

Chapter 9

Rear I/O Transition Boards

9.1 Introduction

VME, VME64 and VME64x boards might route I/O through the backplane via the P2/J2/RJ2/JP2 connectors and the P0/J0/RJ0/JP0 connectors. In the P2/J2/RJ2/JP2 connector family, rows a & c provides 64 I/O pins. Rows z & d of the same connector family provide 46 I/O pins for a total of 110 user defined I/O pins. Additionally, 35 pins are available for ground returns in the z & d rows, as defined in Chapter 3.

When the 2 mm hard metric P0/J0/RJ0/JP0 connector family (as defined in Chapter 4) is used, 95 user defined I/O pins are available. Additionally, 19 or 38 pins are available for ground returns.

In some applications that utilize these user defined I/O pins for I/O through the backplane, there is a need for a commonly defined rear I/O transition board scheme. These boards provide the connectors required for specific kinds of I/O functions such as serial ports, parallel ports, video terminals, disk drive ports, T1/E1 communication lines, etc.

IEEE P1101.11, defines the generic mechanics for rear I/O transition boards. This chapter selects the recommended board and slot depth size to be used for VME64x applications.

9.2 Requirements

9.2.1 Mechanical Dimensions

Rule 9.1:

If rear I/O transition boards are being implemented, the mechanics of such an implementation shall be in accordance to IEEE P1101.11.

Recommendation 9.1:

For I/O through 3U and 6U backplanes, the 80 mm deep rear I/O transition boards should be used.

Recommendation 9.2:

3U and 6U subracks supporting rear I/O transition boards should be designed to accommodate the 80 mm depth version.

9.2.2 Mechanical Components

Recommendation 9.3:

It is recommended that the same front panel, the same handles, the same keying, the same alignment pin, the same EMC and the same ESD mechanics be used as on the front VME64x boards, as defined in chapters 5, 6, 7 and 8.

Recommendation 9.4:

It is recommended that the same subrack rails, card guides, EMC support, ESD support, keying, alignment pin hole, and injector/extractor comb be used as on the subrack front side, except for the card guide's depth, as defined in chapters 5, 6, 7 and 8.

Observation 9.1:

Rear I/O transition boards are "in-line" with the front VME64x boards. This means that the front panel of rear I/O transition boards are reversed (mirrored) from the front VME64x boards. This includes the card guides, the keying scheme and the handles. The top handles are on the bottom and the bottom handles are on the top.

Rule 9.2:

If a transition module has an RP0 then it shall have an RP2 connector.

Observation 9.2:

The rear RJ0 shroud does not have any vertical guiding for the RP0 connector. The RP2 connector is necessary since there is a potential for misalignment and the bending of pins in RP0.

Permission 9.1:

An RP2 housing without pins may be mounted on the transition module if no contacts are used in that connector.

9.2.3 Board Layout Orientation**Recommendation 9.5:**

As a visual aid, the typical orientation for a VME board should be positioned with the front panel on the left side and the backplane connectors on the right side. See Figure 9-1 of this standard and Figures 7-2, 7-3, 7-10 and 7-11 in the VME64 Standard.

Recommendation 9.6:

As a visual aid, the typical orientation for a rear I/O transition board should be positioned with the front panel on the right side and the rear backplane connectors on the left side. See Figure 9-1 of this standard.

Observation 9.3:

By following Recommendations 9.5 and 9.6, layout and I/O signal routing errors will be minimized.

9.2.4 Slot Keying Codes**Observation 9.4:**

The same front panels and shortened card guides are used for rear I/O transition boards. Unfortunately all the slot keying holes in both the card guides and front panels will be upside down. The top and bottom holes are swapped as well as the letter labels will be upside down.

Recommendation 9.7:

The same keying code identification and labeling should be used as on the front boards and front card guide.

