606002	NUT	PYE CONNECTORS	MN	1
	606003	WASHER	PYE CONNECTORS	MLW	1
	605060	14 WAY DIL SOCKET	ASTRALUX DE JERMAN	ICN-246-54T or A25-2023Y	1
	611004	SCREW M3x6mm STEEL POSI-PAN	G.K.N	ZINC PLATED	7
	611007	SCREW M3x6mm STEEL POSI-CSK	G.K.N	ZINC PLATED	7
	611016	SCREW M3x8mm STEEL POSI-PAN	G.K.N	ZINC PLATED.	4
	612020	STAND-OFF NYLON M3x10 TRANS PILLAR.	W.K. ELECTRONICS.	TPI/G 5/10/M3/I/I	5

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS																			
E C O																			
DATE																			
CHKD																			

DATE	9 MAY 79	datron ELECTRONICS LTD	
DRAWN	W.G. SMITH		
CHECKED	ADD	TITLE	REAR INPLT ASSY
APPROVED			1061/71
DATE	17 MAY 79	DRAWING NUMBER	400386
			7 SHEET OF 8

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	613005	WASHER M3 INT SHAKE PROOF ST	GKN DISTRIBUTORS	ZINC PLATED	13
	615001	NUT B8A FULL HEX STEEL		ZINC PLATED	2
	615002	NUT M3 FULL HEX STEEL		ZINC PLATED	2
	700069	DPDT SLIDE SWITCH	WAYCOM	5-5022 CD03-0+3/4 TRIGGER # STYLE 2 C PCB MOUNT CONTACTS	1

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS																			
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DATE																			
CHKD																			

DATE	9 MAY 79	datron ELECTRONICS LTD	
DRAWN	W.G. SMITH		
CHECKED	ADD	TITLE	REAR INPLT ASSY
APPROVED			1061/71
DATE	17 MAY 79	DRAWING NUMBER	400386
			8 SHEET OF 8

J.W. 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1	090054	8k2 .25% 10ppm MF	ACI	SEE DRG-	1
R2	011181	1k18 1% 1/8W 50ppm MF	HOLCO	H8C	1
R3	015900	590R 1% 1/8W 50ppm MF	HOLCO	H8C	1
R4	012940	294R 1% 1/8W 50ppm MF	HOLCO	H8C	2
R5	011470	147R 1% 1/8W 50ppm MF	HOLCO	H8C	1
R6	090054	16k .25% 10ppm MF	ACI	SEE DRG-	-
R7	* 000434	430k 5% 1/4W CARBON	MULLARD	CR25	1
R8	000394	390k 5% 1/4W CARBON	MULLARD	CR25	1
R9	000103	10k 5% 1/4W CARBON	MULLARD	CR25	5
R10	000155	15k 5% 1/4W CARBON	MULLARD	CR25	2
R11	000105	1M 5% 1/4W CARBON	MULLARD	CR25	5
R12	000152	1k5 5% 1/4W CARBON	MULLARD	CR25	1
R13	000224	220k 5% 1/4W CARBON	MULLARD	CR25	1
R14	000333	33k 5% 1/4W CARBON	MULLARD	CR25	3
R15	000104	100k 5% 1/4W CARBON	MULLARD	CR25	6
R16	000685	6M8 5% 1/4W CARBON	MULLARD	CR25	1
R17	000332	3k3 5% 1/4W CARBON	MULLARD	CR25	5
R18	090053	100k .25% 10ppm MF	ACI	SEE DRG-	1
R19	090053	100k .25% 10ppm MF	ACI	SEE DRG-	-
R20	000274	270K CARBON (DO NOT SOLDER)	MULLARD	CR25	1
R21	000821	820R 5% 1/4W CARBON	MULLARD	CR25	1
R22	290026	RMS KIT	DATRON	SEE DRG-	1
R23	000270	27R 5% 1/4W CARBON	MULLARD	CR25	1

NOTES. * NOT USED ON ASSEMBLIES FITTED INTO 1061's

SEE SHEET 2 FOR LATEST ISSUE

ISS	22	22																		
ECD	1730	1801																		
DATE	23.10.84	2.1.85																		
CHKD	D	AP																		

DATE	17.8.79	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	
CHECKED	R.L.W.	AC PCB ASSY	
APPROVED		DRAWING NUMBER	400402
DATE		SHEET	2 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R24	000107	100M 10% 1/4W CARBON	ALLEN BRADLEY	CB10	3
R25	000331	330R 5% 1/4W CARBON	MULLARD	CR25	2
R26	000154	150K 5% 1/4W CARBON	MULLARD	CR25	2
R27	000334	330k 5% 1/4W CARBON	MULLARD	CR25	1
R28	290026	RMS KIT	DATRON	SEE DRG-	-
R29	000221	220R 5% 1/4W CARBON	MULLARD	CR25	4
R30	000680	68R 5% 1/4W CARBON	MULLARD	CR25	3
R31	000561	560R 5% 1/4W CARBON	MULLARD	CR25	2
R32	000182	1k8 5% 1/4W CARBON	MULLARD	CR25	2
R33	000333	33k 5% 1/4W CARBON	MULLARD	CR25	-
R34	000103	10k 5% 1/4W CARBON	MULLARD	CR25	-
R35	063500	50R POT 3/8" SQ. CERMET	BECKMAN	72P	2
R36	049093	909K 1% 1/2W 100ppm CF	ALLEN BRADLEY	CC	1
R37	000222	2k2 5% 1/4W CARBON	MULLARD	CR25	3
R38	000124	120k 5% 1/4W CARBON	MULLARD	CR25	1
R39	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R40	000103	10k 5% 1/4W CARBON	MULLARD	CR25	-
R41	000332	3k3 5% 1/4W CARBON	MULLARD	CR25	-
R42	000332	3k3 5% 1/4W CARBON	MULLARD	CR25	-
R43	000332	3k3 5% 1/4W CARBON	MULLARD	CR25	-
R44	000331	330R 5% 1/4W CARBON	MULLARD	CR25	-
R45	000680	68R 5% 1/4W CARBON	MULLARD	CR25	-
R46	000472	4k7 5% 1/4W CARBON	MULLARD	CR25	1

NOTES.

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DRAWN	IL	TITLE	
CHECKED	R.L.W.	AC PCB ASSY	
APPROVED		DRAWING NUMBER	400402
DATE		SHEET	3 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R47	090051	4k7 .25% 10ppm MF	ACI	SEE DRG	1
R48	090053	8k975.25% 10ppm MF	ACI	SEE DRG	-
R49	000912	9k1 5% 1/4W CARBON	MULLARD	CR25	1
R50	063500	50R POT 3/8"sq. CERMET	BECKMAN	72P	-
R51	000107	100M 10% 1/4W CARBON	ALLEN BRADLEY	CB10	-
R52	000122	1k2 5% 1/4W CARBON	MULLARD	CR25	1
R53	000333	33k 5% 1/4W CARBON	MULLARD	CR25	-
R54	000123	12k 5% 1/4W CARBON	MULLARD	CR25	1
R55	000681	680R 5% 1/4W CARBON	MULLARD	CR25	1
R56	000103	10k 5% 1/4W CARBON	MULLARD	CR25	-
R57	000105	1M 5% 1/4W CARBON	MULLARD	CR25	-
R58	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R59	000120	12R 5% 1/4W CARBON	MULLARD	CR25	2
R60	000120	12R 5% 1/4W CARBON	MULLARD	CR25	-
R61	000222	2k2 5% 1/4W CARBON	MULLARD	CR25	-
R62	000332	3k3 5% 1/4W CARBON	MULLARD	CR25	-
R63	008060	680R 5% 1/5W CARBON	MULLARD	CR16	1
R64	000222	2k2 5% 1/4W CARBON	MULLARD	CR25	-
R65	000101	100R 5% 1/4W CARBON	MULLARD	CR25	4
R66	000221	220R 5% 1/4W CARBON	MULLARD	CR25	-
R67	000183	18k 5% 1/4W CARBON	MULLARD	CR25	1
R68	090053	18k .25% 10ppm MF	ACI	SEE DRG	-
R69	090051	4k7 .25% 10ppm MF	ACI	SEE DRG	-

NOTES.

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DATE	17.8.79	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	
CHECKED	RLW	AC PCB ASSY	
APPROVED		DRAWING NUMBER	400402
DATE		SHEET	4 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R70	000272	2k7 5% 1/4W CARBON	MULLARD	CR25	2
R71	000272	2k7 5% 1/4W CARBON	MULLARD	CR25	-
R72	000330	33R 5% 1/4W CARBON	MULLARD	CR25	1
R73	000105	1M 5% 1/4W CARBON	MULLARD	CR25	-
R74	000824	820k 5% 1/4W CARBON	MULLARD	CR25	1
R75	063504	500k POT 3/8"sq CERMET	BECKMAN	72P	2
R76	090067	62kG .25% 10ppm MF	ACI	SEE DRG	1
R77	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R78	000225	2M2 5% 1/4W CARBON	MULLARD	CR25	2
R79	011103	110k 1% 1/8W MF	HOLCO	H8C	1
R80	000561	560R 5% 1/4W CARBON	MULLARD	CR25	-
R81	000101	100R 5% 1/4W CARBON	MULLARD	CR25	-
R82	000101	100R 5% 1/4W CARBON	MULLARD	CR25	-
R83	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R84	000184	180k 5% 1/4W CARBON	MULLARD	CR25	3
R85	000184	180k 5% 1/4W CARBON	MULLARD	CR25	-
R86	000103	10k 5% 1/4W CARBON	MULLARD	CR25	-
R87	000153	15k 5% 1/4W CARBON	MULLARD	CR25	3
R88	000680	68R 5% 1/4W CARBON	MULLARD	CR25	-
R89	000221	220R 5% 1/4W CARBON	MULLARD	CR25	-
R90	063204	200k POT 3/8"sq. CERMET	BECKMAN	72P	1
R91	000105	1M 5% 1/4W CARBON	MULLARD	CR25	-
R92	000105	1M 5% 1/4W CARBON	MULLARD	CR25	-

NOTES.

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DATE	17.8.79	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	
CHECKED	RLW	AC PCB ASSY	
APPROVED		DRAWING NUMBER	400402
DATE		SHEET	5 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R93	000225	2M2 5% 1/4W CARBON	MULLARD	CR25	-
R94	000564	560K 5% 1/4W CARBON	MULLARD	CR25	2
R95	090052	9k .25% 10ppm MF	ACI	SEE DRG-	1
R96	090052	1k .25% 10ppm MF	ACI	SEE DRG-	-
R97	000101	100R 5% 1/4W CARBON	MULLARD	CR25	-
R98	000471	470R 5% 1/4W CARBON	MULLARD	CR25	1
R99	000182	1k8 5% 1/4W CARBON	MULLARD	CR25	-
R100	000184	180k 5% 1/4W CARBON	MULLARD	CR25	-
R101	012940	294R 1% 1/8W MF	HOLCO	H8C	-
R102	090067	62kG .25% 10ppm MF	ACI	SEE DRG	-
R103	000221	220R 5% 1/4W CARBON	MULLARD	CR25	-
R104	000154	150K 5% 1/4W CARBON	MULLARD	CR25	-
R105	000564	560K 5% 1/4W CARBON	MULLARD	CR25	-
R106	011001	1k00 1% 1/8W 50ppm MF	HOLCO	H8C	3
R107	011823	182k 1% 1/8W 50ppm MF	HOLCO	H8C	1
R108	042215	22M1 1% 1/2W 100ppm MF	ALLEN BRADLEY	CC	2
R109	090066	1k .25% 10ppm MF	ACI	SEE DRG.	1
R110	090066	10k1 .25% 10ppm MF	ACI	SEE DRG-	-
R111	090066	111k .25% 10ppm MF	ACI	SEE DRG-	-
R112	063504	500k POT 3/8" SQ CERMET	BECKMAN	72P	-
R113	042215	22M1 1% 1/2W 100ppm MF	ALLEN BRADLEY	CC	-
R114	090066	1M .25% 10ppm MF	ACI	SEE DRG-	-
R115	000153	15K 5% 1/4W CARBON	MULLARD	CR25	-

NOTES.

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DATE	17.8.79	datron ELECTRONICS LTD
DRAWN	IL	
CHECKED	RXLW	TITLE
APPROVED		AC PCB ASSY
DATE		DRAWING NUMBER
		400402
		SHEET
		6 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R116	000336	33M 10% 1/4W CARBON	ALLEN BRADLEY	CB10	1
R117	000102	1k 5% 1/4W CARBON	MULLARD	CR25	2
R118	000155	1M5 5% 1/4W CARBON	MULLARD	CR25	-
R119	000107	100M 10% 1/4W CARBON	ALLEN BRADLEY	CB10	-
R120	000102	1k 5% 1/4W CARBON	MULLARD	CR25	-
R121	063105	1M POT 3/8" SQ CERMET	BECKMAN	72P	1
R122	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R123	090066	277k .25% 10ppm MF	ACI	SEE DRG-	-
R124	090066	277k .25% 10ppm MF	ACI	SEE DRG-	-
R125	090066	277k .25% 10ppm MF	ACI	SEE DRG	-
R126	090066	277k .25% 10ppm MF	ACI	SEE DRG	-
R127		NOT USED			-
R128	000476	47M 10% 1/4W CARBON	ALLEN BRADLEY	CB10	1
R129	008059	820R 5% 1/8W CARBON	MULLARD	CR16	1
R130		NOT USED			-
R131		.			-
R132		.			-
R133	011001	1K00 1% 1/8W 50ppm M/F	HOLCO	H8C	-
R134	011001	1k00 1% 1/8W 50ppm M/F	HOLCO	H8C	-
R135		NOT USED			-
R136	000153	15K 5% 1/4W CARBON	MULLARD	CR25	-

NOTES.

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DATE	17.8.79	datron ELECTRONICS LTD
DRAWN	IL	
CHECKED	RXLW	TITLE
APPROVED		AC PCB ASSY
DATE		DRAWING NUMBER
		400402
		SHEET
		7 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C1	120018	1/25F 10% 63V POLYCARB	ASHCROFT	A2B1521B	1
C2	120030	820nF 10% 63V POLYCARB	ASHCROFT	SEE DRG.	1
C3	120021	470nF 10% 63V POLYCARB	ASHCROFT	A2B4711B	2
C4	120024	6/8F 10% 63V POLYCARB	ASHCROFT	A2B6821B	1
C5	120020	220nF 10% 63V POLYCARB	ASHCROFT	A2B2211B	1
C6	150012	100nF 20% 35V DIP TANT	UNION CARBIDE	KR10E35	1
C7	120021	470nF 10% 63V POLYCARB	ASHCROFT	A2B4711B	-
C8	102680	68pF 5% 500V CER DISC	ITT	CD10	1
C9	102101	100pF 10% 500V CER DISC	ITT	CD10	2
C10	102471	470pF 10% 500V CER DISC	ITT	CD10	1
C11	150020	10uF 20% 25V DIP TANT	UNION CARBIDE	K10E25	8
C12	110013	100nF 20% 250V POLYESTER	MULLARD	C280AEP100K	5
C13	150020	10uF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C14	150020	10uF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C15	101103	10nF 25% 250V CER DISC	ITT	CD10	7
C16	150003	47uF 20% 6V3 DIP TANT	UNION CARBIDE	K47E6V3	1
C17	110013	100nF 20% 250V POLYESTER	MULLARD	C280AEP100K	-
C18	102108	1pF ±.5pF 500V CER DISC	ITT	CD06	1
C19	102470	47pF 5% 500V CER DISC	ITT	CD10	2
C20	150020	10uF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C21	110013	100nF 20% 250V POLYESTER	MULLARD	C280AEP100K	-
C22	102100	10pF 5% 500V CER DISC	ITT	CD10	3
C23	102100	10pF 5% 500V CER DISC	ITT	CD10	-

NOTES

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ISS															
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DATE	17.8.79	datron	ELECTRONICS LTD
DRAWN	IL		
CHECKED	RJW	AC PCB ASSY	
APPROVED			
DATE		DRAWING NUMBER	400402
		SHEET	8 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C24	102478	4p7F ±.5pF 500V CER DISC	ITT	CD08	2
C25	102478	4p7F ±.5pF 500V CER DISC	ITT	CD08	-
C26	150020	10uF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C27	150020	10uF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C28	150016	1uF 20% 35V DIP TANT	UNION CARBIDE	K10E35	1
C29	130071	150pF 1% 160V POLYSTYRENE	SUFLEX	HSQ150/1-7/160	2
C30	130013	18pF ±1pF 160V POLYSTYRENE	SUFLEX	HS18/1-7/160	1
C31	110013	100nF 20% 250V POLYESTER	MULLARD	C280AEP100K	-
C32	110035	220nF 20% 63V POLYESTER	WIMA	MKS2MIN	2
C33	110035	220nF 20% 63V POLYESTER	WIMA	MKS2MIN	-
C34	102470	47pF 5% 500V CER DISC	ITT	CD10	-
C35	120022	1n5F 20% 100V POLYCARB	WIMA	FKC2MIN	2
C36	120022	1n5F 20% 100V POLYCARB	WIMA	FKC2MIN	-
C37	102101	100pF 10% 500V CER DISC	ITT	CD10	-
C38	102100	10pF 5% 500V CER DISC	ITT	CD10	-
C39	102331	330pF 10% 500V CER DISC	ITT	CD10	1
C40	150020	10uF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C41	101103	10nF 25% 250V CER DISC	ITT	CD10	-
C42	130072	9p1F ±.5pF 160V POLYSTYRENE	SUFLEX	HS9-1/5-7/160	1
C43	130071	150pF 1% 160V POLYSTYRENE	SUFLEX	HSQ150/1-7/160	-
C44	150023	33uF 20% 25V DIP TANT	UNION CARBIDE	K33E25	1
C45	102150	15pF 5% 500V CER DISC	ITT	CD10	1
C46	102120	12pF 5% 500V CER DISC	ITT	CD10	1

NOTES

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DATE	17.8.79	datron	ELECTRONICS LTD
DRAWN	IL		
CHECKED	RJW	AC PCB ASSY	
APPROVED			
DATE		DRAWING NUMBER	400402
		SHEET	9 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
TP's, TL's.	540002	22 SWG TINNED COPPER WIRE			A/R
	590004	SLEEVE - PTFE	HELLERMANN ELECTRIC	FE10	A/R
J1	571095/C	16 WAY AP/3M RIBBON CABLE	DATRON		1
J2	605052	8 WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-8-1	1
	590055	SLEEVE Ø1.0 SIL. RUBBER	HELLERMANN ELECTRIC	HIS CONT. BLACK	50 mm
	400379/1	WIRE/TERMINAL ASSY.			1
	410136-4	PCB			1
	450249-2	GUARD SHIELD			1
	459112-2	RELAY BRACKET			2
	605056	CRIMP TERMINAL	MOLEX	4809-TL	1
	512999	7/0-2 PTFE INSULATED (WHITE) WIRE			A/R
	590001	SLEEVE MAX. CABLE Ø3.0	HELLERMAN ELECTRIC	HIS x 20mm BLACK HELSYN	7
	590002	SLEEVE MAX. CABLE Ø6.0	HELLERMAN ELECTRIC	H30 x 25mm BLACK HELSYN	1
	602001	FSV TERMINAL	MOLEX	02-04-1875	2
	602004	BREAKAWAY TERMINAL STRIP	MOLEX	05-30-0001	16
	605060	14 PIN DIL SOCKET	ASTRALUX	ICL 143-S3T	1
	605061	16 PIN DIL SOCKET	ASTRALUX	ICL 163-S6T	3
	605057	CRIMP TERMINAL	MOLEX	4809-GL	1
	611007	SCREW M3x6mm STEEL POZI-	CSK ZN/PLATED	GKN	3
	611016	SCREW M3x8mm STEEL POZI-	PAN ZN/PLATED	GKN	5

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECO	DATE	CHGD	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE

DATE	17.8.79	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	
CHECKED	RZW	AC PCB ASSY.	
APPROVED		DRAWING NUMBER	400402
DATE		SHEET	16 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	612021	STANDOFF M3x16 HEX STEEL	HARWIN	R6077-M3	3
	613005	WASHER M3 INT./SHAKEPROOF ST.	GKN DISTRIBUTORS	ZINC PLATED	5
	613014	WASHER M2.5 INT./SHAKEPROOF ST.	GKN DISTRIBUTORS	ZINC PLATED	2
	615002	NUT M3 FULL HEX STEEL		ZINC PLATED	2
	615005	NUT 3-48 UNC FULL HEX. ST.		ZINC PLATED	2
	617010	NYLATCH PLUNGER HN3P	ORDER FROM C.J. FOX & SONS	HN3P-32-4-1	4
	617011	NYLATCH GROMMET HN3G	ORDER FROM C.J. FOX & SONS	HN3G-32-1	4
	620003	SOLDER PCB TERMINAL LUG	HARWIN	H 2105A	2
	620005	CLOVERLEAF PTFE TERMINAL	SEALLECTRO	FTE 15 P20	15
	630107	BRASS STRIP .375mm THK #15-5	RIGHTON	1/2 HARD	130mm
	620007	TEST POINT TERMINAL	MICROVAR	C30	6

NOTES.

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DRAWN	IL	TITLE	
CHECKED	RZW	AC PCB ASSY.	
APPROVED		DRAWING NUMBER	400402
DATE		SHEET	17 OF 17

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R1	000104	100k 5% 1/4W CARBON	MULLARD	CR25	3
R2	000103	10k 5% 1/4W CARBON	MULLARD	CR25	1
R3	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R4	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R5	000102	1k 5% 1/4W CARBON	MULLARD	CR25	2
R6	000561	560R 5% 1/4W CARBON	MULLARD	CR25	1
R7	000102	1k 5% 1/4W CARBON	MULLARD	CR25	-
RB	000332	3K3 5% 1/4W CARBON	MULLARD	CR25	1
ANI	090017	100k x7 2% NETWORK	BECKMAN	764-1-R100k	1
C1	150015	10uF 20% 35V DIP. TANT.	UNION CARBIDE	K10E35	3
C2	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	9
C3	150015	10uF 20% 35V DIP. TANT.	UNION CARBIDE	K10E35	-
C4	150015	10uF 20% 35V DIP. TANT.	UNION CARBIDE	K10E35	-
C5	150016	1uF 20% 35V DIP. TANT.	UNION CARBIDE	K10E35	1
C6	150012	100nF 20% 35V DIP. TANT.	UNION CARBIDE	K10E35	1
C7	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	-
C8	101103	10nF 25% 250V CER. DISC	ITT	CD10	1
C9	102681	680pF 10% 500V CER DISC	ITT	CD10	1
C10	102101	100pF 10% 500V CER DISC	ITT	CD10	1
C11	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	-
C12	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	-
C13	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	10																			
E.C.O.	106B1																			
DATE	20-7-04																			
CHKD.	19																			

DATE	19. 9. 80	datron ELECTRONICS LTD TITLE 1061/1065/1071/1081 IEEE PCB. ASSY. DRAWING NUMBER 400427 SHEET 2 OF 5
DRAWN	IL	
CHECKED	D. King	
APPROVED		
DATE		

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
C14	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	-
C15	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	-
C16	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	-
C17	104025	100nF $\pm 80\%$ 50V CER DISC	SIEMENS	B37449	-
MI	280086	BI-DIRECTIONAL BUS TRANSC ^R	MOTOROLA	MC3447P	2
M2	280086	BI-DIRECTIONAL BUS TRANSC ^R	MOTOROLA	MC3447P	-

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																				
E.C.O.																				
DATE																				
CHKD.																				

DATE	28.2.84	datron ELECTRONICS LTD TITLE 1061/1065/1071/1081 IEEE. PCB. ASSY. DRAWING NUMBER 400427 SHEET 3 OF 5
DRAWN	IL	
CHECKED		
APPROVED		
DATE		

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R47		NOT USED			—
R48		NOT USED			—
R49		NOT USED			—
R50		NOT USED			—
R51		NOT USED			—
R52	080064-8	28k0 .1% 3 μ m M.FOIL	VISHAY	SEE DRG-	1
R53	080065	1k60 .1% 10 μ m M.FOIL	VISHAY	VSRC1	1
R54	018250	825R 1% 50 μ m M.F	HOLCO	H8C	1
R55	013920	392R 1% 50 μ m M.F	HOLCO	H8C	1
R56	012000	200R 1% 50 μ m M.F	HOLCO	H8C	1
R57	000182	1k8 5% 1/4W CARBON	MULLARD	CR25	4
R58	000151	150R 5% 1/4W CARBON	MULLARD	CR25	1
R59	000752	7k5 5% 1/4W CARBON	MULLARD	CR25	3
R60	000100	10R 5% 1/3W CARBON	MULLARD	CR25	4
R61	063100	10R POT 3/8 SQ. CERMET	BECKMAN	72P	2
R62	063100	10R POT 3/8 SQ. CERMET	BECKMAN	72P	—
R63	000100	10R 5% 1/4W CARBON	MULLARD	CR25	—
R64	012003	200k 1% 1/8W 50 μ m MF	HOLCO	H8C	1
R65	000124	120k 5% 1/4W CARBON	MULLARD	CR25	1
R66		NOT USED			—
R67		NOT USED			—
R68		NOT USED			—
R69	000103	10k 5% 1/4W CARBON	MULLARD	CR25	—

NOTES

SEE SHEET 7 FOR LATEST ISSUE

ISS	
ECO	
DATE	
CHKD	

DATE	5.7.83	datron ELECTRONICS LTD	
DRAWN	JL	TITLE	1061A AC PCB ASSY
CHECKED	LOG	DRAWING NUMBER	400552
APPROVED		SHEET	4 OF 20
DATE			

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R70	080045-2	5k5 .01% 3 μ m M.FOIL	VISHAY	SEE DRG	—
R71	000331	330R 5% 1/4W CARBON	MULLARD	CR25	—
R72	000680	68R 5% 1/4W CARBON	MULLARD	CR25	—
R73	000562	5k6 5% 1/4W CARBON	MULLARD	CR25	—
R74	080045-2	5k5 .01% 3 μ m M.FOIL	VISHAY	SEE DRG	—
R75	080044-2	4k9925 .01% 3 μ m M.FOIL	VISHAY	SEE DRG	1
R76	014991	4k99 1% 1/8W 50 μ m MF	HOLCO	H8C	1
R77	090111-1	100M 5% THICK FILM	HOLSWORTHY	SEE DRG-	—
R78	000182	1k8 5% 1/4W CARBON	MULLARD	CR25	—
R79	000752	7k5 5% 1/4W CARBON	MULLARD	CR25	—
R80	000471	470R 5% 1/4W CARBON	MULLARD	CR25	1
R81	000105	1M 5% 1/4W CARBON	MULLARD	CR25	—
R82	000475	4M7 5% 1/4W CARBON	MULLARD	CR25	1
R83		NOT USED			—
R84	000103	10k 5% 1/4W CARBON	MULLARD	CR25	1
R85	000105	1M 5% 1/4W CARBON	MULLARD	CR25	—
R86	013323	332k 1% 1/8W 50 μ m MF	HOLCO	H8C	1
R87	011503	150k 1% 1/8W 50 μ m MF	HOLCO	H8C	1
R88	000105	1M 5% 1/4W CARBON	MULLARD	CR25	—
R89	000104	100k 5% 1/4W CARBON	MULLARD	CR25	—
R90	000182	1k8 5% 1/4W CARBON	MULLARD	CR25	—
R91	000101	100R 5% 1/4W CARBON	MULLARD	CR25	—
R92	000221	220R 5% 1/4W CARBON	MULLARD	CR25	—

NOTES

SEE SHEET 2 FOR LATEST ISSUE

ISS	
ECO	
DATE	
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DATE	5.7.83	datron ELECTRONICS LTD	
DRAWN	JL	TITLE	1061A AC PCB ASSY
CHECKED	LOG	DRAWING NUMBER	400552
APPROVED		SHEET	5 OF 20
DATE			

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R93	000221	220R 5% 1/4W CARBON	MULLARD	CR25	-
R94	011002	10k0 1% 1/8W 50ppm MF	HOLCO	H8C	1
R95	000272	2k7 5% 1/4W CARBON	MULLARD	CR25	2
R96	000272	2k7 5% 1/4W CARBON	MULLARD	CR25	-
R97	080047-2	10k .01% 3ppm M. FOIL	VISHAY	SEE DRG	1
R98	080045-2	5k5 .01% 3ppm M. FOIL	VISHAY	SEE DRG	-
R99	000101	100R 5% 1/4W CARBON	MULLARD	CR25	-
R100	000335	3M3 5% 1/4W CARBON	MULLARD	CR25	1
R101	063105	1M POT 3/8 SQ CERMET	BECKMAN	72P	1
R102	000225	2M2 5% 1/4W CARBON	MULLARD	CR25	1
R103	012001	2k00 1% 1/8W 50ppm MF	HOLCO	H8C	4
R104	012001	2k00 1% 1/8W 50ppm	HOLCO	H8C	-
R105	000221	220R 5% 1/4W CARBON	MULLARD	CR25	-
R106	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R107		NOT USED			-
R108		NOT USED			-
R109		NOT USED			-
R110		NOT USED			-
R111		NOT USED			-
R112	013923	392k 1% 1/8W 50ppm MF	HOLCO	H8C	2
R113	013923	392k 1% 1/8W 50ppm MF	HOLCO	H8C	-
R114	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R115	000222	2k2 5% 1/4W CARBON	MULLARD	CR25	3

NOTES

SEE SHEET 2 FOR LATEST ISSUE

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DATE	5.7.83	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	
CHECKED	LOG	1061A AC PCB ASSY	
APPROVED		1062	
DATE		DRAWING NUMBER	400552
		SHEET	6 OF 20

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R116	000752	7k5 5% 1/4W CARBON	MULLARD	CR25	-
R117	000680	68R 5% 1/4W CARBON	MULLARD	CR25	-
R118	000221	220R 5% 1/4W CARBON	MULLARD	CR25	-
R119	063204	200k POT 3/8 SQ. CERMET	BECKMAN	72P	1
R120	000274	270k 5% 1/4W CARBON	MULLARD	CR25	1
R121	080043-2	1k .1% 3ppm M. FOIL	VISHAY	SEE DRG	2
R122	080046-2	9k .1% 3ppm M. FOIL	VISHAY	SEE DRG	1
R123	000103	10k 5% 1/4W CARBON	MULLARD	CR25	-
R124		NOT USED			-
R125	012001	2k00 1% 1/8W 50ppm MF	HOLCO	H8C	1
R126	000102	1k 5% 1/4W CARBON	MULLARD	CR25	-
R127	000682	6k8 5% 1/4W CARBON	MULLARD	CR25	2
R128	000101	100R 5% 1/4W CARBON	MULLARD	CR25	-
R129	000331	330R 5% 1/4W CARBON	MULLARD	CR25	-
R130	000182	1k8 5% 1/4W CARBON	MULLARD	CR25	-
R131	080050-2	62k6 .1% 3ppm M. FOIL	VISHAY	SEE DRG	2
R132	080050-2	62k6 .1% 3ppm M. FOIL	VISHAY	SEE DRG	-
R133	000330	33R 5% 1/4W CARBON	MULLARD	CR25	1
R134	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R135	000103	10k 5% 1/4W CARBON	MULLARD	CR25	-
R136	018251	8k25 1% 1/8W 50ppm MF	HOLCO	H8C	1
R137		NOT USED			-
R138		NOT USED			-

NOTES

SEE SHEET 2 FOR LATEST ISSUE

ISS																				
E C O																				
DATE																				
CHKD																				

DATE	5.7.83	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	
CHECKED	LOG	1061A AC PCB ASSY	
APPROVED		1062	
DATE		DRAWING NUMBER	400552
		SHEET	7 OF 20

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R139	011822	18k2 1% 1/8W 50ppm MF	HOLCO	H8C	2
R140	014321	4k32 1% 1/8W 50ppm MF	HOLCO	H8C	1
R141		NOT USED			-
R142	080043-2	1k .1% 3 ppm M. FOIL	VISHAY	SEE DRG	-
R143	080048-2	10k1 .1% 3 ppm M. FOIL	VISHAY	SEE DRG	1
R144	080051-2	111k .1% 3 ppm M. FOIL	VISHAY	SEE DRG	1
R145	000474	470K 5% 1/3W CARBON	MULLARD	CR25	1
R146	080062	1M .1% 5 ppm M. FILM	VTM	MAR7-TIG-1M-0.1%	1
R147	000101	100R 5% 1/4W CARBON	MULLARD	CR25	-
R148	063104	100k POT 3/8 SQ. CERMET	BECKMAN	72P	1
R149	011822	18k2 1% 1/8W 50ppm MF	HOLCO	H8C	-
R150	000100	10R 5% 1/4W CARBON	MULLARD	CR25	-
R151	000100	10R 5% 1/4W CARBON	MULLARD	CR25	-
R152		NOT USED			-
R153	000104	100k 5% 1/4W CARBON	MULLARD	CR25	-
R154	013320	332R 1% 1/8W 50ppm MF	HOLCO	H8C	1
R155	041004	1M 1% 1/2W 100ppm CF	ALLEN BRADLEY	CC	1
R156	011000	100R 1% 1/8W 50ppm MF	HOLCO	H8C	1
R157	000105	1M 5% 1/4W CARBON	MULLARD	CR25	-
R158	090111-1	100M 5% THICK FILM	HOLSWORTHY	SEE DRG	-
R159	000241	240R 5% 1/4W CARBON	MULLARD	CR25	1
R160	012001	2K00 1% 1/8W 50ppm MF	HOLCO	H8C	-
R161	000101	100R 5% 1/4W CARBON	MULLARD	CR25	-

NOTES:

SEE SHEET 2 FOR LATEST ISSUE

REV	DATE	BY	CHKD	APPV

DATE 5.7.83	datron ELECTRONICS LTD	
DRAWN 	TITLE 1061A AC PCB ASSY	
CHECKED LOG	1062	
APPROVED 	DRAWING NUMBER 400552	SHEET 8 OF 20
DATE 		

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R162	012151	2k15 1% 1/8W 50ppm MF	HOLCO	H8C	1
R163	000912	9k1 5% 1/4W CARBON	MULLARD	CR25	1
R164	008047	470R 1% 1/2W MET-GLAZE	NEOHM	RGPO207	1
R165	008049	100k 1% 1/2W MET-GLAZE	NEOHM	RGPO207	1
R166	008048	560R 1% 1/2W MET-GLAZE	NEOHM	RGPO207	1
R167	080052-2	277k .1% 3 ppm M. FOIL	VISHAY	SEE DRG	4
R168	080052-2	277k .1% 3 ppm M. FOIL	VISHAY	SEE DRG	-
R169	080052-2	277k .1% 3 ppm M. FOIL	VISHAY	SEE DRG	-
R170	080052-2	277k .1% 3 ppm M. FOIL	VISHAY	SEE DRG	-
R171	000104	100k 5% 1/3W CARBON	MULLARD	CR25	-
R172	000562	5k6 5% 1/3W CARBON	MULLARD	CR25	-
R173	000822	8k2 5% 1/3W CARBON	MULLARD	CR25	1
R174	000105	1M 5% 1/3W CARBON	MULLARD	CR25	-
R175	000222	2k2 5% 1/3W CARBON	MULLARD	CR25	-
R176	000222	2k2 5% 1/3W CARBON	MULLARD	CR25	-
R177	000821	820R 5% 1/3W CARBON	MULLARD	CR25	2
R178	000821	820R 5% 1/3W CARBON	MULLARD	CR25	-
R179	000682	6k8 5% 1/3W CARBON	MULLARD	CR25	-
R180	000103	10k 5% 1/3W CARBON	MULLARD	CR25	-
R181	000103	10k 5% 1/3W CARBON	MULLARD	CR25	-
R182	000154	150k 5% 1/3W CARBON	MULLARD	CR25	1
ANI	090017	100k x7 2% NETWORK	BECKMAN	LO8-I-R100K	1

NOTES:

SEE SHEET 2 FOR LATEST ISSUE

REV	DATE	BY	CHKD	APPV

DATE 5.7.83	datron ELECTRONICS LTD	
DRAWN 	TITLE 1061A AC PCB ASSY	
CHECKED LOG	1062	
APPROVED 	DRAWING NUMBER 400552	SHEET 9 OF 20
DATE 		

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
C1	150020	10 μ F 20% 25V DIP TANT	UNION CARBIDE	K10E25	11
C2	150020	10 μ F 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C3		NOT USED			—
C4	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	21
C5	120018	1 μ SF 10% 63V POLYCARB	ASHCROFT	A2B1521B	1
C6	110015	15nF 20% 63V POLYESTER	WIMA	MKS2	1
C7	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C8	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C9	102101	100 μ F 10% 500V CER DISC	ITT	CD10	3
C10	150020	10 μ F 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C11	150020	10 μ F 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C12	150020	10 μ F 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C13	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C14		NOT USED			—
C15	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C16	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C17		NOT USED			—
C18	102121	120 μ F 10% 500V CER DISC	ITT	CD10	1
C19		NOT USED			—
C20	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C21	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C22	120012	1 μ F 10% 160V POLYCARB	ASHCROFT	A2B1025B	1
C23	102102	1nF 10% 500V CER DISC	ITT	CD10	2

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECN	DATE	CHKD

DATE	5.7.83	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	1061A AC PCB ASSY
CHECKED	LOG		1062
APPROVED		DRAWING NUMBER	400552
DATE		SHEET	10 OF 20

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
C24	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C25	101103	10nF 25% 250V CER DISC	ITT	CD10	8
C26	102101	100 μ F 10% 500V CER DISC	ITT	CD10	—
C27	102680	68 μ F 5% 500V CER DISC	ITT	CD10	1
C28	150004	100 μ F 20% 6V3 DIP TANT	UNION CARBIDE	K100E6v3	1
C29	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C30	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C31	102150	15 μ F 5% 500V CER DISC	ITT	CD10	2
C32	102150	15 μ F 5% 500V CER DISC	ITT	CD10	—
C33	102478	4 μ F \pm .5 μ F 500V CER DISC	ITT	CDO8	2
C34	102478	4 μ F \pm .5 μ F 500V CER DISC	ITT	CDO8	—
C35	102228	2 μ F \pm .5 μ F 500V CER DISC	ITT	CDO8	1
C36	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C37	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C38	150023	33 μ F 20% 25V DIP TANT	UNION CARBIDE	K33E25	1
C39		NOT USED			—
C40		NOT USED			—
C41	130065	1n8F 1% 63V POLYSTYRENE	SUFLEX	HS1800/1-10/63	2
C42	102108	1 μ F \pm .5 μ F 500V CER DISC	ITT	CDO6	1
C43	130070	13 μ F \pm .5 μ F 160V POLYSTYRENE	SUFLEX	HS13/1-7/160	2
C44	140058-1	150 μ F x2 MATCHED SET	DATRON	SEE DRG	1
C45	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	—
C46	130070	13 μ F \pm 1 μ F 160V POLYSTYRENE	SUFLEX	HS13/1-7/160	—

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECN	DATE	CHKD

DATE	5.7.83	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	1061A AC PCB ASSY
CHECKED	LOG		1062
APPROVED		DRAWING NUMBER	400552
DATE		SHEET	11 OF 20

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
C47	102278	2p7F ± .5pF 500V CER DISC	ITT	CD10	1
C48	110035	220nF 20% 63V POLYESTER	WIMA	MKS2	2
C49	110035	220nF 20% 63V POLYESTER	WIMA	MKS2	-
C50	102100	10pF 5% 500V CER DISC	ITT	CD10	1
C51	101103	10nF 25% 250V CER DISC	ITT	CD10	-
C52	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	-
C53	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	-
C54	110040	33nF 20% 63V POLYESTER	WIMA	MKS2	1
C55		NOT USED			-
C56	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	-
C57	130065	1n8F 1% 63V POLYSTYRENE	SUFLEX	HS1800/1-10/63	-
C58	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	-
C59	102470	47pF 5% 500V CER DISC	ITT	CD10	2
C60	102102	1nF 10% 500V CER DISC	ITT	CD10	-
C61	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	-
C62	140058-1	150pF x 2 MATCHED SET	DATRON	SEE DRG	-
C63	101103	10nF 25% 250V CER DISC	ITT	CD10	-
C64	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C65	140057-1	10nF 1/2% 125V SILV. MICA	DATRON	SEE DRG	1
C66	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	-
C67	140056-1	1nF 1/2% 300V GLASS	DATRON	SEE DRG	1
C68	110026	6n8F 20% 100V POLYESTER	WIMA	FKS2	1
C69	140055-1	91pF 1/2% 500V GLASS	DATRON	SEE DRG	1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECO	DATE	CHKD

DATE	5. 7. 83	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	1061A AC PCB ASSY
CHECKED	LOG	DRAWING NUMBER	400552
APPROVED		SHEET	12 OF 20
DATE			

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
C70	130025	22pF ± 1pF 160V POLYSTYRENE	SUFLEX	HS	1
C71	102330	33pF 5% 500V CER DISC	ITT	CD10	1
C72	110042	100nF 20% 63V POLYESTER	WIMA	MKS2	-
C73	150001	22μF 20% 16V DIP TANT	UNION CARBIDE	K22E16	1
C74	120010	1μ5F 10% 160V POLYCARB	ASHCROFT	A2B1525B	3
C75	120010	1μ5F 10% 160V POLYCARB	ASHCROFT	A2B1525B	-
C76	120010	1μ5F 10% 160V POLYCARB	ASHCROFT	A2B1525B	-
C77	120001	220nF 10% 1KV POLYCARB	SUFLEX	SN	1
C78	140031	13pF 5% 500V GLASS	ELECTROSIL	CYFM10	1
C79	140008	10pF 1KV TRIMMER	JACKSON	TETFER VPC	3
C80	102338	33pF ± .5pF 500V CER DISC	ITT	CD08	1
C81	140023	20pF 2% 500V GLASS	ELECTROSIL	CYFM10	2
C82	140008	10pF 1KV TRIMMER	JACKSON	TETFER VPC	-
C83	140039	15pF 5% 500V GLASS	ELECTROSIL	CYFM10	1
C84	140008	10pF 1KV TRIMMER	JACKSON	TETFER VPC	-
C85	140023	20pF 2% 500V GLASS	ELECTROSIL	CYFM10	-
C86	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C87	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C88	150002	10μF 20% 16V DIP TANT	UNION CARBIDE	K10E16	2
C89	150002	10μF 20% 16V DIP TANT	UNION CARBIDE	K10E16	-
C90	110027	3n3F 20% 100V POLYESTER	WIMA	FKS2	1
C91	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C92	130074	6.8pF ± 1pF 16V POLYSTYRENE	SUFLEX	HS	1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECO	DATE	CHKD

DATE	5. 7. 83	datron ELECTRONICS LTD	
DRAWN	IL	TITLE	1061A AC PCB ASSY
CHECKED	LOG	DRAWING NUMBER	400552
APPROVED		SHEET	13 OF 20
DATE			

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D24	200008	200mA 125V LL. Si. DIODE	FAIRCHILD	IN458A	-
D25	200008	200mA 125V LL. Si. DIODE	FAIRCHILD	IN458A	-
D26	220020	FET DIODE 100 μ A Ir	TELEDYNE	PAD100/INSUL'D CASE	2
D27	200001	75mA 75V GP Si DIODE	FAIRCHILD	IN4148	-
D28	200001	75mA 75V GP Si DIODE	FAIRCHILD	IN4148	-
D29	213009	15V 5W ZENER	UNITRODE	TV5515	1
D30		NOT USED			-
D31	220020	FET DIODE 100 μ A Ir	TELEDYNE	PAD100/INSUL'D CASE	-
Q1		NOT USED			-
Q2		NOT USED			-
Q3	230027-1	N-CHAN JFET	TELEDYNE	U3114JF	2
Q4	240013	Si NPN TRANSISTOR	NATIONAL	BC184C/TO18	1
Q5	240006	Si NPN TRANSISTOR	NATIONAL	2N3904/TO18	3
Q6	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	4
Q7	230042	N-CHAN I LIM 3.0mA	TELEDYNE	J509	3
Q8	230003	N-CHAN JFET	TELEDYNE	U1899JF	4
Q9	250011	Si PNP TRANSISTOR	NATIONAL	BC327/TO18	3
Q10		NOT USED			-
Q11	250008	Si PNP TRANSISTOR	NATIONAL	BC214C/TO18	1
Q12	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	-
Q13	240006	Si NPN TRANSISTOR	NATIONAL	2N3904/TO18	-
Q14	230042	N-CHAN I LIM 3.0mA	TELEDYNE	J509	-

NOTES

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECO	DATE	CHGD

DATE 5.7.83	datron ELECTRONICS LTD	
DRAWN /	TITLE 1061A AC PCB ASSY	
CHECKED LOG	1062	
APPROVED	DRAWING NUMBER 400552	SHEET 16 OF 20
DATE		

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
Q15	250011	Si PNP TRANSISTOR	NATIONAL	BC327/TO18	-
Q16	230003	N-CHAN JFET	TELEDYNE	U1899JF	-
Q17	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/	-
Q18	230027-1	N-CHAN JFET	TELEDYNE	U3114JF	-
Q19		NOT USED			-
Q20	230002	N-CHAN JFET	TELEDYNE	U1894JF	1
Q21	230056	N-CHAN JFET	SILICONIX	J212	1
Q22		NOT USED			-
Q23	230003	N-CHAN JFET	TELEDYNE	U1899JF	-
Q24		NOT USED			-
Q25	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	-
Q26	240006	Si NPN TRANSISTOR	NATIONAL	2N3904/TO18	-
Q27	250011	Si PNP TRANSISTOR	NATIONAL	BC327/TO18	-
Q28	230042	N-CHAN I LIM 3.0mA	TELEDYNE	J509	-
Q29	230003	N-CHAN JFET	TELEDYNE	U1899JF	-
Q30		NOT USED			-
Q31	230035	N-CHAN JFET	TELEDYNE	U1897JF	4
Q32	230035	N-CHAN JFET	TELEDYNE	U1897JF	-
Q33	230035	N-CHAN JFET	TELEDYNE	U1897JF	-
Q34	230035	N-CHAN JFET	TELEDYNE	U1897JF	-
Q35	230058	N-CHAN I LIM 750 μ A	TELEDYNE	J504	1
Q36	230031	N-CHAN DUAL JFET	SILICONIX	U404	1

NOTES

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECO	DATE	CHGD

DATE 5.7.83	datron ELECTRONICS LTD	
DRAWN /	TITLE 1061A AC PCB ASSY	
CHECKED LOG	1062	
APPROVED	DRAWING NUMBER 400552	SHEET 17 OF 20
DATE		

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
M1		NOT USED			-
M2	260050	412 DUAL BIFET OP AMP	NATIONAL	LF 412 CN	2
M3	260028	1458 DUAL OP AMP	FAIRCHILD	uA1458 CTC	1
M4	260063	7650 OP AMP	INTERSIL	ICL7650CTV	4
M5	280015	QUAD D-TYPE	MOTOROLA	MC14076 BCP	2
M6	280015	QUAD D-TYPE	MOTOROLA	MC14076 BCP	-
M7	280011	DUAL D FLIP FLOP	MOTOROLA	MC14013 BCP	1
M8		NOT USED			-
M9	260063	7650 OP AMP	INTERSIL	ICL7650 CTV	-
M10	260063	7650 OP AMP	INTERSIL	ICL7650 CTV	-
M11	290026	RMS KIT	DATRON	SEE DRG	1
M12	290077	7 * DARLINGTON DRIVER	SPRAGUE / EXAR	ULN2004A / XR 2204CP	1
M13	260065	OP27 OP AMP	PMI	OP27 FZ	1
M14	260027	714 OP AMP	FAIRCHILD	uA714 HC	2
M15	280116	DUAL 4 CHAN AN MUX	SILICONIX	DG 509 CJ	2
M16	260050	412 DUAL BIFET OP AMP	NATIONAL	LF 412 CN	-
M17	280116	DUAL 4 CHAN AN MUX	SILICONIX	DG 509 CJ	-
M18		NOT USED			-
M19	290066	FREQ SENSITIVE SWITCH	CONSUMER MICROCIRCUITS	FX301L	1
M20	260027	714 OP AMP	FAIRCHILD	uA714 HC	-
M21	260063	7650 OP AMP	INTERSIL	ICL7650 CTV	-
M22	260047	2625 OP AMP	HARRIS	HA32625-5	1

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECD	DATE	CHRD

DATE 5.7.83	datron ELECTRONICS LTD TITLE 1061A 1062 AC PCB ASSY DRAWING NUMBER 400552 SHEET 18 OF 20
DRAWN 	
CHECKED LOG	
APPROVED 	
DATE 	

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
RL1	330012-2	REED RELAY 1A GUARDED	HAMLIN	HE721A5134	4
RL2	330018-1	RELAY 2P2W 7V HOLD-IN	AMF	SEE DRG	2
RL3	330018-1	RELAY 2P2W 7V HOLD-IN	AMF	SEE DRG	-
RL4	330012-2	REED RELAY 1A GUARDED	HAMLIN	HE721A5134	-
RL5	330012-2	REED RELAY 1A GUARDED	HAMLIN	HE721A5134	-
RL6	330012-2	REED RELAY 1A GUARDED	HAMLIN	HE721A5134	-
	450388-1	GUARD SHIELD			1
	400379/5	WIRE / TERMINAL ASSY			1
	410217-4	PCB			1
	459112-2	RELAY BRACKET			2
	540002	22SWG BTC WIRE			A/R
	512999	7/0.2 PTFE INSUL. (WHITE) WIRE			490 mm
J1	5710.95/c	16 WAY AP/3M RIBBON CABLE			1
	590001	SLEEVE MAX CABLE 3.0	HELLERMANN ELECTRIC	H15 x 20mm BLACK HELSYN	7
	590004	SLEEVE - PTFE	HELLERMANN ELECTRIC	FE10	A/R
	605059	8WAY D.I.L. SOCKET			4
	602001	FSV TERMINAL	MOLEX	02-04-1875	2
	602004	BREAKAWAY TERM! STRIP	MOLEX	05-30-0001	16
J3	605052	8WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-8-1	1
	605060	14 PIN DIL SOCKET	ASTRALUX	ICL143-S3T	1
	605061	16 PIN DIL SOCKET	ASTRALUX	ICL163-S6T	5
	605057	CRIMP TERMINAL	MOLEX	4809-GL	2

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS	ECD	DATE	CHRD

DATE 5.7.83	datron ELECTRONICS LTD TITLE 1061A 1062 AC PCB ASSY DRAWING NUMBER 400552 SHEET 19 OF 20
DRAWN 	
CHECKED LOG	
APPROVED 	
DATE 	

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	611007	M3 X 6mm POZISCK STEEL	ZN.PL.		3
	611016	M3 X 8mm POZIPAN STEEL	ZN.PL.		5
	612021	M3 X 16mm SPACER	HARWIN	R6377-02	3
	613005	M3 INT. SHAKEPROOF			2
	613014	M2.5 INT. SHAKEPROOF			2
	615002	M3 FULL NUT STEEL ZN.PL.			2
	615005	3-48UNC FULL NUT STEEL	ZN.PL.		5
	617010	NYLATCH PLUNGER 3/16"	HARTWELL CORP	HN3P-32-4-1	5
	617011	NYLATCH GROMMET 3/16"	HARTWELL CORP	HN3G-32-1	2
	620003	SOLDER PIN	HARWIN	H2105 A01	9
	620005	CLOVERLEAF PTFE INSUL.	SEAELECTRO	FTE15P59	12
	620007	TEST POINT TERMINAL	MICROVAR	TYPE C30	220mm
	630107	BRASS STRIP 15.5 X .38mm	RIGHTON	CZ108 1/2H	3
	613029	M3 CRINKLE WASHER S.S.			5
	620001	CLOVERLEAF. PTFE INSUL.	SEAELECTRO	FTE12 P59	2
	620008	PTFE BUSH	SEAELECTRO	119-0034	4
	630024	STEATITE BEAD 16 SWG	PARK ROYAL PORCELAIN	Nº 2	

NOTES.

