Appendix C

The io.conf File

The file **/etc/io.conf** is the configuration file for CMIO bus devices — the DataVault, CM-HIPPI, VMEIO host computer, and CM-IOPG — and the IOBA (the bus's interface to the CM-5). The configuration file must always accurately reflect the state of the CMIO bus system. The **io.conf** file is created by a Thinking Machines Customer Support representative when the system is installed. Thereafter, **io.conf** must be updated whenever the CMIO bus system is reconfigured. This section explains the components of **io.conf** so that you can edit them if the system's configuration changes.

io.conf is an ASCII file. As such, these general format rules apply:

- Numeric arguments can be specified in hex (leading **0x** or **0X**), octal (leading **0**), or decimal.
- Characters following a semicolon on the same line are ignored.
- As long as all entries are left-justified, **io.conf** can contain any amount of white space.
- The parser is case-sensitive; all alpha-text must be typed into **io.conf** exactly as shown in this section.

Some of the entries in **io.conf** require you to count hardware entities. Count the first entity as number 1, not number 0.

C.1 Editing the io.conf File

To help explain how to edit **io.conf**, we provide a sample CMIO bus sytem and its **io.conf** file. Figure 61 illustrates a CMIO bus system with two

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IOBAs, two DataVaults, a CM-HIPPI, and a CM-IOPG. Figure 62 represents the **io.conf** file for the configuration shown in Figure 61.

As shown in Figure 62, the first line in **io.conf** must be:

```
IO_configuration_file_v1.0   ;Identification string
```

The rest of **io.conf** consists of two main modules:

- The **Channel_Board_Configuration** module contains information about the IOBAs. Section C.1.1 describes this module in detail.
- The **IO_device_configuration** module describes the CMIO bus devices configured into the system. Section C.1.2 describes this module in detail.

C.1.1 The Channel_Board_Configuration Module

io.conf must contain exactly one **Channel_Board_Configuration** module, which describes the IOBA(s). The **Channel_Board_Configuration** module is comprised of submodules that describe the IOBAs' channel boards.

The first line of the **Channel_Board_Configuration** module is the title of the module: **Channel_Board_Configuration**. The second line specifies the total number of channel boards in the entire system. Following this line are one or more submodules: one submodule for each channel board. Each submodule must contain eleven lines, in this order:

- The first line specifies the character device number, which is always **107**.
- The second line specifies the block device number, which is always **50**.
- The third line specifies the minor device number, which is **32** for the first submodule, **33** for the second submodule, **34** for the third submodule, and so on.
- The fourth line specifies the physical address of the NI on the controller board in the same IOBA as the channel board.
- The fifth line specifies the slot number of the channel board — either **0** or **0xc**.

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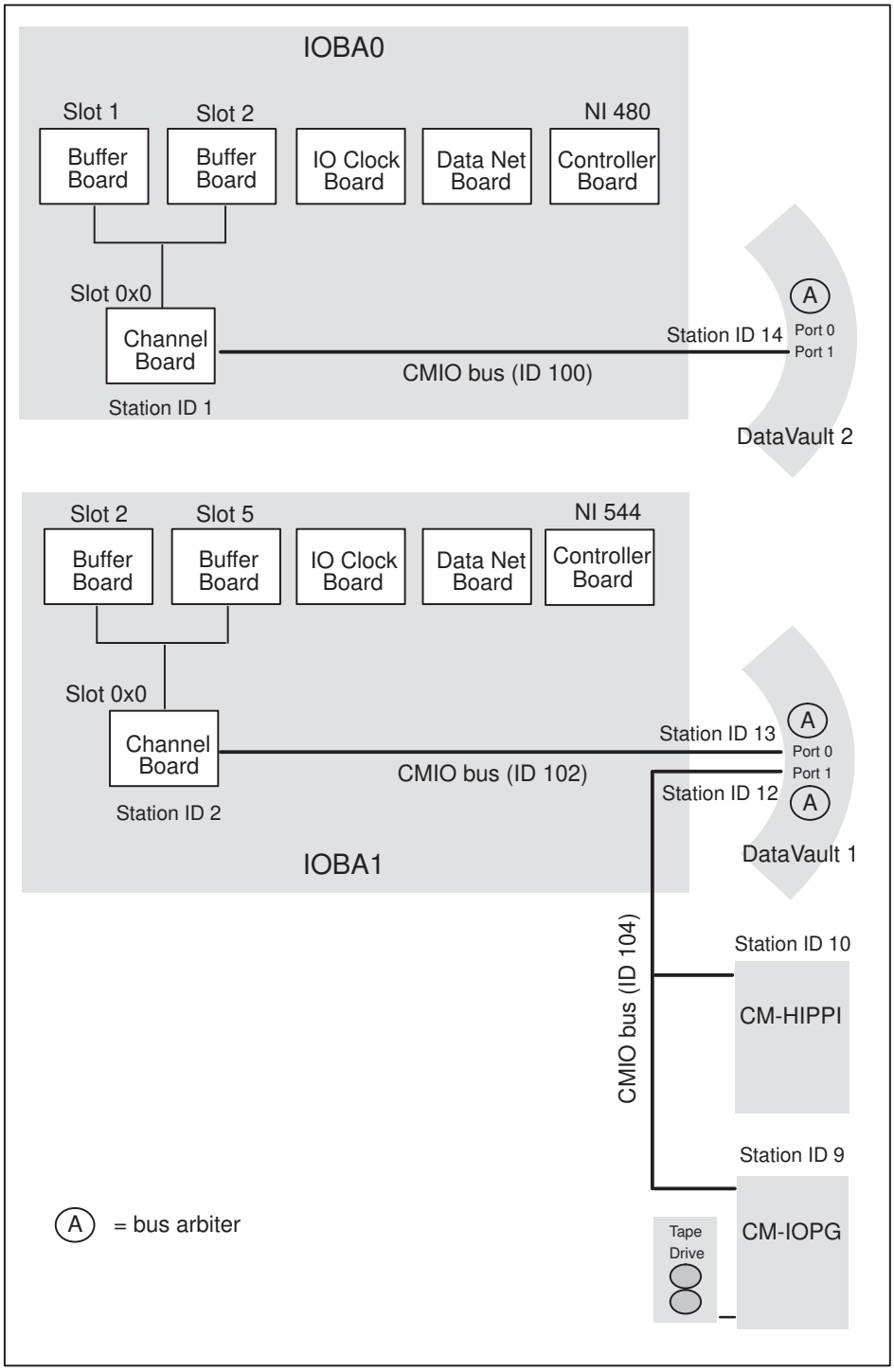

