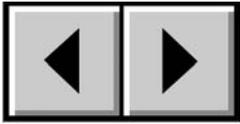
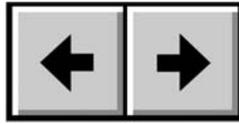


## How To Use This Manual

### In the toolbar:



Previous Page / Next Page



Go to Previous View / Go to Next View



Go to Contents Page / Go to Precautions Page

### On the page:

Click on the text within the Contents page to jump to information on that topic.

### Printing:

While optimized for onscreen viewing, the pages of this manual are formatted for printing on 8 1/2" x 11" and A4 sized paper, giving you the option to print the entire manual or just a specific page or section.

### To Exit:

From the Menu bar at the top of your screen, select: File > Quit.

## Icons Used In This Manual

Italicized paragraphs feature an icon describing the type of information being given.



**Important Info:** *This icon refers to an important step that must be followed.*



**Tech Note:** *This icon refers to tips to help maximize performance.*



**Caution!** *This icon indicates a potential hazard, and gives tips on how to avoid them.*

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## Changes

The material in this document is for information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, LaCie assumes no liability resulting from errors or omissions in this document, or from the use of the information contained herein. LaCie reserves the right to make changes or revisions in the product design or the product manual without reservation and without obligation to notify any person of such revisions and changes.

## Federal Communications Commission Radio Frequency Interference Statement (FCC)

LaCie d2 DL DVD±RW Drive



Tested To Comply  
With FCC standards

FOR HOME OR OFFICE USE

**WARNING:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance

with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antennas.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the reseller or an experienced radio/TV technician for help.

Shielded cables and I/O cards must be used for this equipment to comply with the relevant FCC regulations.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### **Canada Compliance Statement**

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

### **Manufacturer's Declaration for CE Certification**



We hereby certify that this device is in compliance with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms:  
Class B EN60950, EN55022, EN50082-1, EN61000-3-2

With reference to the following conditions:

73/23/EEC Low Voltage Directive

89/336/EEC EMC Directive

### **Laser Products**

This equipment is certified to comply with DHHS Rule 21 CFR Chapter I, subchapter J in effect as of date of manufacture. This equipment is classified as a Class I Laser product and no hazardous laser radiation is emitted outside the drive.

## Health, Safety and General Use Precautions

The drive you have just purchased includes a laser diode device, which classifies it as a "Laser Class I" product. This laser is not dangerous for the user under normal operating conditions. However, we strongly advise you not to place any reflective objects in the disc loading system, due to the risk of exposure to laser emissions that may be reflected by such objects.

Always follow the basic precautions listed below to use your LaCie drive safely and correctly. Respecting these guidelines will help to avoid the possibility of personal injury to yourself or others, as well as to prevent damage to your device and other computer equipment. These precautions include, but are not limited to, the following:

### Health and Safety Precautions:

- Read this User's Manual carefully, and follow the correct procedure when setting up the device.
- Do not look inside or place your hand over the open DVD/CD media tray. Never look directly or indirectly (with a mirror) at the laser diode, even when the device is not in operation. If you expose your eyes or skin to the laser inside you drive, you risk damage or loss of your vision or other personal injury.
- Do not open your drive or attempt to disassemble or modify it. Never insert any metallic object into the drive to avoid any risk of electrical shock, fire, short-circuiting or dangerous emissions. Your drive contains no user-serviceable parts. If it appears to be malfunctioning, have it inspected by qualified LaCie service staff.
- Never expose your device to rain or use it near water or in damp or wet conditions. Never place containers on it containing liquids that may spill into its openings. Doing so increases the risk of electrical shock, short-circuiting, fire or personal injury.
- Make sure that the computer and drive are electrically grounded. If the devices are not grounded, there is an increased risk of electrical shock.
- Do not listen to audio with headphones at an excessive volume for prolonged periods of time. Doing so increases the risk of hearing damage or loss.
- Before listening to music with your drive, set the volume control to minimum. Sudden bursts of sound at loud volumes can cause immediate hearing damage or loss.

## General Use Precautions:

- Do not expose the drive to temperatures outside the range of 5° C to 40° C (41° F to 104° F) during operation. Doing so may damage the drive or disfigure its casing. Avoid placing your drive near a source of heat or exposing it to sunlight (even through a window). Inversely, placing your drive in an environment that is too cold or humid may damage the unit.
- Do not block the ventilation outlets on the rear of the drive. These help to keep your drive cool during operation. Blocking the ventilation outlets may cause damage to your drive and cause an increased risk of short-circuiting or fire.
- Always unplug the drive if there is a risk of lightning or if it will not be used for an extended period of time. Otherwise, there is an increased risk of electrical shock, short-circuiting or fire.
- Do not place heavy objects on top of the drive or use excessive force on its buttons, connectors and tray. Doing so increases the risk of damage to the device.
- Always place your drive in a horizontal position before using it. Otherwise, it may fall, causing damage to the device and / or corruption or loss of data.
- Always remove the disc from the disc tray before transporting your drive. Otherwise, written data may be destroyed or the drive's internal components may be damaged.
- Never use excessive force on the disc loading system; discs should be inserted effortlessly into your drive. If you detect a problem, consult the Troubleshooting section.
- Protect your drive from excessive exposure to dust during use or storage. Dust can build up inside the device, increasing the risk of damage or malfunction.
- Never use benzene, paint thinners, detergent or other chemical products to clean the outside of the drive. Such products will disfigure and discolor the front panel and casing. Instead, use a soft, dry cloth to wipe the device.

## 1. Introduction

Congratulations on the purchase of your new LaCie d2 DL DVD±RW Drive – your complete DVD and CD creation solution! This drive gives you maximum compatibility with the various DVD and CD formats, reading and writing to all of the popular standards (DVD+R/RW, DVD-R/RW and CD-R/RW) and introduces a brand new standard: DVD+R9 Double Layer (DL).

### Supported DVD and CD Logos



### Double Layer DVD Recording

With the same technology that underpins Hollywood-style DVD-Videos, Double Layer (DL) discs are compatible with most consumer set-top DVD players and computer DVD-ROM drives. On one DVD+R DL/ DVD-R DL disc, you'll be able to store up to four hours of MPEG-2 video, sixteen hours of VHS-quality video or increase the video bit rate for higher quality movies. And with 8.5GB of storage space on a single DL disc, they're ideal for archiving and backup applications, and could even be used as replacement for tape in some instances.



The LaCie d2 DL DVD±RW Drive can be integrated into standard 19" computer and audio equipment racks, and is equally at home on any desktop. Now you have the tools to make high-impact, professional quality DVD videos, conveniently make system backups and preserve all of your memories for the future.

### 1.1. What Your LaCie Drive Can Do

- Burn videos for playback on computers and DVD players
- Play, edit, organize and burn your digital music
- Save large data projects or make backups

## 2. Your LaCie Drive

### 2.1. Minimum System Requirements

#### Mac Users



#### Hardware Requirements –

Computer equipped with a FireWire interface card.

#### System Requirements –

##### Single/Double Layer Recording

- 4.7GB or 8.5GB Single/Double Layer disc
- 700MHz G4 or later
- Mac OS 10.2.9 or later
- 64MB of RAM (256MB recommended)
- QuickTime 6 or later

##### Toast Titanium 7

- Power Mac G4 or later
- Mac OS 10.3.9 or higher
- ~300 MB disk space
- QuickTime 7.0 or later
- Recordable CD or DVD media



**Important Info:** MPEG encoding is a system intensive application and requires most of a CPU's power. This process can take several hours on slower systems.

#### Additional Requirements for DVD playback and Pre-Mastering –

Monitor resolution of 1024 x 768, 24-bit color

#### Additional Requirements for DV Capturing and DVD Authoring –

Minimum of 128MB of RAM (256MB is recommended)

1GB of free hard disk space for every 5 minutes of DV video capture

4.5GB of free hard disk space for copying a single layer DVD-Video disc

8GB of free hard disk space for copying a double layer DVD-Video disc



**Important Info:** To ensure optimal recording results, avoid copying from a CD or DVD and record directly from a hard drive that supports sustained data transfer rates for the following speeds:

- 16x = 22.16MB/s
- 8x = 11.08MB/s
- 4x = 5.54MB/s
- 2x = 2.77MB/s
- 1x = 1.385MB/s



#### Tech Note: Mac Users!

##### DVD Playback:

At the time of publication (September, 2005), Apple only supports DVD playback on Macintosh computers with a built-in DVD-ROM drive. If your system does not have a built-in DVD-ROM drive, in order to enable DVD playback you will need to utilize a third-party utility.