SEE SHEET 2 FOR LATEST ISSUE

ISS																		
ICD																		
DATE																		
CHKD																		

DATE	5.7.83	datron ELECTRONICS LTD
DRAWN		
CHECKED	LOG	
APPROVED		
DATE		TITLE 1061A AC PCB ASSY 1062
		DRAWING NUMBER 400552
		SHEET 20 of 20

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	400427	IEEE 488 OPTION P.C.B ASSY	DATRON		1
	400429	SOCKET/CABLE ASSY.	DATRON		1
	400346	ADDRESS SWITCH P.C.B ASSY	DATRON		1
	SEE TABLE	EXTERNAL TRIGGER ASSY	DATRON		1
	450169-3	STUD MOUNT STAND OFF.			2
	450225-2	IEEE ADAPTOR PLATE			SEE TABLE
	611016	SCREW M3 x 8 POSI PAN HD			2
	613005	WASHER M3 INTERNAL SHK PROOF			2
	613020	WASHER M4 FLAT-STEEL			2
	613021	WASHER M4 INTERNAL SHK PROOF			2
	615011	NUT M4 FULL HEX. STEEL			2
	630042	ADHESIVE CABLE CLIP	RICHCO	CFCC-B	2
M3	SEE TABLE	4K x 8 EPROM	DATRON		1

NOTES. CIRCUIT REFER 430427

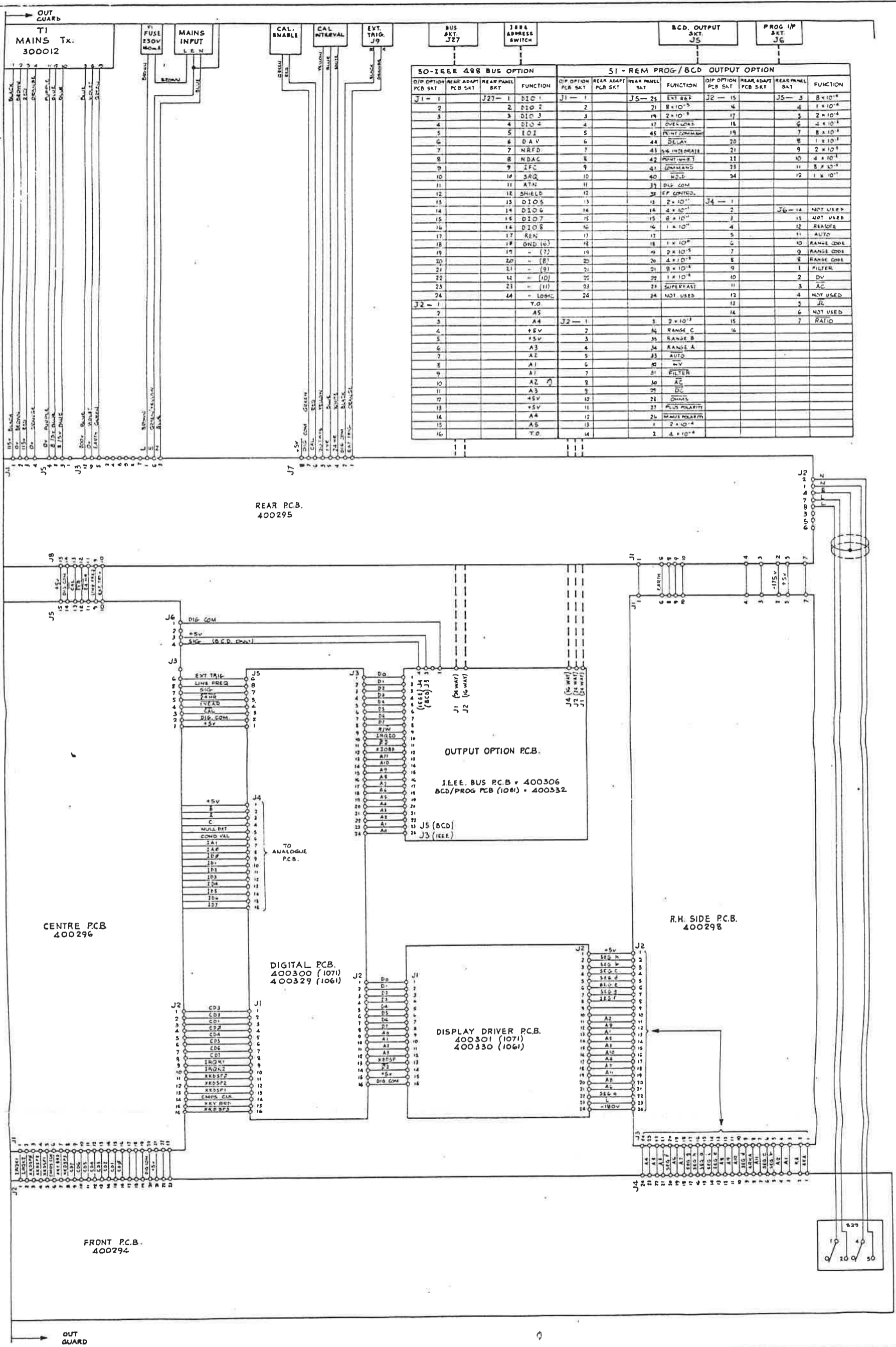
SEE SHEET 7 FOR LATEST ISSUE

TYPE	KIT	M3	450225 QTY	EXT. TRIG. No.
1065	440082	290084-17E	0	400435
1061	440083	290070-17C	1	400400
1071	440084	290069-17C	1	400400

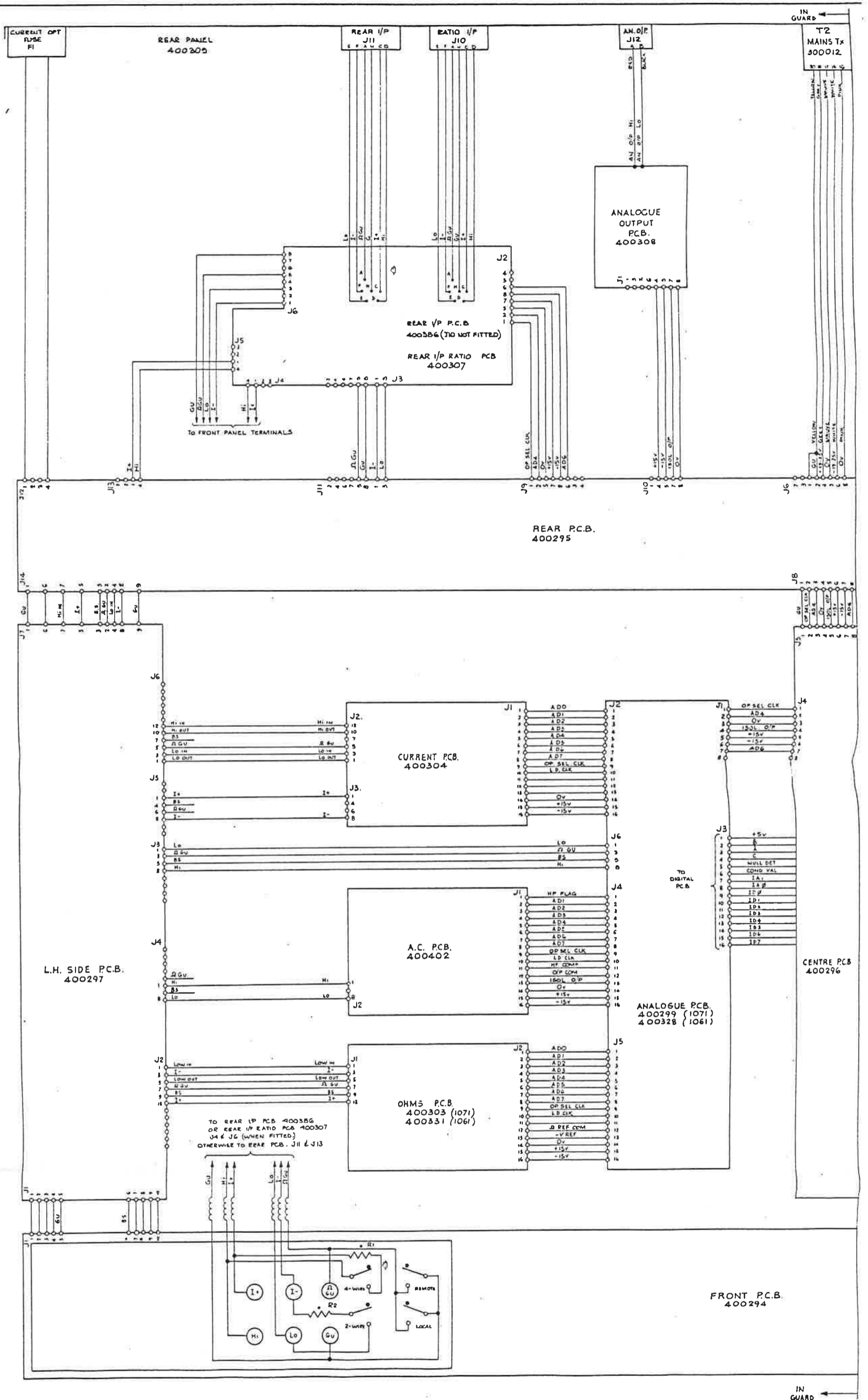
DATE	6.1.81.	datron ELECTRONICS LTD
DRAWN	IL	TITLE
CHECKED	MD	IEEE 488 OPTION.
APPROVED		1071/1061/1065
DATE		DRAWING NUMBER
		440082
		440083
		440084
		SHEET
		1 OF 1

REV	1	2	3	4	5	6	7	8	9
ECO		12.17	13.13	13.71	13.69, 13.89	14.10, 14.11	14.51	14.95	15.19
DATE	6.1.81	19.8.81	13.7.82	24.8.82	9.9.82	24.11.82	31.3.83	2.6.83	18.8.83
CHKD		EP	MD	MD	MD	MD	MD	MD	MD

CHANGES	
B	RELEASED TO PRODUCTION 10.4.80
2	ECO 1023 11-05 SIGNAL CABLE CHOICES ADDED



50-IEEE 498 BUS OPTION				51-REM PROG/BCD OUTPUT OPTION			
DIP OPTION PCB SKT	REAR ADAPT PCB SKT	REAR PANEL BAT	FUNCTION	DIP OPTION PCB SKT	REAR ADAPT PCB SKT	REAR PANEL SMT	FUNCTION
J1-1	J27-1	DIC 1	DIC 1	J1-1	J5-25	J5-3	8 x 10 ⁻⁴
2	2	DIO 2	DIO 2	2	2	4	1 x 10 ⁻⁴
3	3	DIO 3	DIO 3	3	3	5	2 x 10 ⁻⁴
4	4	DIO 4	DIO 4	4	4	6	4 x 10 ⁻⁴
5	5	LOI	LOI	5	5	7	8 x 10 ⁻⁴
6	6	DAV	DAV	6	6	8	1 x 10 ⁻³
7	7	NRFD	NRFD	7	7	9	2 x 10 ⁻³
8	8	NDAC	NDAC	8	8	10	4 x 10 ⁻³
9	9	IFC	IFC	9	9	11	8 x 10 ⁻³
10	10	SRQ	SRQ	10	10	12	1 x 10 ⁻²
11	11	ATH	ATH	11	11	13	
12	12	SHIELD	SHIELD	12	12	14	
13	13	DIO 5	DIO 5	13	13	15	
14	14	DIO 6	DIO 6	14	14	16	
15	15	DIO 7	DIO 7	15	15	17	
16	16	DIO 8	DIO 8	16	16	18	
17	17	REN	REN	17	17	19	
18	18	GND 10	GND 10	18	18	20	
19	19	(7)	(7)	19	19	21	
20	20	(8)	(8)	20	20	22	
21	21	(9)	(9)	21	21	23	
22	22	(10)	(10)	22	22	24	
23	23	(11)	(11)	23	23		
24	24	LOGIC	LOGIC	24	24		
J2-1		Y.O	Y.O	J2-1			
2	A5			2			
3	A4			3			
4	+5V			4			
5	+5V			5			
6	A3			6			
7	A2			7			
8	A1			8			
9	A1			9			
10	A2			10			
11	A3			11			
12	+5V			12			
13	+5V			13			
14	A4			14			
15	A5			15			
16	Y.O			16			



DRAWING No. 400294
FIRST USED ON

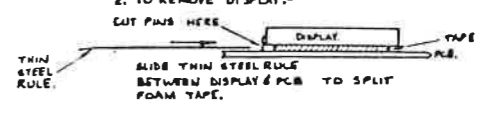
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

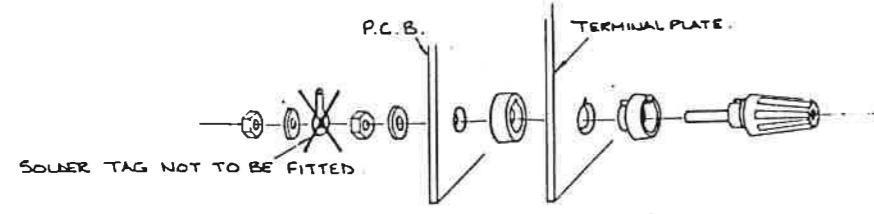
ALL BURRS TO BE REMOVED

NOTES

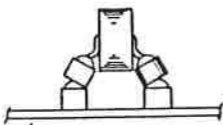
- IMPORTANT.**
- FIT M1 3 4 5 6 B 9 11 12 & 13 INTO 16 WAY AUGAT SOCKET PART NO 605061.
 - FIT M7 & M10 INTO AUGAT SOCKET PART NO. 605062. 16WAY.
 - FIT M2 INTO AUGAT SOCKET PART NO. 605060. 14 WAY.
2. TO REMOVE DISPLAY:-
CUT PINS HERE



NO.	CHANGES
C	
D	UPDATED PCB REMOVED 829
1	REMOVED TO REPAIR 23-3-78
2	SCHEM FOR HOUSING SHAPES ADDED 8.7.80 EGO 778 5-2-78
3	LED'S WARNING LABEL 420060-1 ADDED 10.1.85
4	ECO 867. LKS APAD 8.2.11 JUN 78
5	ECO 988. 20-10-75 UNTESTED P.L.S. 8.2 4.2 PIECES OF 630025 RELATED SOCKETS: 605011 & 605012 DISPLAY REMOVAL NOTE
6	ECO 1111 C3 ADDED 11.21.80
7	ECO 1113 L43 DELETED 11.21.80
8	ECO 1352 MORE TAPE ADDED TO REVERSE OF DISPLAY. JFR 1.7.82
9	ECO 1472 C10 ADDED COMPLETELY WITH SOLDER TAG END 11.2.82
10	ECO 1662 PCB HAS 165 4C R13, R14 C11 AND SCREENS ADDED. C3 NOW TRACKED IN. JFR 6.8.84
11	ECO 1661 C10 & A8A TAGS DELETED. RP. 10.9.84



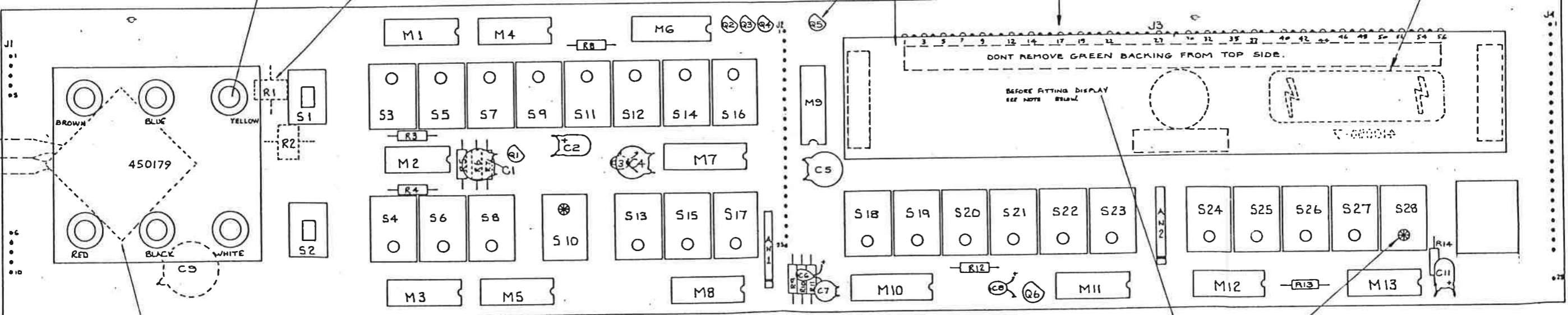
ASSEMBLE 6 TERMINALS TO TERMINAL PLATE No 450179 & PCB AS SHOWN ABOVE. TERMINAL COLOURS MUST BE AS INDICATED BELOW.



NOTE.
NO COMPONENTS TO STAND HIGHER THAN 7.5mm (EXCEPT SWITCHES & TERMINALS)
EXCEPT Q4/Q5 WHICH MUST BE LESS THAN 6.5mm

THE DISPLAY IS TO HAVE 7 PIECES OF PRESSURE SENSITIVE TAPE G30029. 1 PIECE (140mm LONG) STUCK TO THE P.C.B. BELOW THE LINE OF HOLES AND 6 PIECES (25mm LONG) STUCK TOGETHER IN PAIRS AND STUCK TO THE REVERSE OF DISPLAY IN POSITIONS SHOWN. LINE UP AND PRESS DISPLAY FIRMLY INTO PLACE. THEN SOLDER THE 24 PINS WHICH ARE SHOWN BELOW (THERE ARE ONLY SOLDER PADS FOR THESE PINS).

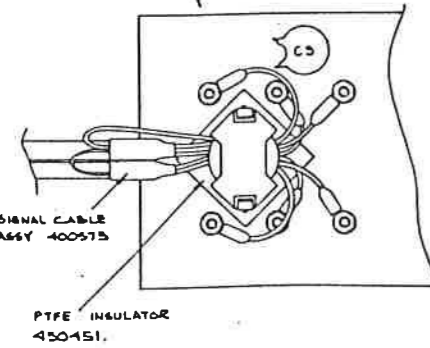
FIT WARNING LABEL 420060-1 IN APPROX POSITION SHOWN ON TRACK SIDE OF PCB. NEAR MAINS AND DISPLAY CONNECTIONS.



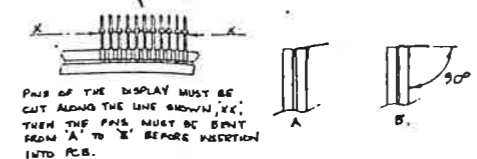
SOLDER SIGNAL CABLE ASSY 400573 TO REVERSE SIDE OF PCB WITH PTFE INSULATOR 450451 BETWEEN PCB & CHOKE.

- CONNECT WIRES TO TERMINALS THIS :-
- WHITE WIRE TO WHITE TERMINAL
 - YELLOW " " YELLOW "
 - GREEN " " BLACK "
 - RED " " RED "
 - VIOLET " " BLUE "
 - BLUE " " BROWN "

WHEN ASSEMBLY IS FINISHED TAPE CABLES TO PCB USING MASKING TAPE G50055. DO NOT STICK MASKING TAPE OVER DISPLAY!



ALL CAPACITORS TO BE Laid DOWN WHERE POSSIBLE, AS SHOWN. LEADS TO BE BENT AT RIGHT ANGLES THEN INSERTED INTO BOARD, THIS IS TO KEEP CAPACITORS AS LOW AS POSSIBLE.

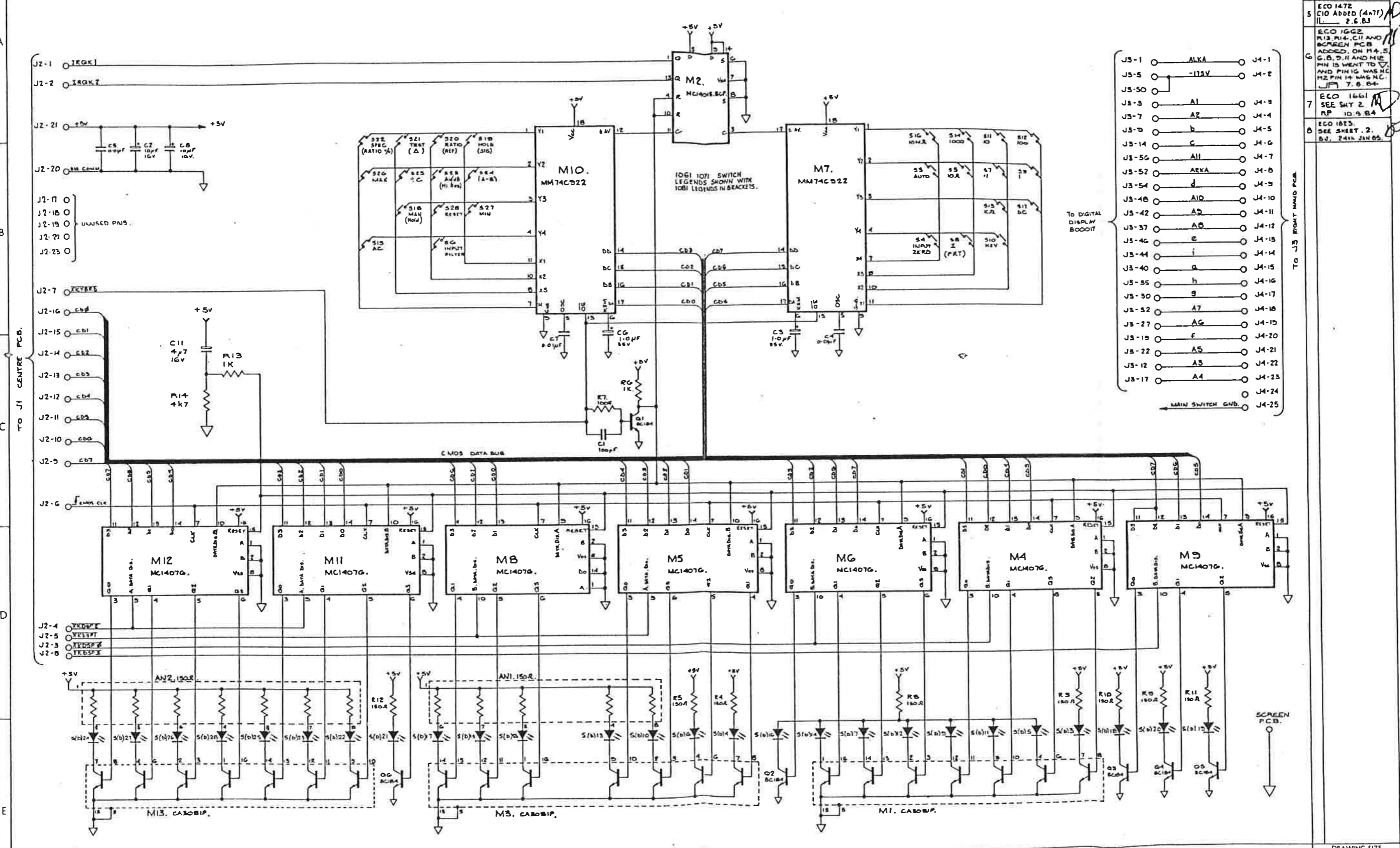


GREEN LED'S 20PF ALL OTHERS RED.

NO.	CHANGES
12	CONT. ECO 1816 GREEN PCB REMOVED. JFR 10.1.85
13	ECO 1825. 8.1.85 SIGNAL CABLE ASSY ADDED. 8.11.85

DRAWN B.J.	CHIEF [Signature]	DIMENSIONS IN MILLIMETRES	TOLERANCES HIGH DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.04 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.04 WHOLE DIMENSIONS UNLESS OTHERWISE STATED	ANGULAR +	MATERIAL	FINISH	datron ELECTRONICS LTD. NORWICH.		DRAWING No. 400294	DRAWING SIZE A1	SHEET 10/6
TRACED	APPROVED	SCALE 2:1 NOT TO BE SCALED			TITLE FRONT P.C.B. ASSY. 1061/1071/1081.						
DATE 19-4-78	DATE										

NO	CHANGES
2	REDRAWN B.J. 21-3-75
3	ECO 1008 20 CHANGE ONE WIRE B.J. 11-6-75
4	ECO 1111 SEE SHEET 2 11-21-80
5	ECO 1472 C10 ADDED (4n7) 11-21-80
6	ECO 1662 R13 P14, C11 AND SCREEN PCB ADDED ON M4, 5 G.B. 5, 11 AND M12 PIN 15 WENT TO V _{CC} AND PIN 16 WAS NC. M2 PIN 14 WAS NC. JFM 7.8.84
7	ECO 1661 SEE SHY 2 RP 10.9.84
8	ECO 1823 SEE SHEET 2. B.J. 24th JAN 85

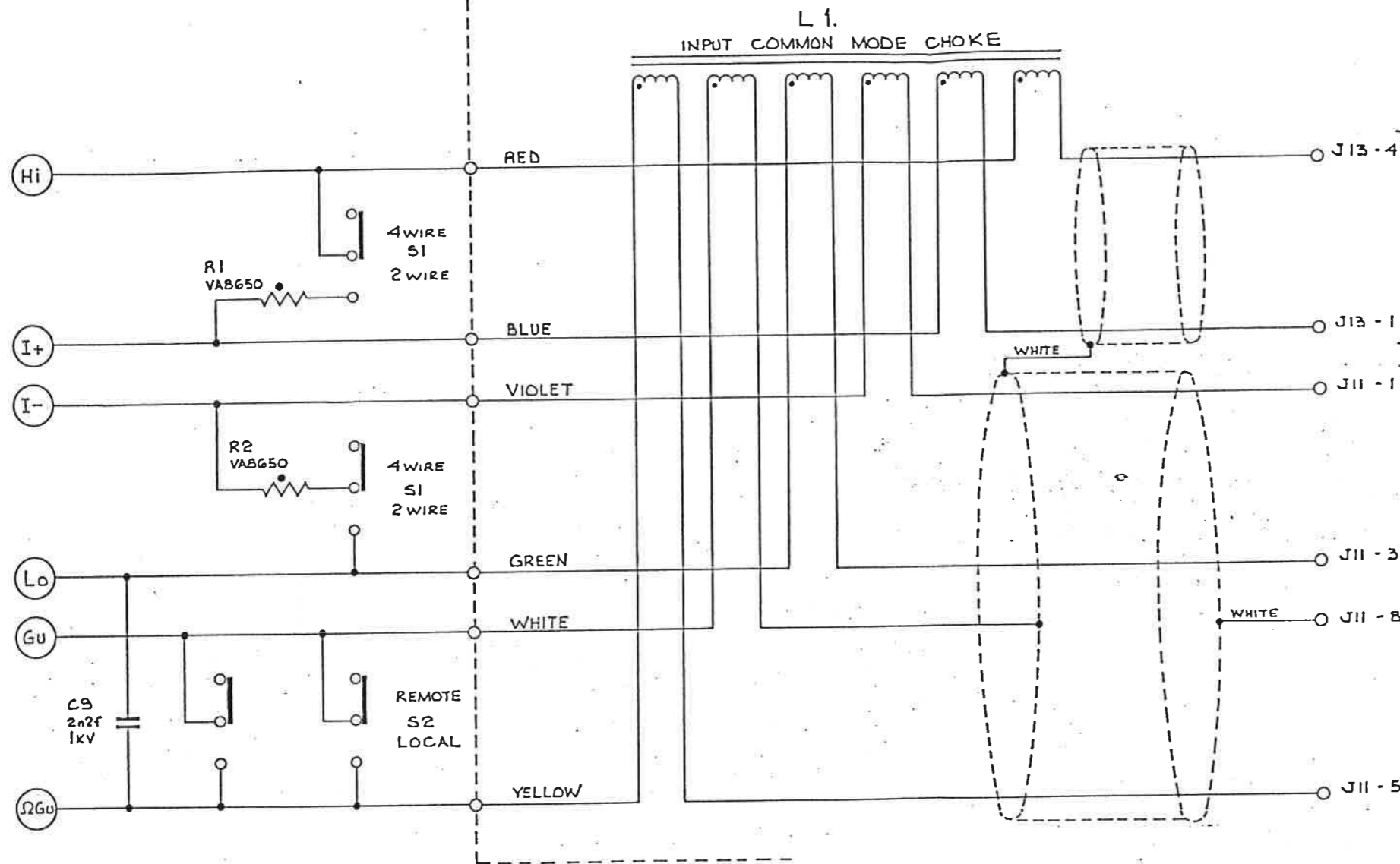


DRAWN B.J.	CHECKED P.R.P.	DIMENSIONS IN MILLIMETRES	TOLERANCES WHOLE DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/16	ANGULAR ± 0.5°	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A1
DATE 21-3-75	DATE	SCALE NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 0.1mm DECIMAL TO 1 PLACE ± 0.2mm WHOLE DIMENSIONS UNLESS OTHERWISE STATED	FINISH	TITLE FRONT PCB. CIRCUIT DIAGRAM 1061/1071/1081		DRAWING No. 430294	SHEET 1 OF 2

DRAWING No.
430294

FRONT PCB
400294

SIGNAL CABLE ASSY
400573



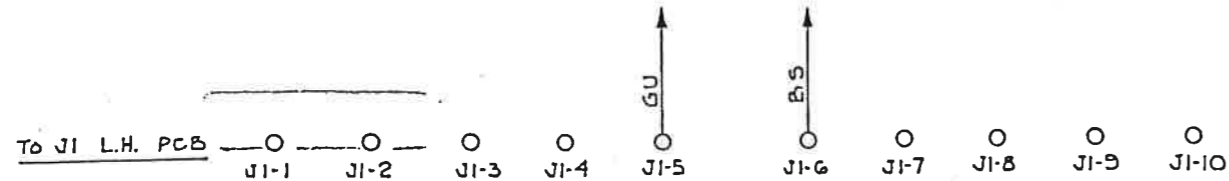
TO J13 REAR PCB.
(VIA SIGNAL CABLE 400573)
(WHEN REAR INPUT/RATIO IS
FITTED, CONNECT TO J4 OF
RATIO PCB)

TO J11 REAR PCB.
(VIA SIGNAL CABLE 400573)
(WHEN REAR INPUT/RATIO IS
FITTED, CONNECT TO J6
OF RATIO PCB)

NOTES:-

1. GU (J1-5) SCREENS ALL CIRCUITRY ON THIS SHEET.
2. B.S. SCREENS Hi & I+.
3. ΩG. SCREENS Lo & I-.

ISS	CHANGES
2	REDRAWN BJ 21.3.79.
3	ECO 899 SCREEN FOR HI & I+ NOW CONNECTED TO GU. VIA WHITE WIRE BJ 11-6-79
4	ECO 1111 C9 ADDED. 11. 21.4.80
5	ECO 1472 C10 ADDED (4n7f) 11. 2.6.83.
6	ECO 1662 SEE SHEET.1.
7	ECO 1661 C10 DELETED AP. 10.3.84.
8	ECO 1823 BJ. REDRAWN. 25-1-85 CABLE ASSY ADDED TO FRONT PCB ASSY. CHOKE ADDED TO SIGNAL CABLE.



datron
INSTRUMENTS
NORWICH
ENGLAND

<p>THIRD ANGLE PROJECTION</p> <p>ALL BURRS TO BE REMOVED</p>	<p>DRAWN B.S. JACKSON</p>	<p>DATE 24th JAN 85</p>	<p>DIMENSIONS IN MILLIMETRES</p>	<p>TOLERANCES</p> <p>DECIMAL TO 2 PLACES ±0.1mm DECIMAL TO 1 PLACE ±0.2mm WHOLE DIMENSIONS ±0.4mm ANGULAR ± 1/2°</p> <p>UNLESS OTHERWISE STATED</p>	<p>MATERIAL</p> <p>—</p>	<p>ASSY DRG & PARTS LIST } 400294</p> <p>CIRCUIT DIAGRAM 430294</p> <p>CHECK PROCEDURE 460294</p> <p>CHECK LIST 470294</p>	<p>TITLE</p> <p>FRONT PCB CIRCUIT DIAGRAM</p>	<p>DRAWING No.</p> <p>430294.</p>
	<p>CHECKED MJD.</p>	<p>DATE 29.1.85</p>	<p>SCALE</p> <p>—</p>						FINISH —	SHEET 2 OF 2

DRAWING No.
400295
FIRST USED ON

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

- 4 OFF STEEL M3x8mm SCREW, 611016.
- 9 OFF NYLON M3x8mm SCREW, 611037.
- 4 OFF STEEL SHAKEROOF WASHER, 615005.
- 9 OFF NYLON M3 WASHER, 613017.
- 2 OFF STEEL M3 NUT, 615002.
- 3 OFF NYLON M3 NUT, 615008.

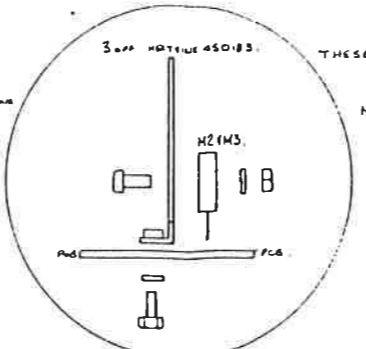
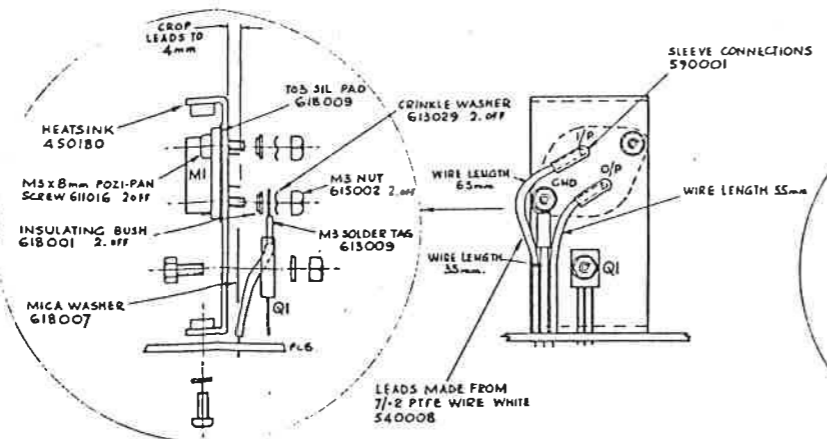
ALL BURRS TO BE REMOVED

NOTES

NO	CHANGES
0	UPDATED PCB BY 22-8-78
1	RELEASED TO PROD BY 23-10-78
2	ECO 783. B-12-70 COMPONENT CHANGES B.J.
3	ECO 816. B-12-70 PCB AND LABEL 490004 ADDS 25 JAN 79 W.G.S
4	ECO 876, D-12, 2000 CIG ADDED. JS NEW GRAD MAKE 4 PCB. U, L2 FL3 ADDED. R13 ADDED. C8 MOVED. EE & E3 CHANGED. G-6-70 B.J.
5	ECO 901 & 904 PCB USE MS 4. J1, B & 14. SETS 60201 DATED 2 FINE LINE WAS SOCKET WIRE & PIN WIRE WERE 200012. WIG 4 WASHERS WERE 613003 B.J. 31-10-79
6	ECO 1085 1087 2001 SOLDER PINE & 1 OFF 4-WAY WAFER (J13) DELETED. 11-21-80
7	ECO 1491. R0 WAS YAW B.J. 11-8-83
8	ECO 1452 M1 WAS MCT805 CT. FRINGS MODIFIED TO SUIT LM309K DEVICE. CB WAS 104 CER. DISC 11-17-83

THIS HEATSINK HELD TO PCB BY STEEL M3x8mm SCREWS STEEL M3 SHAKEROOF WASHERS

Q1 HELD TO HEATSINK WITH NYLON M3x8mm SCREW NYLON M3 WASHER NYLON M3 NUT



FIT WARNING LABEL 420080-1 IN APPROX POSITIONS SHOWN ON TRACK SIDE OF PCB. IN MAINS AREA.

HEATSINK COMPOUND ON BOTH SIDES OF MICA WASHERS ON Q1

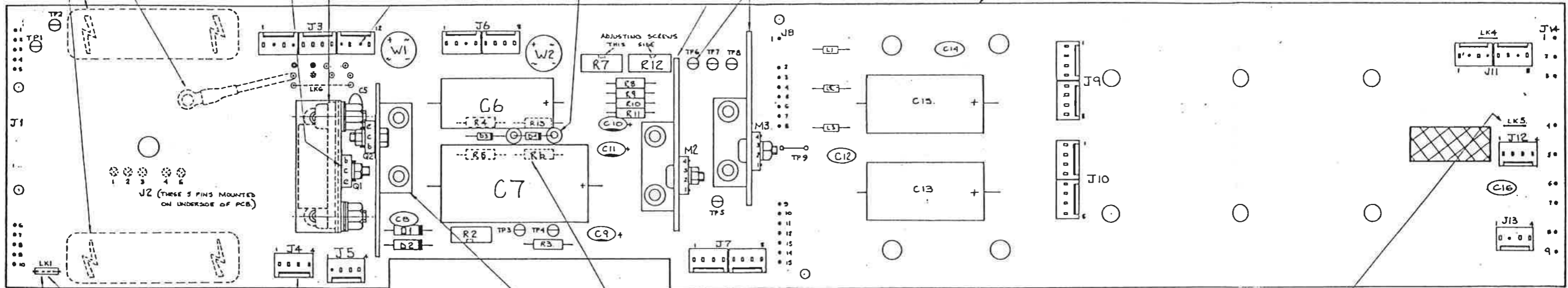
48A SOLDER TAG 613009 7/2 PTFE WIRE x 30mm 540008 HEATSINK x 20mm 590006

BLACK DOTS INDICATE THAT PIN HAS TO BE REMOVED BEFORE INSERTION INTO P.C.B.

MOUNT D4 ON STEATITE BEAD 630024 2 OFF

TEST POINT TERMINAL (620007) 8 OFF

REAR PCB 410091-5A



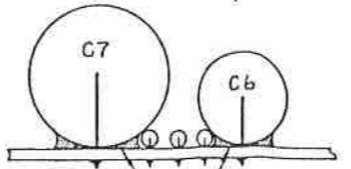
ALL LINKS USE 22 SWG TIN CU. WIRE (DATEW Part No. 540002)

LINKS 1, 2 & 3 MUST BE SLEEVED USING 590004

FOR 15V OPERATION REMOVE LK1, FIT LK2 & LK3



R4, R5 & R6 ARE POSITIONED UNDER THE CURVE OF C6 & C7. (AS SHOWN BELOW)



THE 4 LARGE CAPACITORS C6, C7, C13 & C15 ARE TO BE BEDDED INTO SILICONE RUBBER COMPOUND PART No 900004 BEFORE SOLDERING. THIS SHOULD FINISH UP AS ABOVE DRAWING.

MAKE LK5 AS A TEST POINT LOOP TO FACILITATE EASE OF 'SNIPPING' WHEN NOT REQUIRED.

NO	CHANGES
9	R14 CI DELETED. LK4 ADDED. 48A SOLDER TAG WIRE ASSY ADDED. 11-21-83 ECO 1470
10	ECO 1517 J3, 4, 6, 7, 9, 10 WERE TRN. W.P. 17-8-83
11	ECO 1525 D1 AND DE WERE 200010. PCB WAS ISSUE 3. W.P. 15-8-83
12	ECO 1685 D4 MOUNTED ON STEATITE BEADS. 11-20-84

DRAWN B.J.	CHECKED P.H.	DIMENSIONS IN 1 MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES + .005 DECIMAL TO 2 PLACES + .010 FRACTIONAL FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES + .1mm DECIMAL TO 1 PLACE + .3mm WHOLE DIMENSIONS + .4mm UNLESS OTHERWISE STATED	ANGULAR ± 0	MATERIAL
TRACED	APPROVED	SCALE 2:1 NOT TO BE SCALED			FINISH
DATE 26-4-78	DATE				

datron ELECTRONICS LTD. NORWICH.

TITLE
REAR P.C.B. ASSEMBLY. 1061/1071/1081

DRAWING SIZE
A1
DRAWING No.
400295
SHEET
1 OF 6

DRAWING No. 400295
FIRST USED ON

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

4 off STEEL M3x8mm SCREW, 610016.
9 off NYLON M3x8mm SCREW, 611037.
4 off STEEL SHAKESPROOF WASHER, 613005.
9 off NYLON M3 WASHER, 613017.
2 off STEEL M3 NUT, 615002.
3 off NYLON M3 NUT, 615008.

ALL BURRS TO BE REMOVED

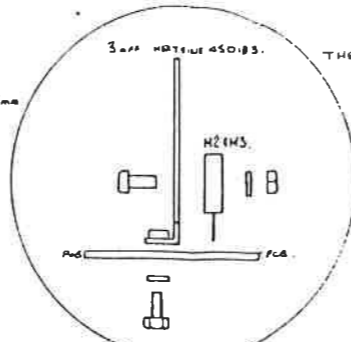
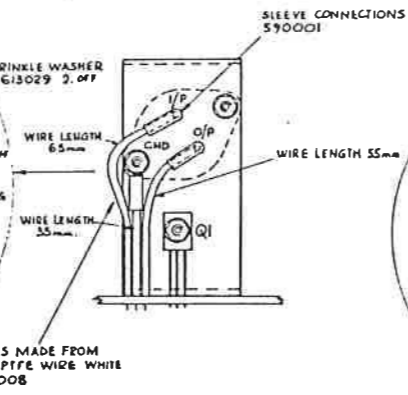
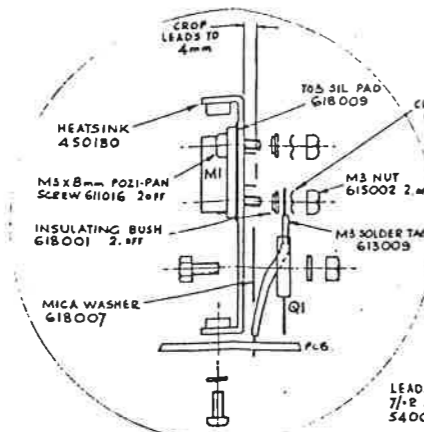
NOTES

NO	CHANGES
0	ISSUED
1	UPDATED PCB, B.T. 22-9-78
2	RELEASED TO PRODUCE 22-9-78
3	ECO 1083, B-12-78 COMPONENT CHANGES B.J.
4	ECO 1076, B62, 2000 CIG ADDED, J5 NEW GRID ISSUE 4 PCB, L12 (L13) ADDED, R13 ADDED, C8 INDUCTED, R24 R25 CHANGED, G-6-78, B.J.
5	ECO 991 of 5094 PCB WAS REVISED. J1, B & 14, EXTRA GOLD PLATE LINK WAS ADDED, W1 WAS 309012, MICA WASHERS WERE 613007, B.J. 31-10-78
6	ECO 1085, 1087 20PF SOLDER PINS (10PF 4-WAY WASHER (J13)) DELETED, B.J. 21-4-80
7	ECO 1491, R6 WAS 14W B.J. 11-8-83
8	ECO 1452 M1 WAS MC7805 CT, FIXINGS MODIFIED TO SUIT LM309K DEVICE. C8 WAS 10W CER. DISC B.J. 17-2-83

THIS HEATSINK HELD TO PCB BY STEEL M3x8mm SCREWS STEEL M3 SHAKESPROOF WASHERS

Q1 HELD TO HEATSINK WITH NYLON M3x8mm SCREW NYLON M3 WASHER NYLON M3 NUT

FIT WARNING LABEL 420080-4 IN APPROX POSITIONS SHOWN ON TRACED SIDE OF PCB. IN MAINS AREA.



HEATSINK COMPOUND ON BOTH SIDES OF MICA WASHERS ON Q1

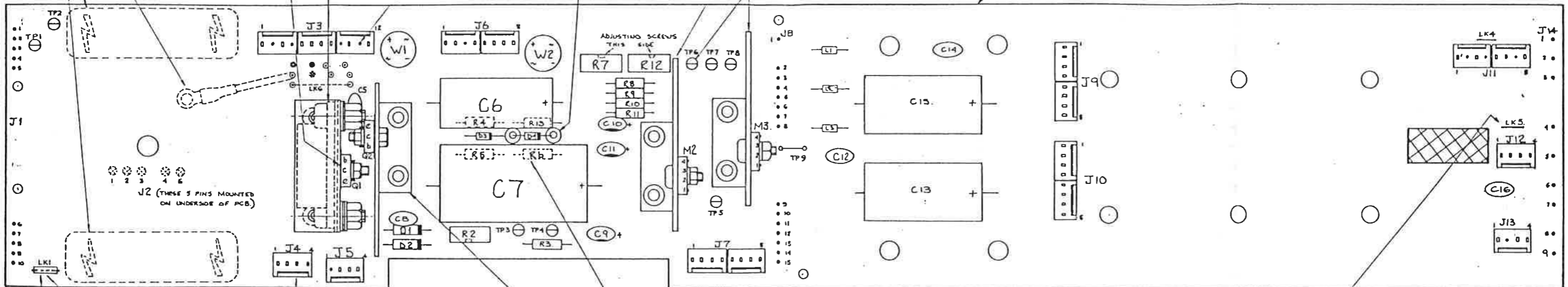
4BA SOLDER TAG 613009 7/2 PTFE WIRE x 30mm 540008 HEATSINK x 20mm 590006

BLACK DOTS INDICATE THAT PIN HAG TO BE REMOVED BEFORE INSERTION INTO P.C.B.

MOUNT D4 ON STEATITE BEAD 630024 2 off

TEST POINT TERMINAL (620007) B OFF

REAR PCB 410091-5A



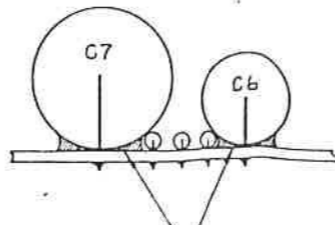
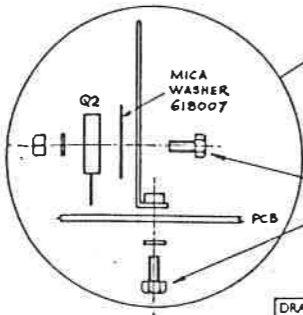
MAKE LK5 AS A TEST POINT LOOP TO FACILITATE EASE OF SNIPPING WHEN NOT REQUIRED.

ALL LINKS USE 22 SWG TIN CU. WIRE (BASED PARTN. 540002)

LINKS 1, 2 & 3 MUST BE SLEEVED USING 690004

FLAT PIN ASSY GOLD (PART NO 604033) 17 off. BACKPLATE INDICATES WHICH WAY THE PIN ASSY FITS INTO THE P.C.B.

