CharisMac Engineering

DISCRIBE User's Manual

Contents

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Introduction

How To Use This Guide

This guide provides installation and operating instructions for *Discribe*™ CD mastering software. Discribe allows Macintosh users of most single disc CD-R and CD-RW recorders to create and copy their own CD-ROM, CD audio, and mixed-mode discs for personal or professional use.

Manual organization:

- How To Use This Guide
- What Discribe Does
- CD-R and CD-RW Requirements
- Installing Software
- Creating Your Own CD
- HFS, ISO, Hybrid, Audio, and Other CDs
- Copying a CD-ROM
- Pulldown Menus
- User Information
- Troubleshooting
- Glossary
- Index

What Discribe Does

Discribe allows you to:

- Organize CD-ROM source material
- Master your own CD-ROMs
- Copy CD-ROM discs

If you would like to know the technical details about CD-R (CD-Recordable) and CD-RW (CD-Recordable / Rewritable) hardware and formats, please refer to the *User Information* section and*Glossary* located toward the back of this manual.

Before You Start

Please take a minute to register Discribe via the online registration form found on the CharisMac web page, http://www.CharisMac.com. This will entitle you to technical support, and will enable us to contact you with important upgrade information.

If you received this software as part of a retail package (not on a CharisMac-branded CD or floppy diskette) please enter the serial number of your CD-R or CD-RW drive in the blank which asks for your software serial number

CD-RW Requirements

Software

Discribe requires Macintosh System 7.5 or later, however system 8.1 or later is recommended. If you do not have System 8.1, you can get it from an authorized [1]Apple® dealer or an on-line service.

Certain hardware interface types, such as USB and Firewire, require higher versions of the Mac OS to run correctly. This is because these interface types require certain support files from Apple that are only compatible with later versions of the Mac OS. For mastering USB or Firewire CDs you will need the following:

USB - Mac OS V8.5 or later (8.6 is recommended). You will also need V1.1 of the USB Manager (Mac OS ROM version 1.2 or later is needed to use USB Manager V1.1). A Macintosh SIM and USB driver may also be installed in your extensions folder.

Firewire - Mac OS V8.6 or later. You will also need V2.1 or later of Apple's Firewire extensions (called Firewire Support and Firewire Enabler), which may be included in the Discribe installer.

Hardware

In order to master a CD-ROM, you will need a system that includes:

- For SCSI or ATAPI-based CD-R or CD-RW devices: 68040 or better CPU, min 8MB of available RAM, Quicktime 2.0 or better.
- For USB-based drives: A USB equipped Macintosh model, preferably an iMac, iBook, USB equipped Powerbook G3 or Blue and White G3.
- For Firewire-based drive: A Blue and White G3.
- [2]A hard drive larger than your Project size and

capable of the data transfer rates necessary to master CDs (in addition to your boot hard drive)

- A CD recorder (a complete list of supported CD Recorders is listed at the back of this manual)
- CD-R or CD-RW recording discs (silver, gold, blue, green, or other)

The performance of the hard disk drive from which you write your CD is critical. For 1X recorders, sustained hard drive data throughput should be 175kB per second or better (2X=350kB, 4X=700kB, etc.). If recording Audio or ISO XA CDs, then the transfer rate should be even faster—at least 15%. Discribe software provides a test write function and a check speed function that will help you determine whether your hard drive is adequate for CD mastering.

[1] Trademarks and product names used in this manual are the exclusive property of their respective holders.

[2] If you set up an entire disc project before mastering the CD you need a hard drive of this size – For some formats, you can choose to build “on-the-fly” and will not need this hard drive. Exclusively audio CDs can contain up to 74 minutes. Data CDs are typically as large as 650MB.

Tips for Writing Better CDs

Although Discribe offers great ease of use, internally it administrates a very complex software and hardware process. As a user you are shielded from the myriad of details that the software controls, but some understanding of the fundamentals will help you achieve better results out of the CD creation process.

Your Macintosh

Macintosh computers have a lot of simultaneous background programs running, which users often aren’t aware of. Screen savers, scheduling utilities,

alarms, fax programs, SCSI drivers, and other programs may be running at the same time and generating loads to the system. Unfortunately, these forgotten processes running in the background can sometimes interfere with your CD recording. Such interruptions generally ruin the CD being recorded, so you should always ensure that non-essential extensions are disabled or removed before recording. Also, refrain from running other programs or using network software such as File Sharing or E-mail at the same time you use Discribe. Doing so prevents untimely interruptions that can render your CD useless.

Newer Macintosh models, like G3s ,do not have many of the same limitations as some of the older Macintosh models and may not require users to disable non-essential extensions to record CDs.

Your Hard Drive and Data

In addition to the software environment on your Macintosh, your hard drive type and condition, and the size of files stored, can all affect recording. Even the type of Macintosh you have can affect performance.

When you are transferring a large number of very small files, the system may be overworked trying to locate each file and send it to the drive buffer before passing it to the CD media. (This event is often called a “buffer under-run.”) Large files are easier for the system to work with since the system spends little time finding a single file.

The speed and performance of your hard disk must be sufficient to keep the CD recorder’s memory buffer full at all times. Use only hard drives that provide access speeds of 12 milliseconds or faster.

To help keep your hard drives at optimum performance, periodically back up your data and initialize the drives. This will cause data to be grouped on the disk in logical locations so that the system won't have to search all over the hard disk looking for the data to be written to the CD. A defragmentation utility is not recommended for this purpose since all volume information may not be written correctly.

Never master disks using disk compression software.

Ensure recordable CD-R or CD-RW discs are free of lint, dust and scratches; if blank media is contaminated with foreign material or contains scratches you may not be able to properly record onto it.

System Setup

When recording (burning) CDs, anything that interrupts your computers communication with the CD recorder can cause the disc to be ruined. To make your recording sessions as fail-safe as possible, take the following precautions.

1. Reduce the hardware configuration of your system to the minimum necessary, especially if running Discribe on an older (68040-based) Macintosh:
   - Your Macintosh with system and Discribe.
   - An additional external hard drive of adequate speed and sufficient capacity to hold more than the Project size you want to record to the CD.
   - CD Recorder.

2. Refer to manufacturer and Apple manuals. Make certain that the SCSI, USB or Firewire cables and connections are correct. Make sure that the last (and only the last) device in the SCSI chain is terminated if using a SCSI-based CD recorder.

3. When starting your system, remember to power up the recorder and external hard drive before you power up the Macintosh.

4. Disable Appletalk and File Sharing.

5. Open Extensions Manager and set up and save an extension set named “Discribe” that you can choose whenever you are going to burn a CD. In this set, shut off all extensions except the System 8 minimum extension set, the CharisMac CD-ROM driver, the QuickTime extensions (2.0 or newer only), and the Thread and Drag Managers, as well as any necessary USB or Firewire extensions if using USB or Firewire-based CD Recorders. Restart the Mac after choosing this extension set so that it becomes active.

6. If you are connecting, or “hot plugging” your USB or Firewire CD-R or CD-RW drive into a Macintosh that has already been powered up, you will need to run the Hot Plug application. The Hot Plug application loads a CD-ROM driver for the CD-R or CD-RW drive to be able to use your drive as a reader (to be able to read CDs).

[1] Discribe lets you build a CD in two ways. The first way is to put all the files you want on the CD onto a separate hard drive. This creates a project of the CD which can then be written by Discribe to the CD. Building a project has the advantage of letting you set up the files exactly as you want them to look on the CD (icon, arrangement, file order, etc.). Building an project requires a second hard drive as described

above.

The second way is to pick files “on-the-fly” using the Discribe interface. This way allows you to skip building a complete project (and thus skip having the requisite project hard drive). When you build the CD on-the-fly, Discribe will arrange files in alphabetical order on the target CD (or arrange them on a grid in icon view).

Installing Discribe

Discribe must be installed on a hard disk. Once you have installed the software, store the original program disks in a safe place.

1. Disable any unnecessary extensions and restart your Macintosh prior to installing Discribe. In some cases, extensions may interfere with the software installation process, causing the Macintosh to generate errors forcing a restart."
2. Insert the Discribe (High Density) disk in your system floppy drive or insert the Discribe CD in your system CD-ROM drive.
3. Double-click on the Installer file icon. Follow on-screen instructions.

Remove Non-CharisMac CD-ROM Drivers

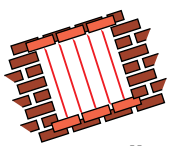
We recommend you remove any CD-ROM driver extensions from other manufacturers.The included CharisMac CD-ROM driver is capable of supporting virtually all SCSI and ATAPI-based CD-ROM drives on the market allowing you to use one CD driver for all of your CD-ROM, CD-R and CD-RW devices, including the original CD-ROM drive provided by Apple. *For more information on the included CD-ROM driver, see "Using the CD-RW drive as a reader" later in the manual.*

1. Open the Extensions folder inside the System folder.
2. Locate and discard existing CD-ROM driver extensions, Apple Menu Items, or Control Panels.

Creating Your Own CD

Using Discribe, creating your own CD is a simple process. You can:

- Create a new CD with your own data, or
- Copy an existing CD (Skip to *Copying a CD* if you are using this method)



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Generically, the sequence of events you follow to create a CD is:

- Select a mastering format.
- Either Drag and Drop files, folders or audio tracks onto the Discribe interface, or alternatively move the files to be copied to a second freshly initialized hard drive (reserved for the CD project).
- Select and prepare the recorder — Select the target CD recorder, set its write speed and test the capability of the hard drive to handle the speed.
- Write the data — copy the project from the hard drive to the CD.

These steps are fully explained in the following sections.

A Word About CD-R or CD-RW

CD-R is the term used to denote CD-Recordable media, or discs. CD-R discs are recorded permanently. Once information is written, it cannot be erased. Data can be added until the disc is full (see “Multi-Session recording). CD-R media is good for creating archived information that does not need to be changed, or for distribution because the price of CD-R media has dropped rapidly in the last few years.

CD-RW is the term used to denote CD-ReWriteable media. CD-RW media is rated for approximately one thousand different writes to the media. CD-RW is a perfect medium for creating reliable backups that can be added to as necessary, and even rewritten as your backup scheme requires.

CD-R or CD-RW drives differ only in the fact that CD-RW drives can write to both CD-R or CD-RW discs. CD-RW drives are also capable of erasing CD-RW discs (through the Discribe interface) and allowing you to write to them again. Discribe handles the writing process to either CD-R or CD-RW media in the exact same fashion. The steps of writing to a CD are exactly the same with the exception of which type of media is inserted prior to the write process (CD-R or CD-RW). With this in mind, the term CD-RW will be used throughout this manual to denote a CD-Recordable device, disc or format.

A Word About Formats

CDs use any one of several formats depending upon what kind of computers they are intended to be read on. The following table lists the most common CD formats and some of their attributes. Discribe lets you select from a subset of these formats for disc mastering. Refer to the *User Information* section of this manual for more information.

Table 1: CD Mastering Formats

Content	Platform	Format	Notes
Data	Macintosh	HFS (Yellow Book)	Provides look, feel, and icons for Macintosh. Standard audio can be added.
Data	General	ISO-9660	Multiple platform support. ISO names on files. Standard audio can be added.
Data	Mac and ISO	Hybrid	Mac data with Mac look and feel, plus ISO files for PCs.
Audio	Audio CD players, computers	CD-DA (Red Book)	Normal audio CD format.
Data/Audio	Audio CD players, computers	CD+ (CD EXTRA/Blue Book)	Records audio in first session, data in another. Hides data from audio CD player.
Data/Audio	Audio CD players, computers	ENHANCED CD	Data and audio.

How to Operate Discribe

1. Open the Discribe application by double-clicking (or by highlighting *Discribe* and selecting **Open** from the **File** menu).

The Discribe "splash screen" will appear.

2.Wait a few seconds and the application window will open automatically.

