Software Installation and Operation Manual

for

DigiCHANNEL PC/X™
DigiCHANNEL MODEM/X™
UNIX System V/386 Rel 3.2

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Introduction

This UNIX System V driver package provides support for the DigiCHANNEL PC/X (4, 8 and 16-port) serial communications boards, and the DigiCHANNEL MODEM/X (4 and 8-port) internal modem boards, under the UNIX System V/386 operating system. See the release notes accompanying this software package for the versions of System V supported by this product.

Be sure to read the *Release Notes* that may be included with this software device driver. The *Release Notes* contain information not available at this manual's press time.

Hardware Installation

Note: Before proceeding with the software installation instructions for **UNIX System V**, you must first configure your board(s) for the correct I/O port addresses and interrupt request (IRQ) line(s), and install the board(s) in your computer system, according to the hardware installation instructions in the *Installation Guide and Reference Manual* for your board, and the instructions on the following pages.

For single-board installations, a streamlined installation has been provided. The device driver has a pre-configured set of parameters for each of the 4, 8 or 16 port boards, so that only one question needs to be answered to assign the Status Port address, I/O Port addresses and the IRQ selection.

The streamlined installation procedures for the PC/X board begin on the next page. The MODEM/X automatic configuration begins on page 12.

There is also a custom configuration option which allows you to install multiple boards, or choose from a list of separate IRQ and addressing options for single-board installations. To perform the custom installation, skip to page 15.

DigiCHANNEL PC/X Board

Switch and Jumper Settings—Standard Configuration

The following procedures apply to the PC/4 and PC/8 boards only. If you are installing a PC/16 board, skip to page 10.

If your board is a **PC/8**, set the board's Status Port address to **140h**.

Set **DS1** to 140h, as shown:
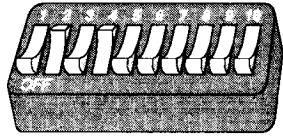
If your board is a **PC/4**, set the board's Status Port address to **120h**.

Set **DS1** to 120h, as shown:
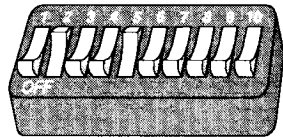
Next, set the I/O port address DIP switches DS2 through DS9 (DS2 through DS5, for the DigiCHANNEL PC/4) as follows:

Set **DS2** to 100h, as shown:
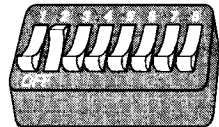
Set **DS3** to 108h, as shown:

Set **DS4** to 110h, as shown:

Set **DS5** to 118h, as shown:

Set **DS6*** to 120h, as shown:

Set **DS7*** to 128h, as shown:

Set **DS8*** to 130h, as shown:

Set **DS9*** to 138h, as shown:

8-port boards only

Select **IRQ3** by installing a jumper on **J85**, and removing any other jumpers that may be installed on **J85—J90**:
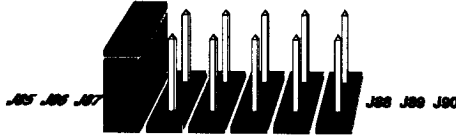
Select **ODD** interrupts by placing jumpers on the *top* two pins (pins 1 & 2) of jumpers **J1—J8** (**J1—J4** for a PC/4 board). Set the board's identification number to **0** by placing jumpers on the *bottom* two pins of **J9** & **J10**:

Finally, install a jumper on the *middle* two pins (pins 2 & 3) of connector **P2**, located in the upper right-hand corner of the board (there may also be a jumper on connector **P3**—this will have no effect on the operation of the board, and may be left installed):
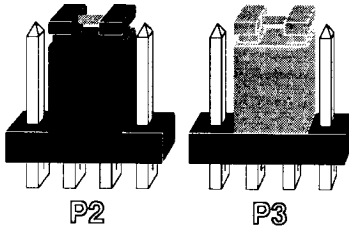
Now proceed to the software installation, on page 20.

