

DigiBoard Card Installation

Each card needs to be given a unique 1/0 port address. There is no strict convention on assigning 1/0 ports, but generally, take the first unused address available (i.e. one that has not been used by another DigiBoard card already). The 1/0 ports available to DigiBoard cards are not used by other hardware we are currently using, so there should not be a problem with 1/0 port address conflicts.

Use the first available address for the type of card you are using. The 'hwconfig, command will tell you what addresses are already taken (as of the last time the system was booted). Hence if you have one each of the C/X, PC/Xem, and PC/Xe cards, the switches can all be set the same, equivalent to the first sequence line below, but each card has its own address. If you added another C/X card, for example, you would use the next available address in the C/X column.

ISA 1/0 Port address switch settings for all 3 types of cards:

Type:	C/X:	PC/Xem:	PC/Xe:	<-Name						
Use:	Remote/Local	Local		<-Where used local						
Soph:	High	Medium	None	<-Sophistication of concentrator						
Term:	Yes	No	N/A	<-Last conc. req.'s termination?						
Conn:	2xHD15	3 rows	4 rows	<-Type of connector on card						
Crds:	4	?	?	<-Max number of cards allowed						
Cncs:	8	4	1	<-Number of concentrators allowed to be chained						
Switches:										
Seq:	ISA Addresses:			1	2	3	4			
	1	108	104	100-103	UP	UP	Dn	Dn	off	is UP
	2	118	114	110-113	UP	Dn	UP	Dn	on	is Dn
	3	128	124	120-120	UP	Dn	Dn	Dn		
	4	208	204	200-203	Dn	UP	UP	Dn		
	5	228	224	220-223	Dn	UP	Dn	Dn		
	6	308	304	300-303	Dn	Dn	UP	Dn		
	7	328	324	320-323	Dn	Dn	Dn	Dn		

Sw 4: Unknown Unused ON (reqld) <-Switch 4 comment

Attaching the concentrators:

C/X: If only 1 channel on the card will be used, use channel 1 1st

RS232 modem use: EY-3026 H cable between card & host modem EY-3026 G cable between remote modem & 1st concentrator (cables obtained from Black Box) CSU/DSU has been successfully tested

Fiber optic cable use: Max distance between computer and concentrator is 1.2 miles

RS422 cable (2 wire) use: Max distance between computer and concentrator is 600 feet

Local use: Supplied short cables between card & its concentrator set thenode number on the concentrators. Each must be given a unique node. When "P111 is displayed on the concentrator, hit "->" once. Then press "<-" until the Right node number is displayed. Then press to select it. Each channel (if both channels are used) will have a node 1. The node number of the last concentrator on the channel must be equal to the total number of concentrators on that channel. In other words, if you have 3 concentrators on one channel, the last concentrator's node number must be 3. It is preferred that the 1st concentrator's is 1 and the 2nd's is 2, but it is required that the 3rd's is 3.

Its channel on host adapter card is closer to the motherboard

A total of 8 concentrators are supported per host adapter card between the 2 channels. They may be all put on 1 channel if desired, or spread as needed between the 2 channels. One channel can be remote (via modem) and the other can be local (not via mux). This is configured via Impi.

You must know how many concentrators are on each channel, and whether that channel is being used locally or remotely. Each concentrator requires a power supply. If you don't use a channel on the host adapter card, you don't have to terminate it.

PC/Xem: Put supplied terminator in last concentrator (required)

If mixing 8- and 16- port concentrators, hook up the 16-port concentrator(s) closer to the computer and make the 8-port concentrator last. This is because ldpal thinks all the concentrators are all 16-ports. If the 1st concentrator has 8 ports and the 2nd has 16, you would have to look at concentrator 1, port 9 in ldpal to actually be looking at concentrator 2, port 1.

You must know how many 8- and 16- port concentrators you have, and what order they are installed, for use with Impil later.