##### Apple Disc Recording Updater:

In order to provide maximum compatibility with Apple software products, LaCie is constantly providing drive support updates. Visit our Web site, [www.lacie.com/support](http://www.lacie.com/support), choose Optical from the pull-down menu and download the LaCie DiscRecording Support for Mac OS X 10.3.2 or later to add LaCie drive support to applications that utilize Apple's DiscRecording framework. These include, but are not limited to, the following applications: Finder, iTunes, iPhoto, Backup, Disk Utility and DVD

## 2.2. Package Contents



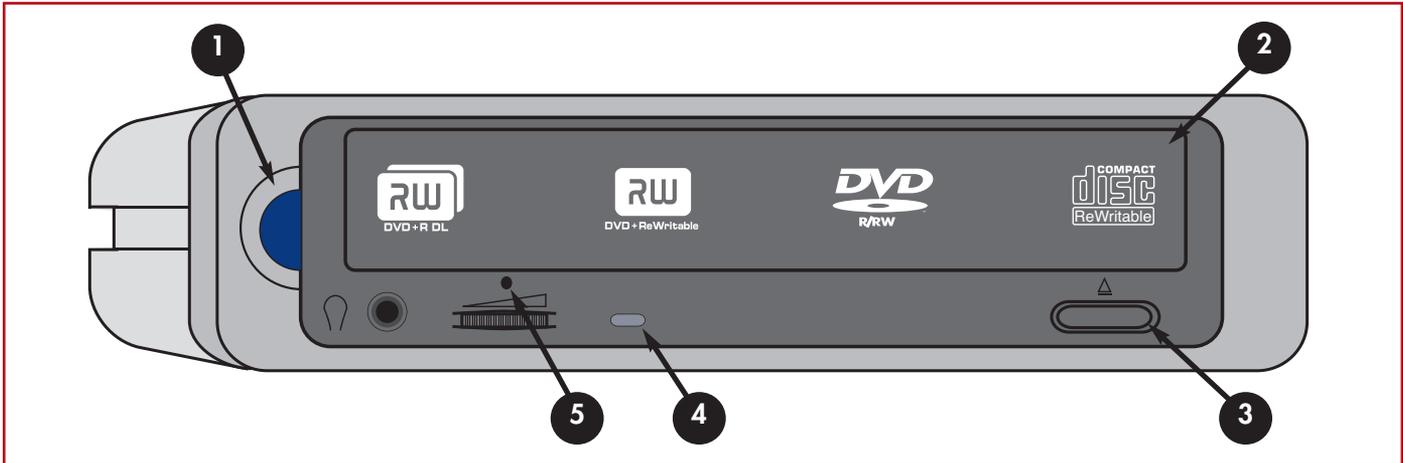
- 1 LaCie d2 DL DVD±RW Drive
- 2 Power supply and adapter cable
- 3 LaCie Toast 7 Titanium CD-ROM with the Toast Titanium software and LaCie d2 DL DVD±RW User's Manual
- 4 FireWire 6-pin to 6-pin cable



**Important Info:** Please keep your box. In the event that the drive should need to be repaired or serviced, it must be returned in its original packaging.

## 2.3. Views Of The Drive

### Front View –



#### 1 – On/Off Button / Power LED –

The Power LED automatically lights up after the power supply has been connected and the drive has been attached to the computer via either the FireWire interface. Use this button to turn your drive on and off.

#### 2 – Media Tray –

Open the tray by pressing the load/eject button, then place a CD/DVD into the tray with the label facing up. Close the tray by pushing the load/eject button or pushing the front part of the tray.

#### 3 – Open/Close Button –

Push this button to open the disc tray.

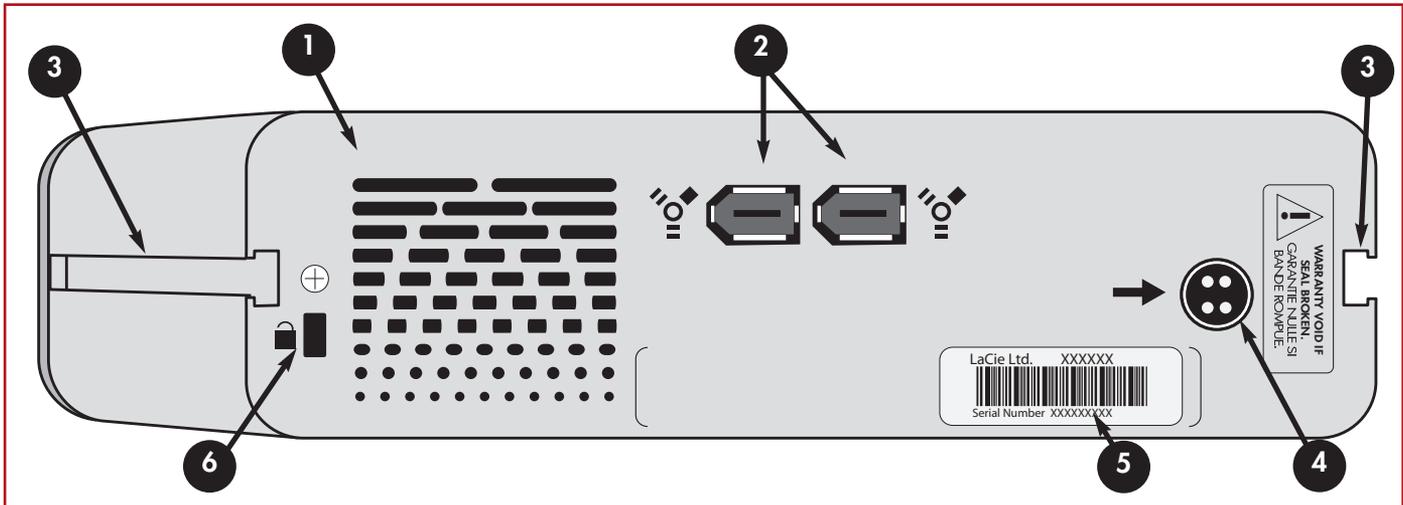
#### 4 – Disc LED –

Lights when a disc is loaded into the drive, and lights in different patterns during operation.

#### 5 – Emergency Eject Hole –

Used to eject the tray if the load/eject button does not work. In normal operation, the eject button should always be used to unload the tray. Please see section [4.5.1. Emergency Ejection Of Discs](#) for more information.

## Rear View –



### 1 – Ventilation Outlet –

These holes help to keep your drive cool during operation. Be sure not to block these openings when using your drive.

### 2 – FireWire 400 Port –

This is where you plug in the FireWire 400 or iLink/DV cables furnished with the drive. See section [3.3. Connecting the Interface Cable](#) for more information.

### 3 – Rackmount Grooves –

These grooves are used for mounting the drive in standard 19" computer and audio equipment racks using the LaCie Rackmount Kit (sold separately).

### 4 – Power Supply Connector –

This is where you plug in the AC adapter supplied with the drive. See section [3.2. Connecting The Power Supply](#) for more information.

### 5 – Serial Number Sticker –

This is where you will find your LaCie drive's serial number. Write down the serial number and keep it in a safe place, because you will need to provide the number in the event you have to call LaCie Technical Support for any reason in regards to the drive's performance. The serial number would also come in handy if your drive is lost or stolen.

### 6 – Lock Slot –

This slot is used to connect an anti-theft system, such as the LaCie Security Lock, for maximum protection. Refer to your anti-theft system documentation for details on how to connect the lock.

## 2.4. Cables And Connectors

### FireWire

FireWire is Apple's implementation of IEEE 1394, and is capable of transferring large amounts of data between computers and peripherals at a high rate of speed. The FireWire standard defines 100, 200 and 400Mb/s devices and can support multiple speeds on a single bus.

FireWire has the following features:

- Hot-pluggable: devices can be added and removed while the bus is active.
- Isochronous data delivery: FireWire supports real-time data delivery.
- Flexible: up to 63 devices can be connected on a single bus.

