

***CDD 521 Recording
Software***

for Sun Workstations

OptImage Interactive Services Company, L.P.

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Publication Editor: Tom Dirks
Publication date: May 28, 1993
Documentation Part Number: OPT155
Revision B

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Introduction

Overview

The OptImage CDD 521 Recording Software extends the functionality of the CD-I Emulator by allowing you to connect the emulator directly to the Philips CDD 521 Compact Disc Recorder™. Through this connection, you can transfer a disc image data from the emulator hard disk to the CDD 521 to produce a WORM (Write Once, Read Many) compact disc. The disc image can be either a CD-I™, CD-DA, or CD-ROM XA (Mode 2) disc image.

The CDD 521 Recording Software includes utilities for both Sun-3™ or Sun-4™ Workstations®. The following utilities can be used to record a CD:

- **cdr521** is a command line utility for recording compact discs on the Philips CDR 521.
- **emutool** is a SunView™ graphical user interface for controlling CD emulation and recording.

About this manual

This manual includes two chapters: *CDD 521 Installation* and *CDD 521 Recording Software*. Chapter 1 explains how to install your recording hardware and software. Chapter 2 contains two

sections: *Using cdr521* explains how to record a disc image using **cdr521**, and *Using emutool* explains how to record a disc image using **emutool**.

Conventions

The following typeface conventions are used throughout the pages of this manual:

- The names of programs, directories, and files are shown in a bold Helvetica typeface:

/h0/myimage

- The names of keys on the keyboard are italicized:

Enter, Escape, Delete

- When two keys are to be pressed simultaneously, they are shown connected by a hyphen:

Control-C

- The names of items in the user interface are shown in bold:

Cancel, O.K., Options

CDD 521 Installation

Overview

The CDD 521 Recording Software consists of the following utilities:

`cdr521` `emutool` `discmap`

The installation procedure is divided into four parts:

- Software installation
- Hardware configuration of the OptImage emulator
- Hardware configuration of the CDD 521
- Installation verification

Required hardware and software

To install the CDD 521 Recording Software, you must minimally have the following hardware/software components:

- Sun-3 or Sun-4 Workstation® running SunOS™ 4.1.1 or later
- 1/4-inch or EXABYTE® tape drive
- OptImage emulator
- Sun to emulator serial cable
- Sun SCSI cable
- Emulator power cord
- 650 MB hard disk drive
- Philips CDD 521/10
- 1/4-inch or EXABYTE tape containing Sun executables (**cdr521**, **discmap**, **emutool**)
- (2) 3.5 inch diskettes (two copies of emulator boot disk)

Software installation

The Sun software is delivered on a 1/4-inch or EXABYTE tape. To install the software on your Sun, follow the steps below:

1. Load the tape in your Sun tape drive.
2. Log in as root or set your user ID to root.
3. Change to the directory where you wish to install the software.
4. Execute the following commands as root:

*NOTE: The following commands assume that the name of your tape device is **rst0**. If not, replace **rst0** with the correct device name.*

```
tar -xvf /dev/rst0
chown -R root /Sun3 /Sun4
cd /Sun3
chmod 4755 cdr521
cd ../Sun4
chmod 4755 cdr521 emutool
cd ..
```

The tar command sets up three directories in your current directory: **Sun3**, **Sun4**, and **Image**. The **Sun3** and **Sun4** directories contain versions of **cdr521** and **discmap** for the Sun-3 and Sun-4, respectively. The **Sun4** directory also contains the **emutool** program.

The **Image** directory contains a simple CD-I disc image. You will use this file to verify proper installation.

5. Once you have installed the software, copy the executable files (**cdr521**, **discmap**, and **emutool**) to the desired bin directory, or set the **PATH** environment variable to point to the installation directory.

Hardware configuration

Connecting the CDD 521 to the emulator

NOTE: *The emulator is now shipped configured for use with the Philips CDD 521 compact disc recorder. In this configuration, one of the Centronics 50 connectors on the rear panel of the emulator is connected internally to a board dedicated for use with the CDD 521. If your emulator is configured for the Yamaha PDS compact disc recorder, follow the configuration instructions in the Appendix before connecting the CDD 521 to the emulator.*

Connect the emulator and CDD 521 as described in the following steps. Figure 1 on the opposite page is a rear view of the emulator and the CDD 521 showing these connections. These instructions assume that the emulator is already connected to a terminal and a CD-I player, as described in the *CD-I Emulator* manual.