DigiCHANNEL PC/16 Board

The Status Port and I/O Port address selections are made in a different manner for the PC/16 board. Instead of DIP switches, the addresses are programmed into special integrated circuits called *PAL's* (for Programmable Array Logic). Each PC/16 board has two PAL chips which determine the addresses for that board. There are two standard sets of PAL's which can be used with the System V operating systems; these designate a PC/16 board as *Board 0* or *Board 1*.

Board 0 is the board with the PAL chips numbered **40000332** and **40000333**. **Board 1** is the board with the PAL chips numbered **40000334** and **40000335**. To install two boards, one must be **Board 0**, and one must be **Board 1**.

Each board's PAL chips are programmed with different I/O Port and Status Register addresses.
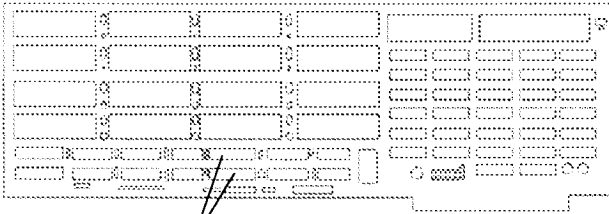
PAL chips

Board 0 PAL's provide a Status Port address of **190h** and I/O Port starting addresses of **110h** through **188h** (each port uses eight contiguous bytes).

Board 1 PAL's provide a Status Port address of **290h** and I/O Port starting addresses from **210h** through **288h**.

The streamlined installation procedure assumes that you are installing a *single* PC/16 board, with **Board 0** PAL's. It also assumes that the interrupt line selected will be **IRQ3**. Three jumpers must be installed on the PC/16 board to complete the hardware configuration. To select **IRQ3**, place a jumper on **J2**. A jumper must also be installed accross pins **2** & **3** (the *bottom* two pins) of **J7**. See the figure below:
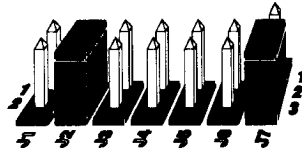
Also, be sure that there is a jumper installed on the daisy-chain connector, **P3**, located in the upper right-hand corner of the board.

If you want to install two PC/16 boards, or a single board with **Board 1** PAL's, you must perform the custom configuration (see page 15).

Now proceed to the software installation, on page 20.

DigiCHANNEL MODEM/X Board

The DigiCHANNEL MODEM/X multiple modem card uses the same addresses and interrupts as the DigiCHANNEL PC/X board. In fact, to the UNIX System V device driver software, the MODEM/X board is indistinguishable from a PC/X board with modems attached.

The MODEM/X board has only one bank of DIP switches, **SW1**. **SW1-1** through **SW1-7** define the status port address, and **SW1-8** enables or disables interrupts. All other configuration parameters are set through software, and are saved in an EEROM (Electrically Erasable Read Only Memory) on the board. A self-booting set-up diskette is included with the MODEM/X board for this purpose (see the *Installation and Operating Manual* for a detailed explanation of the set-up program).

If you are installing a *single* **MODEM/8** board, set the Status Port address for the board to **140h** as shown below:
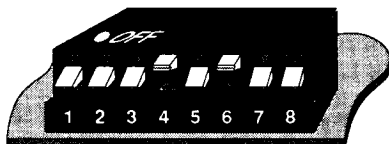
Note that **SW1-8** is ON, enabling interrupts.

If you are installing a *single* **MODEM/4** board, set the switches for a Status Port address of **120h**, as below:
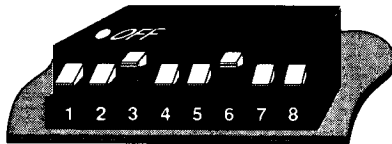
If you are installing multiple boards, or wish to use different address and interrupt parameters, you must perform the *custom installation* beginning on page 15.

Now plug the board into your computer (you can use 8-bit or 16-bit slots). Insert the MODEM/X set-up diskette into the boot drive, and turn the machine on.

When the set-up program boots up, it will scan for a MODEM/X board, and if found, will display the Status Port address and DIP switch settings of the board. If the I/O port addresses and IRQ have been previously set, they will also be displayed; otherwise they will be listed as "disabled".

