



SurfBURNER

SurfBurner Installation Manual

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Congratulations on purchasing a SurfSTOR DVD-RW Drive! Your new SurfSTOR DVD-RW is made from the finest components and drive mechanisms available and is backed by Partners' years of experience providing consistently high quality SCSI solutions for Sun Workstation users.

This booklet will give beginners step by step instructions and more experienced administrators a reference to install any SurfSTOR SCSI DVD-RW drive, both **internal** and **external**. Prior System Administration experience is not necessary but a basic UNIX familiarity is highly recommended. **As you go through each of the steps be sure to read the entire section before starting each step.** Go carefully through the manual and you should be up and running in no time.

This manual includes information for *Solaris 8 (2.8)* and higher. This manual also assumes that you are attaching the new DVD-RW as an additional unit. Technical support is available by phone, fax, e-mail, and via the web.

La Mesa, CA: 619-415-2000
Toll Free: 800-550-3005
Fax: 619-415-2001
E-mail: support@partnersdata.com
WWW: <http://www.partnersdata.com>

• **Experienced:**

If you are experienced at installing DVD-RW drives on Sun you can use this booklet as a reference.

• **First Time Installer:**

If you need step by step information please start at STEP 1. Follow the next few steps and you should be up and running in no time.

Unit Overview

The SurfSTOR DVD-RW is a Sun Compatible DVD-RW that has the same recording capabilities as any other DVD-RW on the market. Below, in Figure A is a front view of the unit and its functions.



Figure A: Front View

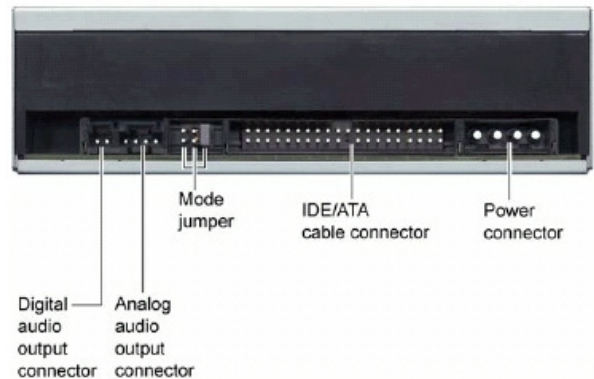


Figure B: IDE Rear View

For purchasers of the Internal IDE Unit, the following Figure B is provided to help aide in the configuration and installation of the unit into the computer.

STEP 1: Halting the System

If you are installing an internal DVD-RW or adding an external DVD-RW to a SCSI channel that already has devices on the system bus, you must shutdown the system. If you are adding an external unit to a new, empty channel you do not need to shut down and may continue to step 3. Before halting your system find out what operating system you are running by typing:

```
# /usr/bin/uname -sr
```

Write down your operating system here _____

You must have root permission and be sure that all users are logged off. Use any command you would use to halt your system normally or use the commands listed below.

```
# sync;/etc/halt
```

Once the system is halted turn off the power to the system and any devices attached to it.

STEP 2: Addressing

External SCSI: SurfSTOR subsystems have an external SCSI ID select switch on the bottom or rear panel of the enclosure. This switch corresponds with the SCSI address of the DVD-RW unit inside the enclosure. See Figure 2A below for a view of the ID Selector:



Figure 2A: ID Selector

Internal SCSI: If you are installing an internal DVD-RW please note that all of the jumpers have already been preset by Partners' technicians to ID6 for compatibility with most Sun systems. Please do not add or take off any other jumpers aside from the SCSI ID selection jumpers.

For a reference of the standard SCSI addresses on Sun Workstations refer to the following GENERIC Solaris kernel setup below. The main point with addressing is to make sure that no two devices have the same address. See Figure 2B below for a view of the unit and its connections:

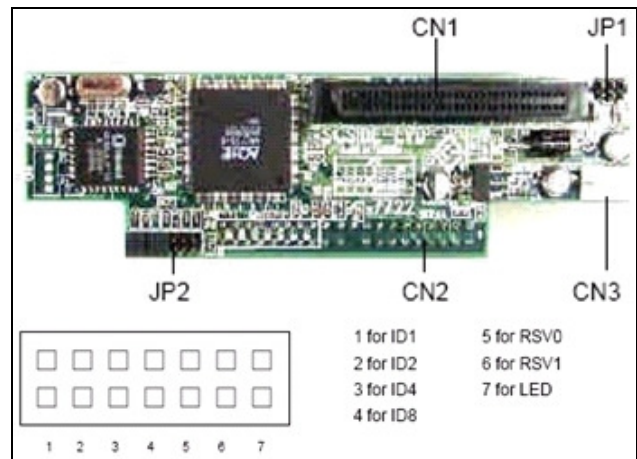


Figure 2B: Internal SCSI Rear View

Key:

CN1 --- 68-pin female SCSI connector.

CN2 --- 40-pin female IDE connector.

CN3 --- 4-pin power connector.

JP1 --- Sets Term Power to unit. Use pins 1 and 2 (left side).

JP2 --- Sets SCSI ID Selection and LED.

Typical SCSI Reservations:

IDs 0, 1, 2 and 3 are typically disk drives

(ID3=sd0 and is normally the boot disk mounted internally).

IDs 4 & 5 are for tape drives or DVD-RW devices.

ID 6 is for bootable CD-ROM or DVD-RW devices.

ID 7 is for the SCSI Controller.

