DTL-H2500 Installation and Operation

Documentation Version 1.018

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Table of Contents

About this Manual

This is the CDROM release of the Installation and Operation Manual for the DTL-H2500 Development System. Library functions and structures are detailed in the Library Reference volume of the PlayStation Developer Reference Series.

Discard the black diskette which came with your development system since it is now out of date. More up-to-date versions are on the CD-ROM that came with your system. The latest software and patches can be obtained from our Web Sites. Read the section "Technical Assistance" below for more details.

Manual Release History

Version	Released	Change
Ver. 1.0	18-Oct-96	
Ver 1.004	18-Nov-96	
Ver 1.006	29-Jan-97	
Ver 1.007	20-Feb-97	
Ver 1.008	12-Mar-97	Added info on running CD-ROMs from the DTL-H2510.
Ver 1.009	14-Mar-97	Corrected info on "If 'addr' is set to any of the addresses from 0x00000001 to 0x000FFFFF (1 M or less), the address mapping by the PCI will fail" to "If 'addr' is set to any of the addresses outside of the range from 0x00000001 to 0x000FFFFF (1 M or less), the address mapping by the PCI will fail." Based on information from K.S. at SCEI.
Ver 1.010	07-Jun-97	Removed references to BBS.
Ver 1.011	09-Jun-97	Added portion on running CD samples
Ver 1.012	01-Jul-97	Set “Micron” incompatible from “incompatible (?)” to definitely incompatible.
Ver 1.013	28-Jul-97	Changed the method for determining the available IO port addresses and interrupts (you can use the "Print…" to print out the summary).
Ver 1.014	01-Aug-97	Changed "415" area code to "650". Revamped the "Technical assistance" section.
Ver 1.015	15-Aug-97	Incorporated new list of computer-compatibility issues, and merged the older table into the new table. Added the bitmap of the memory range dialog box.
Ver 1.016	18-Aug-97	Fixed typographical errors, alphabetization problems, etc., with the computer-compatibility table. Revamped the running of CD-ROMs on the DTL-H2510.
Ver 1.017	11-Sep-97	Manual was reformatted.
Ver 1.018	12-Nov-97	Changed “\psx\bin\” to “\psx\bin\DTLH2500\H25DRV” and “\pssn\bin” to “\pssn\bin\DTLh2500\H25bios” where appropriate. Added a little bit more to the dbugpsx section.
Ver 1.019	26-Nov-97	Fixed typographical errors and table headings.

Related Documentation

In addition to this document, the installation sheets which were provided with the hardware contain helpful information.

The Technical Reference CD contains documentation in "*.pdf" format, and can be read using the Adobe Acrobat readers supplied on the CDROM. Insert the Technical Reference CD into your PC and run the setup programs to install the Adobe Acrobat reader.

Note that the Web Sites post late-breaking developments regarding the Libraries and also provide notices of forthcoming documentation releases and upgrades. Read the section "Technical Assistance" below for more details.

Technical Assistance

If you are experiencing problems, we highly recommend that you first search the Technical Reference CD since this is the same tool our Technical Support group uses to attack a problem. It is highly probable that other developers have encountered the same problem in the past and that it was solved and then documented on the Technical Reference CD. However, don't bang your head against the wall! If (and only if) you are a licensed developer, you can reach technical support for your region at the following addresses and telephone numbers. For more information and for a set of bug report forms, refer to the Technical Reference CD.

SN Systems

SN Systems writes the compilers for the standard PlayStation development kits. All licensees of SCEA and SCEE are welcome to email bug reports or ask questions about the compilers.

E-mail: support@snsys.com.

Web Site: http://www.snsys.com.

Sony Computer Entertainment America

SCEA is available to licensees in North America only.

E-mail: DevTech_Support@interactive.sony.com

Web Site: http://www.scea.sony.com/dev

Developer Support Hotline: 650-655-8181, Monday through Friday, 8am to 5pm, Pacific Standard Time.

Mail: Sony Computer Entertainment America Inc., 919 East Hillsdale Blvd., 2nd Floor, Foster City CA 94404

Sony Computer Entertainment Europe

SCEE is available to licensees in Europe only.

E-mail: dev_support@interactive.sony.com

Web Site: https://www-s.playstation.co.uk

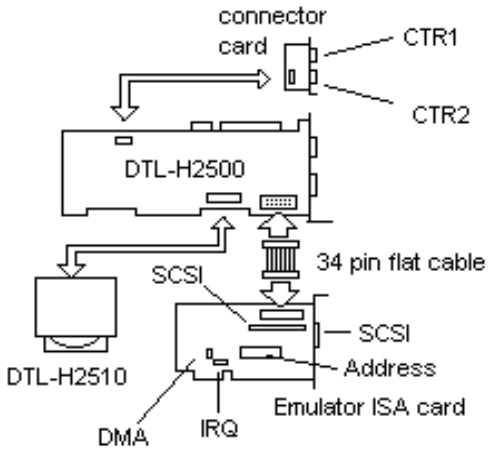
Developer Support Hotline:+44 (0) 171 390 1680

Mail: Waverley House 7-12 Noel Street London W1V 4H

Chapter 1:
Hardware Installation

Before you Begin

This chapter describes the installation procedures for the following equipment:



Required:

DTL-H2500 PCI card and an available PCI slot
DTL-H2500 connector card
Psy-Q security dongle, which allows you to use the PSSN software.

Optional:

DTL-H2510 CD-ROM drive

CD-ROM Emulator ISA card, an available ISA slot, and an AV SCSI hard drive from the following list:

DCAS-34330	ULTRA SCSI 4.3GB/IBM
Fireball ST-3200S	ULTRA SCSI 3.2GB/Quantum
Fireball TM-3200S	ULTRA SCSI 3.2GB/Quantum
Atlas XP-4550S	ULTRA SCSI 4.5GB/Quantum
Medalist ST52160N	ULTRA SCSI 2GB/Seagate
Barracuda ST32171N	ULTRA SCSI 2GB/Seagate

Hardware Installation Procedure

Step 1: Turn off your computer. Discard or recycle the black diskette supplied with the DTL-H2500 kit since it is not needed.

Step 2: Connect the DTL-H2500 connector card onto an open slot on the PC.

Step 3: Insert the DTL-H2500 (PCI card) into an available PCI slot.
Because the PCI card is Plug & Play, setting the IRQ's or DMA numbers is not necessary.

Step 4: Connect the PCI to the controller connector card.
Connect the DTL-H2500 PCI card to the DTL-H2500 connector card using the 10 pin flat cable included in your kit.

Step 5: Connect the audio/visual outputs to your television.
Refer to the "DTL-H2500 PlayStation Board Operating Instructions" sheet for further details.

Step 6: Attach the PlayStation controllers to the outputs of the DTL-H2500 board.
Refer to the "DTL-H2500 PlayStation Board Operating Instructions" sheet for further details.

United States developers: In the US, the DTL-K2500 Programmers Tool Kit includes the DTL-H2080 Controller Box along with 2 SCPH-1010 Controllers. If you did not receive your controllers, call the Tool Operations Group at (US) 650-655-8145.

European developers: In Europe, the DTL-H2500 PlayStation development board is licensed as a separate unit and does not include controllers. We recommend you order a DTL-H2080 Controller Box with your DTL-H2500; call the Tool Operations Group at (Europe) 0171-4471650.

Step 7: Attach the Psy-Q security dongle onto the PC's parallel printer port.
Warning: Do not connect any peripherals to the back of the security dongle. Although it was designed to be a pass through device, the dongle may be damaged when connected to certain devices such as external parallel-interface SCSI hard disks. Damaging the dongle will result in the inability to launch the assembler or debugger until the dongle is replaced.