You need to use power supplies for concentrators past the first two. PC/Xe: Just hook up the (dumb) concentrator and you are in business.

DigiFax Card Installation (optional)

NEW/INCOMPLETE

Switches:	Hex addr:
UP UP Dn Dn	12e
UP Dn UP Dn	22e

DigiBoard Driver Installation:

Driver installation (needs to be done only once):

Note: The same floppy (driver) supports all 3 kinds of DigiBoard cards.

Note: If using the 3-1/21, floppy, append 11 -m /dev/installill to the 'custom' command (next).

```
# custom
l)nstall
RETURN (A New Product)
```

Choose an option: RETURN (Entire Product)

(You will be prompted to insert the floppy. Please do so as instructed)

Please press <CR>	RETURN
Press any key	RETURN
	F2
	Yes (exit)

Driver installation does not require the kernel to be relinked; driver configuration, however (below) does.

Driver configuration (do any time you add a new card):

Note: If adding a new card to an existing system, take the following precautions:

o Save the appropriate files from the /etc/conf/init.d directory, as they will be recreated. The filenames are epxx or epca. When these files are recreated, your enabled ports, baud rates, and comments will be lost! once the new file has been created, you can reconstruct the files as needed before relinking the kernel.

o Save a copy of /etc/ttytype, as all the ports for this card will be deleted and re-added

Note: If configuring DigiBoard over the modem, and your modem is a DigiBoard port, the modem port will have to be reconfigured (ie by reprogramming the modem) before you can get back in. If you take no action before relinking & rebooting, your port will be disabled, have the wrong baud rate, be uncommented, and have no terminal type. If the modem cannot be programmed for you, take the following steps for yourself:

- o Note your tty
- o Make sure to set ALTPIN to ON within Impil
- o Do not relink the kernel from within Impil make yours 'ldialup'
- o Edit the file in /etc/conf/init.d containing your tty and enable it. Change the baud rate while you're at it
- o Perform lfxTTYtype, to fix all ports, terminal types, or edit /etc/ttytyp
- o Perform lfxinittab, to fix all ports' baud rates, or edit the /etc/conf/init.d file(s) manually.
- o Relink the kernel (lfxinittab, offers to do this for you), rebuilding the kernel environment
- o Reboot the system. Disconnect from the modem after the new init state is announced on your screen

```
# digicfg                                (Start the front-end for Impil)
Press RETURN                             RETURN
Press any key                             SPACEBAR
Main                                       C)onfig
Config                                    I)nstall
Pick List                                 (Pick the type of card you are installing. This will generally be
                                           EPCA)
```

For the next few options, use **Arrows** to move & **F2** for choices. Use the **SPACEBAR** to change, **RETURN** to accept the choice, **F4** for a graphical representation of the card you are configuring, including jumpers & switches, **F1** for help & **F5** to proceed to the next screen

Total number of boards (Select the total number of boards of this type (both Xem and PC/X cards fall under the same category; hence if you are adding a C/X card and an Xem card, total number of boards would be 2)

Current Board (Toggle between the board(s) you have selected)

Adapter Type (Select the correct board type. Our normal architecture is ISA. Do not use EISA unless you know you have an EISA motherboard)

1/0 Address (Select the address you used when installing the card above. When done selecting, you can press F4 to see if the address you have chosen matches the card in the computer. Keep in mind that the card is shown backwards from how it is in the machine. Just match "OFF" on the screen to "OFF" on the card, and make sure you are looking at the right switch number, since they are right-to-left on the screen)

Memory Address (This must be a unique memory address. All DigiBoard cards may share the same memory address, but it is suggested that you use different addresses for each card to prevent memory swapping, which increases throughput. You can check 'hwconfig, for already-allocated memory addresses, but check against this table as well:

	C/X & Xem:	PC/X:	Comment:
These addresses	80000		Not available
not found when	88000		11
pressing F2 for	90000		if
PC/X or Xem!	98000		If
	A0000		OK