At the bottom of the screen you will see some command options:

```
C)ustom Configuration   O)perating System Configurations
V)iew Switch Settings   Q)uit
```

Press the "**O**" key to select Operating System Configurations, and you will see a list of operating systems. Select the appropriate version of **System V** by entering its letter. You will now see the I/O addresses and IRQ which correspond to the Status Port address of your MODEM/X board. Enter "**y**" to accept these parameters. When asked if you want to save this configuration in EEROM, answer "**y**".

You will be returned to the initial screen, which will now show the new address and interrupt selections. Enter "**Q**" to quit, remove the diskette from the diskette drive, and reboot your system.

Custom Configurations

The System V driver supports up to four DigiCHANNEL PC/X or MODEM/X boards, in any combination, depending upon the availability of I/O Port addresses and Interrupt Request (IRQ) lines in your particular system. Since they appear to the system to be identical, PC/X and MODEM/X boards may be combined, as long as each board has unique I/O Port addresses and IRQ's.

The System V driver accepts **IRQ** selections of **2, 3, 4, 5** and **7**. See your board's Installation manual for information on selecting IRQ's.

The following tables show the **I/O Port** and **Status Port** addresses which can be used on 4, 8 and 16-port boards, respectively.

The six choices for the **PC/4** or **MODEM/4** are:

Choice Number	I/O Ports (8 bytes apart)	Status Register
1	100h, 108h, 110h, 118h	120h
2	128h, 130h, 138h, 140h	148h
3	150h, 158h, 160h, 168h	170h
4	178h, 180h, 188h, 190h	198h
5	1A0h, 1A8h, 1B0h, 1B8h	1C0h
6	1C8h, 1D0h, 1D8h, 1E0h	1E8h

The six choices for the **PC/8** or **MODEM/8** are:

Choice Number	I/O Ports (8 bytes apart)	Status Register
1	100h, 108h, 110h, 118h, 120h, 128h, 130h, 138h	140h
2	148h, 150h, 158h, 160h, 168h, 170h, 178h, 180h	188h
3	1C0h, 1C8h, 1D0h, 1D8h, 1E0h, 1E8h, 1F0h, 1F8h	200h
4	210h, 218H, 220h, 228h, 230h, 238h, 240h, 248h	250h
5	258h, 260h, 268h, 270h, 278h, 280h, 288h, 290	298h
6	2C0h, 2C8h, 2D0h, 2D8h, 2E0h, 2E8h, 2F0h, 2F8h	300h

The two choices for the **PC/16** are:

Choice Number	I/O Ports (8 bytes apart)	Status Register
1 (Board 0)	110h, 118h, 120h, 128h, 130h, 138h, 140h, 148h, 150h, 158h, 160h, 168h, 170h, 178h, 180h, 188h	190h
2 (Board 1)	210h, 218h, 220h, 228h, 230h, 238h, 240h, 248h, 250h, 258h, 260h, 268h, 270h, 278h, 280h, 288h	290h

MODEM/X: Set DIP switch **SW1** for the Status Port address which corresponds to your choice. The set-up program will automatically supply the correct I/O Port addresses when you select one of the System V operating system configurations. See the **Installation** section of the *Installation and Operating Manual for DigiCHANNEL MODEM/X* for details on running the set-up program.

PC/4, PC/8 Set DIP switch **DS1** for the Status Port address which corresponds to your choice. Set switches in **DS2—DS9** (**DS2—DS5** for the **PC/4**) for the appropriate I/O Port addresses. See the *Installation and Reference Manual for DigiCHANNEL PC/X* for information on how to set the DIP switches and jumpers on the PC/4 and PC/8 boards.

PC/16 The PC/16 choices are made by installing the correct PAL chips on the board for your selection. The part numbers for the PAL's are: **40000332** and **40000333** for **Board 0**, and **40000334** and **40000335** for **Board 1** (see page 10). Refer to the *Installation and Reference Manual for Digi-CHANNEL PC/16* for information on setting the PC/16's jumpers.