### FireWire Cables



**6-to-6-pin cable:** Connects FireWire 400 devices to FireWire 400 ports.

### FireWire Icons

These icons will help you easily identify the FireWire interface. They appear on FireWire cables, and next to the FireWire port connectors on certain computers.

FireWire icon



iLink™ icon



DV icon



## 3. Installing Your LaCie Drive

Follow these steps to quickly get your LaCie Drive powered on and connected to your computer. Refer to a section to get started!

[3.1. Installing The Recording Software](#)

[3.2. Connecting The Power Supply](#)

[3.3. Connecting The Interface Cable](#)

Once you've gotten the drive powered on and connected to your computer, move on to section [4. Using Your LaCie Drive](#) for important information on how to utilize your drive.

### 3.1. Installing The Recording Software

Insert your LaCie Toast CD-ROM into your internal DVD/CD-ROM, and follow the instructions below that are based on each particular operating system. For more information about the various programs, please refer to the Help sections of the specific software program.

#### Mac Users:

##### Mac OS 10.3.9 and later –

Double-click the the Toast 7 Titanium CD-ROM icon and then open the “Toast 7 Titanium” folder. Drag and drop the Roxio Toast 7 Titanium application icon into the Applications folder on your hard drive.



**Important Info:** *The serial number for your copy of Toast 7 Titanium is located on the front of the Toast 7 Titanium CD-ROM sleeve.*



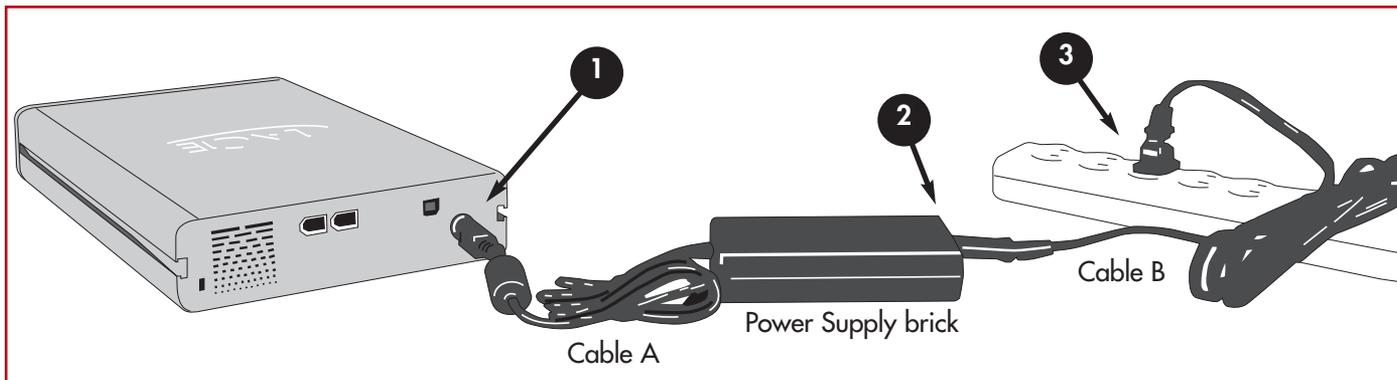
##### Mac OS 10.2.3 and later –

Double-click the the LaCie Toast CD-ROM icon and then open the “Roxio Toast 6 Lite” folder. Drag and drop the Roxio Toast 6 Lite application icon into the Applications folder on your hard drive.



## 3.2. Connecting The Power Supply

There are two cables that are supplied with the power supply: one cable (A) connects to the LaCie drive; and the other cable (B) connects to a power outlet, such as a wall outlet or a surge protector.



- 1 Connect Cable A to your LaCie Drive.
- 2 Connect Cable B to the Power Supply brick.
- 3 Connect Cable B to a grounded surge protector or wall outlet.

Your drive should now turn on automatically when you connect it to a FireWire port on your computer.



**Caution!** Use only the AC adapter supplied with your specific LaCie drive. Do not use a power supply from another LaCie drive or another manufacturer. Using any other power cable or power supply may cause damage to the device and void your warranty. Always remove the AC adapter before transporting your LaCie drive. Failure to remove the adapter may result in damage to your drive and will void your warranty.

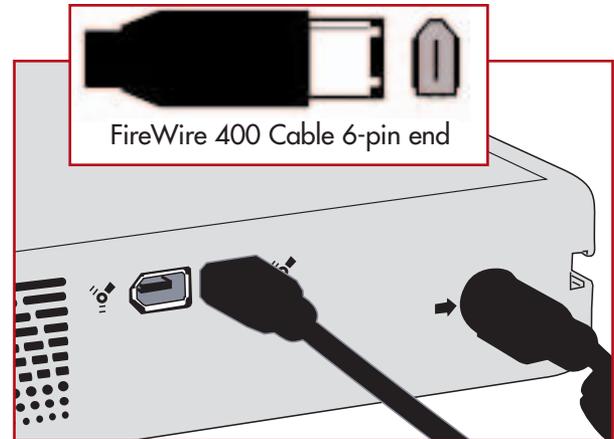


**Important Info:** You may use your LaCie drive when in a foreign country, thanks to its autoswitching 100-240 Volt power supply. To be able to use this feature, you may need to purchase an appropriate adapter or cord. Consult LaCie Technical Support for assistance in choosing the right adapter. LaCie accepts no responsibility for any damage to the drive resulting from the use of an inappropriate adapter. Using an adapter other than one authorized by LaCie will void your warranty.

### 3.3. Connecting The Interface Cable

- 1 Connect one end of the FireWire cable into the FireWire port on the back of the LaCie d2 DL DVD±RW Drive.

 **Tech Note:** For more information about connecting additional FireWire devices to the LaCie d2 DL DVD±RW Drive, please see section [3.4. Installing Multiple Devices](#).



- 2 Connect the other end of the FireWire cable into an available FireWire port on your computer.

FireWire 400 port



- 3 It may take a few seconds for the drive to appear on your desktop, and an icon will only appear when there is a DVD or CD in the drive (CD and DVD icons are similar; only the name is different).



Mac OS X  
CD/DVD Icon

## 3.4. Connecting Multiple Devices

### FireWire

The FireWire interface standard allows for the connection of up to 63 devices on the bus (called daisy-chaining), with a maximum of 16 devices on one branch. FireWire's support of daisy-chaining means that you can connect one FireWire device directly to a computer's FireWire port, and then connect another FireWire device to the first device's other remaining FireWire port. For instance, you could connect your LaCie drive directly to your computer, and then connect another FireWire device, such as a scanner or digital camera, to the other available FireWire port. You can connect a maximum of 16 devices in this manner. To optimize performance, however, you should connect your drive directly to a built-in port on your computer.

## 3.5. Disconnecting Your LaCie Drive

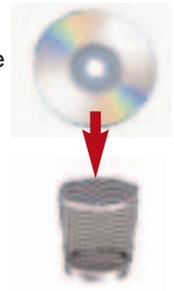
FireWire external devices feature “plug & play” connectivity, which means that your drive can be connected and disconnected while the computer is running. To prevent failures, it is important you follow these steps when disconnecting your FireWire peripheral device.



**Caution!** Do not disconnect the FireWire cable when the drive is reading or writing. Disconnecting while the drive is operating could cause the loss of data. Make sure that your drive is not reading or writing and that the activity LED is off before disconnecting the FireWire cable.

### Mac Users

You must unmount the drive before disconnecting it or powering it down. Drag the disc icon to the **Trash**. Once the device's icon no longer appears on the desktop, the drive can be disconnected.



