Creative Digital Research™

Desktop CD-ROM Publishing Company

Publisher

User's Guide

Creative **D**igital **R**esearch

7291 Coronado Drive,   San Jose, CA 95129

Tel: (408) 255-0999   Fax: (408) 255-1011

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Introduction

Welcome

Prepare to enter the world of desktop CD-ROM publishing. As you are aware, the low cost and convenience associated with CD-ROMs is attracting multitudes of individuals and companies. You are now on the cutting edge of an exciting and revolutionary technology.

What CDR Publisher Software Does

CDR Publisher is Desktop CD-ROM premastering software that takes data from your computer system and generates CD-ROMs. These CD-ROMs can be read by all CD-ROM readers on all major computers. You can produce CD-ROMs yourself to meet your own needs and have total control of the final CD-ROM product, quickly and economically.

CDR Publisher is Different!

CDR Publisher is very different from other CD-ROM recording software.

> **If you have any preconceived ideas about how CD-ROM recording software generally works based on your experience with other software -- throw them away.**

CDR Publisher has a unique graphical user interface packed with advanced features for both the novice and power users that will get you into trouble if you think you know it all -- "A little knowledge is a dangerous thing". We highly recommend that you read the manual before you start creating CD-ROMs.

Valuable uses of CD-ROMs In Your Business

- **Store large amounts of data for backups:**

    A single CD-ROM can hold over 650 MB of data, more if data is compressed. You can maximize its versatility to store any information including Computer Data, Video, Animation, and Audio data on a single CD-ROM.

- **Rapid Access from backups:**

  Directly access or restore your backups from CD-ROM by reading from any CD-ROM reader. This can dramatically reduce time compared to restoring from tape.

- **Internal targeted distribution of information:**

  Provide targeted individuals and departments within your organization with specific and secured data.

- **External distribution of information:**

  Provide targeted prospects or clientele with the valuable information you want them to know. Pricing catalogs, documents, sales/service presentations, training material/ courses, product demonstration/evaluation discs, multimedia presentation, games and educational materials are a few examples.

Benefits of Using A CD-ROM

- **Economy:**

  Less than $1 to distribute large amounts of information to the mass market compared to $15 - $25 per tape.

- **Durability:**

  CD-ROMs are not susceptible to fingerprints, X-ray, magnetic fields or heat.

- **Longevity:**

  CD-ROMS have a projected shelf life of 100 years.

- **Universality:**

  All major computer systems support CD-ROMs.

What CDR Publisher Can Do For You

There are many features and benefits offered by Creative Digital Research's CDR Publisher.

Hybrid and Compliant CD-ROMs Are Sharable on All Major Computers

CDR Publisher can create Hybrid CD-ROMs that are compliant to CD-ROM Standards. Every feature of the existing computing environment is preserved. Therefore, these CD-ROMs are accessible in the native environment of PC, Macintosh, and UNIX systems.

> PC CD-ROM Format: ISO 9660
>
> Macintosh CD-ROM Format: HFS
>
> UNIX CD-ROM Format: ISO 9660 with Rockridge Extension

PC, Macintosh, and UNIX versions can create any combination of CD-ROMs for other computer systems without accessing additional hardware. For example, the user can create a PC and Macintosh Hybrid CD-ROM on a UNIX workstation without using a PC or Macintosh computer. A PC can create a Macintosh CD-ROM without using a Macintosh computer.
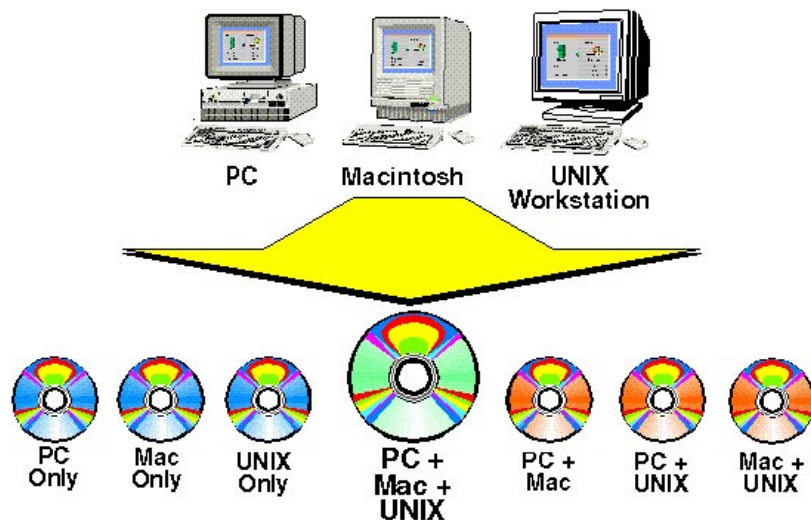
Intel-RISC Processor Compatibility Ensures the User is Supported on the Major Platforms