	A8000	OK	
	B0000	Video RAM	
	B8000	11	
	C0000	Video ROM	
		C2000	
		C4000	
		C6000	
Good 2nd choice-->	C8000	Maxpeed 7; Adaptec 2940?	
		CA000 Maxpeed 8; OK if no Maxpeed 8	
		CC000 Maxpeed 9; OK if no Maxpeed 9	
Good 3rd choice-->	D0000	CE000 Maxpeed 10; OK if no Maxpeed 10	
		DO000 Maxpeed 1; OK if no Maxpeed	1
		D2000 Maxpeed 2; OK if no Maxpeed	2
		D4000 Maxpeed 3; OK if no Maxpeed	3
		D6000 Maxpeed 4; OK if no Maxpeed	4
Good for Adaptec 2940--> D8000		D8000 Maxpeed 5; Adaptec 2842VL dflt	
		DA000 Maxpeed 6	
		DC000 Adaptec 1542C	
		DE000 ?	
Good 4th choice-->		E0000 Adaptec 2842VL w/ sw 6&7 down	
Good its choice-->		E8000 Adaptec 2940?	
		FO000 OK?	
		F8000 OK?	

TTY ID Select Auto

C/X:

Installation Method (Modem use: Custom Local use: Basic)

(Press F5 for next screen)

Total concentrators (Select the number of 16-port concentrators to be attached to this channel)

Cable Type: (Select from: 8W/Direct Supplied wire between card and 1st concentrator

4W/Direct

8W/RS422Modem

8W/RS232Modem EY-3026 G & H cable set used with CSU/DSUs (and other RS232 modems, presumably), even though the EY-3026 H cable has 5 wires

Speed: (Select the speed of the modem you are using. For 56.2 kbaud, use 57.6K)

(After configuring both lines (channels), press F5)

Xem: Number of EBI modules (Select the number of EBI modules (concentrators) that will be attached to this card)

(Press F5 for next screen)

EBI Module X: (Select the type of PORTS module (concentrator) you will have for this concentrator. Types a are:

PORTS/16em

16 ports

PORTS/8em

8 ports

PORTS/8emp

8 ports w/ parallel port

Remember to leave the 8-port concentrator(s), if any, as the *last* concentrator(s) in the line, so ldpal (DigiPort Authority) will be more user-friendly) (Press F5 when done configuring all EBI modules)

If there are more cards to configure of this type, you may hit ESC to back up and configure them before completing the Dscreen/AltPin window. Go to "Current Board" and select the next card; otherwise proceed here.

Install DigiScreen Yes

DigiScreen devices (Choose this for yourself; if in doubt, 32 is a nice number)

Altpin setting On (In spite of what the help screen (FI) says, turn Altpin on. Altpin is used chiefly for modems, and the modem adapter (DB25F-RJ45) has been designed assuming Altpin is on. If Altpin needs to be turned off for a certain port, it can be done with ditty')

Note: Turning Altpin on turns it on for every concentrator for this card (maybe even on all DigiBoard ports). Every time you reconfigure DigiBoards with Impi, (i.e. adding a card or concentrator later) you must turn Altpin back on--it will not remember that you wanted it on from last time. See other caveats above in the "if adding a new card to an existing system" note above.

Note: Pressing F5 here makes changes that require relinking your kernel later. (Press F5 when done with this screen. Several screens of information will be presented. Hit buttons as prompted)

```
rebuild kernel now      n)o
Config                  ESC
Main                    ESC
```

(The already-existing DigiBoard ports will now be restored to their current status, and new DigiBoard ports will be configured with defaults (gettydef 'loll & terminal type wy150-25)) You may not be asked the next question: relink kernel now? y

If you had to relink the kernel, please reboot the system as soon as possible. Printers:

A new version of /etc/rc.d/8/userdef that supports DigiBoard must be installed. This should not be a problem for new systems, but systems already using Maxspeed and being converted to DigiBoard must be given this file. It may be transferred from ABCSSup!, but be sure to make it executable after transferring it (chmod +x /etc/rc.d/8/userdef).

