

MVME920/D2  
February, 1983

VME 20/9 CONNECTOR  
BACKPLANE  
USER'S GUIDE

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## THE 30V CONNECTOR

### BACKGROUND

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## CHAPTER 1

### GENERAL INFORMATION

#### 1.1 INTRODUCTION

The 20 connector and 9 connector backplanes are designed to interconnect VME modules. Being fully compatible with the VMEbus specification, these boards provide particularly low signal distortion and good current distribution.

The backplanes are designed to comply with mounting requirements of a large variety of Eurocard compatible card cages. They are capable of propagating digital signals with a frequency of more than 20 MHz.

#### 1.2 SPECIFICATIONS

##### 1.2.1 AMBIENT TEMPERATURE

Storage -30°C to + 85°C

Operation 0°C to + 70°C

##### 1.2.2 HUMIDITY

0% to 93% within operating temperature range, non condensing. Ref. DIN 41611 part 4 proposal.

##### 1.2.3 POWER CONSUMPTION

Power consumption of the backplane itself is created by terminator resistor packs. It is

5.4W (1.084A, +5V) + / - 3%

##### 1.2.4 OPERATIONAL ENVIRONMENT

Both backplane types are designed for mounting in standard Eurocard card cages. For further details see 3.2 MECHANICAL REQUIREMENTS.

##### 1.2.5 DIMENSIONS

20 connector backplane 416mmx129mm (16.38"x5.08")

9 connector backplane 193mmx129mm ( 7.6 "x5.08")

##### 1.2.6 INTERCONNECTION

The backplanes provide an interconnection of all

VMEbus P1 signals and power supply lines. Standard 603-2-IEC096F female connectors are used to connect the backplane with VMEcards.

### 1.2.7 POWER CONNECTORS

Fast-on connectors 6.3x0.8mm, gold plated (0.8 $\mu$ m)nickel

9 conn. backplane: Voltage	Number of Fast-on Conn.	max.current 70°C
+5V	2	30A
+5V sense	1	
Ground	2	-30A
Ground sense	1	
+12V	1	15A
-12V	1	-15A
+5V standby	1	2A
20 conn. backplane: +5V	4	75A
+5V sense	1	
Ground	5	-75A
Ground sense	1	
+12V	2	30A
-12V	2	-30A
+5V standby	1	2A

The high number of connectors has been chosen to warrant an even current distribution under full load. The five fast-on connectors providing +5V supply on the 20 connector backplane all connect to the same current rails in the backplane.

Therefore and depending on application, a user might chose to use less connectors.

### 1.2.8 JUMPERS

All daisy-chain lines of the VMEbus can be separately shorted by shunt plugs. This is required if the daisy-chains are in use and if a VME card's artwork does not provide the propagation of the daisy-chain. Daisy-chain jumper areas are provided for:

<u>Signal</u>	<u>mnemonic on backplane</u>
BG0IN* - BG0OUT*	BG0
BG1IN* - BG1OUT*	BG1
BG2IN* - BG2OUT*	BG2
BG3IN* - BG3OUT*	BG3
IACKIN*- IACKOUT*	IACK

#### 1.2.9 POWER MONITOR CONNECTION

A connection of the power monitor signals ACFAIL\* and SYSRESET\* to the backplane can be performed by

- a) using one of the VME P1 connectors
- b) using a 4pin female connector with keyed slot 3. It is plugged into the wire-wrap pins FL (for ACFAIL\*) and RS (for SYSRESET\*). A GND pin provides for shielding of the power monitor cable. A ground loop must be avoided in most cases.

#### 1.2.10 TERMINATION

To prevent signal reflections, all signal lines which are not daisy-chained are terminated with 470 Ohm (pull down) to 330 Ohm (pull up).

#### 1.2.11 TEST CONNECTOR

A test connector in the last board position gives easy access from the rear to every bus signal and power line.