R4, R5 & R6 ARE POSITIONED UNDER THE CURVE OF C6 & C7. (AS SHOWN BELOW)



THE 4 LARGE CAPACITORS C6, C7, C13 & C15 ARE TO BE BEDDED INTO SILICONE RUBBER COMPOUND PART NO 900004 BEFORE SOLDERING. THIS SHOULD FINISH UP AS ABOVE DRAWING.

FOR 115V OPERATION REMOVE LK1, FIT LK2 & LK3

NO	CHANGES
9	R1 & C1 DELETED. LK5 ADDED. 4BA SOLDER TAG WIRE ASSY ADDED. L. 2-8-83 ECD1470
10	ECO 1517 J3, 4, 6, 7, 9, 10 WERE TRN. WJF 17-6-83
11	ECO 1585 DIAND DE WERE. E00010. PCB WAS ISSUE 5. LPM 15-8-83
12	ECO 1688 D4 MOUNTED ON STEATITE BEADS. B.J. 20-8-84

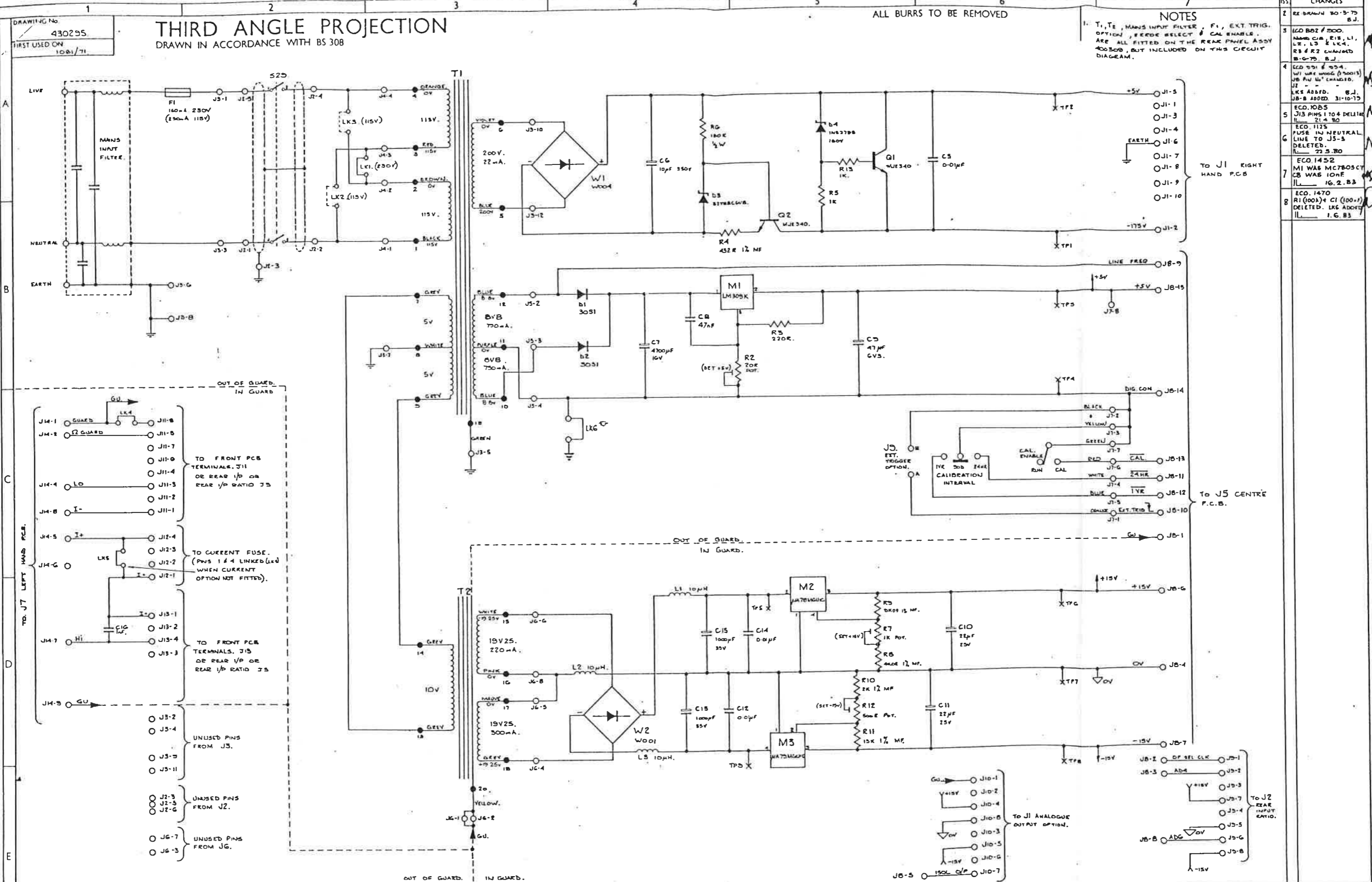
DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	ANGULAR	MATERIAL
B.J.	JAM	1 MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± 0.01 FRACTIONAL ± 0.04	± 0.5	
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 3 PLACES ± 0.1 FRACTIONAL ± 0.2	± 1mm ± 0.2mm ± 0.1mm	
DATE	DATE	2:1 NOT TO BE SCALED	UNLESS OTHERWISE STATED		

datron ELECTRONICS LTD. NORWICH.

TITLE REAR P.C.B. ASSEMBLY. 1061/1071/1081

DRAWING SIZE A1

DRAWING No. 400295 SHEET 1 of 6



DRAWN B.J.	CHECKED <i>[Signature]</i>	DIMENSIONS IN MILLIMETRES	TOLERANCES IN CH DECIMAL TO 2 PLACES + DECIMAL TO 2 PLACES + FRACTIONAL	ANGULAR ±	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING No. 430295	DRAWING SIZE A1	SHEET 1 of 1
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 2 PLACES + DECIMAL TO 1 PLACE + WHOLE DIMENSIONS UNLESS OTHERWISE STATED		FINISH		TITLE REAR PCB (INCLUDING REAR PANEL) CIRCUIT DIAGRAM 1061/1071/1081		

DRAWING No.
400296
FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

ISS	CHANGES
C	
D	EX. 12, 13, K1 & K2 ADDED TO NEW 100 PCB 25-3-78
1	RELEASED TO PRODUCE 25-3-78
2	ECO 1004 RIBBON CABLE MODS. B.T. G-12-78
3	ECO B-10 PCB MODS. B.J. 4-3-79.
4	ECO B.C.T. PCB UPDATE B.J. 11-6-79 & ECO 1004 B.T. 1004 MODS TO STD-100A 600008 CURR. EXEMPT & ECO B.T. J3, 4 & C 10-10-79
5	ECO 952 B-10-79 PCB WAS 125 4A, B.J. PCB OF J5 BARRED. PLS CUT OUT INCREASED IN DEPTH.
6	ECO 1000 RIBBON CABLE ASSEMBLY WAS 572100/A 11-1-80
7	ECO 1102 PCB WAS ISSUE 5 11-4-80
8	ECO 1217 RIBBON CABLE WAS 572100/B 16-8-81

IMPORTANT:

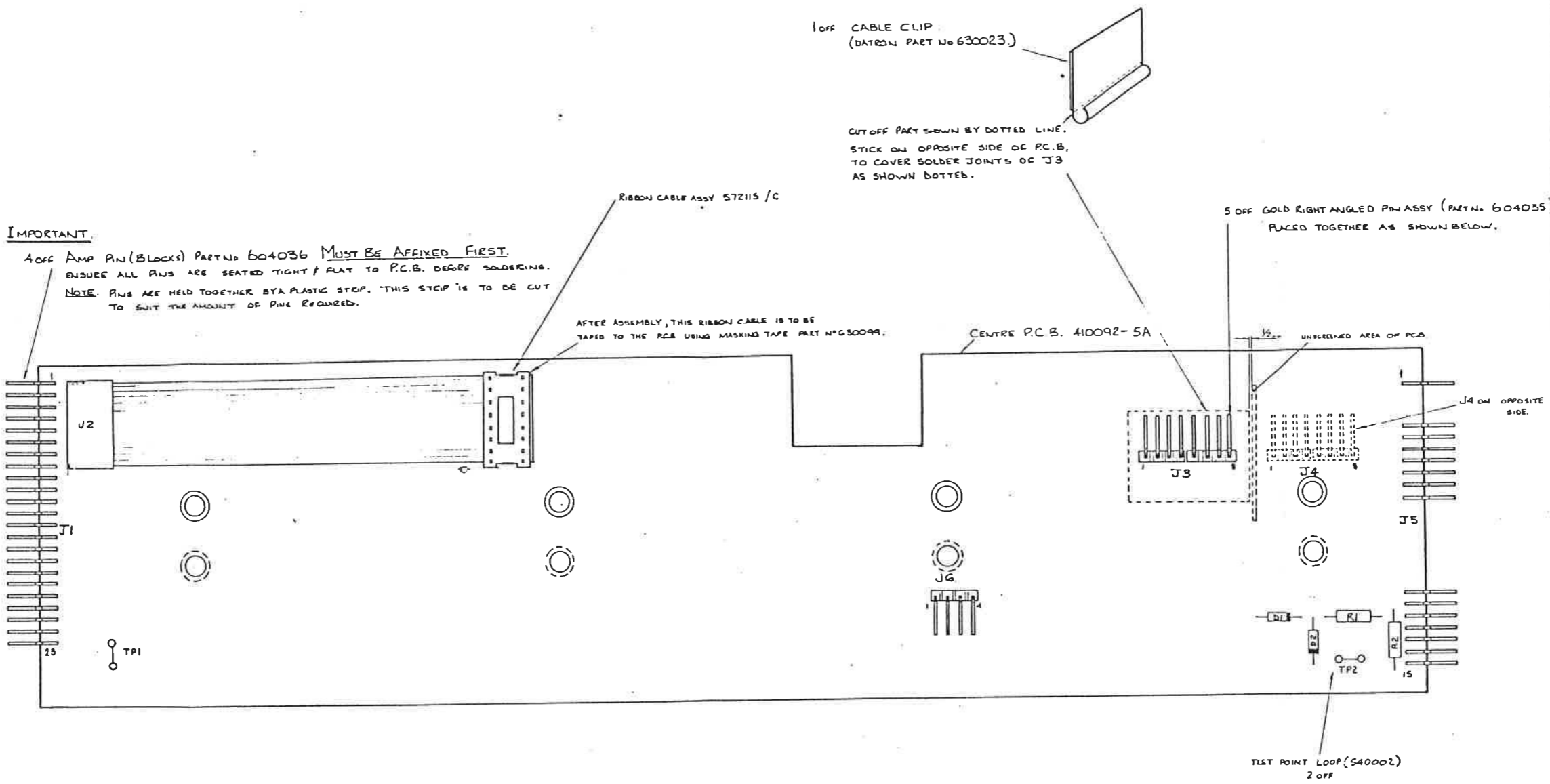
4 OFF AMP PIN (BLOCKS) PART No 604036 MUST BE AFFIXED FIRST. ENSURE ALL PINS ARE SEATED TIGHT & FLAT TO P.C.B. BEFORE SOLDERING.
NOTE: PINS ARE HELD TOGETHER BY A PLASTIC STRIP. THIS STRIP IS TO BE CUT TO SUIT THE AMOUNT OF PINS REQUIRED.

AFTER ASSEMBLY, THIS RIBBON CABLE IS TO BE TAPED TO THE PCB USING MASKING TAPE PART No 630099.

1 OFF CABLE CLIP (DATRON PART No 630023)

CUT OFF PART SHOWN BY DOTTED LINE. STICK ON OPPOSITE SIDE OF P.C.B. TO COVER SOLDER JOINTS OF J3 AS SHOWN DOTTED.

5 OFF GOLD RIGHT ANGLED PIN ASSY (PART No 604035) PLACED TOGETHER AS SHOWN BELOW.



DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	ANGULAR	MATERIAL
B.J.	[Signature]	MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES + 0.01 DECIMAL TO 2 PLACES + 0.10 FRACTIONAL + 1/64		
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 2 PLACES + 1mm DECIMAL TO 1 PLACE + 2mm WHOLE DIMENSIONS + 4mm		FINISH
DATE	DATE	NOT TO BE SCALED	UNLESS OTHERWISE STATED		
25-4-78					

datron ELECTRONICS LTD. NORWICH.
TITLE: CENTRE P.C.B. ASSEMBLY. 1061/1071/1081

DRAWING No. 400296
DRAWING SIZE A1
SHEET 1 OF 2

DRAWING No.
430296
FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION

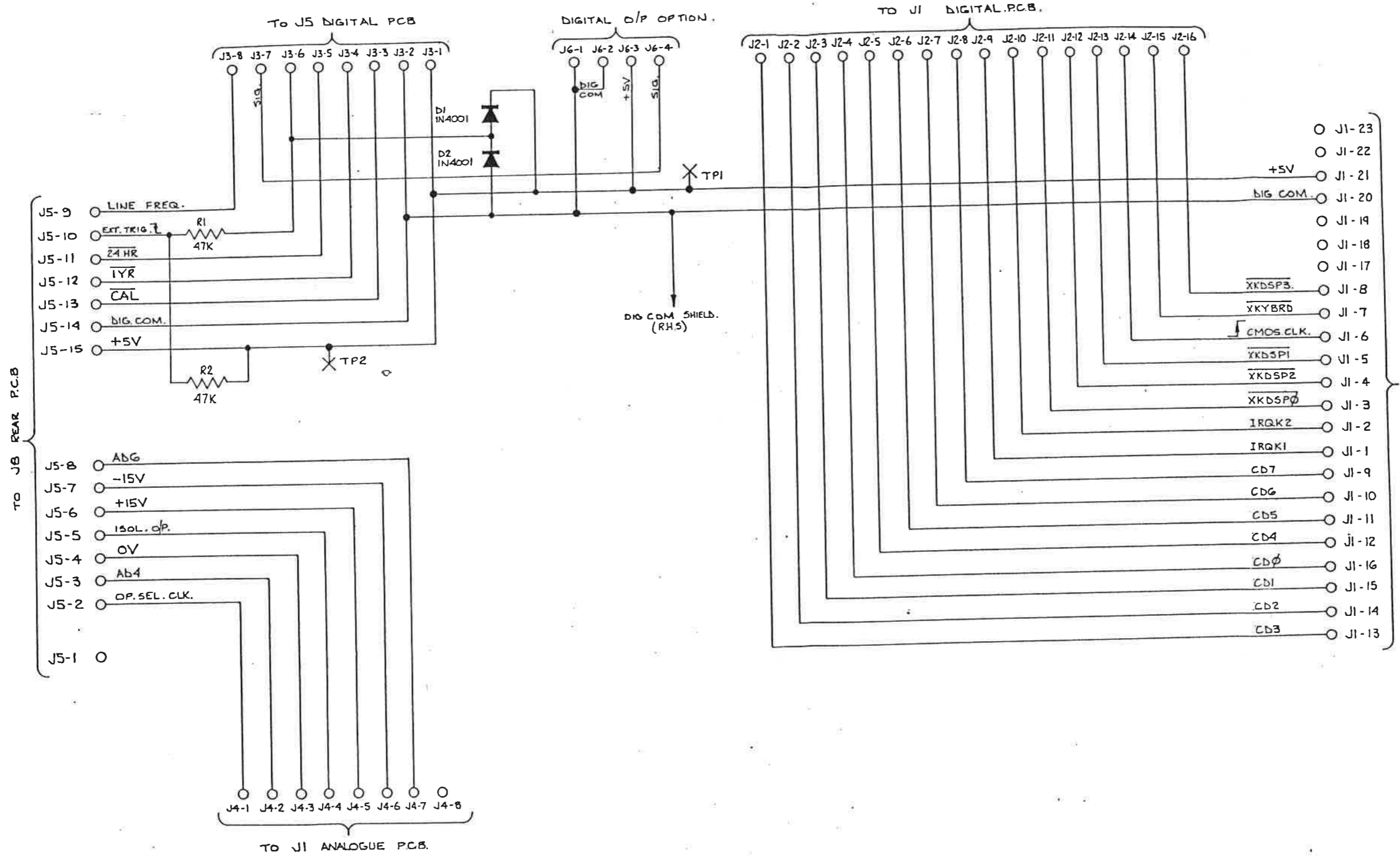
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1. "IN GUARD" TRACKS TO BE ON C.C.T. SIDE (SHT. 2) &
"OUT OF GUARD" TRACKS TO BE ON THE COMP.
SIDE (SHT. 3) OF P.C.B. WHERE POSSIBLE.

ISS	CHANGES
D	
1	RELEASED TO PRODN 20-5-78.
2	ECD 845. J6-1 SIG JOINED TO J5-7. B.J. 4-5-79
3	ECD 852. B.J. J5-8 ADDED & J5-1 GU. DELETED 25-10-79



DRAWN BJ.	CHECKED <i>Sch</i>	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/64	ANGULAR ± 1°	MATERIAL
TRACED	APPROVED	SCALE NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 0.1mm DECIMAL TO 1 PLACE ± 0.2mm WHOLE DIMENSIONS ± 0.4mm		FINISH

datron ELECTRONICS LTD. NORWICH.
TITLE
CENTRE PCB SCHEMATIC 1061/1071/1081

DRAWING No. 430296	DRAWING SIZE A2
SHEET 1 OF 1	

DRAWING No.
400297
FIRST USED ON
1061/71

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

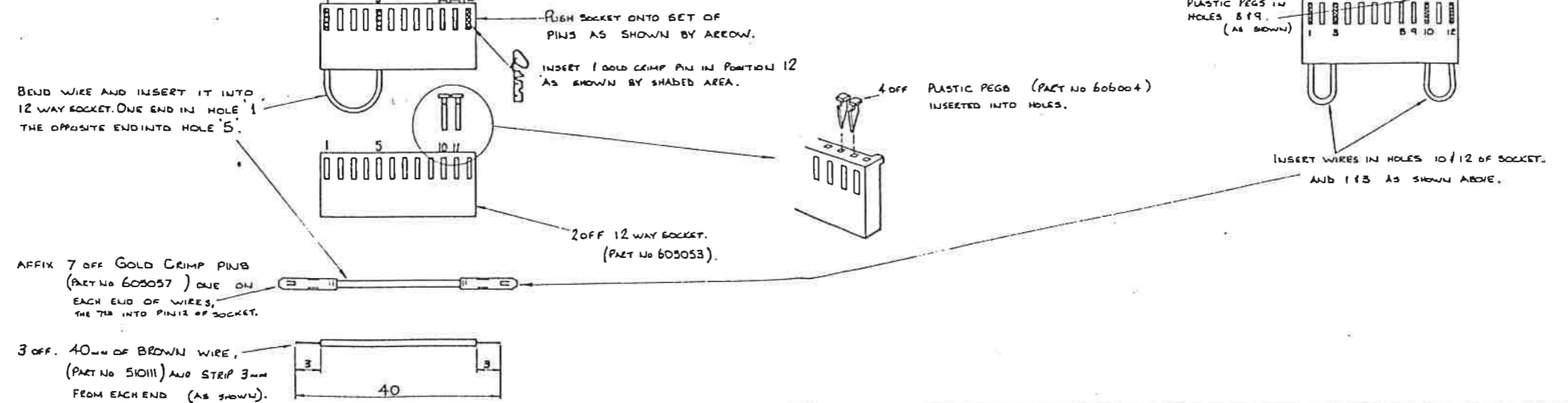
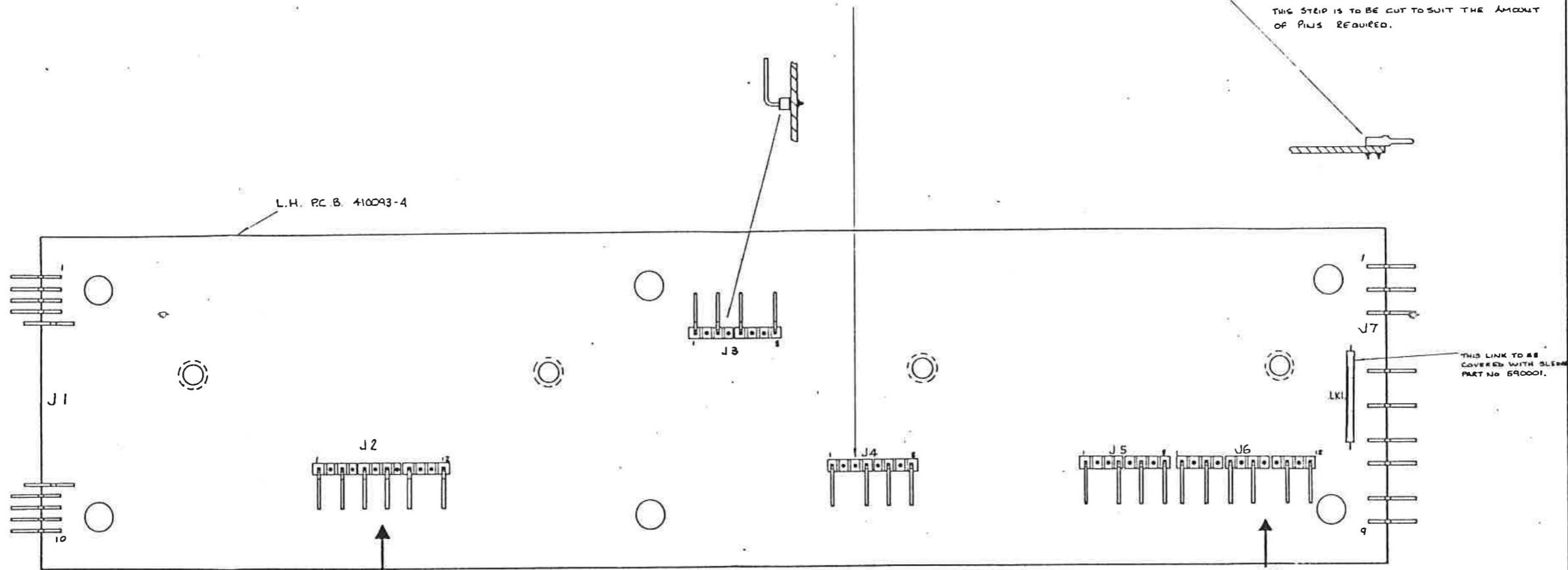
ALL BURRS TO BE REMOVED

NOTES

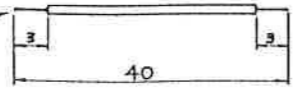
CHANGES	
1	NEW/ISSUE PCB BY 14.8.78
2	RELEASED TO PRODU 25.5.78
3	REWORK PCB UPDATE 03.11.75

USE THE GOLD 4 RIGHT ANGLED PIN ASSY (PART NO 604035). 12 OFF.
PLACED TOGETHER TO MAKE UP THE REQUIRED AMOUNT OF CONTACTS (SHOWN BELOW).
REMOVE PINS IN PLACES SHOWN BY BLACK DOTS.

IMPORTANT.
2 OFF. AMP PINS (PART NO 604036)
MUST BE AFFIXED FIRST.
ENSURE ALL PINS ARE SEATED TIGHT & FLAT TO P.C.B. BEFORE SOLDERING.
NOTE: PINS ARE HELD TOGETHER BY A PLASTIC STRIP. THIS STRIP IS TO BE CUT TO SUIT THE AMOUNT OF PINS REQUIRED.



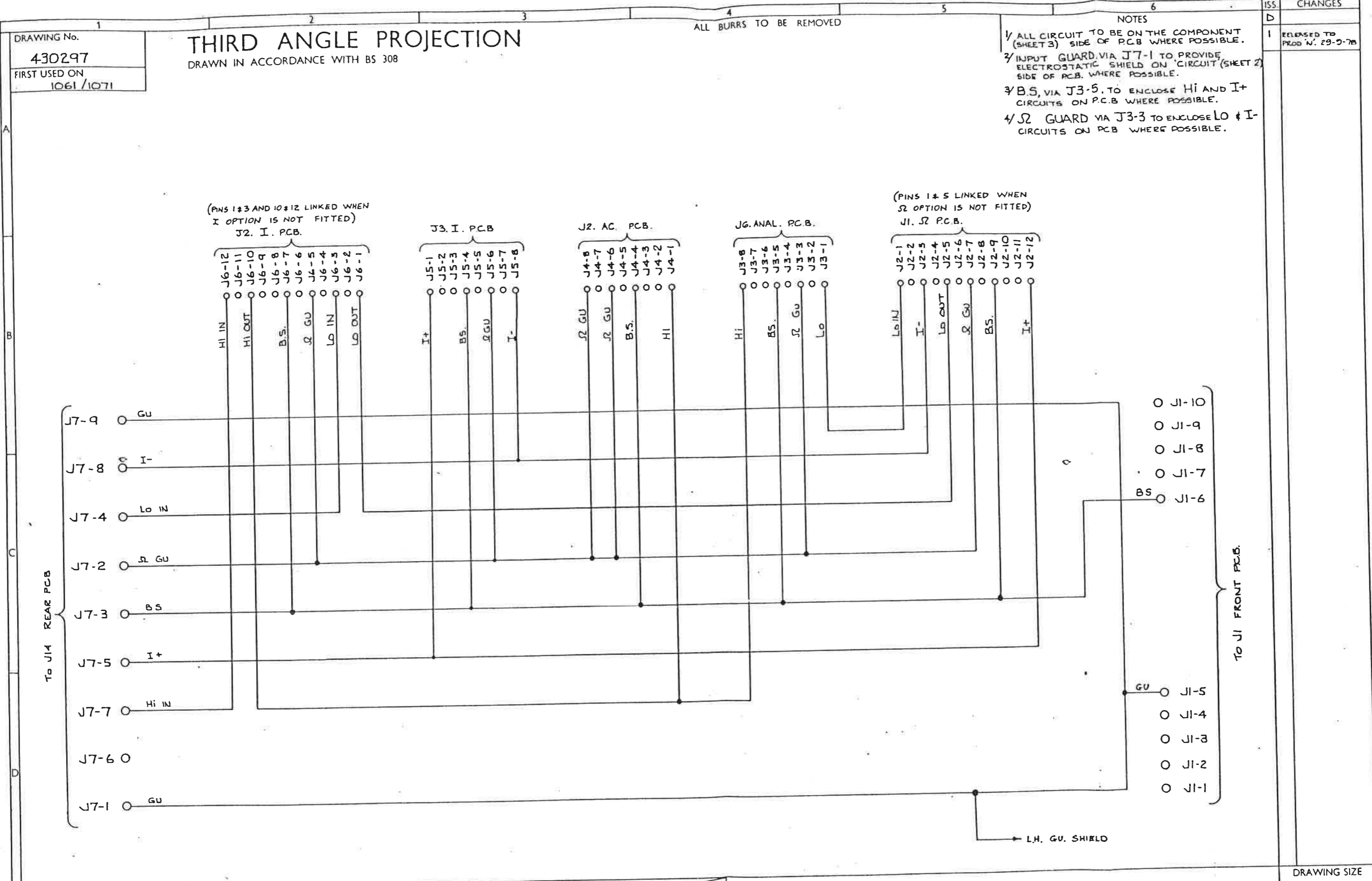
3 OFF. 40" OF BROWN WIRE, (PART NO 51011) AND STRIP 3mm FROM EACH END (AS SHOWN).



DRAWN B.J.	CHECKED <i>[Signature]</i>	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 1 PLACE ± .1mm DECIMAL TO 2 PLACES ± .2mm WHOLE DIMENSIONS UNLESS OTHERWISE STATED	ANGULAR ±	MATERIAL
TRACED	APPROVED	SCALE 2:1 NOT TO BE SCALED			FINISH
DATE 21.4.78	DATE				

datron ELECTRONICS LTD. NORWICH.
TITLE
1061/71/81 L.H. PCB ASSEMBLY

DRAWING No. 400297
DRAWING SIZE A1
SHEET 1 OF 1



DRAWN BJ	CHECKED <i>[Signature]</i>	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/64	ANGULAR ± 1/2°	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING No. 430297	DRAWING SIZE A2
TRACED	APPROVED	SCALE NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED		FINISH	TITLE L.H. P.C.B. SCHEMATIC 1061/1071/1081		SHEET 1 OF 1
DATE 30.5.78	DATE							

DRAWING No
400298
FIRST USED ON
1061/71

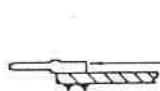
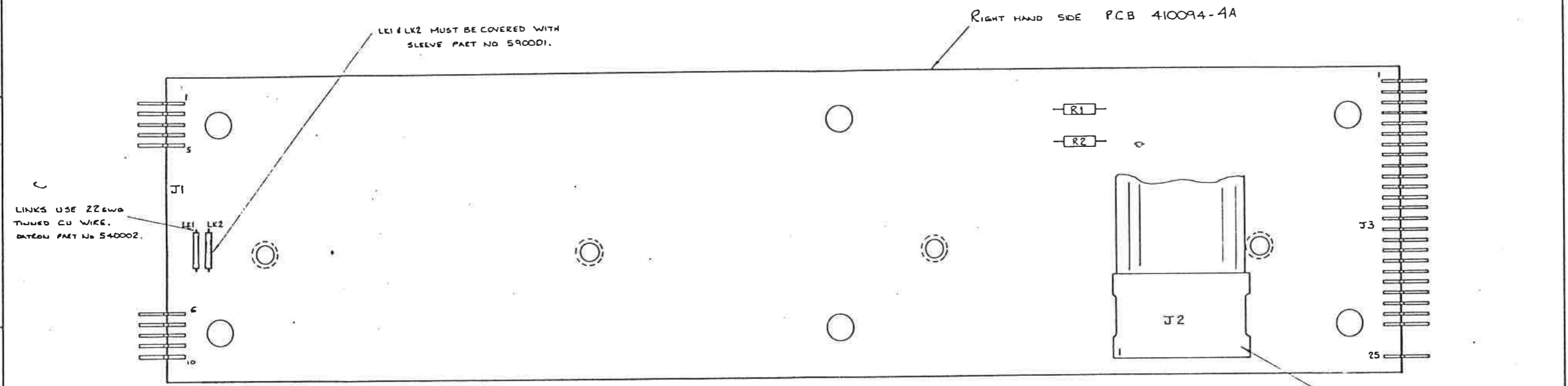
THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS	CHANGES
D	NEW ISSUE PCB B.J. 24.8.71
1	RELEASED TO PRODU 23.9.78.
2	ECO 850. 4-5-79 UPDATED PCB. J1-6 WAS REMOVED.
3	ECO 867 & 804. B.J. UPDATED PCB CABLE ADDRESS CHANGED TO 52444A
4	ECO 943. 10.9.79 RIBBON CABLE ASSY WAS 574250/A IL
5	ECO 1417 JE WAS 4-00345 02 18.8.81
6	ECO 1474 PCB ISSUE N° WAS 4 IL 3.6.83

A
B
C
D
E

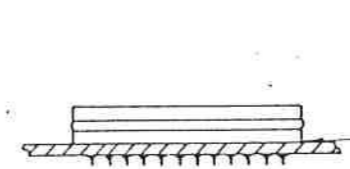


IMPORTANT

AMP PINS (DATRON PART No.604036.) 40FF MUST BE AFFIXED TO P.C.B FIRST. ENSURE ALL PINS ARE SEATING TIGHTLY AND FLAT TO PCB BEFORE SOLDERING.

NOTE. PINS ARE HELD TOGETHER BY PLASTIC STEP. THIS STEP IS TO BE CUT TO SUIT THE AMOUNT OF PINS REQUIRED.

FOR EXAMPLE ABOVE 2 BLOCKS OF 5 PINS ARE REQUIRED, THEREFORE STEP OF 10 PINS TO BE CUT IN HALF.



RIBBON CABLE ASSY Part No 574270/c

NOTE. WHEN SOLDERING CABLE PLUG INTO BOARD ENSURE THAT THE PLUG BODY SITS FLAT AGAINST PCB.

AFTER ASSEMBLING PCB WRAP THE ABOVE RIBBON CABLE ROUND THE PCB AND TAPE DOWN USING MASKING TAPE PART No G30099.

DRAWN B.J. TRACED DATE 20.4.78.	CHECKED APPROVED DATE	DIMENSIONS IN MILLIMETRES SCALE 2:1 NOT TO BE SCALED	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.10 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 3 PLACES + 0.1mm DECIMAL TO 2 PLACES + 0.2mm WHOLE DIMENSIONS + 0.5mm UNLESS OTHERWISE STATED	ANGULAR ± FINISH	MATERIAL datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A1	TITLE 1061/71/81 R.H. PCB ASSEMBLY.	DRAWING No. 400298	SHEET 1 of 2
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DRAWING No.
430298
FIRST USED ON
1061/1071

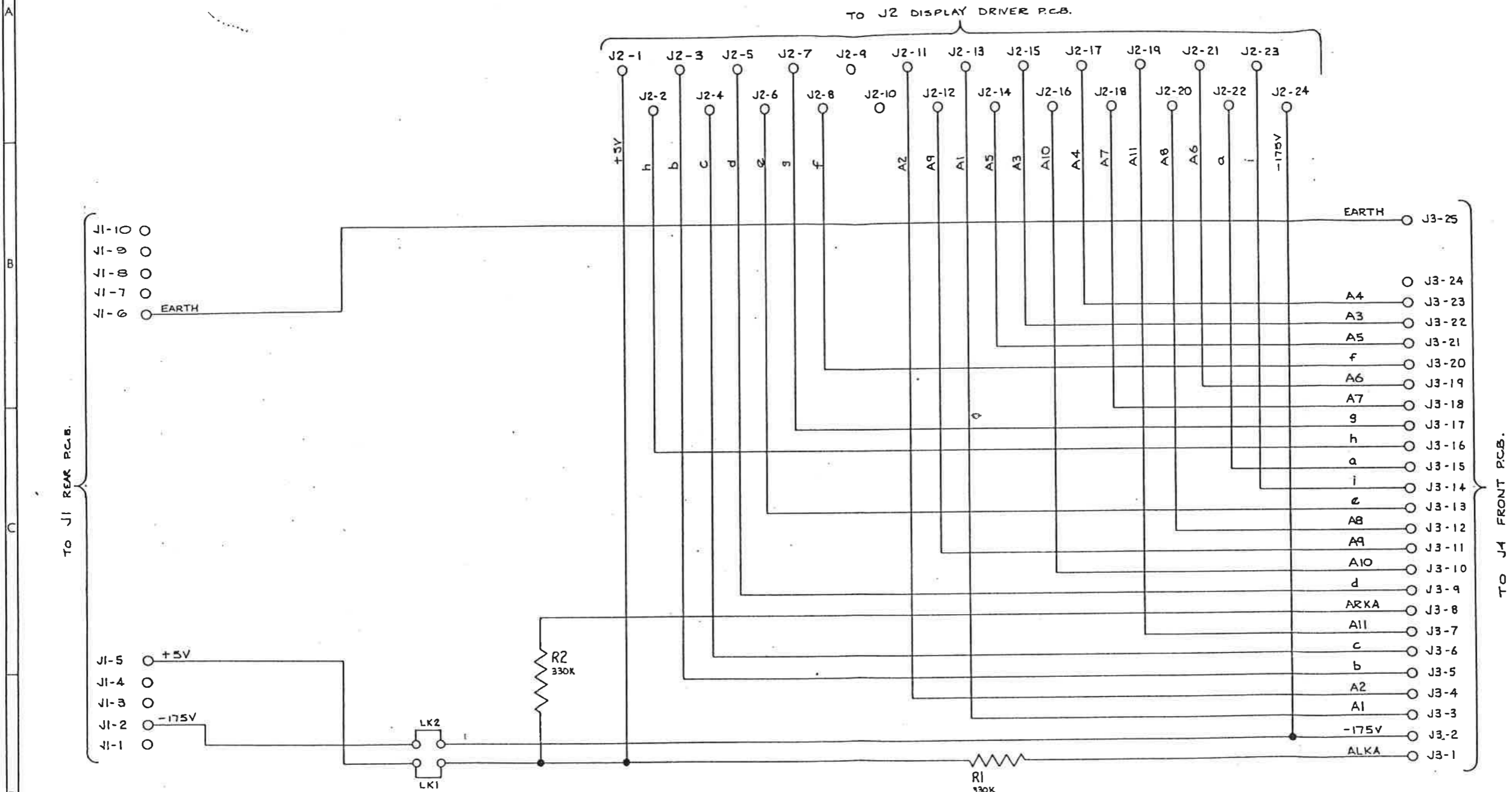
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
D	
1 ^c	RELEASED TO PROD 20-9-78
2	BIG COM SCREEN REMOVED. B.J. Eq. B50 4-8-79



DRAWN B.J.	CHECKED <i>[Signature]</i>	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/64	ANGULAR ± 30°	MATERIAL
TRACED	APPROVED	SCALE NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED		FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE
R.H. SIDE P.C.B. SCHEMATIC. 1061/1071/1081

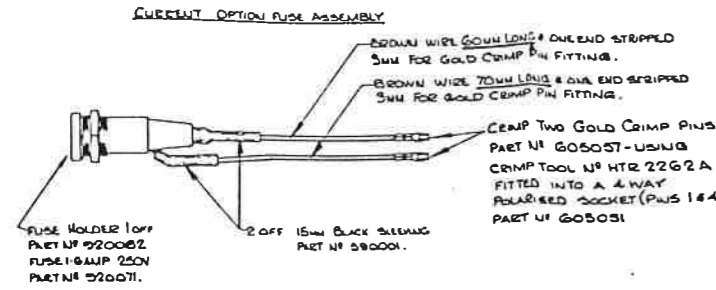
DRAWING No. 430298	SHEET 1 OF 1
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DRAWING No.
400304
FIRST USED ON
10/61/1071

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

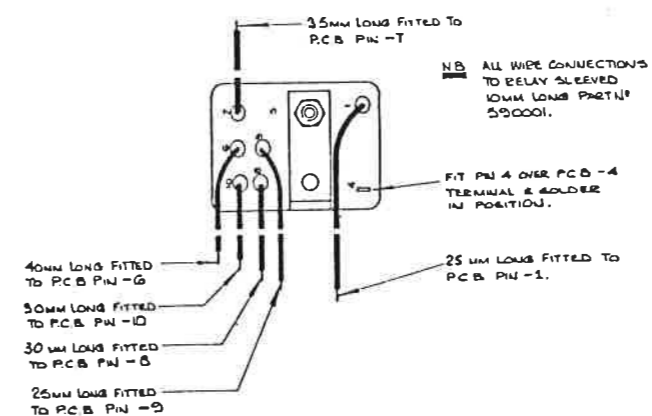
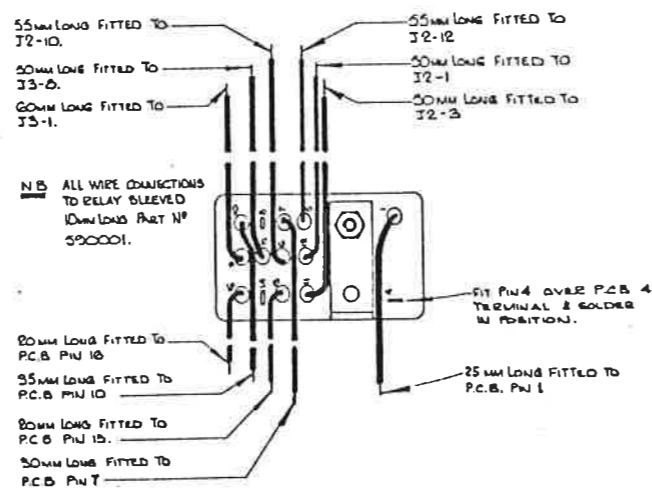
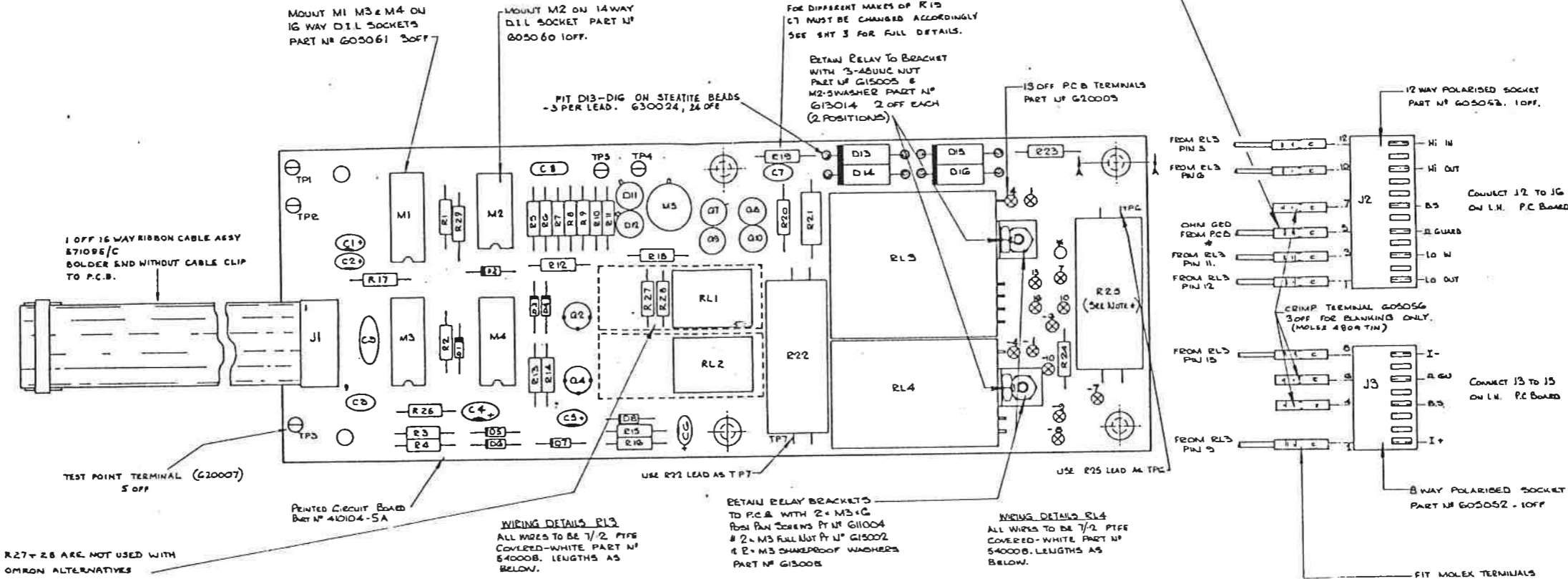
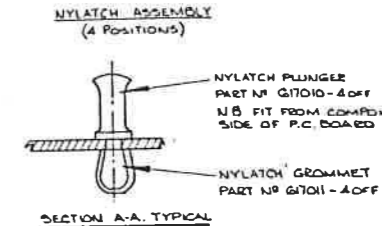
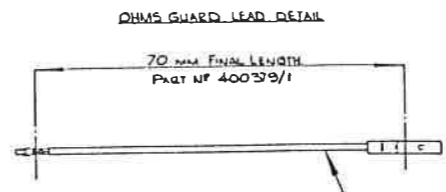
ALL BURRS TO BE REMOVED

NOTES



R25 NOTE
R25 RESISTOR TO BE FITTED LAST SO THAT R13 & R14 WIRING TO PCB CAN BE DONE WITH EASE.

*** IMPORTANT NOTE:**
R25 RESISTOR TO BE FITTED LAST SO THAT R13 & R14 WIRING TO PCB CAN BE DONE WITH EASE.



ISS	CHANGES
A	7 JULY 79 N.B.S.
B	C1 POSITION CHANGED PCB WMS ISSUE 2. R13 & R14 WERE CHANGED N.B.S. 21 AUG 79
C	STEATITE BEADS ADDED TO MOUNT D13-D16 24 OFF. 11. 24.5.79
1	RELEASED TO PRODUCTION. 24.5.79
2	ECO 972, 987. R13 & R14 WERE INT. RELAY WIRING WAS P.C.B. 25-10-79
3	ECO'S 1000, 1012, 1057 & 1058. GREEN CABLE CLIP WAS G05007 CABLE WAS 871096/A. FUSE HOLDER WAS 990041. C7 WAS 2n2F. LK1 ADDED. R5, R8, R9, D10, Q5 & Q6 DELETED. 6.1.4.80.
4	ECO 1048. R25-R28 ADDED. 17.8.80
5	ECO 1095, 1110, 1047, J2-7, J3-4 & J3-6 WERE G05057. D17 & D18 REMOVED. C8 ADDED. 11. 18.4.80
6	ECO 1116. R29 ADDED. CUT TRACK ON PCB BETWEEN M2 & 4-1-79. SLEETS LST CHANGE TO C3. 11. 3.6.80
7	ECO 1189. OHMS GUARD LEAD WAS 400879/2. 11. 17.12.80
8	ECO 1080. R 8, 9, C9, ADDED. R 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.
9	ECO 1187. J1 WAS 16 WAY SOCKET. UIR. 18.8.81
10	ECO 1187. R27 & R28 WERE 330 R. 18.8.81
11	ECO 1520. D13, D14, D15 AND D16 WERE 200010. PCB WMS ISSUE 5. UPT. 10.3.85.

DRAWN W.G. SMITH	CHECKED APPROVED	DIMENSIONS IN	TOLERANCES	ANGULAR ±	MATERIAL
		MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± 0.01 DECIMAL TO 2 PLACES ± 0.02 FRACTIONAL ± 1/64		
DATE 18 JULY 79	DATE	SCALE NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 3 PLACES ± 0.01 DECIMAL TO 2 PLACES ± 0.02 WHOLE DIMENSIONS ± 0.25		FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE
CURRENT P.C. BOARD LAYOUT 10/61/1071

DRAWING No.
400304

DRAWING SIZE
A1

SHEET
1 of 7

DRAWING No
430 304
FIRST USED ON
1061/1071

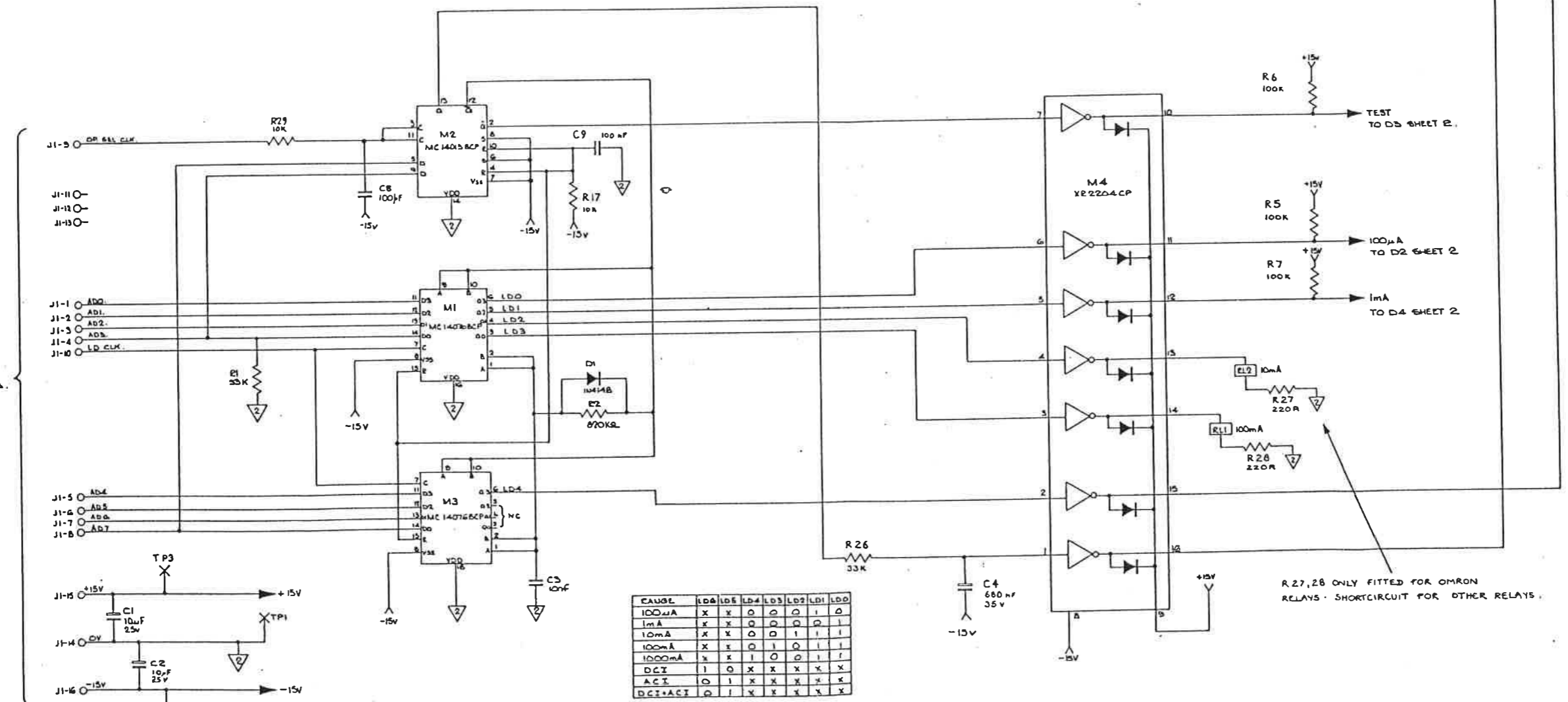
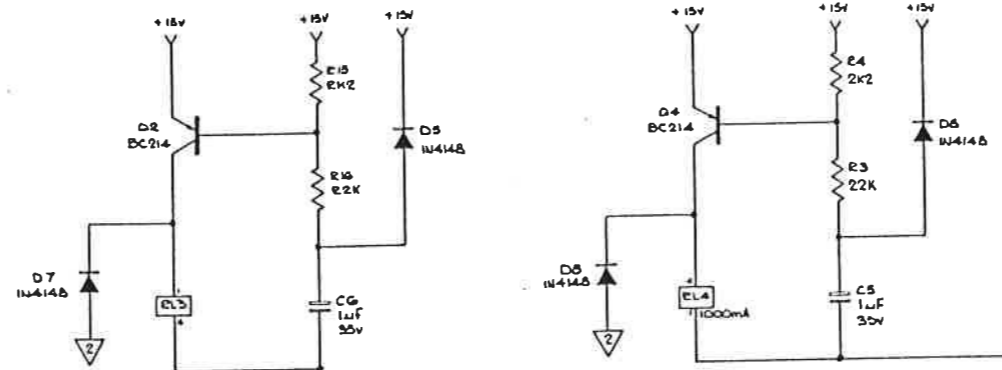
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
1	10 JULY 79 W.G.S.
2	R29 WAS INC. - 000005 C.A. WAS INC. 250V CAP IN 101103. W.G.S. 21 AUG 79
3	RELEASED TO PRODUCTION 1061/1071
4	ECO 1037 & 1038. SEE SHEET 2. 8.3
5	SEE SHEET 2 ECO. 1048 ILL. 18.1.80
6	ECO 1087, 1110 CB ADDED ILL. 16.4.80
7	ECO 1116 R29 ADDED. CB WAS 1µF. ILL. 3.6.80
8	ECO 1080 R13, R14, Q1, Q3 + AND DELETED. R5-7, C4 MOVED C9, R17, R26-R28 ADDED ILL. 24.2.81
9	ECO 1257 R27 AND R28 WERE 330R. ILL. 24.11.81



CAUSE	LD0	LD1	LD2	LD3	LD4	LD5	LD6	LD7
100µA	X	X	0	0	0	0	0	0
1mA	X	X	0	0	0	0	0	0
10mA	X	X	0	0	0	0	0	0
100mA	X	X	0	0	0	0	0	0
1000mA	X	X	0	0	0	0	0	0
DCI	0	0	X	X	X	X	X	X
ACI	0	0	X	X	X	X	X	X
DCI+ACI	0	0	X	X	X	X	X	X

0 = LOGIC '0' = -15V
1 = LOGIC '1' = 0V
X = DONT CARE CONDITION

R 27, 28 ONLY FITTED FOR OMRON RELAYS. SHORTCIRCUIT FOR OTHER RELAYS.