1. Make sure the power switches are turned off on the emulator and the CDD 521.
2. Connect the second emulator SCSI port to the CDD 521 SCSI port. You can use either of the two SCSI connectors on the CDD 521.

CAUTION:

The second SCSI port on the emulator should connect only to the CDD 521; it must not connect to any other device.

3. Set all dipswitches on the CDD 521 to the down position.
4. Set voltage selector on the CDD 521 to the correct voltage.
5. Connect power cords and power up the emulator and the CDD 521.

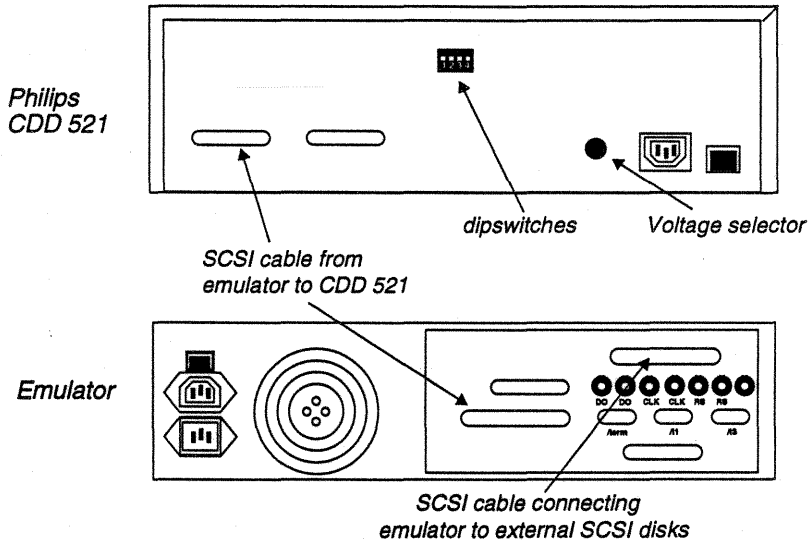


Figure 1 CDD 521 to emulator cable connections

Verifying installation

Verify the installation by recording the provided disc image.

NOTE: If errors occur, re-install the distribution software. If repeated problems with installation occur, contact your local OptImage Support Group.

Recording the demo disc image

1. Insert the diskette labeled "CDD 521 Recording Software" into the emulator.
2. Press the reset button on the emulator. The emulator accesses the diskette for 30 to 40 seconds as it boots.
3. Open the disc tray and insert a blank Philips CD-R disc, label side up. Leave the tray open.
4. Change your directory to the provided **image** directory:
5. Type the following command:

```
cdr521 -t=demo.cdi.toc demo.cdi.cd
```

After initializing, the emulator produces the following standard status messages:

```
No Old Disc Map ('demo.cdi.cd.map') Found.  
Disc image size is 01:33.00  
Creating Disk Map ...  
connected  
cdrsp521 -s=16405200 -t  
>>> Waiting to Receive Image Map <<<  
>>> Waiting to Receive TOC <<<  
diskread: Beginning Disk Caching  
Image Type is CD-I  
Track 01/00 - 0  
Track 01/01 - 150  
>>> Beginning CDD-521 Recording: Tue May 18 10:26:35 1993 <<<  
cdrsp521: Beginning Track 01  
cdrsp521: Beginning Leadin and Leadout
```

**cdrsp521: CD Recording Successful.
Exiting cdrsp521...
Terminating Cache...
Cache Terminated.
... Complete.
Emu:**

6. Type *Control-C* to exit the recording process.
7. Play the disc.



CDD 521 Recording Software

Using cdr521

cdr521 uses a command line to record a compact disc. The syntax for **cdr521** is shown below:

```
cdr521 [option...] {filename} [option...]
```

where

- | | |
|-----------------|---|
| cdr521 | is a keyword and must be typed exactly as it appears in the syntax command line. |
| <i>filename</i> | is the filename of a disc image created by master . |
| <i>option</i> | is replaced by any option described in the following section. Zero or more options can be used before or after the <i>filename</i> element. |

Options

The following options are available for **cdr521**:

- | | |
|-----------|--|
| -? | displays help about cdr521 usage. |
| -a | specifies that the disc image being recorded is CD-ROM XA. CD-I, and CD-DA do not require a command line option to specify the image type. |

-d=*<device name>*

specifies an emulator hard disk device descriptor for the location of the disc image. Use this option when the disc image is not on **/h2**, which is the default. The following are the available descriptors:

<u>Descriptor</u>	<u>SCSI ID</u>
/h0	0
/h1	1
/h2	2
/h3	3
/h4	4

-f creates a new image sector map. Use this option if your disc image was last emulated with any version of **emulate** prior to 2.0.