IDs 8 through 15 are for Tape Libraries and RAID systems

Internal IDE: SurfSTOR DVD-RW subsystems ship in both IDE and SCSI flavors. If you are installing an internal IDE DVD-RW, please select the appropriate Master, Slave, or Cable Select jumper setting from the rear of the unit before installing and be sure to verify that it does not conflict with another device on the channel. It may also be noted that some systems do not support Cable Select and you may have to choose Master or Slave. See Figure 2C below for a view of the unit and its connections.

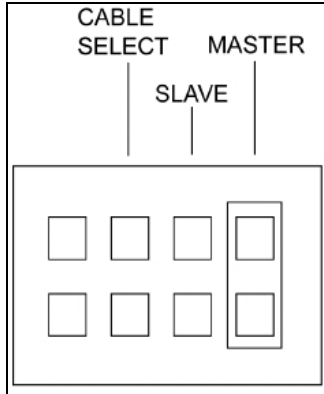


Figure 2C: Internal IDE Jumper Block

The Master/Slave/Cable Select setting for the drive is determined by the mode jumper. The jumper is placed over one of the sets of mode pins. To change the drive from Master to Slave or to Cable Select, you must move the jumper.

For example, to change the drive to be a Slave, move the jumper to the middle set of mode pins, leaving the other pins uncovered. To change the drive for Cable Select, move the jumper to the left set of mode pins.

NOTE: If you are using an Internal IDE, proceed to Step 5 and then Step 6A.

STEP 3: SCSI Termination

The SCSI bus is a daisy chaining system. Several devices can be attached to the bus by connecting each of the devices together in a single line. The end of the SCSI bus needs to have a terminator installed either internally or externally. The SurfSTOR subsystems utilize the external termination method while the internal units use JP1 pins 1 and 2 (see Figure 2B for the location of JP1). The terminator will match the characteristic impedance of the cable to keep signals from reflecting back and forth on the bus creating noise and mixed signals. Each of the devices in the middle of the SCSI chain should not have terminators installed so the signal will be at full power as it goes on to the next device in the chain. If you are installing the device in the middle of the chain do not use a terminator. If you install this unit at the end of the chain, put a terminator at the end of the SCSI chain. See Figure 3 below.



Figure 3: Termination

STEP 4: Attaching the SCSI Cable

The Sun SCSI host adapter (controller) accesses the SCSI bus through the rear of the Sun chassis with a 50 pin (8-bit SCSI), 68 pin (16-bit SCSI) D type connector, or Very High Density Connection Interface (VHDCI). Plug the SCSI cable into the Sun SCSI controller (usually in the back of the system). If the subsystem is in the middle of the SCSI chain, plug in the cable from the new subsystem into the back of the next subsystem in the SCSI chain. See Figure 4 for possible connection types to the Host Computer System.

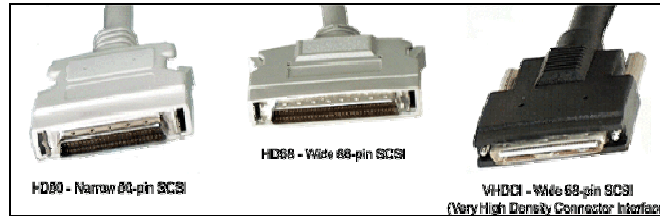


Figure 4: SCSI Connectors

STEP 5: Power Connection & Consumption

Plug the power cord into the SurfSTOR subsystem and into an appropriate power outlet. All SurfSTOR subsystems have an auto-ranging circuit to support single phase 100-260VAC 47Hz-63Hz automatically.*

*If power in your area has voltage spikes (power goes high) or brownouts (power goes low), it is recommended that you use a UPS (Uninterruptible Power Supply) or a surge protector to minimize the risk of damaging the subsystem and losing data. For more information contact your sales representative at Partners, 800-550-3005.

Auto-Ranging Power Supply Performance:

	<u>Typical</u>	<u>Peak</u>
+5V	40W	60W
+12	3A	5A
AC Input	96-276 VAC:	50-60 HZ
Fan/CFM	60mm2 ball barring fan / 22CFM	

STEP 6: Probing SCSI Devices

Read STEP 6 entirely before proceeding! The following is for SCSI Devices, if you have an IDE unit, proceed to STEP 6A. The easiest way to make sure that you have attached the new DVD-RW to the system correctly is to use 'probe-scsi-all'. At this point the Sun and the new DVD-RW should be physically connected together and set up correctly. **Turn on all of the external devices and then turn on the computer.** Your workstation will check memory and run various internal tests. It may also automatically boot itself. **If your system starts to boot, stop it immediately** by pressing and holding down the 'STOP' key (upper left hand corner) and then the 'A' at the same time - also known as 'L1-A'. This should bring you to an 'ok' prompt. This is the "new command mode" and has a variety of diagnostic and system setup options available.

Now you can test the device and SCSI ID. At the 'ok' prompt type 'probe-scsi-all'. You should see a listing of all the SCSI devices attached to your primary SCSI interface.

```
ok probe-scsi-all

/pci@1f,4000@scsi3
Target 1
Unit 0 SCSI Disk      Seagate Disk ST373307LC
Target 6
Unit 0 Removable Read Only Device    Plextor DVDR PX-800A
```

The "Target" is the SCSI ID that you set on the DVD-RW before attaching it to the system. You should see a listing of all the SCSI devices on your system including the new DVD-RW. If you do, proceed to the next step. If you do not, check the SCSI IDs being used on the system and choose one that is not being used for your new DVD-RW.