CDR Publisher runs on major computer systems supporting the user on Intel based PC computers and clones running Microsoft Windows and RISC processor based computers from SUN, AXIL and Silicon Graphics. This ensures that you are supported on most of the major computer platforms.

"Image On-The-Fly" Feature Saves Time

With CDR Publisher, you can utilize the "Image on-the-fly" feature to create your CD-ROM. Unlike other software packages that force the user to create a CD-ROM image on a hard disk and then copy it to a CD-ROM Recorder, CDR Publisher allows you to directly write to a CD-ROM Recorder. This eliminates the duplication of data, thereby reducing the time required to create a CD-ROM.

CDR Publisher Builds Correct *CD-ROMs*

CDR Publisher generates each CD-ROM image "Dynamically". Unlike many CD-ROM premastering software packages that pre-allocate spaces for directory and file records, which limits the user to recording a pre-defined number of files and directories, CDR Publisher has no preset limitations. This allows you to freely tailor the CD-ROM to your specific needs without any restrictions.

For example: At EDS, a division of General Motors, after many premastering software packages had failed, CDR Publisher reliably created a CD-ROM image with a directory containing more than 24,000 files.

Save Money and Resources: Safe-guard Against Creating Erroneous Discs

The CDR Publisher software provides <u>two features</u> to safe-guard the user against creating erroneous discs due to the computer's inability to sustain the data transfer rate required by all of the CD-ROM Recorders.

Through the use of the "Profile System Speed" and the "Virtual Write" features, CDR Publisher will test the communication speed between the computer system and the recorder prior to actual recording. Furthermore, CDR Publisher will assist the user in fine-tuning the computer system in order to create usable discs and ensure a correct, accurate recording the first time.

Optimizing and Customizing Disc Layout Creates Fast Access CD-ROMs

CDR Publisher provides the user with an easy method of optimizing the CD-ROM image. It organizes the underlying CD-ROM image layout while preserving all the files and directory structure of the original source. At the user level, there are no visible differences in where the files are. However, a read process on an optimized disc may be twice as fast on a normal 1X CD-ROM reader.

To help the user to achieve an even better throughput, CDR Publisher provides you with the capability to further customize the disc layout after the automated optimization process.

Windows' Support and Consistent Graphical Interface Reduce Learning Time

CDR Publisher is compatible with Microsoft Windows and X-Window Systems. It adapts an "Intuitive Graphical Interface" that the user can easily run from CD-ROM or run from an installed hard disk. The ability to run from CD-ROM allows the user to free up the hard disk with minimum effort.

Creating a CD-ROM requires only three steps:

> **1. *Source.*** (Select where your data currently resides)
>
> **2. *Destination.*** (Transfer the data to the target device)
>
> **3. *Create Image.*** (Starting the premastering process)
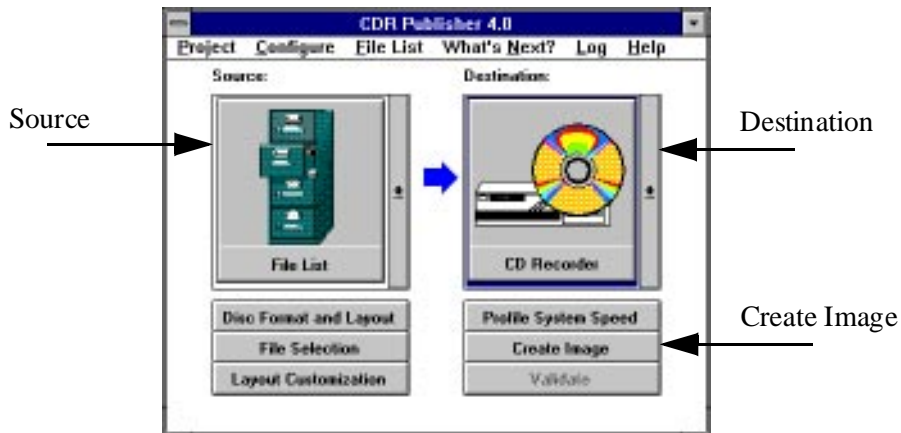
The Graphical Interface is consistent on all the platforms CDR Publisher supports, therefore reducing the learning time when the user is operating in a different platform.