Step 8: (Optional) Install the DTL-H2510 CD-ROM drive
The CD-ROM drive reads PlayStation debugging disks. Follow these steps:

_ Place the drive in an open drive bay on the PC.
_ Connect the 50 pin flat cable, included in your kit, to the CD-ROM drive.
_ Connect the other end of the 50 pin flat cable of the CD-ROM drive to the DTL-H2500 board.
_ Connect the 4 pin hard-drive power cable into the CD-ROM drive's power inlet.

Step 9: (Optional) Install the emulator card.
If you have a CD-ROM emulator card (PSX-04 or DTL-K4) and a dedicated AV SCSI hard drive (for more details, refer to the manual "DTL-H2510 CD-ROM drive"), please read the comprehensive "readme.txt" that came with the software in that kit. The "readme.txt" explains how to install the card. However, you should defer this installation until after you are certain that your PCI card is functioning properly.

Please make a note of the address settings, DMA, and IRQ on the ISA card:

DMA: _____

IRQ: _____

IO Address: _____

Although the emulator card's actual address is in 4 byte hexadecimals, the DIP switch host's A15-A4 3 bytes are in decimal format. The actual addresses and a table of their equivalents are entered below:

IO Address Decimal Notation	Hex Notation	Actual Address	Remarks
300	0x12C	0x12C0	
308	0x134	0x1340	Default
310	0x136	0x1360	
318	0x13E	0x13E0	
380	0x17C	0x17C0	
388	0x184	0x1840	
390	0x186	0x1860	
398	0x18E	0x18E0	

In this case, take A15-A4 from 0x1340 and match it with 0x134 to get "308". In addition, the DMA channel and the interrupt number have their own DIP switches. Make a note of the settings, since they will be used as parameters to the driver software in Chapter 3.

Step 10: Reboot your computer.

If you have Windows 95 with Plug & Play support, the hardware wizard will report that it has found the PCI card. Next you will be asked if you want to install the driver or not. Be sure to choose "Do not install the driver". The PCI's device driver is an MS-DOS, so it is not possible to install it from the Windows 95 hardware wizard.

If the computer does not boot up properly,

- Recheck your work.
- Make sure all cables are securely plugged in
- Make sure the boards fit snugly in their slots.
- Try switching boards and slots. For instance, if your computer has multiple PCI slots, try temporarily detaching a board which is not necessary for PlayStation development. Reinstall the PCI card into that slot, and then try to start the system again. Refer to the case study in Chapter 6 to see how one person ran into similar problems and solved them.
- Read the next chapter to learn how to install the DTL-2500 device drivers and the PlayStation development software.

Chapter 2:
Software Installation

Before you Begin

Before following the instructions in this chapter, you should have already completed the steps in the previous chapter. This chapter describes the installation procedures for the PlayStation software tools, which are distributed in the Programmer Tools CD DTL-H2500 Update disk.

Make sure your Psy-Q security dongle is in place. Go on to the next section, "Installing Software Drivers and Software Tools".

Installing Software Drivers and Software Tools

In the following steps, we assume that the local hard drive is your "c:\" drive and your PC CD-ROM drive is " d:\":

Step 1: Insert the Programmer's Tools CDROM

Insert the Programmer's Tools CD (DTL-S2002) into your CD-ROM drive (not the DTL-H2510) of your system. **If you have Windows 95**, you can run the Setup program, "setup.bat" in the root directory of the CDROM. Follow all of the instructions. After the computer reboots (to set environment variables) skip to **Step 6.**

Step 2: Install the "psx" tool

The directory "[cdrom]:\psx" contains the PlayStation Development directory, which includes over 100 sample programs with full source code, the includes, and the linking libraries.

If applicable, back up or delete your previous "c:\psx" directory.

To be consistent with the automatic installation of the software under Win95, we are creating a parent directory "PS" which all PlayStation software will be installed under. Copy the "psx" directory, d:\psx, from the CD to your local hard drive c:\ps\psx:

```
xcopy /s d:\psx c:\ps\psx
```

(or just drag and drop the folder).

_ Add the line

```
set path=%path%; c:\ps\psx\bin
```

to the end of your "c:\autoexec.bat" file.

Step 3: Install the "pssn" tools

The directory "[cdrom]:\pssn" contains the standard PlayStation development system, which includes an interactive debugger and the C compiler.

_ If applicable, back up or delete your previous "c:\pssn" directory.
_ Copy the "pssn" directory, d:\pssn, from the CD to your local hard drive c:\ps\pssn.
_ Copy the contents of the "gnu" directory, d:\gnu, from the CD to your local hard drive c:\ps\pssn:
_ xcopy /s d:\gnu* c:\ps\ pssn \bin
_ Add the following line to the end of your "c:\autoexec.bat" file.

```
set path=%path%;c:\ps\pssn\bin
```

Step 4: (Optional) Install the "psxgraph" tools.

The directory "[cdrom]:\psxgraph" contains the tools for converting between standard graphics file formats and the PlayStation formats. Although we are setting up the "Graphic Artist Tools program" area, it does not contain the entire tool set for the Graphic Artist Tools. Only the conversion tools are included on this CD. Please contact your regional tools coordinator for information on how to obtain the Graphic Artist Tools CD (DTL-S220).

- If applicable, back up or delete your previous "c:\psxgraph" directory.
- Copy the "psxgraph" directory, d:\psxgraph, from the CD to your local hard drive c:\ps\psxgraph.
- Add the following line to the end of your "c:\autoexec.bat" file.

```
set path=%path%;c:\ps\psxgraph\bin
```

- Copy the all files located in the "system" directory, d:\psxgraph\system, to the window's system directory, i.e. c:\windows\system. These files are used by the Movie Converter.

- If you have Windows 95, skip to step 5. Otherwise, you will have to create the groups and match the icons yourself, by performing the following steps in Windows 3.1:

Graphic Artist Tools program group

Create a Graphic Artist Tools program group in the Windows 3.1 environment.

1. Under the Program manager "File" pulldown click on the "File>New" button.
2. Select Program Group; click OK.
3. Fill in the Description "Graphic Artist Tools". You may leave the "Group File" field blank. A new group will be displayed.
4. You are now ready to add the individual tool icons. Please follow the individual program installation instructions listed below if you are using Windows 3.1.
   Note: For additional details on setting up program icons, please refer to your Windows 3.1 manual.

Movie Converter

With the "Graphic Artist Tools" program group selected, create a program icon for the Movie Converter tool:

1. Under the Program manager "File" pulldown, click on "File->New" button.
2. Select Program Item and click OK.
3. A Program Item Properties dialog will pop up. Type "Movie Converter" in the Description field.
4. Use Browse, to identify the name of the executable to be placed in the "Command Line" field. (i.e. c:\ps\psxgraph\bin\movconv.exe)
5. Click OK.

Movie Pack

With the "Graphic Artist Tools" program group selected, create a program icon for the Movie Pack tool:

1. Under the Program manager "File" pulldown, click on "File>New" button.
2. Select Program Item and click OK.
3. A Program Item Properties dialog will pop up. Type "Movie Pack" in the Description field.
4. Use Browse, to identify the name of the executable to be placed in the "Command Line" field (i.e. c:\ps\psxgraph\bin\movpack.exe).
5. Click OK.

3DStudio Plug-In

This release is for 3DStudio plug-in utilities. We highly recommend removing the Psy-Q dongle and attaching the 3DStudio dongle before progressing with a modeling session utilizing the 3DStudio plug-in.