Mac OS 10.x

## 4. Using Your LaCie Drive

### 4.1. Supported DVD/CD Formats

Your LaCie drive is compatible with most popular DVD and CD formats:

Format	Type of Disc	Record	Read
DVD	DVD+R9 DL	X	X
	DVD+R9	X	X
	DVD+RW	X	X
	DVD-R 4.7GB for General use (Ver. 2.0)	X	X
	DVD-R DL	X	X
	DVD-ROM	--	X
	DVD-R (General use only for write)	X	X
	DVD-RW (General use only for write)	X	X
	DVD-ROM (single and dual layer)	--	X
	DVD (single and dual layer) 80 mm disc	--	X
	CD	CD-R	X
CD-RW (supports AM2)		X	X
CD-ROM		--	X
CD-ROM XA Mode2 (form 1, form 2)		--	X
CD-Extra		--	X



**Tech Note:** When recording video, audio or data to DVD+R9 DL, DVD+R/RW, DVD-R/RW or CD-R/RW media, LaCie recommends that you use media from one of the following manufacturers:

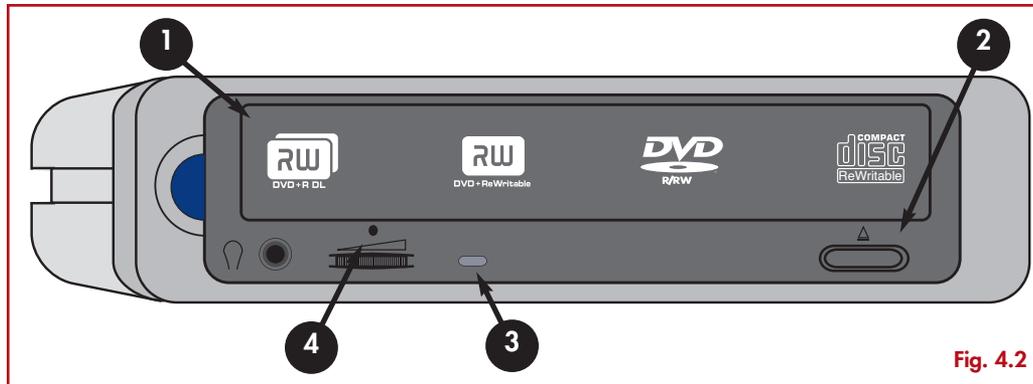
- LaCie
- Apple
- Taiyo Yuden
- Sony
- TDK
- Verbatim
- Ricoh

Ideal recording techniques:

- Close all other open programs and disconnect from the internet;
- Copy data to your hard drive first;
- Use the correct media with the appropriate speed rating;
- Use media that is free of scratches and fingerprints;

Check LaCie's Web site ([www.lacie.com](http://www.lacie.com)) often for the latest information on creating CDs and DVDs.

## 4.2. Inserting Discs



- 1 Media Tray
- 2 Open/Close Button
- 3 Activity LED
- 4 Emergency Eject Hole

To insert a disc push the Open/Close (#2) button on your LaCie d2 DL DVD±RW Drive. When the disc tray opens, put the DVD or CD media into the tray with the label side facing up. Make sure the DVD or CD is correctly placed in the center of the disc tray. Gently push in the disc tray or push the Open/Close button to close it.

Do not attempt to force the tray open, you will damage the drive. The power must be on in order to open the drive. The drive must be on a flat surface to work correctly.

To close your LaCie d2 DL DVD±RW Drive, press the Open/Close button on the front of the drive.



### Caution!

- Do not force the tray closed. You will damage the drive.
- Always remove discs before transporting the drive.
- Never move the drive while it is in operation.

## 4.3. Accessing Discs

### Mac Users

The CD or DVD volume will appear as an icon on the Desktop. Click on the icon to have access to the contents of the CD or DVD.

## 4.4. Writing Discs

The following is a brief overview of some of the recording terminology to help you understand how to use your drive to write discs.



**Important Note:** Please refer to your recording software's user's guide for information on how to best use your LaCie d2 DL DVD±RW drive in write mode.

### 4.4.1. DVD Writing Methods

**Disc at Once (DAO)** – A DVD writing process in which the entire DVD is recorded in one session, and data cannot be added after the recording is finished. Differs from the CD-R DAO method because the lead-in, data area and lead-out areas are all written sequentially.

**Incremental Recording (IR)** – A DVD writing process that is similar to the Session at Once (SAO) CD-R writing method; files may be added directly to the DVD-R disc one recording at a time, instead of recording the files to a hard drive before writing the disc. The minimum recorded size, though, must be at least 32KB (even if the file to be recorded is smaller than that), and capacities and write speeds are decreased due to the overhead of combined lead-in/out areas and data. Also, the disc must be finalized before it may be played back by a drive other than the drive recording the disc.

**Multi-Border Recording (MBR)** – A DVD writing process that is very similar to IR, MBR allows you to make an IR disc and then play the disc back on a device that recognizes this type of recording method. MBR creates a very short boundary zone around a recording session so a compatible player or DVD-ROM drive does not attempt to play beyond the border of the recorded area, instead allowing the unfinalized disc to be read by a player that supports this recording method.

**Restricted Overwriting (RO)** – A DVD writing process that only applies to DVD+/-RW discs. With this method, if a disc has already been written to, new data segments can be randomly inserted anywhere within the recorded boundary. New data, however, can only be added to an area of the disc that has already been recorded over and from the point where the last session was stopped.

**Session at Once (SAO)** – A DVD writing process which is similar to DAO, where all of the information is written in one session, but SAO allows for the ability to begin another session and record at a later time. This mode allows for greater control of the recording process than Packet Writing (PW) or TAO, and more disc space can be utilized because there is no need for gaps between tracks.

**Packet Writing (PW)** – A writing process that is very useful for data backup. Buffer underrun\* is impossible in this mode, because the data is written in "packets" of a few KBs.

### 4.4.2. CD Writing Methods

**Disc at Once (DAO)** – A CD writing process in which the entire CD is recorded in one session, and data cannot be added after the recording is finished. This mode allows for the most control of the recording process for audio CDs because the gap between tracks can be set and the maximum capacity of the CD can be utilized.

**Packet Writing (PW)** – A CD writing process that is very useful for data backup, but cannot be used to write audio CDs. Buffer underrun\* is impossible in this mode, because the data is written in “packets” of a few KBs.

**Session at Once (SAO)** – A CD writing process which is similar to DAO, where all of the information is written in one session, but SAO allows for the ability to begin another session and record at a later time. This mode allows for greater control of the recording process than PW or TAO, and more disc space can be utilized because there is no need for gaps between tracks.

**Track at Once (TAO)** – A CD writing process where data is added one track at a time, and the data can be added at a later time. The CD being written to, though, can only be read in the CD rewritable drive that is recording it until the disc is finalized (meaning that no more data can be added). There is also a gap of 2 seconds added between tracks, which will be heard as noise in some audio players.



**Tech Note: \*Buffer Underrun** – *The recording of a disc is a system-intensive application, and the rewritable drive needs a constant stream of data. A buffer underrun occurs when the stream of data to the rewritable drive is not fast enough to keep the rewritable drive's buffer full, causing the an error in the recording process. If this problem occurs often, turn down the recording speed and consult section [5.5. Optimizing Data Transfers](#).*

## 4.5. Ejecting Discs



**Caution!** Do not attempt to open the drive's disc tray or remove the DVD or CD while the unit is in use and being accessed by the computer. You may injure yourself, and damage the drive and/or your computer system. Do not transport the drive with the tray open or with a DVD or CD disc inside it. Doing so may damage the drive and/or data stored on the disc, and will void your warranty.

### Mac Users

Drag the DVD/CD icon on the desktop to the **Trash**. The drive's tray will then open. Remove the DVD or CD. Gently push in the disc tray or push the Open/Close button to close it.

### 4.5.1. Emergency Ejection of Discs

In the event that a CD or DVD cannot be ejected with the Open/Close button and the software is not controlling the drive, use the emergency eject operation to open the disc tray. First, switch off your computer and the drive and unplug the drive's power.



**Caution!** Make sure the drive is off and the power unplugged before attempting the emergency ejection procedure.

On the front of the drive is the Emergency Eject Hole (Fig.4.2 #2). Insert a small metal poker, such as an unbent paper clip, into the Emergency Eject Hole until the poker presses against the manual eject mechanism. You will feel the mechanism eject the disc tray. Only use this method when the Open/Close button is not working.

## 5. Tech Tips

### 5.1. CD and DVD Media Definitions

Your LaCie d2 DL DVD±RW Drive will let you create, save and share your digital files to CD-R/RW, DVD-R/RW, DVD+R/RW and DVD+R9 DL/DVD-R DL media. Please refer to section [2.1. Minimum System Requirements](#) and your recording software's documentation to see which recording techniques your computer supports.

#### DVD+R9 DL Discs:

- Best suited for: recording high-quality DVD videos, backing up systems and archiving large data DVDs.
- These discs follow the DVD+ recording techniques, but with 8.5GB of capacity versus 4.7GB for DVD±R discs.
- With the increased capacity, it is now possible to increase the video bit rate for higher quality DVD videos.