The cascading shape of the application window sug-

gests the sequence of steps that must be accomplished to master a CD. As you complete each sequence, the associated LED changes from red to green — visually letting you know you're moving into the next stage.

Pulldown Menus: *The pulldown menus provide a shortcut to Discribe functions. Until you gain experience with the software, access Discribe functions through the application window. (Pulldown menu functions are described later.)*

Common Controls for all Formats

Regardless of whether you're creating an HFS or ISO CD, Discribe operates using the same controls. As you go through the cascading steps of Project, Recorder and Write, you are presented with similar choices. You can think of the Discribe window as a CD recorder itself, one that can be operated using several different methods.

Message and Configuration Buttons: *These buttons appear on most application windows. In Message mode, the screen displays status and any error messages generated. In Configuration mode, the screen displays information including the number of files selected, their size, and remaining space on the target CD-ROM. If you are in Configuration mode and a message is pending, an "LED" will blink to alert you.*

A Quick Way to Learn Discribe

Because all formats are handled similarly by Discribe,

read the discussion on HFS Format CDs. In its steps, you'll learn about all the common controls and features such as creating projects, selecting recorders, speed checks for ensuring proper data transfer rate, and how to test data before writing. Once you're familiar with how to create an HFS CD, read on for the other types of recording that Discribe offers.

Drag & Drop

Discribe provides standard Macintosh menus for adding files to projects. However, you can also drag audio files, data files and folders or HFS volumes directly onto the Discribe window to accomplish the same goal. You may need to move the Discribe window in order to see the Finder or Discribe allows you to shrink the size of the main window to better take advantage of Discribe's drag-and-drop functionality.

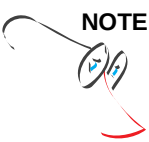
To shrink the size of the main window, simply click on the ZOOM box in the upper right hand corner of the interface, as is standard with Macintosh programs that support the ZOOM box. To return the window to the larger size, simply click the ZOOM box again.

HFS Format CDs

If you wish to create a CD for use only on Macintosh computers, then you will want to make it an HFS (Hierarchical File System) format disc. HFS format provides a disc with the same look and feel as Macintosh volumes. Refer to the *User Information* section towards the back of this manual for additional format information, and for instructions on creating custom volume and CD icons.

To create an HFS disc, you will:

- Copy the data to be mastered to a freshly initialized hard drive (the project volume) — Or, skip this step and simply select the files you want on the CD inside the Discribe interface by placing the source files in a project list on-the-fly.



You may also simply drag and drop any Macintosh file, folder or audio track onto the Discribe interface to create a new CD project. Once you drag any file, folder or audio track onto the Discribe interface, Discribe will automatically select the correct CD format you will master.

- Select the *Macintosh HFS* or *Build a Mac HFS* format from the Discribe interface
- Select the HFS volume to be written to the CD, or simply drag & drop the HFS physical volume from the Mac finder to the Discribe interface, or just select the individual files on-the-fly if you've chosen not to build a project volume

- Set up the recorder and insert a blank CD-R or CD-RW disc
- Test Write
- Write the CD

HFS Choices

As briefly described above, when you want to master an HFS CD, you have two choices:

Choice 1: Set up a project as described in the following section, then select the *Macintosh HFS* format from the Discribe interface to copy that project - just as you set it up - to a CD.

Choice 2: You can skip setting up a project and simply select the *Build a Mac HFS* format from the Discribe interface. This will allow you to select files from any mounted volume on-the-fly which Discribe will then copy to a CD without having to create a disc image first.

If you want to pick files on-the-fly, skip the *Setting up a project* and *Macintosh HFS/Volume Selection* descriptions and go directly to the *Build a Mac HFS* description.

Setting up a project

If you want to set up a physical volume to be written to a CD by Discribe, copy the CD-bound data to a volume that is not your Macintosh start-up volume. (A volume is a hard drive or hard drive partition that can be mounted on the Macintosh desktop.)

If necessary, use CharisMac's Anubis™ or another formatting utility to format, then create a volume on your second hard drive. The volume must be adequate to hold all the data you intend to record to the CD.

The entire volume will be written to the CD exactly as

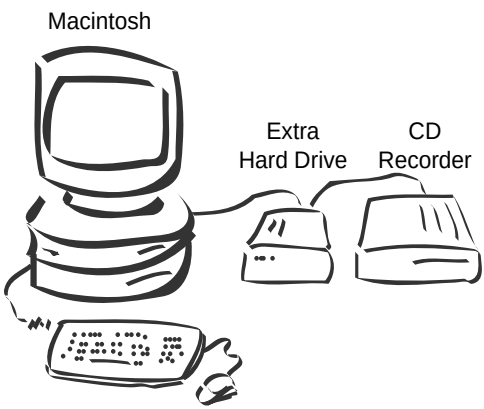
it appears on your Macintosh desktop. If you use the Erase Free Space option, Discribe will remove the blank space at the end of the volume.

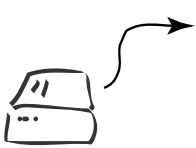
If you don't use the Erase Free Space option, try to size the volume to fit the actual amount of data you intend to master to the CD to avoid copying blank space. Set the volume up with files arranged exactly as you want them to appear on the CD.

When creating and copying data to the volume:

1. Make sure the amount of data does not exceed the capacity of the target CD.

2. Check that all folders, files, and windows appear exactly the way you want them to look on the CD.
3. Make sure that none of the files on the volume are in use or shared. Empty the trash if needed.





Set up the external drive as a single volume (One icon on desktop) large enough to contain all the data for the CD.

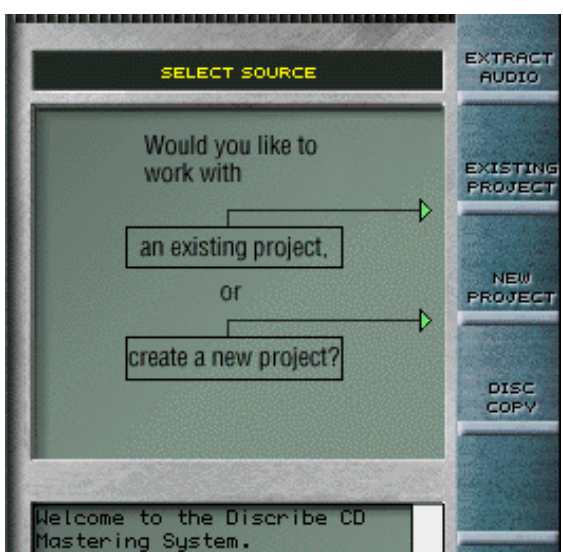
Macintosh HFS/Volume Selection

1. Once all the files you intend to put on the CD are copied to the project volume, open the Discribe application. (This procedure is for a single session CD, but a multisession CD is created much the same, with additional sessions added at the write stage.)
2. Locate the project volume on the Mac desktop and drag it over the Discribe interface. A dialog will ask if you want to create a Hybrid (rather than

HFS) disc, and allow you to select the “don’t copy free space,” “speed up,” and “bootable” options. Discribe will then use the dropped volume to create a project list and move directly to the *Add Audio* screen to provide you the opportunity to add audio files to the project list.)

The application will present you with options for setting up the source material list.

3. Click on ***New Project***. Or, if you are returning to a project you began earlier, click on ***Existing Project*** to navigate to it.(Remember, when creating a new project, you can select “Don't copy free space” to only copy the data used and not the entire size of a partition. You can also select the Speed Up option which automatically defragments files as they are written to the CD.)



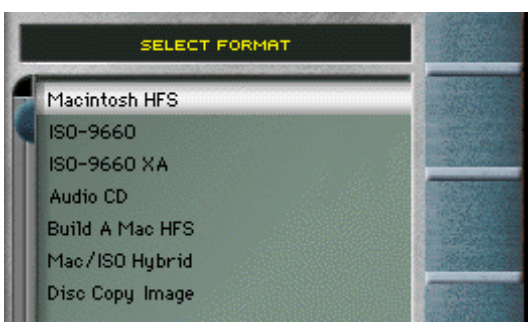
All the file names associated with data you select to

write to a CD are assigned to a list called a “project” by Discribe. The *new* or *existing project* selections refer to this project.

NOTE

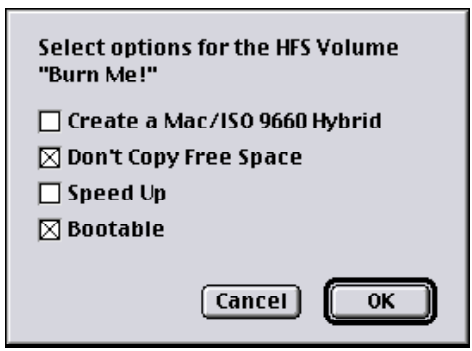
Message and Configuration Buttons: *In Message mode, the screen displays status and any error messages generated. In Configuration mode, the screen displays information including the number of files selected, their size, and remaining space on the target CD.*

4. Click on ***Macintosh HFS*** to select that format.
5. Click on ***Done*** *(or simply double click on Macintosh HFS to select that format).*



You will see a dialog box that allows you to select the HFS volume you copied data to earlier.

1. Select the volume, then click on **OK**.



Create a Mac/ISO 9660 Hybrid: If checked, will allow you to write a CD with shared data files between a Macintosh and a PC. Hybrid CD-ROMs contain both an HFS volume and an ISO 9660 volume. The HFS portion of the disc will not be seen by the PC, and the ISO portion of the disc will not be seen on a Macintosh. Shared files can be seen on both platforms. Visit the *Creating a Hybrid CD-ROM* portion of this manual for more information.

Don't Copy Free Space: If checked, existing free space on the HFS volume will not be copied to the CD, thus making the CD data occupy less total space.

Speed Up: If checked, files will be optimized (defragmented) while they are written to the CD, thus improving CD performance beyond what it would otherwise have been.

Bootable: If checked, Discribe will prompt for a bootable CD to be inserted into the burner so that driver information can be read from a known good bootable CD. For best results, use your most current Apple system CD available.

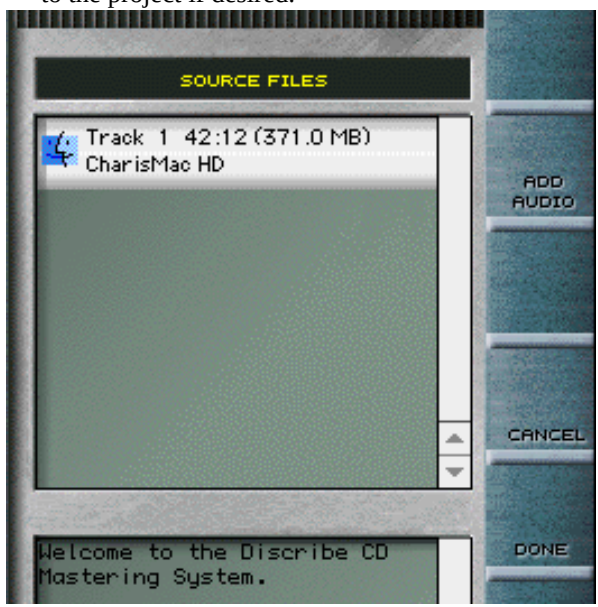
Remember that this volume has to meet certain re-

quirements:

- It cannot be your startup volume
- All files must be closed and must appear just as you want them on the CD
- Total volume size must be small enough to fit on the CD
- Ensure you have emptied the trash
- Don’t write from a volume used by Discribe or used for disk projects

For more information on creating a bootable CD, see Bootable HFS/Hybrid CD-ROMs later in this manual.

Once you click OK (or if you just dragged and dropped the HFS volume onto the Discribe interface), you'll get an opportunity to add audio files (standard CD audio) to the project if desired.