DRAWN W.G. SMITH	CHECKED APPROVED	DIMENSIONS IN MILLIMETRES	TOLERANCES NOM DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/64	ANGULAR ± 1°	MATERIAL
DATE 20 JULY 79	DATE	SCALE	METRIC DIMENSIONS DECIMAL TO 3 PLACES ± 0.10 DECIMAL TO 2 PLACES ± 0.20 WHOLE DIMENSIONS ± 0.50		FINISH
NOT TO BE SCALED			UNLESS OTHERWISE STATED		

datron ELECTRONICS LTD. NORWICH.

TITLE
CURRENT PC BOARD CIRCUIT DIAGRAM 1061-1071

DRAWING No.
430304

DRAWING SIZE
A1
SHEET
1 of 2

DRAWING No
430304
FIRST USED ON
10/61/1071

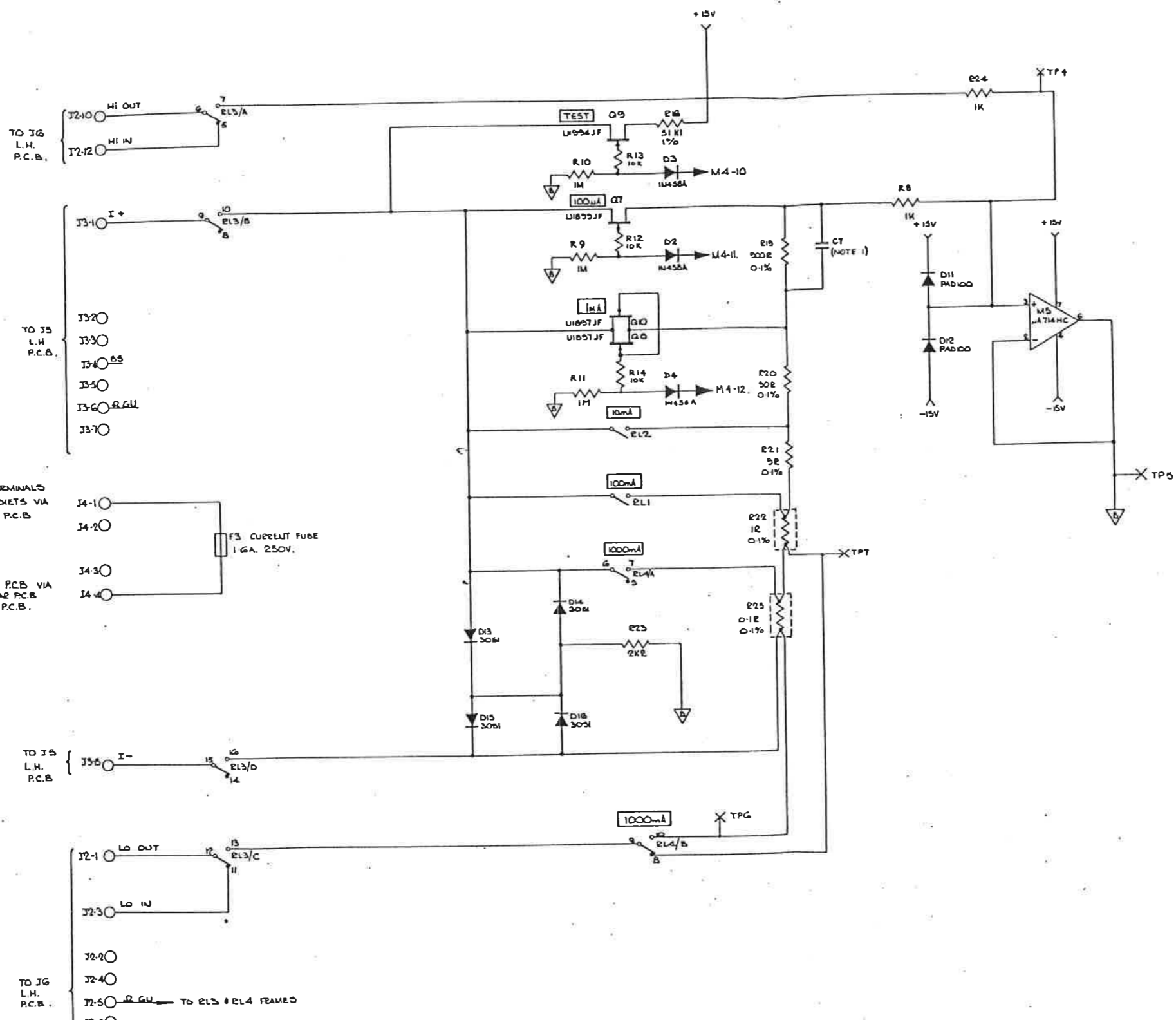
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES
1. 470pF IF R19 MANUFACTURED BY MANN COMP.
330pF - - - - - KELVIN.

REV	CHANGES
A	18 JULY 79 WOS
B	641 SH1
1	RELEASED TO PRODUCTION 24.9.79
2	ECO 1087 & 1038. C7 WAS 5nF. R8, R9, D3, D10, Q5, R26 DELETED. S.J. 4-1-80
3	ECO 1028 R26 - R28 ADDED R. M. 1.80
4	ECO 1087 D11 D18 REMOVED M. J. A. 80
5	SEE SHEET 1
6	ECO 1080 R12-14 TRACKED INTO P.C.B. DESIGNATORS REFERENCES M. J. A. 81
7	SEE SHEET 1



TO FRONT VP TERMINALS
OR REAR VP SOCKETS VIA
J12-1 & J13-3 REAR P.C.B.

TO J5-1 CURRENT PCB VIA
J12-4 & J14-5 REAR P.C.B.
J13-5 & J5-1 L.H. P.C.B.

TO J6 L.H. P.C.B. TO EL3 & EL4 FRAMES

DRAWN W.G. SMITH	CHECKED <i>[Signature]</i>	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± DECIMAL TO 2 PLACES ± FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES ± DECIMAL TO 1 PLACE ± WHOLE DIMENSIONS ± UNLESS OTHERWISE STATED	ANGULAR ± °	MATERIAL
TRACED	APPROVED	SCALE			FINISH
DATE 18 JULY 79	DATE	NOT TO BE SCALED			

datron ELECTRONICS LTD. NORWICH.

TITLE
CURRENT P.C. BOARD Circuit Diagram - 1061-1071

DRAWING No
430304

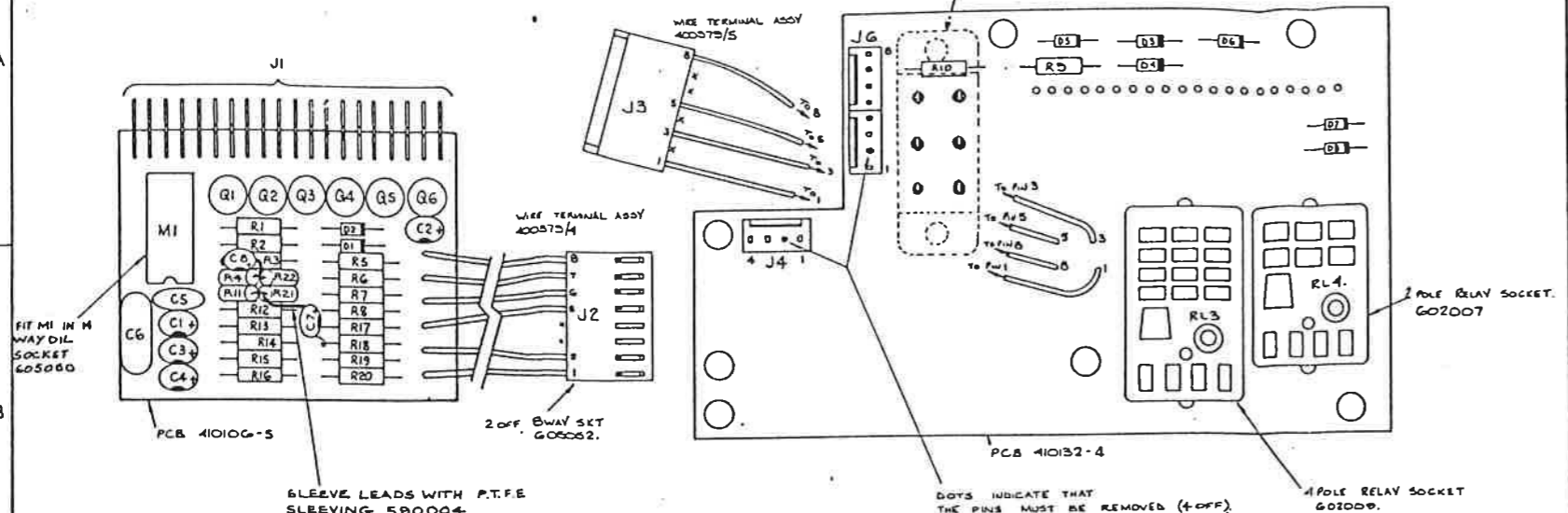
DRAWING SIZE
A1

SHEET
2 OF 2

DRAWING No. 400307
FIRST USED ON 10/1/1071

THIRD ANGLE PROJECTION

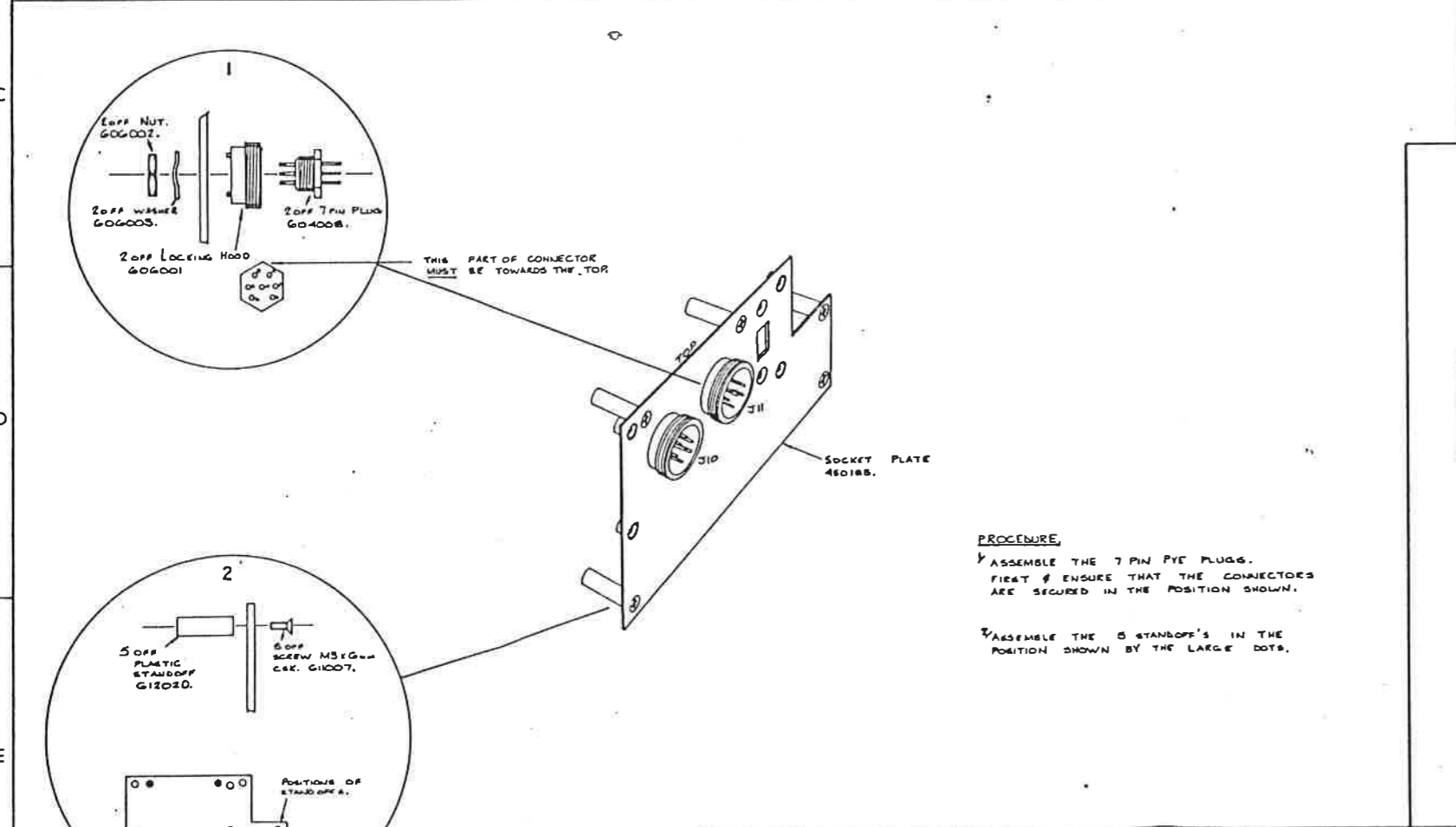
DRAWN IN ACCORDANCE WITH BS 308



SLEEVE LEADS WITH P.T.F.E SLEEVING 580004.

FIT M1 IN 4 WAY DIL SOCKET 605060

2 OFF BDA NUTS G15001
2 OFF SHAFERPROOF WASHER G13005



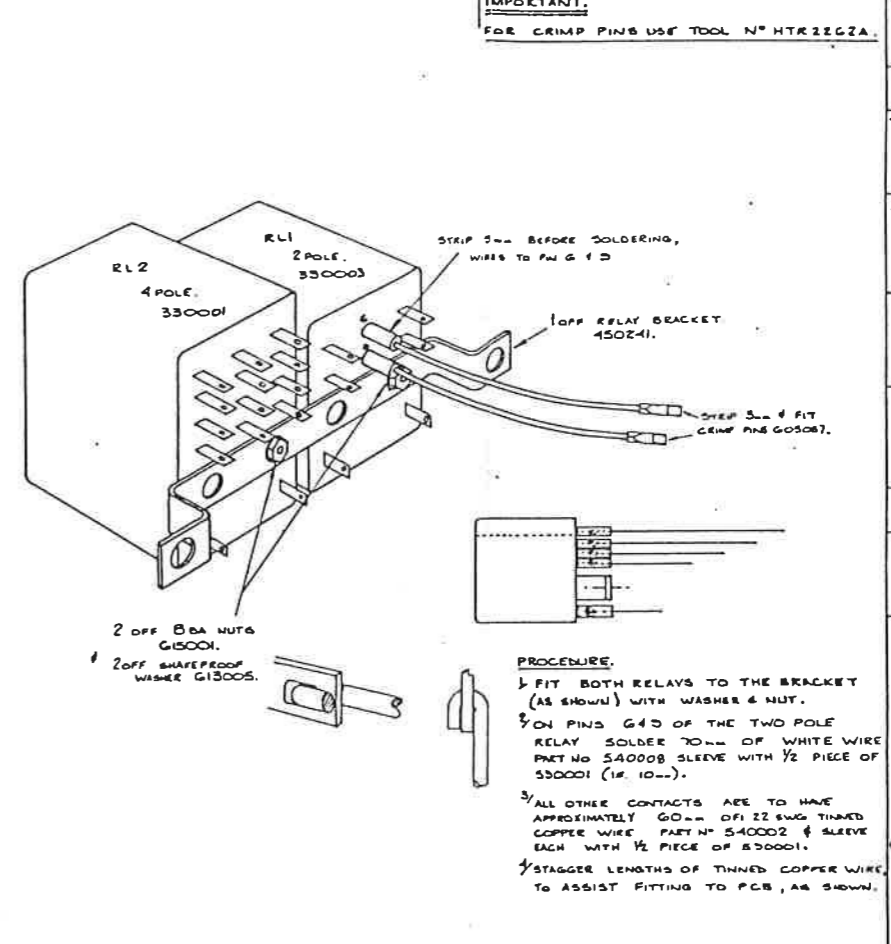
PROCEDURE

1 ASSEMBLE THE 7 PIN PYLE PLUGS. FIRST & ENSURE THAT THE CONNECTORS ARE SECURED IN THE POSITION SHOWN.

2 ASSEMBLE THE 6 STANDOFFS IN THE POSITION SHOWN BY THE LARGE DOTS.

ALL BURRS TO BE REMOVED

IMPORTANT.
FOR CRIMP PINS USE TOOL N° HTR22GZA.



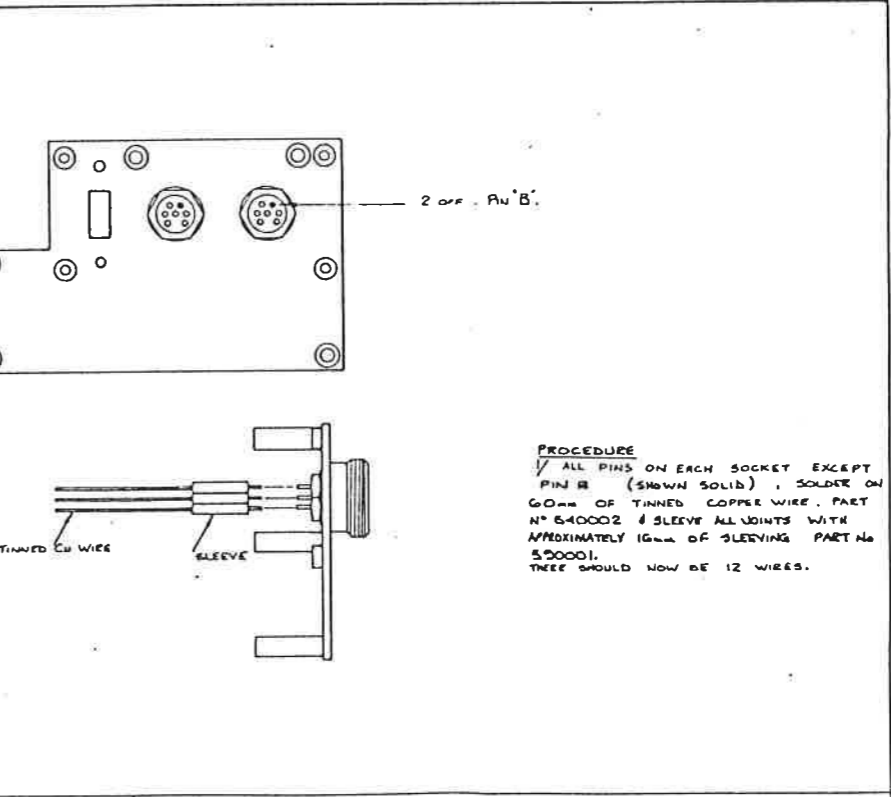
PROCEDURE

1 FIT BOTH RELAYS TO THE BRACKET (AS SHOWN) WITH WASHER & NUT.

2 ON PINS 6 & 7 OF THE TWO POLE RELAY SOLDER 70mm OF WHITE COPPER WIRE PART NO 540008 WITH 1/2 PIECE OF 530001 (12.10...).

3 ALL OTHER CONTACTS ARE TO HAVE APPROXIMATELY 60mm OF 22 SWG TINNED COPPER WIRE PART NO 540002 & SLEEVE EACH WITH 1/2 PIECE OF 530001.

4 STAGGER LENGTHS OF TINNED COPPER WIRE TO ASSIST FITTING TO PCB, AS SHOWN.



PROCEDURE

1 ALL PINS ON EACH SOCKET EXCEPT PIN 8 (SHOWN SOLID), SOLDER ON 60mm OF TINNED COPPER WIRE PART NO 540002 & SLEEVE ALL JOINTS WITH APPROXIMATELY 16mm OF SLEEVING PART NO 530001. THERE SHOULD NOW BE 12 WIRES.

NO	CHANGES
1	RELEASED EG-3-7D
2	LKI REPLACED BY EIO 600008
3	ECO 072 25-10-70 RL1, RL2, RL3 & RL4 WERE I.T.T. 8-J
4	ECO 084 6-11-70 RL WAS 18K. RL WAS 18K. RL & RL1 4008. 07 4008, 05 DELETED 40057D & 40057D. PINS UP DATED.
5	ECO 1071 10/54 RIF NAMED & WAS 59K NOW 1M. LKI ADDED. RT & R10 DILTED R9 WAS 18K. R.J. 7-1-80
6	ECO 1085 POLARISING KEY FOR J3 REMOVED. J4 WAS BWAY CONN. J5 REMOVED - SEE SHEET 2. IL 22.4 B0
7	ECO 1102 11/54. R1 WAS 18K. R10, R11, R14, R15, R16, R17, R18, R19, R20, C3, C4, C5, C6, D5, D6, D7, D8, D9 & LKI ADDED. IL 24 B 80
8	ECO 1199 R10 WAS 12K. JR 24.2.81
9	ECO 1329 R 21, R 22, C 7 AND C 8 ADDED. PART LIST CHANGES. JPM 8-7-82

DRAWN	CHECKED	DIMENSIONS IN		TOLERANCES		ANGULAR ± °		MATERIAL		datron ELECTRONICS LTD. NORWICH.		DRAWING SIZE	
TRACED	APPROVED	MILLIMETRES		DECIMAL TO 3 PLACES ± 0.05		° 010		---		TITLE		A1	
DATE	DATE	SCALE		FRACTIONAL		° 1/4		FINISH		REAR INPUT / RATIO ASSY		SHEET	
23-2-79		NOT TO BE SCALED		METRIC DIMENSIONS		DECIMAL TO 2 PLACES ± 0.2mm		---		DRAWING No. 400307		1 of 8	

DRAWING No. 400307
FIRST USED ON 10/1/71

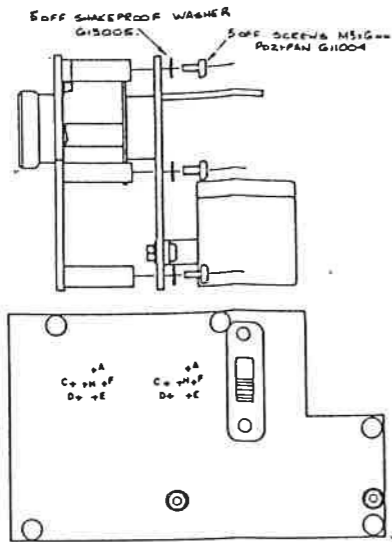
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

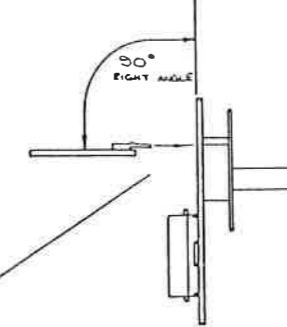
NOTES

ISS	CHANGES
1	RELEASED 26-3-70
2	REWORKED SHEET 1 3 TAD 70
3	SEE SHEET 26-4-70
4	SEE SHEET 26-4-70
5	SEE SHEET 26-4-70
6	ECO TOGS JS WAS 8 WAY CONN. IL 22-4-80
7	SEE SHEET 24-3-80
8	SEE SHEET 24-2-81
9	SEE SHEET 1



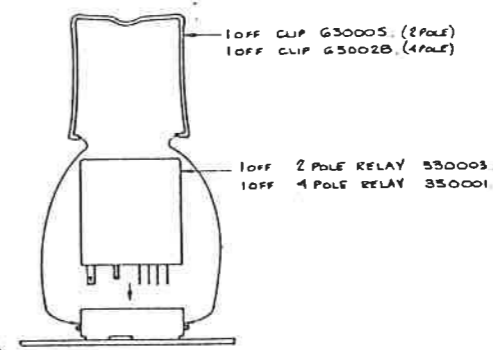
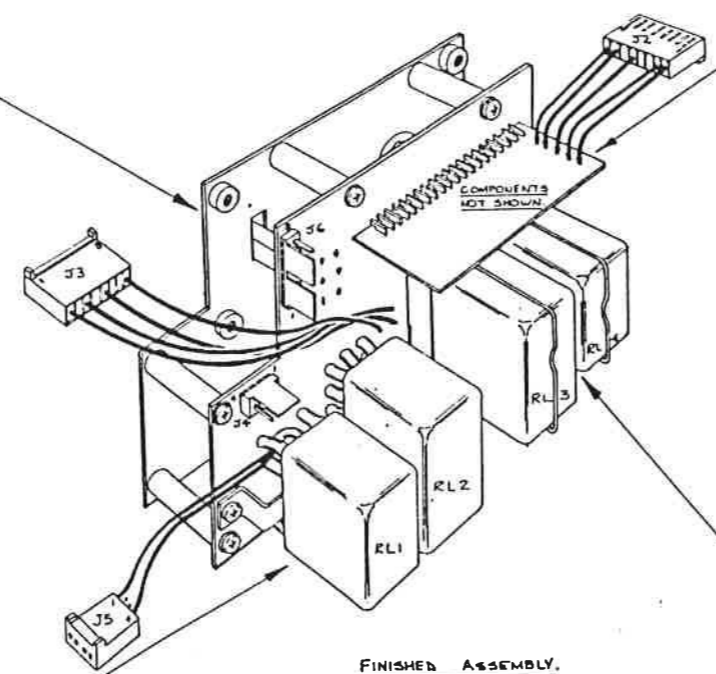
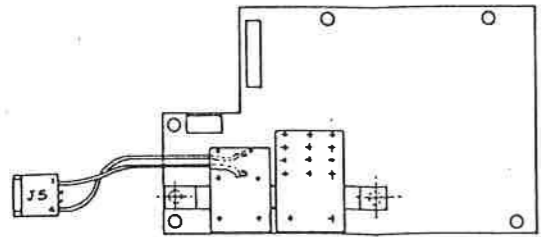
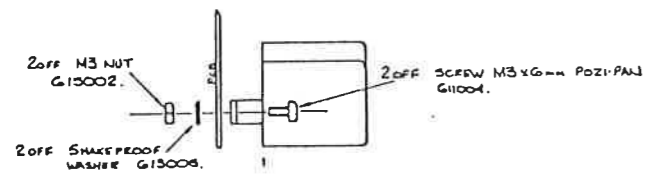
- 3/ BOTTOM VIEW SHOWS THE HOLES IN THE P.C.B. (INDICATED BY CROSSES). THESE HOLES ARE FOR THE WIRES FROM THE TWO 7 PIN SOCKETS. IT IS A SUGGESTION THAT THE WIRES ARE STAGGERED TO MAKE ASSY EASIER (AS WIRING THE RELAYS).
- PROCEDURE.**
- 1 THE WIRES SHOULD LINE UP WITH THE APPROPRIATE HOLES. I.E. WIRE FROM PIN A OF SOCKET SHOULD BE INSERTED INTO HOLE 'A', WIRE FROM PIN 'C' TO HOLE 'C' AND SO ON.
 - 2 WHEN THE WIRES ARE INSERTED IN THE APPROPRIATE HOLES, SECURE THE 2 ASYS TOGETHER WITH THE M3xG= POZI-PAN SCREWS & SHAKEPROOF WASHERS, SCREWED IN THE 5 STANDOFFS. (AS DETAILED)
 - 3 LIGHTLY PULL ON THE TWO COPPER WIRES SO THE WIRE IS TAUT, THEN SOLDER & CROP IN THE USUAL MANNER.

- 2/ INSERT CONNECTORS AS SHOWN. SOLDER ALL 20 MPP PINS & CROP LEADS IN USUAL MANNER. THE BOARD IS TO BE AT 90° WHEN SOLDERED IN.



1/ SKETCH BELOW SHOWS THE 2 RELAY & BRACKET ASSEMBLY (FROM SHEET 1). THE CROSSES INDICATE HOLES IN THE PCB INTO WHICH THE WIRES FROM THE RELAYS ARE INSERTED.

- PROCEDURE**
- 1 INSERT THE WIRES INTO THE APPROPRIATE HOLES IN THE PCB (WIRES CUT AT DIFFERENT LENGTHS TO AID ASSEMBLY).
 - 2 WHEN THE WIRES ARE ALL IN PLACE SECURE THE BRACKET TO THE PCB USING THE SCREWS, WASHERS & NUTS SHOWN BELOW.
 - 3 SOLDER & CROP WIRES IN THE USUAL MANNER. INSERT THE CRIMP PINS INTO SOCKET JS PIN 6 OF RELAY TO PIN 4 OF JS & PIN 5 TO PIN 1 AS SHOWN BELOW.



- 4/ THE LAST PROCEDURE IS TO PLUG IN THE 4 & 2 POLE RELAYS & HOLD IN PLACE BY THE CLIPS PROVIDED AS DETAILED IN ABOVE SKETCH & FINISHED VIEW.

DRAWN B.J. TRACED DATE 2-3-70	CHECKED M.S.D. APPROVED DATE	DIMENSIONS IN MILLIMETRES SCALE NOT TO BE SCALED	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	ANGULAR ± °	MATERIAL FINISH	datron ELECTRONICS LTD. NORWICH. TITLE REAR INPUT / RATIO ASSY.	DRAWING SIZE A1 DRAWING No. 400307 SHEET 2 OF 8
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DRAWING No.
430307
FIRST USED ON
10/61/1071

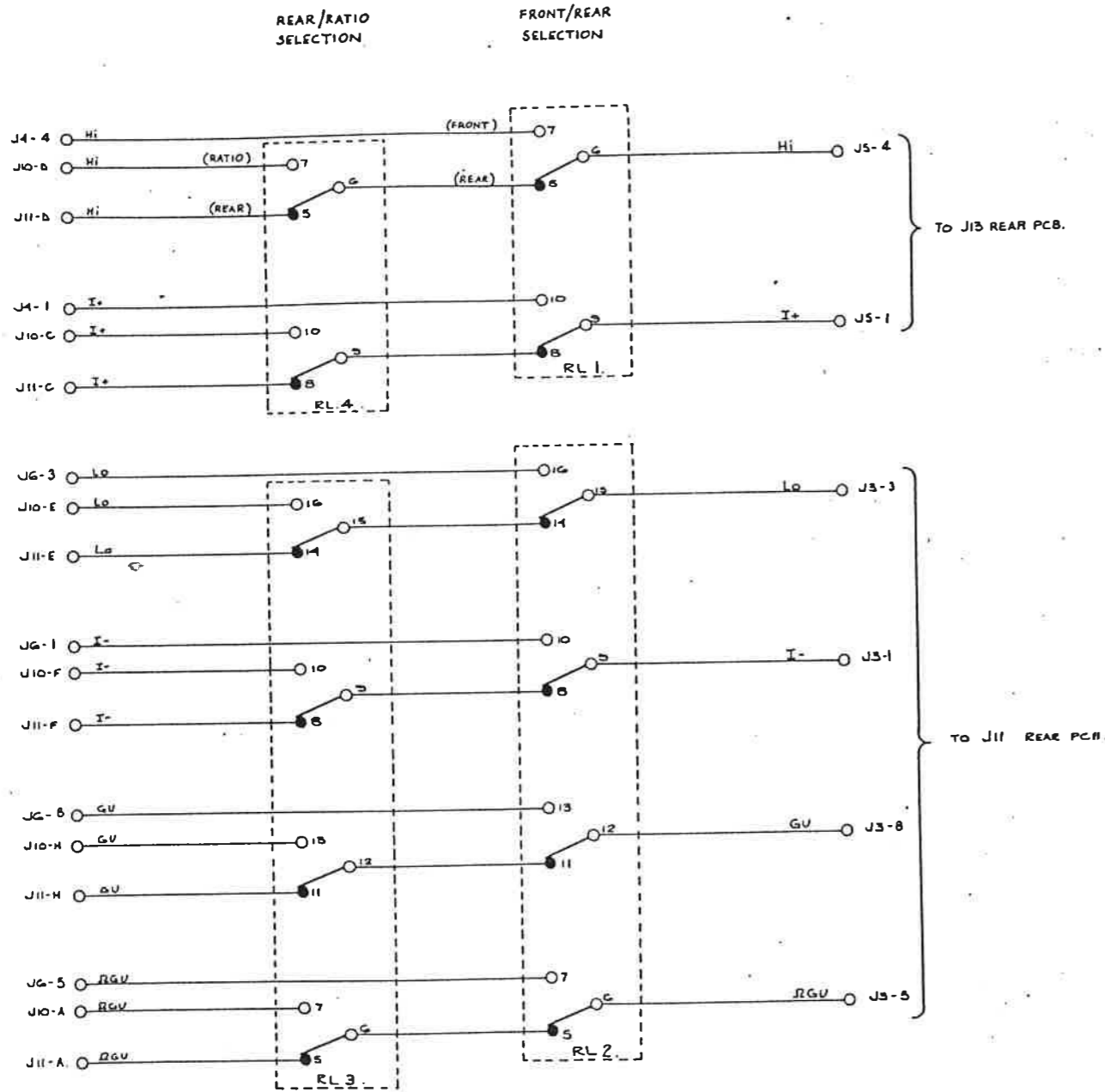
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

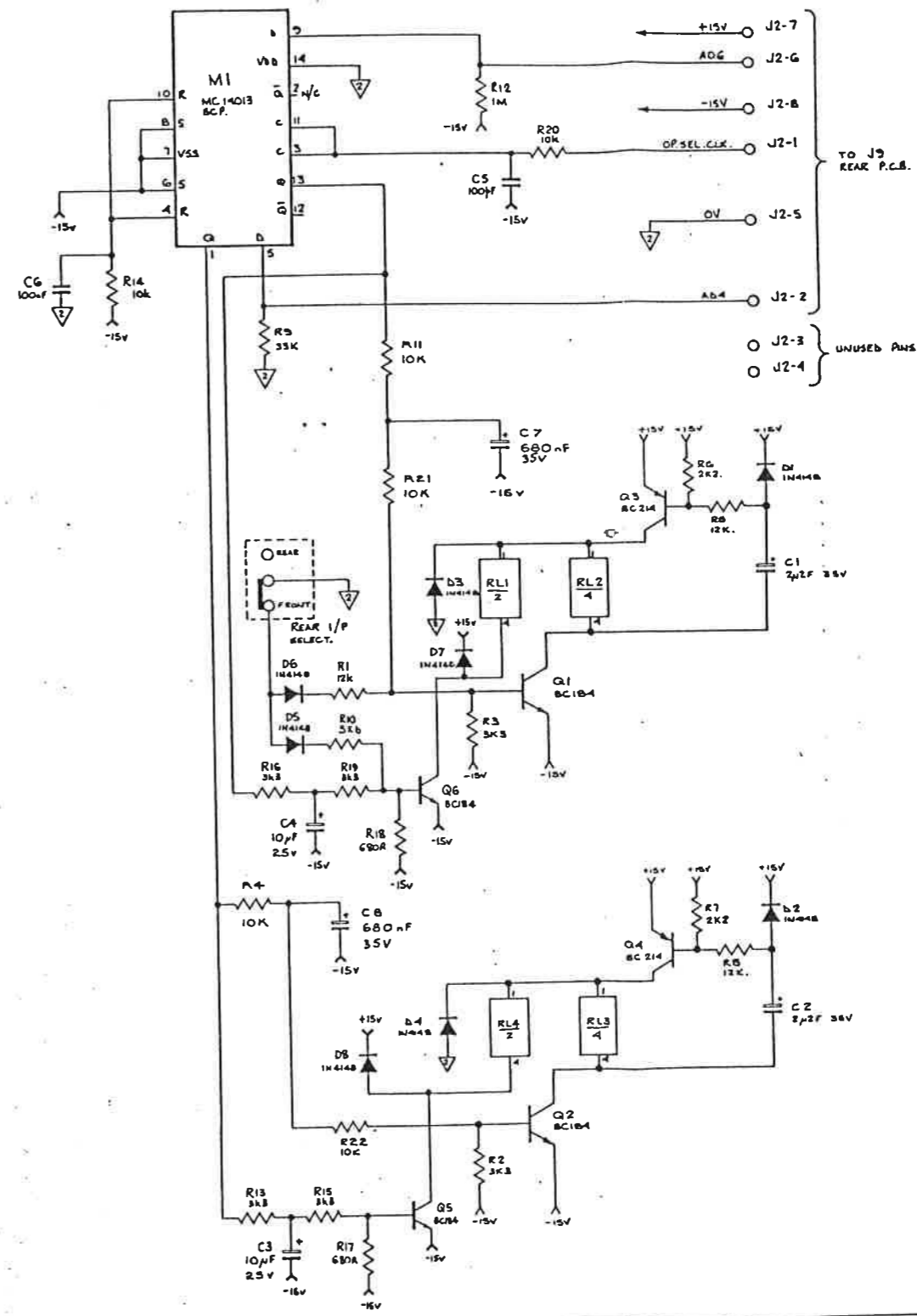
ALL BURRS TO BE REMOVED

NOTES

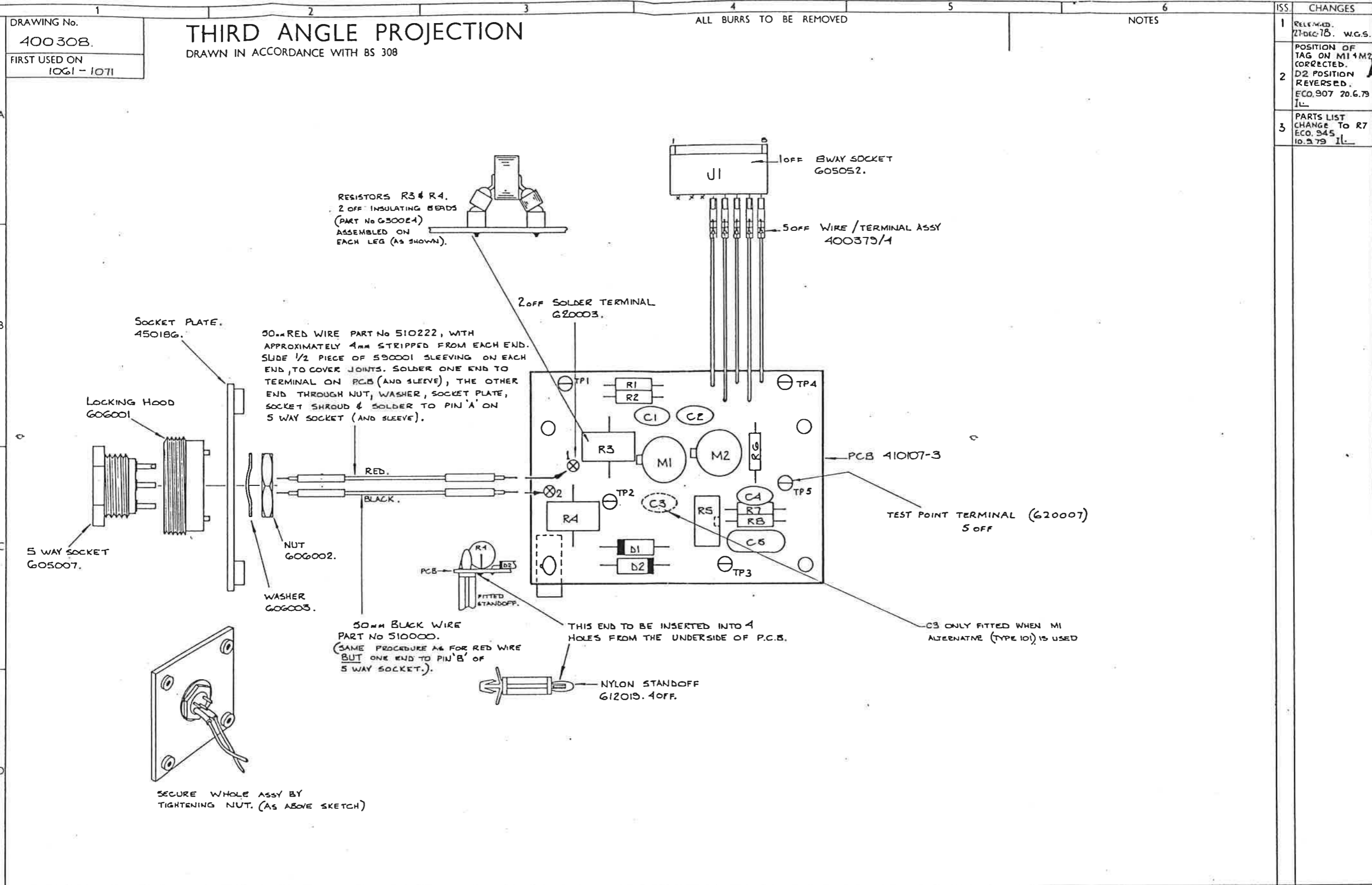
ISS.	CHANGES
1	RELEASED 10-8-70
2	REV. 10/10/70 BY E.C. 100
3	ECO 1001 10/10/70. E.C. 100 WAS 33K. R11 & R12 ADDED. D7 ADDED. 10/10/70/4 ADDED. D5 DELETED.
4	ECO 1001 4 10/10/70. E.C. 100 WAS ADDED TO J2-4 & M1-14. LK1 ADDED. R9 WAS 10K. D7 & R10 DELETED. D7 & R10 DELETED. 2-1-80
5	ECO 1005 05-10-70. J4-1 & J5-1 REMOVED. PINS OF J4-1 & J5-1 RE-NUMBERED FROM 4-WAY CONNECTORS TO 2-2-80
6	ECO 1166 11/5/70. R1 WAS 10K. R10, R11, R14, R15, R16, R17, R18, R19, R20, C3, C4, C5, C6, D5, D6, D7, D8, D9, D10, ADDED. R10 WAS 10K. 24-9-80
7	ECO 1329 10/10/70. R10 WAS 10K. JR 2L 2-81
8	ECO 1329 03-10-70. C3 AND C4 WERE 6P8F. R4 AND R11 WERE 10K. C7, C8, R21 AND R22 ADDED. JFR 8-7-82.



NOTE: J44JG ARE FROM THE FRONT PANEL TERMINALS.
 J10. IS THE RATIO INPUT SOCKET ON REAR PANEL.
 J11. IS THE REAR INPUT SOCKET ON REAR PANEL.



DRAWN B J	CHECKED APPROVED	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES + DECIMAL TO 2 PLACES + FRACTIONAL METRIC DIMENSIONS DECIMAL TO 3 PLACES + DECIMAL TO 1 PLACE + WHOLE DIMENSIONS +	ANGULAR + 005 010 044	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING No. 430307	DRAWING SIZE A1	SHEET 1 OF 1
DATE 3-3-70	DATE	SCALE NOT TO BE SCALED	UNLESS OTHERWISE STATED		FINISH		TITLE REAR INPUT / RATIO CIRCUIT.		



DRAWN B.J.	CHECKED <i>[Signature]</i>	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64	ANGULAR ± 30°	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A2
TRACED	APPROVED	SCALE 2:1 NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 3 PLACES ± 1mm DECIMAL TO 2 PLACES ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED		FINISH		TITLE ANALOGUE OUTPUT PCB ASSY. 1061/1071/1081	SHEET 1 of 4
DATE 27-11-78	DATE					DRAWING No. 400308	

DRAWING No.
430308
FIRST USED ON
1061-1071

THIRD ANGLE PROJECTION

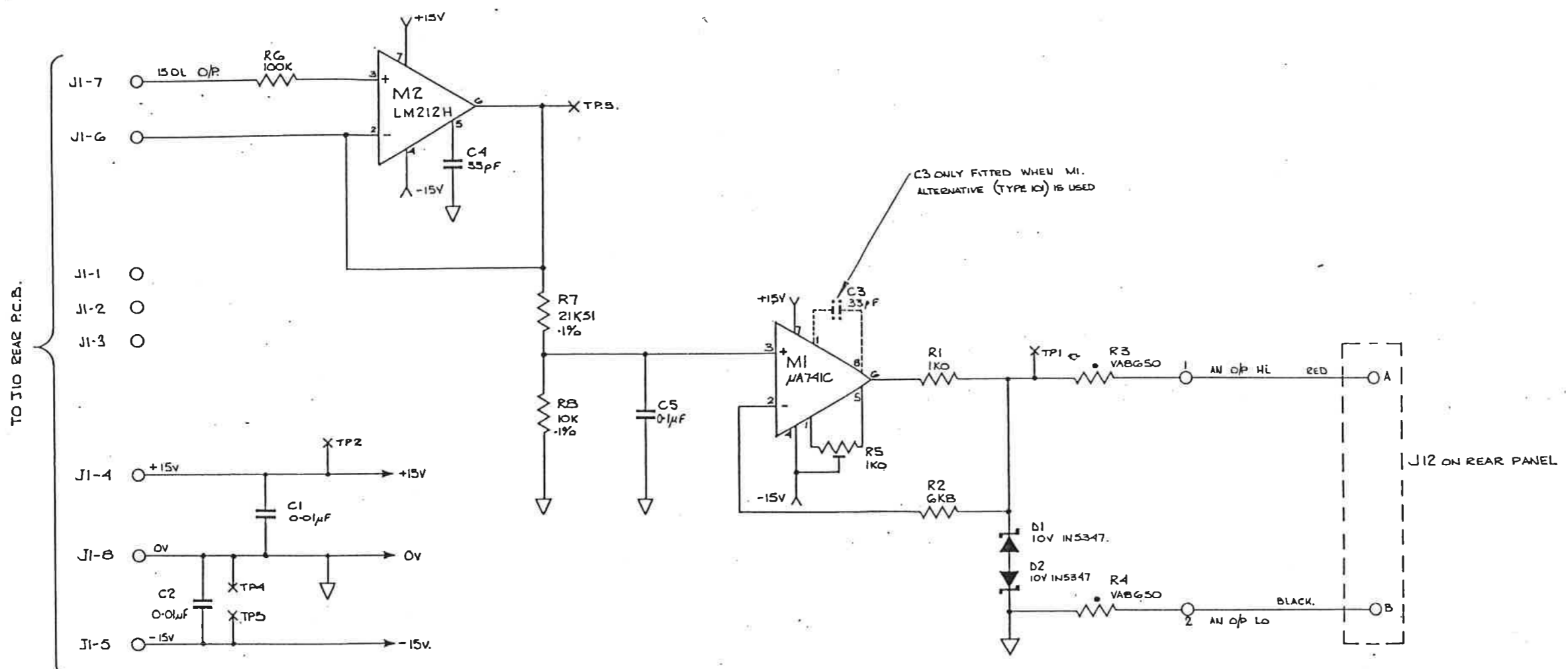
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

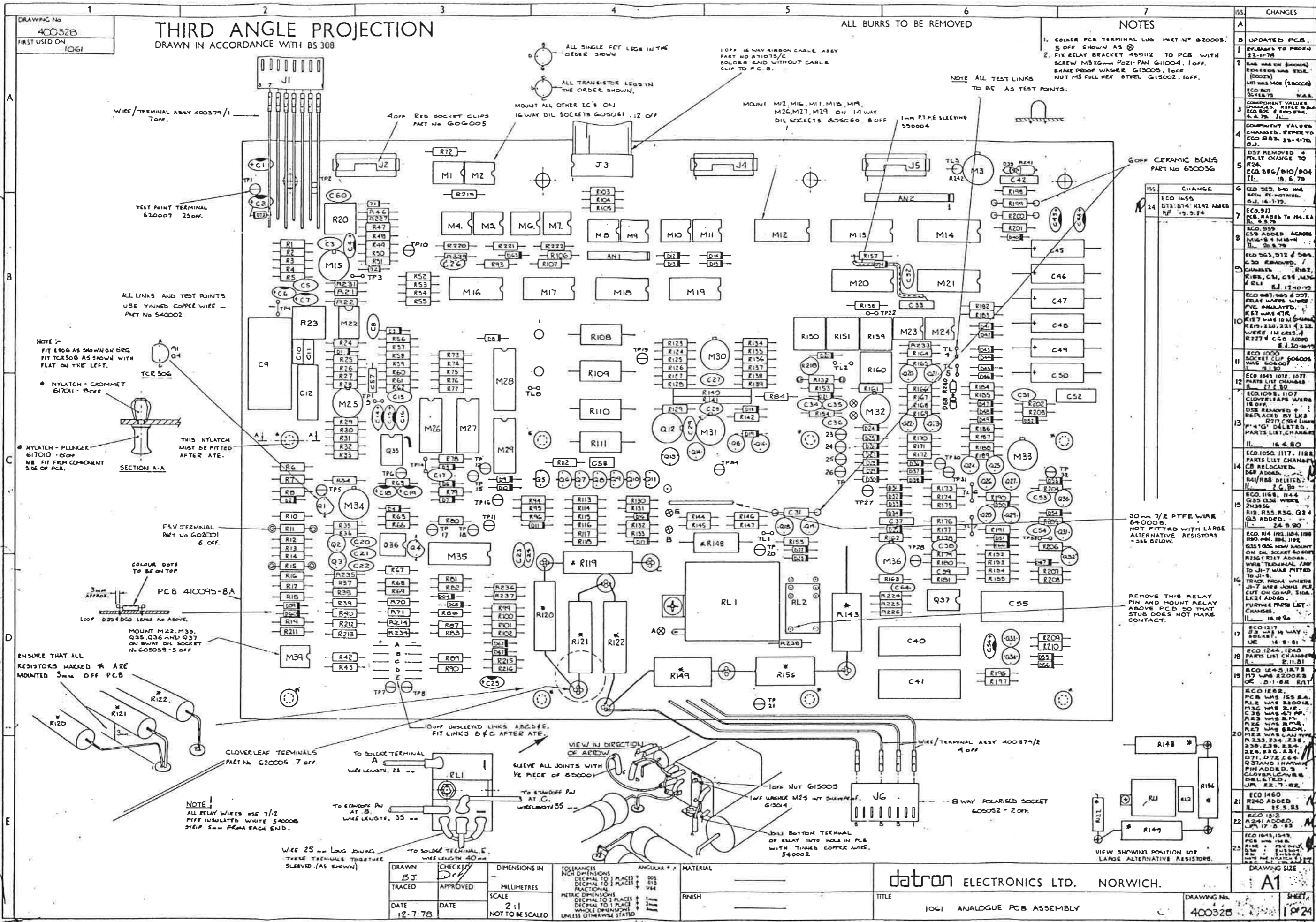
NOTES

ISS.	CHANGES
1	RELEASED. 27 DEC 78. W.O.S
2	R7 WAS 21K73 ECO. 945 10.9.79 JL

B.J



DRAWN B.J.	CHECKED <i>M.S.D.</i>	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/64	ANGULAR ± 30°	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A2
TRACED	APPROVED	SCALE NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 0.1mm DECIMAL TO 1 PLACE ± 0.2mm WHOLE DIMENSIONS ± 0.4mm	FINISH	TITLE ANALOGUE OUTPUT CIRCUIT. 1061/1071/1081		DRAWING No. 430308	SHEET 1 OF 1



THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1. COLOUR PCB TERMINAL LUG PART N° 820005. 5 OFF SHOWN AS ⊗
2. FIX RELAY BRACKET 459112 TO PCB WITH SCREW M3X6mm POZI-PAN G10004. 1 OFF. SHAKE PROOF WASHER G13005. 1 OFF. NUT M5 FULL HEX STEEL G15002. 1 OFF.