#### DVD+R Discs:

- Best suited for: recording DVD videos, storing multiple photo albums and data DVDs under 4.7GB.
- These discs have the same write-once concept as CD-R media, but with 4.7GB of capacity versus 700MB for CD-R discs.
- DVD+R supports "lossless linking" and the combination of Constant Angular Velocity (CAV) and Constant Linear Velocity (CLV) recording techniques.

#### DVD+RW Discs:

- Best suited for: backing up and archiving digital content.
- These discs are functionally similar to CD-RW and DVD-RW discs, but utilizes the same recording techniques as DVD+R.
- Incorporates the Direct Overwrite (DOW) system, allowing data to be written directly over existing data in a single pass.

#### DVD-R Discs:

- Best suited for: recording DVD videos, storing multiple photo albums and data DVDs under 4.7GB.
- These discs are also functionally similar to CD-R media, and have the same capacity as DVD+R discs.
- There are two types of DVD-R discs: DVD-R General, which are intended for home applications, and DVD-R Authoring, which are intended for professional DVD-Video development applications.

#### DVD-RW Discs:

- Best suited for: backing up and archiving digital content.
- These discs serve the same general purpose as CD-RW media, but with 4.7GB of space versus 650MB.
- Discs can be written and erased up to 1,000 times.

#### CD-R Discs:

- Best suited for: recording audio CDs, store photos and data CDs.
- Files can not be deleted from CD-R discs, and you cannot write over existing files on a CD-R disc.

#### CD-RW Discs:

- Best suited for: passing medium sized files around an office or among students.
- Discs can be reformatted up to 1,000 times, and files can be written over.
- Most CD-ROM drives and audio CD players cannot read CD-RW discs.

## 5.2. File System Formats - Definitions

When writing DVD-R DL, DVD+R DL, DVD±R/RW and CD-R/RW discs, you will have the option to assign the disc a particular file format (the way in which a computer names and organizes files for storage and retrieval). There are essentially three file system formats to be concerned with when using a LaCie DVD or CD Drive:

- Universal Disk Format (UDF)
- ISO 9660
- Mac OS Extended

### UDF –

This file system was developed to ensure consistency between various optical media, compatibility across platforms and among various CD and DVD applications. UDF is used by DVD to contain MPEG audio and video streams, and is required by DVD-ROMs.

### ISO 9660 –

This is the standard file system for CD-ROMs, which allows them to be read on a Mac, PC or other major computer platform. Microsoft created an extension to the format, called Joliet, which allows for Unicode file character names and file names up to 64 characters in length (twice as many as the ISO 9660 Level 2 and 3 specifications).

### Mac OS Extended –

Also known as HFS+, this is the file system used by Mac OS 8.1 and higher. If you will be using your disc only on Macs, this is the preferred file format.

## 5.3. DVD Capacity

There are important factors to consider when recording video, audio or data to DVD. The DVD media specification provides for two physical sizes: 4.7" (12cm) and 3.1" (8cm) (both are .47" (1.2cm) thick). DVD discs can also be single-sided (SS) or double-sided (DS), and each side can have one (SL) or two (DL) layers of data.

The amount of data or video that a disc can hold are dependent upon factors such as the amount of audio and the degree of compression of the data, video or audio. For example, a single-layer DVD±R disc typically will store just over two hours of MPEG-II video, but it is possible to put up to eight hours of VHS-quality video or one hundred sixty hours of audio on a single-layer disc.

When media companies reference the amount of data that a disc can hold, they represent the total amount in terms of gigabytes (GB), or a billion bytes (1000 x 1000 x 1000 bytes). This number, though, is not the way in which a computer addresses the data; to a computer the value is binary and larger than a billion bytes – 1,073,741,824 (1024 x 1024 x 1024 bytes). Therefore, when you put in a 4.7GB DVD disc, the actual available capacity is 4.38GB; and a 8.5GB Double Layer disc has an actual available capacity of 7.95GB.

## 5.4. DVD-Video Regional Playback Zones

Nearly all commercially-available DVD discs feature a Region Protection Code (RPC). In order to watch DVD-Video discs, the RPC needs to match the setting on the DVD player. By default, all LaCie DVD-Video-compatible drives are set to the RPC zone of the country in which it was purchased. This RPC setting may be changed using your hardware or software MPEG-II decoder (please refer to the documentation supplied with your decoder for more information). DVD-Video discs that do not feature RPC II encoding may be played on all DVD players set to Zone 1.

The worldwide RPC zones are:

<b>Zone 1</b>	USA and Canada
<b>Zone 2</b>	Europe, Japan, the Middle East and South Africa
<b>Zone 3</b>	Southeast Asia (including Hong Kong)
<b>Zone 4</b>	Australia, New Zealand, Central and South America
<b>Zone 5</b>	Northwest Asia, North Africa
<b>Zone 6</b>	China

When you insert a DVD-Video disc into your drive for the first time, the hardware or software MPEG-II decoder will detect if the setting of your drive is the same as on the DVD-Video. If not, a message will appear on your screen and you will be asked to change the RPC setting of your drive.



**Important Note:** You can only change the RPC of your drive four times. The RPC setting is copied into an internal component in the drive. This chip makes an average of the first five readings and sets the drive to the most read zone. After this, it will not be possible to change or reset the RPC of the drive.

**Example:** You change the RPC Zone to play a Zone 1 DVD-Video, and then you change to a Zone 2 DVD-Video. You switch back and forth between the zones a total of five times, twice in Zone 1 and three times in Zone 2. Your drive will then be set on Zone 2, without the possibility to reset the drive later on in order to view DVD-Video discs from Zone 1.

## 5.5. Optimizing Data Transfers

Data transfers are the flow of data that accomplishes a task, usually related to moving data from storage to computer RAM, or between storage devices. With external drives, such as the LaCie d2 DL DVD±RW Drive, the data is transferred from the drive to the computer via the FireWire or USB interface. The data is fed from the drive through the FireWire port on the drive, and passes to the computer through the FireWire host-bus adapter interface.

### FireWire

Computer manufacturer's implementation of the FireWire host-bus adapter interfaces vary widely. For computers running Windows 2000 and later, the FireWire interface, which is referred to as either IEEE 1394 or iLink on PCs\*, is less common as a native host-bus adapter. Nearly all recent Apple computers have native FireWire interface ports.

The FireWire interfaces specify certain requirements, filed under the OHCI (Open Host Controller Interface) standards. All LaCie drives comply to OHCI standards and have been rigorously tested on computers that have host bus adapters that also comply to OHCI standards. Unfortunately, not all manufacturers respect these guidelines, and anomalies may arise with computers that have host bus adapters that do not conform to OHCI standards.

For the best performance, connect your LaCie d2 DL DVD±RW Drive directly to a native FireWire port on your computer, and avoid daisy-chaining\*. During data transfers, it's best to wait before launching other applications that will be using the same port.

If you do not have a native FireWire port, LaCie offers FireWire host bus adapter cards, also known as PCI or PC/PCMCIA cards, that have been tested and comply with LaCie drives. Please contact your reseller or LaCie Customer Support for more information, or visit our Web site: [www.lacie.com](http://www.lacie.com).

## 6. FireWire Questions & Answers

### What Does IEEE 1394 Mean?

IEEE (the Institute of Electrical and Electronics Engineers) refers to the engineering corps that developed the 1394th standard, defining the high-performance serial input/output (I/O) bus used to connect peripheral devices. There are now two standards: IEEE 1394a, which refers to the original standard adopted in 1995, and IEEE 1394b, which refers to the new standard, adopted in 2002.

### What Is The Relationship Between IEEE 1394, FireWire, iLink And DV?

These four names all refer to the same interface:

- IEEE 1394 is the term commonly used in the computer industry.
- FireWire is the brand name used by Apple.
- iLink is the brand name used by Sony for both consumer electronics and personal computers.
- DV is short for "Digital Video," and is used as the logo for the interface on most video camcorders.