STEP 6A: Probing IDE Devices

Read STEP 6A entirely before proceeding! The easiest way to make sure that you have attached the new DVD-RW to the system correctly is to use 'probe-ide' command. At this point the Sun and the new DVD-RW should be physically connected together and set up correctly. Your workstation will check memory and run various internal tests. It may also automatically boot itself. **If your system starts to boot, stop it immediately** by pressing and holding down the 'STOP' key (upper left hand corner) and then the 'a' at the same time - also known as 'L1-A'. This should bring you to an 'ok' prompt. This is the "new command mode" and has a variety of diagnostic and system setup options available. At the 'ok' prompt type 'probe-ide'. You should see a listing of all the IDE devices attached to your IDE interface.

```
ok probe-ide

Device 0 ( Primary Master )
    ATA Model: ST3120026A
Device 1 ( Primary Slave )
    Removable Read Only Device Plextor DVDR PX-800A
Device 2 ( Secondary Master )
    Not Present
Device 3 ( Secondary Slave )
    Not Present
```

Assuming that the DVD-RW device jumper was set to Slave mode, it would show up as either Device 1 or Device 3 (depending on the cable used). Setting the DVD-RW as a Master device is not recommended as Master is usually reserved for Hard Drives.

Note: If you do not see the new DVD-RW and all the other devices previously attached to the system, repeat all the steps starting at step 2

4. Boot the system using the -rv switch option, which will reconfigure the system for new devices added since the last reconfigure, including your new SurfSTOR DVD-RW and verbosely log these changes.

ok boot -rv

As the Sun is booting you should be able to see it recognize the new device(s) during post.

STEP 7: OS Configuration Start Point

The following steps are intended to aide you in determining if the SurfSTOR DVD-RW drive unit has been successfully loaded by the Solaris Operating System.

1. When the computer is done booting it will give you a login prompt. Login as root:

login: root
Password:

2. You may have been able to see that the drive was recognized during the boot up sequence at the correct address. By default, Solaris starts an application called the "Volume Manager" which automatically mounts and dismounts CD-ROM and DVD type units. This makes it easy to place a CD or DVD into the drive and automatically start reading from it. To see if the "Volume Manager" has mounted and recognized the DVD-RW device, open an XTerm to see if a symlink has been created for the device by changing directories to /cdrom and listing the directory contents:

```
mycomputer# cd /cdrom
mycomputer# ls
cdrom0
```

This will give you a listing of all the CD-ROM's and DVD's attached to the system, including the SurfSTOR DVD-RW. If you have more than one SurfSTOR DVD-RW, then be careful to note the NEW SurfSTOR DVD-RW that has been added. If you do not know which one that is and have multiple units listed, it is recommended that you put a CD or DVD with information on it already into the SurfSTOR and type: "ls" for each cdromX (where X is the cdrom number assignment) until you see the contents of the disk. Make note of the cdrom# as it will list them as cdrom0, cdrom1, and so on.

3. Now determine if your SurfSTOR DVD-RW device mapped to the system correctly by running the iostat -En command:

```
mycomputer# iostat -En

c0t6d0          Soft Errors: 1 Hard Errors: 0 Transport Errors: 0
Vendor: PLEXTOR Product: DVDR   PX-800A   Revision: 1.0 Serial No:
Size: 0.00GB <0 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 1 Predictive Failure Analysis: 0
```

STEP 8: Manually Mounting the DVD-RW

The Volume Manager needs to be turned off any time you write to a CD or DVD (This will be discussed further in the SurfBURNER portion of the manual). Once it has been turned off however, the DVD-RW and any other ROM type unit will not be automatically mounted and will need to be mounted manually. To mount the SurfSTOR DVD-RW with volmgt stopped, you must do the following:

1. To mount the DVD-RW drive to a directory, put a written CD or DVD in the drive and mount it by typing the following:

```
# mount -o ro -F hfs /dev/dsk/c#t#d#s0 /some_directory
```

(Note: Put the desired mount point directory in place of /some_directory - i.e. /cdrom)

The actual SurfSTOR device varies based on where it is plugged in on the SCSI chain. You can find this information from the output of the probe command done in STEP 7 or by typing: iostat -En and looking for the c#t#d# number.

```
mycomputer# iostat -En

c0t6d0          Soft Errors: 1 Hard Errors: 0 Transport Errors: 0
Vendor: PLEXTOR Product: DVDR   PX-800A   Revision: 1.08 Serial No:
Size: 0.00GB <0 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 1 Predictive Failure Analysis: 0
```

3. At this point, you should have your # prompt back and the drive mounted to the desired directory. To confirm this you can use the 'df' command with a -k option. The 'df -k' command will report free disk space in kilobytes on a mounted partition. This will confirm that the disk drive is mounted.

```
mycomputer# df -k

Filesystem          kbytes  used  avail  capacity  Mounted on
/dev/dsk/c0t6d0s0  503084  503084    0    100%    /cdrom
```

Note: If you don't see the drive, then repeat step 9.

SurfBURNER CD/DVD Writer

The following has been provided to help in the installation, configuration, usage, and basic features. If you find yourself having any problems with the steps herein, please contact Partners Data Systems Technical Support. Support numbers and hours are provided at the end of this manual.

A DVD, for all general purposes of this document is nothing more than a CD with approximately 4.7GB of storable Data. Because of this, the term CD and DVD can be used interchangeably.