-g enables debug messages. These messages are displayed on the Sun during recording.

-t=*<TOC_file>*

specifies the TOC (table of contents) file for a disc image containing multiple tracks.

IMPORTANT: *The TOC file MUST be specified when recording a compact disc on the CDD 521.*

-u specifies that the disc image was mastered with unscrambled data tracks and byte-swapped audio tracks. Normally, this option is not used.

-x test mode. Prevents writing the disc. This mode is useful for testing the hardware connections.

For example, the following command line shows the **cdr521** command along with the **-t** option designating a TOC file (**demo.cdi.toc**) to use for recording the disc image **demo.cdi**. Also

included on the command line is the **-f** option to force creation of a new image sector map, and the **-d=/h0** option to specify **/h0** as the device descriptor for the location of the disc image.

```
cdr521 -t=demo.cdl.toc demo.cdl -f -d=/h0
```

Recording a compact disc

CAUTION:

The SCSI bus connecting the local Sun hard disk and emulator should not have additional SCSI traffic while recording a disc. The recording process consumes a large percentage of the SCSI bus bandwidth. If the bus becomes unavailable during the recording due to extraneous conditions (server/client disk operations, tape transfers, etc.), the recording process is likely to fail.

To record a compact disc with `cdr521`, follow the steps below:

1. Verify the hardware is connected as described in the *CDD 521 Installation* manual.
2. Power up the emulator and the CDD 521.
3. Insert the diskette labeled "CDD 521 Recording Software" into the emulator.
4. Press the reset button on the emulator. The emulator accesses the diskette for 30 to 40 seconds as it boots.
5. Open the disc tray and insert a blank Philips CD-R disc, label side up. Leave the tray open.
6. Type

```
cdr521 -t=<TOC_file>
```

followed by any other options, then press *Return*. `cdr521` executes, the disc tray closes, and the disc image is recorded on the WORM disc.

CAUTION:

The CDD 521 is very sensitive to vibration or shock. Do not bump or jar it during recording.

Using emutool

emutool is a graphical user interface for controlling emulation and CD recording in a SunView window. **emutool** is available only for Sun-4 platforms.

emutool is executed using the following command line syntax:

```
emutool [option...]
```

where

emutool is a keyword and must be typed exactly as it appears in the syntax command line.

option is replaced by any option described in the following section. Zero or more options can be used after the **emutool** keyword.

Options

- d=<path>** sets working directory to *<path>*. This is the directory that the pull-down menus first display when selecting a disc image file and a TOC file. The default directory is the current directory.
- g** enables debug messages. These messages are displayed in the **emutool** window during recording.
- s=<device>** specifies the Sun serial port connected to the emulator. The default is **/dev/ttyb**.

Configuring emutool

When **emutool** is executed, it uses two environment variables to determine the emulator serial port and the initial file browser path:

EMU_PATH is the pathlist to the directory displayed by drop-down menus. If not defined, **emutool** defaults to the current directory. You may override the default or **EMU_PATH** with the **-d=<path>** option.

EMU_PORT is the emulator serial port. If it is not defined, the serial port defaults to **/dev/ttyb** (19200 baud, 8 bits, no parity). You may override the default or **EMU_PORT** with the **-s=<device>** option.

Starting emutool

To execute **emutool** and display the **emutool** window:

1. Open a command shell.
2. Type **emutool** followed by any options you wish to use.

*NOTE: You may add **emutool** to your **.sunview** file to display the window each time you enter SunView.*

The **emutool** window appears as shown in Figure 2.

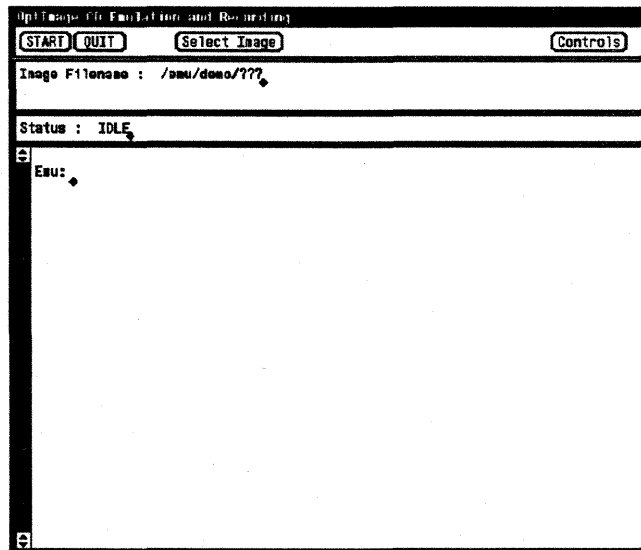


Figure 2 emutool window

Recording a disc image

To record a disc image using **emutool**, follow the steps below:

1. Click the **Controls** button to view the controls window.
2. Click the **Select Image** button and select the disc image to record.
3. Click the **Select TOC** button and select the TOC file for the disc image.
4. Power up the emulator and the CDD 521.
5. Insert the diskette labeled "CDD 521 Recording Software" into the emulator.
6. Press the reset button on the emulator. The emulator accesses the diskette for 30 to 40 seconds as it boots.
7. Open the disc tray and insert a blank Philips CD-R disc, label side up. Leave the tray open.
8. Click the **Start** button to begin recording.

The controls window

Clicking the **Controls** button in the **emutool** window displays the pop-up window shown in Figure 3.

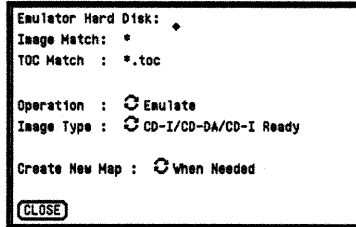


Figure 3 Controls window

The controls window allows you to select the following items.

Emulator Hard Disk

The **Emulator Hard Disk** field allows you to select the hard disk containing the disc image. The default for this field is **/h2** and is not displayed.

Image Match, TOC Match

The **Image Match** field limits the filenames displayed in the **Select Image** menu in the **emutool** window. Likewise, the **TOC Match** field limits the filenames displayed in the **Select TOC** menu. Both fields use the standard UNIX[®] wildcards ***** and **?** to limit the names displayed.

The default for the **Image Match** field is *****, which displays every filename in the directory displayed in the **Select Image** menu. The default for **TOC Match** is ***.toc**, which limits the filenames displayed in the **Select TOC** menu to those that end in **.toc**.

Operation

The operation field allows you to select the operation you want to perform. To select an operation, either click on the **Operation** field with the left button to cycle through the selections, or press and

hold the right button to select the operation from a pull-down menu. One of three operations may be selected:

- **Emulate** (the default selection)
- **Record CD (Philips CDD 521)**
- **Record CD (Yamaha YPE-101/YPR-201)**

To record an image using the CDR 521, select the **Record CD (Philips CDD 521)** option. The **Emulate** option is used to emulate the disc image. The **Record CD (Yamaha YPE-101/YPR-201)** option is functional only if you have purchased the *Yamaha PDS Recording Software*.

Image Type

Image Type selects the type of disc image to record. Two options are available for the image type:

- **CD-I/CD-DA/CD-I Ready** (the default selection)
- **CD-ROM XA (Mode 2)**

NOTE: The CD-I Ready format is not supported by the CDD 521.

Create New Map

Create New Map determines when a new disc image map is created. The choices are to create the map **When Needed** or to create it **Always**. **When Needed** is the default selection.

CLOSE

After making your selections, you may click **CLOSE** to close the controls window.

Selecting the disc image

Click the **Select Image** button at the top of the **emutool** window to select the disc image. A drop-down menu appears with the names of files contained in the current directory. Figure 4 shows the **Select Image** drop-down menu.

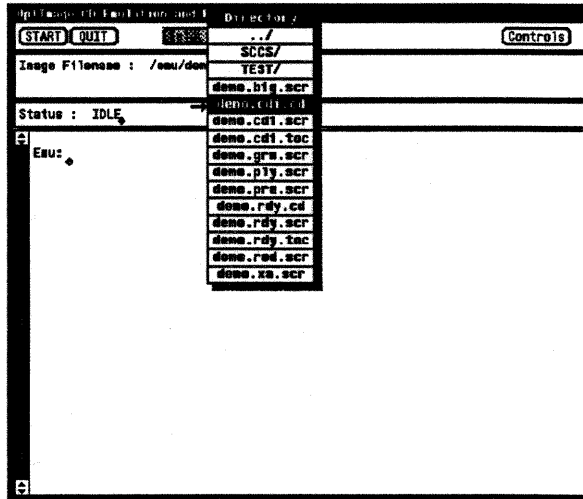


Figure 4 Select Image menu

Select a file from the drop-down menu by highlighting the file and clicking the left button.

Selecting a TOC file

The **Select TOC** button appears next to the **Select Image** button after the disc image is selected. Clicking **Select TOC** displays a drop-down menu that allows you to select a TOC file. When you select a TOC file, the filename appears in the TOC Filename field.