Network Ready Flexibility Allows User to Create CD-ROMs with Data Residing on Other Computer Systems

CDR Publisher is "Network Ready". If you have a multi-platform computer environment, such as a combination of IBM PC, Macintosh, SUN, HP, SGI, or Digital VAX workstations, you can access the computer data across the network and create your own CD-ROM on the CDR Publisher supported computer. For example, you can create CD-ROMs on a SUN workstation or on a PC with data from an IBM main frame or VAX station. This advanced feature fully utilizes all information residing in multiple computing environments.

Automatic File Name Conversion Feature Saves Time

With this feature selected, directory and file names will be converted automatically to a specified CD-ROM standard. A record of the original names and converted names will be saved into the Conversion File for reference. This feature saves the user a great deal of time by automating the file name conversion process in order to create portable CD-ROMs that conform to the ISO standard.

Simulated CD-ROM Feature Saves Money

CDR Publisher allows the user to create a CD-ROM image and output to a hard disk (virtual disk). The user can use the virtual disk to correct any mistakes or optimize the disc layout prior to any recording. This process helps the user to ensure the integrity of the CD-ROM without spending money on performance testing on expensive recordable CD-ROMs.

Project Management Feature Simplifies Creation of Multiple Discs

CDR Publisher records all configurations, parameters and lists during a session. This enables the user to easily store and retrieve any customization and optimization of functions the software product supports. Each instance of the customization is recorded as a project. Each version of the CD-ROM can be managed by a project. With this feature, the user can easily keep track of multiple versions of different CD-ROMs.

CDR Publisher is Able to Maintain Reliable Data Transmission

In many multi-user (UNIX) and multi-process (PC & Mac) operating environments, pre-mastering software packages are frequently unable to sustain the data transfer rate a CD-ROM Recorder needs. As a result, many recordable CD-ROMs are unusable and wasted. CDR Publisher controls the writer directly. CDR Publisher uses a unique Multi-Buffered I/O mechanism to speed up the data transfer throughput, thereby eliminating the creation of erroneous discs. The following examples show some of the options available with CDR Publisher:

On a SUN SPARCstation 2 with single SCSI controller or on a 486 PC with 2 SCSI Controllers where the recorder resides on a single SCSI card and the other devices on another SCSI Card:

- Record from Virtual Disk at 4X.
- Record from Image File at 4X.
- Record from File List (Image on-the-fly) at 2X.
- 4X to 4X duplication from CD Reader to CD Recorder.

On a 486 PC with a single SCSI Controller with all devices connected in a single SCSI chain:

- Record from Virtual Disk at 4X.
- Record from Image File at 2X.
- Record from File List (Image on-the-fly) at 2X.
- 2X to 2X duplication from CD Reader to CD Recorder

Overview

This documentation is meant to be an easy guide to creating a CD-ROM. A Reference Section has been provided at the end of this manual to provide you with all of the technical instructions you will require.

Before You Begin

You will need to take the following steps prior to using the CDR Publisher Software:

1. Determine your operating system requirements.

2. Familiarize yourself with the "Terminology" and "Display Conventions" Sections of this manual, as these are convenient references.

3. Install and configure your hardware.

4. Install and configure CDR Publisher software.

If you encounter any difficulty in your set-up, consult your system administrator.

Quick Start

A Quick Start instruction sheet is provided in the package to help you get started rapidly.

A simplified version is also provided in the Appendix A of this manual for your reference.

Operating System Requirements

CDR Publisher is a cross-platform solution to desktop CD-ROM publishing needs. As a result, CDR Publisher's users will utilize the software product to create discs which will be read on a variety of platforms. The operating system requirements for each CDR Publisher version are outlined below:

PC Version:

- 486 PC, MS-DOS 6.2, Windows 3.1, WfW, Windows NT, Win 95, 8MB extended memory or higher, WinASPI or WinASPI32 SCSI Driver installed from EZSCSI 3.0 or EZSCSI 4.0.