SurfBURNER is an easy to use JAVA based CD and DVD Recording Software that has been specifically designed to interface with the SurfSTOR DVD-RW units. SurfBURNER has the ability to easily drag-and-drop files between the Solaris Filesystem and a CD or DVD, enabling you to make quick backups of files or sharable copies of files that can be read on various types of computer systems.

STEP 1: SurfBURNER Patches

1. Log into the X Windows Session as root.
2. Insert the SurfBURNER CD/DVD Writer disk.
3. Wait for the file manager to open the CD Contents.
4. Open a Terminal session or command window.
5. `cd /cdrom/cdrom0/Patches/J2SE_Solaris_X_Recommended` (**NOTE: X** = OS version you are running)
6. `sh ./install_cluser`
7. Answer yes when asked: "Are you ready to continue with install? [y/n]:" yes
(**NOTE:** If you receive error codes: 5,9,18, or 19 and up, please review the detail logfile. All other error messages can safely be ignored.)
8. When the installation completes, it will ask you to reboot, but you will want to install the SurfBURNER software first before doing so. Proceed to STEP 2.

STEP 2: SurfBURNER Install

To install the SurfBURNER CD/DVD Writer application, run the sun package located under /cdrom/cdrom0. It is suggested that you read the following install example carefully as the script will create a dir named PDSIdvdrw in your /opt filesystem directory.

1. Change directories to the /cdrom/SurfBURNER folder. This assumes that the volume manager is turned on.
2. Once in the install directory, run the package manager to install the software using the following command:

```
mycomputer# pkgadd -d ./PDSIdvdrw-1.XX-sparc-local

The following packages are available:
  1  PDSIdvdrw      http://www.partnersdata.com SurfBURNER CD/DVD Writing utility.
      (sparc) 1.XX
Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?, ??, q]:
```

(**NOTE:** X = OS version you are running)

3. Type **all** and hit enter
4. Read the Software License Agreement and type: **yes** and hit **enter** to agree to the License.
5. The installation will copy all necessary files, finish, and display the options on how to run the application.
6. You will now need to reboot in order for the process to finish and run the software correctly. Type: **init 6**
7. Once the system as rebooted, continue to STEP 3: SurfBURNER Registration

(**NOTE:** To execute the software after rebooting, type: /opt/PDSIdvdrw/bin/surfburner to start the SurfBURNER application.)

STEP 3: SurfBURNER Registration

Now that SurfBURNER has been installed, you should be able to launch the application either by running the application from a self-made shell script or by running the /opt/PDSIdvdrw/bin/surfburner application from a terminal window as shown below:

```
mycomputer# /opt/PDSIdvdrw/bin/surfburner
```

When you first launch SurfBURNER, the application will notify you that it does not have a valid license to run and will run in demo mode until registered (See **Figure 5** for a view of the message). Demo mode will run with all features turned on, but will only allow write jobs of less than 50MB until it is registered. Click OK to the message and it will disappear until the next use of the product or will disappear when it has been registered.

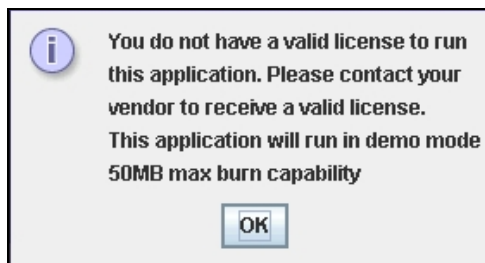


Figure 5: License Warning

To register your copy of SurfBURNER:

1. Open a shell prompt and type: `hostid`
2. The output should be something similar to the following:

```
mycomputer# hostid  
80d1f45e
```

3. Write down the number and E-mail or Fax it along with your Name, Company, Address, Phone number, E-mail Address, and SurfBURNER Software Serial # as provided in the form shipped with the product to:

FAX: 619-415-2001

E-Mail: Support@Partnersdata.com Subject: Register SurfBURNER

4. Once we have received your request, we will generate you a license key and E-mail it to you.
5. Edit the license file in the /opt/PDSIdvdrw directory using your favorite text editor and copy the license key information in the first line. Save the file with just the License key text without spaces and exit.

```
mycomputer# vi /opt/PDSIdvdrw/license  
  
1234567890  
~  
~  
:wq!  
"license" 1 lines, 11 characters
```

6. Once the license file has been edited, you will need to restart the software to activate the key. You may also register the key in the software under the Help/Register menu. You may review the Help/ About menu to ensure the product licensed correctly.
7. Should you experience any trouble in this process, feel free to contact us:

Monday - Friday 8am-5pm PST (-08:00 GMT)

E-mail: support@partnersdata.com

US and Canada: (800) 550 3005 extension 501

International: 011 01 619 415 2000 extension 501

STEP 4: Running SurfBURNER

Assuming everything has installed correctly, you should now be able to run the SurfBURNER software. To be able to write with the SurfBURNER software you will need to run the application as root. Otherwise, the entire program group directory permissions for the recording application will need to be changed. This can be done using the following commands:

```
mycomputer# chown <user>:<group> /opt/PDSIdvdrw/bin/cdwriter
mycomputer# chmod 4711 /opt/PDSIdvdrw/bin/cdwriter
```

Turn off any volume manager software. **You must do this in order to burn disks.**

On Solaris (pre-Solaris 10 06/06), this can be done by running this command:

```
mycomputer# /etc/init.d/volmgt stop
```

When you are done recording, turn it back on with:

```
mycomputer# /etc/init.d/volmgt start
```

NOTE: Solaris 10 6/06 and up no longer utilizes the volmgt init.d script for starting and stopping the volume manager. You must use the svcadm command to disable the service. **All Solaris 10 6/06 and greater users must do the following:**

```
mycomputer# svcadm disable svc:/system/filesystem/volfs:default
```

The service can be re-enabled any time by using the same command above, except replacing disable with enable.