#### 1.3 REFERENCE DOCUMENTS

- a) VMEbus specification manual, all versions
- b) MVME900 series equipment user's manual

Pin	Signal
800	BE0IN* - BE0OUT*
801	BE1IN* - BE1OUT*
802	BE2IN* - BE2OUT*
803	BE3IN* - BE3OUT*
JACK	JACKIN* - JACKOUT*

### 1.1.8 POWER MONITOR CONNECTION

A connection of the power monitor signals BE0IN\* and BE0OUT\* to the backplane can be performed by

- using one of the VME R1 connectors
- using a 4-pin female connector with keying (it is plugged into the wire-wrap pins J1, J2, J3 and J4 (for SYRSETT\*), A and B) and soldering the power monitor cables. A ground loop must be avoided in most cases.

### 1.2 TERMINATION

To prevent signal reflections, all signal lines which are not data-channels are terminated with 50 Ohm (pull-down to 500 Ohm) and

### 1.2.1 TEST CONNECTOR

A test connector in the last board position gives easy access from the rear to every bus signal and power line.

### 1.3 REFERENCE DOCUMENTS

- WMESS specification manual, all versions
- WME900 series equipment user's manual



## CHAPTER 2

### INSTALLATION

#### 2.1 UNPACKING INSTRUCTIONS

IF THIS SHIPPING CARTON IS DAMAGED UPON RECEIPT, REQUEST THAT CARRIER'S AGENT BE PRESENT DURING UNPACKING AND INSPECTION OF THE MODULE.

Unpack the backplane, user's guide, and shunt plugs from the shipping carton. Refer to the packing list and verify that all items are present. Save the packing material for storing and reshipping of the module.

#### 2.2 INSPECTION

The module should be inspected upon receipt for broken, damaged, or missing parts and for physical damage to the printed circuit board.

#### 2.3 MOUNTING

Fig.2-1 shows how the backplane is to be fixed in the upper half of a standard Eurocard cage. Please note, that the distance between front panel and backplane has to be 175mm. Therefore, adapter rails, normally supplied by the card cage manufacturer, could be necessary in some cases.

For further details see 3.3 Mechanical Requirements.