SUN Version:

- A SUN SPARCstation, Sun OS 4.1.2 or Solaris 2.3 or higher, Openwindows or X Window System.

Silicon Graphics Version:

- IRIS Indy, Indigo2, Onyx workstation, IRIX 5.2, 5.3 or 6.0.

Apple Version:

- Macintosh Quadra / Power Mac with System 7.1 or higher.

Required Equipment

- CD-ROM Drive
- External SCSI Hard Drive (Required for using Virtual Disk)

Optional Equipment

- SCSI Tape Drive
- SCSI DAT Drive
- Philips CDD 521, 521 Upgrade, 522, 2000 CD-ROM Recorder
- Plasmon RF 4100, 4102 CD-ROM Recorder
- Kodak PCD Writer 200 Plus, 225, 600 CD-ROM Recorder and transporter
- Sony CDW-900E, CDU-920S, CDU-921S CD-ROM Recorder
- Yamaha CDE 100, CDR 102 CD-ROM Recorder
- More in the future. Please call.

Terminology

ANSI	American National Standards Institute.
Device Driver	A computer program to be installed on your system in order for CDR Publisher to communicate with the selected hardware devices.
High Sierra	The first proposed structure designed for CD-ROM, later amended to become ISO 9660.
Hybrid CD	CD-ROM that has integrated formats enabling the CD to be read on different computer platforms.
HyCD	A specific type of hybrid CD-ROM format developed by Creative Digital Research that enables the CD to be read by PC, Mac and UNIX platforms.
ISO 9660	Industry standard file structure designed for the CD-ROM and accepted by the International Standards Organization (ISO).
Image File	A single file on your source hard drive which contains all the files selected for the image you are creating.
Image on-the-Fly	When a CD-ROM is created from a Source directly to a CD-ROM recorder.
License	Permission received from an application developer to use their application.
Mastering	Recording of encoded input data on a glass substrate.
Premastering	Preparing and encoding of input data to send to recording unit prior to mastering and replication.
RRIP	Rock Ridge Interchange Protocol (See Rock Ridge Extension).
Rock Ridge Extension	A File structure designed for users of POSIX and UNIX systems.
SCSI	Small Computer Systems Interface. Used as an interface to connect peripherals to computers.
Virtual Disk	An external hard drive to which you record data in the image of a CD-ROM. This can then be mounted back and viewed as though it were an actual CD-ROM to correct any mistakes or optimize the disc layout prior to actually recording to the CD-ROM.

Virtual Write   The Virtual Write process is used to send data to the recorder
                         without physically writing to a recordable disc. This process is
                         dependent on the CD-ROM recorder supporting such a feature.

Standards Reference

The user is encouraged to reference the following materials for additional information on various CD-ROM formats.

Red Book, Yellow Book and ISO 9660

American National Standards Institute
1430 Broadway
New York, NY 10018

Orange Book

Philips Consumer Electronics
Optical and Magnetic Media Systems
PO Box 80002
5600 JB
Eindhoven, The Netherlands

Display Conventions

This manual uses standard display conventions.

bold text	Keystrokes that you should type.
`courier typeface`	System messages, programming fragments, commands, files and directories.
`bold courier`	Critical parts of program listings, keystrokes that you must type.
`<...>`	Item that must be filled in by you.
%	C shell prompt.

Note: Windows and buttons (keys) which appear on your screen will appear (in this manual) in helvetica typeface.

Installing CDR Publisher

Installing CDR Publisher onto a Hard Disk

You may install CDR Publisher from the CD-ROM or floppy disks onto your hard disk. Please follow these steps.

Using CD-ROM Recorder as a CD-ROM Reader

Most of the Operating System companies currently do not support CD-ROM recorders in their OS. Therefore, during system boot up, it is very normal that the CD-ROM recorder will not be recognized by the Operating System. In order to communicate with the CD recorder during runtime, CDR Publisher installs a device driver to each Operating System during the installation process.

Therefore, if you have received a copy of CDR Publisher distributed on CD-ROM, you must use a CD-ROM reader supported by your Operating System to perform installation.