ISS	CHANGES
A	UPDATED PCB
1	RELEASED TO PRODUCE 23-11-78
2	RELAY WAS ON (BRACKET) R24 R25 WAS 2.1C. (COVER) M31 WAS 108 (28000) ECO 101 23-11-78
3	COMPONENT VALUES CHANGED. REFER TO ECO 883. 23-11-78
4	COMPONENT VALUES CHANGED. REFER TO ECO 883. 23-11-78
5	DST REMOVED & PTL LT CHANGE TO R24. ECO 886/810/804 IL. 19.6.79
6	ECO 923. 24.9.79
7	ECO 937. 24.9.79
8	ECO 959. 24.9.79
9	ECO 959. 24.9.79
10	ECO 959. 24.9.79
11	ECO 1000. 24.9.79
12	ECO 1043. 10.11.79
13	ECO 1098. 11.07.79
14	ECO 1050. 11.17.79
15	ECO 1168. 11.14.79
16	ECO 1168. 11.14.79
17	ECO 1217. 11.14.79
18	ECO 1244. 12.10.79
19	ECO 1245. 12.7.79
20	ECO 1282. 12.7.79
21	ECO 1460. 12.24.79
22	ECO 1512. 12.24.79
23	ECO 1512. 12.24.79

datron ELECTRONICS LTD. NORWICH.

1061 ANALOGUE PCB ASSEMBLY

DRAWING No. 400328 SHEET 1 OF 24

DRAWING No
43032B
FIRST USED ON
1061.

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

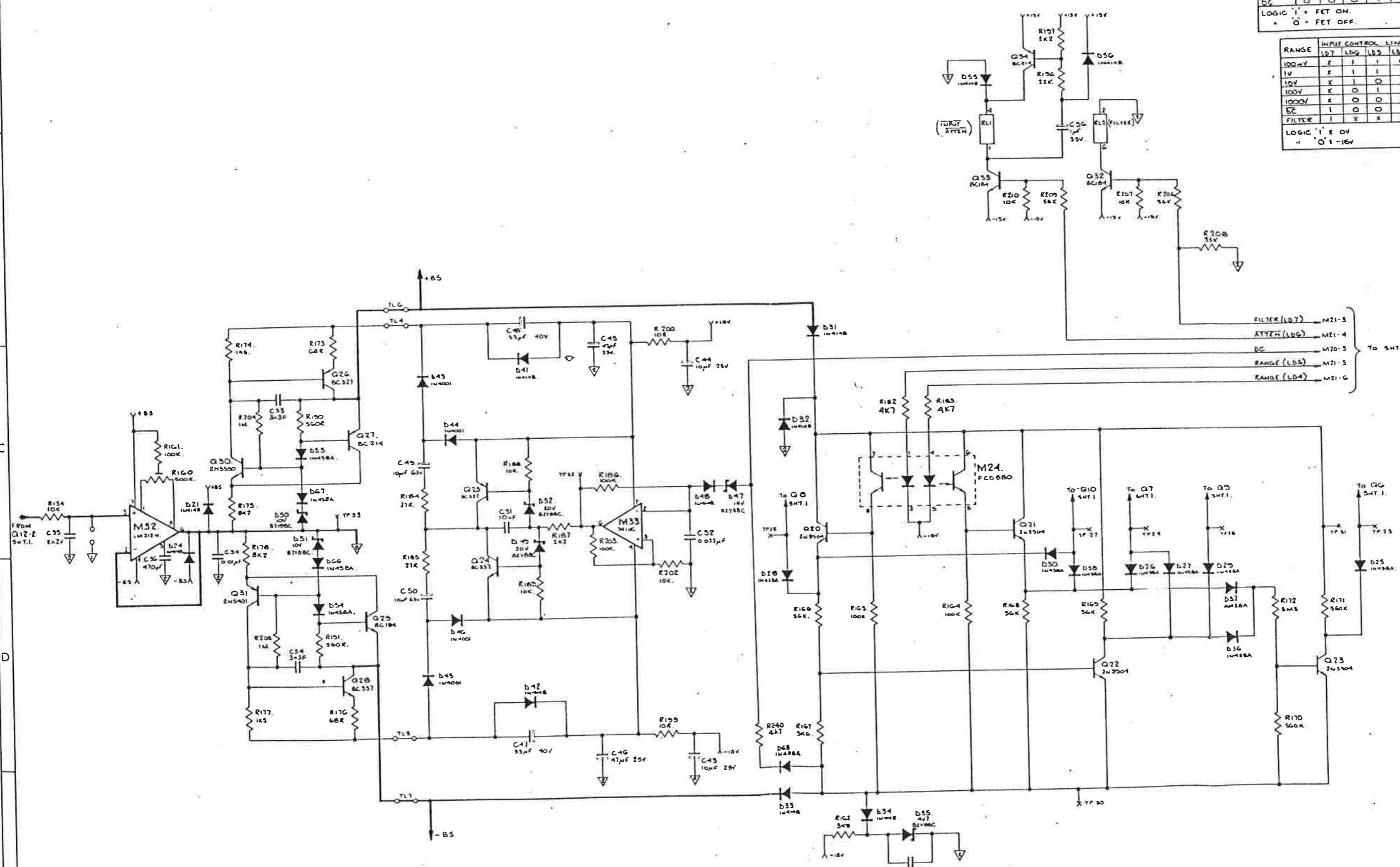
RANGE	FET CONTROL LINE				
	TP 23	TP 24	TP 25	TP 26	TP 27
100mV	1	0	1	0	0
1V	0	0	1	0	1
10V	0	1	0	1	0
100V	0	0	1	0	1
1000V	0	1	0	1	0
DC	1	0	0	1	0

LOGIC '1' = FET ON.
'0' = FET OFF.

RANGE	INPUT CONTROL LINE			
	LD7	LD5	LD3	LD4
100mV	X	1	1	0
1V	X	1	1	1
10V	X	1	0	1
100V	X	0	1	1
1000V	X	0	0	1
DC	1	0	0	0
FILTER	1	0	X	X

LOGIC '1' = OV
'0' = -15V

- CHANGES
- RE-DETAILED 17-4-75
ECO 876, B54 & B J
ECO 858
 - D57 DELETED.
ECO 866 20.6.70
 - SEE SHEET 5.
 - SEE SHEET 5.
 - ECO 963.
R182 & 188 WERE
10K. B J 17-10-70.
 - ECO 965 & D57. B J
SEE SHEET 1. 30-1-71
 - ECO 1072
C51 WAS 2A2F
C53 C54 WERE 10M
ILL. 17.2.80
 - SEE SHEETS 1, 3 & 4
ILL. 16.4.80
 - ECO 1117
D68 ADDED.
ILL. 2.5.80
 - SEE SHEET 3
 - SEE SHEETS 1, 3 & 4
 - SEE SHEETS 3 & 4
 - ECO 1273
SEP. SHEET 1
ILL. 7.1.82
 - ECO 1273
ECO 1273
ECO 1273
 - ECO 1460
R40 ADDED
ILL. 25.5.83
 - SEE SHEET 1
 - ECO 1645.
Q30 WAS 2N5504
Q31 WAS 2N5506
B J 19-08-84
 - SEE SHTS 1 & 5



TO SHTS 5

- FILTER (LD7) - M21-5
- ATTEN (LD5) - M21-4
- DC - M20-5
- RANGE (LD5) - M21-5
- RANGE (LD4) - M21-6

DRAWN B J	CHECKED APPROVED	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES DECIMAL TO 1 PLACE WHOLE DIMENSIONS UNLESS OTHERWISE STATED	ANGULAR °	MATERIAL
TRACED	DATE	SCALE	NOT TO BE SCALED		FINISH

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE
A1
DRAWING No.
43032B
SHEET
2 OF 5

TITLE
BOOT STRAPPED SUPPLIES & RANGE LOGIC 1061

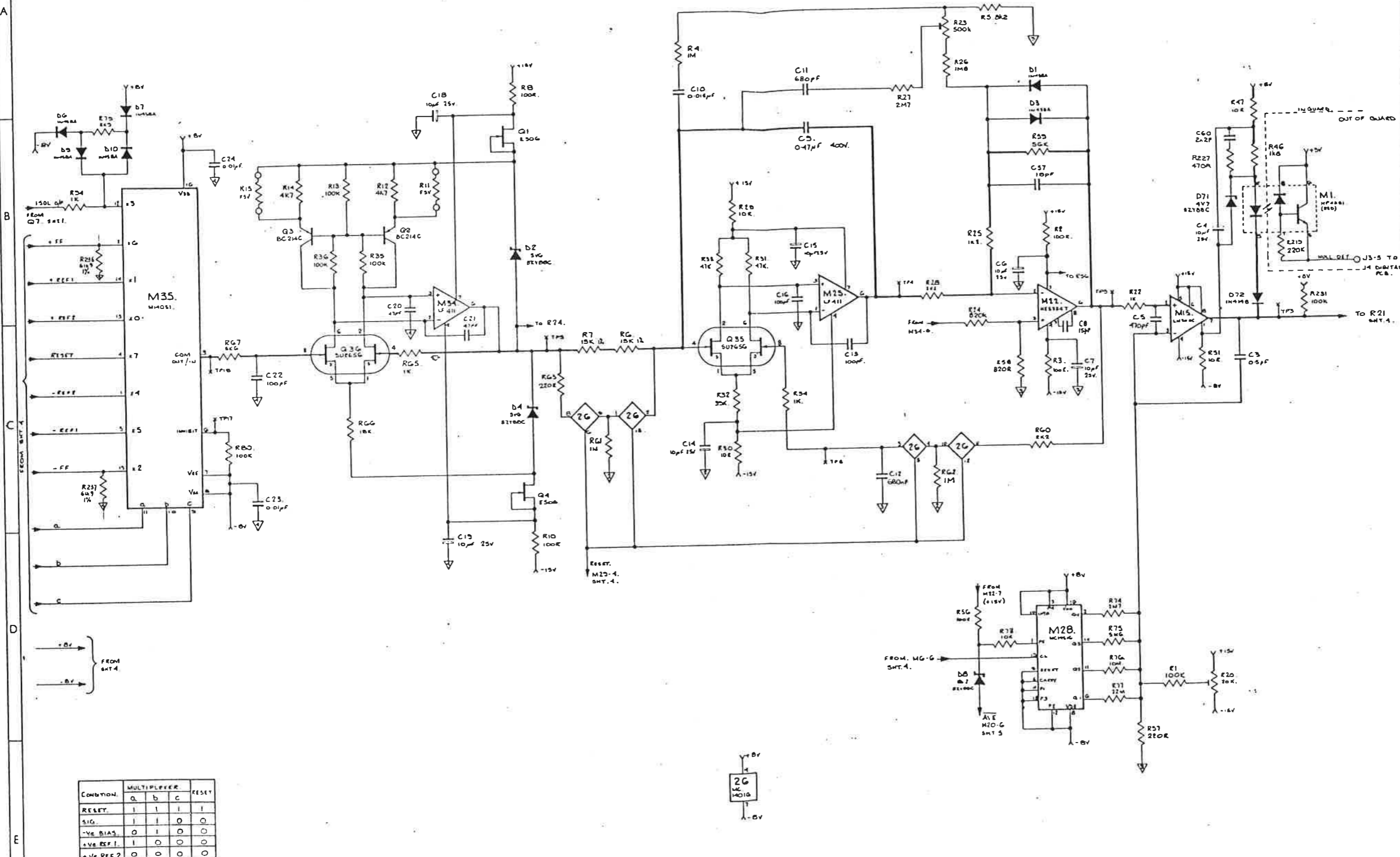
DRAWING No
430328
FIRST USED ON
10G1

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES



ISS	CHANGES
3	RE-DRAWN 15.4.75 ECO 076, B34 & B.7 ECO 055
4	R24 WAS BROKE ECO 910 20.6.79
5	SEE SHEET 5
6	SEE SHEET 5
7	SEE SHEET 1 & 2
8	ECO 385 & 391. B.J SEE SHT. 1. 30.10.75
9	SEE SHEETS 1 & 2 ECO 1038 Q55 Q56 WERE SUF255GM. R46 WAS INC. D58 DELETED & REPLACED WITH LK3 11. 16.4.80
10	ECO. 1050. R58 WAS 18. C8 WAS ACROSS R24. C11 WAS 10K. C57 WAS 68PF. M72 WAS LF 35GH. 11. 2.6.80
12	Q55 & Q56 WERE DMS5C R4 WAS 10M R5 WAS 10K R12 & R14 WERE 5M R15 & R35 WERE ADDED R24 R24 WAS 680K C2 WAS 0.47UF. Q24 Q35 ADDED. LK1 & LK2 REMOVED. 11. 25.9.80
13	R236 & R237 ADDED R57 WAS 200R 11. 16.12.80
14	M1 NOW SELECTED SEE ALSO SHT. 4 11. 3.11.81
15	ECO 1273 SEE SHEET 1 PC. 7.1.82
16	ECO 1282 R231, D71, D72 ADDED. R26 WAS 2M2 R27 WAS 820R JFR. 23.7.82
17	SEE SHEET 2
18	SEE SHEET 1
19	SEE SHEET 2
20	SEE SHTS 1 & 5

CONDITION	MULTIPLIER			RESET
	a	b	c	
RESET	1	1	1	1
SIG.	1	1	0	0
-VE BIAS	0	1	0	0
+VE REF 1	1	0	0	0
+VE REF 2	0	0	0	0
-VE BIAS	0	1	1	0
-VE REF 1	1	0	1	0
-VE REF 2	0	0	1	0

DRAWN B J	CHECKED 11/2/75	DIMENSIONS IN MILLIMETRES	TOLERANCES DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.10 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 3 PLACES + 0.1mm DECIMAL TO 2 PLACES + 0.2mm WHOLE DIMENSIONS + 0.5mm UNLESS OTHERWISE STATED	ANGULAR * ± 0.5°	MATERIAL —
TRACED	APPROVED	SCALE	NOT TO BE SCALED		FINISH —
DATE 11.4.75	DATE				

datron ELECTRONICS LTD. NORWICH.

TITLE
A-D CONVERTOR. 10bit

DRAWING No 430328	SHEET 3 of 5
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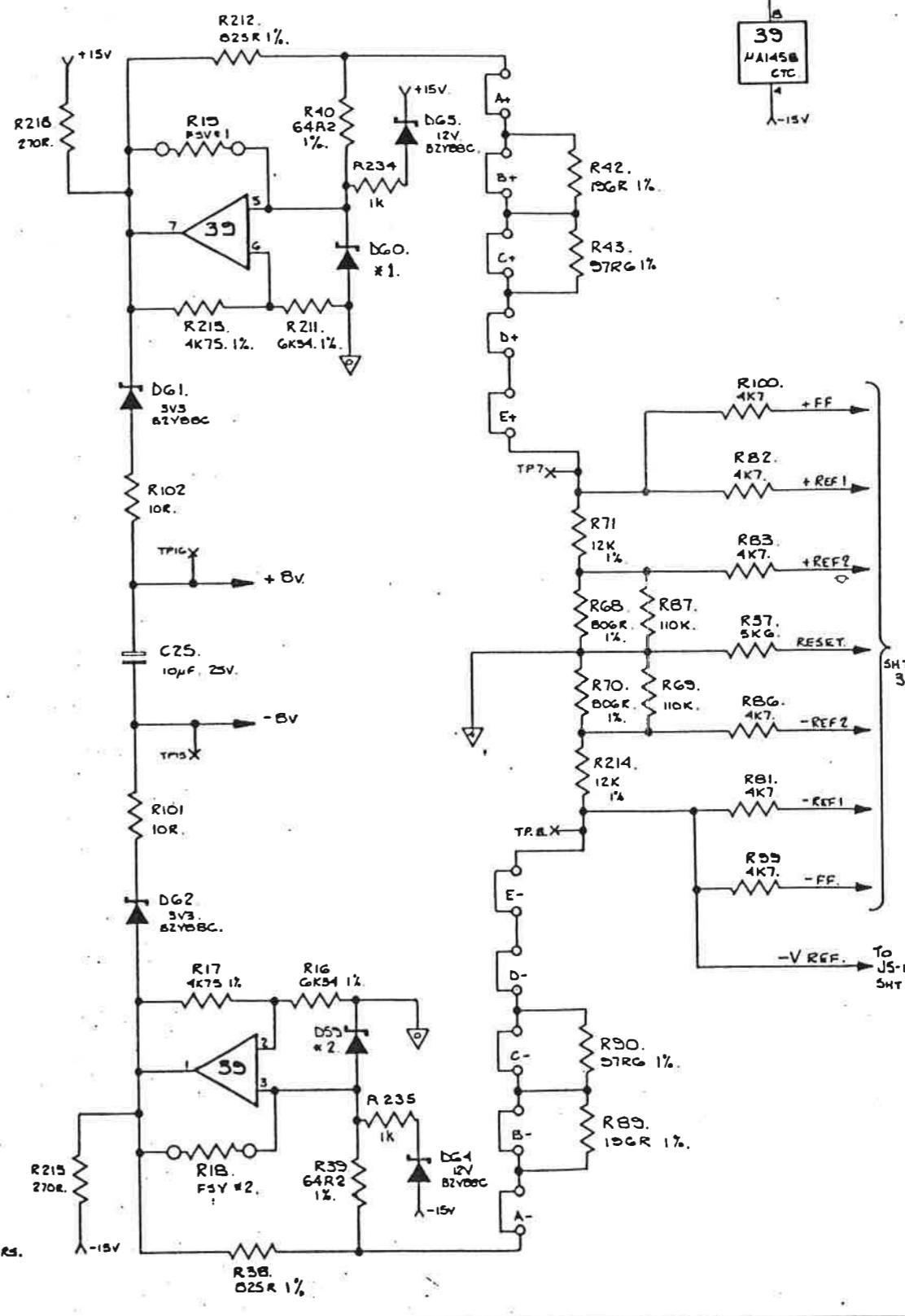
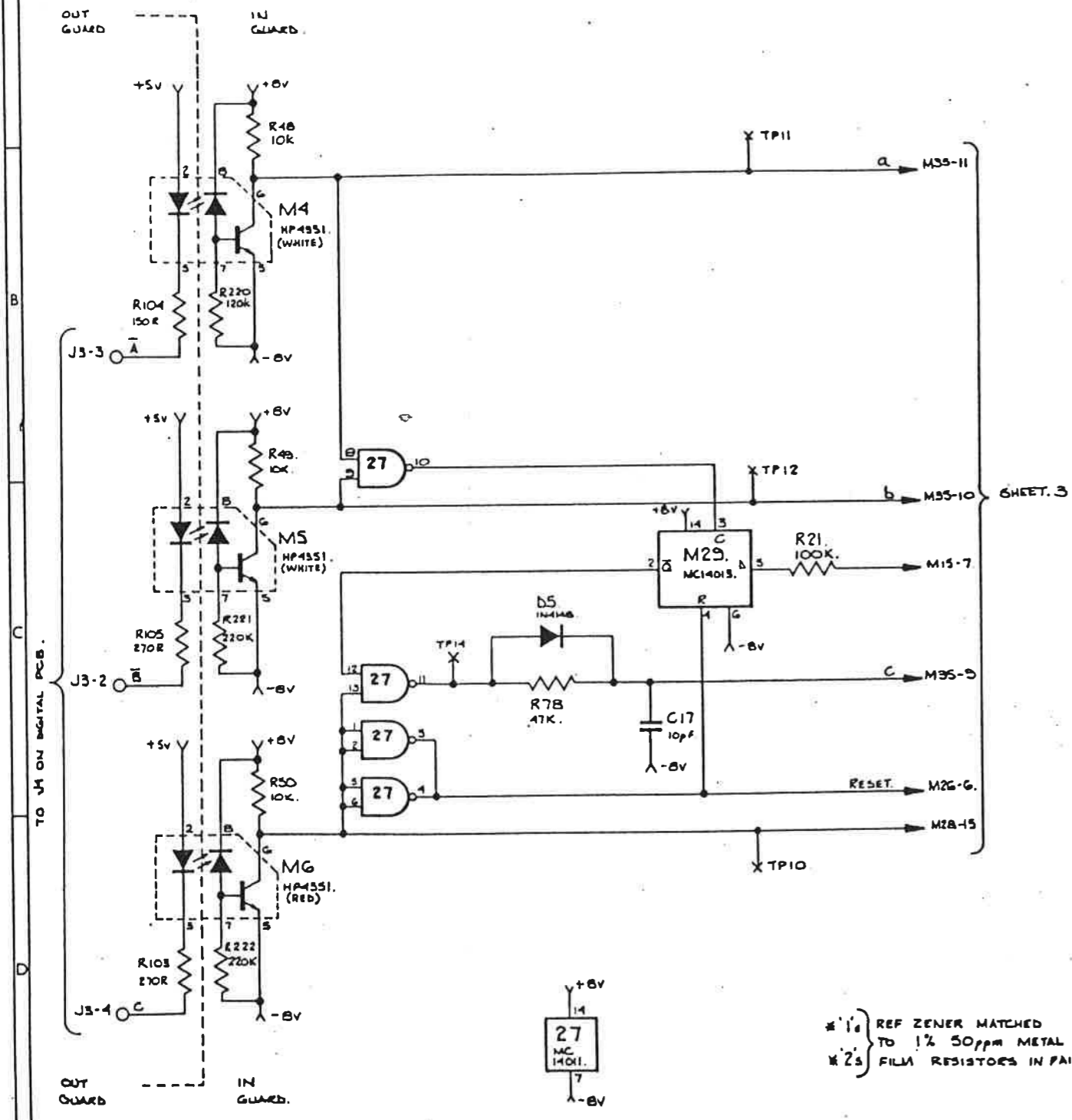
DRAWING No.
43032B
FIRST USED ON
1061

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES



ISS.	CHANGES
3	RE-DRAWN B.J. 10-4-79. ECO B20, B34 & ECO B53.
4	SEE SHEETS 2 & 3.
5	SEE SHEET 5.
6	SEE SHEET 5.
7	SEE SHEET 1 & 2.
8	ECO B55 & B57. REF SHT 1. B.J. 30-10-79.
9	SEE SHEETS 1 & 2.
10	SEE SHEETS 1 & 2. 16.4.80.
11	ECO.112B. R41 & R88 DELETED. 9.6.80.
12	SEE SHEET 3.
13	R48 WAS 5K. R105 WAS 150R. R220 WAS 220K. 16.12.80.
14	R39 & R40 WERE 40R2. M4-M6 SELECTED. SEE ALSO SHT.3. 3.11.81.
15	ECO 1273. SEE SHEET 1 OR 7.1.82.
16	ECO 1282. R234, R235 ADDED. UJR 23.7.82.
17	SEE SHEET 2.
18	SEE SHEET 1.
19	SEE SHEET 2.
20	SEE SHTS 1 & 5.

DRAWN B.J.	CHECKED [Signature]	DIMENSIONS IN MILLIMETRES	TOLERANCES RICH DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/64	ANGULAR ± 30"	MATERIAL
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 WHOLE DIMENSIONS ± 0.25		FINISH
DATE 6-4-79.	DATE	NOT TO BE SCALED	UNLESS OTHERWISE STATED		

datron ELECTRONICS LTD. NORWICH.

TITLE
A-D CONTROL & REFERENCES. 1061

DRAWING No.
43032B

DRAWING SIZE
A2
SHEET
4 of 5

DRAWING No
43032B
FIRST USED ON
1061

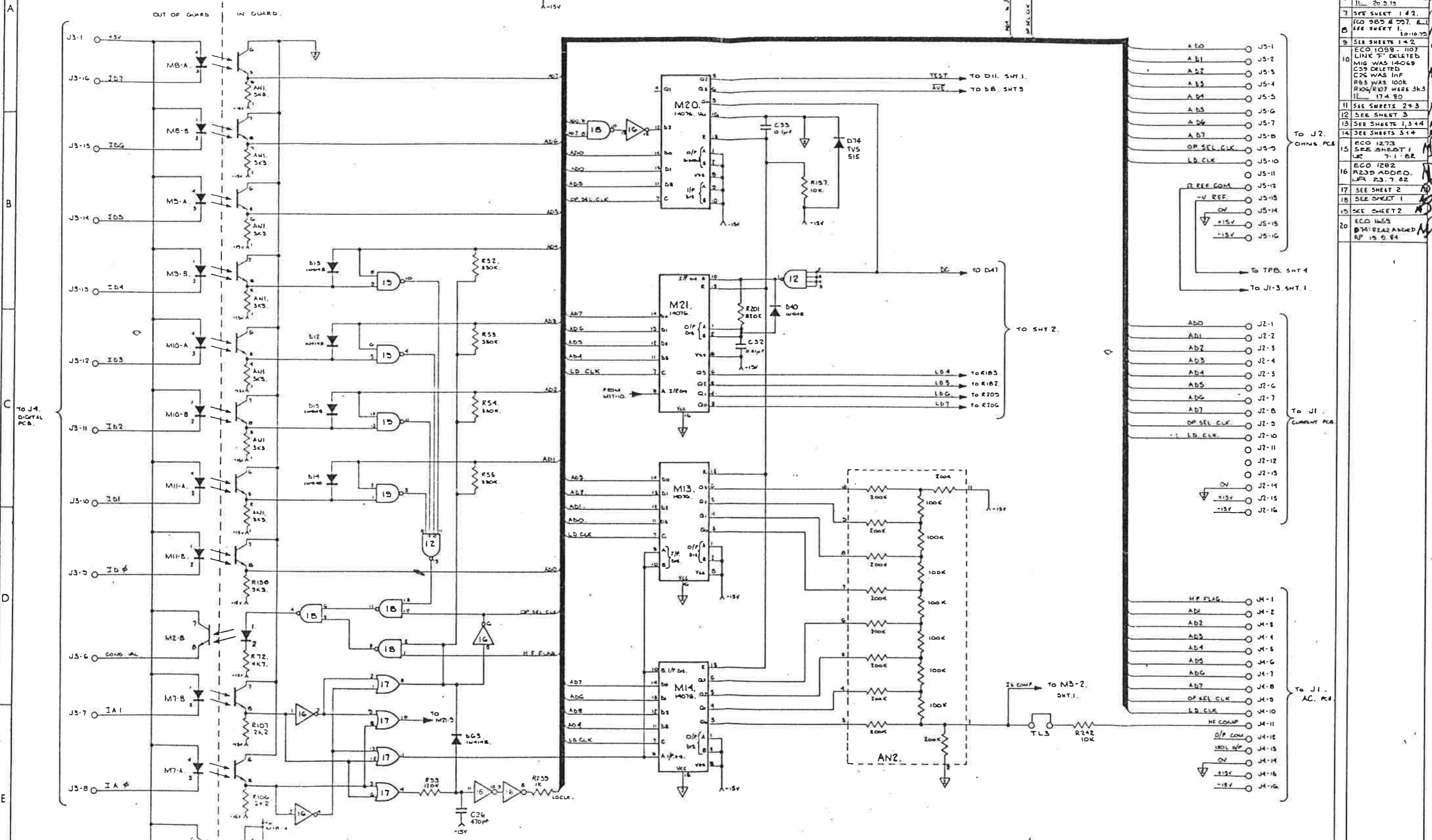
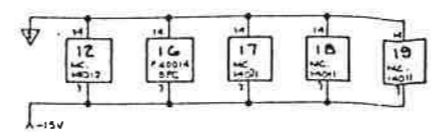
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS	CHANGES
3	RE-DRAWN 17-4-79 ECO B7C, B54 & B7 ECO B58
4	SEE SHEETS 2+3
5	ECO D29, D40 HAS BEEN RE-WATERED B7 16-7-79
6	ECO D59, C55 ADDED, AC004, M10-B & M11-B 11-20-79
7	SEE SHEET 1 & 2
8	ECO D55 & D57, B7 SEE SHEET 1 10-10-79
9	SEE SHEETS 1+2
10	ECO 105B, 1107 LINK 'F' DELETED M10 WAS 14069 C59 DELETED R03 WAS 100K R104/R107 WERE 3k3 11-17-80
11	SEE SHEETS 2+3
12	SEE SHEET 3
13	SEE SHEETS 1,3 & 4
14	SEE SHEETS 3+4
15	ECO 1273 SEE SHEET 1 15-7-1-82
16	ECO 1282 R233 ADDED, 15-23-7-82
17	SEE SHEET 2
18	SEE SHEET 1
19	SEE SHEET 2
20	ECO 1465 D74: RE-ANNEALED 15-9-84



DRAWN BJ TRACED DATE 18-4-79	CHECKED 267 APPROVED DATE	DIMENSIONS IN MILLIMETRES SCALE NOT TO BE SCALD	TOLERANCES FINISH DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.10 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 3 PLACES + 0.1mm DECIMAL TO 2 PLACES + 0.2mm WHOLE DIMENSIONS + 0.5mm UNLESS OTHERWISE STATED	ANGULAR ° ±' MATERIAL FINISH	datron ELECTRONICS LTD. NORWICH. TITLE ANALOGUE INTERFACE LOGIC 1061	DRAWING SIZE A1 DRAWING No. 43032B SHEET 5 of 5
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DRAWING No
430329
FIRST USED ON

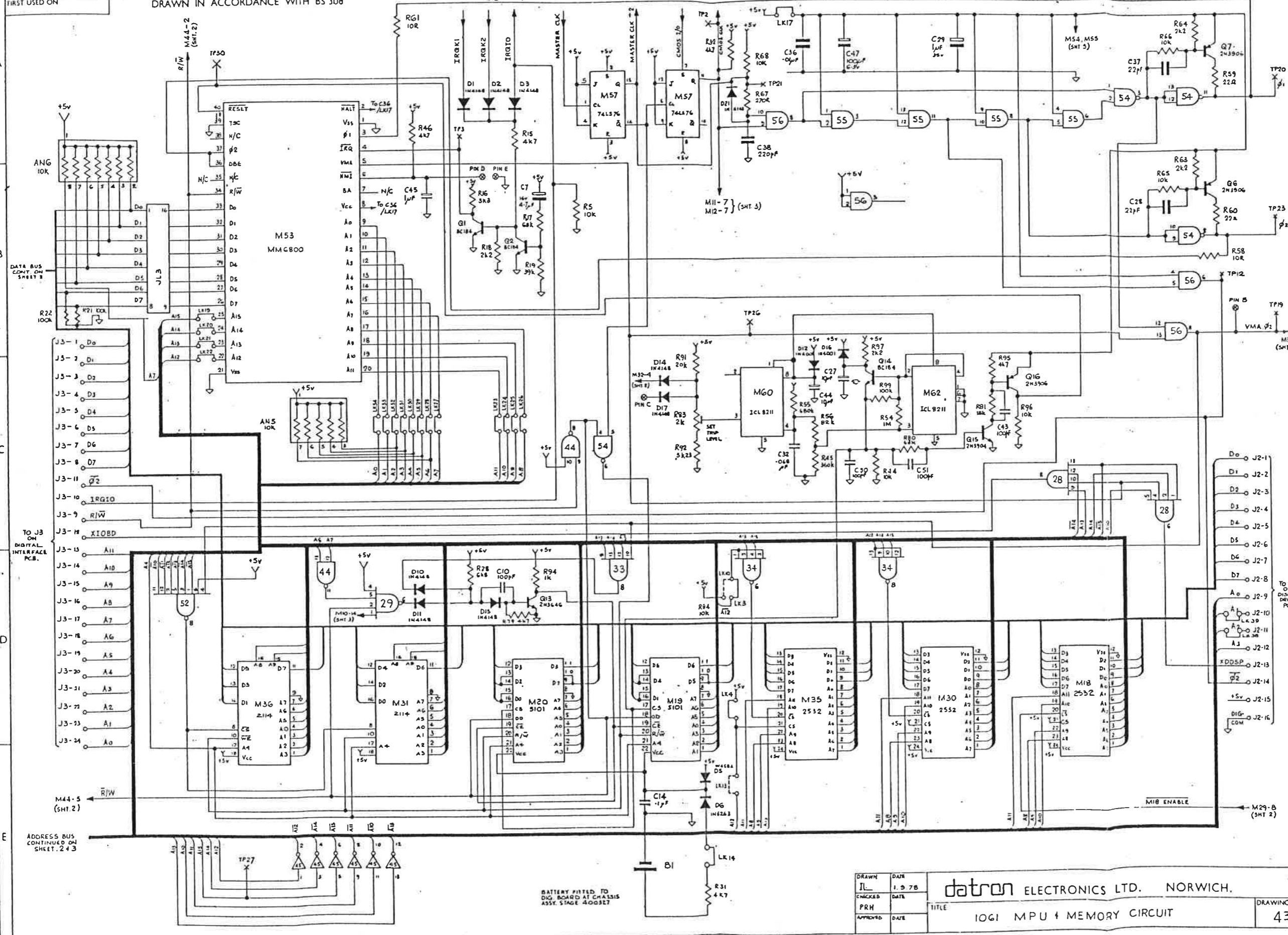
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

NO	CHANGES
1	RELEASED TO PRODF 24.11.78
2	ECO 811 PCB UPDATE TO 1554 IL 8.1.79
3	ECO 815 SMT 4 of Cap 1000F (10101) added C23 WAS 1000PF (1000M) C24 WAS 1000F (1000M) C25 WAS 470F (1000M) 25 JAN 79
4	ECO 814/852 155 S UPDATE TO PCB IL 8.1.79
5	ECO 812/811/863 R91 WAS 100K R92 WAS 27K R93 WAS 10K LK17 WAS R62 (0.47K) IL 19.6.79
6	ECO 828 17.7.79 SEE SHEET 3
7	ECO 841/849 155 S SHEET 3 4.9.79
8	ECO 1004 SEE SHEET 3 25.10.79
9	ECO 808 J1-J2 REMOVED & REPLACED WITH WIRE LINKS. R25 REMOVED. BATTERY ASST. NOW OSCILLATOR. J7 & LK14 DELETED TP20 ADDED. SEE ALSO SHEET E-4 IL 8.1.80
10	ECO 1046, 1052 568 SHEETS 3, 4 & 5 IL 24.8.80
11	ECO 1108 R15 WAS 22K R18 WAS 10K IL 18.4.80
12	ECO 1135 SEE SHEET 4 IL 19.6.80
13	ECO 1147 D21 ADDED IL 30.9.80
14	ECO 1198 SEE SHEET 5 IL 5.1.81
15	ECO 1214 LK 39 ADDED IL 12.6.81
16	ECO 1243, 1251 R56 WAS 100K R45 WAS 330K R31, 36 WERE 2.2K & 8 BIT RAMS LK 38 ADDED. PCB WAS 155 S B IL 2.12.81
17	ECO 1342 SEE SHT 2 & 5. B.J. 28-2-84.
18	ECO 1637 M19 WAS 5101 RAM M20 DELETED IL 22.5.84
19	ECO 1748 M19 & M20 WERE PART OF MV RAM EXTN PCB ASSY UNDER MID R57 IL 1.11.84



ADDRESS BUS CONTINUED ON SHEET 243

BATTERY FITTED TO DIG. BOARD AT CHASSIS ASSY. STAGE 400357

DRAWN JL	DATE 1.5.78	<p>datron ELECTRONICS LTD. NORWICH.</p> <p>TITLE 1061 MPU + MEMORY CIRCUIT</p>	DRAWING No 430329	DRAWING SIZE A1
CHECKED PRH	DATE		SHEET 1 of 5	
APPROVED	DATE			

DRAWING NO. 430329

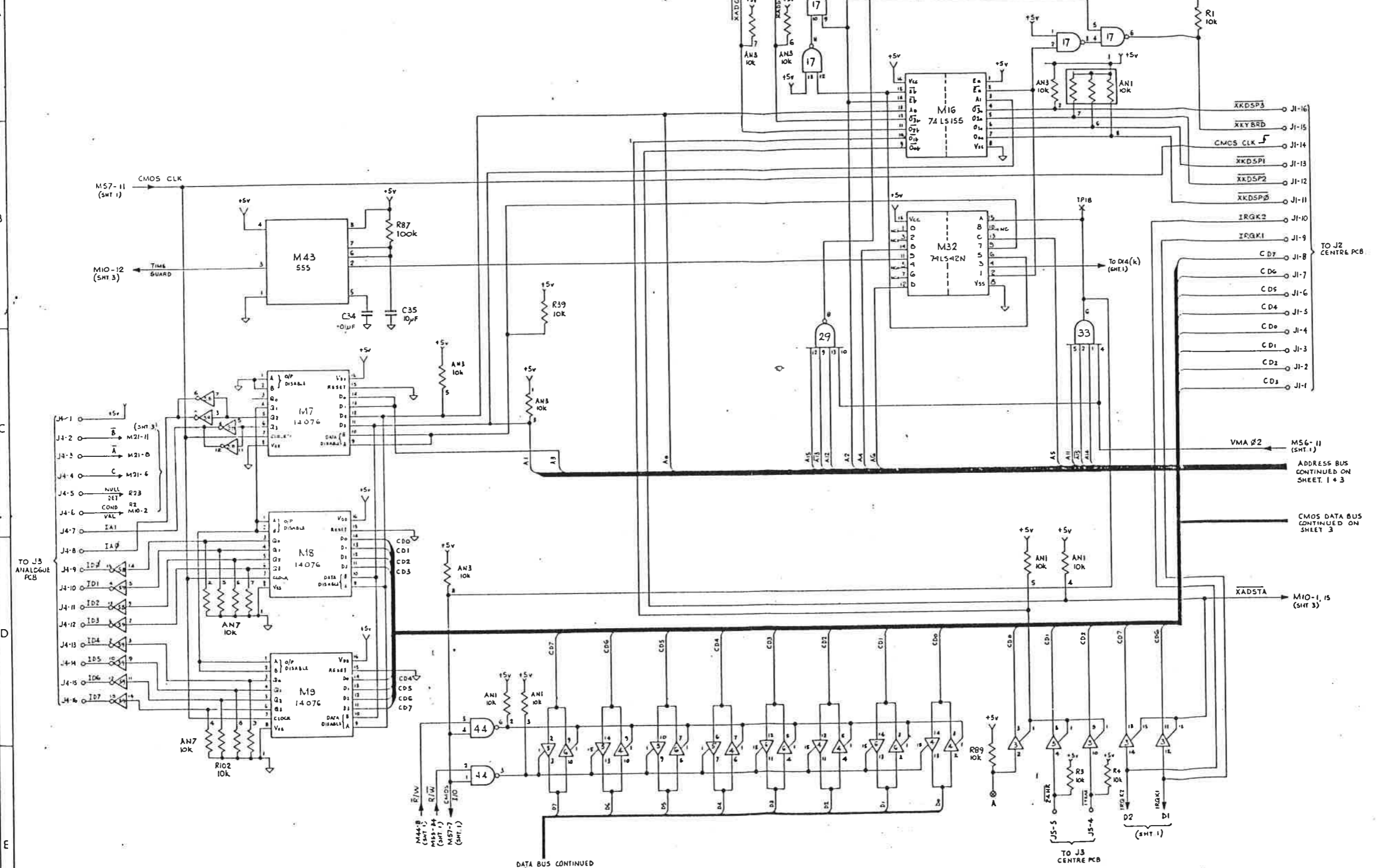
FIRST USED ON

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES



NO.	CHANGES
1	RELEASED TO PROD 24.11.78
2	ECO 011 P.A. UPDATE TO ISS 4 11.1.79
3	ECO 015 C24 100K (100K) ASSEMB C23 100K (100K) C24 100K (100K) C23 100K (100K) 27.1.79
4	ISS 2 UPDATE TO P.A. ECO 035/ISS 4.4.79
5	SEE SHEETS 1 & 3
6	SEE SHEET 3
7	SEE SHEET 3
8	SEE SHEET 3
9	ECO 058 S14 LR15-LR16 DELETED. ANT. R102 ADDED 11.8.80
10	SEE SHEETS 3, 4 & 5 11.8.80
11	SEE SHEETS 1, 3 & 5 11.8.80
12	SEE SHEET 4
13	SEE SHEET 3
14	ECO 124 S16 AND J11 DRIVES INCREASED. 17.6.81
15	ECO 124.3.125 SEE SHEET 1
16	ECO 1542. M52 WAS 74LS155. SEE SHT 3. 28.2.84
17	SEE SHEET 1
18	SEE SHEETS 1 & 4

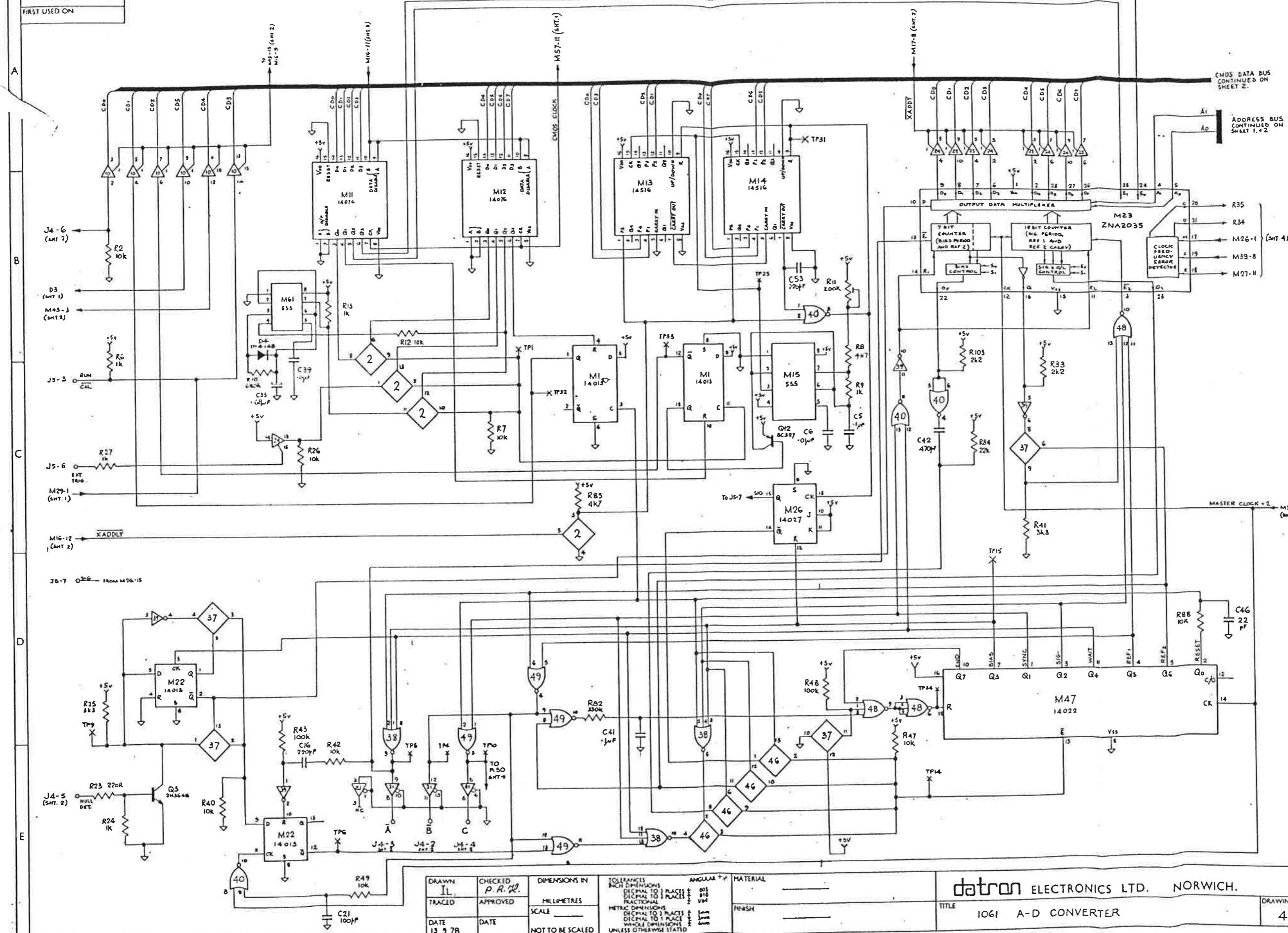
DRAWN IL	CHECKED P.R.H.	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.10 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 1 PLACE + 1mm DECIMAL TO 2 PLACES + 0.2mm WHOLE DIMENSIONS + 6mm	ANGULAR * °	MATERIAL
TRACED	APPROVED	SCALE	FINISH		
DATE 13.9.78	DATE	NOT TO BE SCALED			

datron ELECTRONICS LTD. NORWICH.		DRAWING SIZE A1
TITLE 1061 CMOS ADDRESS DECODE + I/O CIRCUIT	DRAWING No. 430329	SHEET 2 OF 5

DRAWING NO. 430329
FIRST USED ON

NOTES

- 1 RELEASED TO FRONT 24.11.78
- 2 ECO B11 PCB UPDATE TO 1554 11.11.78
- 3 ECO B15 C48 100PF 50V(2) ANGRD C38 100PF 50V(2) ANGRD C34 100PF 50V(2) ANGRD C25 100PF 50V(2) ANGRD 12.2.81
- 4 Q3 WAS BCR04 ECO 938 155.5 UPDATE TO PCB 4.4.78
- 5 ECO 896 RIO WAS 680L 15.6.78
- 6 ECO 926 C53 ADDED. P1-L1 CHANGE TO R85 17.7.79
- 7 ECO 941/949 R2 WAS 1K D18 & D19 ADDED 11.4.79
- 8 ECO 1004 R84 DELETED 11.8.80
- 9 ECO 958 D18/D19 DELETED TP11-TP13 ADDED 11.8.80
- 10 ECO 1092 JOB6 R3 WAS 575 R33 WAS 407 R41 WAS 10K SEE ALSO SHTS 4 & 5 11.8.80
- 11 ECO 1108 RIO3 ADDED 18.4.80
- 12 SEE SHEET 4
- 13 SEE SHEET 1
- 14 ECO 1188 R25 WAS 1K 11.8.81
- 15 ECO 1214 M21 WAS MC14030 & C16 12.8.81
- 16 ECO 1243 1251 SEE SHEET 1
- 17 ECO 1542 SEE SHEET 2 & 5 D.J. 28.2.84
- 18 SEE SHEET 1
- 19 SEE SHEETS 1 & 4



DRAWN IL	CHECKED P.R.L.	DIMENSIONS IN MILLIMETRES	TOLERANCES DIMENSIONS DECIMAL TO 1 PLACE FRACTIONAL METRIC DIMENSIONS DECIMAL TO 1 PLACE WHOLE DIMENSIONS UNLESS OTHERWISE STATED	ANGULAR ± 0.5° ± 0.1°	MATERIAL
TRACED	APPROVED	SCALE			FINISH
DATE 13.9.78	DATE	NOT TO BE SCALED			

datron ELECTRONICS LTD. NORWICH.

