DTL-H2000 Installation and Operation

Revision 1.005 (CDROM)

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About this Manual

About this Release

This is the CDROM release of the Installation and Operation Manual for the DTL-H2000 Development System. Library functions and structures are detailed in the Library Reference volume of the PlayStation Developer Reference Series.

Related Documentation

In addition to this document, the installation sheets that came with your hardware have helpful information.

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

Note that the Developer Support BBS posts late breaking developments regarding the Libraries and also provides notice of forthcoming documentation releases and upgrades.

Technical assistance

If you need help, you can use any of the following resources:

Developer Support Hotline (415-655-8181) Available Monday through Friday, 8am to 5pm, Pacific Standard Time.

Email. Send your questions to DevTech_Support@interactive.sony.com. Questions about any of the Psy-Q tools can also be sent to support@snsys.com.

PlayStation Developer Support BBS (415-655-8181). Available 24 hours a day, seven days a week. In order to access the BBS, you must have a user ID, which you can get by contacting your account executive or the Developer Support Hotline. Through the BBS, you can ask questions to tech-support, catch the latest news, participate in discussions with other PlayStation licensees, and download software updates. We recommend that you log on at least once a week.

PlayStation Developer WEB site (http://www.scea.sony.com/dev) Beginning January 1997, we will introduce the PlayStation Developer WEB site. This will replace our existing dial-up BBS and provide the same services.

Access to the BBS

What do I need to get an account?
You must complete both the Non-Disclosure Agreement and a developers, publishers, or sub-contractors agreement and have it filed and accepted by Sony Computer Entertainment America
Contact the developer support hotline at (415)-655-8181 and arrange an account with the BBS-Coordinator. Your account will be activated after the BBS coordinator completes the setup for your account.

The BBS phone Number is: **(415) 655-8119**

How do I activate my account?
To Activate your account, follow these steps:

- Call the BBS using a VT-100 or ANSI terminal emulat or telecommunications program. If you already have the FirstClass Client software, you may use that. Connect at up to 14400 baud, 8 bits, no parity, 1 stop bit. The First Class client software can be retrieved from www.softarc.com. We recommend using the following mo dems: USRobotics Courier Dual Standard Modem or the USRobotics Sportster v.34 Modems (28.8). If you would like to use these modems, they are available through either MicroWarehouse (1-800-367-6808 x2098) or Egghead Software (1-800-344-1123).

- Login using the user ID given . You may want to write both your logon name and password below.

User ID: _____

Initial password:_____

After your first call, you may change your pas sword to anything you want.

If you don't already have version 2.6 of the First Class software, download it. It is located under the "Releases" Conference. Both Macintosh and Windows versions are available. If you are having difficulties logging on, please call your Dev eloper Support representative, or the developer support hotline at 415-655-8181.

How many accounts can my company have?
BBS Accounts are given with developer tool kits, with one account being given per tool kit. E.G. Code-R-Us software has purchased 3 developer kits, they are allowed three accounts.

How do I obtain access to other conferences?
The BBS administrator grants access to conferences depending on toolkits purchased.

Access to the PlayStation Developer Web Site

What do I need to get an account?
You must complete both the Non-Disclosure Agreement and a developers, publishers, or sub-contractors agreement and have it filed and accepted by Sony Computer Entertainment America.
Contact the developer support hotline at (415)-655-8181 and arrange an account with the Web-Coordinator. Your account will be activated after the Web-master completes the setup for your account.

The URL for the PlayStation Developer Web Page is:
HTTP://www.scea.sony.com/dev

This is a secure web site and will require an internet connection, a user logon name and password (provided by Sony Computer Entertainment America) and Netscape 2.0 or later or Internet Explorer.

The structure of the web site is similar to the BBS. A messaging system, as well as a chat area are featured on the web site. All old messages posted to the BBS are archived into a document that will be available for downloading.

How many accounts can my company have?
One account is given to each licensed developer. Multiple logons to the web site are allowed.

Installing 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 your Programmer's Tools CDROM
Insert the Programmers 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 5**.

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, backup or delete your previous "c:\psx" directory.
- To be consistant 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 "psyq" tools
The directory "[cdrom]:\psyq" contains the Psy-Q development system, which includes an interactive debugger and the C compiler.

- If applicable, backup or delete your previous "c:\psyq" directory.
- Copy the "psyq" directory, d:\psyq, from the CD to your local hard drive c:\ps\psyq.
- Copy the contents of the "gnu" directory, d:\gnu, from the CD to your local hard drive c:\ps\psyq:

```
xcopy  /s  d:\gnu\*  c:\ps\psyq
```

The GNU license is labeled gnu.txt.