Warning: Do not remove or add dongles while the PC is powered on. Do not start a 3DStudio plug-in session before performing the following:

1. Remove dexbios (only if dexbios is installed)
2. Remove mess1.com (only if mess1 is installed)
3. Remove cdbios (only if CDBIOS is installed)

Please read the files *.doc and *.txt in the "c:\ps\3rdParty\3ds" directory. Specific installation instructions are included in the 3dstod_e.txt file.

Step 5: Add environment variables.

Edit your autoexec.bat file to contain the lines listed below.

Note: This example depends on where you have set up your root PSX and Psy-Q directory. The file paths contain forward slashes, unlike the normal DOS convention which uses backward slashes.

```
REM ===== PSX Development Environment Variables =====
set SN_PATH=c:/ps/pssn/bin
set COMPILER_PATH=c:/ps/pssn/bin
set PSX_PATH=c:/ps/psx/bin
set C_INCLUDE_PATH=c:/ps/psx/include
set C_PLUS_INCLUDE_PATH=c:/ps/psx/include
set LIBRARY_PATH=c:/ps/psx/lib

set GO32=DMPISTACK 1000000

REM ===== GNU C/C++ ==================================
set GO32TMP=c:/tmp
set TMPDIR=c:/TMP

REM If your computer does not have a floating point
REM co-processor then uncomment the following line:
REM set GO32=emu c:\ps\pssn\bin\emu387
REM ================================================
```

The file c:\ps\pssn\bin\SN.INI is referenced by the compiler. This file can be used to contain some of the DOS environment variables. When the environment variables and SN.INI are both defined, SN.INI is given preference. For example, your c:\ps\pssn\bin\SN.INI file could include

```
[ccpsx]
    stdlib=libapi.lib .....
    set PSYQ_PATH=c:\ps\pssn\bin
    COMPILER_PATH=c:\ps\pssn\bin
    LIBRARY_PATH=c:\ps\psx\lib
    C_INCLUDE_PATH=c:\ps\psx\include
```

to achieve the same result.

Step 6: Verify your ability to compile.
To make sure you can compile, reboot your machine to register the environment variables. Make sure your paths are set correctly. If they are not, you may have to increase the environment memory space in your config.sys, using a line similar to this:

```
shell = command.com /E:1024 /p
```

The "/E:1024' sets the environment size to 1024 (valid ranges are from 160 to 32768), and '/p' makes this command.com the default command prompt. (See p.342 of *Peter Norton's Complete Guide to DOS 6.22* 6th Edition for further details).

Once you are certain that the paths are set up correctly, you can proceed to compile. At an MS-DOS prompt, type the following two lines:

```
cd c:\ps\psx\sample\graphics\balls
psymake all
```

The sample should compile with no errors and return a command-line prompt. If you have problems, please recheck your steps. Otherwise please contact us (refer to the section in Chapter 1 about Technical Assistance).

However, since the device drivers for the DTL-H2500 board have not been installed yet, the program cannot be run. The following steps explain how to do this.

Step 7: (Optional) Install the CDROM emulator software.
If you have the CD-ROM emulator, you can install it now. However, since you may encounter problems, we recommend that you defer this installation until after you have finished installing the driver software for the DLT-H2500. Finish the rest of the installation and then return to this step.

Read the "readme.txt" that came with your CD-ROM emulator kit, since this is a full set of instructions for setting up your emulator card. In addition, note that the “cdbios” driver contains commands of the following form:

```
cdbios /a<address> /d<dma>  /i<interrupt>
```

The address, dma channel, and interrupt number correspond to the three DIP switch settings on the ISA board. Although the emulator board’s actual address is in 4 byte hexadecimals, the DIP switch host’s A15-A4 3 bytes are in decimal format. The actual addresses and a table of their equivalents are entered below:

Decimal Notation	Hex Notation	Actual Address (in hex)	Remarks
300	0x12C	0x12C0	
308	0x134	0x1340	Default
310	0x136	0x1360	
318	0x13E	0x13E0	
380	0x17C	0x17C0	
388	0x184	0x1840	
390	0x186	0x1860	
398	0x18E	0x18E0	

In this case, take A15-A4 from 0x1340 and match it with 0x134 to get "308". For more information, please refer to the "CD Emulator" book on the Technnical Reference CDROM.

In some PC's it is difficult to use the short ribbon cable supplied with the emulator board to the DTL-H2500. The cable is standard and a longer version can be acquired from most electronic shops.

Step 8: Install the device drivers for the DTL-H2500.
You are now ready to read the next section, "Installing the H25DRV.EXE driver."

Installing the H25DRV.EXE driver

There are currently two device drivers.

H25Drv.exe allows you to use a terminal-based program called DECICONS. To debug your programs, 'printf's' must be used. You cannot use the SDevTC tools for running programs or loading memory, although you can still compile programs using "psymake". H25Drv.exe is the basic, "no-frills" device driver which works with the PCI card. **You must use this driver to verify that the PCI card is functional.**

H25Bios.Com allows you to use the SDevTC tools RUN, PQBLOAD, and the interactive debugger DBUGPSX.

To install H25DRV.EXE, perform the following steps:

Step 1: Edit "config.sys" and "system.ini".
Add the following line to "c:\config.sys":

```
DEVICE=C:\ps\psx\bin\H25DRV.EXE  /V   /N
```

If you use the EMM386.EXE memory manager, add the following line to "c:\config.sys":

```
DEVICE=EMM386.EXE. . . . . X=C800-C9FF
```

This reserves a block of memory for the PCI card.

To allow the DECICONS program (discussed later) to use colors, a line similar to the following should be added to your "c:\config.sys" file:

```
devicehigh=c:\dos\ansi.sys
```

The "ansi.sys" file may exist in a different directory, so please modify the above line accordingly. Otherwise, some of the text output by the DECICONS program will look like garbage.

If you use Windows 3.1 , add the following line to the “386Enh” section of “c:\windows\system.ini“:

```
[386Enh]
EMMExclude=C800-C8FF
```

Step 2: Run FLASHB8.BAT.

If your PCI board was OK on bootup, run FLASHB8.BAT (this needs to be done only once):

```
cd c:\ps\psx\bin\DTLH2500\H25DRV
flashb8.bat
```

This loads the OS ROM image file c:\ps\psx\bin\DTLH2500\H25DRV\H2500b8.img into the flash ROM of the PCI board, which enables access to the PC filing system (PCFS). During the installation, your TV monitor will flash strange colors for a period of time. This does not indicate a problem; leave it alone until the configuration has finished. (If your monitor does not flash strange colors, there may be a memory conflict, but you should perform the following two steps and take special note of the BIOS. If you have an AMI BIOS, follow the steps in the section ‘Installing to an AMI BIOS Machine.’)

Step 3: Shut down your machine.

Step 4: Reboot.

Take careful note of the type of BIOS that is reported on the screen during the reboot. If you have an AMI BIOS, you will need to take some special actions.

If you still have problems, review the previous steps and recheck your work. For additional information refer to the chapter “Troubleshooting your installation.”

Step 5: Rename RESET25.exe.

This is a program which resets (initializes) the PCI card. Every time you intend to run a PlayStation program, this program must be run first. If you intend to use the PCI board in NTSC mode, rename RESET25N.EXE to RESET25.EXE by typing the following:

```
cd c:\ps\psx\bin
rename reset25n.exe reset25.exe
```

If you intend to use the PCI board in PAL mode, rename RESET25P.EXE to RESET25.EXE by typing the following:

```
cd c:\ps\psx\bin
rename reset25p.exe reset25.exe
```

Step 6: Run a sample program using H25DRV.EXE and the DECICONS utility.