Remember which Status Port and I/O Port Addresses you choose for each board, as well as the IRQ selections—you will have to inform the software of them during the device driver custom software installation procedure.

Board 1: Choice # ____   IRQ ____

Board 2: Choice # ____   IRQ ____

Board 3: Choice # ____   IRQ ____

Board 4: Choice # ____   IRQ ____

Software Installation

Software changes more rapidly than printed documentation can keep up. For this reason, some of the screens or prompts may not appear exactly as shown.

Step 1.   Log onto the console as super-user (root).

Step 2.   Type in the starting command according to the operating system you are using:

EURIX System V/386   **Intel System V/386**
Everex ESIX V/386

Step 2.   To begin the installation, type the command:

            `installpkg`   [Press ENTER]

This will run the System Administration program designed to assist in Add On Package installation.

(Refer to the Operations/System Administrators Guide, for more information on **installpkg.**)

AT&T UNIX:

Step 2. To begin the installation, type:

face [Press ENTER]

When asked by the software, select **System Administration**. Select **Software Setup**, and then select **Install UNIX System Application**.

This will run the System Administration program designed to assist in Add On Package installation.

(Refer to your *Operations/System Administrators Guide* for more information.)

Interactive 386/ix

Step 2. To begin the installation, type:

sysadm [Press ENTER]

When asked by the software, select **Softwaremgmt**, and then select **installpkg**.

This will run the System Administration program designed to assist in Add On Package installation. Answer the on-screen questions about diskette location and type.

(Refer to your Operations/System Administrators Guide for more information.)

Step 3.   Insert the DigiBoard device driver diskette into the diskette drive. The system asks you to confirm that this is the package you want to install, with a screen similar to this:

```
Confirm

Please insert the floppy disk.

If the program installation requires more than one floppy disk,
be sure to insert the disks in the proper order, starting with
disk number 1.

After the first floppy disk, instructions will be provided for
inserting the remaining floppy disks.

Strike ENTER when ready
or ESC to stop.
```

Press ENTER to start the installation process. You will see the following message (or similar):

```
Installation is in progress -- do not remove the floppy disk.

Install in Progress.

Installing DigiCHANNEL PC/X Async Driver Package - Version
x.x.x

Copyright 1991 DigiBoard Inc.
All Rights Reserved.
```

Step 4. You must now answer a series of questions about the installation. In each case, options will be presented and/or examples will guide you in answering the questions. The driver may be installed by using one of three pre-configured versions (one each for *single* 4, 8 or 16-port boards, or may be installed in a variety of custom configurations. You will see a screen similar to this:

```
The DigiCHANNEL async driver may be installed using one of
three pre-configured versions or you may choose to create your
own custom configuration.  Please select your configuration
from the following list:

Channels |Start I/O Port| Last I/O Port|Status Port| IRQ
         |   Address    |   Address    |  Address
---------|--------------|--------------|-----------|------
1)   4   |    0x100     |    0x118     |   0x120   |  3
2)   8   |    0x100     |    0x138     |   0x140   |  3
3)  16   |    0x110     |    0x188     |   0x190   |  3

4)           Custom or multi-card installation

5)           Exit installation procedure
```

When asked, select your configuration from the above list (1-4).

- If you answered **1**, **2** or **3**, skip to Step 9 (on page 27).

- If you selected **Option 4** (Custom), the next prompts you see will be for Custom Configuration Instructions.

Step 5.   The software asks:

```
Enter the number of boards in system (1-4):
```

Instructions 6 through 8 are repeated for each of the boards you specified in Step 5.