TITLE: 1061 A-D CONVERTER

DRAWING No. 430329

DRAWING SIZE
A1
SHEET
3 OF 5

DRAWING No.
430329
FIRST USED ON

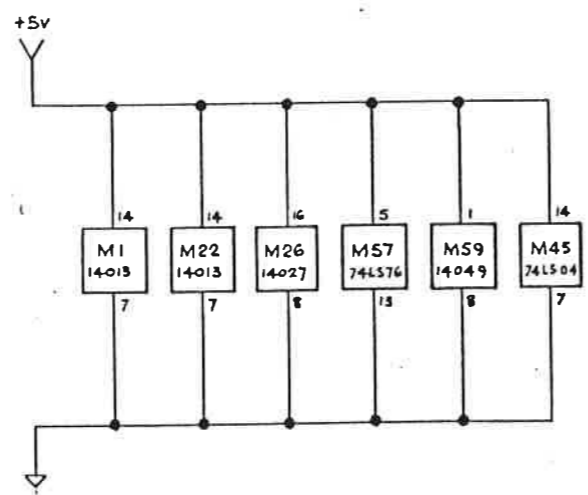
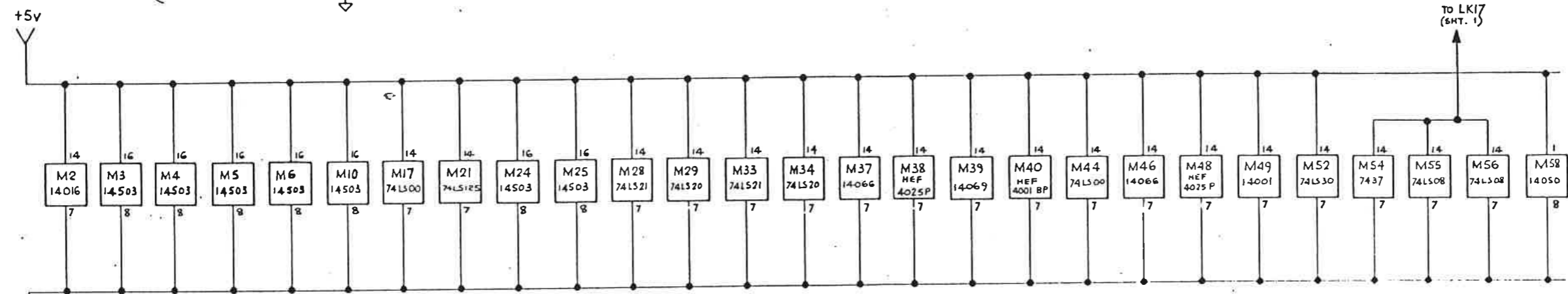
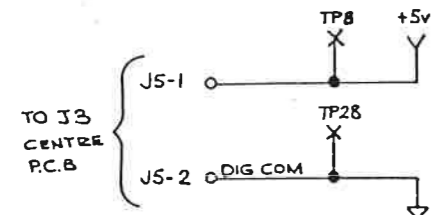
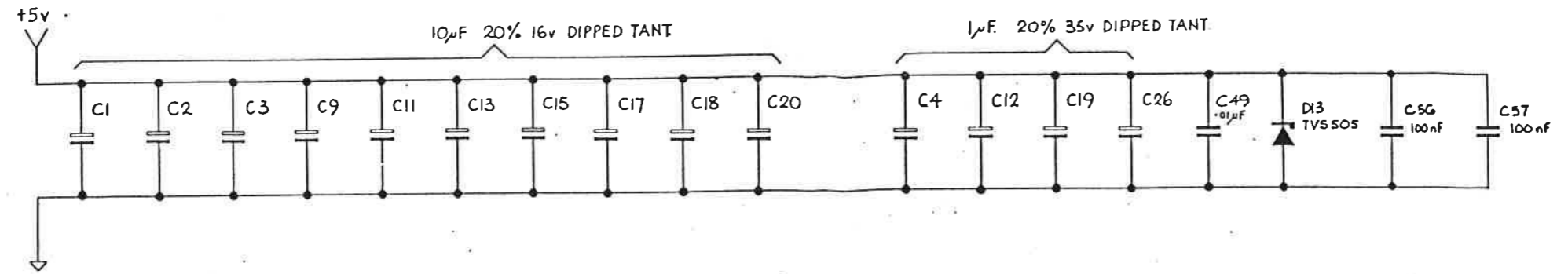
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS	CHANGES
A	
1	RELEASED TO PROD 24.11.78
2	ECO B11 PCB UPDATE TO ISSUE 4 JL 8.1.79
3	ECO B15 C4B 1000nF (0210) added C23 WAS 1000nF (1000nF) C24 WAS 1000nF (1000nF) C25 WAS 47nF (1000nF) 201ANT79 W.D.S.
4	ISS UPDATE TO R8 ECO 935/BS2 4-4-79 JL
5	SEE SHEETS 143
6	SEE SHEET 3
7	SEE SHEET 3
8	SEE SHEET 3
9	ECO 990, 1047 SEE SHTS 1-4 M38 WAS 14025 JL 8.1.80
10	ECO 1048 D13 WAS ICTE-5 M37+ M46 WERE 14016. JL 24.3.80
11	ECO 1108 M40 WAS 14001 JL 18.4.80
12	SEE SHEET 4
13	SEE SHEET 1
14	SEE SHEET 3
15	ECO 1214 M21 WAS 14050 JR 12.6.81
16	ECO 1243, 1251 SEE SHEET 1
17	ECO 1512 C57 & C56 ADDED SEE SHEET 2. BJ. 28-2-84.
18	SEE SHEET 1
19	SEE SHEETS 144



ALL RESISTORS: 5% 1/4 WATT CARBON

DRAWN IL	CHECKED P.R.H.	DIMENSIONS IN MILLIMETRES	TOLERANCES EACH DIMENSION DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL _____	datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A2
TRACED	APPROVED	SCALE NOT TO BE SCALED	FINISH _____	TITLE 1061 DIGITAL PCB. ASSY.		SHEET 5 OF 5
DATE 12.10.78	DATE				DRAWING No. 430329	

DRAWING No.
400330

FIRST USED ON

THIRD ANGLE PROJECTION

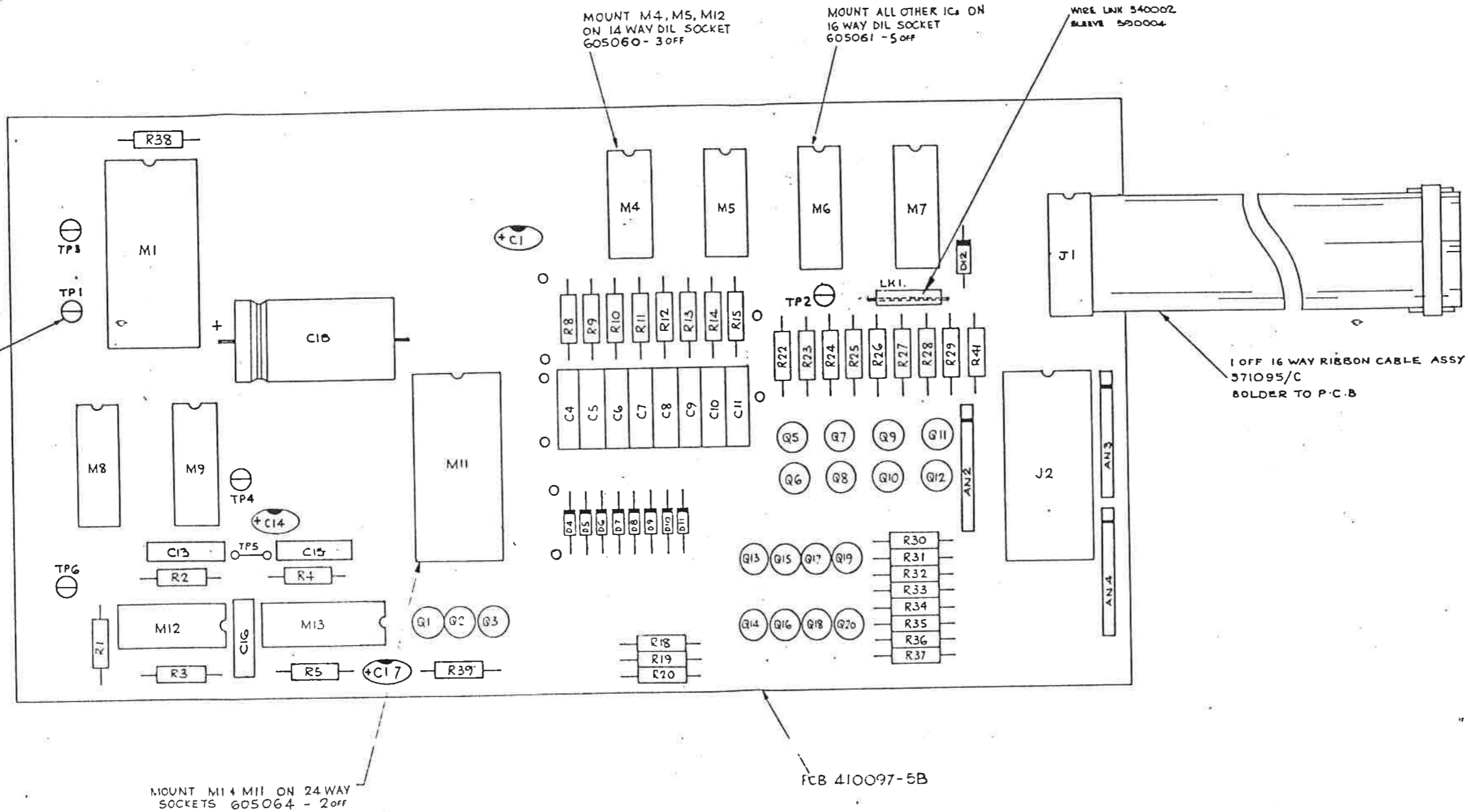
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1. MAKE TPI-TP6 FROM 22 SWG. BTC. WIRE - PART N° 54-0002.

ISS.	CHANGES
C	
1	RELEASED TO PRODUCTION 29.9.78
2	C18 ADDED 1R40 ECO 789. 17 NOV 78. W.G.S.
3	AN2-AN4 ADDED R41 & D12 ADDED ECO B22 20-FEB-79 W.A.S.
4	R40 WAS 180R 2001R NOW WIRE LINK ECO B54 10 MAY 79 W.G.S.
5	CLIP FOR J1 WAS 606005. ECO 804 21.6.79 IL
6	ECO 1000 & 1025 RIBBON CABLE CLIP WAS 606007. B2 D12 WAS B24.
7	ECO 1217 J1 WAS 16 WAY SOCKET. JR 17.8.81
8	ECO 1253 PARTS LIST CHANGE TO J2 JR 2.12.81
9	ECO 1588 NYLATCH DELETED PCB WAS 1555A 6J. 14 MAR 84.



TEST POINT TERMINAL G20007 5 off.

1 OFF 16 WAY RIBBON CABLE ASSY 371095/C BOLDER TO P.C.B

MOUNT M11 & M12 ON 24 WAY SOCKETS 605064 - 2 off

PCB 410097-5B

DRAWN IL	CHECKED <i>[Signature]</i>	DIMENSIONS IN MILLIMETRES	UNLESS OTHERWISE STATED
TRACED	APPROVED	SCALE 2:1	DECIMAL TO 1 PLACE DECIMAL TO 2 PLACES FRACTIONAL
DATE 3 5 78	DATE	NOT TO BE SCALED	WHOLE DIMENSIONS DECIMAL TO 1 PLACE WHOLE DIMENSIONS UNLESS OTHERWISE STATED

MATERIAL SEE PARTS LIST
FINISH

datron ELECTRONICS LTD. NORWICH.
TITLE
1061 DISPLAY DRIVER PCB ASSY.

DRAWING SIZE A2	DRAWING No. 400330	SHEET 1 of 7
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DRAWING No. 430330
FIRST USED ON 10G1

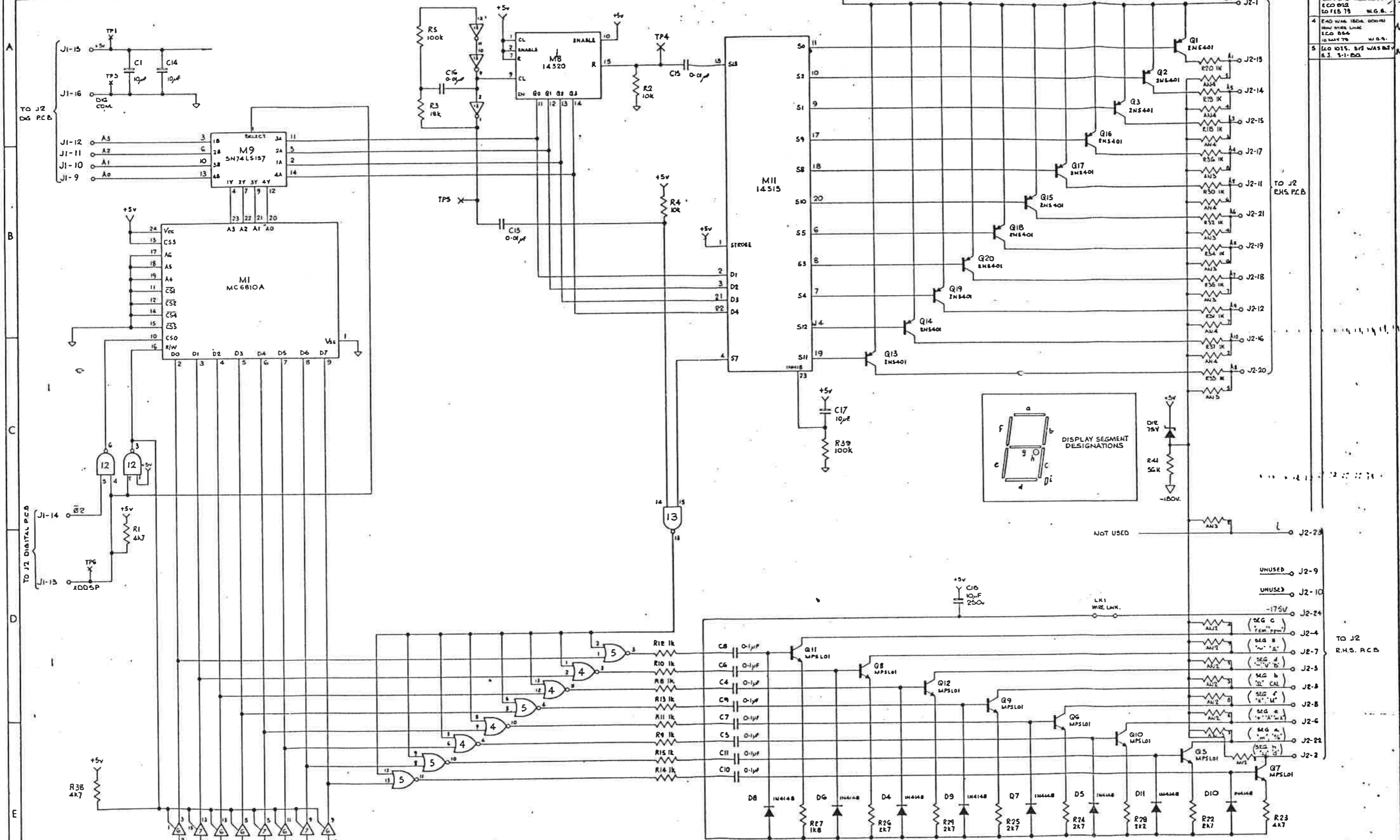
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

NO.	CHANGES
1	RELEASED TO PRODUCTION 20 NOV 78
2	C15 ADDED & READ E.C.D. TOP 17 MAR 79 W.G.S.
3	RES-544 ADDED E.C.D. D12 20 FEB 79 W.G.S.
4	R40 WAS 180Ω. CORRECTED TO 180Ω. E.C.D. B54 10 MAY 79 W.G.S.
5	E.C.D. 1015. B7 WAS B7. A.3 3-1-80



UNSPECIFIED DEVICES:
M3 = MC14572
M4, M5 = MC14001BCR
M6, M7 = MC14503BCP
M12 = 5N74LS00
R1 - R57 = 5% 1/4 W CARBON
C1, C15 = 20% 25V DIP TANT
C2 - C14, C16 = 10% 250V POLYESTER

DRAWN IL	CHECKED APPROVED	DIMENSIONS IN MILLIMETRES	TOLERANCES FOR DIMENSIONS DECIMAL TO 3 PLACES FRACTIONAL METRIC DIMENSIONS DECIMAL TO 1 PLACE WHOLE DIMENSIONS UNLESS OTHERWISE STATED	ANGULAR ° ' "	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING No. 430330	SHEET 1 OF 1
TRACED	DATE	SCALE	NOT TO BE SCALED	FINISH	TITLE 10G1 DISPLAY DRIVER PCB			

DRAWING No. 400331
FIRST USED ON 1061

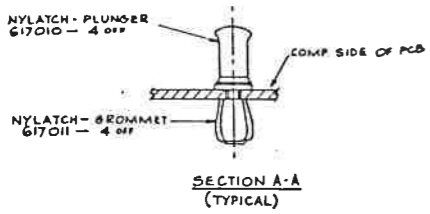
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
12	ECO 1176 ASSY COMPLETELY RE-DRAWN. PCB WAS ISSUE 4. R71 - R74 ADDED R66/R70 TRACKED-IN. R10 DELETED. C27 D28 ADDED. C24 D27 TRACKED-IN OWNER PARTS LIST CHANGES - SEE ECO. 20.11.80
13	ECO 1217 12 WAY 16 WAY SOCKET. JR 18.8.81.
14	ECO 1800. R34, R46 & R58 WIRE CHANGE R56 PARTIAL CHANGE SOMMERSET ST.
15	ECO 1667. R28 ADDED. R55 NOW ON TOP OF PCB. 27.11.84.



MOUNT R2 + R9 WITH 2 off PORCELAIN BEADS 620024 ON EACH LEG, AS SHOWN

4 off F.S.V. TERMINAL 602001

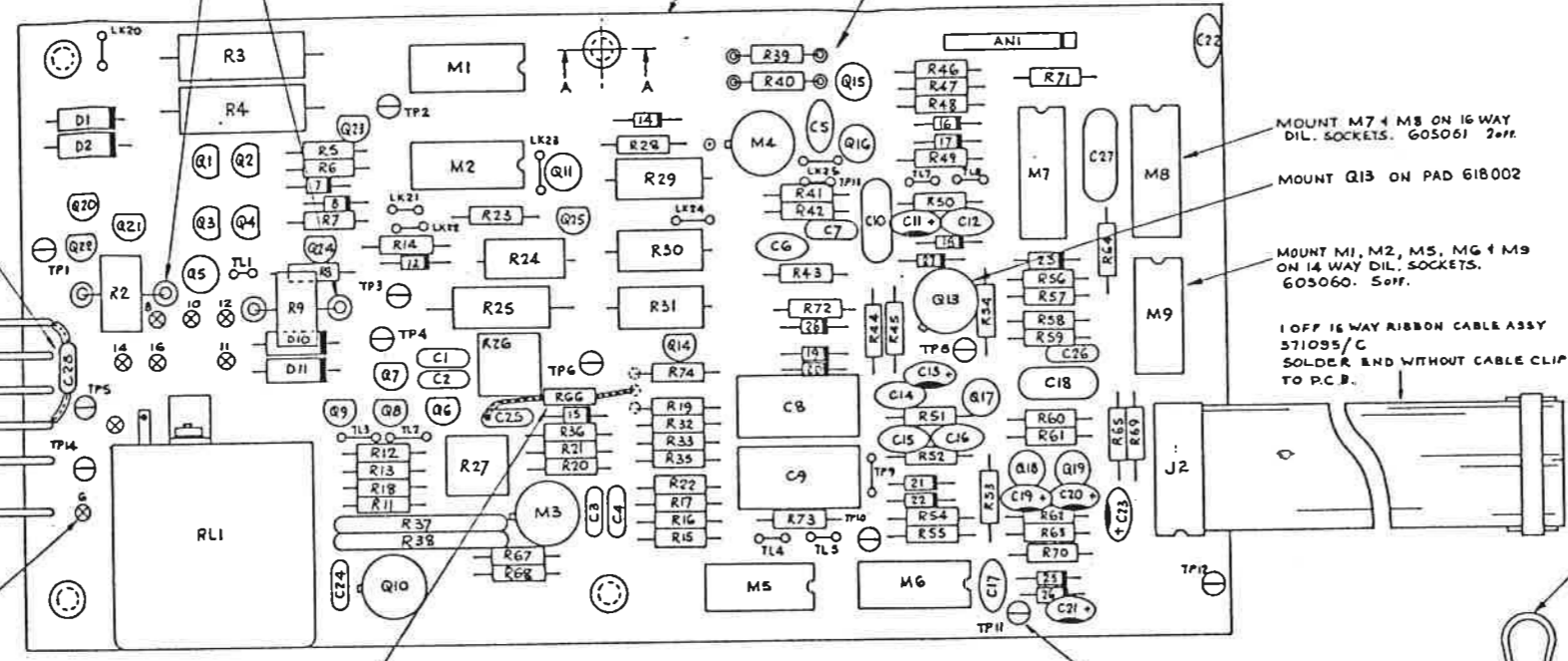
PCB. 410099-6

FIT C28 ON TOP OF PCB BETWEEN J1-1 & J1-7. SLEEVE LEADS WITH 590004. WEAP LEADS AROUND PINS & SOLDER.

12 WAY POLARISED SOCKET 605053 1 off

WIDE/TERMINAL ASSY. 400378/2 6 off

SOLDER PCB TERMINAL 620005 8 off



MOUNT M7 + M8 ON 16 WAY DIL. SOCKETS. 605061 2 off

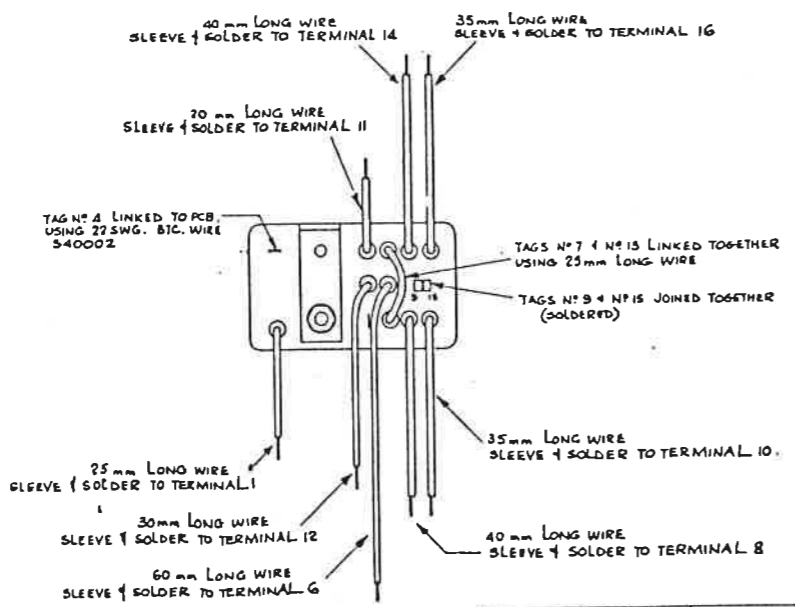
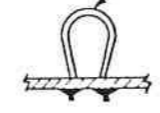
MOUNT Q13 ON PAD 618002

MOUNT M1, M2, M5, M6 + M9 ON 14 WAY DIL. SOCKETS. 605060. 5 off.

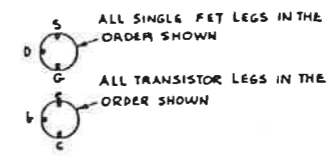
1 OFF 16 WAY RIBBON CABLE ASSY 571035/C SOLDER END WITHOUT CABLE CLIP TO PCB.

ALL TEST POINTS TO BE MADE FROM 22 SWG BIC WIRE. 540002

NB. SOME LINKS SHOWN AS TEST POINT LOOPS SHOULD ALSO BE FORMED THUS, FOR EASE OF PRODUCTION (eg LK20)



NOTE
ALL WIRE IS 540008 PTFE INSULATED WHITE
ALL LENGTHS OF WIRE SHOWN ON RELAY ARE TOTAL LENGTHS, THEN 3 mm IS TO BE STRIPPED FROM EACH END.
SLEEVE WIRES WITH 590001 1/2 PIECE FOR EACH CONNECTION, i.e. 1 PIECE FOR EACH WIRE.



DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	ANGULAR	MATERIAL
IL		MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.148	°	
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 3 PLACES + 0.1mm DECIMAL TO 2 PLACES + 0.2mm WHOLE DIMENSIONS + 0.4mm		
DATE	DATE	NOT TO BE SCALED	UNLESS OTHERWISE STATED		
30.7.80					

datron ELECTRONICS LTD. NORWICH.

TITLE 1061 OHMS PCB. ASSY.

DRAWING No. 400331
SHEET 1 of 12

DRAWING SIZE A1

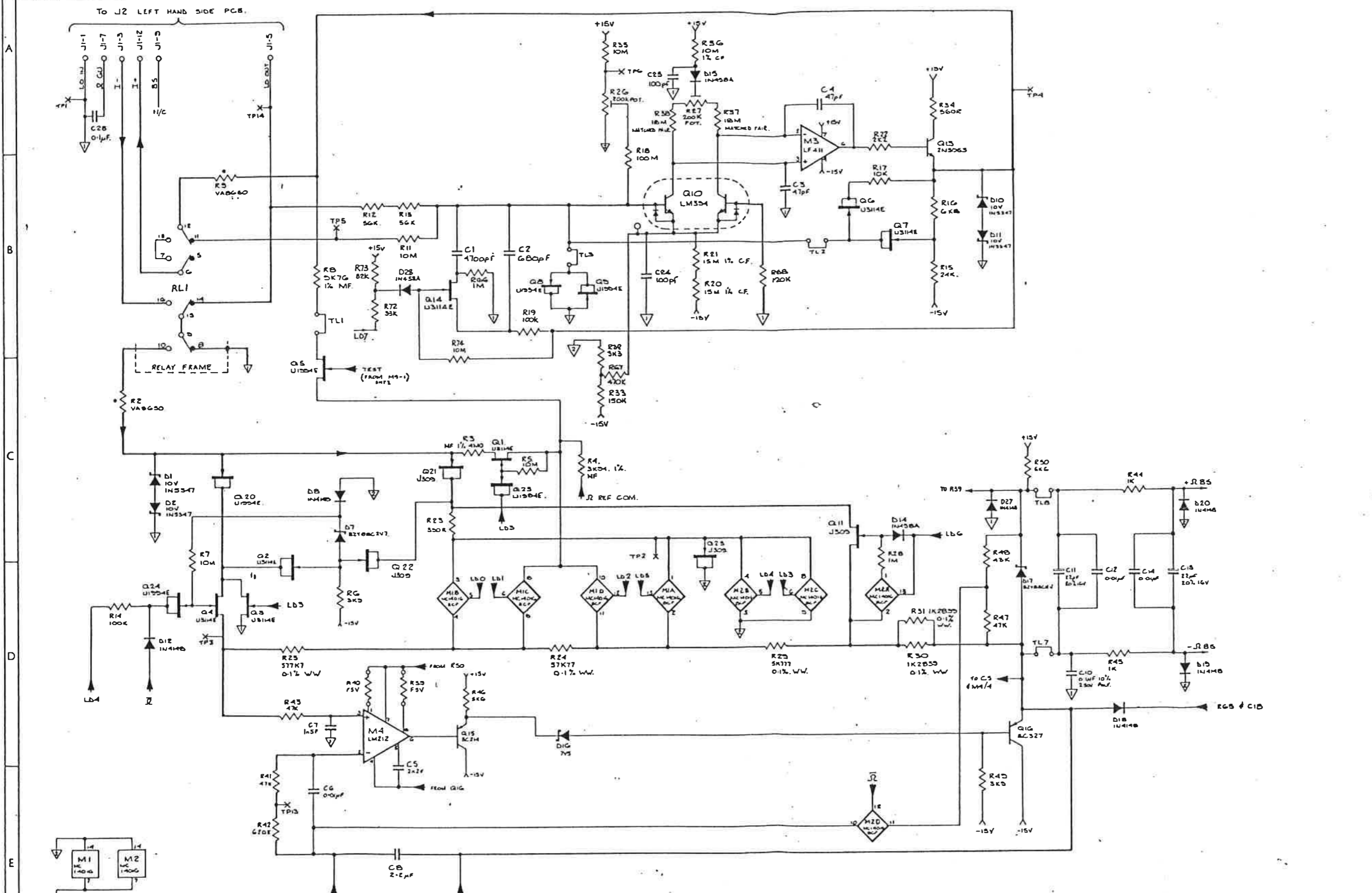
DRAWING No
430331
FIRST USED ON
1061

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES



ISS	CHANGES
1	RELEASED
2	D13 WAS 1N4148, & J2 R46 = 1M, 1/4W, 10% C10 = 0.1µF, 50V
3	ECO 1056, D24, & J2 DELETED 20-6-79. ECO 1068 D13 WAS 1N4148 R46 1M 1/4W 10% R15 15K 1/4W 10%
4	ECO 1050 RE-INITIATE LOG D1051, Q1, Q2, Q3, Q4, Q5 WIPPER'S NEW J300'S Q1 1N4148
5	ECO 1054 & 1000-E Q12 DELETED D13 WAS 1N4148, Q1000E D13 WAS 1N4148, Q1000E R46 1M 1/4W 10% R47 47K 1/4W 10% R48 47K 1/4W 10% R49 47K 1/4W 10% R50 47K 1/4W 10% R51 1K2000 0.1% W.W. R52 1K2000 0.1% W.W. R53 1K2000 0.1% W.W. R54 1K2000 0.1% W.W. R55 10M 1% R56 10M 1% R57 10M 1% R58 10M 1% R59 10M 1% R60 10M 1% R61 10M 1% R62 10M 1% R63 10M 1% R64 10M 1% R65 10M 1% R66 10M 1% R67 10M 1% R68 10M 1% R69 10M 1% R70 10M 1% R71 10M 1% R72 10M 1% R73 10M 1% R74 10M 1% R75 10M 1% R76 10M 1% R77 10M 1% R78 10M 1% R79 10M 1% R80 10M 1% R81 10M 1% R82 10M 1% R83 10M 1% R84 10M 1% R85 10M 1% R86 10M 1% R87 10M 1% R88 10M 1% R89 10M 1% R90 10M 1% R91 10M 1% R92 10M 1% R93 10M 1% R94 10M 1% R95 10M 1% R96 10M 1% R97 10M 1% R98 10M 1% R99 10M 1% R100 10M 1%
6	SEE SHEET 2
7	ECO 1124 C1 WAS 3n3P IL 10 6 80
8	ECO 1134 D17 ADDED IL 10 6 80
9	ECO 1176 R72, R73, Q74, 1 D28 ADDED. R10 DELETED. R26 WAS 20K R33 WAS 1M2 SEE ALSO SHEET 2 IL 12 12 80
10	ECO 1300 R54 WAS 600K R48 - 81K R49 WAS ADDED TO Q4, R19 HAD W 10M 1/4W 10% IL 10 6 80
11	ECO 1567, C28 ADDED. 718 AUG 01.

DRAWN BJ TRACED DATE 20-4-79	CHECKED APPROVED DATE	DIMENSIONS IN MILLIMETRES SCALE NOT TO BE SCALED	TOLERANCES NICH DIMENSIONS DECIMAL TO 3 PLACES DECIMAL TO 2 PLACES FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES DECIMAL TO 1 PLACE WHOLE DIMENSIONS UNLESS OTHERWISE STATED	ANGULAR * ° 005 010 044 1mm 2mm 5mm	MATERIAL FINISH	datron ELECTRONICS LTD., NORWICH. TITLE CHMS PCB CIRCUIT 1061.	DRAWING No. 430331	DRAWING SIZE A1 SHEET 1 of 2
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DRAWING No
430331
FIRST USED ON
10G1

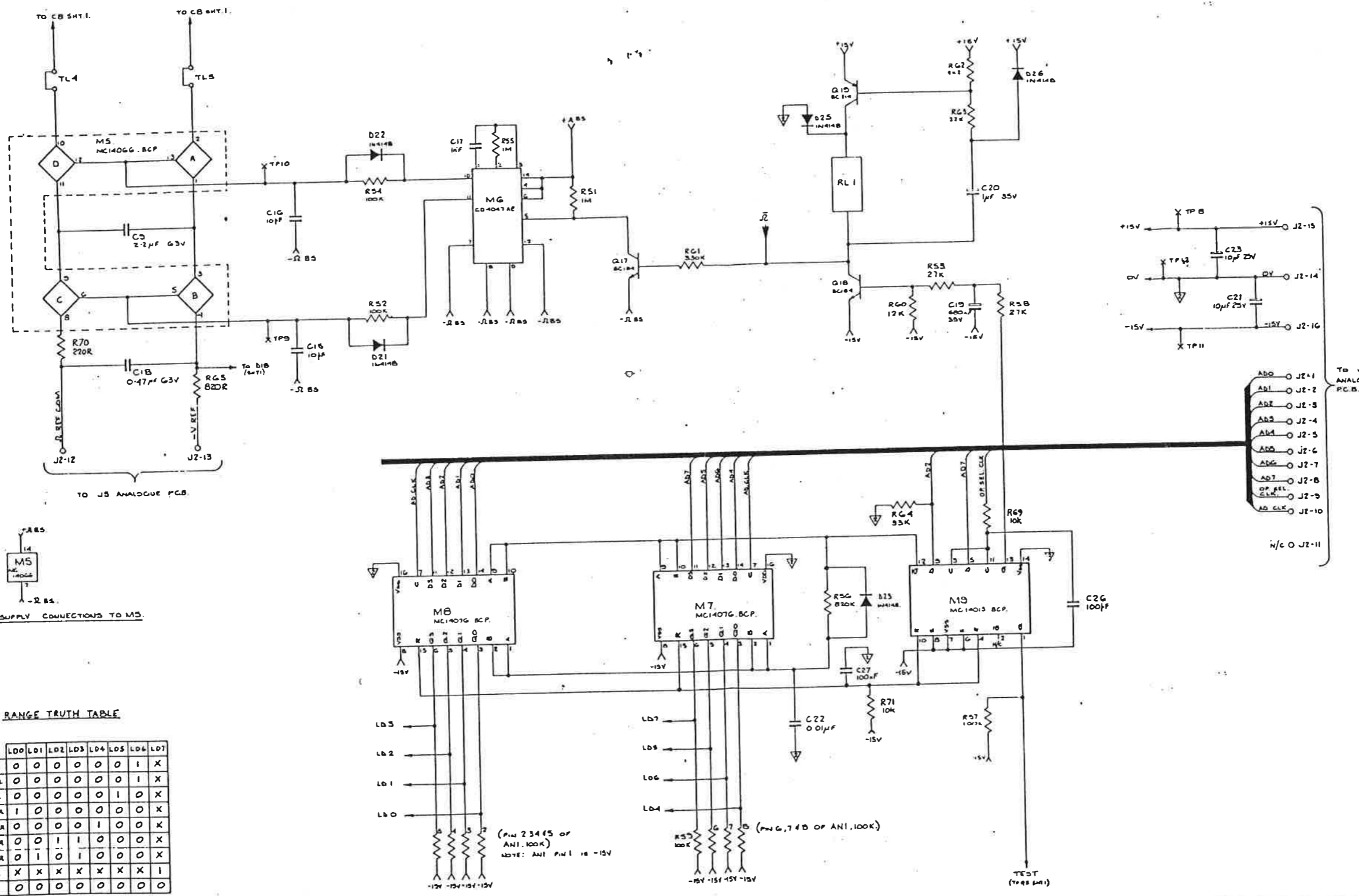
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS	CHANGES
1	RELEASED.
2	D23 WAS 1N4148. Q1 R56 WAS 1M. ECO 091 C19 = 0.1µF. 11.3.79
3	ECO 098. D24 B.J. DELETED. 20.8.79 ECO 308. D1, D28 NEW C217. R2, R26 NEW 345. R19, R18 NEW 24K.
4	ECO 310 REWASHER BITE C2085 Q21, R217 NEW UNPOPULATED NOW J307. E.J. 13.7.79
5	ECO 1054 & 1052 R48 SENT 1 FOR DETAILS W.B.S. 6 FEB 80
6	ECO. 1109 C26 ADDED R. 21.4.80
7	ECO. 1119 C28 WAS 1µF R89 ADDED. 11. 3.80
8	ECO. 1154 R70 ADDED 15.6.80
9	ECO. 1176 R71 & C27 ADDED 12.12.80
10	ECO 1300 R65 WAS ZK7 SUN WAC 82 87
11	SEE SHEET 1.



RANGE TRUTH TABLE

RANGE	LD0	LD1	LD2	LD3	LD4	LD5	LD6	LD7
10.A	0	0	0	0	0	0	0	1
100.A	0	0	0	0	0	0	0	1
1M.A	0	0	0	0	0	0	0	1
10K.A	1	0	0	0	0	0	0	0
100K.A	0	0	0	0	0	1	0	0
1M.A	0	0	1	1	0	0	0	0
10M.A	0	1	0	1	0	0	0	0
FILTER	X	X	X	X	X	X	X	1
X	0	0	0	0	0	0	0	0

LOGIC '0' = -15V
LOGIC '1' = 0V
LOGIC 'X' = 'DONT CARE' CONDITION

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	ANGULAR ±	MATERIAL
BJ	APPROVED	MILLIMETRES	NCH DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.10 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 3 PLACES + 0.1mm DECIMAL TO 2 PLACES + 0.2mm WHOLE DIMENSIONS + 4mm		
TRACED		SCALE			
DATE	DATE	NOT TO BE SCALED			

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE	DRAWING No.	SHEET
A1	430331	2 OF 2

TITLE
OHMS PCB CIRCUIT. 10G1.

DRAWING No
400332

FIRST USED ON

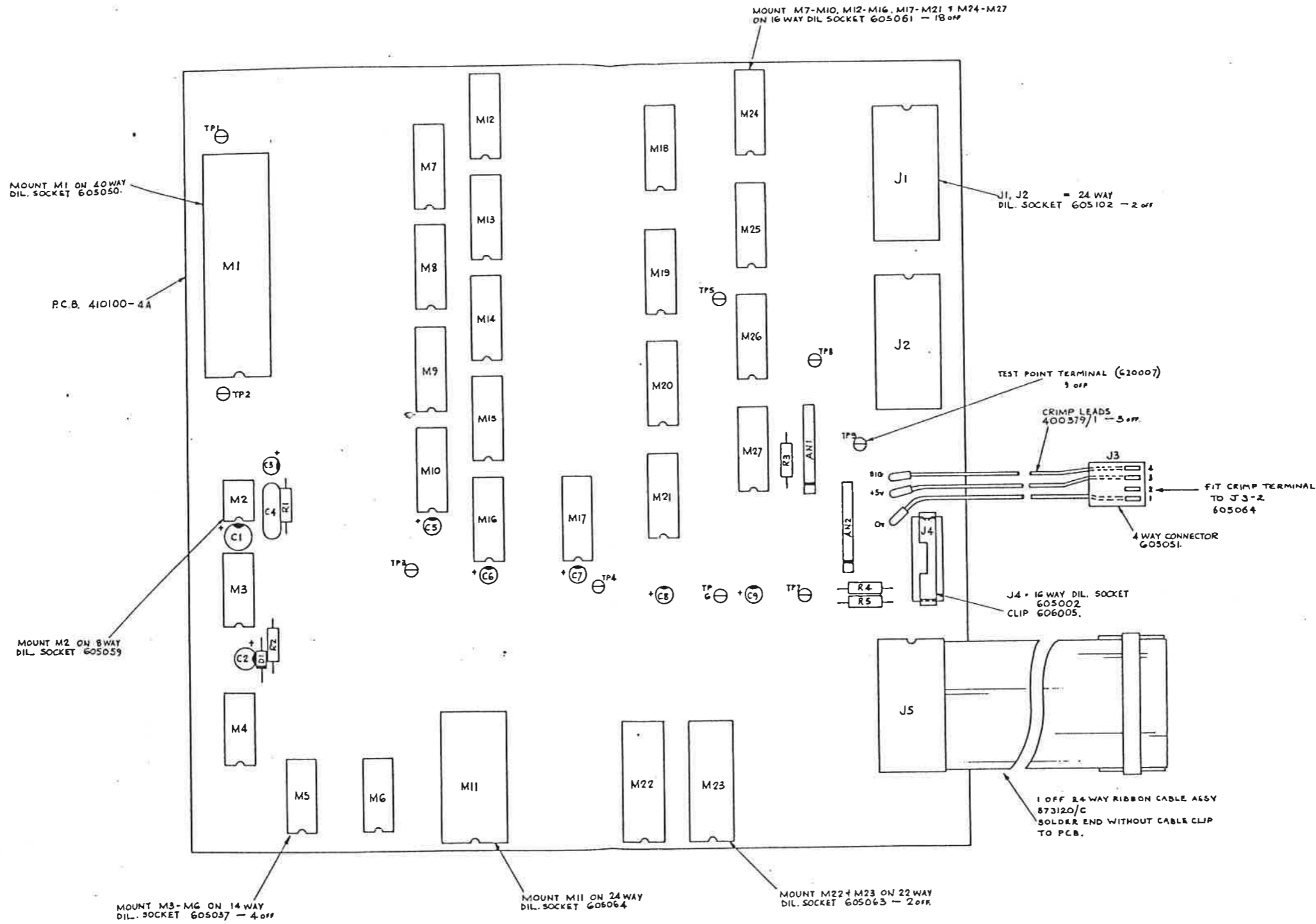
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS	CHANGES
1	RELEASED TO PRODUCTION 1.3.80
2	ECO 1078 TEST POINTS TPI-TP9 ADDED J3 PINS RE-ORGANIZED PCB WAS ISS 3. R. 27.2.80
3	ECO 1098 PARTS LIST CHANGE R. 28.3.80
4	ECO 1137 PARTS LIST CHANGE R. 29.7.80
5	ECO 1168 PARTS LIST CHANGE R. 16.12.80
6	ECO 1188 605036 CRIMP ADDED TO J4 JA 25.2.81
7	ECO 1217 P8 WAS 24 WAY SOCKET. JC 16.8.81
8	ECO 1246 PARTS LIST CHANGE R. 4.11.81
9	ECO 1253 J1 & J2 WERE 605064 JC 3.12.81
10	ECO 1403 PARTS LIST CHANGE TO M11 (ISS 4A TPI 17) R. 24.11.82
11	ECO 1532 PCB WAS ISSUE 4 NYLATCHES REMOVED M11 (EPROM) WAS ISS R. R. 25.8.84



CIRCUIT DIAGRAM = 430332-2

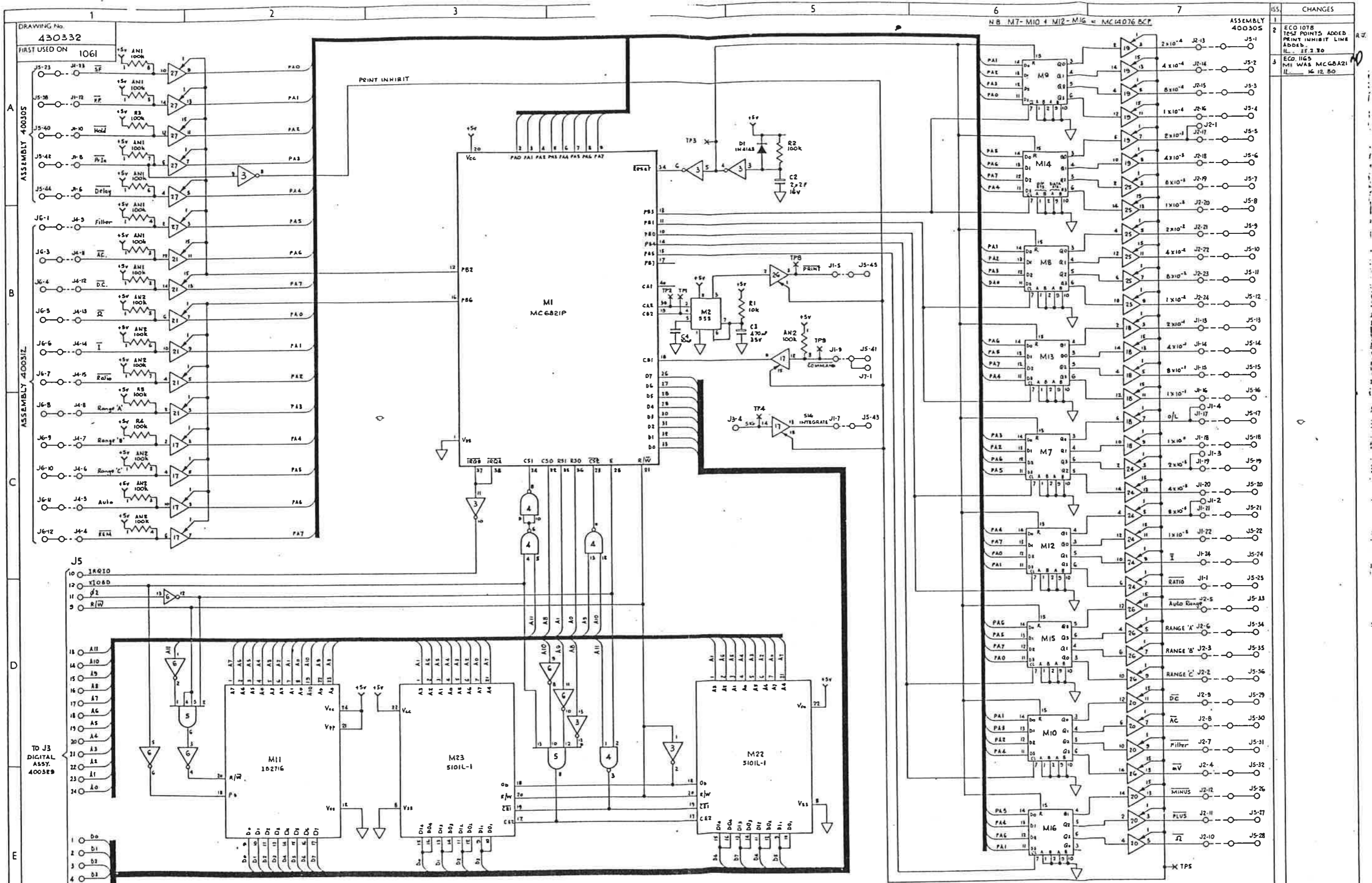
DRAWN JL	CHECKED MA	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± 0.01 DECIMAL TO 2 PLACES ± 0.04 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 3 PLACES ± 0.1mm DECIMAL TO 2 PLACES ± 0.2mm WHOLE DIMENSIONS ± 0.4mm UNLESS OTHERWISE STATED	ANGULAR ± 0.5°	MATERIAL _____
TRACED	APPROVED	SCALE 2:1	FINISH _____		
DATE 31.1.80	DATE	NOT TO BE SCALED			

datron ELECTRONICS LTD. NORWICH.

TITLE
BCD/PROGRAM PCB. ASSY.