The sample program resides in c:\ps\psx\sample\balls, so type

```
cd c:\ps\psx\sample\graphics\balls
```

To start decicons, type

```
decicons
```

If the H2500 is operating correctly, the DOS prompt will switch to the DTL-H2500 Console Mode. The following commands can now be used:

[F1]	displays help
[F4]	loads a program file
[F3]	runs loaded program
[F7]	sets switch
	0 boots PlayStation CD-ROM
	1 PSX> prompt mode
	2 boots PlayStation CD-ROM with tty out
[F5]	Sets up logfile. All messages, such as printf output, will be sent to the file name you specify, as well as to the screen. To stop the output, hit [F10], [F5].
[F9][F7]	Sets video mode
	0 NTSC mode
	1 PAL mode
[F9][F10]	resets
[F10][F2]	quits decicons

Note: After hitting F9, F10 to reset the boards, hit F8 to get the prompt back.

The following steps explain how to run the sample program, BALLS.EXE:

- Press the [F9][10] keys to reset the PCI board.
- Press the [F4] key. This puts decicons into a "downloading" mode.
- When "Load[1]" is displayed, type

  ```
  BALLS.EXE
  ```

- Press the [F3] key This executes the downloaded program.
- You should see a ball bouncing around on a blue screen (make sure your color television is hooked up and turned on).
- Press [F10] [F2] key to exit out of the DECICONS mode.

If you don't see the bouncing ball, please recheck your work and refer to the chapter "Troubleshooting the installation" for more help.

Step 7: (Optional) Running other sample programs.
Using the DECICONS console, you can run the other examples in the "c:\ps\psx\sample" directory. For example, to run a sound demo,

- Type "decicons". This puts you into the terminal mode.
- Press the [F9][F10] keys to reset the PCI board.
- Wait until the message "Monitor started" appears.
- Press the [F2] key. This puts you in DOS mode. Type

  ```
  cd c:\ps\psx\sample\graphics\clutfog
  ```

- Press the [F2] key (yes, again). Type

  ```
  psymake all
  ```

- Press the [F2] key. Type

  ```
  edit makefile.mak
  ```

  "edit" just happens to be the editor on most DOS machines. Invoke any editor you want. Replace the word "pqbload" with "bload25". These programs will load raw binary data into the RAM of the PCI card. "bload25" works with H25DRV.Exe; "pqbload" works with "H25bios.com", which will be installed later.

- Exit out of the editor, and you will automatically be in decicons mode.

- Press the [F2] key. Type

```
psymake load
```

- Press the [F2] key. Type

```
run25  tuto0.cpe
```

- You willl get in the habit of pressing the F2 keys time and again.
- When you are satisfied that your installation is working properly, re-edit the makefile.mak and replace the word "bload25" with "pqbload".

Installing the H25BIOS.COM driver

Now that you are sure that your PCI card is running under H25DRV.exe, you can install the SDevTC driver H25BIOS.COM. This driver allows you to use the SDevTC tools *run, pqbload, resetps,* and *DBUGPSX* version 4.93 (or above).

Step 1: Edit and reboot.
Since the H25DRV.exe driver is already installed, delete the line

```
DEVICE=C:\ps\psx\bin\H25DRV.EXE  /V   /N
```

from your "c:\config.sys" file and reboot your machine.

Step 2: Run PFLASH.BAT.
Your PCI board has a flash ROM. Install the new kernel and debug stub into the flash ROM by running PFLASH.BAT . This needs to be done only once.

```
cd c:\ps\pssn\bin\DTLH2500\H25BIOS
pflash.bat
```

Warning: There are two programs in this directory; one is "pflash" and the other is "pflash.**bat**". You must explicitly type out "pflash.bat" in order to run the correct program. In addition, you must be in this directory because "pflash.bat" uses files which are stored in this directory. Many people mistakenly execute "pflash" or run the program in the wrong directory.

Step 3: Invoke the H2500 device drivers for the Psy-Q tools.
Type the following in an MS-DOS prompt:

```
h25bios.com
mess1.com
```

Unlike the previous H2000 drivers, these are effective only for the DOS-session in which these commands are executed. We do not recommend putting these in your "config.sys" or "autoexec.bat", so you must run these device drivers after every reboot. Under Windows 95 you may want to put these in a .BAT batch file associated with a DOS box used for development.

You can turn off the "h25bios.com" by typing

```
h25bios.com
```

Note to PlayStation developers familiar with the DTL-H2000 ISA Developer's Board: You should now be able to use PQBLOAD, RUN, RESETPS, DBUGPSX as you normally did using the ISA board. There is no need to RUN SNPATCH.CPE. You can switch from Emulator to CD-ROM drive by running SELCD.CPE, SELEMU.CPE and using CDEXEC.CPE as with DTL-H2000 systems. Use TESTMESS for message output.

Step 4: Run a sample program.

To verify that the installation was successful, run a sample program such as "balls.cpe". Type the following lines:

```
cd c:\ps\psx\samples\graphics\balls
psymake all
resetps
run balls.cpe
```

A bouncing ball should appear on a blue screen. If you have problems running the program, please recheck you work and read the chapter "Troubleshooting the installation".

For some of the other samples in the "c:\ps\psx\sample" directory, you must execute "psymake load" to load the data into the RAM of the PCI card. Read the individual "readme_e.txt" files in each sample subdirectory to learn more about the samples.

Note the following syntax for the functions "h25bios" and "resetps":

H25BIOS (Version 1.36 or above)

Usage : h25bios <options>

Options :

/b <size> ; specify file transfer buffer size (in K bytes 2 - 32)

/p ; set PAL video mode (NTSC is default)

RESETPS (Version 1.04 or above)

Usage: RESETPS <optional switches> <num> <optional switches>

Switches for DTL-H2500 only:-

/n set NTSC video mode

/p set PAL video mode

Step 5: Run other sample programs.
Programs can be built by giving the command PSYMAKE. The makefile can also be used to run a program as some programs the preloading of model and texture data before being executed.

For some of the samples you may need to execute psymake load to download the necessary data files to the development boards.

The following is a list of file suffixes which may be found in some of the sample directories:

```
.c              C source
.h              C include (header) file
.obj            object file
.sym            symbol file
.cpe            PS-X executable file
.tim            texture data file
.tmd            3D model data file
.lnk            psylink command file

makefile.mak    makefile for building executable
```

All of the samples assume that the "pssn" and "psx" directories were placed directly in the "c\" directory. If you have a different directory structure for the PSX libraries and header files, you will need to modify the .lnk files for some programs. The .lnk linker command file specifies the file path where the libraries can be found and additional object modules used in the program.

Running from the CDROM

No extra software drivers need to be installed to run the external CDROM drive DTL-H2510 (the "black box") other than the usual H25DRV.EXE or H25BIOS.COM.

Running with H25DRV.EXE

- Place a PlayStation bootable CD containing your favorite game into the DTL-H2510.
- Reset the board by typing

```
reset25 0
```

- Have fun!

Running with H25BIOS.COM

- Place a PlayStation bootable CD containing your favorite game into the DTL-H2510.
- Type the following at a DOS-console prompt.

```
resetps 1
run /w5 c:\ps\pssn\bin\selcd
run /w5 c:\ps\pssn\bin\cdexec
```

- Have fun!

Note that the gold disk can be made bootable by following the instructions in the document "faq\cd4.pdf" on the Technical Reference CD.

Debugging using the DTL-H2500

Debugging with Printf

If you sprinkle "printf's" throughout your code, the output will be directed to your MS-DOS window. Here is the entire procedure to follow:

- Make sure that h25drv.exe is not running.
- At an MS-DOS command prompt, type "h25bios.com" the PSSN driver.
- Type "mess1.com" to start the message handler TSR.
- Type "resetps" to reset the h2500 board.
- (Optional) If you need to run from the cd, type "run c:\ps\pssn\bin\selcd".
- (Optional) If you need to run from the emulator, type "run c:\ps\pssn\bin\selemu".
- Run your program.
- Type "testmess" to see your messages.