To start SurfBurner by typing the following:

```
mycomputer# /opt/PDSIdvdrw/bin/surfburner
```

This will launch SurfBurner and allow you to start making disk compilations using the software. Please note the following however:

To manually mount the CD or DVD disc on Solaris after writing refer to “STEP 9: Manually Mounting the DVD-RW” or restart the Volume Manager and change directories to the /cdrom/cdrom0 folder to view the contents of the CD or DVD just created.

Before writing, ensure the recording device is found under the "Recorder" tab as shown in Figure 6. If you do not see any devices listed, you probably have volume management turned on or you may need to be root.

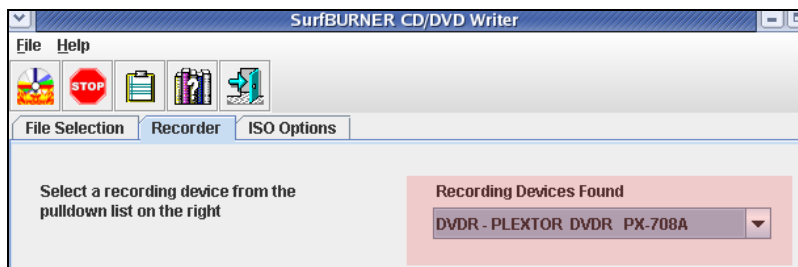


Figure 6: Recorder Tab

STEP 5: Creating a CD or DVD

SurfBurner has 5 toolbar icons which are intended to make recording a CD or DVD easier. Holding the mouse over any item in SurfBURNER will provide an explanation of each item. From left to right they are:



Record is used to Record a disk once you have created a file selection list. The Cancel button is used to cancel a recording. The Logs button is used to review errors or verify the burned disk. The Help button is used for registration and basic help. The Exit button is used to exit out of the application.

NOTE: Even though the physical DVD-RW unit may support various media types and media, Partners Data Systems, Inc. has only qualified CD-R, CD-RW, DVD-R, and DVD-RW media for use with the SurfBURNER software. Please do NOT use DVD+R, DVD+RW, DVD+DL, or DVD+Lightscribe media in this unit.

The left window pane will contain the file system of your machine. You may browse through the entire filesystem or any mounted remote filesystems. Left-click and drag files from the left window to the right window pane; these will be the files you will write to the CD/DVD disc. See Figure 7:

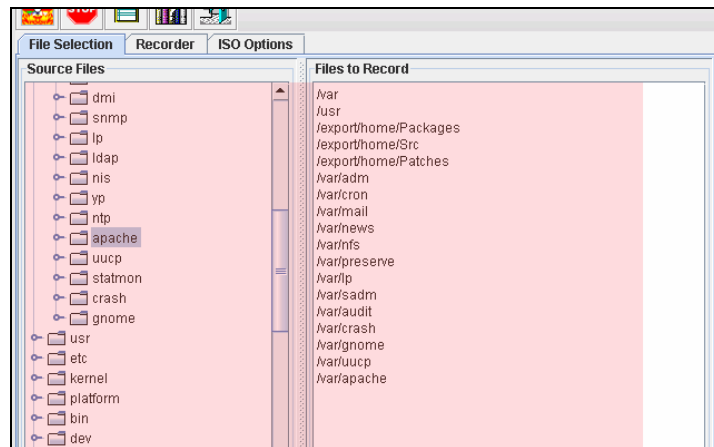


Figure 7: File Selection

Once you have finished dragging all the files you wish to copy to DVD, review the bottom of the screen to ensure you have enough space on the disk for your CD or DVD. You may have a total of 4.37GB of files that can be recorded to a DVD-R disc and 700MB for a CD-R and since the space is calculated for you in the lower left window under the file system listing, you need only review it before writing. See Figure 8:

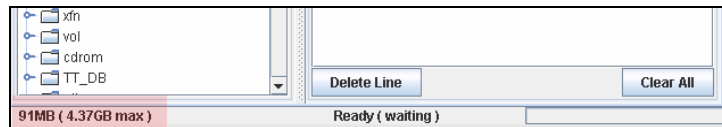


Figure 8: Data Allocation

Should you need to delete files or folders that have been added to the right window pane for recording, you may delete them by selecting the line and clicking the “Delete Line” button at the bottom of the right window pane. The “Clear All” button will delete all the files in the right window without having to select any of them. It will also clear the total MB value in the lower left window pane. See Figure 9:

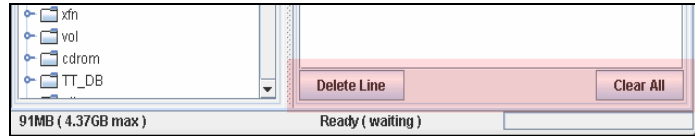


Figure 9: Deleting Files and Folders

While it is not necessary to select any options other than the default selected ones listed, it is recommended that you:

1. Review the “ISO Options” tab to determine which write method is best for your needs before actually writing the data to disk. Again, moving the mouse pointer over any item will give you an explanation of each item. Refer to the end of this document under ISO Options for a full explanation of each option.
2. Create a label for the disk you are creating. Under the Recorder tab, change the text field that states: “my_data” to something pertaining to the data in which you are copying to disk.
3. Verify you have enough space on the CD or DVD after you’ve dragged and dropped the files to the session file selection folder. You can do this by reviewing the “File Selection” data count total at the bottom right of the screen.