DRAWING No. 400332	SHEET 1 OF 4
-----------------------	-----------------

DRAWING SIZE
A1



ASSEMBLY 400305
 NB M7-M10 + M12-M16 = MC14076 BCP

CHANGES	
1	ECO 1078
2	165J POINTS ADDED PRINT INHIBIT LINE ADDED. IL. 28.80
3	ECO 1165 M1 WAS MC68A21 IL. 16.80

DRAWN IL	CHECKED A.J.	DIMENSIONS IN MILLIMETRES	TOLERANCES WHOLE DIMENSIONS DECIMAL TO 3 PLACES + 0.05 DECIMAL TO 2 PLACES + 0.10 FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES + 0.2mm DECIMAL TO 1 PLACE + 0.5mm WHOLE DIMENSIONS + 2mm UNLESS OTHERWISE STATED	ANGULAR +	MATERIAL
TRACED	APPROVED	SCALE			FINISH
DATE 11.2.80	DATE	NOT TO BE SCALED			

datron ELECTRONICS LTD. NORWICH.
 TITLE BCD / PROGRAM

DRAWING SIZE
A1
 DRAWING No. 430332
 SHEET 1 of 2

DRAWING No.
430332
FIRST USED ON 1061

THIRD ANGLE PROJECTION

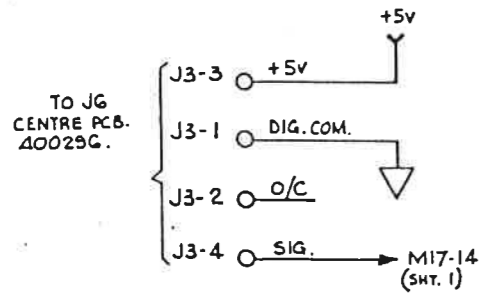
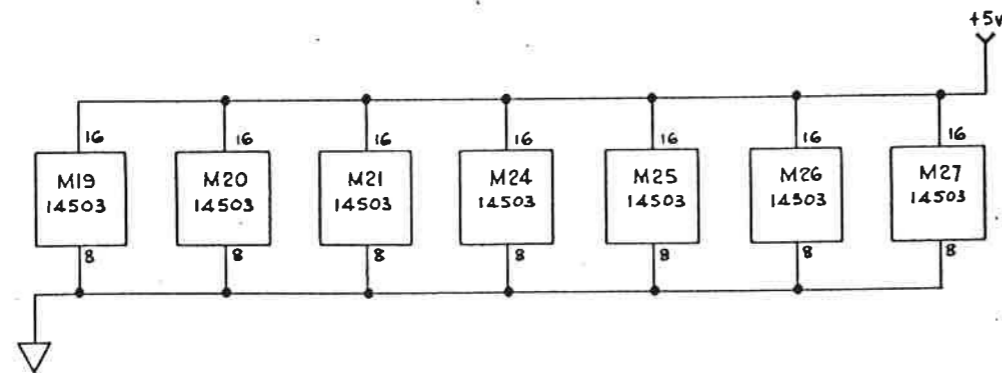
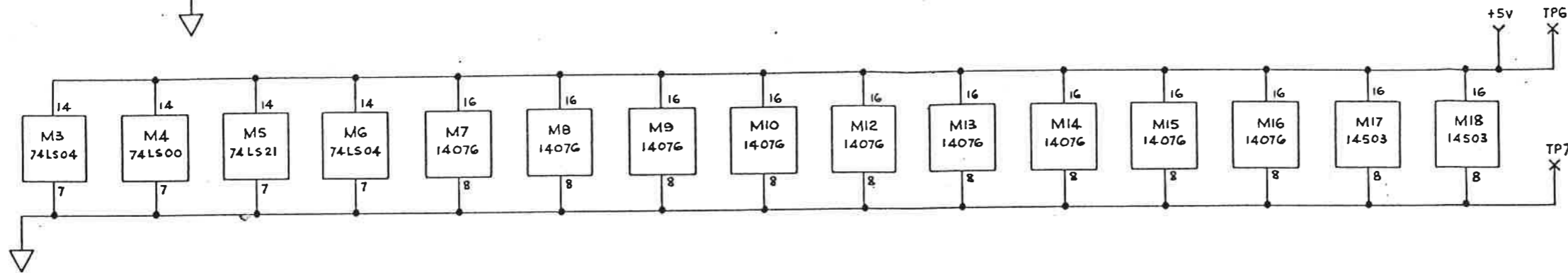
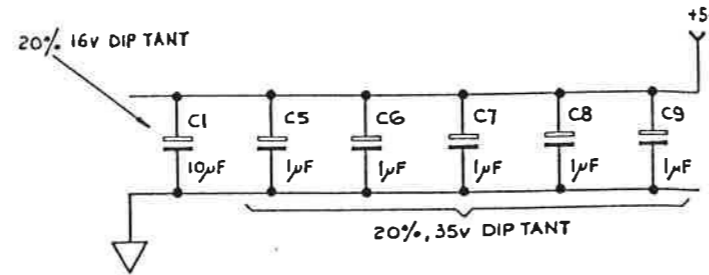
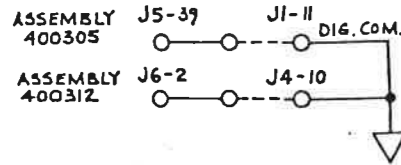
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
1	
2	TP6 & TP7 ADDED ILL. 22.2.80
3	SEE SHEET 1

N.B. ALL RESISTORS SHOWN ON SHEET 1
= 5%, 1/4 W, CARBON FILM.



DRAWN IL	DATE 11. 2. 80	DIMENSIONS IN MILLIMETRES	METRIC DIMENSIONS ANGULAR ± 1/2° DECIMAL TO 2 PLACES ± 0.1mm DECIMAL TO 1 PLACE ± 0.2mm WHOLE DIMENSIONS ± 0.4mm UNLESS OTHERWISE STATED
CHKD. A.J.	DATE 15. 2. 80	SCALE	
APPD.	DATE	NOT TO BE SCALED	

MATERIAL	_____
FINISH	_____

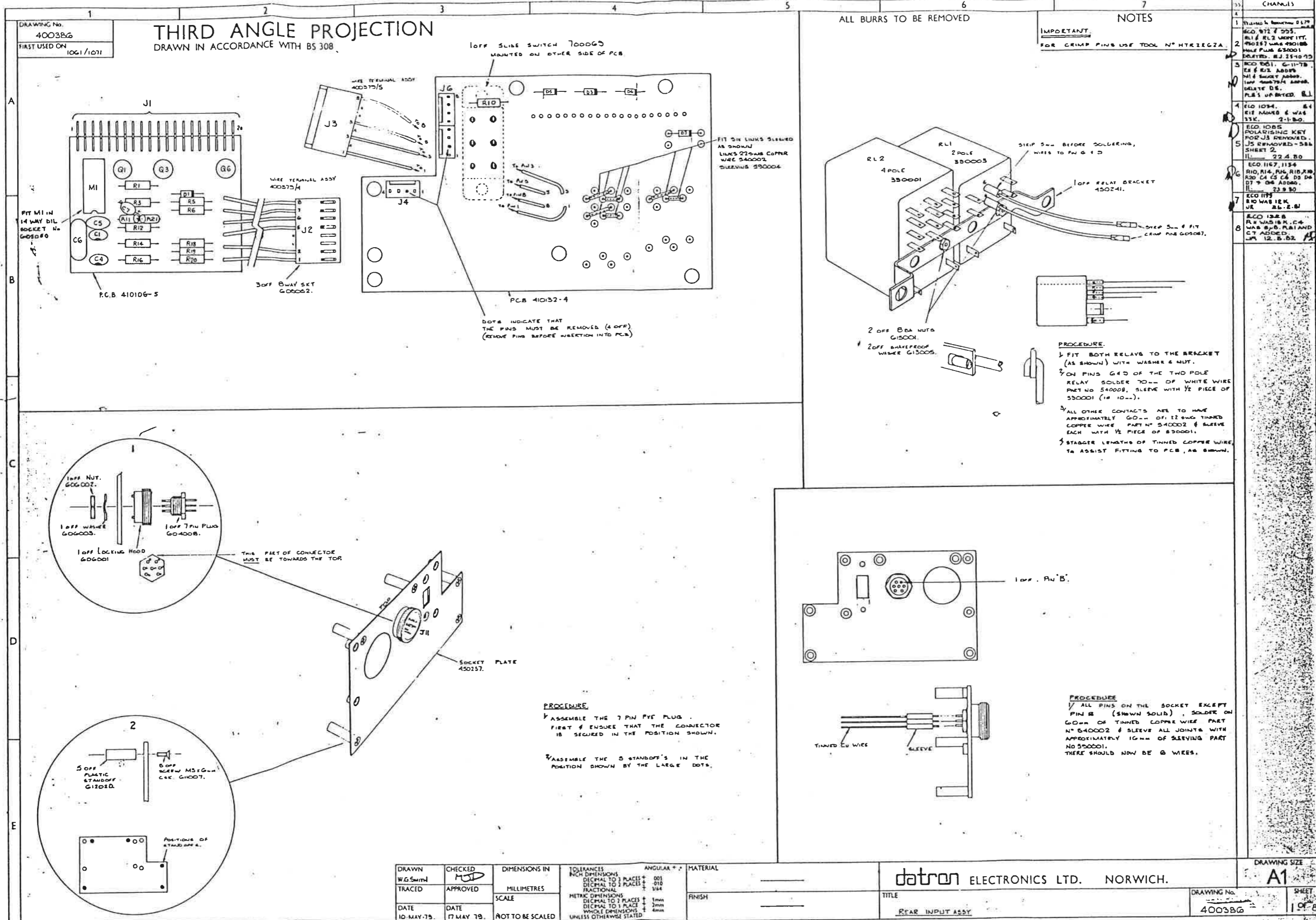
datron ELECTRONICS LTD. NORWICH.

TITLE
BCD/PROGRAM

DRAWING No.
430332

DRAWING SIZE
A2

SHEET
2 OF 2



ALL BURRS TO BE REMOVED

IMPORTANT
FOR CRIMP PINS USE TOOL N° HTRIEGZA

NOTES

- 1 CHANGE DRAWING 0179
- 2 EDO 871 & 555
- 3 RL1 & RL2 WERE 117
- 4 PROJECT WAS 250108
- 5 NAME PLUG 630001
- 6 DELETED. E.J. 25-10-75
- 7 EDO 061. G-11-78
- 8 E1 & R12 ADDED
- 9 M1 & SOCKET ADDED
- 10 10FF 8WAY SKT ADDED
- 11 DELETE D6.
- 12 PLS'S UNBATED. R.L.
- 13 EDO 1054. E1
- 14 R12 ADDED & WAS
- 15 33K. 2-1-80.
- 16 EDO 1085
- 17 POLARISING KEY
- 18 FOR J3 REMOVED.
- 19 J5 REMOVED-S&A
- 20 SHEET 2.
- 21 I.L. 22.4.80
- 22 EDO 1167.1154
- 23 R10, R11, R12, R13, R14
- 24 R15, R16, R17, R18
- 25 R19, R20, C1, C2, C3, C4, C5, C6
- 26 DT 7 ON ADDED.
- 27 I.L. 23.9.80
- 28 EDO 1175
- 29 R10 WAS 18K
- 30 R11
- 31 R12
- 32 R13
- 33 R14
- 34 R15
- 35 R16
- 36 R17
- 37 R18
- 38 R19
- 39 R20
- 40 C1
- 41 C2
- 42 C3
- 43 C4
- 44 C5
- 45 C6
- 46 DT 7
- 47 DT 8
- 48 DT 9
- 49 DT 10
- 50 DT 11
- 51 DT 12
- 52 DT 13
- 53 DT 14
- 54 DT 15
- 55 DT 16
- 56 DT 17
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- 127 DT 88
- 128 DT 89
- 129 DT 90
- 130 DT 91
- 131 DT 92
- 132 DT 93
- 133 DT 94
- 134 DT 95
- 135 DT 96
- 136 DT 97
- 137 DT 98
- 138 DT 99
- 139 DT 100

PROCEDURE

- 1 FIT BOTH RELAYS TO THE BRACKET (AS SHOWN) WITH WASHER & NUT.
- 2 ON PINS G4D OF THE TWO POLE RELAY SOLDER 70-- OF WHITE WIRE PART NO 540003, SLEEVE WITH 1/2 PIECE OF 330001 (18 10--).
- 3 ALL OTHER CONTACTS ARE TO HAVE APPROXIMATELY 60-- OF 12 SWG TINNED COPPER WIRE PART NO 540002 & SLEEVE EACH WITH 1/2 PIECE OF 330001.
- 4 STAGGER LENGTHS OF TINNED COPPER WIRE TO ASSIST FITTING TO PCB, AS SHOWN.

PROCEDURE

- 1 ALL PINS ON THE SOCKET EXCEPT PIN 6 (SHOWN SOLID), SOLDER ON 60mm OF TINNED COPPER WIRE PART NO 540002 & SLEEVE ALL JOINTS WITH APPROXIMATELY 10mm OF SLEEVING PART NO 330001.
- 2 THERE SHOULD NOW BE 6 WIRES.

PROCEDURE

- 1 ASSEMBLE THE 7 PIN PVE PLUG. FIRST & ENSURE THAT THE CONNECTOR IS SECURED IN THE POSITION SHOWN.
- 2 ASSEMBLE THE 5 STANDOFF'S IN THE POSITION SHOWN BY THE LARGE DOTS.

DRAWN W.G. Smith	CHECKED M.D.	DIMENSIONS IN MILLIMETRES	TOLERANCES WHOLE DIMENSIONS DECIMAL TO 3 PLACES ± 0.01 DECIMAL TO 2 PLACES ± 0.02 FRACTIONAL ± 1/64	ANGULAR ± 1°	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING No. 400386	SHEET 1 OF 8
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 3 PLACES ± 0.01 DECIMAL TO 2 PLACES ± 0.02 WHOLE DIMENSIONS ± 0.1	FINISH	TITLE REAR INPUT ASSY			
DATE 10-MAY-75.	DATE 17 MAY 75.	NOT TO BE SCALED	UNLESS OTHERWISE STATED					

DRAWING No
400386
FIRST USED ON
10/61/71

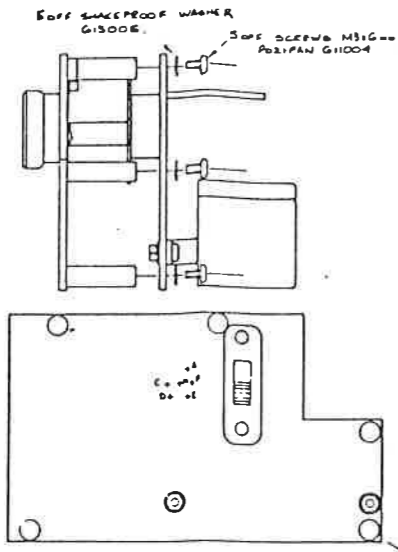
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1	PLANNED BY	W.G.S.
2	DESIGNED BY	W.G.S.
3	DATE	28-10-70
4	SEE SHEET 1 & 2	
5	ECO. 1005	
6	JS HAS 8 WIRE DOWN	
7	SEE SHEET 1 & 2	
8	SEE SHEET 1 & 2	

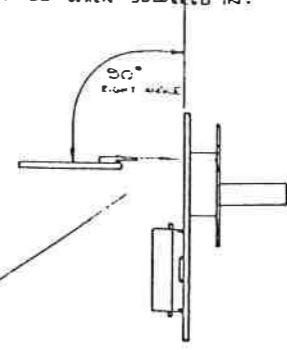


3/ BOTTOM VIEW SHOWS THE HOLES IN THE PCB (INDICATED BY CROSSES). THESE HOLES ARE FOR THE WIRES FROM THE 7 PIN SOCKET. IT IS A SUGGESTION THAT THE WIRES ARE STAGGERED TO MAKE ASSY EASIER (AS WIRING THE RELAYS).

PROCEDURE.

- 1 THE WIRES SHOULD LINE UP WITH THE APPROPRIATE HOLES. IE WIRE FROM PIN A OF SOCKET SHOULD BE INSERTED INTO HOLE 'A', WIRE FROM PIN 'C' TO HOLE 'C' ALSO SO ON.
- 2 WHEN THE WIRES ARE INSERTED IN THE APPROPRIATE HOLES, SECURE THE 2 ASYS TOGETHER WITH THE M3x6mm POZI PAN SCREWS & SHAKEPROOF WASHERS, SCREWED IN THE 5 STANDOFFS (AS DETAILED).
- 3 LIGHTLY PULL ON THE TWO COPPER WIRES SO THE WIRE IS TAUT, THEN SOLDER & CROP IN THE USUAL MANNER.

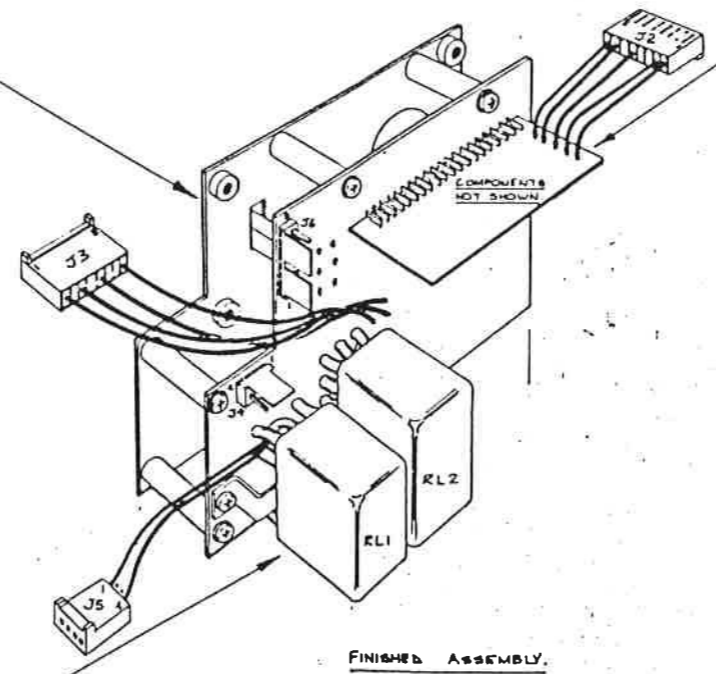
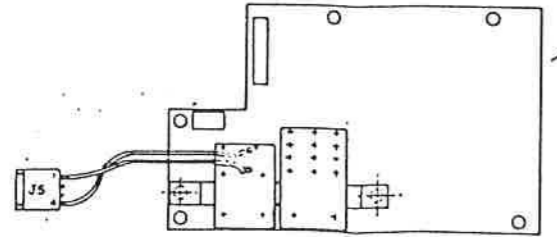
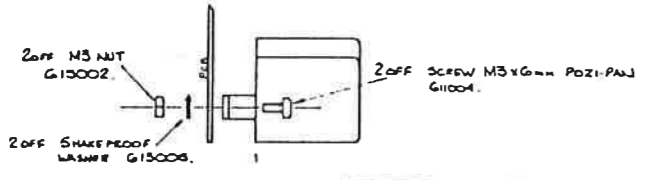
2/ INSERT CONNECTOR AS SHOWN. SOLDER ALL 20 AMP PINS & CROP LEGS IN USUAL MANNER. THE BOARD IS TO BE AT 90° WHEN SOLDERED IN.



1/ SKETCH BELOW SHOWS THE 2 RELAY & BRACKET ASSEMBLY (FROM SHEET 1). THE CROSSES INDICATE HOLES IN THE PCB INTO WHICH THE WIRES FROM THE RELAYS ARE INSERTED.

PROCEDURE

- 1 INSERT THE WIRES INTO THE APPROPRIATE HOLES IN THE PCB (WIRES CUT AT DIFFERENT LENGTHS TO AID ASSEMBLY).
- 2 WHEN THE WIRES ARE ALL IN PLACE SECURE THE BRACKET TO THE PCB USING THE SCREWS, WASHERS & NUTS SHOWN BELOW.
- 3 SOLDER & CROP WIRES IN THE USUAL MANNER. INSERT THE CRIMP PINS INTO SOCKET JS. PIN 6 OF RELAY TO PIN 4 OF JS & PIN 5 TO PIN 1 AS SHOWN BELOW.



FINISHED ASSEMBLY

DRAWN W.G. SMITH	CHECKED MSD	DIMENSIONS IN MILLIMETRES	TOLERANCES NCH DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/64	ANGULAR ± 0.5°	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A1
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 WHOLE DIMENSIONS UNLESS OTHERWISE STATED		FINISH		TITLE REAR INPUT ASSY	DRAWING No. 400386
DATE 10 MAY 79.	DATE 17 MAY 79.	NOT TO BE SCALED					SHEET 2 OF 8

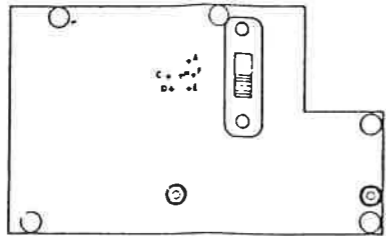
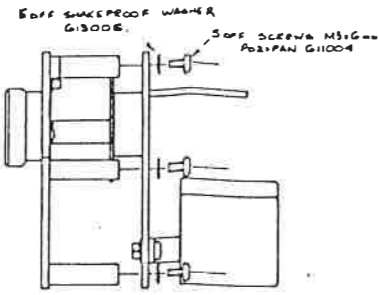
DRAWING No
400386
FIRST USED ON
10/61/71

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

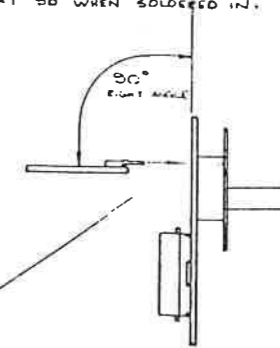


3/ BOTTOM VIEW SHOWS THE HOLES IN THE PCB (INDICATED BY CROSSES). THESE HOLES ARE FOR THE WIRES FROM THE 7 PIN SOCKET. IT IS A SUGGESTION THAT THE WIRES ARE STAGGERED TO MAKE ASSY EASIER (AS WIRING THE RELAYS).

PROCEDURE.

- 1 THE WIRES SHOULD LIE UP WITH THE APPROPRIATE HOLES, I.E. WIRE FROM PIN A OF SOCKET SHOULD BE INSERTED INTO HOLE 'A', WIRE FROM PIN 'C' TO HOLE 'C' AND SO ON.
- 2 WHEN THE WIRES ARE INSERTED IN THE APPROPRIATE HOLES, SECURE THE 2 ASYS TOGETHER WITH THE M3x6mm POZI-PAN SCREWS & SHAKEPROOF WASHERS, SCREWED IN THE 5 STANDOFFS (AS DETAILED).
- 3 LIGHTLY PULL ON THE TWO OUTER WIRES SO THE WIRE IS TAUT, THEN SOLDER & CROP IN THE USUAL MANNER.

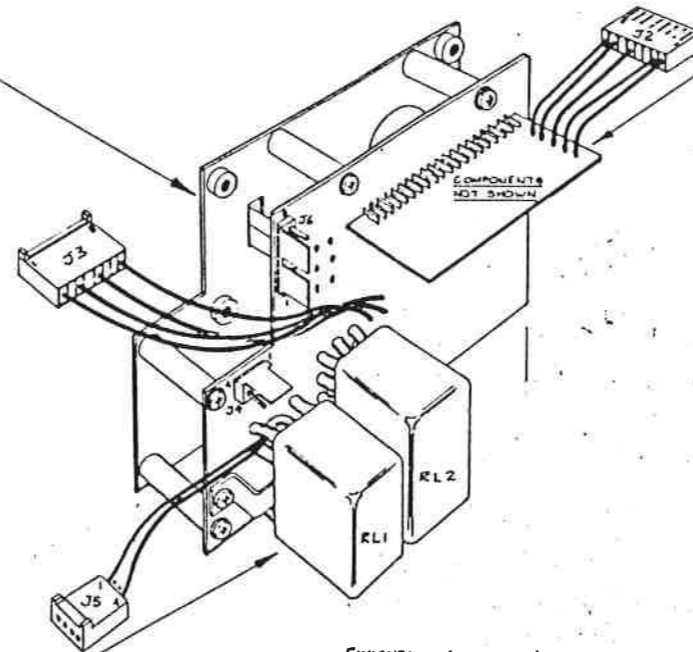
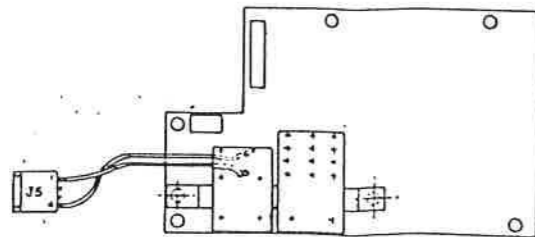
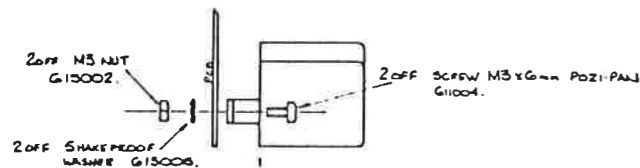
2/ INSERT CONNECTORS AS SHOWN. SOLDER ALL 20 AMP PINS & CROP LEGS IN USUAL MANNER. THE BOARD IS TO BE AT 90° WHEN SOLDERED IN.



1/ SKETCH BELOW SHOWS THE 2 RELAY BRACKET ASSEMBLY (FROM SHEET 1). THE CROSSES INDICATE HOLES IN THE PCB INTO WHICH THE WIRES FROM THE RELAYS ARE INSERTED.

PROCEDURE

- 1 INSERT THE WIRES INTO THE APPROPRIATE HOLES IN THE PCB (WIRES CUT AT DIFFERENT LENGTHS TO AID ASSEMBLY).
- 2 WHEN THE WIRES ARE ALL IN PLACE SECURE THE BRACKET TO THE PCB USING THE SCREWS, WASHERS & NUTS SHOWN BELOW.
- 3 SOLDER & CROP WIRES IN THE USUAL MANNER. INSERT THE CRIMP PINS INTO SOCKET JS. PIN 6 OF RELAY TO PIN 4 OF JS & PIN 5 TO PIN 1 AS SHOWN BELOW.



FINISHED ASSEMBLY.

1	PLATE 10
2	SEE SHEET 1 & 2
3	SEE SHEET 1 & 2
4	SEE SHEET 1 & 2
5	SEE SHEET 1 & 2
6	SEE SHEET 1 & 2
7	SEE SHEET 1 & 2
8	SEE SHEET 1 & 2

DRAWN W.G. SMITH	CHECKED W.S.D.	DIMENSIONS IN MILLIMETRES	TOLERANCES WHOLE DIMENSIONS DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL ± 1/16	ANGULAR ± 1°	MATERIAL
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 0.10 DECIMAL TO 1 PLACE ± 0.20 WHOLE DIMENSIONS UNLESS OTHERWISE STATED		FINISH
DATE 10 MAY 75	DATE 17 MAY 75	NOT TO BE SCALED			

datron ELECTRONICS LTD. NORWICH.

TITLE
REAR INPUT ASSY

DRAWING No 400386	DRAWING SIZE A1	SHEET 2 OF 8
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DRAWING No.

430386

FIRST USED ON
10/61/1071

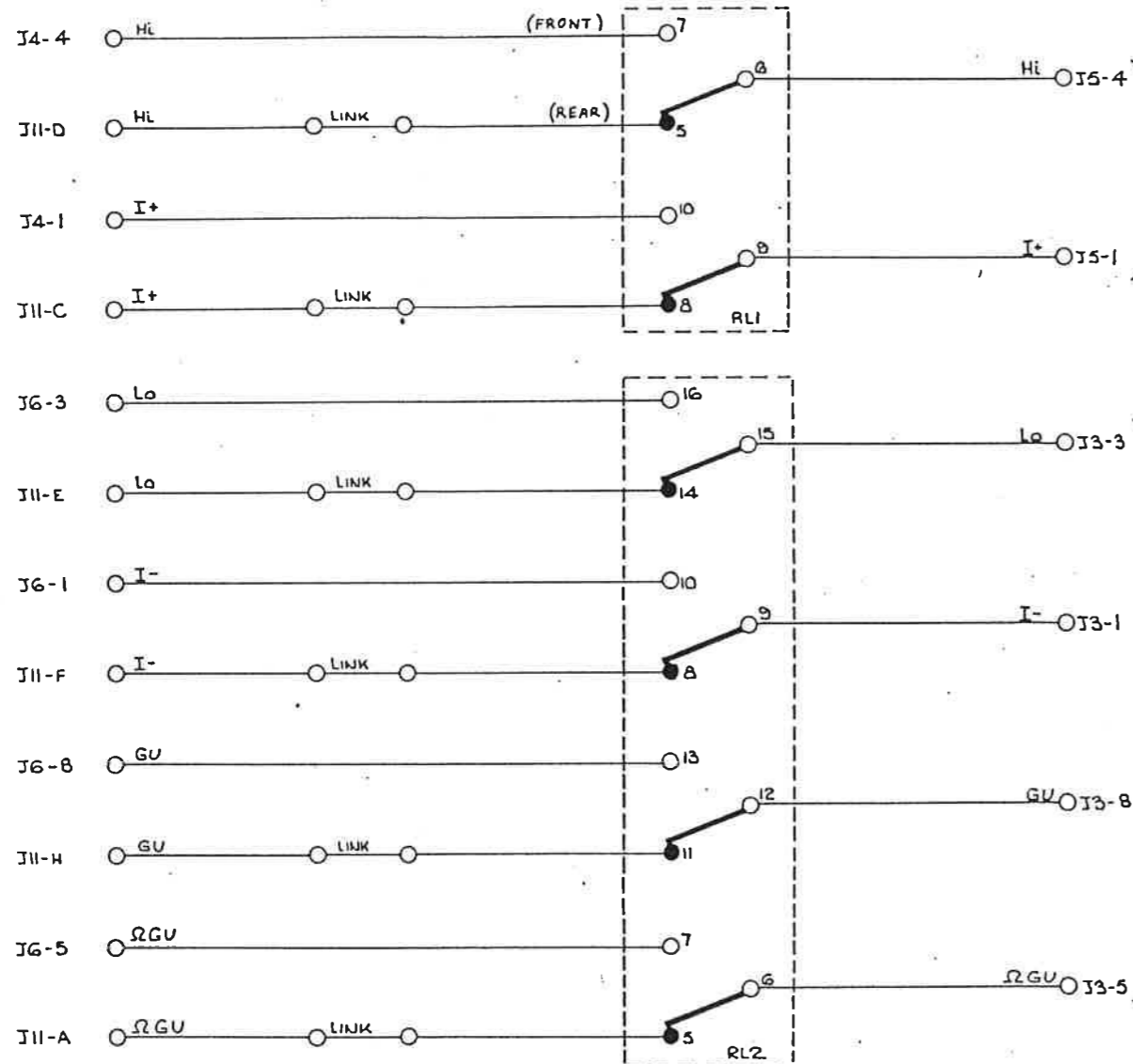
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
1	RELEASED TO PRODUCTION 17 MAY 79 W.G.S.
2	ECO 581. E.J. MI ADDED. R11 = R12 = DS DELETED. G-11-75
3	ECO 1034. S.J. R12 WAS JOINED BETWEEN J1-G & MI-14. 2-1-80.
4	ECO 1085 BS- BETWEEN J4-1 & J5-1 REMOVED. PINS OF J4 & J5 RE-NUMBERED FOR 4WAY CONNECTORS. I.L. 22.4.80
5	ECO 1167. 1154. R1 WAS 18K. R10. R14. R16. R18. R20. C4. C5. C6. BS. DS. D7 & Q6 ADDED. I.L. 23.3.80
6	ECO 1199 R10 WAS 12K. JR 24.2.81
7	ECO 1328 C4 WAS 600P. R11 WAS 18K. R21 AND C7 ADDED. JR 13.5.82

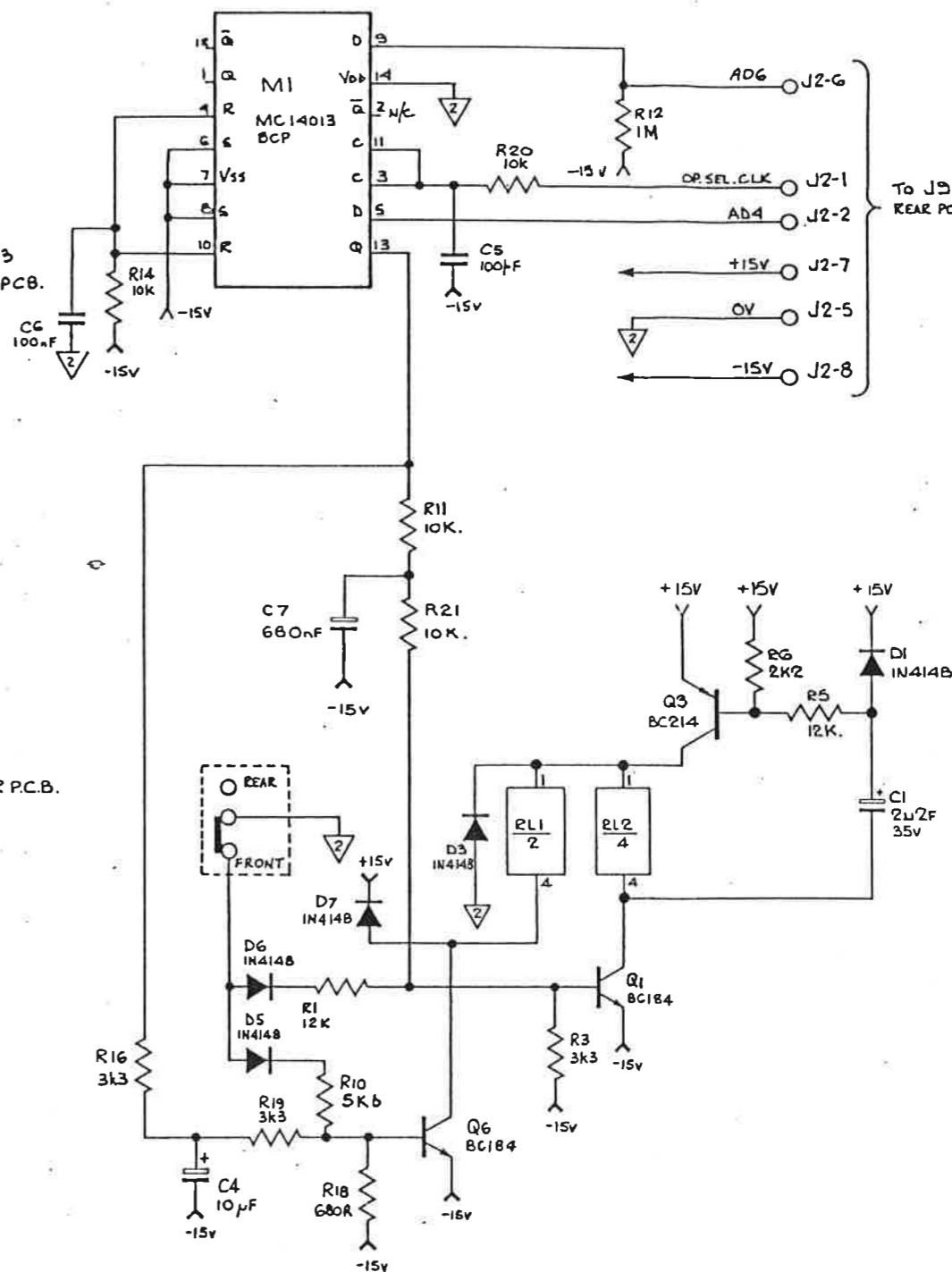


NOTES

- J4 & J6 ARE FROM FRONT PANEL TERMINALS.
- J11 IS THE REAR INPUT SOCKET ON REAR PANEL.

UNUSED PINS.

- J2 = 3 & 4.
- J3 = 2, 3, 5 & 7
- J4 = 2, 3
- J5 = 2, 3
- J6 = 2, 3 & 4



DRAWN
W.G. SMITH

CHECKED
APPROVED

DIMENSIONS IN
MILLIMETRES

TOLERANCES
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± 0.05
DECIMAL TO 2 PLACES ± 0.10
FRACTIONAL ± 1/64

METRIC DIMENSIONS
DECIMAL TO 3 PLACES ± 0.1mm
DECIMAL TO 2 PLACES ± 0.2mm
WHOLE DIMENSIONS ± 0.4mm
UNLESS OTHERWISE STATED

MATERIAL

FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE

REAR INPUT CIRCUIT DIAGRAM.

DRAWING SIZE

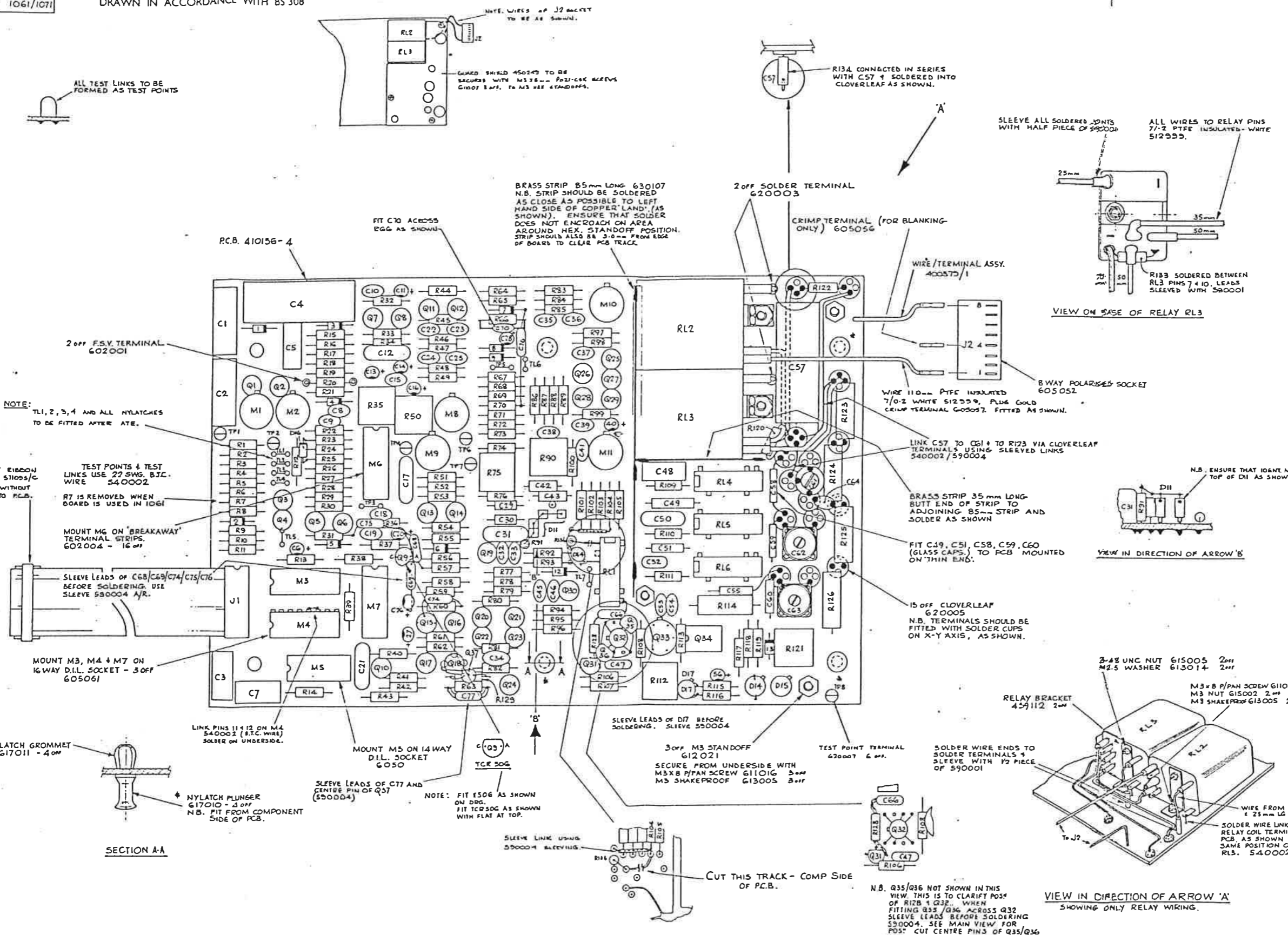
A2

DRAWING No.

430386

SHEET

1 OF 1



NOTE:
TL1, 2, 3, 4 AND ALL NYLATCHES TO BE FITTED AFTER ATE.

1 OFF 16 WAY RIBBON CABLE ASSY 51005/C SOLDER END WITHOUT CABLE CLIP TO PCB.

TEST POINTS & TEST LINKS USE 27 SWG. B.T.C. WIRE 540002.

R7 IS REMOVED WHEN BOARD IS USED IN 1061

MOUNT M6 ON 'BREAKAWAY' TERMINAL STRIPS. 602004 - 16 OFF

SLEEVE LEADS OF C68/C69/C74/C75/C76 BEFORE SOLDERING. USE SLEEVE 550004 A/R.

MOUNT M3, M4 & M7 ON 16 WAY D.I.L. SOCKET - 3 OFF 605061

* NYLATCH GROMMET 617011 - 4 OFF

LINK PINS 11 & 12 ON M4 540002 (B.T.C. WIRE) SOLDER ON UNDERSIDE.

MOUNT M5 ON 14 WAY D.I.L. SOCKET 605061

SLEEVE LEADS OF C77 AND CENTRE PIN OF Q37 (550004)

* NYLATCH PLUNGER 617010 - 2 OFF N.B. FIT FROM COMPONENT SIDE OF PCB.

SECTION A-A

NOTE: FIT 1506 AS SHOWN ON DRG. FIT TCR 506 AS SHOWN WITH FLAT AT TOP.

SLEEVE LINK USING 590004 SLEEVING.

CUT THIS TRACK - COMP SIDE OF PCB.

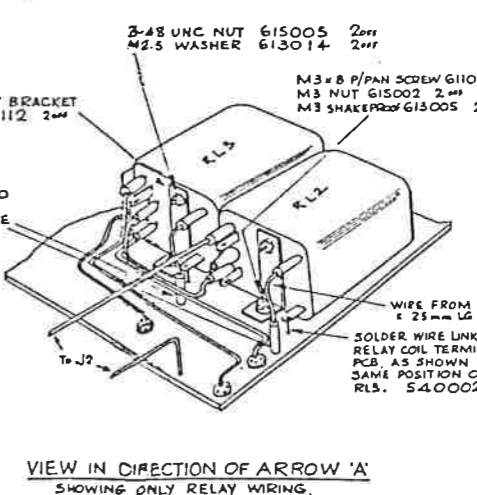
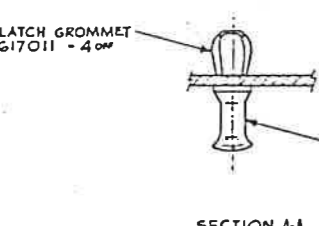
3 OFF M3 STANDOFF 612021 SECURE FROM UNDERSIDE WITH M3X8 P/PAN SCREW 611016 3 OFF M3 SHAKEPROOF 613005 3 OFF

TEST POINT TERMINAL 620007 6 OFF.

SOLDER WIRE ENDS TO SOLDER TERMINALS & SLEEVE WITH 1/2 PIECE OF 590001

WIRE FROM RL2 PIN 1 & 25mm LG

SOLDER WIRE LINK BETWEEN RELAY COIL TERMINAL 4 PCB AS SHOWN (IN SAME POSITION ON RL2 & RL3. 540002



DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	ANGULAR ±	MATERIAL	AS PARTS LIST	drawing size
IL	R.W	MILLIMETRES	INCH DIMENSIONS				
TRACED	APPROVED	SCALE	DECIMAL TO 3 PLACES ± 0.05 DECIMAL TO 2 PLACES ± 0.10 FRACTIONAL				A1
DATE	DATE	2:1	METRIC DIMENSIONS DECIMAL TO 1 PLACE ± 1mm DECIMAL TO 2 PLACES ± 0.2mm WHOLE DIMENSIONS ± 1mm				
27.8.79	3.9.79	NOT TO BE SCALED	UNLESS OTHERWISE STATED				

TITLE: A.C. PCB. ASSY (OPTION 10) 1061/1071

DRAWING No. 400402

SHEET 1 OF 17

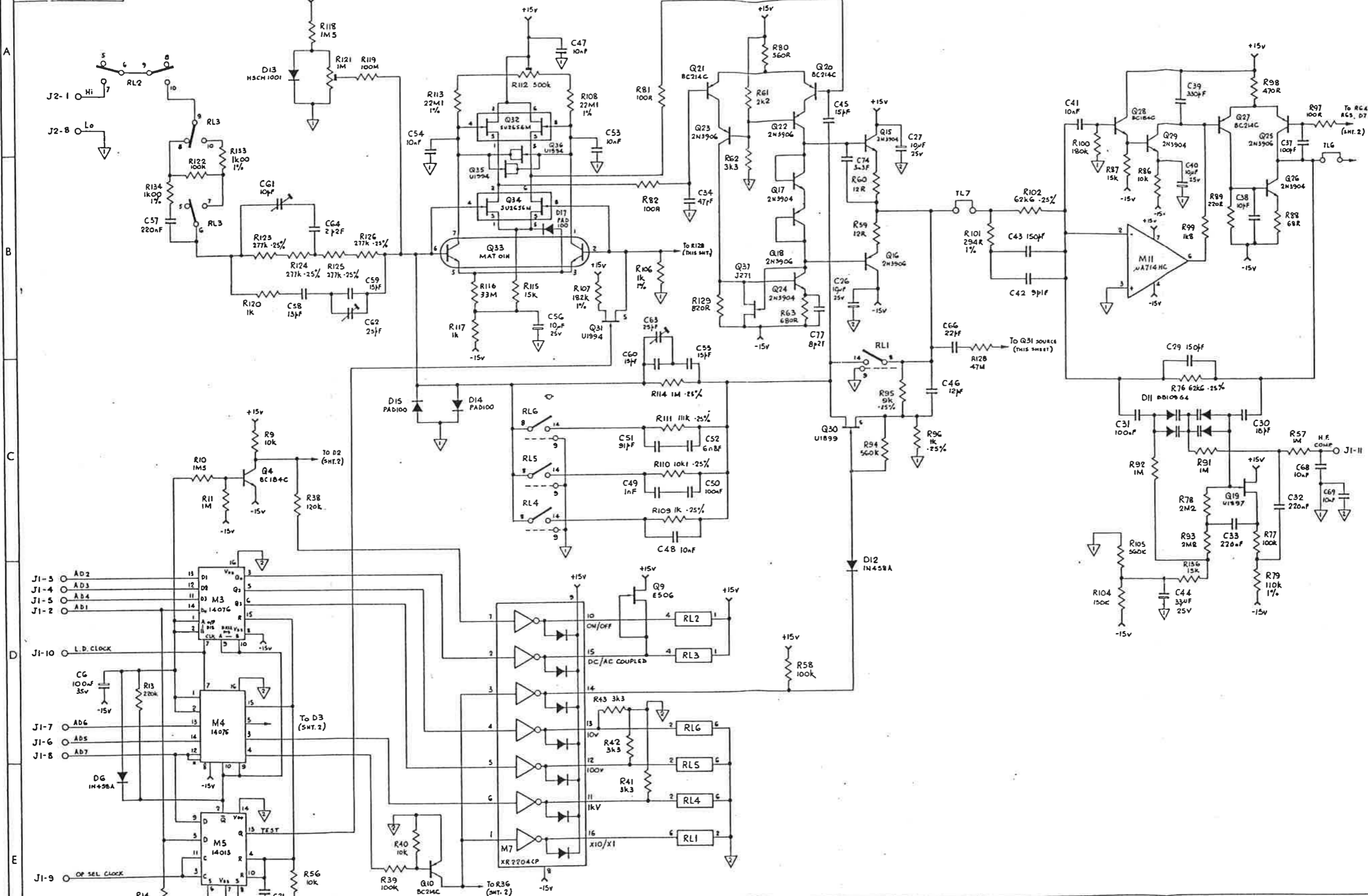
DRAWING No
430402
FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES



NO.	CHANGES
1	RELEASED TO PROOF 11. 17.75
2	ECO. 956. 957 R10 WAS 270K R11 WAS 10K R18 WAS 33K C6 WAS 680pF SEE ALSO SHEET 2 11. 8.10.75
3	ECO. 953. 956. R11 WAS 150K. R13 100M 100P D13 WAS OA47 B.J. 24.10.75
4	ECO. 999. 1007 R17 WAS 100R M4/11-4 12 LINKED C44 WAS 10pF C56 WAS 10pF C34 WAS 10pF C46 WAS 3pF C63 1 C66 Added R81 WAS 100R R82 WAS 1K R128 Added SEE ALSO SHT. 2 11. 1.11.75
5	ECO. 1011. 1016. 1036. C68 WAS 33pF C46 WAS 10pF C34 WAS 27pF TANT. C65 REMOVED C66 WAS 220pF. R128 WAS 15M. R81, R82 WERE 330R C56 WAS 100pF. D10 REMOVED. C67, R129 Added. D104 WAS 10K R105 WAS 68K. C64 WAS 5pF 11. 2.1.80
6	ECO. 1058 C68 + C69 Added 23.1.80
7	ECO 1069 SEE SHEET 2. 11. 15.3.80
8	SEE SHEET 2
9	ECO. 1112. 1113 C71, R150, R151, R152 Added SEE ALSO SHEET 2 11. 14.4.80
10	ECO. 1133 D17 ADDED. 11. 15.5.80
11	ECO. 1160 R135 1 C7E ADDED
12	ECO. 1190 D11 WAS MVAM-E C30 WAS 15pF 11. 3.1.80
13	ECO. 1201. 1207 C84 + C7E DELETED R136 Added C39 WAS 100pF C44 WAS 10pF C45 WAS 10pF C46 WAS 8pF R79 WAS 110K Q28 WAS 2N3904 11. 8.4.81
14	ECO. 1392 R150, C67, C71 DELETED C34, C74, D10 + D13 ADDED. C45 WAS 12pF. C46 WAS 8pF. D17 WAS CONNECTED TO Q33 PIN 8 (IE BY COMMON ANA) 11. 8.9.82
15	ECO. 1428 R18 WAS 82K D13 WAS IN4148 SEE ALSO SHT. 2 11. 25.11.82
16	ECO 1446. R127 + R133 DELETED R94 WAS 270K R104 = 10K R105 = 62K. D17. 15-2-83
17	ECO. 1622. 1626 Q35 Q36 WERE D18/ D19 RESP. (IN 458A) D17 WAS FITTED FROM Q33 PIN 5 TO V. R79 WAS 120K R101 WAS 20R R136 WAS 27K 11. 2.5.84
18	SEE SHEET 2.
19	ECO. 1730 C77 + Q37 Added. R63 WAS 2K2 R115 WAS 8.2K R123 WAS 2A2 11. 23.10.84

DRAWN JL	CHECKED R.J.W	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES + .005 DECIMAL TO 2 PLACES + .010 FRACTIONAL 1/64	ANGULAR ° ' "	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING No. 430402	SHEET 1 of 2
DATE 20 8 79	DATE 2.9.79	SCALE NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 3 PLACES + 1mm DECIMAL TO 2 PLACES + 3mm WHOLE DIMENSIONS + 4mm UNLESS OTHERWISE STATED	FINISH	TITLE 1061/1071 AC - PREAMP			

DRAWING No
430402
FIRST USED ON

THIRD ANGLE PROJECTION

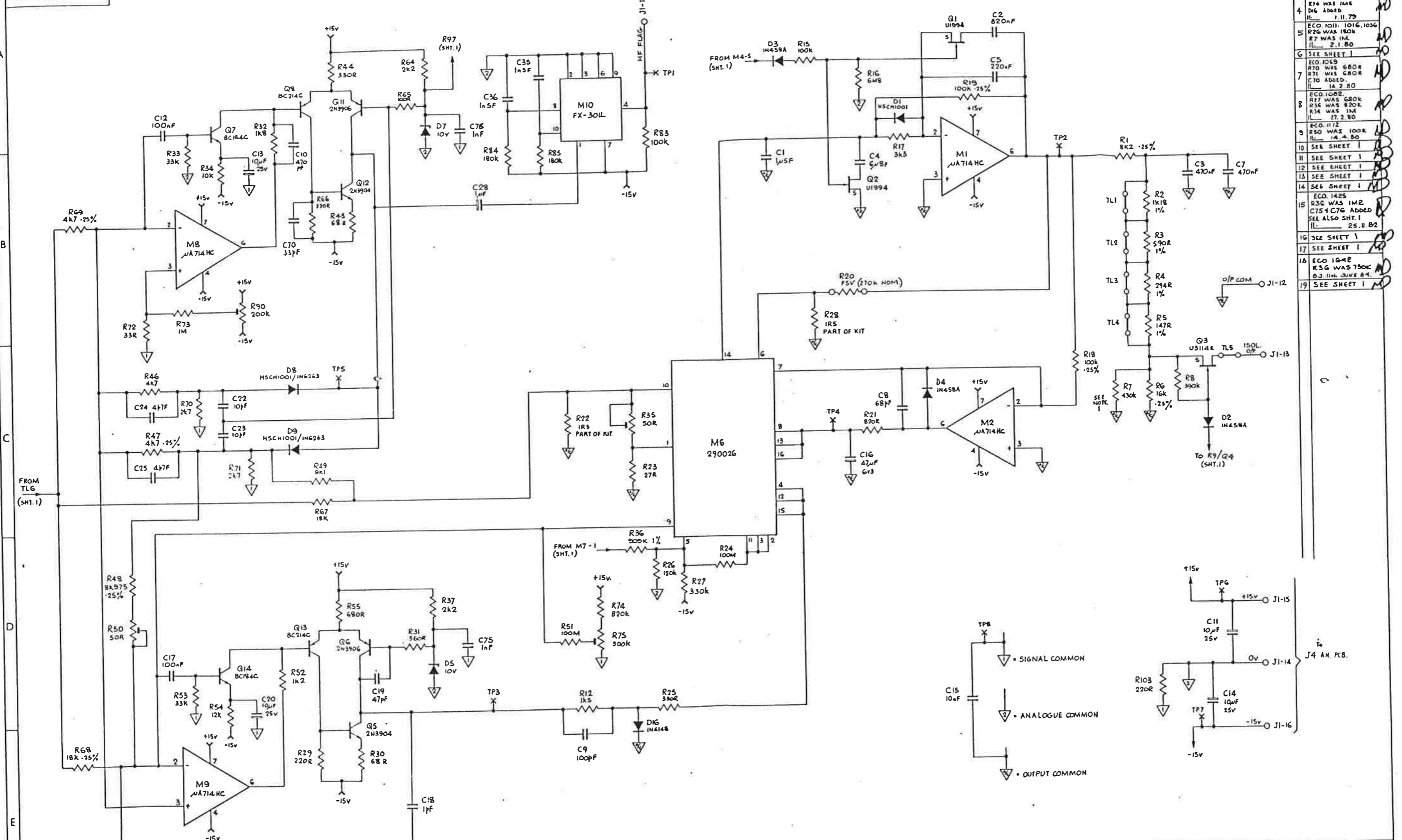
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1. RESISTOR R7 IS NOT FITTED ON A.C. ASSEMBLIES USED IN IOGI'S INSTRUMENTS.