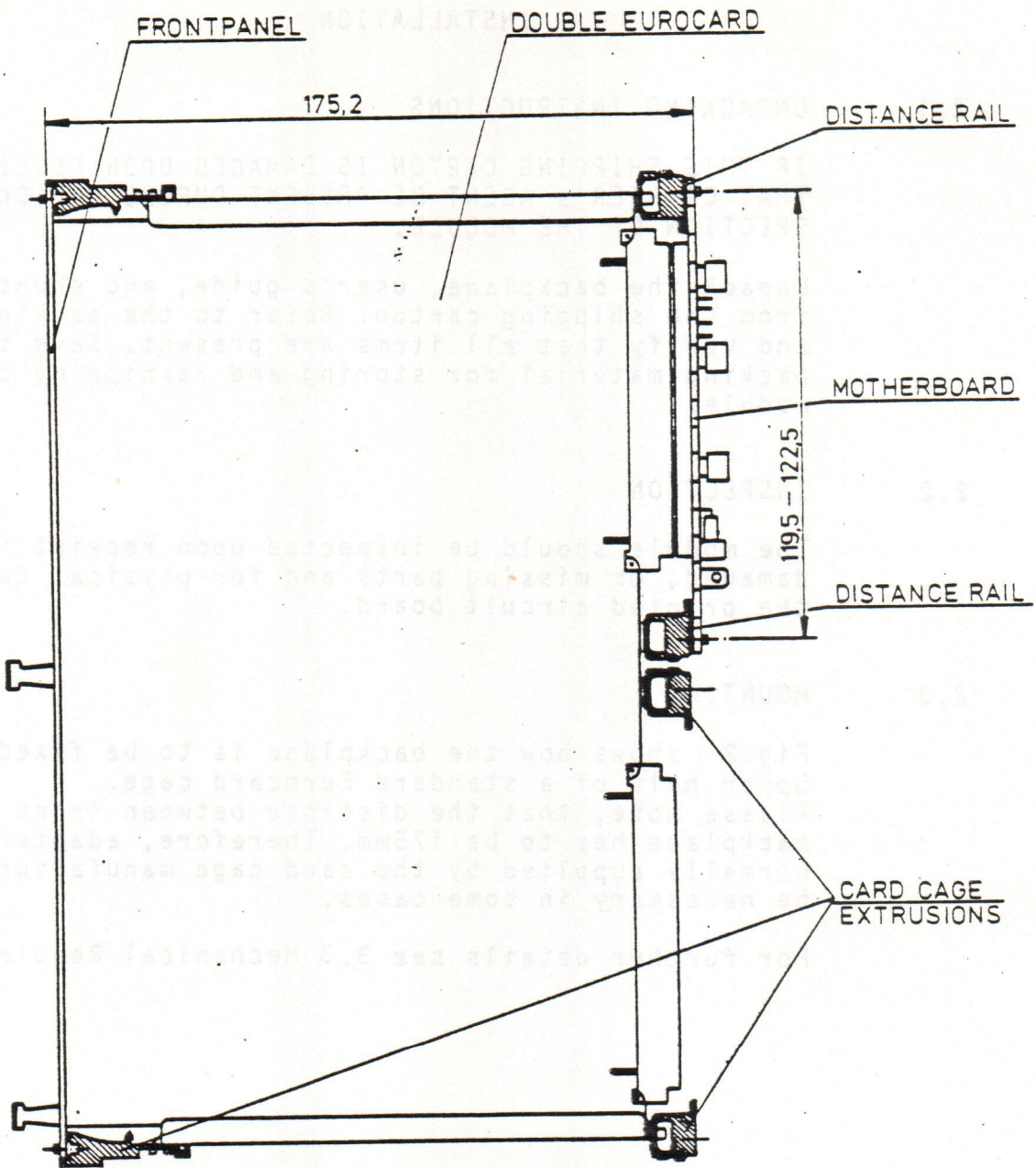


FIGURE 2-1 Backplane Mounting

## CHAPTER 3

### FUNCTIONAL DESCRIPTION

#### 3.1 BOARD TEST

All signal lines of the backplane without terminators are tested with 100V to assure long-term operation.

A point-to-point test on all connector pins is performed to detect opens and shorts.

Finally the terminator resistor packs are checked after installation.

The VME backplanes are qualified according to DIN 41611 part 5 (proposed). The fast-on connectors may not be extracted by a force lower than 100N.

#### 3.2 ELECTRONIC FEATURES

All signal lines with the exception of the daisy chain lines are terminated on both ends with 330 Ohm (+5V) and 470 Ohm (Ground). This is done to reduce signal reflections.

The time delay of a leading or trailing signal edge traveling down the backplane from slot 1 to slot 20 is 3.5 to 4nsec.

This time is increased up to 25nsec. (worst case) on a backplane which is fully equipped with VME cards, if drivers with the recommended characteristics are used.

The VME backplanes comply with the VMEbus timing.

#### 3.3 MECHANICAL

The IEC standard for Eurocard cages specifies size and location of IEC connectors within the rack and the distance to the board's front panel. It does not yet specify the mounting of backplanes. Nevertheless, the VME backplanes are designed to fit into various card cage configurations.

##### a) Z-Bars

Within a VME system, an I/O connection can be provided in location P2 on the VME card.

The mating connector is firmly mounted within the card cage. This can be done on Z-bars.

The VME backplane is mounted without Z-bars. Therefore an adjustment of the VME connectors relative to the I/O connectors might be required. In some vendor's card cages, this requires distance rails

of the thickness of up to 3mm. In other card cages, no adjustment at all is required.

#### b) Hight of Mounting Holes

Card cages for rack mount require a distance of the mounting holes of 122.5mm. To mount the VME backplanes in these card cages, use the round mounting holes.