Debugging with dbugpsx

Alternatively, you can use "dbugpsx". This is described in detail in the manual "Psy-Q Development Environment".

- Compile your source files with the "-g" option enabled (as in "ccpsx -g foo.c -o foo.cpe,foo.sym").
- Make sure the h25bios.com driver is running. Type " Resetps". Make sure the SN security dongle is installed on your printer port.
- At an MS-DOS prompt, type "dbugpsx foo /e".
- This should bring up the blue debugging window.

Miscellaneous

Compiler

For a quick summary on the compiler, please refer to the ccpsx.pdf document included in the compiler document on the Technical Reference CD (DTL-S2002), in the directory `progcd\gnu\doc.`

The GNU CC document is also available.

No Floating Point Co-processor on PC

If your PC does not have a floating point co-processor then add the following line in your autoexec.bat as well.

```
set GO32=emu c:\ps\pssn\bin\emu387
```

Debugger

For a quick tutorial on how to use the debugger, refer to the file debugdoc.txt in the Technical Reference CD, in the `progcd\pssn\debugger` directory.

Chapter 3: Troubleshooting the installation

Preliminaries

Check your board. It should have at least a PD2 chip on it.

Check your interrupts. Your PCI card should be assigned to one interrupt, and no other peripherals can be assigned to that interrupt. You can use the "MSD" program included in most versions of DOS. Alternatively, in Windows 95, you can see what interrupts are assigned by performing the following:

Go the “My Computer” icon. Yours may be named differently, but it looks like a computer:

1. Right click on the icon and select “Properties”.
2. Select the “Device Manager” tab.
3. Select the “PrintÖ” button.
4. Choose the "All devices and system summary".
5. Print out the document. For available IRQ's, read the "IRQ SUMMARY" section.

Alternatively, some IBM PC-Compatibles are equipped with a "Setup" routine hidden in the boot sector of the boot-up hard drive which can be accessed during a cold-boot (turning off the computer's power supply, then turning it back on). After the computer runs its memory check and the cursor moves to the top-right corner of the screen, you can hit a function key (F1 through F10) to get into the "setup" mode. Since computers vary, you may have try them one at a time. If you have a manual for your computer, read it for more information.

We are working on improving the PCI card so that it will not have this problem in the future.

Problem: PC fails to recognize board

The DTL-H2500 main board is the board for the PCI slot. When a PC is started up with the main board mounted into the slot, the PC usually recognizes the main board automatically. However, some models of PCs may fail to recognize it. The problem with the PCI BUS interface can be caused by BIOS bugs or hardware bugs. Currently, there are no general purpose solutions for either bug. PC models which may cause problems should not be used. Please check the table at the end of this chapter.

Known problems with BIOS of PC

Problem	Workaround
AMIBIOS Intel Endeavour version 1005C B0	Use AMIBIOS Version 1002CB0

Diagnostic steps

If your board is not in the tables below, in the section "General known compatibility … ", then the board's addresses could be incorrect, or the PCI bus is malfunctioning. Before you can proceed with the diagnosis, the H25DRV.EXE must be installed, and the BIOS settings may need to be changed. These are explained in Step 1 and Step 2 below.

Step 1: Install the H25DRV.EXE driver.
Before the DTL-H2500 main board can be used, the DTL-H2500 main board should be mounted into the PCI slot (see the chapter "Installing the Hardware"), and the device driver for DTL-H2500 should be installed as well (see the chapter "Installing the Software", in the section "Installing the H25DRV.EXE driver). Make sure that you do not have a dexbios or h25bios.com running.

Step 2: Change the BIOS settings.
The BIOS settings may need to be changed for some models of PCs. A setup utility is usually accessible on PC's by hitting the F10 key:

- Turn off your computer.
- Turn on your computer. A memory check will be run.
- When the memory check finishes, the cursor will appear on the right of the screen. Hit the F10 key to invoke the CMOS setup program.

The main changes to be made to the settings are as follows:

- Enable the PCI BUS
- Disable the Shadow area in RAM
- Disable the 4 KB Shadow area to be allocated to the DTL-H2500.

Step 3: Check for failure in address mapping.
Executing FRESET.EXE informs you which addresses the PC allocates for the PCI card. Generally, the PC allocates an area with one of addresses 0x000C8000 to 0x000EFFFF.

```
C:\ps\psx\bin\FRESET.EXE
```

and the following message should appear:

```
PCI version 2.10 Special Cycle 1, Config Mechanism 1 1 bus
bus 0: dev=13 func=0 irq=11, io=000C8000
UNIT 0: I/O addr=0x000C8000, IRQ=11(vect=0x0073, 8259=a0)
```

If "addr" is set to any of the addresses outside of the range from 0x00000001 to 0x000FFFFF (1 M or less), the address mapping by the PCI will fail.

The solution is to modify the mapping with a special utility for modifying the address mapping called REALLOC.EXE. Typing the following will allocate some PCI memory at 0x000c8000

```
realloc 0x000c8000
```

When the address has been modified, warm-boot the PC (with Alt+Ctrl+Del). The address should be mapped to 0x000c8000, and the main board should begin to work properly. This method has been shown to work for DEC PCs (DECpc XL 466d2 and DECpc LPx 560).

Step 4: **If the previous step did not work, check for problems with the PCI bus interface.** If the address mapping succeeds, check the PCI interface operation with the DOS debug command by doing the following:

Type "debug". You are now in the debugging mode of DOS.

At the "-" prompt, type "d c800:0000". This number is the lead address of the area allocated to the PCI board.

You should see something similar to the following:

```
C800:0000  01 01 00 09 01 01 00 09-01 01 00 09 01 01 00 09   ................
C800:0010  01 01 00 09 01 01 00 09-01 01 00 09 01 01 00 09   ................
```

If the PCI works properly, a large number of numeric characters are displayed with regular patterns by 4 bytes. If numeric characters are displayed with an irregular pattern, there is a problem with the PCI BUS interface.

Problem: Board will not reset/Can't run programs

Step 1: If using **decicons**, and the boards do not reset correctly (F9, F10) or download programs (F4): Try reinstalling the PlayStation OS ROM image on the board, using **Flashb8.bat**. (Remember not to use PFLASH.BAT if you wish to use DECICONS).

Step 2: If using **decicons**, try running **decicons** on your Win95 PC in "DOS" mode, rather than in a DOS shell. If this works, it would imply that you have a Win95-related clash.

Step 3: If step (2) did not help (or you are not using decicons), use the standard DOS **debug** option to examine the memory used by the driver. i.e. if 0xE7000 is the start of the address space allocated for the driver, run debug, and type "-d e800:0". A hex dump will be displayed. If the sequence is not of the form "01 00 09 00 01 00 09 00-01 00 09 00 01 00 09 00", then review the "shadow" setting of BIOS. The "shadow" at E7000h (in this case) must be disabled.

Step 4: If this does not cure the problem, check the version of BIOS that you are using. SCEE found problems with some H2500's in PC's with AMI BIOS and Intel mother boards. In

particular, BIOS version 1.00.02.CB0 works, but later versions do not. Their solution was to downgrade the PC's BIOS to 1.00.02.CB0 and reinstall Win95. (Win95's installer appears to make some choices about the hardware and these cannot be changed once the program in installed.) This file can be downloaded from:

```
ftp://ftp.funet.fi/pub/hw/vendors/intel/bios
```

There is a known problem with this version of the BIOS in that sometimes it does not recognize the PC hard-disk. Rebooting with CTRL+ALT+Delete seems to cure the problem. We will let you know when we find the latest version of the BIOS which works correctly.