PC Version

After loading the CD-ROM or floppy disk, use `File Manager` to view the directory:

<CD-ROM Drive>:\PACKAGES\MSWIN for Windows 3.1 or WfW, or

<CD-ROM Drive>:\PACKAGES\WINNT for Windows NT, or

<CD-ROM Drive>:\PACKAGES\WIN95 for Windows 95, or

<Floppy Disk Drive>:\

Execute the `install.exe` command.

Silicon Graphics Version

CD-ROM will automatically mount.

Extract the software with the following commands:

> # **cd /CDROM/packages/SGI**
> # **install.sgi**

Answer the questions regarding which CD-ROM recorder you are using. After installation, the system will automatically reconfigure the system. You then must reboot the system after installation.

SUN OS 4.1.X Version

Become a root user if necessary and mount the CD-ROM with the following command:

> # **mount -rt hsfs /dev/sr0 /cdrom**

Extract the software with the following commands:

> # **cd /cdrom/packages/SUNOS**
> # **install.sunos**

Solaris 2.3 Version

Become a root user if necessary and mount the CD-ROM with the following command:

> # **mount -rF hsfs /dev/sr0 /cdrom**

Extract the software with the following commands:

> # **cd /cdrom/packages/SOLARIS23**
> # **install.solaris**

Solaris 2.4 Version

Become a root user if necessary and mount the CD-ROM with the following command:

    # **mount -rF hsfs /dev/sr0 /cdrom**

Extract the software with the following commands:

    # **cd /cdrom/packages/SOLARIS24**
    # **install.solaris**

Removing CDR Publisher from a Hard Disk

If you are updating a new version of CDR Publisher onto your system, you do not need to perform the removal process. However, if you wish to remove CDR Publisher from the installed hard disk permanently please follow these steps.

PC Version

In the Windows' `Program Manager`, find the CDR Publisher Program Group. Select the `Uninstall` icon and follow the instruction.

Silicon Graphics Version

Become a root user and issue the following command:

```
#  inst
>  remove CDR_Publiser.release.relnotes
>  remove CDR_Publisher.sw.base
>  go
>  quit
```

SUN OS 4.1.X Version

Become a root user and issue the following command:

```
#  rm -rf <installed directory>
```

Solaris 2.3 and 2.4 Version

Become a root user and issue the following command:

```
#  pkgrm CDRPub
```

Directory Structures

The directory structure will appear as below:

`README.TXT`	Important notes on CDR Publisher. Must Read.
`cdrenv`	A c shell script to set up your environment variables.
`bin/`	Binary directory.
`bin/SGI`	Silicon Graphics binary directory.
`bin/SUNOS`	Sun binary directory for SUNOS 4.1.X
`bin/SOLARIS23`	Sun binary directory for SOLARIS 2.3
`bin/SOLARIS24`	Sun binary directory for SOLARIS 2.4
`bin/MSWIN`	PC binary directory for MS Windows 3.1 or WfW.
`bin/WINNT`	PC binary directory for Windows NT.
`bin/WIN95`	PC binary directory for Windows 95.
`resource/`	Template files.
`doc/`	Documentation directory.
`log/`	Directory for storing logs from the license manager.

Registering CDR Publisher

Once you have installed CDR Publisher onto your hard disk, you must first register it:

If you have already registered and received the license password, it is not necessary to re-register. Please skip the Register Your Software section.

PC Version

Register Your Software:

1. Double click the `CDR Register` icon in Windows' `Program Manager` to invoke `register.exe`
2. Enter Registration Number printed on the package and generate the Registration Code by pressing `License Request` button.
3. Print and completely fill out the Registration file generated. Fax, mail or e-mail (license@cdr1.com) the Registration file to Creative Digital Research, and we will send you a license password.
4. After you have received the license password, invoke `register.exe,` type in the password, then press the `Start CDR Publisher` button to start CDR Publisher.

Run CDR Publisher in future sessions:

Double click the `CDR Publisher` icon in Windows' `Program Manager`.

Silicon Graphics Version

Register Your Software:

  As a root user,

   1. Setup the environment variables by issuing the following command:

      # source <toplevel>/cdrenv

   2. Issue the command on the host where the licensed software is going to run:

      # register

   3. Enter the Registration Number printed on the package and generate the Registration Code by pressing the License Request button.