Add Audio — Click to select audio files to add to your project hard drive. Audio must be in the first session only on multi-session discs. (Once you've added audio files to the project, a second button will appear that will allow them to be deleted if desired; delete only appears when an audio track is selected.)

Drag & Drop Audio — You can also drag audio files directly from an Audio CD or an AIFF file onto the Discribe interface. Audio files which are dragged directly from an Audio CD will be extracted into AIFF file format first. For more information, see the Audio Format CDs section of this guide.

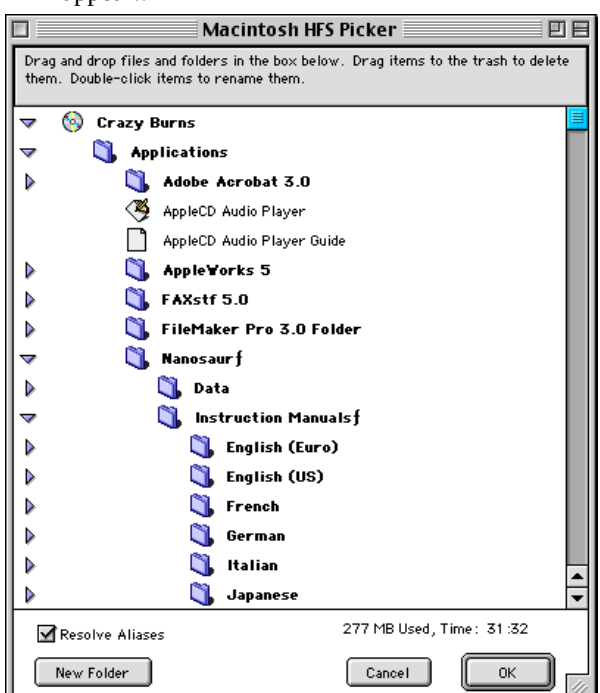
Cancel — Closes panel without making changes.

Done — Closes the panel and saves changes.

Build a Mac HFS

If you decided to select files on-the-fly rather than building a project volume on a second hard drive as in the preceding two descriptions, *Build a Mac HFS* is the format you'll want to select. (If you did choose to build a project volume, skip this description and go on to the *Set Up the Recorder* description.) To build a Mac HFS disc on-the-fly, open Discribe and:

1. Select *New Project*
2. Select *Build a Mac HFS*, then click *Done*.
3. Double click on the track displayed in the track list or click on Edit File list. The following screen will appear:.

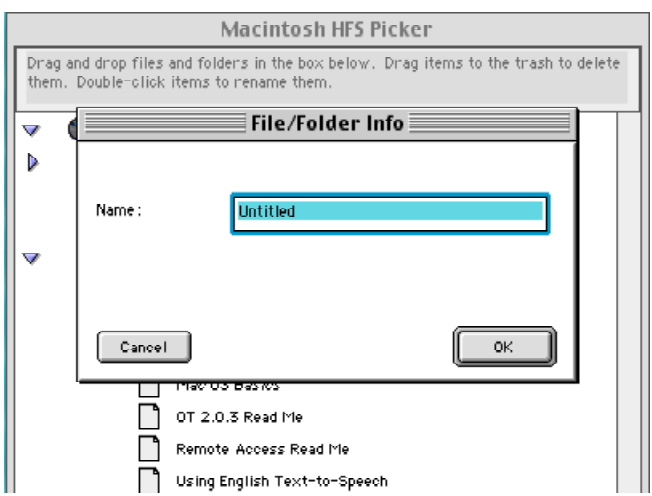


4. To add files or folders, simply drag them into the file list. If you add files or folders to the project that duplicate an existing file or folder, a number is appended to the last added file or folder to differentiate it.

5. If you make a mistake, simply drag the selected file(s) or folder(s) to the trash can on your Macintosh desktop.

6. Below the project list (bottom right), you'll be shown a running total of the project size (in MB and in minutes:seconds).

7. To set or change the volume name (CD name), folder or file name, simply double click on the corresponding icon in the Project list. The following dialogue box will appear.



9. To add a new folder to the project list, click on *New Folder.*

10. If you check the *Resolve Aliases* box, aliases are re-

solved before you see them in the file picker list on the left. If unchecked, aliases are not resolved and, if added to the project, the alias rather than the file it points to will be burned to the CD.

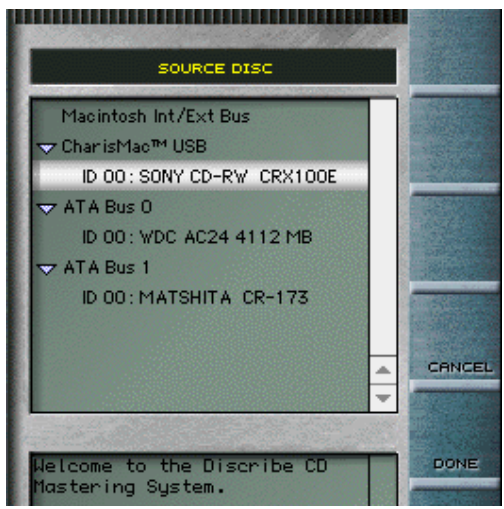
11. When you've added all the files to the list that you want burned to the CD, click *Done* to return to the source file window.

You can of course come back and make changes to the file list at any time.

Set up the Recorder

You need to provide Discribe with information about the CD recorder you intend to use. The following window will appear to let you do that. Use the slider to navigate the list.

Highlight your recorder in the list by clicking on its name. If there is only a single recorder, it will be selected automatically.

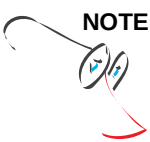


Once you've selected a recorder, you select a data write transfer speed, then check the speed to make sure the recorder won't outrun your hard drive.

Write Speed - Recorders are speed rated at 1X (175kB per second) through 8X (8 x 175kB per second), or even faster. Only speeds the selected recorder is capable of will be displayed. Select the desired write speed. When you're ready, click ***Done*** to exit and save changes or click ***Cancel*** to exit without saving changes.

For your convenience, the fastest recorder-supported speed will be auto-selected as a default.

Check Speed - Pressing Check Speed helps you determine whether or not your recorder will outrun your hard drives ability to supply data. If this were to happen while the disc was being recorded, the data would be corrupted and the disc potentially wasted. A progress indicator and information about test results will be displayed.

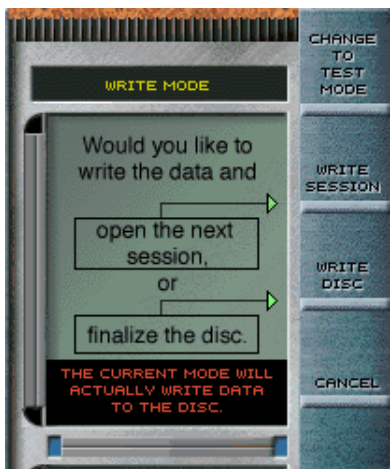


If your hard drive fails the Check Speed test, it could be because the drive is too slow, is fragmented, or because an extension is running in the background. A drive becomes fragmented over time when files are copied and discarded. If your drive is fragmented, you should back up your data and initialize the drive. After restoring the data, the drive will be fully defragmented. Also, you can abort Check Speed test by pressing Command period.

When your drive has passed the Check Speed test, click on ***Done*** to continue.

Write the Data

After you select a recorder type and press “Done”, the Write Mode screen is displayed. Write Mode allows you to final-test your transfer of data to CD, and to begin the mastering process.



Change To Test Mode — Shuts the write laser off in the target CD recorder (if it supports this mode of operation), which allows you to test “write” a session or complete disc just as if the laser were on. Successful completion of a test assures you that the actual write process will succeed. Some recorders do not support this test. If yours does not, the test mode button will not appear. This button is a toggle; if you press it again, you’ll be out of test mode and back in Write mode.

Write Session — When you have completed and tested a session for a multisession disc, click ***Write*** to transfer the session to the CD. You can add more sessions later by repeating the whole process again. Some disc space between sessions is consumed for file management:

- First Session: 2 1/2 minutes (26MB)
- Additional Sessions: 1 1/2 minutes (14MB)

Write Disc — When preparing a single session CD, click ***Write Disc*** to transfer your HFS project volume to the CD. To write a single session to the disc and leave it open for additional sessions later, click *Write Session*. A dialog box will appear that provides you with an opportunity to write the data and finalize the disc or leave it open for additional sessions. If you intend to record additional volumes, leave the CD open. If this is the final volume, finish the CD.

Remember that the entire volume, (including any free space it contains—if *Don't copy free space* isn't selected) is written to the CD. If you intend to write multiple volumes to the CD, it is important to size the volumes appropriately when setting up their partition size.

CAUTION

If your Macintosh is on a network, disable all network connections before beginning to write to the CD. Incoming mail messages or file sharing attempts can cause the CD recording process to fail.

Writing a CD can take anywhere from 10 minutes at 6X speed to an hour or longer at 1X speed (data is transferred at about 10 megabyte per minute at 1X), depending upon the amount of data to be written.

Hybrid Format CDs

Hybrid CDs can be read on a Macintosh and also on any computer that supports ISO 9660 (PC-compatibles). To master a Hybrid, you set up an HFS volume with all the Mac-only files and all the files that will be shared between Mac and ISO machines, then you set up the ISO file list containing the files that will be ISO only. Finally, you display both lists and select those files in the HFS list that will be shared between the two volumes. (This allows Discribe to write the files to be shared only once — thus saving you critical disc space.)

To prepare a Hybrid CD:

1. Set up the HFS volume as described in the preceding manual section. Be sure and include all files that you want to share between the Mac and the ISO machine. The volume restrictions from page 16 apply to hybrid volumes.

2. In the select source window, click on *New Project* to open the format select window.

3. Select *Mac/ISO Hybrid.* Discribe will ask you to select your Mac HFS volume, do so. You'll also be given the option to check three boxes: *Don't Copy Free Space, Speed Up, and Bootable.* Alternatively, you can drag and drop the HFS volume directly onto the Discribe interface and check the appropriate Create Mac/ISO 9660 Hybrid box.

Don't Copy Free Space: If checked, existing free space on the HFS volume will not be copied to the CD, thus making the CD data occupy less total space.

Speed Up: If checked, files will be optimized (defragmented) while they are written to the CD, thus improving CD performance beyond what it would otherwise have been.

Alternatively, you can drag and drop the HFS volume directly onto the Discribe interface and check the appropriate Create Mac/ISO 9660 Hybrid box.

Bootable: If checked, Discribe will prompt for a bootable CD to be inserted into the burner so that driver information can be read from a known good bootable CD. For best results, use your most current Apple system CD available.

Remember that this volume has to meet certain requirements:

- It cannot be your startup volume
- All files must be closed and must appear just as you want them on the CD
- Total volume size must be small enough to fit on the CD
- Ensure you have emptied the trash
- Don't write from a volume used by Discribe or used for disk projects

For more information on creating a bootable CD, see Bootable HFS/Hybrid CD-ROMs later in this manual.

5. After you select the HFS volume, Discribe will prompt you to *Select a Naming Scheme* for the ISO files, either *Auto* or *Manual*.

Auto Naming: Automatically assigns ISO compatible names to source files. If supporting files are involved, you may need to edit the list to name supporting files appropriately. See the following note on Naming Conventions.

Manual Naming: Allows each file to be named manually. See the following note on Naming Conventions.

Naming Conventions: *If you are mastering an ISO-9660 CD intended for use across multiple computer platforms, you will need to learn and observe file naming conventions appropriate to the different operating systems. For example, DOS computers demand an eight character maximum name, followed by a period, then a three character extension. Some operating systems also expect a semicolon (;) and a version number of 1 or greater following the three character extension. Strict ISO-9660 names can only contain the capital letters A through Z, the arabic numbers 0 through 9, the underscore. For example, a correct ISO file name might look like:*
GAME_B2.TXT;3

"." and ";" are special characters and may only appear in the positions shown. Otherwise, they will be replaced with an underscore. Naming conventions become very important when you have an application, a game for instance, that depends upon supporting files. Supporting files must be named appropriately so that the application can locate them on the CD. Directory names cannot have periods or semicolons and can be 8 chars max.