### What Are The Benefits Of The FireWire Interfaces?

The FireWire interface is a fast, cross-platform serial bus, and is ideal for digital audio, video and graphic applications that demand plenty of bandwidth. Both versions of FireWire offer Plug & Play connectivity, so all you have to do is plug in your drive and begin using it, they also allow up to 63 devices to be connected via a single bus and offer peer-to-peer connectivity, enabling multiple computers and FireWire devices to be connected at the same time. FireWire also supports both isochronous and asynchronous capabilities, meaning that it can guarantee real-time data delivery, so there is no danger of inaccurately ordered or delayed frames.

### What Is The Difference Between FireWire 400 And FireWire 800?

Essentially, the main difference between the two interfaces can be summed up in one word: speed. FireWire 800 effectively doubles the bandwidth of the original FireWire 400 interface. The new FireWire 800 interface offers truly impressive results, with speeds up to 800Mb/s for a single bus, and even greater for several buses in RAID 0 configurations.

Other key advancements include the support of increased cabling distances and a newly enhanced arbitration architecture. Utilizing cables constructed of professional-grade glass optical fiber, when both devices are connected via a FireWire 800 hub, FireWire 800 can burst data across 100 meters of cable.

The new arbitration scheme greatly improves on the existing architecture by incorporating advanced 8B10B data encoding (based on codes used by Gigabit Ethernet and Fibre Channel), which reduces signal distortion, and also improves the arbitration time by prepping the arbitration while the current data packet is being sent, so that data is sent as soon as the current transmission is completed.

## What Are The Ideal Uses For FireWire?

FireWire helped fuel a revolution for digital content creators, and was awarded a 2001 Primetime Emmy Engineering Award by the Academy of Television Arts & Sciences for its contribution. Due to its high bandwidth and support of both isochronous and asynchronous data delivery, FireWire has found a very successful place in both the computer and consumer electronics industries. Whether connecting game consoles, personal video recorders, home stereo equipment, digital TVs, hard drives, CD/DVD-RW drives, printers, scanners, tape drives or other digital hardware equipment, FireWire is well-suited to handle all these various requirements.

With the advent of the new FireWire 800 standard, the revolution created by the original will only grow. For those working with digital video, the new standard will enable new bandwidth-intensive applications, such as multiple-stream, uncompressed, standard-definition video.

## Will FireWire 400 Devices Run Faster When Connected To A FireWire 800 Port?

Unfortunately, this is not the case. In order to attain FireWire 800 speeds, both the device and port have to be FireWire 800 enabled. For instance, an external hard drive with a FireWire 800 9-pin connection will only reach FireWire 800 transfer rates when it is connected to a FireWire 800 9-pin host bus adapter card via a properly certified FireWire 800 9-pin to 9-pin beta cable.

When a FireWire 400 device is connected to a FireWire 800 port, the FireWire 400 device will only operate at the original FireWire 400 speeds.

## Will FireWire 800 Devices Work On FireWire 400 Ports And Vice Versa?

The new standard was designed to be backwards compatible, meaning that FireWire 800 devices will still operate via the original FireWire 400 port. To connect a FireWire 800 device to a FireWire 400 port, a specific adapter cable must be used, though. There are two types of FireWire 400 ports: 6-pin and 4-pin. For FireWire 800 devices to work, they must be connected by placing the 9-pin end of the FireWire cable into the FireWire 800 port of the device, and the opposite 6-pin or 4-pin end into the FireWire 400 port.

The same holds true for FireWire 400 devices being connected to a FireWire 800 host port. The 4-pin or 6-pin end of the FireWire cable must be connected to the FireWire 400 port of the device, and the 9-pin end must be connected to the FireWire 800 port.

When FireWire 400 and FireWire 800 devices are mixed, all transfer rates revert to the original FireWire 400 speed.

## What Do I Do If My Computer Does Not Have A FireWire Port?

Most computers manufactured today incorporate at least one FireWire port. If your computer does not have a native port, you can install one by adding a PCI or PCMCIA host bus adapter card. Please contact your computer supply specialist for a specific card that will work with your system.

For more information about the FireWire interface, please visit:

[www.lacie.com/technologies](http://www.lacie.com/technologies)

## 7. Troubleshooting

In the event that your LaCie d2 DL DVD±RW Drive is not working correctly, please refer to the following checklist to find out where the problem is coming from. If you have gone through all of the points on the checklist and your drive is still not working correctly, please have a look at the FAQs that are regularly published on our Web site – [www.lacie.com](http://www.lacie.com). One of these FAQs may provide an answer to your specific question. You can also visit the drivers pages, where the most recent software updates will be available.

If you need further assistance, please contact your LaCie reseller or LaCie Technical Support (see [9. Contacting Customer Service](#) for details).

### Manual Updates

LaCie is constantly striving to give you the most up-to-date, comprehensive User's Manuals available on the market. It is our goal to provide you with a friendly, easy-to-use format that will help you quickly install and utilize the many functions of your new device.

If your manual does not reflect the configurations of the product that you purchased, please check our Web site for the most current version available.

## Mac Users

The Problem	Questions to Ask	Possible Solutions
<p>The drive is not recognized by the computer.</p>	<p>Does your computer's configuration meet the minimum system requirements for use with this drive?</p>	<p>Check section <a href="#">2.1. Minimum System Requirements</a> for more information.</p>
	<p>Is the drive's power supply connected and turned on?</p>	<p>Make sure that the power supply is properly connected (see section <a href="#">3.2. Connecting The Power Supply</a>), and that the outlet the power supply is connected to is also turned on.</p>
	<p>Did you follow the correct installation steps for the specific interface and operating system.</p>	<p>Review the installation steps under <a href="#">3.3. Connecting The Interface Cable</a>.</p>
	<p>Is there an icon for the drive appear on the desktop?</p>	<p>When there is a CD or DVD disc in the drive, there should be an icon for the LaCie drive on the desktop. Open <b>Apple System Profiler</b> and click on the <b>Devices and Volumes</b> tab. If your device is not listed, follow the rest of the Troubleshooting tips to isolate the problem.</p>
	<p>Are both ends of the FireWire/USB cable firmly attached?</p>	<ul style="list-style-type: none"> <li>• Disconnect the FireWire cable, wait 10 seconds and then reconnect.</li> <li>• Ensure that the FireWire connectors are properly aligned. FireWire cables can only be inserted one way. Make sure that they are correctly oriented.</li> <li>• Check that the FireWire connectors are straight and fully seated into the FireWire ports.</li> <li>• Only use certified FireWire cables, such as the cables provided with your LaCie drive.</li> </ul> <p>If you have followed all of these steps and the drive is still not recognized, shut down your computer, wait 3 to 5 minutes, restart your computer and try again.</p>

The Problem	Questions to Ask	Possible Solutions
<p>The drive is not recognized by the computer.</p>	<p>Is the drive connected to the computer through another drive?</p>	<p>Try connecting the drive directly to the computer. For best performance and reliability, connect the LaCie d2 DL DVD±RW Drive directly to the computer.</p>
	<p>Is there a conflict with other device drivers or extensions?</p>	<p>Contact <a href="#">LaCie Technical Support</a> for help.</p>
	<p>Are you running Mac OS 9.x?</p>	<p>If your LaCie drive is not being recognized by the recording software, you may be experiencing an extension conflict between the software and iTunes or DiscBurner. There are two possible solutions to this problem.</p> <p>If you do not plan on using iTunes or DiscBurner, follow these steps:</p> <ol style="list-style-type: none"> <li>1) From the <b>Apple Menu</b>, go to <b>Control Panels</b> and open the <b>Extensions Manager</b>.</li> <li>2) Scroll down to the <b>Extensions</b> folder and disable (uncheck) the <b>USB Authoring Support</b> and the <b>FireWire Authoring Support</b>.</li> <li>3) Click on the <b>Restart</b> button to restart your computer.</li> <li>4) Launch the recording software again and check to see if it recognizes the drive now.</li> </ol> <p>If you plan on using both the recording software and iTunes or DiscBurner, you may want to create a separate Extension Set for the recording software:</p> <ol style="list-style-type: none"> <li>1) From the <b>Apple Menu</b>, go to <b>Control Panels</b> and open the <b>Extensions Manager</b>.</li> <li>2) Press the <b>Duplicate Set</b> button.</li> <li>3) Give the new Extension set a name, such as Writing.</li> <li>4) Scroll down to the <b>Extensions</b> folder and disable (uncheck) the <b>USB Authoring Support</b> and the <b>FireWire Authoring Support</b>.</li> <li>5) Click on the <b>Restart</b> button to restart your computer.</li> </ol> <p>Now when you want to use this set, simply go back into <b>Extensions Manager</b> choose your new set from the <b>Selected Sets</b> pull-down menu.</p>