9.2.5 Connector Pin Labeling**Rule 9.3:**

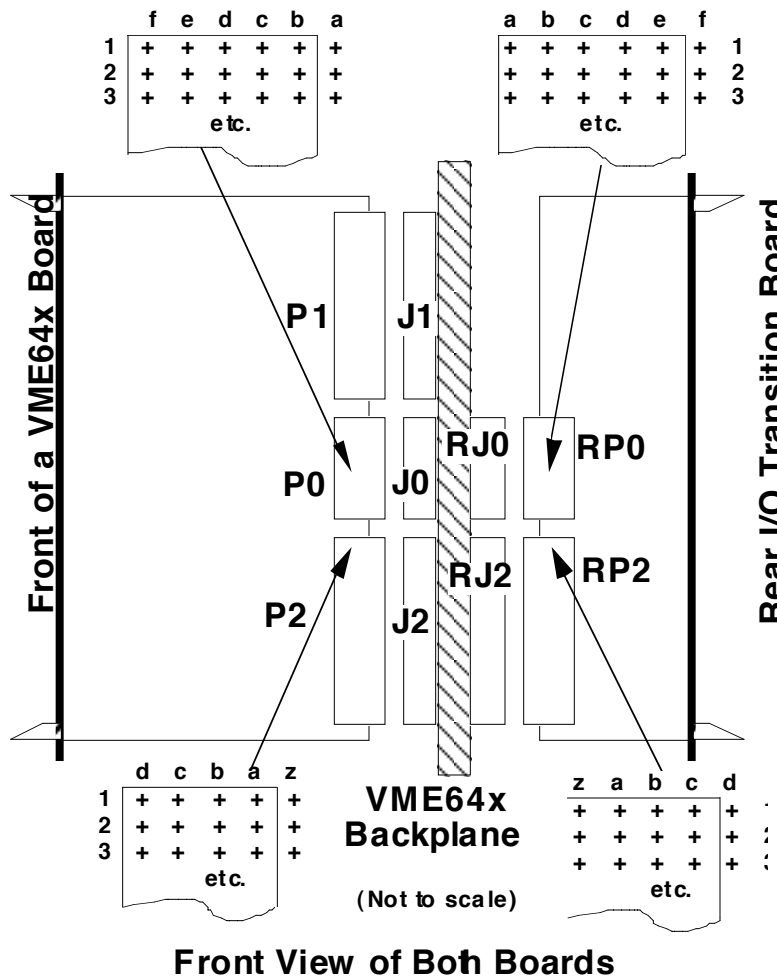
Whenever rear I/O transition boards are implemented, any connector that plugs into the rear of the backplane shall use the same pin numbering scheme, mirror image, as used on the front boards.

Observation 9.5:

Rule 9.3 eliminates confusion and I/O signal pin mapping problems by requiring a 1 for 1 pin mapping. Example, P2, a3 is connected to RP2, a3 and P0, d1 is connected to RP0, d1. See Figure 9-1 above for illustration.

Observation 9.6:

If the same CAD component database is used for connectors on front plug-in boards and rear plug-in boards the pin labels will be incorrect on rear plug-in board connectors. The pin sequence needs to be re-sequenced.



Note: Connectors RJ1 and RP1 are not normally used and therefore are not shown. If these two connectors are used, care should be taken when connecting to the VME64x based signals and to the power pins.

Figure 9-1 Front and Rear Board Orientation & Connector Pin Labeling
(view of component side on both boards)

9.2.6 Increase in Backplane Height

When rear I/O transition boards are used, the attachment of power connectors and associated power cabling might need to be done outside the normal connector area. It might be necessary to extend the height of VME64x backplanes on either or both the top or bottom edges.

Recommendation 9.7:

The incremental height extensions of VME64x backplanes should be in one half of a 1U increment or 22.22 mm.

9.2.7 Power to Rear I/O Transition Board

In some applications, the rear transition board will have active components. Power can be applied either through the I/O pins from the front board, or from the normal power and ground pins defined as part of the P1/J1 and P2/J2 connectors.

Rule 9.4:

When power is routed through the I/O pins from the front board to the rear I/O transition board, the maximum current through each pin shall be the same as allowed per pin for the normal connector operation.

Rule 9.5:

Backplanes that provide long tail connectors on the rear of the backplane shall design the backplane to accommodate full power being drawn from both the front and rear connectors at the same time.