- Add the line

```
set path=%path%;c:\ps\psyq
```

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

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 entire tool set for the Graphic Artist Tools. Only the conversion tools are included on this CD. Please contact your regional tool's coordinator on information on how to obtain the Graphic Artist Tools CD (DTL-S220).

- If applicable, backup 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 line

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

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

- 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 on to the next step, Step 6. 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; press 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 install 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 ma nual

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

1. Under the Program manager "File" pulldown click on "File->New" button.

2. Select Program Item; press OK
3. A Program Item Properties dialog will pop up. Fill in the Description field with "Movie Converter"
4. Use the 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 program icon for the Movie Pack tool:

1. Under the Program manager "File" pulldown click on "File>New" button.
2. Select Program Item; press OK
3. A Program Item Properties dialog will pop up. Fill in the Description field with "Movie Pack"
4. Use the 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.

3D Studio Plug-In This release is for 3D Studio plug-in utilities. We highly recommend the following: Please remove the Psy-Q dongle, and attach 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 accomplishing the following:

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

Please read the files *.doc and *.txt in the "c:\ps\psxgraph\doc\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  PSYQ_PATH=c:/ ps/psyq
 set  COMPILER_PATH=c:/ ps/psyq
 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:\psyq\emu387
```

```
REM ==========================================
```

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

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

to achieve the same result.

Step 5: Turn off your computer.

Step 6: 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 meant 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 not being able to launch the assembler or debugger until the dongle is replaced.

Step 7: Reboot your machine.

Step 8: 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 aren't, you may have to increase the environment memory space in your config.sys, using a line like 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 your 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, you cannot run the program, because the device drivers for the DTL-H2000 board have not been installed yet. The next steps show you how to do this.

Step 9 (optional): Install the CDROM emulator software.

If you have the CD-ROM emulator, you can install it now. However, we recommend that you defer this installation until after you have finished installing the driver software for the DLT-H2000, since you might encounter problems. You should finish the rest of the installation, and then come back to this step.

Read the "readme.txt" that came with your CD-ROM emulator kit, which 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	Notation 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 Developer Tools CDROM.

Step 10: Install the DTL-H2000 boards.
The next section shows you how to install the DTL-H2000 board.

Installing the DTL-H2000

Step 1: Determine a free memory address and a free IRQ for your boards.
By default, the dip-switch/jumper settings of the board are set to

```
 IRQ: OFF
Base Port Address: 1340
```

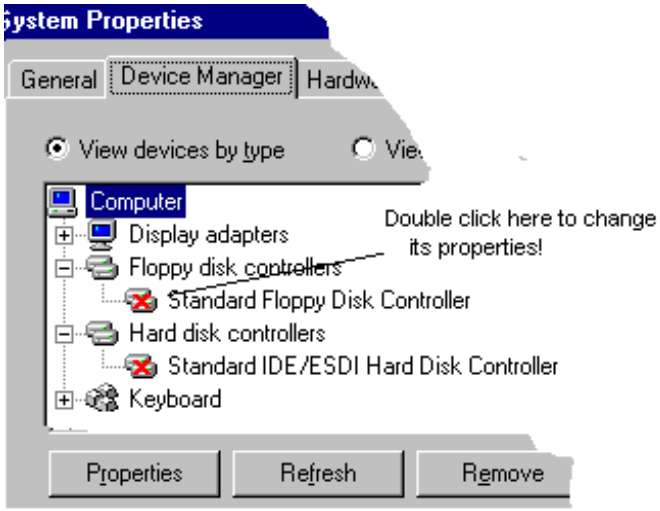
You will have to set the jumpers of the board to an available interrupt and address. Follow the installation instructions entitled "PlayStation Board" (for PC/AT) that is packaged with the boards. **Note:** You may have to refer to the Japanese version of these instructions to see the value each jumper setting corresponds. This is because the

English version may be illegible. **The interrupt and address you choose should not be in conflict with other boards on the system**

There are a number of ways to determine which interrupts and addresses are available. You can use the "MSD" program included in most versions of DOS. Or, if you are running Windows 95, you can see what interrupts are assigned by performing the following:

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

2) Right click on it ; select “Properties”.
3) Select the “Device Manager” tab.
4) Select the “Computer” icon. Then click on the “Properties” button at the bottom of the screen.
5) If other devices are assigned to the same interrupt as the PCI card, disable the other peripherals by reinstalling the peripheral’s device drivers, or by changing the properties of the peripherals. For example, in the “Device Manager” list, you can double-click on the icons of the peripherals as in the diagram below:



A dialog with the properties of the device should appear. Using the “Resources” tab, determine which “Interrupt Request” it uses (you may have to scroll down to this field). If it matches the interrupt you want, select the “General tab”. In the “Device Usage” field, there may be a check box with the caption “Original Configuration (Current)”. If this is selected, then deselect it. This will disable the peripheral and thereby prevent it from generating interrupts that will confuse the ISA card. Continue through the list of peripherals, then reboot your computer to register the changes.

Alternatively, some IBM PC-Compatibles are equipped with a "Setup" routine hidden in the boot sector of the boot-up hard drive that 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.

Step 2: Edit your autoexec.bat to include the "dexbios" device driver.
Suppose you modified the interrupt jumper on the board from **OFF** to an unused interrupt **11** . Then the dexbios line in the autoexec.bat file must be modified as follows:

```
c:\ps\psyq\dexbios /a 1340 /i11
```

This example assumes that you placed "psyq" directly under the " c:\ps\" directory.

In general, the syntax of the line should be as follows:

```
<parent>\ps\psyq\dexbios /a<address> /I<interrupt>
```

Modify your autoexec.bat and save your changes.

Step 2: Turn off your computer.

Step 3: Install the two development boards into two free 16-bit ISA slots in the PC.
Make sure that the ISA boards fit snugly in their sockets.

Step 4: Reboot your computer.
If you have difficulties during the booting process, you probably have an interrupt or memory conflict. Recheck your work.

Step 5: Run a program.
Open up a DOS-command window. Alternatively, it may help to run the computer completely in DOS, without Windows 3.1 or Window 95.

- Type

  ```
  resetps 1
  ```

  This resets the DTL-H2000.

- Type

  ```
  run /w5   c:\ps\psyq\snpatch.cpe
  ```

  This patch fixes a bug in the ROM of the DTL-H2000. Throughout the literature of the PlayStation, you may see references to "patchw" or "patchx" or "patchj". Ignore them, since "snpatch.cpe" is the current version.

- Type

  ```
  run /w5 main.cpe
  ```

  This loads the file main.cpe into the memory of the DTL-H2000 after pausing for a delay of "5" and runs the program.

- Wait for few seconds. What should appear on your video monitor is a blue screen with a bouncing ball. If the program does not execute, type "resetps 1" and repeat the sample program steps. If it fails again, review your setup procedures. Make sure that "dexbios" is actually running.

NOTE: If you receive "Cannot connect to target" while executing your set commands, add a longer pause between your commands or verify your board settings.

- To exit the sample press the rectangle button, "select", on the pad-controller.

Step 6: Run other example 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 that 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 you placed the "psyq" and "psx" directories directly in the "c\ps\" 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 software drivers need to be installed to run the external CDROM drive DTL-H2010 (the "black box").

A sample program has already been compiled on the Programmer Tools CDROM (DTL-S2002) and will run directly from the DTL-H2010. The following represents the flow which you may use to execute a program in the CD-ROM player.

- Insert the Programmer Tools CDROM (DTL-S2002) into the DTL-H2010 drive.
- At a DOS-command prompt, type the following:

```
resetps 1
run /w5 c:\ps\psyq\snpatch
run /w5 c:\ps\psyq\selcd
```

```
run /w5 c:\ps\psyq\cdexec
```

The CDMENU.EXE from the CD-ROM will be started and the menu will appear. The Up/Down key and start button on the PAD can access and execute the sample program. The source code for “CDMENU.EXE” is in \ps\psx\utility\menu\cdexec.

Miscellaneous

Compiler
For a quick summary on the compiler, please refer to the ccpsx.txt document included in the compiler document on the Technical Reference CD (DTL-S2003), 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\psyq\emu387
```

Global Allocation
Please refer to the file GblReg.doc included in the Technical Notes document directory of the Technical Reference CD (DTL-S2003), in `\ Technote.`

Debugger
For a quick tutorial on how to use the debugger, refer to the file debugdoc.txt in the Technical Reference CD (DTL-S2003), in the `\progcd\psyq\debugger` directory.

Known Problems.
We've experienced problems with time-outs when quickly using "run.exe" immediately after the command "resetps 1". This is most often the case when the commands are placed in a batch file. We recommend that a pause or a delay command be inserted between the resetps and run commands.

Sometimes one is unable to remove the CD that is in the DTL-2010. Make sure the "selcd" switch is executed to activate it.