The Problem	Questions to Ask	Possible Solutions
<p><b>The drive is working slowly.</b></p>	<p>Is the LaCie d2 DL DVD±RW Drive connected directly to the host computer?</p>	<p>Make sure that your LaCie d2 DL DVD±RW Drive is connected directly to the computer (see section <a href="#">3.3. Connecting The Interface Cable</a> for more information). For best performance, avoid daisy-chain configurations and connect devices directly to the computer. For more information, see section <a href="#">5.5. Optimizing Data Transfers</a>.</p>
<p><b>The drive turns on and off when you turn your computer on and off.</b></p>	<p>This is normal. Your drive has an autoswitching power feature, which means that if your drive is connected to your computer, turning the computer on will automatically turn the drive on. Likewise, turning the computer off will automatically turn the drive off. If you wish to power off the drive while it is connected to your computer, first make sure that your computer is not accessing the drive and then follow the steps in section <a href="#">3.5. Disconnecting Your LaCie Drive</a>. After you have disconnected the drive, push the blue On/Off button on the front of the drive to turn the drive off.</p>	
<p><b>DVD-Video playback will not work.</b></p>	<p>Do you have a DVD-ROM, Combo or SuperDrive installed in your computer.</p>	<p>At the time of publication (September, 2005), Apple does not support DVD playback over external DVD drives if there is not a DVD drive (DVD-ROM, Combo or SuperDrive) installed in the host computer. If your system does not have a built-in DVD drive, in order to enable DVD playback you will need to utilize a third-party software utility.</p>
<p><b>The drive's media tray will not open.</b></p>	<p>Have you tried dragging the disc's icon to the Trash?</p>	<p>Drag the disc icon onto the Trash icon. The disc should then eject automatically. If this does not work, try using the eject function of the software program that you are using.</p>
<p></p>	<p>Has a running software program locked the eject function?</p>	<p>To check, disconnect the interface cable, then reconnect and push the Open/Close button.</p> <p>If the disc still will not eject, go to section <a href="#">4.5.1. Emergency Ejection of Discs</a> for more information on how to eject your media.</p>

The Problem	Questions to Ask	Possible Solutions
<p>The drive's media tray automatically ejects a disc when you try to record on it, or the drive is not writing to CD/DVD correctly.</p>	<p>Is the disc already full?</p>	<p>Verify the contents of the disc by using your recording software or viewing its contents by going to File and clicking on Get Info. If after checking and it still won't record, try using another piece of media.</p>
	<p>Does the drive support the format of the disc you have inserted?</p>	<p>Check section <a href="#">4.1. Supported DVD &amp; CD Formats</a> for information about the different formats supported by your drive.</p>
	<p>Is the disc damaged?</p>	<p>Carefully inspect the disc. Look to see if there are highly visible scratches to the recording surface (the bright, shiny, reflective side) of the disc. If in doubt, try another disc.</p>
	<p>Has the recording software been installed correctly?</p>	<p>Double-check the installation of your recording software and re-install the software, if necessary. Review the recording software's troubleshooting and help sections for further tips about the recording software.</p>
	<p>Has buffer underrun occurred (has something interrupted the stream of data to the recorder)?</p>	<p>For the best recordings, follow these tips to avoid buffer underrun interruptions:</p> <ul style="list-style-type: none"> <li>• Quit all other running software programs before starting to record so that there are no other programs operating during the recording;</li> <li>• De-activate <b>File Sharing</b> if it is active;</li> <li>• If you are making a direct recording, such as a copy, from a CD or a DVD, make sure that the speed of the drive playing the CD or DVD is fast enough to provide a sufficient data stream to the LaCie drive. When making copies, it is recommended that you transfer the material to be copied to your hard drive, and then make the recording from the data on the hard drive.</li> <li>• Reduce the write speed of the LaCie drive using the appropriate menu in the recording software.</li> </ul>

## 8. Contacting Customer Support

### Before You Contact Technical Support

1) Read the manuals and review the [Troubleshooting](#) section.

2) Try to isolate the problem. If possible, make the drive the only external device on the CPU, and make sure that all of the cables are correctly and firmly attached.

If you have asked yourself all of the pertinent questions in the troubleshooting checklist, and you still can't get your LaCie drive to work properly, contact us via the provided Web link. Before contacting us, make sure that you are in front of your computer and that you have the following information on hand:

- Your LaCie drive's serial number
- Operating system(Mac OS or Windows) and version
- Computer brand and model
- Names of CD or DVD drives installed on your computer
- Amount of memory installed
- Names of any other devices installed on your computer

## LaCie Technical Support

### LaCie Asia, Singapore and Hong Kong

Contact Us At:

<http://www.lacie.com/asia/contact>

### LaCie Belgium

Contact Us At:

<http://www.lacie.com/be/contact/>

### LaCie Denmark

Contact Us At:

<http://www.lacie.com/dk/contact/>

### LaCie France

Contact Us At:

<http://www.lacie.com/fr/contact/>

### LaCie Italy

Contact Us At:

<http://www.lacie.com/it/contact/>

### LaCie Netherlands

Contact Us At:

<http://www.lacie.com/nl/contact/>

### LaCie Spain

Contact Us At:

<http://www.lacie.com/es/support/request>

### LaCie Switzerland

Contact Us At:

<http://www.lacie.com/chfr/contact>

### LaCie USA

Contact Us At:

<http://www.lacie.com/contact/>

### LaCie Australia

Contact Us At:

<http://www.lacie.com/au/contact/>

### LaCie Canada

Contact Us At:

<http://www.lacie.com/caen/contact/> (English)

### LaCie Finland

Contact Us At:

<http://www.lacie.com/fi/contact>

### LaCie Germany

Contact Us At:

<http://www.lacie.com/de/contact/>

### LaCie Japan

Contact Us At:

<http://www.lacie.co.jp>

### LaCie Norway

Contact Us At:

<http://www.lacie.com/no/contact/>

### LaCie Sweden

Contact Us At:

<http://www.lacie.com/se/contact/>

### LaCie United Kingdom & Ireland

Contact Us At:

<http://www.lacie.com/uk/support/request>

### LaCie Grand Export

Contact Us At:

<http://www.lacie.com/intl/contact/>

## 9. Warranty

LaCie warrants your drive against any defect in material and workmanship, under normal use, for the period designated on your warranty certificate. In the event this product is found to be defective within the warranty period, LaCie will, at its option, repair or replace the defective drive.

This warranty is void if:

- The drive was operated/stored in abnormal use or maintenance conditions;
- The drive is repaired, modified or altered, unless such repair, modification or alteration is expressly authorized in writing by LaCie;
- The drive was subjected to abuse, neglect, lightning strike, electrical fault, improper packaging or accident;
- The drive was installed improperly;
- The serial number of the drive is defaced or missing;
- The broken part is a replacement part such as a pickup tray, etc.
- The tamper seal on the drive casing is broken.

LaCie and its suppliers accept no liability for any loss of data during the use of this device, or for any of the problems caused as a result.

LaCie will not, under any circumstances, be liable for direct, special or consequential damages such as, but not limited to, damage or loss of property or equipment, loss of profits or revenues, cost of replacement goods, or expense or inconvenience caused by service interruptions.

Any loss, corruption or destruction of data while using a LaCie drive is the sole responsibility of the user, and under no circumstances will LaCie be held liable for the recovery or restoration of this data.

Under no circumstances will any person be entitled to any sum greater than the purchase price paid for the drive.

To obtain warranty service, call LaCie Technical Support. You will be asked to provide your LaCie product's serial number, and you may be asked to furnish proof of purchase to confirm that the drive is still under warranty.

All drives returned to LaCie must be securely packaged in their original box and shipped with postage prepaid.



**Important Info:** Register online for free technical support: [www.lacie.com/register](http://www.lacie.com/register)

## Glossary

**Asynchronous** – Data transfer method where the data is transferred independently of other processes. With this transfer method, the intervals between transmissions can vary, and data can be resent if it is initially missed.