   4. Print and completely fill out the Registration file generated. Fax, mail or e-mail (license@cdr1.com) the Registration to CDR and we will send you a license password.

   5. After receiving a license password, continue with registration:

      In the same directory where you generated the registration file, type in the command:

      # register

      Type in the license password then press Start CDR Publisher to start CDR Publisher.

Run CDR Publisher in future sessions:

  As a regular user,

  % source <toplevel>/cdrenv
  % cdrpub

Link Resources (Openwindows Only):

If you are running under X11R4 or X11R5 X server, skip this step.

If you are running under Openwindows, continue:

```
# cd /usr/lib
# ln -s /cdrom/resource/openwin/X11
```

Register Your Software:

As a root user,

1. Setup the environment variables by issuing the following command:

    ```
    # source <toplevel>/cdrenv
    ```

2. Issue the command on the host where the licensed software is going to run:

    ```
    # register
    ```

3. Enter the Registration Number printed on the package and generate the Registration Code by pressing the `License Request` button.

4. Print and completely fill out the Registration file generated. Fax, mail or e-mail (license@cdr1.com) the Registration to CDR and we will send you a license password.

5. After receiving a license password, continue with registration:

    In the same directory where you generated the registration file, type in the command:

    ```
    # register
    ```

    Type in the license password then press `Start CDR Publisher` to start CDR Publisher.

Run CDR Publisher in future sessions:

As a regular user,

```
% source <toplevel>/cdrenv
% cdrpub
```

Solaris 2.X Version

Register Your Software:

 As a root user,
 1. Setup the environment variables by issuing the following command:
    # source <toplevel>/cdrenv
 2. Issue the command on the host where the licensed software is going to run:
    # register
 3. Enter the Registration Number printed on the package and generate the Registration Code by pressing the `License Request` button.
 4. Print and completely fill out the Registration file generated. Fax, mail or e-mail (license@cdr1.com) the Registration to CDR and we will send you a license password.
 5. After receiving a license password, continue with registration:
    In the same directory where you generated the registration file, type in the command:
       # register
    Type in the license password then press `Start CDR Publisher` to start CDR Publisher.

Run CDR Publisher in future sessions:

 As a regular user,
 % source <toplevel>/cdrenv
 % cdrpub

Configure Your Hardware

Hardware Support

The CDR Publisher supports a variety of hardware devices with SCSI interface including hard disks, 4 mm DAT tape drives, 8 mm Exabyte tape drives, CD-ROM readers. It supports Philips CDD 521 Upgrade, 522, Kodak PCD Writer 200 Plus, 225, 600 and Disc Transporter, Plasmon RF 4100, 4102, Sony CDW-900E, CDU-920S, CDU-921S, Yamaha CDE 100, CDR 100 and CDE 102 CD-ROM recorders. Additional recorders are always being added.

CDR Publisher and SCSI Devices

It is not necessary to have each of these hardware devices in order to use CDR Publisher. With any of the above-mentioned hardware devices, you will be able to utilize the features CDR Publisher offers. The following table lists the devices and associated usages of the software:

SCSI Device	Usage
Hard Disk (Separate SCSI Hard Drive)	Create CD-ROM image onto the Virtual Disk. Mount the Virtual Disk as a CD-ROM device for validation and disc optimization.
CD-ROM Reader (Used as a source device)	Create a backup of CD-ROMs. Use the reader to validate premasters created from the CD-ROM recorder or create a back-up of the existing CD-ROM.
Tape Drive	Record the CD-ROM image onto tape. Send the tape to a service bureau for premaster or replication.
CD-ROM Recorder	Create a CD-ROM premaster for validation, testing, or backups. These CD-ROMs can be used for limited distribution or be sent to a replication facility for mass distribution.

Warning:

Please note that a Virtual Disk is <u>not</u> your source hard disk drive. It is an extra Hard Disk separate from all of your source disks.

Contents Of The Virtual Disk Will Be Overwritten By Your CD-ROM Image.