Once you've picked a naming scheme, Discribe will display the Source Files screen.

6. Select ***Edit File List*** to add or change files in the

source list. The following dialog box will appear.

7. Add all ISO files as desired by simply dragging them into the File List. When you're ready, navigate to the HFS volume you set up earlier and add from it to the ISO list those files you want to be shared between the two formats. In this window you can rename the CD, a folder or a file by double clicking on the desired icon. You can also rearrange files and folders through drag and drop.

Check the *Resolve Aliases* box if you want the files they point to, rather than just the aliases, to be burned to the CD.

8. Click Done to return to the Project screen.

Add Audio — Click to select any audio files you want to add to your CD. (Once you've added audio files to the project, a second button will appear that will allow them to be deleted if desired. This button

appears only when an audio track is selected.) Alternatively, audio tracks and files can be dragged from an audio CD or volume and dropped on the Discribe source files list.

CAUTION

Mixed Mode CDs & Audio CD Players: *Mixed Mode CDs in which the data tracks are accessible to audio CD players are safe for play only on computer CD-ROM players or newer audio CD players. If a Mixed Mode CD data track is played on an audio CD player incapable of automatically muting the data tracks, the speakers may be* ***SEVERELY DAMAGED****. Data must be in the first track for Mixed Mode CDs. All audio tracks must be in the first recording session for multi-session CDs so that audio CD players can see them.*

Set Up Recorder, Check Speed and Write CD

After the ISO project is ready, set up the CD recorder, check data transfer speed, test the write and then write the CD. These steps are the same as those described in the HFS Format CD section presented earlier (beginning on page 20).

ISO Format CDs

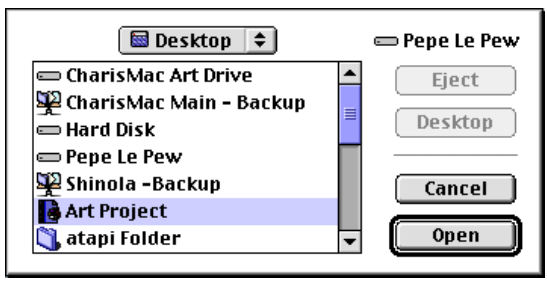
If the CD you are mastering will be used exclusively on multiple platform ISO-compatible computers, use the ISO or ISO XA format. Depending on whether you are recording single session or multisession, you will select ISO Format or ISO XA Format. These formats are typically used when mastering multipurpose CDs for DOS and Windows environments. Operation of Discribe for formatting ISO CDs uses similar controls as when formatting HFS CDs (discussed previously).

1. Open Discribe.
2. The application will ask if you will be work on a project you started earlier, or will be beginning an entirely new project.

Existing Project

If you have already begun a project, select ***Existing Project*** to navigate to that list. A dialog box like the following will be displayed, allowing you to select the project you were previously working with.

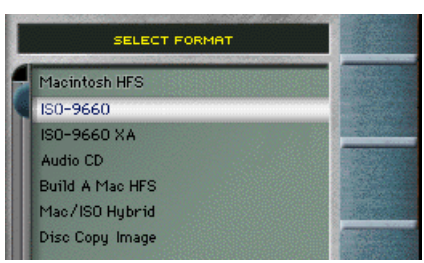
Simply select the project file and click on **Open**.



New Project

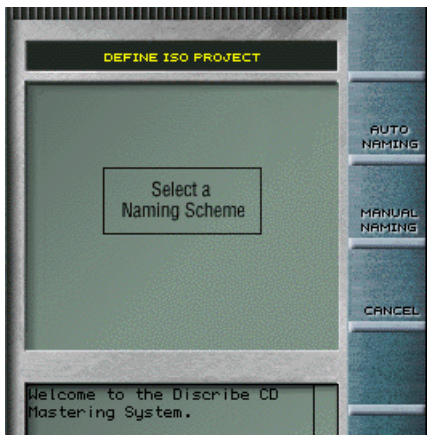
If you are beginning a new project, select ***New Project***. You will next be asked to select the mastering format.

1. Select ISO-9660.
2. Once you have made the format selection, click on ***Done*** to continue.



Naming Conventions

A screen will appear letting you select auto or manual naming of source files.



- ***Auto Naming*** — Automatically assigns ISO compatible names to source files. If supporting files are involved, you may need to edit the list to name supporting files appropriately. See the following note on Naming Conventions.
- ***Manual Naming*** — Allows each file to be named manually. See the following note on Naming Conventions.
- ***Cancel*** — Closes without saving changes.

NOTE

Naming Conventions: *If you are mastering an ISO-9660 CD intended for use across multiple computer platforms, you will need to learn and observe file naming conventions appropriate to the different operating systems. For example, DOS computers de-*

mand an eight character maximum name, followed by a period, then a three character extension. Some operating systems also expect a semicolon (;) and a version number of 1 or greater following the three character extension. Strict ISO-9660 names can only contain the capital letters A through Z, the arabic numbers 0 through 9, the underscore. For example, a correct ISO file name might look like:
GAME_B2.TXT;3

"." and ";" are special characters and may only appear in the positions shown. Otherwise, they will be replaced with an underscore. Naming conventions become very important when you have an application, a game for instance, that depends upon supporting files. Supporting files must be named appropriately so that the application can locate them on the CD. Directory names cannot have periods or semicolons and can be 8 characters max.

Once you have selected a naming scheme, you are prompted to add source files to your project.

1. Discribe will default with the ISO track you are building already highlighted.

To add or change files in your ISO list you can click on **Edit File List**, or double click the highlighted track. Alternatively, you can drag and drop folders and files directly to the Discribe interface. Discribe will add the folders and files to your project as they are drug over. To arrange and change the filename you will then want to click the Edit File List button.

Edit File List — Clicking this option allows the following dialog box to appear.

Drag and Drop principals apply here as well. Drag folders and files directly to the window to add them to the list. To rearrange the files simply drag and drop them within the window. To remove folders or files from the list you can drag them to the Finder's Trash.

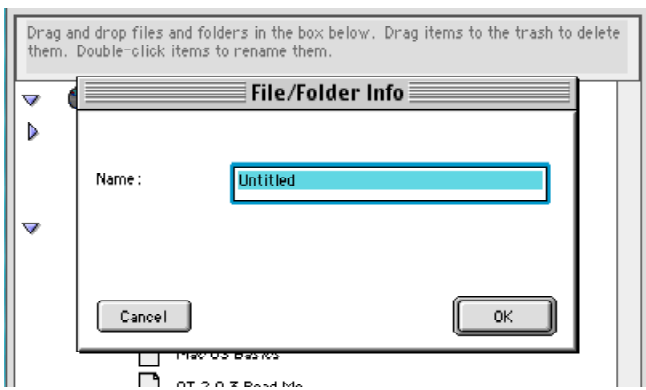
If any of the files you add to the list are aliases, you will need to resolve aliases by clicking in the **Resolve Aliases** box (a checkmark will appear in the box). If you don't resolve aliases, the aliases will be copied to the CD instead of the files to which they point.

The **Import Session** button in this dialog box is for importing previously recorded sessions from an ISO-9660 format disc. The source disc must still be recordable, with an open session.

Below the project list (right bottom), you'll be shown

a running total of the project size (in MB and in minutes:seconds).

To set or change the volume name (CD name), a folder or file, simply double click it's name or icon in the list. You'll use the following dialog box to rename the item.



When you are finished arranging your file list click **Done**.

Add Audio — Click to select any audio files you want to add to your CD. (Once you've added audio files to the project, a second button will appear that will allow them to be deleted if desired. This button appears only when an audio track is selected.) Alternatively, audio tracks and files can be dragged from an audio CD or volume and dropped on the Discribe source files list.

CAUTION

Mixed Mode CDs & Audio CD Players: *Mixed Mode CDs in which the data tracks are accessible to audio*

CD players are safe for play only on computer CD-ROM players or newer audio CD players. If a Mixed Mode CD data track is played on an audio CD player incapable of automatically muting the data tracks, the speakers may be ***SEVERELY DAMAGED****. Data must be in the first track for Mixed Mode CDs. All audio tracks must be in the first recording session for multi-session CDs so that audio CD players can see them.*

Cancel — Closes the current project. You will be prompted to save if you haven't already done so

Done — Advances Discribe to the Recorder screen.

Set Up Recorder, Check Speed and Write CD

After the ISO project is ready, set up the CD recorder, check data transfer speed, test the write and then write the CD. These steps are the same as those described in the HFS Format CD section presented earlier (beginning on page 20.

ISO XA Format

Creating ISO XA Compact Discs is similar to ISO Format, except that more than one session can be used to create the final project written to the CD. In the **Edit File List** dialog box (described on page 36), a button entitled **Import Session** provides the means for adding additional sessions to an ISO XA CD.

When *Import Session* is clicked, Discribe scans the SCSI bus for a CD recorder with a CD having at least one ISO 9660 XA session written and one session open (the last session). Discribe automatically selects this last session to import.

The first track in the session must be an ISO-9660 volume. As the session imports, all root references, files and sub-directories are copied into the ISO-9660 project list as a new sub-directory. You can view, rename, delete, or add to the sub-directory just as you would to any other files in the project.

Writing ISO XA CDs

When you write the ISO XA project to recordable disc, Discribe reads the disc in the recorder and compares it with the imported session information. If the two pieces don't match, Discribe prompts you to insert the proper disc. This also happens on a test write. ISO volume information will be written to the new session, but none of the actual data is recorded for the imported session. The new session's volume directory and path tables refer back to the imported session for the directories and files imported. New data files not imported will be written to the new session.

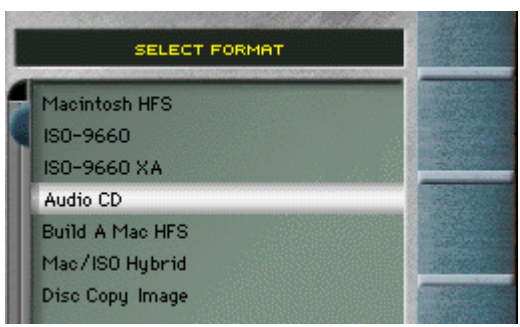
Audio Format CDs

Discribe provides support for creating and copying Audio format CDs, and extracting Audio CD tracks into AIFF files. You have the flexibility of simply clicking and dragging audio CD tracks onto the Discribe interface window, or using the menus and dialogs to select tracks.

You can choose audio tracks using the interface buttons and lists, or by dragging and dropping audio files.

Using the interface buttons and lists -

1. Click *New Project*.
2. Select *Audio CD* format and click *Done*. Discribe will display a source screen, where you can click on the *Add Audio* and *Delete Audio* buttons to specify audio tracks to be added/deleted to the screen.



3. After all Audio tracks are selected, click *Done* and choose the destination folder for the project.

Drag & Drop -

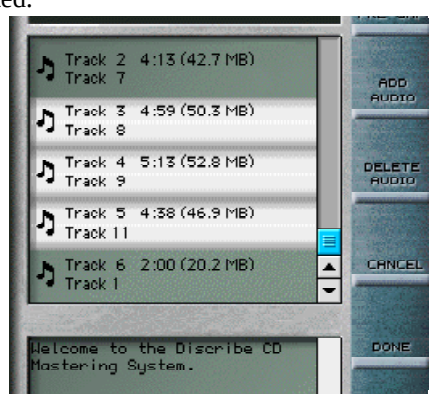
Add audio tracks by dragging an audio track or tracks directly to the Discribe window. This adds the track(s) to the list and automatically selects the audio format. Discribe then displays the source screen audio tracks.