When you are ready to record the files to the CD or DVD, click the record icon in the tool bar or the “Record Now” button found under the Recorder tab at the top of the application. See Figure 10:



Figure 10: Recording

If you are using a re-writable disk, you may wish to erase it prior to creating a new compilation. To erase a disk, navigate to the Recorder tab and review the information under the “Erase Now” button. Review the “Recorder Options” to determine which erase type is best for your needs. The “Quick erase” is the most commonly used approach as it will delete the header of the disk and overwrite data as needed. You should only choose Full erase when the Quick method does not work. See Figure 11:

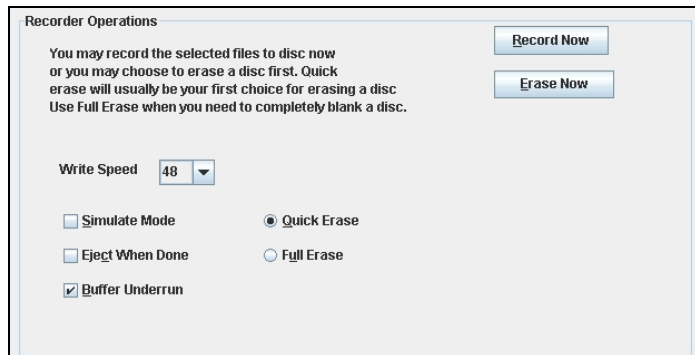


Figure 11: Disk Erasing Options

Using the CLI Interface

If for some reason you would prefer to use the command-line to create a disk, you may do so using the below commands. This can be useful when you can not be in front of the monitor and wish to use a remote connection such as Telnet or SSH. Below is a basic example of how to create a CD or DVD with data from the system.

1. Stop the volume manager first:

```
mycomputer# /etc/init.d/volmgt stop
```

2. Change directories to the /opt/PDSIdvdrw/bin

```
mycomputer# cd /opt/PDSIdvdrw/bin
```

3. Create an ISO image of the data you wish to burn to disk using the mkisofs command. (**NOTE:** You may use the mkisofs -help command for a full list of options):

```
mycomputer# # mkisofs -r -l -D -o data.iso -volid /some_directory /some_file /
88.84% done, estimate finish Mon Jan 15 13:57:54 2007
Total translation table size: 0
Total rockridge attributes bytes: 245
Total directory bytes: 0
Path table size(bytes): 10
Max brk space used a000
5629 extents written (10 MB)
```

4. Once done, an iso image will be created in the current working directory. To burn the ISO to disk, ensure you know the path to the writer. If not, run the scan.sh command found in the /opt/PDSIdvdrw/bin folder or refer to using iostat in Step 7 of the Unit Overview section.

5. Burn the disk using the /opt/PDSIdvdrw/bin/cdwriter command.

```
mycomputer# /opt/PDSIdvdrw/bin/cdwriter dev=1,6,0 -v -eject data.iso
```

Note: You will need to change the “dev=1,6,0” to match your system. The structure is <cntrlr>,<scsi id>,<lun>. Also, this will only work on a CDROM disc. For a DVD disc you need to add the “-dao” switch as follows:

```
mycomputer# /opt/PDSIdvdrw/bin/cdwriter dev=1,6,0 -dao -v -eject my_data.iso
```

6. Once it finishes you can mount it up to use:

```
mycomputer# mount -F hsfs -o ro /dev/dsk/c0t6d0s0 /mnt
```

7. You may now change directories into the /mnt folder and view the contents of the newly created disk to verification.
8. Once you’ve completed burning, restart the volume manager:

```
mycomputer# /etc/init.d/volmgt start
```

An ISO image that has been created either under Windows or UNIX should work with the above instructions as long as the image was created within ISO standards.

Booting from the SurfBURNER Unit

This is an example of how to boot from a Blade 150. Your particular configuration will vary from system to system and this is why it is suggested you pay special attention to these instructions:

1. Hit Stop + A when the system is counting memory and probe for SCSI Devices. In this instance, an external CD-ROM was connected to a Sun Combo Card on the top channel.

```
OK> probe-scsi-all
/pci@1f,0/pci@5/pci@0/scsi@2,1
  Target 6
    Unit 0   Removable Read Only Device 'PLEXTOR ' 'DVDR PX-800A ' '1.04' Removable CD-ROM
```

2. Looking on the back of the SCSI caddy, we can see that a SCSI ID has been set to assign an ID of 6 to the CD-ROM. Once you know your SCSI ID for the CD-ROM we can now translate this and boot directly from the address with the following command:

```
OK> boot /pci@1f,0/pci@5/pci@0/scsi@2,1/disk@6,0:f
```

3. If you need to boot off of this device again in the future, it is suggested that you make a simple alias to this device as well as note the cable and ID settings. To make an alias, simply type: `devalias <some_name> <hardware_address>`

```
OK> devalias xcdrom /pci@1f,0/pci@5/pci@0/scsi@2,1/disk@6,0:f
```

4. Now that an alias has been created, you can type the following from the OK> prompt to save and boot from it:

```
OK> nvstore
OK> boot xcdrom
```

Creating A DVD from Sun ISO Files

If you have a login for Sun Solve, then you more than likely have the ability to download the latest Solaris Disk Images. The following is outlined at Sun's site at: www.sun.com/software/solaris/download_instruction.xml, but the basic steps for taking the files downloaded from Sun's site at: <http://www.sun.com/software/solaris/get.jsp> and creating a single, unified ISO image that can be burned to disk.