Card cages for desk-top-operation sometimes require a distance of the mounting holes of

119.5mm

To mount the VME backplanes, use the oval mounting holes.

#### c) Length of Backplane

Some desk-top card cages are 81 or 80 partitions wide (5.08 mm each).

Rack mount card cages provide 84 partitions.

The VME backplane is 82 partitions long and therefore fits in most cases.

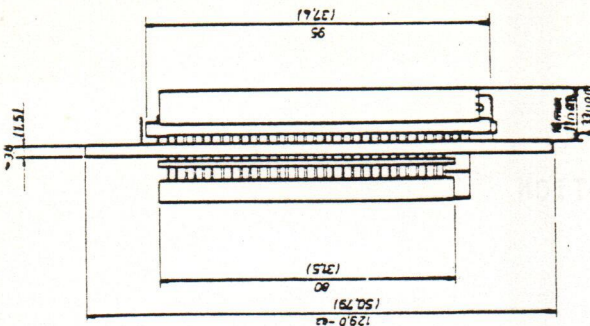
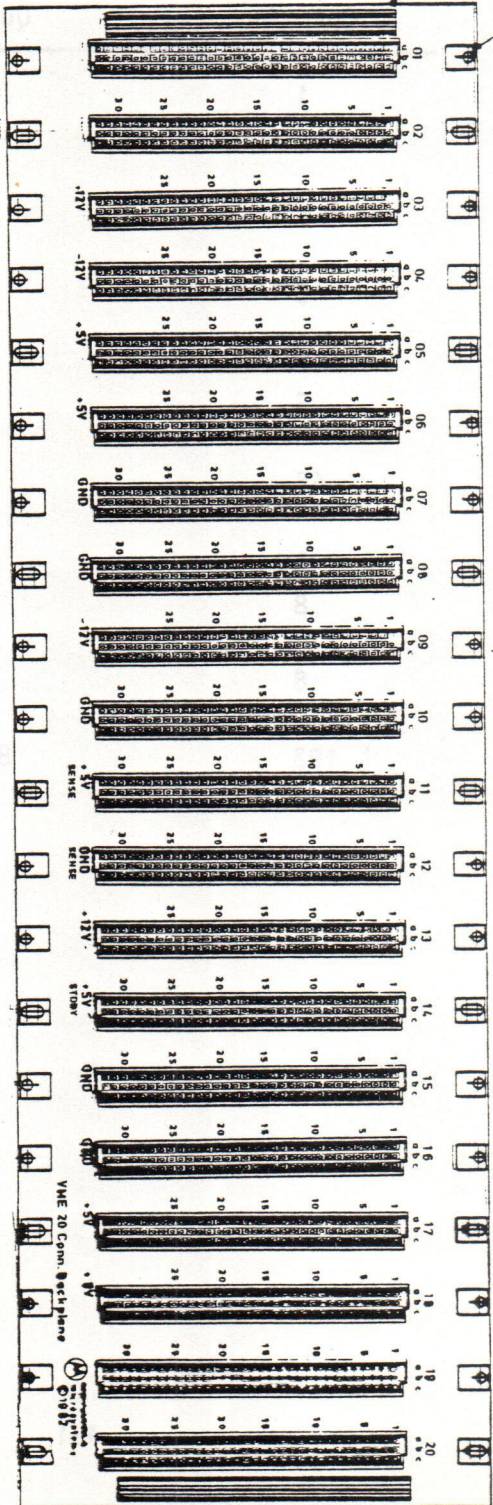
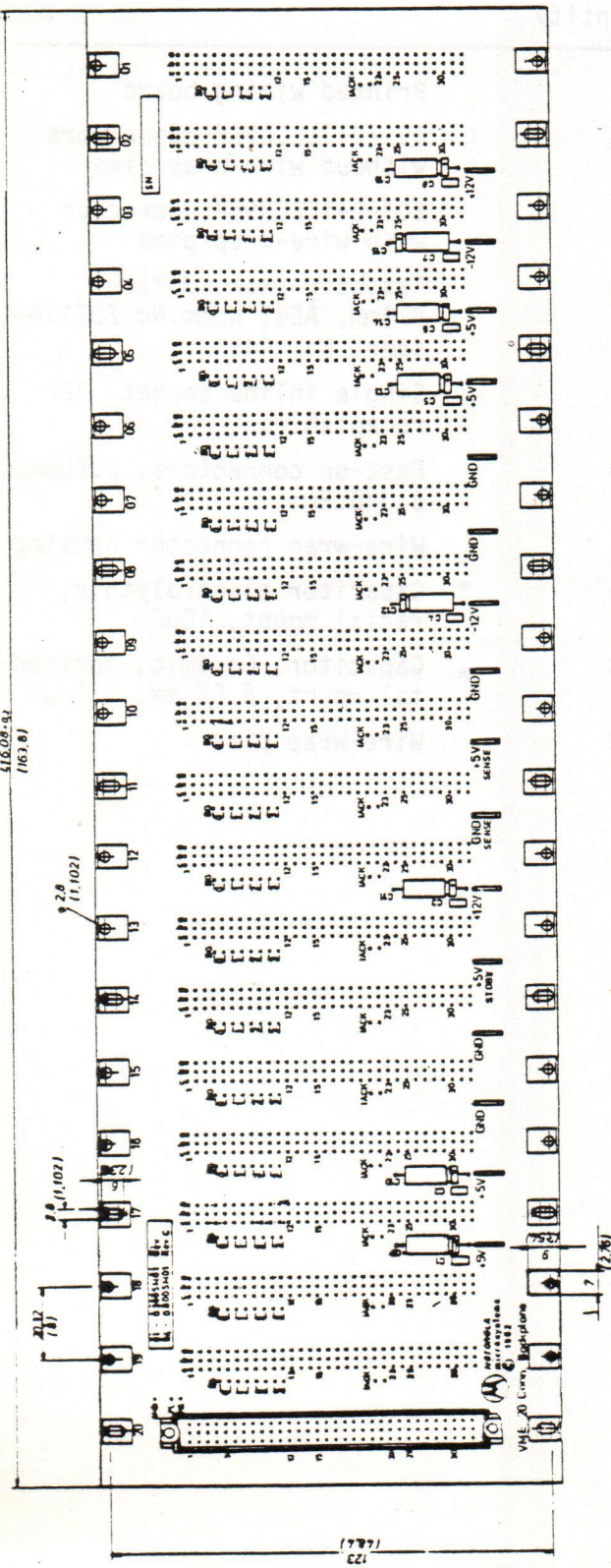
CHAPTER 4  
SUPPORT INFORMATION