Step 6.   You must let the system know how many channels are installed on the PC/X or MODEM/X card (either four, eight or sixteen).

```
Enter the number of channels (16, 8 or 4):
```

Step 7. Each board installed must have its own Interrupt Vector (IRQ). The available interrupt vectors are listed on the screen:

```
Enter IRQ vector (2, 3, 4, 5 or 7):
```

Step 8. You must select a range of Port Addresses for each board. Each board has one Status Port and one I/O Port for each channel. The I/O Port address options for the PC/8 and MODEM/8 are shown in the example screen below; a similar screen will appear for four and sixteen port boards. Select the option for which you have set the board.

```
I/O Port Address and Status Port Address choices for this
board:
    Start I/O Port  |  Last I/O Port  |  Status Port
       Address      |     Address     |    Address
 ---------------------------------------------------------
 1)     0x100       |      0x138      |     0x140
 2)     0x148       |      0x180      |     0x188
 3)     0x1c0       |      0x1f8      |     0x200
 4)     0x210       |      0x248      |     0x250
 5)     0x258       |      0x290      |     0x298
 6)     0x2c0       |      0x2f8      |     0x300
 Please select option (1-6):
```

Note that if any of the I/O Port addresses or IRQ's you have selected are not available, you will see a message advising you of the problem, and you will have to reconfigure the PC/X or MODEM/X board(s).

For example, if your Hard Disk Controller had previously claimed I/O Port addresses that you requested for the PC/X or MODEM/X board, the following message (or similar) would be displayed:

```
System Message

DigiCHANNEL PC/X Async Driver Package - Version x.x.x cannot be
installed as the I/O Port Address Range conflicts with the
previously installed (hd) driver.

Re-configure the driver's characteristics to avoid the conflict
and install the DigiCHANNEL PC/X Async Driver Package - Version
3.0.0.

Strike ENTER when ready. If you strike ESC instead, the
installation is canceled.
```

Step 9.   The software now asks for the Altpin setting. This allows alternate wiring of the RJ-45 modular connectors, if you are installing a PC/X board with the RJ-45 option. The default for Altpin is OFF, giving you the standard DigiBoard RJ-45 pinouts. Setting Altpin to ON enables the alternate RJ-45 pinouts. The software asks:

```
The default setting for altpin is off.
Is this acceptable (y/n)?
```

Answer **y** or **n**, as appropriate. *If you are installing a MODEM/X board, answer n.*

Step 10.   At this point, the installation procedure sets up device names to be created in **/dev** and commands to be added to **/etc/inittab**, giving UNIX the information to use these additional ports.

For instance, if you are installing a PC/8 or MODEM/8, the software displays:

```
By default, dial-in ports are installed as devices
ttydla through ttydlh.  Dial-out ports are
installed as devices cudla through cudlh.

Is this acceptable? (y or n)
```

Step 11. The default device names are **ttyd1a** through **ttyd4p**, as described above and in the box "Format Used for Port Names" on page 29. Ports with Modem Control are installed as devices **cud1a** through **cud1p**.

The installation program allows you to choose alternate names for each port. You will be asked:

```
Is the base name "ttyd" acceptable? (y or n):
```

"Yes" Answer "**Y**" if the default device names listed above (and on your console screen) are acceptable. You may then proceed to *Building the New Kernel* (page 30).

"No" If you answered "**N**" to the preceding question, enter the name you wish when the systems responds:

```
Device names will be a base name with the board
number (1-4) and the port letter (a-p) appended.

Please enter base name to use: (default 'ttyd')
```

At this point, you may proceed to *Building the New Kernel* (page 30).

Format used for port names:

ttyd   Base name. You may select a different one. (**cud** is the default base name for dial-out ports.)

b   Board number. (1 through 4 possible, depending upon the number of boards installed. Only two PC/16 boards can be installed.)

p   Port number on the individual board (**a - d** for a four-port board, **a - h** for an eight-port board, **a - p** for a PC/16.)

(For example, if **crt** was the base name, Port 4 on the 3rd board would be **crt3d**.)

Building the New Kernel

In this part of the installation procedure a new kernel is made. This procedure is invoked automatically by the installation script.