If the software is obtained via download, selecting DVD has an additional benefit: you only have to burn a single disk. However, many utilities found on the Internet or included with various operating systems do not function properly with files that exceed 2GB in size, and a DVD image can be much larger than that. To minimize this problem, Sun has broken the Solaris 10 OS DVD image into five parts. To reconstitute the full DVD image:

NOTE: Once one has downloaded an .ISO file, checking the ISO files to see if it has been corrupted during the download, before burning it to a DVD is recommended. For that, one will need to compare checksums of the downloaded file against the file found on the download server. With Solaris 10 and beyond, use the digest application supplied with the Solaris 10 operating system.

Example1:

```
# digest -a md5 filename
```

This will create an md5 sum that can be compared against the published value at the download site.

Another option is to install the free downloads of md5-sparc or md5-x86 available at <http://sunsolve.sun.com/md5/md5.tar.Z>.

Make sure to use the same kind of media as supported by your DVD burner. There are CD-R, CD-RW, DVD-R, and DVD-RW disks that can be used. Do not use DVD+R DL (dual layer) discs.

1. Download all 5 parts of the image. Each of these parts is an individual slice of the DVD Filesystem, or an individual CD that can be burned on 5 separate CD's.
2. Use the command: `#unzip sol-XX-u2-ga-sparc-dvd-iso-Y` where XX is the OS version and Y is the part. Unzip all of the files into a single directory.
3. In order to make a single DVD image, instead of 5 separate CD's, one will need to concatenate them all sequentially at once and redirect the output to a single file. An example of this is using the Solaris 10 distribution is as follows:

```
mycomputer# cat sol-10-u2-ga-sparc-dvd-iso-a sol-10-u2-ga-sparc-dvd-iso-b sol-10-u2-ga-sparc-dvd-iso-c sol-10-u2-ga-sparc-dvd-iso-d sol-10-u2-ga-sparc-dvd-iso-e > sol-10-GA-sp-dvd.iso
```

4. The end result is a single ISO image that can be burned to DVD.
5. To burn the ISO image, insert a blank DVD-R media into the SurfSTOR DVD/CD Writer
6. Open a terminal window under Solaris, su to root, and turn off volmgt as follows:

```
mycomputer# su -
mycomputer# /etc/init.d/volmgt stop
```

7. Now burn the image to disk by running the cdwriter program from the SURFBurner Directory such as follows:

```
mycomputer# /opt/PDSIdvdrw/bin/cdwriter dev=X,Y,Z -dao -v -eject sol-10-GA-sp-dvd.iso
```

NOTE: dev=X,Y,Z is the device path to your particular DVD+/-RW and can be determined by running the following command:

```
mycomputer# /opt/PDSIdvdrw/bin/scan.sh
```

The output of the scan.sh should appear similar to the following:

```
scsibus1:
1,0,0 100) 'FUJITSU ' 'MAP3735N SUN72G ' '0401' Disk
1,1,0 101) *
1,2,0 102) *
1,3,0 103) *
1,4,0 104) *
1,5,0 105) *
1,6,0 106) 'PLEXTOR ' 'DVD-R PX-800A ' '1.08' Removable CD-ROM
```

In this case, 1,6,0 is the target of dev=X,Y,Z and should be used in the above cdwriter command to make the DVD.

8. Depending on the amount of data being recorded to the device, this process may take up to an hour to record to disk. Once completed however, put the CD into the drive again and mount it using the following command:

```
mycomputer# mount -F hsfs -o ro /dev/dsk/c0t6d0s0 /cdrom
```

9. Now change directories into the /cdrom folder and list the contents using the ls command.

NOTE: On bootable disks, there are various slices, not all of which are viewable using the mount command. It is advisable to try mounting slices 1 and 2 (ex: c0t6d0s1 and c0t6d0s2) as further tests before trying to boot the CD or DVD.

Once completed, be sure to restart the volume manager again.

Technical Support

Technical Support is available 8:00 A.M. - 5 P.M. Pacific Standard Time, Monday - Friday excluding holidays. We are not responsible for products other than those provided by Partners, but we will make every attempt to interface and integrate with other vendors' products as necessary to the best of our ability. Technical Support can help with installations, defective equipment, and support questions. Your Account Manager can assist you with incorrect shipments, missing parts, and general information. Our goal is to get you up and running as quickly and easily as possible. Please do not hesitate to call.

If you need Technical Support your technician will need the following information:

1. Company name, your name, and phone #.
2. Serial #.
3. IMPORTANT! If at all possible, have the system you are working on available when you call so we may better assist you with the installation of the equipment. Technicians are normally available immediately when you call except during peak times (10AM-2PM PST). If a technician is not available you will receive a call back typically within 60 minutes.

Call 619-415-2000 within California
Call 800-550-3005 outside California
Fax 619-415-2001
E-Mail: support@partnersdata.com
WWW: <http://www.partnersdata.com>

To help us serve you better, send comments or suggestions:

Partners Data Systems, Inc.

3663 Via Mercado
La Mesa, CA 91941
Attn: Customer Service
or
Via e-mail: comments@partnersdata.com

Thank you very much for your purchase and support.