4.1 PARTS LIST

20 Conn. Backplane Quantity	9 Conn. Backplane Quantity	Item
1	1	Printed wiring board
19	8	603-2-IECC096F connectors without wire-wrap pins
1	1	603-2-IECC096F connector with wire-wrap pins
6	6	Resistor pack, 30*330/ 470mm, AEG, Komm.No.2271144, ident No. 4451
6	6	Single inline socket, 32 receptables
16	9	Fast-on connectors, 0.8μAu, 6.3*0.8mm
1	1	Wire-wrap connector housing
8	4	* Capacitor electrolytic, radial mount, 10μF
8	3	* Capacitor, Ceramic, horizon- tal mount, 5.08 mm, 0.1 μF
193	83	Wire-Wrap pins

\* optional

416.08-92  
1163.B)



Mounting plate recessed from rim of board by 0.4mm  
solder mask apertures mounting plate

Copper thickness 70µm  
Sik screen white  
Both sides solder mask

DATE	ISSUE	COMMENT	SR	SCALE	UNIT	DATE	BY	CHKD	APPROV
11/82	1	Fast on, w/rpins, (recp gold plate)	1/24/82	1:1	MM	11/82	S.R.		
2/83	2	PRE-RELEASE							

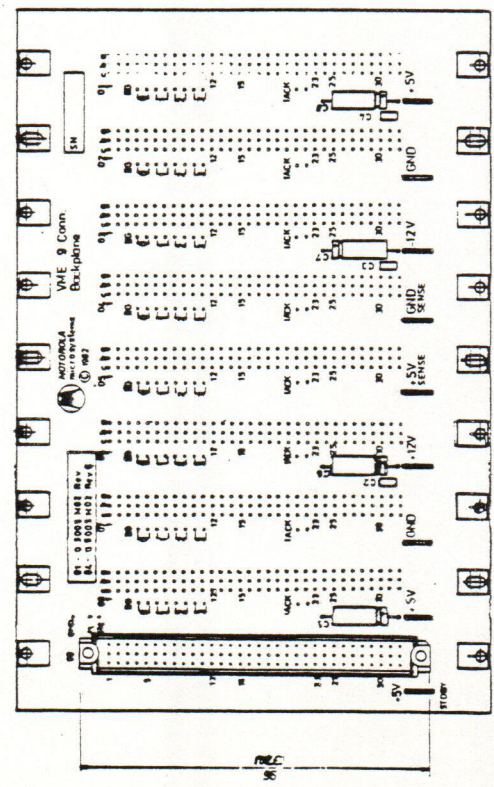
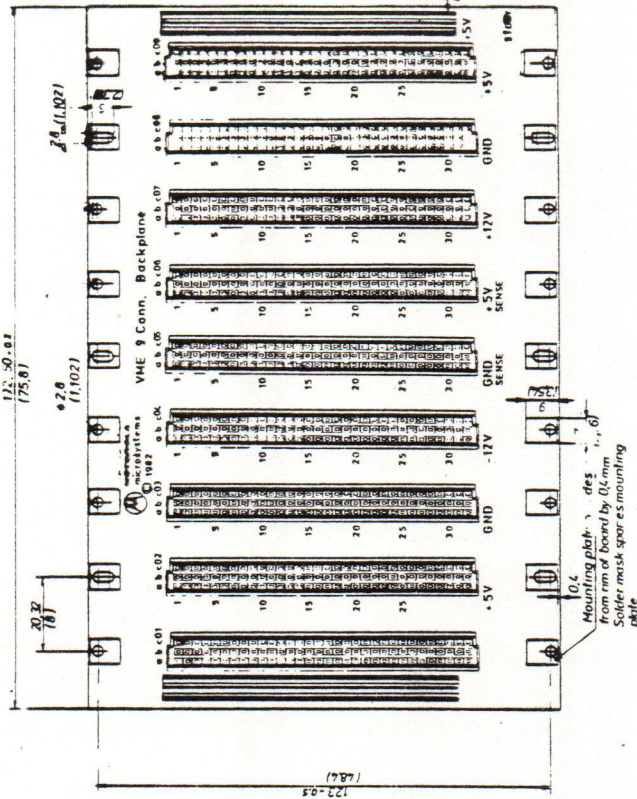
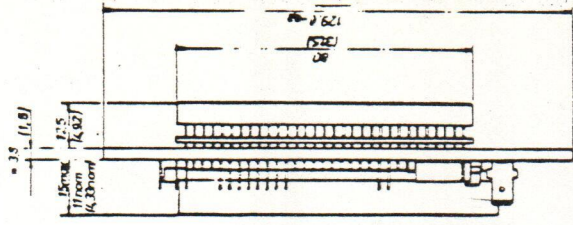
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MANUFACTURE IN AMERICA OR IN PART THEREOF  
DRAWN BY: THOMPSON 1.6  
DATE: 11/82  
CHECKED BY: S.R.  
FLIGHTER: S.R.  
11-10-82