General known compatibility issues with PC Brands and models

The following table lists known computer compatibility issues with the DTL-H2500 board. It consists of lists compiled from SCEI, SCEE, SCEA, and licensees. **This list was recently updated with a new set of information in August 1997.** Note that, although the boards may have worked for the computers here, you may have differing levels of success. This list is *not a guarantee* that the boards will work for *all* instances of these computers. Contact Technical Support if you have further difficulties. We use Compaq computers, and do not recommend Dell or Gateway because they tend to use a custom BIOS that makes installation very painful.

Brand	Assus	Archipelego	AST	Compaq	Compaq	Compaq
Model	Tech P/I - P55TP4N / 100	P133	Manhattan V Series 5090	Deskpro 575	Deskpro 5100	Deskpro 5166
Cpu	-	-	Pentium 90 MHz	Pentium 75 MHz	Pentium 100 MHz	Pentium 166 MHz
BIOS	Award Modula Bios V.4.51 PG from Award Software	-	AST Manhattan BIOS Rel 1.12	-	-	-
Motherboard	P166	-	-	-	-	-
Slot	-	-	-	-	-	-
HDD	-	-	-	-	-	-
Video	-	-	-	-	-	-
Memory	-	-	-	-	-	-
PCI Chipset	-	Intel Endeavour	-	Compaq	Compaq	Compaq
OS	-	-	Windows 95	Windows 95	Windows 95	Windows 95
Problem	OK	OK	OK, but see warnings below	OK , but see solution below	OK , but see solution below	OK , but see solution below
Solution	-	-	You will need to try the PCI board at different PCI slots. If your machine does not finish booting properly, try the next slot. If H25DRV.EXE does not work, skip to the section "Installing the H25Bios.com Driver"	You can assign the PCI interrupts by invoking the Compaq setup utility at boot up time. Cold boot the machine, then hit F10 after the memory test finishes. Navigate to the main screen and select the "Add-In Devices" screen. You can thereby change PCI interrupts.		

Brand	**Compaq**	**Compaq**
Model	Deskpro 6000	Compaq Deskpro 6200
Cpu	Pentum 200 MHz	Pentium Pro 200MHz
BIOS	-	Unidentified (specifically designed by Compaq)
Motherboard	-	PCI 1-Slot + ISA 1-Slot + PCI/ISA 1-Slot
Slot	-	-
HDD	-	-
Video	-	Matrox MGA Millennium 4MB
Memory	-	16MB x 2 (SIMM Socket x 8)
PCI Chipset		
OS	Windows 95	"Windows NT 3.51 Workstation" and "Windows 95" coexisted. Both OSs were set bootable.
Problem	OK, but see Solution below.	The unit operated correctly with factory setting, after following the steps presented in "Solution" below.
Solution	You can assign the PCI interrupts by invoking the Compaq setup utility at boot up time. Cold boot the machine, then hit F10 after the memory test finishes. Navigate to the main screen, and select the "Add-In Devices" screen. You can thereby change PCI interrupts.	Step 1. Prior to connecting H2500, start BIOS SETUP(DIAG) once. Check that no message from SETUP, such as "The boards have been detected/deleted" is displayed at this point. Step 2. Check that the boards are recognized by SETUP. If they are, select "Save and Exit". Step 3. Power off the unit and connect H2500. Start BIOS SETUP once again. Check that the message, "The new board has been detected", is displayed. H2500 must have been recognized as "Other Device". You can find it from the description, "SONY", at the Inquiry indicator. Check that IRQ and Memory are allocated. If they are, select "Save and Exit". (The actual figures were 4 for IRQ and C8000-C8FFF for Memory.) Step 4. Start Windows 95. (It may be better to power off once before starting Windows 95.) Check that the new board has been detected. Then at driver installation select "Without Driver". After executing H25BIOS from DOS Prompt if Color-Bar gets displayed, it is no problem. You may make sure of it with "System Property" just in case. Step 5 (Optional) *If Color-Bar is not displayed* at this point, you need to do the set-up again from the first after following the steps below: A. Delete H2500 at "System Property" and power off. B. Remove H2500 and restart Windows 95. Check that H2500 has been deleted with "System Property" (The message from BIOS SETUP, "The board has been deleted", must be displayed.)

Brand	DEC	DEC	DEC	DEC	DEC	DEC	DELL
Model	DEC Personal Workstation 200i	Celebris FP590	Celebris GL5133ST	Celebris GL6200ST	Celebris XL5100	Venturis FP5100	MT XPS
Cpu	Pentium Pro 200MHz	-	-	Pentium Pro 200 MHz	-	-	Pentium Pro 200N
BIOS	Phoenix ROM BIOS 4.05	-	-	-	-	-	-
Motherboard	(specifically designed by DEC)	-	-	-	-	-	-
Slot	PCI 2-Slot + PCI/ISA 3-Slot	-	-	-	-	-	-
HDD	2.1GB(SCSI)	-	-	-	-	-	-
Video	AccelGraphics AccelR8	-	-	-	-	-	-
Memory	96MB [32x2 + 16x2] (SIMM Socket x 8)	-	-	-	-	-	-
PCI Chipset	-	-	Triton		Neptune	-	-
OS	"Windows 95 " only	-	-	-	-	-	-
Problem	The unit operated correctly with the factory setting. However, for the set-up you need to follow the steps below in "Solution".	OK	OK	OK	OK	OK	OK
Solution	Connect H2500 to the second Connector from the uppermost. (Usually, Video Card is connected here.) If you connect H2500 to a connector other than that above, you will see a message informing you that it has caused a conflict with the Motherboard Resource, and the unit does not operate correctly	-	-	-	-	-	-

Brand	DELL	DELL	DELL	DELL	DELL	DELL	DELL	DELL
Model	OptiPlex GXPro 200	OptiPlex GXi 5200M	Optiplex GXM 5200	P120T Pentium	XM5100	XMT5100	XMT5120	XPS P120C
Cpu	Pentium Pro 200MHz	Pentium 200MHz	200 MHz	-	-	-	-	-
BIOS	Phoenix ROM BIOS PLUS 1.10.A02	Phoenix ROM BIOS PLUS 1.10.A00	-	-	-	-	-	-
Motherboard	(specifically designed by DELL)	(specifically designed by DELL)	-	-	-	-	-	Specifically designed by Dell
Slot	PCI 3-Slot + PCI/ISA 2-Slot	PCI 2-Slot + ISA 2-Slot + PCI/ISA 1-Slot	-	-	-	-	-	-
HDD	2 + 2GB(IDE)	3.0GB(IDE)	-	-	-	-	-	-
Video	#9 Imagine128	S3 Trio64V+	-	-	-	-	-	-
Memory	64MB EDO x 1 (DIMM Socket x 4)	96MB SDRAM [64x1 + 32x1] (DIMM Socket x 4)	-	-	-	-	-	-
PCI Chipset	-	-	-	-	Neptune	Neptune	Neptune	-
OS	"Windows NT 4.0 Workstation" (pre-installed) overwritten by "Windows 95" (Only "Windows 95" was set bootable.)	"Windows 95 (OSR2)" only (pre-installed)	-	-	-	-	-	Windows 95
Problem	The unit operated correctly with the factory setting. However, for the set-up you need to follow the steps below. (There may be difficulties in modifying the interrupts.)	The unit operated correctly with factory setting. (There may difficulties in modifying the interrupts.)	Incompatible. (There are unsolvable difficulties in modifying the interrupts.)	Incompatible?	OK	OK	OK	Incompatible
Solution	Connect H2500 to one of the two PCI Connectors in the lowest part (either PCI1 or PCI2). If you connect H2500 to other connector than those above you will see the error messages, "Plug & Play Configuration Error" and "Strike the F1 key to continue, F2 to run the setup utility", and the unit does not operate correctly.	Not applicable.	-	-	-	-	-	Do not use!