Figure 61. Sample CMIO bus configuration.

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- The sixth line specifies the bus ID of the CMIO bus to which the channel board is connected.
- The seventh line specifies the station ID of the channel board.
- The eighth line specifies whether the channel board is the bus arbiter (`1`) or not (`0`).
- The ninth line specifies the CMIO bus's speed. This value is always `2`.
- The tenth and eleventh lines each specify the slot number of one of the two buffer boards associated with the channel board. It does not matter which board's slot number is listed on the tenth line and which is listed on the eleventh. (Both lines must be present, even if only one buffer board is associated with the channel. The entry for a non-present buffer board must be `0`).

The ordering of the submodules is arbitrary. That is, if there is more than one IOBA in the system, you need not place the submodule for IOBA0's channel board before the submodule for IOBA1's channel board, although it is conventional to do so.

C.1.2 The IO_device_configuration Module

`io.conf` must contain exactly one **`IO_device_configuration`** module. Its submodules describe each CMIO bus device — DataVault *port*, CM-IOPG, and CM-HIPPI — configured into the CM-5 system.

The first line of the **`IO_device_configuration`** module specifies the title of the module: **`IO_device_configuration`**. The second line specifies how many CMIO bus devices are in the system. Be sure to count each configured DataVault *port* as a separate device.

Each device must be described by exactly one submodule. Each submodule must contain four lines, in the order listed:

- The first line specifies the hostname of the device.
- The second line specifies a code that indicates the type of the device:
  - **`DV`** indicates a DataVault port.
  - **`VME`** indicates a CM-IOPG or VMEIO host computer.

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  - **`HIPPI`** indicates a CM-HIPPI.
- The third line specifies the device's station ID.
- The fourth line specifies the bus ID of the CMIO bus on which the device resides.

The ordering of the submodules is arbitrary except as it is used by the CMFS file system and CMIO-bus diagnostics to determine the default CMIO bus device. The system determines the default device by searching **`io.conf`** for the first channel board that has at least one device on its bus, and then, if there is more than one device, choosing the one that appears first in the **`IO_device_configuration`** module.

```
IO_configuration_file_v1.0 ;Identification string

Channel_Board_Configuration
2               ; Total number of channel boards in
                ; all IOBAs combined.

                ; Channel board in IOBA0
107             ; Character device
50              ; Block device
32              ; Minor device
480             ; IOPN NI physical address
0x0             ; Channel board slot number
100             ; CMIO bus id
1               ; Station id
0               ; CMIO arbiter status flag
2               ; CMIO bus speed
0x1             ; Buffer board slot number
                ;     (Must be one of
                      0,1,2,5,7,8,a,b)
0x2             ; Buffer board slot number
                ;     (Must be one of
                      0,1,2,5,7,8,a,b)
```

(cont'd)

Figure 62. The `io.conf` file for the CMIO bus configuration diagrammed in Figure 61 *(page 1 of 2).*

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```
                ; Channel board in IOBA1
107             ; Character device
50              ; Block device
33              ; Minor device
544             ; IOPN NI physical address
0x0             ; Channel board slot number
102             ; CMIO bus id
2               ; Station id
0               ; CMIO arbiter status flag
2               ; CMIO bus speed
0x2             ; Buffer board slot number
                ;     (Must be one of 1,2,5,7,8,a,b)
0x5             ; Buffer board slot number
                ;     (Must be one of 1,2,5,7,8,a,b)

IO_device_configuration
5               ; Number of IO devices in system

dv2             ; hostname of IO device 1 (Also
                ; default host name)
DV              ; type of IO device 1
14              ; station id of IO device 1
100             ; bus id of IO device 1

dv1             ; hostname of IO device 2
DV              ; type of IO device 2
13              ; station id of IO device 2
102             ; bus id of IO device 2

dv1             ; hostname of IO device 3
DV              ; type of IO device 3
12              ; station id of IO device 3
104             ; bus id of IO device 3

hioc1           ; hostname of IO device 4
HIPPI           ; type of IO device 4
10              ; station id of IO device 4
104             ; bus id of IO device 4

iopg1           ; hostname of IO device 5
VME             ; type of IO device 5
9               ; station id of IO device 5
104             ; bus id of IO device 5
```

Figure 62, *cont'd.* **The `io.conf` file for the CMIO-bus configuration diagrammed in Figure 61** *(page 2 of 2).*

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