Sequencing Audio Tracks

You may arrange the order of the audio tracks by clicking directly on a track displayed in the window and dragging it to a desired location in the audio list.

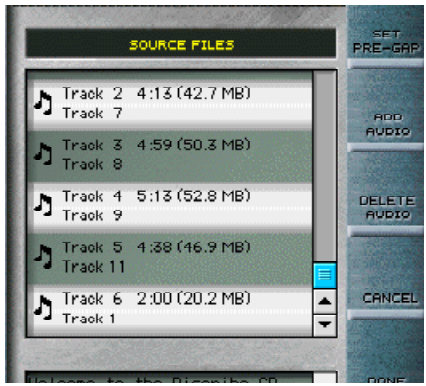
Multiple tracks may also be manipulated by the following methods:

1. Shift Click - To select consecutive tracks, highlight the first of the desired tracks. Shift click on the last desired track and Discribe will select all of the tracks located between the first and last tracks selected.



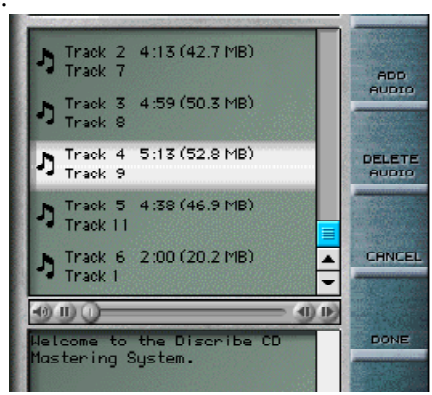
2. Command Click - To select multiple non-consecutive tracks, simply Command Click the desired

tracks in the audio list.



Proofing Audio Tracks

To listen to, or proof, an audio track, simply double-click on the track in the audio project list. The Discribe program will play the Audio file to insure a “clean” extraction. If the file has any static or does not sound like the original, check cabling and termination. Also check the condition of the source CD for dust or scratches.

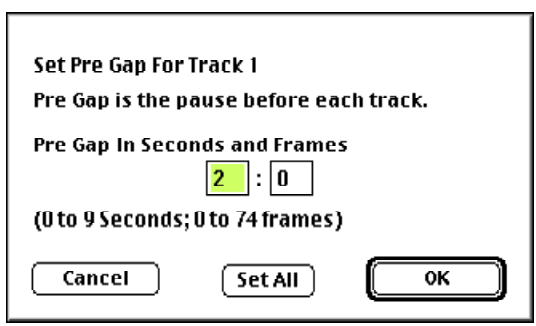


Adjusting Audio Pre-Gap / DAO Writing

On all-audio, single session, closed CDs, you can adjust the time gap between audio tracks if your recorder supports the function. (Open session pre-gaps default to 2 seconds.) Setting the Pre-Gap of at least one track allows Discribe to write in Disc-At-Once mode (DAO). If your recorder doesn't support DAO writing Discribe will alert you, and set all Pre-Gaps back to the default 2 seconds and write the CD in Track-At-Once mode (TAO). DAO writing is essential if you intend on having the CD duplicated by a CD duplication house.

To adjust pre-gap:

1. Select an audio track in the project menu source files section. Then, click on *Set Pre-Gap*.



   Pre-gap can be set from 0 to 9 seconds and from 0 to 74 frames. (75 frames is equal to 1 second.) If audio files are not in the source list, the Pre-Gap button is not visible. Pre-gap for the first track is always forced to 2 seconds when you write the CD.

   To set the pre-gap on all tracks, set your desired gap length and then click on *Set All*.

   You may change the file name of an existing AIFF file that resides on your hard disk by renaming it in

the Finder. Once the file is drug into Discribe, Discribe will display the track's new file name.

Set Up Recorder, Check Speed and Write CD

After the Audio project is ready, set up the CD recorder, check data transfer speed, test write data, and then write the CD. These steps are the same as those described in the HFS Format CD section presented earlier in the manual (beginning on page 20).

Capturing Digital Audio with Apple's Movie Player™ application

You can use Discribe to extract digital audio files or you can use Movie Player and other similar audio utilities (such as SoundEdit 16™). Audio files must be converted to an AIFF file, 44.1 KHz, 16-bit stereo prior to audio CD mastering.

To capture digital audio files in the Movie Player application, follow these steps:

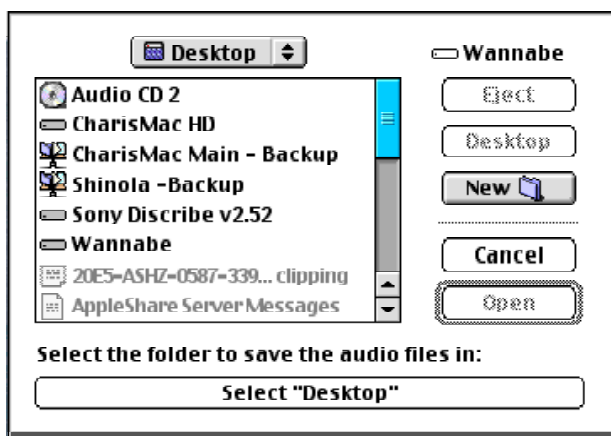
1. Open a track from an Audio CD mounted on your desktop
2. Use Movie Player's "Import" feature to import the audio to a QuickTime movie file. The Discribe CD ROM driver will properly import the file. Select the 44.1kHz and 16-bit stereo parameters using the *Option* button before you extract the tracks.
3. Save the file to disk for later retrieval.

Extracting AIFF Files with Discribe

Discribe allows you to convert CD Audio files to AIFF files directly from the opening Discribe window. Use the following steps:

1. Insert an Audio CD in your Macintosh CD-ROM or CD-RW drive. Open Discribe.

2. Click on the Extract Audio button and choose a desired file, or click on a track on the Audio CD in the Finder and drag it to the Discribe window. In either case, Discribe will display a dialog, asking you where to put the extracted audio AIFF file. Note that clicking Extract Audio does not add the file to the current project, it simply extracts the file.



3. Once the AIFF file has been extracted you may use movie player to open the file or add the audio file to a Discribe project list and double click the file. The Discribe program will play the Audio file to insure a “clean” extraction. If the file has any static or does not sound like the original, check cabling and termination. Also check the condition of the source CD for dust or scratches.

Other Format CDs

Refer to the Read Me file on the program floppy disk or CD for information about other supported formats. Other formats may require special equipment or additional software. Typically, special software is required to set up the data. Discribe is then used to master the data to CD. Please refer to *User Information* later in this manual for additional format information.

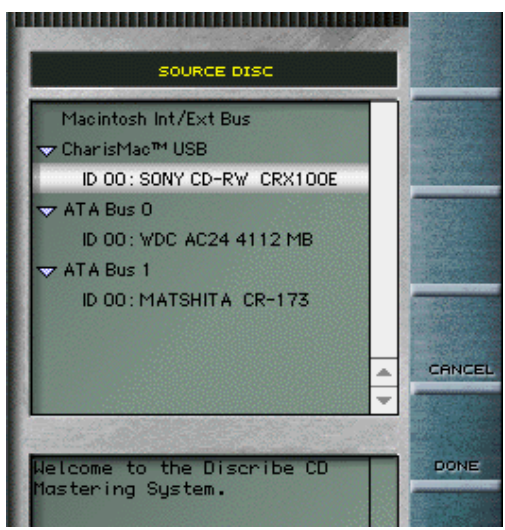
Copying a CD

If you want to make a backup copy of an existing Audio or data CD, select ***Disc Copy*** from the main window.

Discribe will begin prompting your actions.

Once you've clicked on ***Disc Copy*** you'll be asked to select a source disc. The source disc MUST be inserted into your CD-R or CD-RW drive. Discribe will not read a source disc from your internal CD-ROM drive.

1. Discribe will display your CD-R or CD-RW drive where the source disc must reside.
2. Click ***Done*** to proceed or ***Cancel*** to quit.

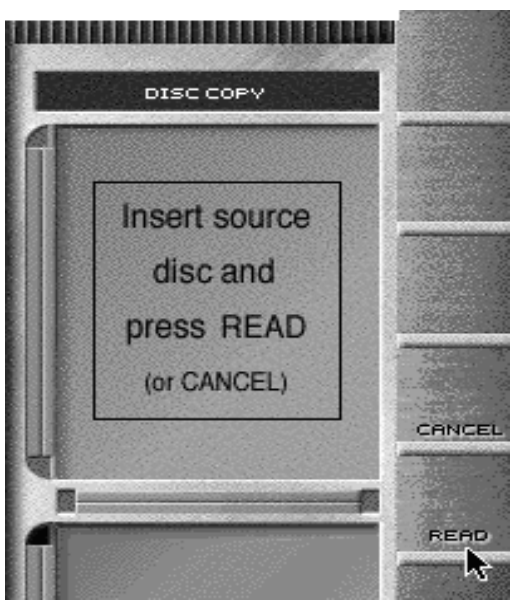


3. Insert the disc to be copied into your CD-R or CD-RW drive, then click on ***Read***. A dialog box will allow you to target the hard drive volume to which the data will be initially copied. You must have the

necessary amount of free space on this volume. (Or, click on ***Cancel*** to close without saving changes.) Data read from the source disc is stored in a project set containing one file for each track copied from the source disc.

4. If the disc was successfully copied, Discribe will open the source files view showing the new project. All of the track files will be added to the project track list.

5. Insert a blank disc in your recorder.



Set Up Recorder, Check Speed and Write CD

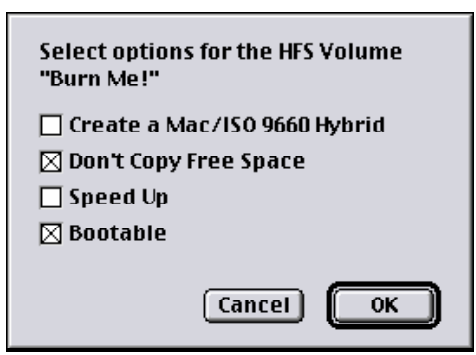
After the source disc has been read, select the CD recorder, check data transfer speed, test write data, and then write the duplicate CD. These steps are the same as those described in the HFS Format CD section presented earlier in the manual (beginning on page 20).

CD to CD Copy

Discribe allows you to copy from one CD directly onto another. This can only be done from an HFS or Hybrid CD. Audio CDs may not be copied directly from one CD to another as the audio tracks must be extracted onto a hard drive first. To Copy a CD directly onto a CD-R or CD-RW disc, you must follow these steps:

1) Insert the source CD to be copied from into your Macintosh CD-ROM drive.

2) Drag the icon of the mounted CD over the Discribe interface, you will see the following dialogue box:



3) From this point, simply proceed as you would with a standard HFS or Hybrid burn.

Bootable HFS/Hybrid CD-ROMs

Discribe allows you to create a bootable CD-ROM from an existing physical HFS volume. Certain considerations must be applied when creating a bootable CD-ROM.

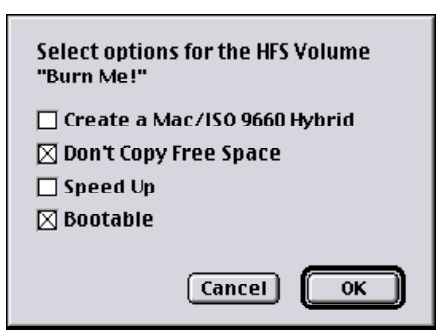
1. The HFS volume must not be your startup volume.

2. The HFS volume must contain a valid system folder. This system folder may be installed from a system CD, or can be drug over from your current boot volume.

3. Pay special attention to extensions or control panels that may not work well from a read only medium.

4. Use the most current Apple system CD that is available to you. This will ensure that you are using the most current bootable CD-ROM driver available.