Reference Documents

- Partners Data Systems, Inc. website: <http://www.partnersdata.com>
- Mkisofs website: <http://cdrecord.berlios.de/old/private/mkisofs.html>
- BigAdmin System Administration Portal: <http://www.sun.com/bigadmin/home/index.html>
- Sun BluePrints: <http://www.sun.com/blueprints/>
- cdrecord website: http://freshmeat.net/redirect/cdrecord/35795/url_homepage/cdrecord.html

ISO Options

Rock Ridge - (-R or -rock option) Makes the disk UNIX readable with longer than 8.3 filenames. This allows the ISO-9660 extension to allow long file names, UNIX symlinks and file protection (rwx). You may use this with Joliet to create a Windows and UNIX compatible hybrid readable disk.

Joliet - (-J or -joliet option) Required in addition to Rock Ridge to create a Windows readable disk as it makes MS/Windows 95 like 8.3 file names with translation to 64 character names. This is the Microsoft extension to ISO-9660.

Deep directories - (-D option) This means that you can have more than 8 directory levels even when not rock-ridge is used as it disables deep directories, putting them in the format as seen on the disk. This is useful under Windows, but it violates the ISO-9660 standard and should be used with caution as it can cause for invalid directory interpretation under certain systems.

Long Names - (-l, -full-iso9660-filenames option) Allows for long file names using 31 characters. By default, the disk will only allow for DOS-like 8.3 characters to be written. This must be selected or you will otherwise end up with files such as: "somefil~1.con".

Backup - (-nobak option) Do not copy any file that ends with .bak, ~, or # to the CD or DVD upon creation.

Follow Symbolic Links - (-f or -follow-links) This is set so files and directories that are links under a UNIX filesystem will be included and followed from within the Disk.

Hide RR_Moved Dir - (-hide-rr-moved option) This moves the RR_Moved to a .rr_moved directory so it is hidden in the filesystem when using Rock Ridge. This is useful when you want to have a clean disk without these directories.

Rationalized - (-r or -rational-rock option) This resets the security attributes of the files and folders with rationalized owner and mode information.

Relaxed Filenames - (-relaxed-filenames option) Allows for uppercase and lowercase characters, as well as numbers to all exist in a single filename, but it also violates the ISO-9660 standard and should be used with caution even though it can be very useful to some.

Allow Lowercase - (-allow-lowercase option) Allows just lowercase characters. This is not needed if Relaxed Filenames is selected and all you want is lowercase characters, but please note that this technically violates the ISO-9660 standard.

Allow Multidot - (-allow-multidot option) This option allows more than one dot to appear in filenames. This violates the ISO9660 standard, but it happens to work on many systems. Use with caution.

Omit Trailing Period - (-d option) This omits trailing periods from files that do not have a period. This too violates the ISO9660 standard, so use with caution.

Leading Period - (-L or -allow-leading-dots option) This option allow filenames, such as hidden ones, to begin with a period. Usually, a leading dot is replaced with an underscore in order to maintain MS-DOS compatibility, but please use with caution as this is for legacy support only (pre-2001).

Glossary of Terms

boot disk - The disk that holds the system kernel and boot information, typically a swap partition, and executable files (except for data-less setup) necessary to run the computer.

cat - Concatenate and display. Similar to “more” but displays entire file at once even if the file output is larger than the display.

cp - Copies a file from one location to another.

data disk - A disk typically made with maximum size partitions with the fewest total partitions allowable by the operating system using UFS.

<i>OS Release</i>	<i>Single file</i>	<i>File system</i>
Solaris 2.5.1	2 Gbyte	1 Tbyte
Solaris 2.6 - 9 12/02	~1012 Gbyte	1 Tbyte
Solaris 9 08/03 - Solaris 10	~1023 Gbyte	16 Tbyte

dev - Stands for device. The directory /dev has all the supported devices.

df - Reports information about a disk’s geometry and partitioning.

du - Reports the information about a folder’s size.

format - Enables one to format, label, repair and analyze disks on your system.

iostat - The iostat utility iteratively reports terminal, disk, and tape I/O activity through kernel level calls.

kernel - The SunOS kernel has a listing of the supported devices for that machine. As the system boots up, it polls each device in the kernel to confirm it responds. When adding new devices kernel support is required.

man - Stands for “manual”. Running man <some_command> results in a description and usage of a particular command. Example: “man fsck”.

mkdir - Makes a directoryX/

more - Browse or page through a text file. Similar to “cat” except that “more” scrolls down to display one more line or page of text at a time

mv - Allows one to move files from one location to another.

newfs - New file system, creates a new file system.

NFS - Network File System, allows transparent file access over networks.

prtvtoc - Prints the disk’s partition map.

root - Usually used by the System Administrator. Root, also referred to as the “Super User”, has permission and access to all computer files and functions.

SCSI - Small Computer System Interface, pronounced “scuzzy”, which is an industry standard for connecting peripheral devices and their controllers to a microprocessor. The SCSI defines both hardware and software standards for communication between a host computer and a peripheral device. Computers and peripheral devices designed to meet SCSI specifications should work together.

UFS - Default Disk based file system for the Solaris OS.

vfstab - Is the file system table, static file system mounting table, mounted file system table used by the computer to mount disks, NFS, etc during boot.

vi - Visual display editor based on ex. Used to modify files.

ZFS - ZFS is a new files system that eliminates volume management altogether. Instead of forcing you to create virtualized volumes, ZFS aggregates devices into a storage pool. It acts as an arbitrary data store from which file systems can be created.