**Backup** – (1) The act of creating at least one additional copy of data onto a different (and safe) storage device from where it can be retrieved at a later time if needed. (2) A copy of a file, directory, or volume on a separate storage device from the original, for the purposes of retrieval in case the original is erased, damaged, or destroyed.

**Bit** – The smallest measure of computerized data, either a 1 or a 0. Eight bits equal one byte, or one character.

**Block** – A very small section of the storage media comprised of one or more sectors. A block is the smallest amount of space allocated on a drive for data storage. By default, a sector of data consists of 512 bytes.

**Buffer** – RAM cache that is faster than the data that is being delivered. Buffers are used so data may be stored and delivered to the receiving item as it is needed.

**Bus** – Electronic links that enable data to flow between the processor, RAM and extension cables (peripherals).

**Byte** – A sequence of adjacent binary digits, or bits, considered as a unit, 8 bits in length. There are 8 bits in 1 byte. See also MB (Megabyte) or GB (Gigabyte).

**Cache, -ing** – This is an area of electronic storage (usually RAM) set aside to store frequently used data from electro-mechanical storage (hard drives, floppy disks, CD/DVD-ROM, tape cartridges, etc.) Therefore, storing frequently used data in RAM can enhance your system's overall response to disk-intensive operations significantly.

**Configuration** – When talking about a PC, configuration is understood to be the sum of the internal and external components of the system, including memory, disk drives, the keyboard, the video subsystem and other peripherals, such as the mouse, modem or printer. The configuration also implies software: the operating system and various device managers (drivers), as well as hardware settings and options set by the user via configuration files.

**Controller** – This is a component or an electronic card (referred to in this case as a "controller card," such as PCI or PCMCIA cards) that enables a computer to communicate with or manage certain peripherals. The controller manages the operation of the peripheral associated with it, and links the PC bus to the peripheral via a ribbon cable inside the PC. An external controller is an expansion card which fills one of the free slots inside your PC and which enables a peripheral (CD-ROM drive, scanner or printer, for instance) to be connected to the computer.

**Cross-platform** – Term that refers to a device that is able to be operated by both Mac and Windows operating systems.

**Data Stream** – The flow of data that accomplishes a task, usually related to moving data from storage to computer RAM or between storage devices.

**Digital** – Discrete information that can be broken down to zero or one bits.

**Driver (peripheral manager)** – A software component that enables the computer system to communicate with a peripheral. Most peripherals will not operate correctly – if at all – if the appropriate drivers are not installed on the system.

**File System** – Links the physical map of a disc to its logical structure. Thanks to the file system, users and computers can easily display path, directories and files recorded onto the disc.

**Firmware** – Permanent or semi-permanent instructions and data programmed directly into the circuitry of a programmable read-only memory or an electronically-erasable, programmable read-only memory chip. Used for controlling the operation of the computer or tape drive. Distinct from the software, which is stored in random access memory and can be altered.

**Folder** – A list created on a disk to store files. Creating folders and sub-folders enables you to organize the storage of your files in a logical, hierarchical manner so that you can find and manage them more easily.

**Format, -ting, -ted** – This is a process where a device is prepared to record data. In this process, the hard disk writes special information onto its own recording surfaces into areas (blocks) that are ready to accept user data. Since this operation causes all current user data stored on the hard disk to be lost, this is an infrequent operation that usually only happens at the factory that created the hard disk. It is unusual for something to happen to a hard disk that requires the end-user to initially perform this operation.

**GB (GigaByte)** – This value is normally associated with data storage capacity. Basically, it means a thousand million or a billion bytes. In fact, it equals 1,073,741,824 bytes (or 1,024 x 1,024 x 1,024).

**Hardware** – Physical components of a computer system, including the computer itself and peripherals such as printers, modems, mice, etc.

**Host Bus Adapter (HBA)** – A printed circuit board that installs in a standard microcomputer and an interface between the device controller and the computer. Also called a controller.

**Initialize, -ed, Initialization** – After a hard drive (or other storage device) is formatted and partitioned, some special data needs to be written to it that helps the Mac and Windows create files and save data. The process is called initialization. This process, like formatting, causes all user data on the storage device to be lost.

**Interface** – The protocol data transmitters, data receivers, logic and wiring that link one piece of computer equipment to another, such as a hard drive to an adapter or an adapter to a system bus. Protocol means a set of rules for operating the physical interface, such as: do not read or write before the drive is ready.

**I/O (Input/Output)** – Refers to an operation, program or device whose purpose is to enter data into or to extract data from a computer.

**Isochronous** – Data transfer method that ensures that data flows continuously and at a steady rate. These transfers provide guaranteed transmission opportunities at defined intervals.

**Kb (Kilobit)** – Equivalent to 1,000 bits.

**Kb/s** – Kilobits per second. 480Kb/s is equal to 60KB/s.

**KB (KiloByte)** – Basically, this means 1,000 bytes, but it is actually 1,024 bytes.

**KB/s** – Kilobytes per second. A means of measuring throughput.

**Mb (Megabit)** – Equivalent to 1,000,000 bits.

**Mb/s** – Megabits per second. A means of measuring throughput. 480Mb/s is equal to 60MB/s.

**MB (Megabyte)** – Basically means one million bytes, but is actually 1,024 Kilobytes or 1,024 x 1,024 bytes, which equals 1,048,576 bytes.

**MB/s** – Megabytes per second. A means of measuring throughput.

**Media** – The material or device used to store information in a storage subsystem, such as a tape cartridge, CD, DVD or disk drive.

**Operating System (OS)** – Software that controls the assignment and use of hardware resources such as memory, processor time, disk space and peripherals. An operating system is the basis on which software (applications) run. Windows, Mac OS and UNIX are among the most common.

**Overwrite** – To write data on top of existing data thus erasing the original data.

**Partition, -ing** – After formatting, the hard drive is not yet ready to store files. It must be divided into sections that will contain special information required for a Mac or PC to operate and other sections that will contain the files. This process of dividing up the hard drive is called partitioning. A partition is just one section of the hard drive that will contain either special data put there by Silverlining or other files and data.

**Peripheral** – A generic term applied to printers, scanners, mice, keyboards, serial ports, graphics cords, disk drives and other computer subsystems. This type of peripheral often relies on its own control software, known as a peripheral driver.

**Port, hardware** – A connection component (SCSI port, for example) that enables a microprocessor to communicate with a compatible peripheral.

**Port, software** – A memory address that identifies the physical circuit used to transfer information between a microprocessor and a peripheral.

**RAM (Random Access Memory)** – Generally referred to as a computer's "memory." An integrated circuit memory chip that allows information to be stored and retrieved by a microprocessor or controller. The information can be stored or accessed in any order, and all storage locations are equally accessible.

**Seek Time** – The amount of time (in thousandths of a second, or milliseconds) that it takes a hard drive's read/write head to move to a specific location on the disk. Average seek, then, is the average of a large number of random samplings all over the disk. Seek time is CPU independent, meaning that seek time is the same for a disk drive, whether it is attached to a computer or not.

**Software** – In a nutshell, software is a set of instructions for the computer. A set of instructions to perform a particular task is called a program. There are two main types of software: system software (an operating system such as Mac OS or Windows) which controls the operation of the computer and application software (programs such as Word or Excel) which enable users to perform tasks such as word processing, spreadsheet creation, graphics, etc.

**Storage** – In computers, any equipment in which information may be kept. PCs generally use disk units and other external storage media (diskettes, CD-ROMs, magnetic disks, etc.) for permanent storage of information.

**Striping** – Spreading data evenly over multiple disk drives to enhance performance. Data striping can be performed on a bit, byte or block basis for optimum application performance.

**Transfer Rate** – The rate at which the drive sends and receives data from the controller. Transfer rates for reading data from the disk drive may not be the same as the transfer rate for writing data to the disk drive. Transfer rates are CPU dependent, meaning that regardless of how great a transfer rate your drive is capable of, the actual transfer rate can only be as fast as the slowest of your hard drive and computer.

**Volume** – A desktop mountable storage area, may be a partition of a hard drive, a removable disk or a cartridge. Typically measured in Megabytes or Gigabytes.

**Utility** – Software designed to perform maintenance tasks on the system or its components. Examples include backup programs, programs to retrieve files and data on disk, programs for preparing (or formatting) a disk or and resource editors.