Brand	FMV	Fujitsu	Gateway	GoodTech	HotChips	HP	IBM	IBM	IBM
Model	-	FMV 590DE	Gateway 2000 P5-200	P200	Pentium Pro 200	Vectra XM	PC 750	PS/V Master 100	PS/V Master P120
Cpu	Pentium Pro 200 MHz	-	Pentium 200 MHz	-	-	-	-	-	-
BIOS	-	-	AMI 1.00.06.CY1T	-	-	-	-	-	-
Motherboard	-	-	Intel ATX Motherboard	-	-	-	-	-	-
Slot	-	-	PCI 3-Slot + ISA 2-Slot + PCI/ISA 1-Slot	-	-	-	-	-	-
HDD	-	-	-	-	-	-	-	-	-
Video	-	-	-	-	-	-	-	-	-
Memory	-	-	-	-	-	-	-	-	-
PCI Chipset	-	-		-	-	VLSI	-	-	Triton
OS	-	-	"Windows 95" only (pre-installed)	-	-		-		-
Problem	OK	OK	The unit operated correctly with the factory setting when used as stand alone. However, with Network Card or SCSI Card installed in the unit, it hung up after executing h25bios.	OK	OK	OK	OK	OK	Incompatible
Solution	-	-	Set either "Standard" or "OFF" at Power Management setting in Windows 95 Control Panel. ("Details" is set as default setting.)	-	-	-	-	-	-

Brand	**Mesh**	**Micron**	**Micron**	**Micron**
Model	Elite 120R Pentium	Client D (MARL-P200-MT)	Millennia D (M55HIPLUS-P200-MT)	Millennia Plus
Cpu	-	Pentium 200MHz	Pentium 200MHz	Pentium 200 MHz
BIOS	-	AMI 1.00.07.DB05	Phoenix 4.05	-
Motherboard	-	(Intel ATX Motherboard)	(MICRONICS Motherboard)	-
Slot	-	PCI 3-Slot + ISA 2-Slot + PCI/ISA 1-Slot	PCI 3-Slot + ISA 3-Slot + PCI/ISA 1-Slot	-
HDD	-	2.1GB(IDE)	3.1GB(IDE)	-
Video	-	#9 9FX Motion 2MB EDO DRAM	#9 Imagine128 4MB VRAM	-
Memory	-	8MB EDO x 2 (SIMM Socket x 4)	16MB EDO x 2 (SIMM Socket x 4)	-
PCI Chipset	-	-	-	-
OS	-	"Windows 95" only (pre-installed)	"Windows 95" only (pre-installed)	-
Status	Incompatible	The unit did not operate correctly with the default setting. Plug & Play failed and Color-Bar was displayed.	The unit did not operate with factory setting.	Incompatible
Solution	-	Clear the check of auto setting and manually reset "Memory Range" at System Device Manager in Windows 95 Control Panel. (e.g. : Memory Range is D0000-D0FFF)	Set "OFF" at Plug & Play OS setting in BIOS setting.	-

Brand	**Micron**	**Olivetti**	**Oki**
Model	Millenia Pro A (LIGHT-PP200-MT)	M4 82	IF Station 590/DG
Cpu	Pentium Pro 200MHz	-	-
BIOS	Phoenix 4.05	-	-
Motherboard	(MICRONICS Motherboard)	-	-
Slot	PCI 3-Slot + ISA 1-Slot + PCI/ISA 1-Slot	-	--
HDD	3.1GB(IDE)	-	-
Video	#9 Imagine128	-	-
Memory	32MB EDO x 1 (DIMM Socket x 4)	-	-
PCI Chipset	-	-	-
OS	"Windows NT 3.51 Workstation" and "Windows 95" coexisted (Both Os's were set bootable.)	-	-
Problem	The unit operated correctly with the factory setting for the reason described below.	Incompatible	OK
Solution	The unit operated correctly with the factory setting, because the factory setting of the Plug & Play OS setting in the BIOS was set "OFF".	-	-

Chapter 4:
DTL-H2500 Questionnaire

We would greatly value your help with the attached questionnaire so that we can let other developers know about other problematic PCs.

DTL-H2500 QUESTIONNAIRE **Please FAX back to (Attention: Developer Support) at:** **44 (0) 171 390 4324 (Europe)** **1-650-655-5511 (United States)**		
Company Name	**Contact Name**	**Telephone Number**
DTL-H2500 Serial No.		
Is your system in use ? **If yes, for how long ?**		
Make of PC and OS (e.g. Archipelego, Win95)		
PC Speed and RAM (e.g. 120MHz, 16Mb)		
PC Chipset (e.g. Triton)		
PC BIOS Manufacturer/Version (e.g. AMIBIOS 1.00.02.CB0)		

Chapter 5:
Case study

Since every IBM-PC compatible seems to have its own character, you may have to take additional steps during the installation. For instance, you may have to move IRQs around, or switch boards and slots. Here is the experience and advice of one of our techies, who was trying to install a DTL-H2500 PCI board and the CDROM-emulator card.

The PSX development system using the DTL-H2500 PCI development board will need two IRQs for its exclusive use, one for the PCI Dev. board and the other for the CDROM emulator. The PCI Dev. board tries to use IRQ11, so it will be safe to have this interrupt free for its exclusive use. The emulation card uses one of the IRQ 5,7,10,11,12,15.

Before we begin installing the development boards on a Windows95-based system, we should follow the following steps :

Step 1: Switch on your machine and find out the list of IRQs, DMA Channels and I/O addresses already in use. If you are using Windows95 the process is very easy. Choose "System" from the control panel and click on the Device Manager. Printing "All devices and system summary" will make a hard copy of all various system resources utilized and various drivers loaded.

Step 2: Install the PCI Dev. Board in one of the empty slots and boot up your machine again. Go into the device manager and check which IRQ has been assigned to our Dev. Board. If the IRQ assigned to the Dev. Board is available for its exclusive use (i.e. is not shared by any other devices), you are all set. The system generally assigns IRQ11 to the Dev. Board.

Otherwise you should shut down your machine and remove the Dev. Board. Boot up your machine and go into BIOS setup by pressing F10 (in most cases) while your machine is just starting up. Try to reassign IRQs to various devices and free IRQ11 (or the one the Dev. board was requesting earlier in this step). Save the BIOS setting and quit the system setup. Boot up your machine. Under Windows95 you should be able to check the list of IRQs in the device manager. The IRQ11 should be free at this point. If any other device is trying to use that IRQ, disable it under the device manager.

While reassigning IRQs under system setup, also try to free one of the IRQ 5,7,10,12,15 for the CDROM Emulator card.

Step 3: Shut down your machine once again and install the PCI Dev. board. Rebooting your machine will assign IRQ11 to the PCI development board. Under Windows95, you can go back into the Device Manager to verify that IRQ11 is being used exclusively by the development board only. At this point you should have one of the other IRQs which you freed in the previous step for Emulator use.

Step 4: Follow the steps given in the Installation Guide to install various drivers and test to see if your system is working properly.

Step 5: Shutdown your machine. Change the jumper settings on the CDROM Emulator board to reflect the IRQ (freed in Step 2 above), the DMA channel and the IO addresses. Put the card in one of the empty slots and connect it to the PCI Development board using the 10-pin flat cable. Connect the emulator drive (follow the steps given in the CD Emulation manual). Reboot your machine and try installing various drivers and emulator initialization routines.