You will see the following (or similar) message:

```
The UNIX Operating System will now be rebuilt.
This will take a few minutes.  Please wait.
```

When the re-build is completed, the following message will be displayed:

```
To complete the install/remove process a shutdown is now being
initiated automatically.

Make sure your floppy drive is empty.  If you are installing or
removing controller boards, you may power down the system after
shutdown is completed.
```

When the computer reboots, you should see messages which indicate the board is functioning. Your screen will look something like this:

```
DigiCHANNEL PC/X async driver V x.x.x, Copyright 1988, 89
DigiBoard Inc.

I/O Port Address Range    Status Reg Address  IRQ  Channels
-----------------------------------------------------------
0x100 - 0x138                   0x140           3      8
```

Enabling the New Ports

EURIX System V/386	Intel System V/386
Everex ESIX V/386	

Step 1. Use **vi** to enable the new terminal entries in the **/etc/inittab** file. The following entries have been automatically added for the boards (and ports) installed:

```
dla:23:off:/etc/getty ttydla 9600 # PC/X
dlb:23:off:/etc/getty ttydlb 9600 # PC/X
```

and so on.

- Change the word "**off**" to "**respawn**" for each terminal you want to be enabled.

- *If the board is a MODEM/X board, change the inittab entries to:*

```
dla:23:off:/usr/lib/uucp/uugetty ttydla 2400 # MODEM/X
dlb:23:off:/usr/lib/uucp/uugetty ttydla 2400 # MODEM/X
```

etc.

- The numbers associated with each "**ttyd**" represent the board and port number. ("**ttydla**" is Board 1 Port 1, "**ttydlh**" is Board 1 Port 8).

- The last number is an entry into the **gettydefs** file, which may be set to any of the allowable baud rates. In this case, "9600" specifies 9600 baud, 7 data bits, 1 stop bit, and even parity.

Step 2. Finally, enter the following command to get the login prompt on the screen:

```
init q
```
[Press ENTER]

AT&T UNIX:

Refer to the *Peripherals Setup* section of your AT&T
Operations System Guide for details on how to enable
serial ports. The following is an example of how to set
up one serial port (**ttyd1a**) for terminal usage:

Step 1.   Log onto the console as super-user (root).

Step 2.   Type:

        face   [Press ENTER]

     When asked by the software, select **System
Administration**. Select **Peripherals Setup**,
and then select **Serial Ports Setup**.

Step 3.   With the cursor "Serial Port Number," enter
the port number, or strike CHOICES to
obtain a list of the valid ports. If you
struck CHOICES, the Port Number pop-up
menu appears. Highlight the port number
related to **/dev/ttyd1a** and press the ENTER
key. The port number now appears in the
"Serial Port Number" field.

Step 4.   Move the cursor to the "Device Type" field
and enter **terminal**.

Step 5.   Move the cursor to the "Device Speed"
field and enter the device speed, or strike
CHOICES to obtain a list of the valid
device speeds. For example, enter **9600** as
your desired device speed.

Step 6.   Strike SAVE. Now the device **/dev/ttyd1a**
is available for use with a terminal.

Interactive 386/ix:

Step 1. To enable the ports, use the System Administration command **sysadm**. Then select **7** to access the **tty management menu**.

Step 2. At the next menu, choose **modtty** to show and modify characteristics of the tty lines.

Step 3. The software will list the current ports. Enter the name of one of the listed ports. The options you can then change for that port are:

> **State:**
> **Hangup Delay:**
> **Line Setting:**
> **Description:**

- Change the state from off to on.

- Change the hangup delay from off to the desired delay (in seconds).

- Choose the Line Setting from the list of supported devices/baud rates. (This list comes from *gettydefs*.) If in doubt, choose 9600 (2400 for MODEM/X boards). Refer to your UNIX documentation for more information.

- Add a description of the port if desired.

Repeat Step 3 for each added port.

Step 4. Select Quit, and the ports will automatically be enabled.

Uninstalling the Device Driver

To remove the DigiCHANNEL device driver software, follow the appropriate instructions for the operating system you are using:

AT&T UNIX:

Step 1.	Log onto the console as super-user (root).
Step 2.	Type:
	`face` [Press ENTER]
	When asked by the software, select **System Administration**. Select **Software Setup**, and then select **Remove Installed Software.**
Step 3.	From the on-screen display, select the label corresponding to the PC/X device driver.
	It will take some time for the new kernel to be built. When it is finished, perform a system shutdown.