Normally, printers are configured using DigiBoards, 'ditty, command as ditty printer 9600 ctspace rtspace ttyXXX where ttyXXX is the DigiBoard printer port. This configures the printer for 9600 baud, DTR handshaking. If you wish to use alternate settings, create the file /etc/rc.d/8/dittycfg. File layout is as follows:

```
ttyXXX whitespace      alt-settings
ttyXXX                  DigiBoard printer port to be given alternate setting
whitespace              Tab(s) and/or space(s). A single tab is recommended
alt-settings            Alternate arguments to be passed to 'ditty'. For example:
9600 XON/XOFF           9600 ixon
38400 DTR                38400 ctspace rtspace
```

Just like with lttysset,' changes do not take effect by merely changing the file. To make the changes take effect, perform /etc/rc.d/8/userdef.

DigiFax Driver Installation (optional):
NEW

Load the driver (2 floppies) with custom, or use lswinstall' if available.

```
DigiFax Commands Installed ..... [Enter]
Installing the dfax ..... y)es
DigiFax FAX/1 or FAX/2 installed ..... [Enter]
Installing the jfax ..... n)o
Installing the bfax ..... n)o
Installing the hpsj ..... y)es
HP ScanJet(Plus) installed ..... [Enter]
Installing the sjii ..... y)es
HP ScanJet IIp/IIc installed ..... [Enter]
Enter a device name to modify dfax
Enter hexadecimal starting 10 (Use:
..... 12e for UP UP dn dn
.....or 22e for UP dn UP dn)
Do you want to enable the board.....y)es
Enter hexadecimal starting 10 .....q)uit
Enter a device name to modify .....q)uit
```

```

Enter a device name to modify .....q)uit
Device Drivers configured .....[Enter]
Symbol set PC-8 is currently .....q)uit
Fonts configured .....[Enter]
OK to build your new kernel right now? .....y)es
kernel boot by default?.....y)es
ernel environment rebuilt?.....y)es
New Kernel Built ..... [Enter]
Type channel number to modify ..... q)uit
1 FAX channels configured ..... [Enter]
run /etc/faxconfig right now?.....n)o

```

If using 1swinstall:1
Please enter one of the following: l)gnore the error, and continue
If using custom:,
(verification error message) Continue

After rebooting, make sure the DigiFax card is found. (There should be a lldfax0x" line, and it should not say "Device Not Present." lbootpagel will report it, but 'hwconfig' will not.)

To configure the fax card:
32v5: sysut -> Third Party -> DigiFax configuration
32v4: faxconfig

Second Tape Drive Installation (optional):

Please perform the following based on the type of interface on the tape drive:

Proprietary: (No info available)

SCSI: Configure the address on the tape drive using the proper jumpers and/or DIP switch settings. It must be unique among the devices being served by its host adapter. For instance, the following probably already exist:

ID	Device
0	Hard drive
1	Second hard drive (if installed)
2	Original tape drive

In this case, the next logical number to use is 3. (In general, it is a good idea to leave l for later expansion as the second hard drive.)

If using Adaptec host adapters, don't forget to make sure that the only last physical device, and perhaps the first physical device, on the daisy cable are terminated.

```

#                               mkdev tape
Select an option:                1 (Install)
Select an option:                4 (Install SCSI Tape Drive)
config. SCSI drive now?         y
ID of controller:                (Type the number of the address you
                                chose above. This will probably be 3.)
SCSI host adapter:              0
LUN:                             0

```

You should see a screen similar to this:

The following special devices have been created:

```
/dev/rStpi /dev/nStpi /dev/xStpl
```

Another SCSI Tape Drive is currently linked to the default device /dev/xctO. Would you like the current SCSI Drive linked to the default devices? (y/n) Answer: n

Another Tape Drive is currently listed as the default in /etc/default/tape. Do you wish to change this to the current SCSI Tape Drive (y/n)?