Step 6: The system is now ready for PSX development.

Another tech supporter discovered that the PCI board was being assigned to IRQ 9, which was shared by other devices. Again, since your computer and its configuration could be different from our own, your mileage may vary.

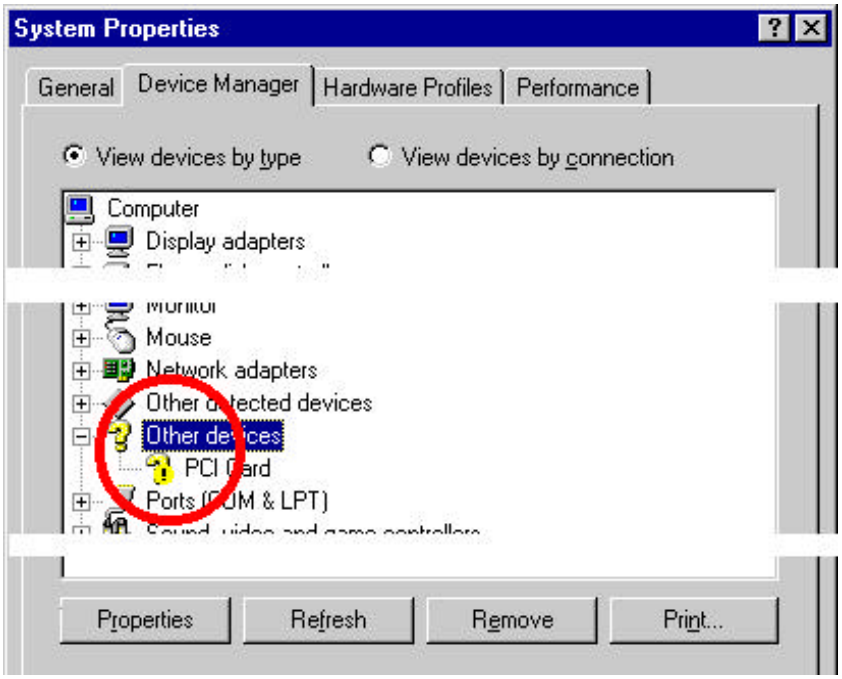
Chapter 6:
Installing to an AMI BIOS Machine

Machines using AMI BIOS (1.00.05.CB0,1.00.06.CBO) may cause problems when you are installing the DTL-H2500. Follow these steps:

Step 1: "Uninstall" the PCI card.

- Go the “My Computer” icon. Yours may be named differently, but it looks like a computer:

- Right click on it; select “Properties”.
- Select the "Device Manager" tab (see figure below).
- Double-click on "Other Devices", then select "PCI card" (circled in the figure below).



- Select "Remove".

Step 2: Shutdown Windows 95.

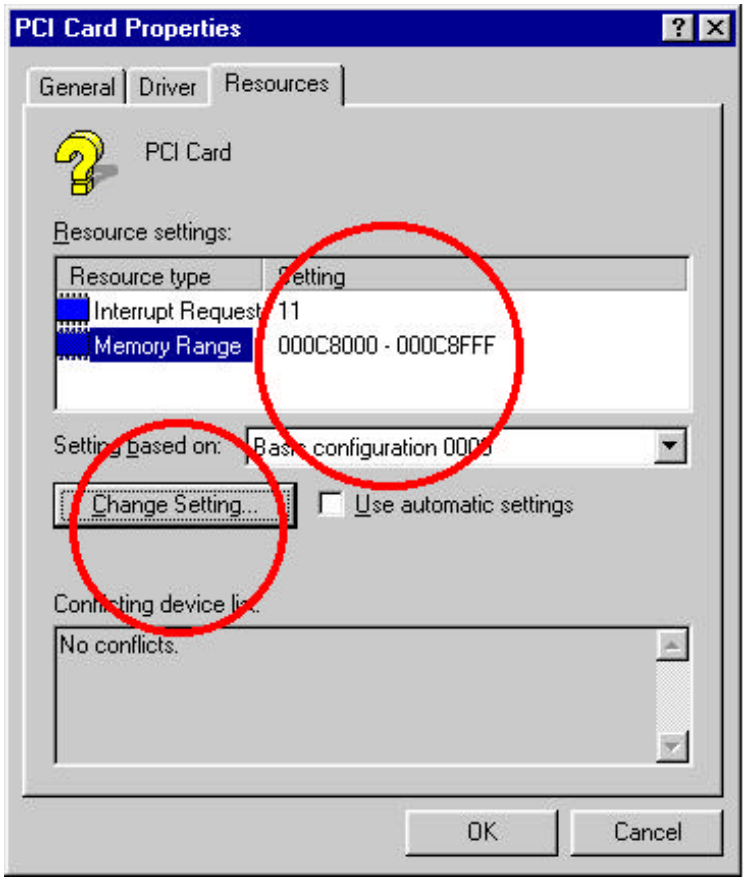
Step 3: Clear the NV-RAM of the motherboard.

Step 4: Reboot the machine.
When Win95 displays the message "New Hardware Found", select "Do not install a driver".

Step 5: Change the memory location of the PCI Card Resource.
The operating system, under the AMI BIOS, will allocate the PCI card to an unsuitable memory space. This needs to be changed by performing the following:

- Open the "Device manager" as in Step 1.
- Double-click on the PCI card icon (ignore the warning icon). If the icon does not appear, reboot the machine, so that the Windows 95 operating system can install the icon. Again, if you are asked to install a device driver, choose NOT to install one.
- Select the resources tab, which will show the memory range of E7000-E7FFF.
- Clear the "Automatic settings" check box.

- Change the memory to a non-conflicting memory address, such as C8000-C8FFF:



- After modification, Win95 asks you "Do you want to restart now?". Select "Yes".

Step 6: **Verify that the PCI card uses the addresses you specified.**
After Win95 is restarted, open the "PCI Card Resources" as before, and check to see that the Memory Range has been changed to the address you specified. Again ignore the warning icon.

At this stage, issuing the "freset" from the DOS prompt will show that the H2500 is allocated to C8000 and at the same time, it is reset. When the PCI Card is once allocated correctly as above, it will be kept allocated to the same Memory Range (C8000-C8FFF for this example), even after rebooting with the PCI card resources being set to "automatic settings".

Chapter 7:
Commands for the Flash-ROM

"flash.bat", "flashb8.bat", and the "pflash.bat" are simple batch files which call more primitive commands to the DTL-H2500; therefore, it is necessary to run the batch files in the same directory which contains "freset", "fload", and "fquit". You will almost never need to know what the parameters do; but if you are curious, here is the information.

flash.bat.
A batch file to write the OS binary image into the flash ROM. It uses the file 'h2500.img' and is equivalent to typing the commands shown below in an MS-DOS prompt:

```
freset -r 1
fload h2500.img
fquit
freset 1
```

freset.
Resets the boot mode and the DTL-H2500 video mode.

Syntax

freset [-r] [-pl-n] [*switch*(hex)]

where

-r	The main board is booted by EPROM. (Default booted by flash ROM.)
-n	video mode is set to NTSC mode
-p	video mode is set to PAL mode if both are not specified, the previous mode is kept.

The *switch* option can have the following values:

0	boot PlayStation CD-ROM
1	wait to load files If no switch is specified, the previous mode continues.

Fload.
Load a file to the main board and run that program. This should be done after the main board has been set to wait for loading.

Syntax

fload [-ll-rl-b<*address*>] *file_name*

where

file_name loaded file name

-l only loads a file

-r only runs without loading a file
if both are not specified, load a file and run.

-b *<address>*

loads a binary file to the specified address

fquit.
Causes the main board to quit waiting mode.

Syntax

fquit