EURIX System V/386   **Intel System V/386**
Everex ESIX V/386:

To remove the DigiCHANNEL device driver from the
default kernel, type:

     removepkg   [press ENTER]

The system will ask which package you wish to remove.
Choose the DigiCHANNEL PC/X async driver.

It will take some time for the new kernel to be built.
When it is finished, perform a system shutdown.

Interactive 386/ix:

To remove the DigiCHANNEL device driver from the
default kernel, type:

     sysadm   [Press ENTER]

When asked by the software, select **Softwaremgmt**, and
then select **removepkg**. When the system asks which
package you wish to remove, choose the DigiCHANNEL
PC/X async driver.

It will take some time for the kernel to be rebuilt. When
it is finished, perform a system shutdown.

Installation problems /
Reinstalling the old kernel

If you experience problems installing the DigiCHANNEL device driver, you can restore the original kernel and /etc/inittab file by performing the following steps:

When the system is first coming up, a message is printed:

```
Booting the UNIX System...
```

If you strike the space bar immediately after this message appears, you will be prompted for an alternate kernel to boot. Type:

        /unix.bak   [press ENTER]

This will boot your old kernel. Since even this old kernel will obey commands in the (now modified) /etc/inittab file, there may be many error messages sent to the system console regarding failure to open the DigiCHANNEL devices. Ignore these messages as best you can, and log in as root. As soon as possible thereafter, remove the DigiCHANNEL PC/X package from your system.

DigiCHANNEL TTY Devices

The PC/X - MODEM/X driver supports two different UNIX devices on each line. On line "1a," where "1" stands for the first board installed, and "a" is for the first line (port) on that board, there are two devices:

ttyd1a   The "regular" tty device, used for terminals, modems, printers, laboratory equipment, etc. This is also referred to as a "dial-in" device.

cud1a   The "Dial-out Device" for modem dial-out only. Put this name in **/usr/lib/uucp/Devices** and you can dial out on a modem otherwise used for dial in. If you are installing a MODEM/X board, you can use a dialer script for a Hayes 2400 baud modem.

Regular TTY Devices (ttydxx)

The **ttydxx** device is a traditional UNIX port with modem control. It requires Carrier Detect (pin 8) to be high before it will operate (Carrier Detect is sensed internally in the MODEM/X board).

When used with a modem, the port will wait for carrier before sending out the **login:** prompt, so the user is greeted properly on making a connection. When the carrier disappears, he is automatically logged out so the next person dialing in won't be able to access the system without a password. This also allows a remote user with a "hung" terminal to hang up, clear everything out, and then dial back in.

When used with a terminal or other device, it is usually wise to wire the DigiBoard DCD (pin 8) signal to the terminal's DTR (pin 20). When the terminal is turned on, the system outputs a

login: prompt. When the terminal is turned off, any associated jobs are killed, and the user logged out.

Dial-out Devices (cudxx)

Dial-out devices allow you to use a single modem for both dial-in and dial-out service. In theory, this can be done by the regular UNIX programs **uucp** and **cu**. In practice, however, this requires a complicated collection of locking and switching mechanisms that often don't work properly.

Dial-out devices fool errant communication programs into believing there are two real devices out there, making the locking mechanisms unnecessary. This allows a much broader set of programs to work together properly.

The regular device handles dial-in traffic only. An associated **getty** waits on the device open until the line is idle and carrier detect appears. This combination means a caller has dialed in. When this happens, **open** completes, and the line is assigned for dial-in use until the caller hangs up.

The dial-out device handles dial-out traffic only. A dial-out program looking for a free modem is allowed to open the device and assign it for dial-out service any time it is not already busy in dial-in serivce. Note that carrier is *not* required to proceed.

In most Unix V.3 systems, the **ttydxx** device is mentioned in **/etc/inittab** and **/etc/ttytype**, while the **cudxx** device appears in **/usr/lib/uucp/Systems** and **/usr/lib/uucp/Devices**.