ISS	CHANGES
1	RELEASED TO PROD. 17.9.79
2	ECO 956 C2 WAS 680nF IL 8.10.79
3	SEE SHT 1. B.J.
4	R33 WAS 10K R74 WAS 1M6 D6 ADDED IL 1.11.79
5	ECO 1011, 1016, 1036 R26 WAS 180R R7 WAS 1M4 IL 2.1.80
6	SEE SHEET 1
7	ECO 1069 R70 WAS 680R R71 WAS 680R C70 ADDED IL 14.2.80
8	ECO 1068 R77 WAS 680K R34 WAS 800R R74 WAS 1M4 IL 17.2.80
9	ECO 1112 R50 WAS 100R IL 14.4.80
10	SEE SHEET 1
11	SEE SHEET 1
12	SEE SHEET 1
13	SEE SHEET 1
14	SEE SHEET 1
15	ECO 1425 R36 WAS 1M2 C75 + C76 ADDED SEE ALSO SHT. 1 IL 25.8.82
16	SEE SHEET 1
17	SEE SHEET 1
18	ECO 1648 R36 WAS 750K B3 IHL JUNE 84
19	SEE SHEET 1



DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	ANGULAR	MATERIAL
JL	R.L.	MILLIMETRES	DIGITAL TO 3 PLACES + 0.05	°	
TRACED	APPROVED	SCALE	DIGITAL TO 2 PLACES + 0.10		
DATE	DATE	NOT TO BE SCALED	FRACTIONAL		
20.8.79	3.9.79		DECIMAL TO 3 PLACES + 1mm		
			DIGITAL TO 2 PLACES + 2mm		
			WHOLE DIMENSIONS + 4mm		
			UNLESS OTHERWISE STATED		

datron ELECTRONICS LTD. NORWICH. DRAWING SIZE **A1**

TITLE: 1061/1071 A.C. RMS SECTION. DRAWING No. 430402 SHEET 2 of 2

DRAWING No.
400427
FIRST USED ON

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED
FIT CRIMP TERMINALS
TO J4-2 & J4-4
605056

NOTES

ISS. CHANGES
9 ECO. 1538.1588
3 NYLATCHES
REMOVED.
P.C.B WAS ISS 2
C7 WAS 10UF TAN
C2 WAS 10UF CD.
C11-C17 ADDED.
11. 28.2.84

10 ECO 1681
R8 ADDED.
BJ. 26-7-84.

J5 AND J6 NOT FITTED

J1 24 WAY DIL SOCKET
605102

4 WAY CONNECTOR
605051

CRIMP LEADS
400379/1
2 OFF

J2 16 WAY DIL
SOCKET 605002
CLIP 606005

24 WAY CABLE ASSY
573120/C. SOLDER
END WITHOUT CABLE
CLIP TO P.C.B.

MOUNT M1, M2 AND M3
ON 24 WAY DIL. SOCKET
605064 3 OFF

SLEEVE R8 LEAD WITH PTFE
SLEEVE 590004.

22 SWG BTC WIRE 540002
SLEEVE. PTFE 590004

LINK A LINK B
1065 1061
ONLY 1071
1081

MOUNT M8, M11-M13
ON 14 WAY DIL
SOCKETS 605060
4 OFF.

MOUNT M9 ON 40 WAY DIL
SOCKET 605050

MOUNT M6 AND M10 ON
16 WAY DIL SOCKETS
605061 2 OFF

P.C.B 410165-4A

TESTPOINT TERMINALS
620007 5 OFF.

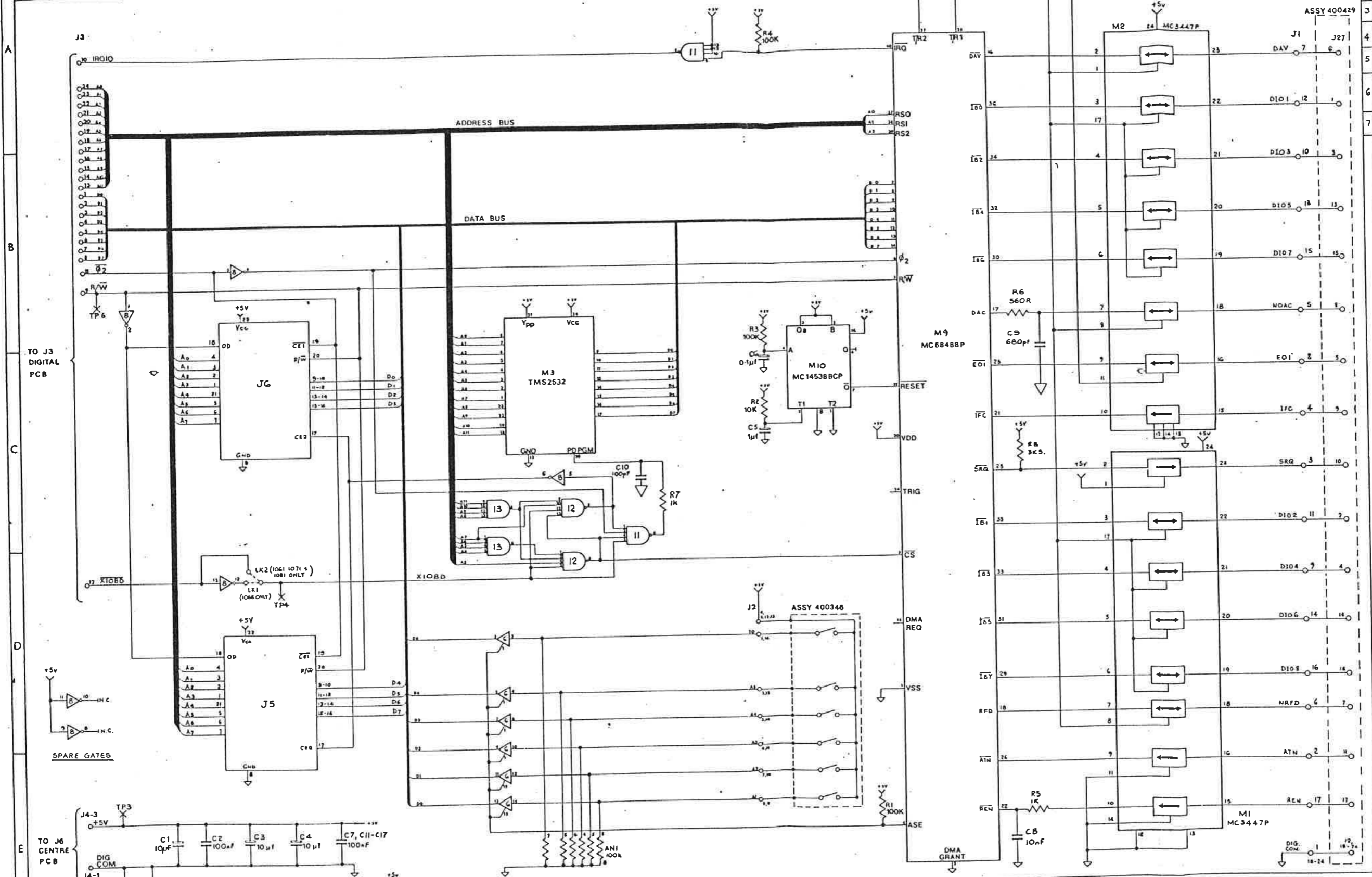
DRAWN JR	DATE 5.10.83	DIMENSIONS IN MILLIMETRES	METRIC DIMENSIONS ANGULAR ± 1/4° DECIMAL TO 2 PLACES ± 0.1mm DECIMAL TO 1 PLACE ± 0.2mm WHOLE DIMENSIONS ± 0.4mm UNLESS OTHERWISE STATED	MATERIAL —	<p>datron ELECTRONICS LTD. NORWICH.</p> <p>TITLE IEEE P.C.B ASSY 1065 1061 1071 1081</p>	DRAWING SIZE A2
CHKD.	DATE	SCALE 2:1 NOT TO BE SCALED	FINISH —	DRAWING No. 400427		SHEET 1 OF 5
APPD.	DATE					

DRAWING No.
430427
FIRST USED ON
1065

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ISS	CHANGES
A	
B	M7, LK2 DELETED
1	RELEASED 18.12.80
2	ECO 1257 R5 & C8 ADDED 23.5.82. B.J.
3	ECO 1347 R6 AND C9 ADDED J4 7.7.82.
4	ECO 1448. M4 AND M5 DELETED IC 2.83.
5	ECO 1543. R7/C10 ADDED IC 28.10.83
6	ECO 1538 C2 WAS 10nF C.D. C7 WAS 10pF TAM. C11-C17 ADDED. IC 28.2.84
7	ECO 1601 R8 ADDED. 28.7.84. B.J.



TO J3
DIGITAL
PCB

TO J6
CENTRE
PCB

SPARE GATES

DRAWN 11	CHECKED R. Nelson	DIMENSIONS IN MILLIMETRES	TOLERANCES FRACTIONAL DECIMAL TO 3 PLACES + 0.01 DECIMAL TO 2 PLACES + 0.05 METRIC DIMENSIONS DECIMAL TO 1 PLACE + 0.2mm WHOLE DIMENSIONS + 0.5mm UNLESS OTHERWISE STATED	ANGULAR ±	MATERIAL
TRACED	APPROVED	SCALE			FINISH
DATE 14.10.80	DATE	NOT TO BE SCALED			

datron ELECTRONICS LTD. NORWICH.

TITLE
IEEE 480 OPTION CIRCUIT DIAGRAM 1065.1061.1071.1081

DRAWING SIZE
A1

DRAWING No.
430427

SHEET
1 OF 1

DRAWING No. 400552

GLASS SHIELD 450488 TO BE SECURED WITH M3 x 8mm POSI-CRIP SCREWS 611007 2mm TO M3 HEX STANDOFFS.

MOUNTING I.C.s			
NO OF WAYS	PART NO	NO OF I	USED TO MOUNT
8	605059	4	M2, M8, M13, M16
14	605060	1	M7
16	605061	5	M5, G. 12, 15, 17

TEST POINT TERMINAL 620007 12 off

ALTERNATIVE DEVICE FOR D26

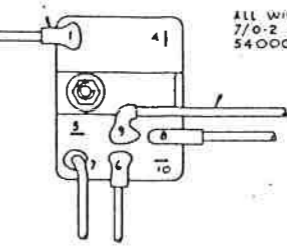
TEST LINKS MADE FROM 22 SWG BIC WIRE 540002 1/2

SLEEVE ALL SOLDERED JOINTS WITH HALF PIECE OF 590001

ALL WIRES TO RELAY PINS 7/0-2 PTFE INSULATED - WHITE 540008

CRIMP TERMINAL (FOR BLANKING ONLY) 605057

WIRE TERMINAL ASSY 400379/5



VIEW SHOWING RELAY PIN NOS.

B-WAY POLARISED SOCKET 605052

WIRE 120 - PTFE INSULATED 7/0-2 WHITE 540008. PLUS GOLD CRIMP TERMINAL 605057 FITTED AS SHOWN

SOLDER TERMINAL 620005 2 off

CLOVERLEAF TERMINAL 620005 5 off

SLEEVE LEADS OF CBO BEFORE SOLDERING LEADS INTO CLOVERLEAF - 590004 POSITION CAP AND LEADS AWAY FROM CLOVERLEAFS.

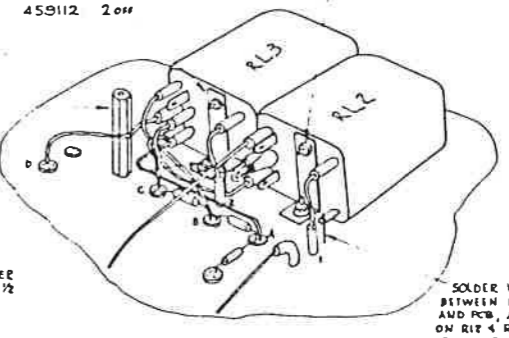
BRASS STRIP 220 - LONG 650107 N.B. STRIP SHOULD BE SOLDERED AS CLOSE AS POSSIBLE TO LEFT HAND SIDE OF COPPER 'LAND' AS SHOWN

SMALL CLOVERLEAF TERMINAL 620001 5 off

PTFE BUSH 620008 2 off

RELAY BRACKET 459112 2 off

3-48 UNC NUT 615005 2 off
M2.5 WASHER 613014 2 off



M3 x 16mm SPACER 612021 SECURE FROM UNDERSIDE OF PCB.
M3 x 8mm POSI-CRIP SCREW 611016 M3 CRINKLE WASHER 613025. 3 off EACH

M3 x 8 P/PAN SCREW 611016 2 off
M3 NUT 615002 2 off
M3 SHAK-PROOF 7 off

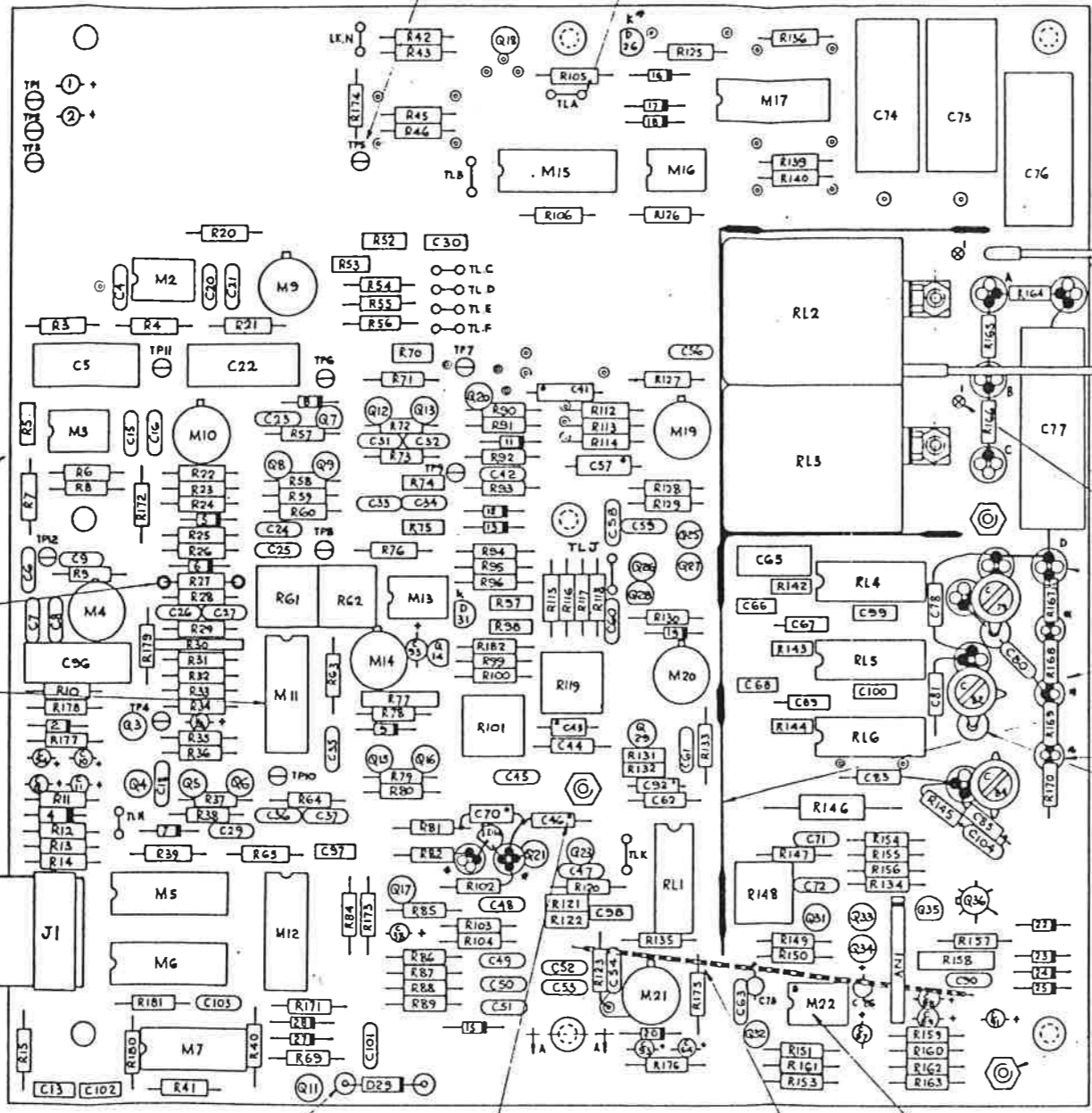
SOLDER WIRE ENDS TO SOLDER TERMINALS & SLEEVE WITH 1/2 PIECE OF 590001

SOLDER WIRE LINKS BETWEEN RELAY TERM AND PCB, AS SHOWN ON R12 & R13 540002

VIEW IN DIRECTION OF ARROW 'A' SHOWING RELAY WIRING

N.B. C77 REMOVED FROM VIEW, FOR CLARITY.

RELAY WIRING		
FROM	TO	LENGTH (mm)
RL2 PIN 1	SOLDER PIN 1	25
RL2 PIN 6	RL2 PIN B	WIRE, SOLDBRIDGE JOIN, 540002
RL2 PIN 7	J5 PIN 1	120
RL2 PIN 10	RL3 PIN 9	40
RL3 PIN 1	SOLDER PIN 2	25
RL3 PIN 7	C/LEAF B	45
RL3 PIN 6	C/LEAF D	40
RL3 PIN 10	C/LEAF C	25
RL3 PIN 8	C/LEAF A	35



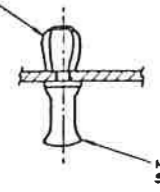
PCB 410217-4

F5V TERMINAL 602001 2 off

MOUNT M11 ON 'BREAKAWAY' TERMINAL STRIP 602004. 16 off.

16 WAY RIBBON CABLE ASSY 671005/C 1 off.

NYLATCH GROMMET 617011 5 off



SECTION A-A

NYLATCH PLUNGER 617010 5 off
NB. FIT FROM COMPONENT SIDE OF PCB.

CERAMIC BEAD 630024 2 off. (MOUNT D25)

DOT DENOTES OUTER FOIL (RED) END OF POLYSTYRENE CAPACITORS I.E. C92, C41, C43, C46, C57, C70

LINK MADE FROM 7/0-2 PTFE INSULATED WHITE WIRE 540008 x 70mm FIT TO UNDERSIDE OF PCB.

CROP PIN 8 FROM M22 BEFORE FITTING INTO PCB

DRAWN	DATE 4.4.84	DIMENSIONS IN MILLIMETRES	TOLERANCES
CHECKED L.O.G.	DATE 10-4-84	SCALE 2:1	DECIMAL TO 2 PLACES : 1mm DECIMAL TO 1 PLACE : 2mm WHOLE DIMENSIONS : 4mm ANGULAR : °
APPROVED	DATE 13-9-84	NOT TO BE SCALED	UNLESS OTHERWISE STATED FIRST ANGLE PROJECTION

MATERIAL	FINISH
ASSY DRG & PARTS LIST	CIRCUIT DIAGRAM
400 552	430 552
	CHECK PROCEDURE
	460 552
	CHECK LIST
	470 552

TITLE	1061A/62.AC PCB ASSY (OP.12)
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CHANGES	
1	RELEASED 13.9.84
2	ECO 1700 & 1702 R145 & C104 ADDED P-CB W-4-155.3 R/P 14.9.84
3	ECO 1784 C54 WAS INT. CRIMP

DRAWING No.	400552
SHEET 1 OF 20	

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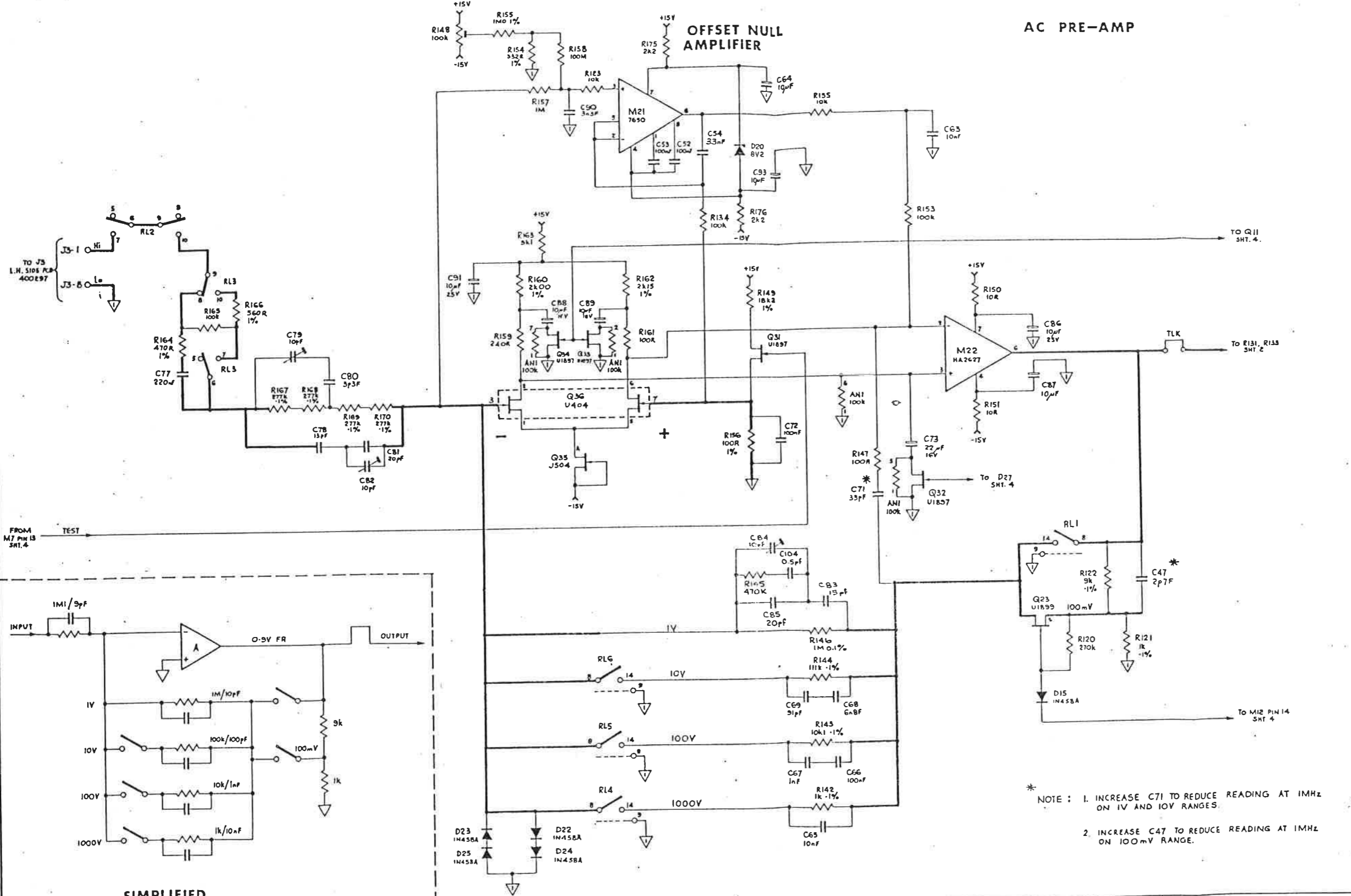
DRAWING No. 430552

ISS	CHANGES
A	7.7.83
B	25.3.84
1	RELEASED 13.9.84
2	E.C.O.1702 C104 & R145 AMED R.P. 14.5.84
3	E.C.O.1824 C54 WAS 100F CER D.S.C. ILL. 24.1.85

BIAS CURRENT

OFFSET NULL AMPLIFIER

AC PRE-AMP



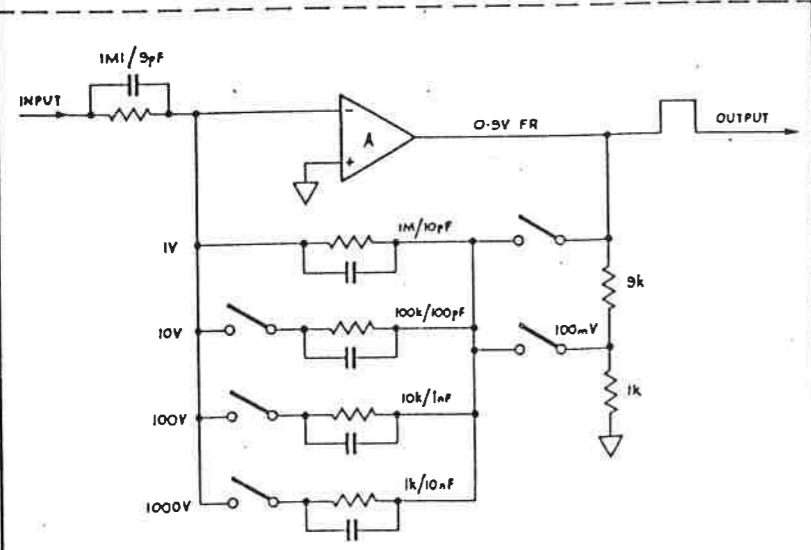
FROM M7 PIN 15 SHT. 4

TO Q11 SHT. 4.

TO R131, R133 SHT. 2.

TO D27 SHT. 4

TO M12 PIN 14 SHT. 4



SIMPLIFIED SCHEMATIC

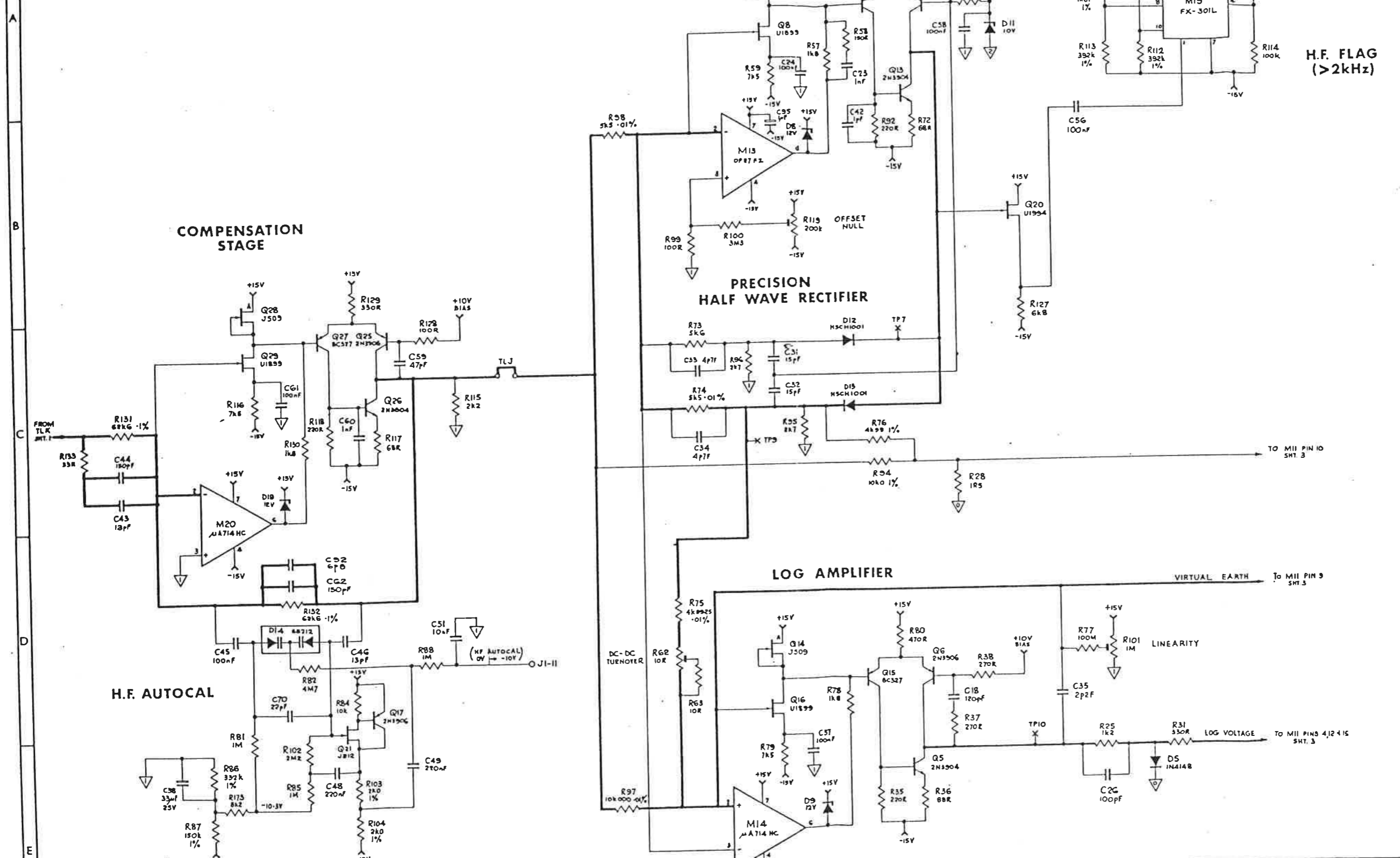
* NOTE : 1. INCREASE C71 TO REDUCE READING AT 1MHZ ON 1V AND 10V RANGES.
2. INCREASE C47 TO REDUCE READING AT 1MHZ ON 100mV RANGE.

DRAWN	DATE	DIMENSIONS IN MILLIMETRES	TOLERANCES	MATERIAL	ASSY ORG & PARTS LIST	TITLE	DRAWING No.
11	7.7.83	SCALE	DECIMAL TO 2 PLACES : 1mm DIGITAL TO 1 PLACE : 2mm WHOLE DIMENSIONS : 2mm ANGULAR : 30°		400552	1061/62 AC PRE-AMP (OPTION 12)	430552
CHECKED	DATE		UNLESS OTHERWISE STATED		CHECK PROCEDURE		SHEET 1 OF 4
L.O.G.	11-7-83	NOT TO BE SCALED	FIRST ANGLE PROJECTION		460552		
AP	15.9.84				470552		

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DRAWING No. 430552

CHANGES	
A	7 7 83
B	20 3 84
1	RELEASED 13 9 84
2	SEE SHT 1
3	SEE SHT. 1



DRAWN J.L.	DATE 8.7.83	DIMENSIONS IN MILLIMETRES	TOLERANCES DECIMAL TO 3 PLACES : 1mm DECIMAL TO 2 PLACES : 2mm WHOLE DIMENSIONS : 5mm ANGULAR : 40°	MATERIAL	ASSY DRG & PARTS LIST	400552	TITLE	DRAWING No.
CHECKED L.O.G.	DATE 11-7-83	SCALE	UNLESS OTHERWISE STATED FIRST ANGLE PROJECTION	FINISH	CIRCUIT DIAGRAM	460552	1061/62 A.C. (OPTION 12)	430552
APP'D J.L.	DATE 13.9.84	NOT TO BE SCALED			CHECK PROCEDURE	470552		SHEET 2 OF 4

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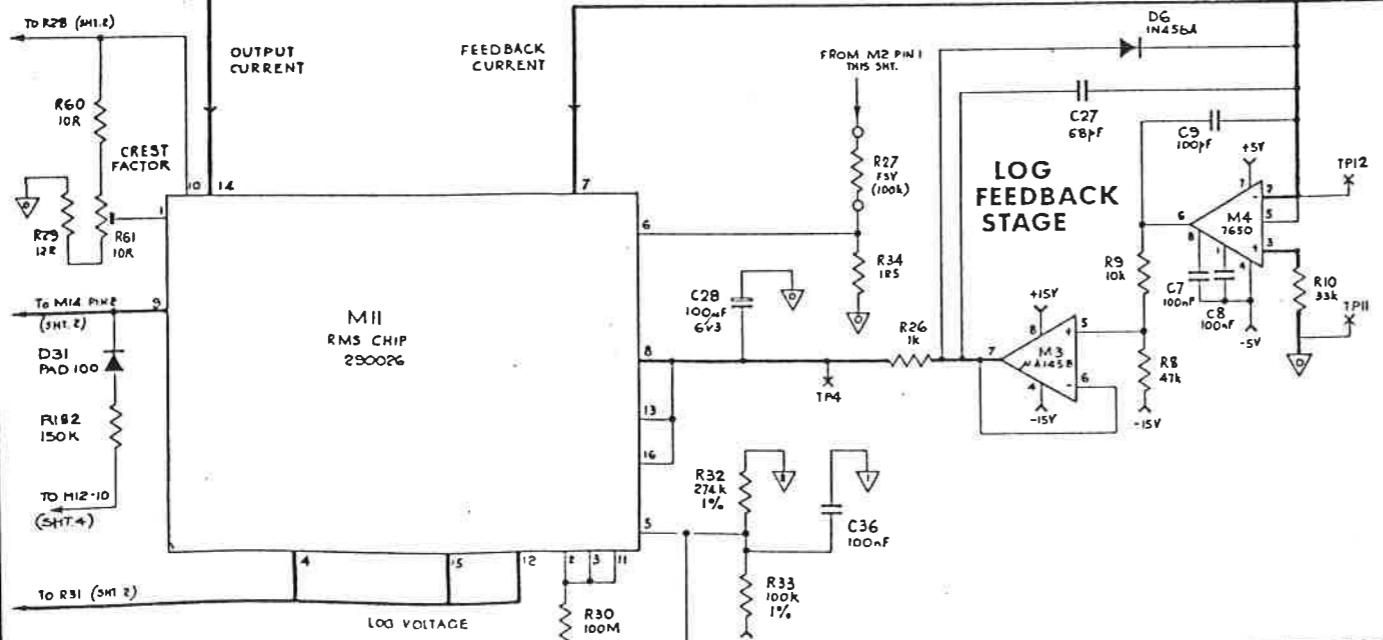
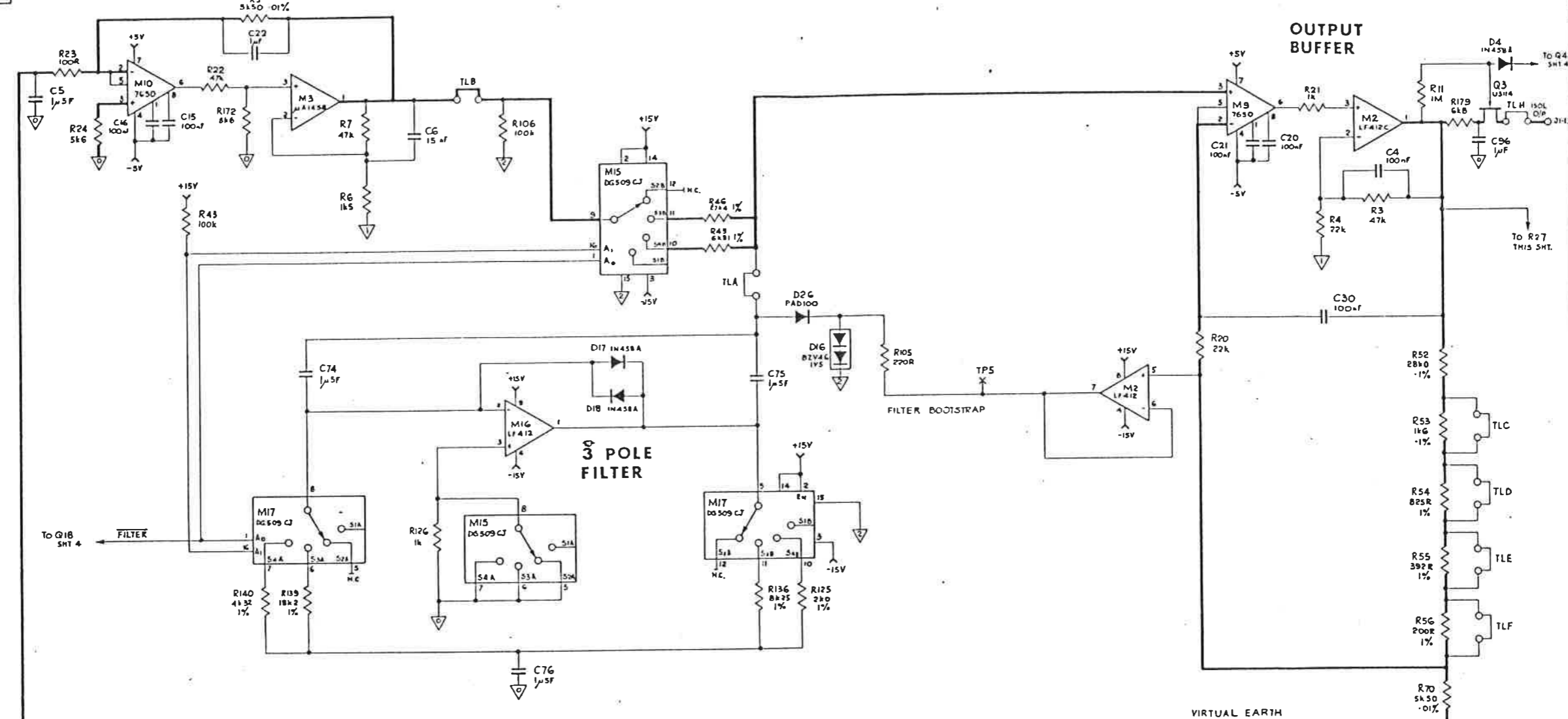
DRAWING NO
430552

LOW PASS FILTER

OUTPUT BUFFER

3 POLE FILTER

LOG FEEDBACK STAGE



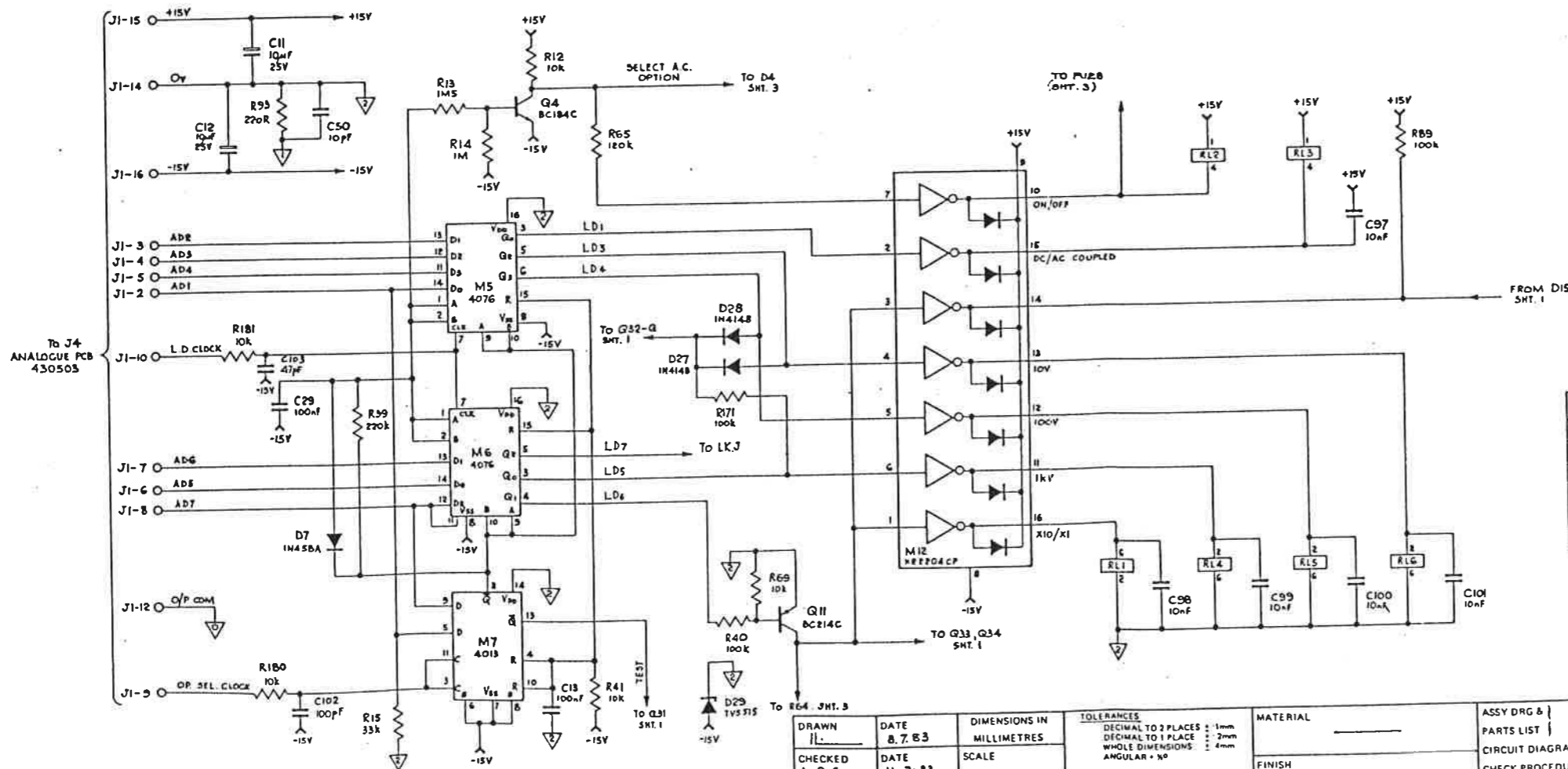
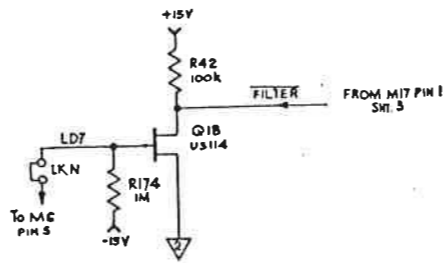
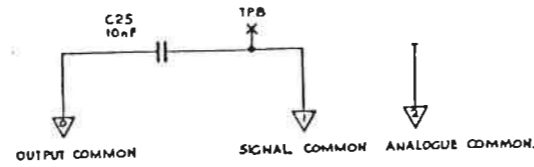
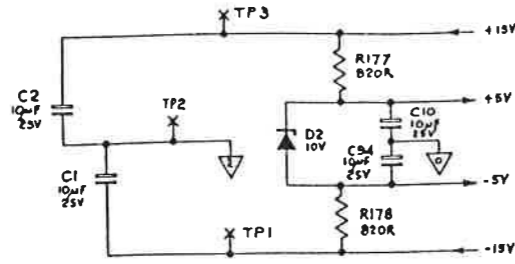
CHANGES	
A	7 7 83
B	23 3 84
1	RELEASED 13 9 84
2	SEE SH1 1
3	SEE SH1 1

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DRAWN		DATE		DIMENSIONS IN		TOLERANCES		MATERIAL		ASSY DRG & PARTS LIST		TITLE	
IL		0 7 83		MILLIMETRES		DECIMAL TO 2 PLACES : 1mm				400552		1061/62 AC RMS CONVERTER (OPTION 12)	
CHECKED	LOG	DATE	11-7-83	SCALE		DECIMAL TO 1 PLACE : 2mm				CIRCUIT DIAGRAM		DRAWING NO	
APPROVED	PRJ	DATE	13 9 84	NO1 TO BE SCALED		WHOLE DIMENSIONS : 4mm				CHECK PROCEDURE		430552	
								UNLESS OTHERWISE STATED		CHECK LIST		470552	
								FIRST ANGLE PROJECTION				DRAWING No	
												430552	
												SHEET 3 OF 4	

DRAWING No.
430552

REV	CHANGES
A	7.7.83
B	25.3.84
1	RELEASED 13.9.84
2	SEE SHT. 1
3	SEE SHT. 1



RANGE	LD ₁	LD ₂	LD ₃	LD ₄	LD ₅	LD ₆	LD ₇
0.1V	X	0	0	0	0	1	X
1V	X	0	0	0	0	0	X
10V	X	1	0	0	0	0	X
100V	X	0	1	0	0	0	X
1000V	X	0	0	1	0	0	X
FILTER	X	X	X	X	X	X	1

DRAWN
L.L.

CHECKED
L.O.G.

DATE
8.7.83

DATE
11-7-83

DATE
13.9.84

DIMENSIONS IN
MILLIMETRES

SCALE

NOT TO BE SCALED

TOLERANCES
DECIMAL TO 2 PLACES : 1mm
DECIMAL TO 1 PLACE : 2mm
WHOLE DIMENSIONS : 4mm
ANGULAR : N°

UNLESS OTHERWISE STATED
FIRST ANGLE PROJECTION

MATERIAL

FINISH

ASSY DRG & PARTS LIST } 400552

CIRCUIT DIAGRAM } 460552

CHECK PROCEDURE } 470552

CHECK LIST

TITLE
10G1/G2 AC RANGING
(OPTION 12)

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DRAWING No.
430552

SHEET 4 OF 4