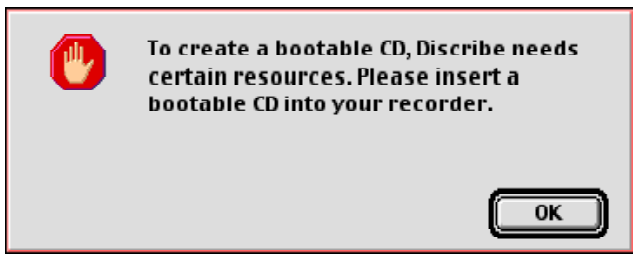
To create a bootable CD-ROM, drag the hard disk volume that contains the system folder and any other data you wish to write to the CD over the Discribe interface.



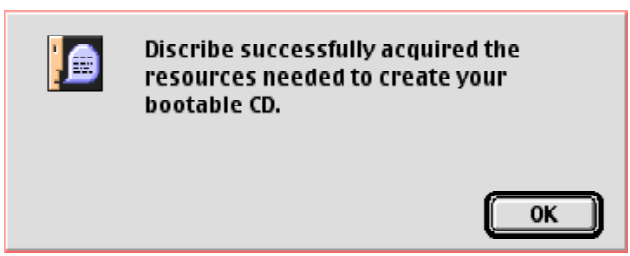
Check the Bootable option and click OK.

Discribe will let you know that it needs a bootable CD

inserted into your CD writer.



Click OK to dismiss the dialog box. Insert a bootable CD-ROM into he CD-RW drive. Discribe will read the information that it needs and prompt you when it is finished.



Click OK.

Continue with your burn as you would normally.

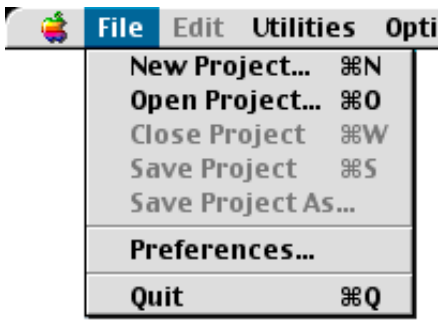
Backup Mastery Scripts

Discribe works with Backup Mastery scripts to allow easy backup to CD-ROM. To backup to CD:

1. Create a backup script using Backup Mastery (as described in the Backup Mastery guide).
2. Open Discribe, then select *Existing project* from the interface or *Open project* under the *File* menu (or use the Command, O shortcut). Backup scripts are located in the Backup•Scripts folder inside the root directory of the System folder.
3. Once a script is open, Discribe will ask you to choose a format for the CD. (HFS or ISO with auto or manual naming). Do so, then proceed with mastering the CD as described in this manual for the selected CD format.

Pulldown Menus

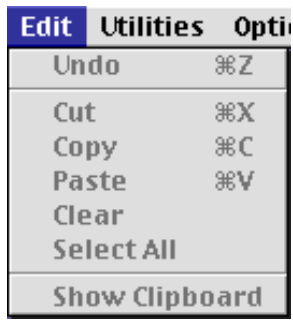
The pulldown menus provide shortcuts to Discribe functions and to other features familiar to most Macintosh users.



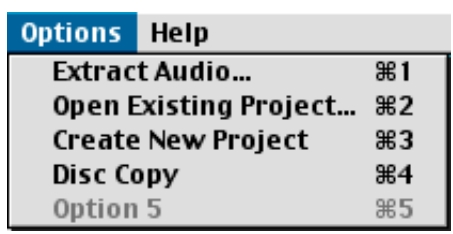
- New Project - allows you to pick a mastering format.
- Open Project - lets you open an project you created earlier.
- Close Project - closes the active project file.
- Save Project - used to name and save your project file. It's a good habit to save frequently as you work.
- Save Project As - allows you to rename and save a copy of the current project file.

- Preferences - Lets you control the content of some Discribe displays. You can control whether you see a Disable Inits warning at program startup, whether only existing devices on the SCSI bus are displayed in the recorder list, and how you wish to view track lengths.

The Edit menu provides the editing functions familiar to Mac and DOS-compatible users alike:

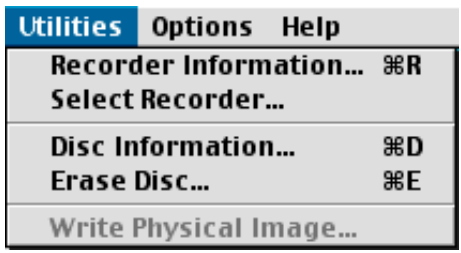


The Options menu provides different functions depending upon where you are in the main window's steps (Source, project, recorder, or write).

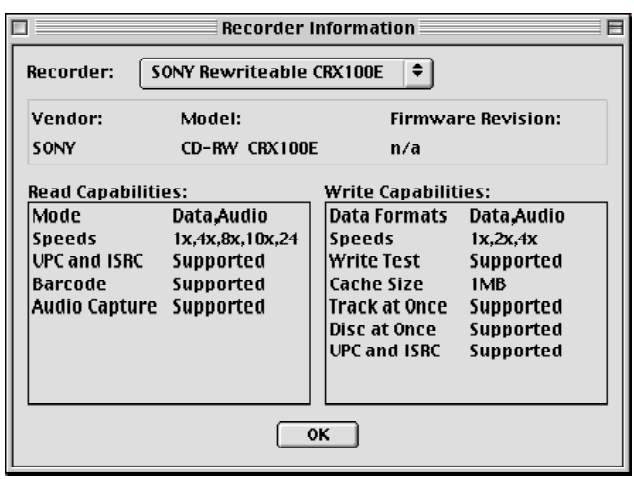


As you can see, much of what you need to do to master a CD is available in the pulldown menus. Many of the functions can be initiated by quick-key combinations as well. However, the most direct, application-guided CD mastering tool is the Discribe application window.

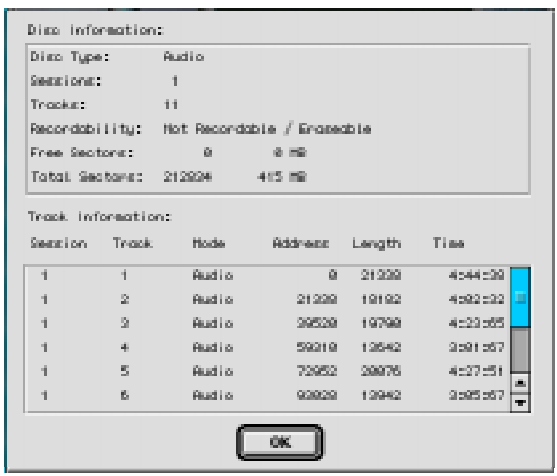
Utilities menu - provides recorder and disc information.



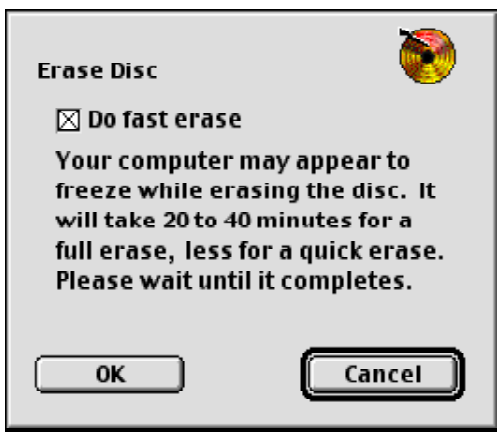
- Recorder Information - lists all supported recorders and includes such things as the recording modes supported, firmware version, etc. (Command, R)



- Disc Information - provides users with the ability to check previously burnt media to see if a session is still open, which tracks have already been burned, how much space is still available, and other details. (Command, I)



- Erase Disc - If your CD recorder supports erasable media, you can select Erase Disc from the Utilities menu (or use the Command, E shortcut) to erase all data on the CD in the erase-capable recorder.
- Fast Erase - If the fast erase check box is selected, Discribe will only erase the table of contents and the pre-gap of the first session of the first track of the re-writeable CD. This is used for blanking a disc quickly. Caution is advised when using this option because the program area still contains user data.



Using the CD-RW Drive as a Reader

Discribe includes software that allows you to use your CD-RW drive as a CD-ROM reader. The method that this is accomplished is dependent upon the hardware interface type of your drive.

SCSI - A SCSI-based CD-RW drive loads a driver from the CD-ROM extension included with Discribe. If the extension loads during startup, you may use your CD-RW drive as a standard CD-ROM reader.

ATAPI - An ATAPI-based CD-RW drive works in the same manner as a SCSI-based CD-RW drive requiring the included CD-ROM extension to be loaded at boot time.

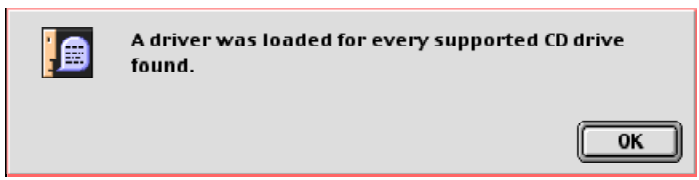
USB - A USB-based CD-RW drive works in a similar fashion to the SCSI and ATAPI-based drives with the following exceptions. A USB device may be “hot plugged” or disconnected from the Macintosh while the machine is running. A device may also be connected after the Macintosh has been booted. If the drive is connected after the Macintosh has been booted, a driver will not be loaded for the drive. To load a driver you must first launch the Hot Plug application.

Firewire (IEEE 1394) - A Firewire-based CD-RW drive works in a similar fashion to the USB-based drive. Firewire drives may be “hot plugged” or disconnected from the Macintosh while the machine is running. A device may also be connected after the Macintosh has been booted. If the drive is connected after the Macintosh has been booted, a driver will not be loaded for the drive. To load a driver you must first launch the Hot Plug application

Hot Plug Application

Macintosh device drivers normally load during system boot time if they see a device attached to the Mac

which requires a driver. If a USB or Firewire CD-RW drive is hot plugged (connected after boot time) there will not be a driver loaded for the device. To load a driver for a USB or Firewire CD-RW drive run the included Hot Plug CD application. If a device is found (correctly connected to the Mac) the following dialogue box will appear.



At this point your CD-RW drive can mount CDs like any standard CD-ROM drive.

NOTE

A CD-ROM driver is not necessary in order to master a CD. It is required for using your CD-RW drive as a reader.

User Information

This section contains information about hardware and formats that will be useful to beginning CD-RW enthusiasts. We put it back here so that experienced users could choose to skip it if they wanted.

CD-RW Hardware

CD-ROMs provide durable, easily portable storage for large amounts of data (typically 650MB). Until recently, producing your own CD involved having a specialized agency burn a “glass” master that could then be used to mass produce CD-ROMs. The process was time consuming and expensive for those who wanted to produce small numbers of CDs.

Recently, relatively inexpensive CD recorders began to enter the market. These recorders can write data to special dye coated CDs. CD recorders use a laser to selectively melt the coating, writing data in streams of “ones” and “zeros” (digital data readable by computers, audio CD players, and other specialized equipment depending upon equipment capability and information format).

CD-RW Device Types

CD-RW drives are available in four main interface types: SCSI, ATAPI,USB and Firewire (IEEE 1394).

SCSI (Small Computer Systems Interface) - SCSI is a very popular computer peripheral interface technology. All SCSI devices can be connected to a built in SCSI port on SCSI-based Macintosh computers or connected to a SCSI interface adapter. Each SCSI device must have it's own unique SCSI ID# and be terminated properly for Discribe to function reliably and burn CDs dependably.

ATAPI (Attachment Packet Interface) - ATAPI devices do not require any external termination or SCSI-type ID settings. ATAPI buses can handle two devices at any one time per ATAPI bus. Discribe supports CD mastering to either the Master (ID 0, recommended) or Slave (ID1) device on ATAPI buses.