Note: This question involves use of the 'tape' command. Answer: (If the customer is to do backups on his primary drive, answer 'ln;" if he is to do his backups on the new (second) drive, answer)

Select an option: q (Quit)

(Both Proprietary & SCSV: create kernel now? y
This kernel to boot by default? y
Kernel environment rebuilt? y
#shutdown -go -y (Reboot the system)

When the system has rebooted, make sure the sizes of the tape devices in /etc/default/tar (probably archive8 & archive9) are correct. Use a text editor to edit the file. For example:

```
archive8=/dev/rcto          20          0          y
archive9=/dev/rStpi        20          256000y
```

Shows that /dev/rcto has no defined size to it, but /dev/rStpi has a limit of 256000 blocks (250 MB). If a device is a 1.3GB drive, the second-to-last column can be 0, since we have no hard disk that exceeds the storage capacity of a 1.3GB tape drive; if the device is a 150 MB tape drive, the number needs to be 256000 (250 MB).

Tape Drive Installation (Software):

Unix 3.2 v4.0:

It is likely not necessary to perform this section for the first tape drive configured on the system when using a SCSI tape drive.

Address the tape drive and card as described under the "Hardware Installation" section.

You may do this section either in single-user mode (type "abcsill at the "Type CONTROL-d.... 11 prompt) or in multi-user mode (login as root).

Please perform the following based on the type of interface on the tape drive:

Proprietary:

```
# mkdev tape
Select an option: 2 (Remove)
Select an option: 1 (Remove Cartridge Tape Drive)
```

Installation from tape:

In /etc/default/boot:
Current boot string is 11wangtek(Ox220,7,1)11
Enter new string, 'lrm' to ... rm

```
Select an option: 2 (Remove)
Select an option: 4 (Remove SCSI Tape Drive)
ID of controller: 2
SCSI host adapter: 0
LUN: 0
```

Installation from tape:

```

In /etc/default/boot:
No current boot string
Enter new string, 'lrm' to ... rm
Select an option: 1 (Install)
Select an option: 1 (Install Cartridge Tape Drive)

```

You may get a message stating: The Cartridge Tape Driver is already present in system configuration files. Do you wish to continue? (y/n)

If this happens, answer

```

Enter an option: 1 (Display current tape parameters)
Enter an option: 2 (modify current tape parameters)
Enter a parameter: 1 (Controller type)
Controller type: (Under most circumstances, 3 (type W (Wangtek)) will work; however,
                  1 (type an Archive tape drive)
Enter a parameter: 2 (DMA Channel)
DMA: 1
Enter a parameter: 3 (Interrupt Vector)
Interrupt: 7
Enter a parameter: 4 (Base Address)
Base Address: Ox220
Enter a parameter: q (Quit)
Enter an option: 1 (Display current tape parameters)

```

Your output should say this:

Tape Parameters	Value	Comments
-----	----	-----
1. Controller Type	3	1 = type A, 3
2. DMA Channel	1	1 or 3
3. Interrupt Vector	7	logical vector number
4. Base Address	Ox220	i/o addresses start here

If it does not, choose option 2 and change the proper parameter. Make sure you have these settings before proceeding.

Enter an option: q (Quit)

You should see a screen containing the following:

Default special devices have been created with the following links:

```

/dev/xcto
/dev/rcto          linked to          ...