Starting the recording

Click **START** to record the disc image. When the **START** button is selected, it changes to a **STOP** button. As the recording proceeds, status messages appear in the bottom area of the window. To abort the recording in progress, click **STOP**.

Quitting the emutool window

The **QUIT** button quits emutool.

Re-configuring the Emulator

Prior to this release, the emulator was shipped configured for use with the Yamaha Programmable Disc System™ (PDS) WORM recorder. In this configuration, one of the Centronics 50 connectors on the rear panel of the emulator is connected internally to a board dedicated for use with the Yamaha PDS. The emulator is now being shipped configured for use with the Philips CDD 521.

If your emulator is configured for the Yamaha PDS and you want to use the emulator with the Philips CDD 521, you need to re-configure the emulator so that a second SCSI Bus is connected internally to the Centronics 50 connector. To do this, follow the steps below.

1. Back up local discs.
2. Switch off emulator power.
3. Unplug the emulator power cord.
4. Remove the case screw located at the top center of the rear panel, then remove the case top by moving it forward one half inch and lifting it off the base.

5. Locate the Centronics 50 connector on the rear of the emulator as shown in Figure 5..

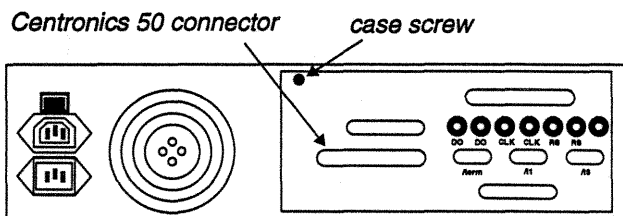


Figure 5 Rear view of OptImage emulator

6. Locate the 50-wire ribbon cable in the interior of the emulator that connects to the Centronics 50 connector shown in Figure 5..
7. Follow the 50-wire ribbon cable to its other end on the board (top board, left hand edge, as viewed from the front of the emulator) labeled "GMX SBC-CP" .
8. Disconnect the 50-wire ribbon cable from the connector on the GMX SBC-CP board.
9. Locate the GMX Micro-20 board in the emulator. This board is at the bottom of the stack containing the GMX SBC-CP board.
10. Locate the P5 connector on the GMX Micro-20 board. This connector is found on the right hand edge of the board as viewed from the front of the emulator (see Figure 6.)
11. Locate the striped edge (pin 1) of the 50-wire ribbon cable.
12. Insert the header of the 50-wire ribbon cable into the P5 connector so that the striped edge of the ribbon cable is on the pin 1 side of the P5 connector. Pin-1 is the rear-most pin on the left side of the connector, as viewed from the front of the emulator (see Figure 6.). The cable header should be in contact with the power connector housing. It should NOT be in contact with the P3 connector.

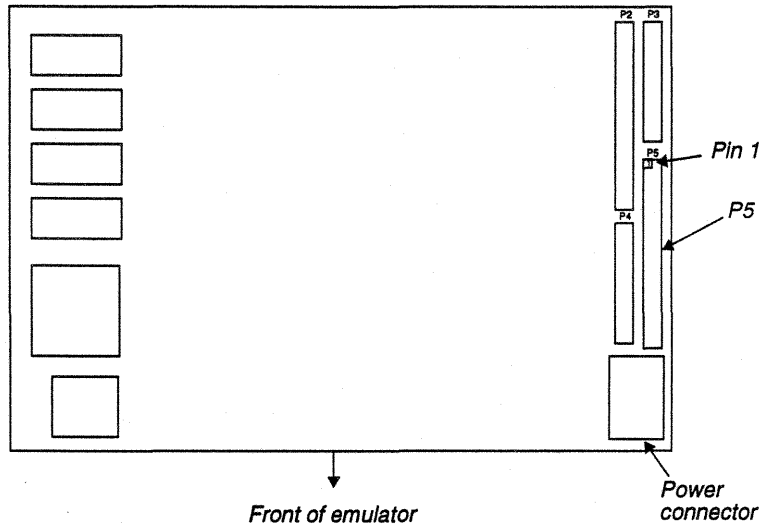


Figure 6 GMX Micro-20 board.

CAUTION:

Be sure to correctly align the sockets of the ribbon cable header on the pins of the P5 connector on the board. It is easy to misalign the header, which results in malfunction of the emulator when recording a compact disc.

13. Verify that all internal cables are securely seated.
14. Replace the emulator case top.