USB (Universal Serial Bus) - Native USB devices require no external termination or ID settings, they are totally dynamic. USB devices can be “hot plugged” (unplugged and reconnected while the power is on). Unfortunately CD-RW devices don't currently support this feature as drivers need to be loaded at startup time for the device to function as a CD-ROM reader. To get around this limitation, Discribe includes the Hot Plug application. Running Hot Plug will load a driver for the CD-RW drive even if it has been plugged in after the system has booted up (see “Using CD-RW Drive as a Reader). This will allow you to “hot plug” the device while the Mac is running .

A USB CD-RW drive can be plugged into any open USB port, either directly attached to the Macintosh, via a hub or through a keyboard USB connection.

Firewire (IEEE 1394) - Firewire devices, like USB, require no external termination or ID settings and are totally dynamic. Firewire devices can be “hot plugged” (unplugged and reconnected while the power is on). Unfortunately CD-RW devices don’t currently support this feature as drivers need to be loaded at startup time for the device to function as a CD-ROM reader. To get around this limitation, Discribe includes the Hot Plug application. Running Hot Plug will load a driver for the CD-RW drive even if it has been plugged in after the system has booted up (see “Using CD-RW Drive as a Reader). This will allow you to “hot plug” the device while the Mac is running.

Hybrid USB and Firewire devices are com-

posed of non-USB/Firewire hardware (SCSI or ATAPI devices) which then, through a series of software and hardware combinations, ends up looking like a USB or Firewire interface to the host computer. Manufacturers have developed this technology using existing hardware devices to take advantage of lower development costs, ease-of-use and other benefits to quickly and reliably bring USB and Firewire connectivity to the end user. We have found this technology to work well in our testing and it is fully supported within Discribe.

CD-RW Speeds

The original recorders were single-speed. They operated at a data transfer rate of 175kB per second. As faster recorders were developed, they used multiples of the original single speed. For example, 2X recorders operate at two times the original single speed rate, or 350kB per second. 1X recorders can take over an hour to master a CD. 8X recorders might take as little as ten minutes. Allow an additional 15% increase in time for recording ISO XA or Audio CD formats.

CD-ROM Playback

Different recorders have different capabilities and features. Some CD recorders can be used to play back a CD, others cannot. Check the manufacturer documentation. As a matter of routine, it is more practical to play CDs on a CD player and avoid the wear on the more expensive recorder.

Multisession

Most CDs are single session. This means that the CD has a single “table of contents”, a continuous block of data, and a single end sequence or “closing” (called lead-in/lead-out), all accomplished during a single recording session. Some CD-ROM players and some re-

corders are capable of multisession.

Multisession allows more than one recording session on a single disc. There are multiple tables of contents on these discs, each duplicating, then adding to the previous table of contents so that the final (newest) table of contents includes everything on the disc. This newest table of contents is the one used by a player when it reads the CD. There are variations on this arrangement.

Because of the lead-in and table of contents for the first session and the tables of contents for following sessions, multisession recording uses up more disc space. Usually about an additional 26MB for the first session and an additional 14MB for each additional session.

In addition to multisession CDs, there are multivolume CDs.

Multivolume

Multivolume CDs are also recorded in multiple sessions. Each session will mount as a separate volume on the Macintosh desktop.

When the HFS (the Mac's Hierarchical File System) format is chosen, and multiple recording sessions are written, the CD will be a multivolume CD.

CD Formats

A CD can be recorded in any of several different formats depending upon what computer platforms are intended to be able to access the data and upon what kind of data is to be recorded.

- ISO-9660 - Primarily used to master discs on which data will be shared between multiple computer platforms (i.e., Macs and DOS/Windows compatibles). This is a widely used standard, but

does not provide the complete look and feel (i.e., Window views, folder views) that different system users are used to seeing. See *Manual and Auto Naming* earlier in this manual, and read the following note.

Naming Conventions: *If you are mastering an ISO-9660 CD intended for use across multiple computer platforms, you will need to learn and observe file naming conventions appropriate to the different operating systems. For example, DOS computers demand an eight character maximum name, followed by a period, then a three character extension. Some operating systems also expect a semicolon (;) and a version number of 1 or greater following the three character extension. Strict ISO-9660 names can only contain the capital letters A through Z, the arabic numbers 0 through 9, the underscore, the period, and the semicolon.*

For example, a correct ISO file name looks like:
GAME_B2.TXT;3

"." and ";" are special characters which can only appear in the positions shown above. Otherwise, they will be replaced with an underscore. Naming conventions become very important when you have an application, a game for instance, that depends upon supporting files. Supporting files must be named appropriately so that the application can locate them on the CD.

- Macintosh HFS - ISO-9660 variant intended for the Macintosh Hierarchical File System. Only Macintosh and Mac OS compatible computers can read the HFS format.

- CD-XA - Specialized format. Allows audio and computer data to be interleaved.

CAUTION

Mixed Mode CDs & Audio CD Players: *Mixed Mode CDs in which the data tracks are accessible to audio CD players are safe for play only on computer CD players or newer Audio CD Players. If a Mixed Mode CD data track is played on an audio CD player incapable of detecting and muting data tracks, the player and speakers will be* ***SEVERELY DAMAGED****.*

Refer to the Glossary at the back of this manual for definitions of other CD formats and CD recording terms.

Creating HFS Volume and CD Icons

When you use a utility to create an HFS volume on a hard drive, the manufacturer's default icon will appear on the Macintosh desktop. This icon will also be used for an HFS CD-ROM mastered from the volume. If you want, you can copy an icon you like better from another volume, or, you can create your own icon.

Copy an Existing Icon

To copy an existing icon:

1. Highlight the volume whose icon you intend to copy. Select *Get Info* from the *File* menu.
2. In the Get Info window, click on the icon representation. A box will appear around it.
3. Copy the icon. Close the Get Info window.
4. Highlight the volume whose icon you want to replace. Select *Get Info* from the *File* menu.
5. In the Get Info window, click on the icon representation. A box will appear around it.
6. Paste the icon you copied in place of the existing icon.

Create Your Own Icon

To create your own icon, you need a graphics application that will export or save in a format that can be pasted into the Mac clipboard. EPS files, for example, don't work because they will appear in the clipboard and on the desktop as the EPS representative icon. Photoshop works well to create the icon. Or, you can create the icon in a drawing program, then open it with Photoshop to arrive at the needed format. Many other graphics applications will work as well.

1. Create the icon. Restrain your work to a 5/8 x 5/8

inch square. Use large “filled” areas rather than empty line art.

2. Copy the project to the clipboard. Go to the Finder (desktop).
3. Highlight the volume whose icon you want to replace. Select *Get Info* from the *File* menu.
4. In the Get Info window, click on the icon representation. A box will appear around it.
5. Paste the icon you created in place of the original icon.

Troubleshooting

The following list includes some common problems that might be encountered while working to master your CD.

Write Test Failure

The write test simulates writing data to the CD by exactly duplicating the write process while holding the recorder's write laser in the off state. If this test is failed, check the following:

- Fragmentation
  If the files to be recorded are fragmented (not written cleanly and contiguously) on the hard drive, the time consumed in accessing them may cause the recorder's buffers to "run out" of information temporarily. During the actual write process, this would make the disc being written to useless.
  Use Norton™ Speed Disk or another drive utility to test the hard drive for fragmentation. If fragmentation is greater than moderate, you will need to reinitialize to optimize the hard drive.
- Hard Drive Too Slow
  If you have an older hard drive, it may be too slow in transferring data to the recorder. Try using a slower recorder speed (1X or 2X). If you are still not successful, you need a faster hard drive.

Recorder Won't Play CD-ROM

Some recorders can be used to play back CD-ROMs, others can not. Check your manufacturer's documentation and make sure the CD-ROM Extension is loaded. Ensure also that the device is connected and turned on before you start up your Macintosh, otherwise the CD-ROM Extension will be unable to see the device to load a device driver.

CD Recorder Not Accessible

SCSI - Like other SCSI devices, CD recorders must have a correctly set SCSI ID, a properly terminated SCSI connection, currently supported by Discribe and must be started before the Macintosh in order to show up on the SCSI bus. Refer to the recorder manufacturer and Apple documentation for information. Refer to the user manual *List of Supported CD Recorders* or the Discribe read me for the latest up to date information regarding support for your recorder. Note that SCSI IDs 0, 3 (internal CD player), and 7 are generally reserved for the Macintosh itself.

ATAPI - It is possible that the drive was unable to register it's 'bios' information with the Macintosh at boot time. This would hinder any software's ability to see the drive connected to the Mac. Check your CD-RW drives IDE and power cabling to ensure a firm fit.

USB / Firewire - Make sure that the proper software is loading in the System Folder. Items to double check are the USB (USB manager V1.2 or higher) or Firewire (Firewire V2.1 or higher) drivers (available from Apple) and the USB or Firewire SIM that would have come with the hardware, all of which should be loaded in the Extensions folder. Also check to ensure a tight fit for all USB or Firewire cabling.

Faster Recorder Speeds not Available

Only those speeds (1X, 2X, etc.) which your recorder is capable of will appear in the Discribe Screen. Note that CD-RW write speeds are often slower than standard CD-RW write speeds. Many CD-RW drives are distinguished in the following way: 8x4x24. In this example, the recorder would record to CD-RW media at speeds up to 8x, CD-RW media at speeds up to 4x and read CDs at speeds up to 24x.

Cross Platform Incompatibility

ISO-9660 multi-platform format does not mean that a file written for a DOS machine will run on a Macintosh or vice versa, only that either machine will be able to view the disc contents and use those data files written for its operating system.

System Hangs During Startup

You may have extensions that conflict with each other. Try starting your Macintosh with the <SHIFT> key held down to keep all extensions off.

Discribe and/or Hotplug CD doesn't see my Sony i.Link (Firewire) Spressa drive?

Usually, turning the drive on and off will reset the hardware and allow the drive to be seen. This is provided that all necessary software is installed.

Discribe doesn't see my Sony Spressa USB CD-RW drive?

When you are unable to see the Sony recorder, there are three possible things that could be wrong.

1.The simplest first: the drive is not connected or turned on. Make sure the drive is connected snugly via the USB port and powered up.

2.The USB SIM is not installed properly. Check for the following two files (not written by CharisMac) in your Extensions folder:

1. Shuttle USB-ATAPI SIM 1.0

2. Shuttle USB-ATAPI

These two components along with Apple's USB Manager make the whole solution work. They make the CD-RW drive look as if it resides on a SCSI bus, not a

USB bus, even though you are hooking the drive up through USB.

Barring the first two, if your iMac came with system 8.5 then you will want to download and install the iMac Updater 1.1 and the iMac Firmware updater. The updaters are available at <http://asu.info.apple.com/swupdates.nsf/artnum/n11178>.

For further information regarding this, visit <http://til.info.apple.com/techinfo.nsf/artnum/n58174?OpenDocument&software>.

The newer multi-colored iMacs shipped with system 8.6 and already had the new firmware version and USB Manager and should not have a problem.

System 8.1 users will need to update their iMacs to system 8.5 as the USB Manager will not install under system 8.1

I'm having problems burning CDs with my Sony Spressa iLink (Firewire) CD-RW drive attached to a Firewire PCI card.

Currently the Spressa iLink solution has not been qualified with any firewire PCI cards. The solution is only supported on Macintoshes which utilize the built-in firewire ports.

AIFF—Audio Interchange File Format. A standard cross-platform file format for storing sound files. It can be used to exchange audio files between differing hardware platforms and applications.

Access Time—Time to read and transfer data.

Audio Sectors—Sound data plus error correction data stored on hard disk. Audio sectors generally cannot be read by CD-ROM drives.

Audio Tracks—A group of Audio Sectors combined into a track and playable on an Audio CD player. If recording multisession, the audio tracks must be in the first session.

Blue Book—A written standard that specifies the CD EXTRA standard for interactive CDs. The standard details CD EXTRA made by creating a multisession CD with audio tracks in the first session and a data track in the second session.