```

Installation from tape: In /etc/default/boot: No current boot string

Enter new string, 'lrm' to ... rm

You may get a message stating:

Another Tape Drive is currently listed as the default is /etc/default/tape. Do you wish to change this to the current Cartridge Tape Drive? (y/n) If this happens, answer

Select an option: q (Quit)

SCSI:

Note: Before installing the SCSI tape drive, make sure the changes to /etc/perms/rtsmd (outlined at the end of the 11***Unix Installation*** section) are completed so that the correct minor numbers are assigned to the SCSI tape devices.

```
# mkdev tape
```

Select an option: 2 (Remove)
Select an option: 1 (Remove Cartridge Tape Drive)

Unix 3.2 v2.0:

Installation from tape:

In /etc/default/boot:
No current boot string
Enter new string, 'lrm' to ... rm

Select an option: 2 (Remove)
Select an option: 4 (Remove SCSI Tape Drive)
ID of controller: 2
SCSI host adapter: 0
LUN: 0

Unix 3.2 v4.0:

Select an option: 2 (Remove)
Select an option: 4 (Remove SCSI Tape Drive)
Select an option: 1 (Remove SCSI Tape Drive Enter h for a list ad (Adaptec host adapter)
SCSI host adapter: 0
Target ID of device: 2
LUN: 0
Update SCSI config? y

Installation from tape:

In /etc/default/boot: No current boot string
Enter new string, 'lrm' to ... rm

Unix 3.2 v2.0:

Select an option: 1 (Install)
Select an option: 4 (Install SCSI Tape Drive)
config. SCSI drive now? y
ID of controller: 2
SCSI host adapter: 0
LUN: 0

You should see a screen similar to this:

The following special devices have been created:
/dev/rStpo /dev/nStpO /dev/xStpo

Default special devices have been created with...

If you do not see this screen, the SCSI tape drive will not be recognized. Make sure that the Cartridge Tape Drive has been removed, and try again, starting at the "(Install)" line above.

Unix 3.2 v4.0:

Select an option: 1 (Install)
Select an option: 4 (Install SCSI Tape Drive)
Select an option: 1 (Install SCSI Cartridge)

Note: Even with DAT drives, use option 1. Option 4, for DAT drives, configures the DAT device for logical devices within the DAT tape, which we do not take advantage of.

```
config. SCSI drive now?                y
Enter h for a list ....                ad (Adaptec host adapter)
SCSI host adapter:                     0
Target ID of device:                   2
LUN:                                    0
Update SCSI config?                    y
```

You should see a screen similar to this:

The following special devices have been created:

```
/dev/rStpO          (default)
/dev/urstpO         (rewind, unload)
Press <Return>     RETURN
```

Default special devices have been created with...

If you do not see these screens, the SCSI tape drive will not be recognized. Make sure that the Cartridge Tape Drive has been removed, and try again, starting at the "(Install)" line above.

Installation from tape:

```
In /etc/default/boot: No current boot string
Enter new string, 'lrm' to...                rm
```

Note: If you wish to install the second SCSI tape drive now, you may do so by "inserting" the "Second Tape Drive Installation" section, "SCSI:" paragraph, the line after
#mkdev tape

However, device 11911 will not be available via the "tar tv911 command until after the abcscfg tape is loaded.

```
Select an option:                q (Quit)

(Both Proprietary & SCSI):
create kernel now?                y
this kernel to boot by default?   y
kernel environment rebuilt?       y
#                                  reboot      (Reboot the system)
```

Note: If, when you are trying to bring the system back up, and at the "Boot:" prompt you get something strange like hd(40)Unix rmn

You need to follow the procedures in the "Data Recovery/Hung System" section entitled "Fixing a Bad 'Boot:' String."

When the system comes back up, test that the tape drive works. Get any tape that you know has 'tar' data on it (the abcscfg tape is a good example) and insert it in the tape drive.

```
# tar tv8 (Get a table of contents from the tape w/o loading its contents)
```

Make sure that the tape does more than just make noise--it can make noise and still not read properly. After you have seen some file names go by, you know it works. You can either let the tape read all the way to the end, or if you want to abort it (it can take quite a long time if you're using a data tape), either:

- 1) If it is a DAT drive, press CTRL-D
- 2) If it is not a DAT drive, remove the tape from the tape drive without trying to abort the operation with CTRL-D (CTRL-D may hang the process and force you to reboot before using 'tar' again). This will cause error messages to appear on the console, but don't worry about that.