**MOTOROLA microsystems**  
**EUROPE**

TITLE: **VME 20 Conn. Backplane**

CREATING NO: **84 CG 8005 M01**  
SHEET: **10**



Copper thickness 70µm  
Solder mask white  
Both sides solder mask

DATE	ISSUE	COMMENT	SIGN	DATE	SUBSTITUTION	SCALE	REVISION	TITLE
11-02	1	FAST ON WIREPRINT, KEEP GOLD PLATEL	SR	11-02	SCALE 1:1	REWORK AT 0.05mm		
12-01	2	PRE-RELEASE		12-01	REWORK AT 0.05mm	SHARPENED		

DATE	ISSUE	COMMENT	SIGN	DATE	SUBSTITUTION	SCALE	REVISION	TITLE
11-02	1	FAST ON WIREPRINT, KEEP GOLD PLATEL	SR	11-02	SCALE 1:1	REWORK AT 0.05mm		
12-01	2	PRE-RELEASE		12-01	REWORK AT 0.05mm	SHARPENED		

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DATE: 11/02									
DRAWN BY: TSC									
CHECKED BY: SR									
DATE: 11/02									

MOTOROLA microsystems		EUROPE		VME 9 Conn. Backplane		84CG8005M02 REV C	
DRAWING NO.		106		DATE		11/02	
DESIGNER		TSC		DRAWN BY		SR	





APPENDIX A: Pin Assignments for VMEbus Connector P1

PIN	ROW A	ROW B	ROW C
1	D00	BBSY*	D08
2	D01	BCLR*	D09
3	D02	ACFAIL*	D10
4	D03	BGOIN*	D11
5	D04	BGOOUT*	D12
6	D05	BG1IN*	D13
7	D06	BG1OUT*	D14
8	D07	BG2IN*	D15
9	GND	BG2OUT*	GND
10	SYSCLK	BG3IN*	SYSFAIL*
11	GND	BG3OUT*	BERR*
12	DS1*	BR0*	SYSRESET*
13	DS0*	BR1*	LWORD*
14	WRITE*	BR2*	AM5
15	GND	BR3*	A23
16	DTACK*	AM0	A22
17	GND	AM1	A21
18	AS*	AM2	A20
19	GND	AM3	A19
20	IACK*	GND	A18
21	IACKIN*	SERCLK	A17
22	IACKOUT*	SERDAT	A16
23	AM4	GND	A15
24	A07	IRQ7*	A14
25	A06	IRQ6*	A13
26	A05	IRQ5*	A12
27	A04	IRQ4*	A11
28	A03	IRQ3*	A10
29	A02	IRQ2*	A09
30	A01	IRQ1*	A08
31	-12V	+5V STDBY	+12V
32	+5V	+5V	+5V

ROW C	ROW B	ROW A	PIN
D08	BSSY*	D08	1
D09	BCLR*	D07	2
D10	ACRALL*	D07	3
D11	BODIN*	D06	4
D12	BODOUT*	D04	5
D13	BGTIN*	D06	6
D14	BGTOUT*	D05	7
D15	BGSIN*	D03	8
DND	BGSOUT*	DND	9
SYSFRILL*	BGSIN*	SYSCLK	10
BEAK*	BGSOUT*	DND	11
SYSRESET*	BRD*	LS1*	12
LEWORD*	BR1*	REQ*	13
AND	BR2*	WRITER	14
A23	BR3*	24V	15
A22	AND	STACK*	16
A21	AM1	DND	17
A20	AMS	10*	18
A19	AMS	02B	19
A18	GRD	PACK*	20
A17	SERCLK	PACKEN*	21
A16	SERDAT	JACKOUT*	22
A15	DND	AM3	23
A14	TRD3*	A07	24
A13	TRD6*	A08	25
A12	TRD5*	A05	26
A11	TRD4*	A04	27
A10	TRD3*	A03	28
A09	TRD2*	A02	29
A08	TRD1*	A01	30
+12V	+5V STDBY	12V	31
+5V	+5V	+5V	32