Buffer—Memory used to temporarily store data during a data transfer operation. Buffer memory helps compensate for differences in speed between dissimilar devices such as hard disks and CD recorders.

Cache—A high speed memory area within a CD-ROM drive or a CD-ROM WRITER used during a data transfer operations.

Caddy—A plastic and metal cartridge used with some CD players and recorders to hold a CD during playing/recording.

CD—Compact Disc. A polished non-magnetic disk encased within an optically clear plastic coating. CDs store digital data for playback on optical scanning CD players. Playback involves the use of lasers and optical tracking hardware to read data from the surface of the CD disc.

The CD was developed by Philips and Sony as a medium for storing music, but has also found application as a durable medium for storage of computer data.

CD-DA—Compact Disc Digital Audio. A standard for digital recording and playback of music developed by Philips and Sony (often referred to as the “Red Book”).

CD EXTRA/CD Plus/Enhanced CD—A standard for interactive collections or albums. CD Extra discs have two sessions, one for audio tracks and for a special type of data track. CD Extra CDs can be played in audio CD players or computer players; the data accessible will be limited to what the player can play. (For example, audio CD players only play the audio tracks.)

CD-I—Compact Disc Interactive. A standard for the television screen presentation of data, including text, projects, and video, developed by Philips and Sony (referred to as the “Green Book”).

CD-R—CD Recordable. A type of compact disc that can record data by having microscopic pits burned into its recordable surface by a laser in a CD-R Recorder. A standard CD ROM recorder can read the pits on the CD-R just like a standard CD. CD-R discs require more careful handling than standard CDs, especially on the label side of the disc.

CD-ROM—Compact Disc Read Only Media. A computer storage medium for read-only data based on audio CD recording and playback technology. Developed jointly by Sony and Philips, the standard is often referred to as the “Yellow Book.”

CD-ROM Tracks— CD recording formats use Tracks as part of their format (HFS, ISO 9660, and others). CD-ROM tracks are made up of data sectors laid down on the CD (such sectors are called “mode 1 sectors.”

CD-ROM XA—Compact Disc Read Only Memory

Extended Architecture. This standard provides for differing data types and track types that can be synchronized for multimedia use.

CD-RW—Like CD-R, except that the recorder is additionally capable of erasing and the blank media is different.

Disc-At-Once—A CD recording method where the laser writes the entire CD in one pass without turning off. Use of this method allows control over the pauses between tracks (pre-gap and post-gap). Commercial audio CD production house generally require audio CDs to be created using disc-at-once mode. Support for disc-at-once mode varies between CD-recorders; consult a manufacturer's operation manual for details and individual requirements.

Disc Projects—All data required to create a CD can be stored as a Disc Project. Disc Projects contain the actual data, whereas projects contain only pointers or references to where data actually resides. Disc Projects offer the utility that they can be easily checked for appearance and content.

Data Capture—Methods for acquiring and converting data from non-electronic form—such as artwork, photos, and paper—into electronic file formats that can be manipulated by computer.

Data Compression—A technique for reducing the storage requirements of electronic data. Methods can be "lossy" (compression removes some data during the process) or "loss-less" (compression does not remove or alter file integrity, but rather encodes it more efficiently in its compressed form).

Directory—A logical structure on the disc that contains name, location and data information on all the files stored within. In most disc format schemes, a directory corresponds to a tree and branch method of organization, where branches contain other directories (sub directories) and/or files. Folders are used in the Macintosh HFS file system to visually represent direc-

tories.

ECC/EDC—Error Correction Code and Error Detection Code used by CD drive hardware to find and correct data errors caused by dirt or damage to the disc.

Green Book—See CDI.

HFS—Hierarchical File System for Macintosh computers. A system for organizing directories (folders) and sub-directories (folders within folders) and files. The HFS system offers longer file names than other formats and also uses a specialized data fork/resource fork structure for the files. Due to these differences and improvements, HFS is not directly compatible with the ISO Standard. On an HFS formatted CD, each session will result in a separate volume on the desktop.

Hybrid Disc—(1) An Orange book standard specifying a recordable CD with one or more recorded sessions and also having space open for future recording. **(2)** The term "hybrid" also refers to a CD having the necessary formatting so that it can be read on either DOS/Windows or Macintosh platforms. On the DOS/Windows platform data is seen as an ISO 9660 disc, while on the Macintosh data is seen as standard HFS data. This duality is accomplished by having separate partitions for the HFS and ISO 9660 data.

Project, or Disc Project—A virtual hard disk copy of the soon-to-be-written CD-ROM disc. An project is useful for testing and verifying disk contents prior to writing a CD.

Index / Index Point—A number between 0 and 99 placed at each sector. Most CD recorders only support index pointers of 0 or 1. Additionally, the index numbers of 0 and 1 define a pause sector (0) and the start of data in a track (1), respectively.

ISO 9660—Defines a standard for multiple platform CD-ROMs. ISO 9660 CDs can be read by many operating systems, including Mac OS, Windows, DOS, and UNIX. Note: ISO 9660 has file name and view limitations that make it undesirable for CDs intended for Macintosh-only applications. Use ISO 9660 only for CDs where multi-platform readability is necessary.

ISRC-Code—A code that holds the "serial number" of each track in a format defined in the "Red Book."

Media Catalog Number—Unique 13 digit identification for a CD (UPC/EAN Bar-Code) issued by EAN.

Mixed Mode CD—A CD containing a data track (placed first) and one or more audio tracks—all written in a single session. This format has generally fallen out of use in favor of the CD Extra format.

MPEG—A high compression method for video and audio data. MPEG supports the CD playing of full screen/full motion video. Mode2 form2 sectors form the basis of all MPEG tracks.

Multisession—CD format allowing the recording of multiple sessions at different times. Sessions are associated so that only one volume appears when the CD mounts. Support for multisession CDs varies among CD players and recorders. Check your manufacturer's manual to determine support for this format. A variation on multisession is multivolume, which records data to the disc as if each session were a separate and distinct disc.

Multivolume—A CD containing multiple sessions, each recorded at a different time. When mounted, each session appears as a separate and distinct logical volume. Support for multivolume CDs varies among CD players and recorders. Check your manufacturer's

manual to determine support for this format.

Orange Book—The formatting standard developed by Sony and Philips for recordable CDs (CD-Rs).

PhotoCD™—CD format used to store photographic projects. Kodak PhotoCD format is defined by the Beige Book, and includes CD XA tracks in a special format.

Post-Gap—A space recorded within the track data area (near its end) used to divide tracks. When used, post-gap is 150 sectors (2 seconds) long. Typically, post-gap is used only when successive tracks are of different types.

Pre-Gap—A space recorded before the track data area used to divide tracks. Pre-gap length depends on the type of each track, and with the type of CD recorder employed. Successive audio tracks may not have a pre-gap. Data tracks placed successively use a separation pre-gap of 150 sectors (2 seconds). Differing types of successive tracks use a separation pre-gap of 225 sectors (or 3 seconds).

QuAC File—QuickTime Album Container file. This file can contain sound and picture data, and control information. QuAC files are created with the Apple Interactive Music Toolkit™ (AIMT) or another file-compatible application.

Red Book—CD-DA (Compact Disc Digital Audio) formatting standard developed by Sony and Philips. Defines the format of an Audio CD so that an audio CD-player can properly play it.

Run-Out Sectors—Wasted non-readable sectors created as the laser beam turns off after data recording. Two sectors are normally used up or wasted for this purpose.

Scrambling—Data encrypted on a CD during writing. Data bits are recorded in a predefined pattern that allows descrambling by a CD player reading the data and decrypting the data following the defined pattern.

Session—A recording event that defines the content of one or more tracks, possibly of various types. If more than one session occurs, the CD is a multisession CD.

Shared Hybrid—A CD containing data for use on two different platforms. Application programs used on the various platforms for accessing the CD data are operating system specific, while the data is shared.

Single session—A drive that can read only discs recorded once in a single session, or a CD-ROM recorded in a single pass.

SoundDesigner II—Macintosh sound format developed originally for a proprietary hardware product.

Table of Contents (TOC)—A list of the contents of a CD. An entry for each session and each track, listing the index 1 of each track is contained in the TOC. (Note: CD-I tracks have no entry in the TOC).

Track—The building block of data on a CD. CDs can contain from one to 99 tracks. Track types include: audio tracks, CD-ROM tracks and XA/CD-I tracks.

Track-At-Once—A formatting mode where each track of a CD is preceded by 150 empty sectors and concluded by run-out sectors.

Transfer rate—The speed used for data transfer, usually expressed in terms of KB per second.

Video CD—White book format used to record full-motion video (MPEG 1) or movies on CD. Playback often requires special hardware. Video CD tracks must be in the first session of a disc (on multisession CDs).

Virtual Project—A database of pointers and references describing the files from volumes that will be written to the CD.

White Book—The data format standard for a Video CD.

XA/CD-i Tracks—Tracks made up of mode2 sectors for use on ISO 9660, XA CDs, Video CDs, Photo CDs and CD-I's.

Yellow Book—The data format standard developed by Philips and Sony that ensures compatibility between CD-ROM drives. Yellow Book specifies all parameters for CD-ROMs, but does not address data structures.

List of Supported CD Recorders

SCSI CD Recorders
Acer CR-1420C
DynaTek CDM-4000
HP SureStore 4020, CD Writer 6020
Imation CDR 8x20, CDRW 8x2x20 (internal), CDRW 8x2x20 (external)
JVC Writable CD-ROM, XR-W1001, XR-W2010, XR-W2012, XR-W2020, XR-W2022
Kodak PCD 200, 225, 600(6X)
Mitsubishi CDVR 2X4, CDVR 2X6, CDVR 4X4, CDRW 226
Olympus CDS620, CD-R2
Optima DisKovery 1300CDR, 650CDR
Panasonic CW-7502, CW-7503
Philips CDD2000, CDD2600, CDD3600, CDD521, CDD522, Omniwriter 2x6
Pinnacle RCD-202, RCD-1000, RCD-5020, RCD-5040
Pioneer DW-S114X, DR-504X
Plasmon RF-4100, RF-4102
Plextor PX-R24CS, 4x12, 8x20, RW 4x2x20, RW 8x2x20
Ricoh RS9200CD, RO1060C, RO-1420C, MP6200S, MP6201S, MP6211S, CRW620
Smart & Friendly 2x6
Sony CDU-900, 920S, 921S, 924S, 926S, 948S, CDW-E1/W1, CDW- 900E, CD-RW CRX145
TEAC CD-R50, CDR-55, CD-R56
Traxdata CDRW4260
Yamaha CDE100, CDR100, CDR102, CDR200, CDR400c/t, CRW2260, CRW4260, CRW4416, CRW6416

ATAPI CD Recorders
HP CD-Writer+ 7100, CD Writer+ 7200
Iomega Zip CD
JVC Rewriteable RW2224, Rewritable XR-W2080, Rewritable XR-2082
LG CD-RW CED-8041B
Mitsumi 2x6 CR-2600TE, 2x8 CR-2801TE, 4x8 CR-4801TE, CR-4802TE
Philips IDE Rewritable 2x2x6, IDE Rewritable 2x2x24, Rewriteable CDD3610, Rewritable CDD3801, RewritablePCA382
Ricoh Rewritable MP6200A
Sony CDU928E, CRX100E Rewriteable, CRX120E Rewritable
Traxdata CDRW2260+, CDRW2224+
Yamaha CDR401, CRW4001, CRW4261, CRW2216E, CRW4416E

List of Supported CD Recorders

USB CD Recorders
Sony CRX100E, CRX120E Rewriteable

Firewire CD Recorders
Sony CRX120E Rewritable

If your drive is not on this list it may still be supported. CharisMac Engineering™ continues to qualify and add support for additional drives. Contact CharisMac regarding support for any CD recorder not on this list.

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