Connecting your SCSI Device

Since the hardware equipment are SCSI devices, they can be chained together with SCSI cables and terminated at the last device. To distinguish the devices, each device on the chain is identified by the unique SCSI ID configured on the device. The following figures will demonstrate some examples of how the devices can be chained together:

PC Version:

SCSI
Card 1

SCSI
Card 2

Hard Disk

Tape Drive

CD Reader
(Terminated)

CD Recorder
(Terminated)
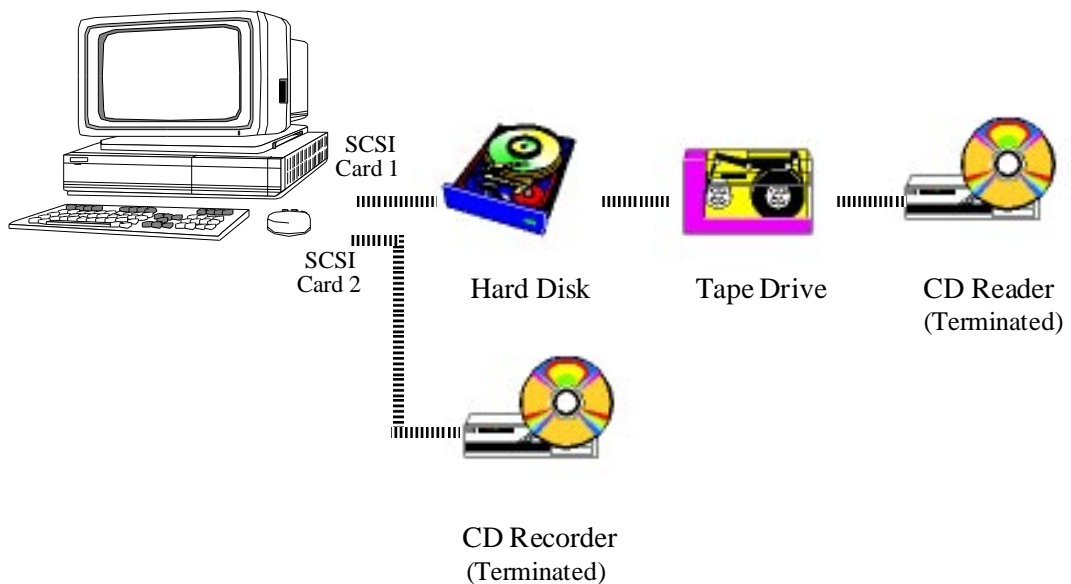
NOTE: When using a 486 PC, it is recommended to have the CD-ROM recorder device as the only device connected to a SCSI interface card and have other devices connected to the second SCSI interface card. This will eliminate the creation of problematic CD-ROMs caused by an unsustainable data transfer rate from your PC. Please refer to the chapter on "Create Image to a CD-ROM Recorder" for additional details.

Configuration

You must configure your windows properly because CDR Publisher is a true Windows compliant software and not a Quickwin or DOS application.

Please use the following as a check list:

- There should be a "WINA20.386" file on your "C:\" drive.
- In "CONFIG.SYS" file, you must have the HIMEM and EMM386 entries. i.e.
    DEVICE=C:\DOS\HIMEM.SYS
    DEVICE=C:\DOS\EMM386.EXE
- If you were using Incat Systems' EASYCDMS driver, comment it out.
    Change
        DEVICE=C:\ECDMM\EASYCDMS.SYS /D:CDWO
    To
        REM DEVICE=C:\ECDMM\EASYCDMS.SYS /D:CDWO

SCSI Controllers and ASPI Device Driver

You must use the most updated version of either the WINASPI Device Driver shipped with the Adaptec SCSI Adapter or a 100% compatible WINASPI device driver shipped with SCSI Adapters made by other vendors.

We have successfully tested the Windows version on:
    386, 486 and Pentium Processors
   All Adaptec SCSI adapter cards with EZSCSI 3.0 and 4.0.
    All BusLogic SCSI adapter cards.

IMPORTANT:

You must use the `winaspi.dll` and `vaspid.386` that comes with the SCSI card from the manufacturer. Do not mix the drivers from different vendors.

For example, use EZSCSI for Adaptec controller cards and use BusLogic's "`winaspi.exe`" patch for BusLogic's controller cards.

<u>SUN SPARCstation Version:</u>

SCSI
Card 1

Hard Disk   Tape Drive   CD Reader

CD Recorder
(Terminated)
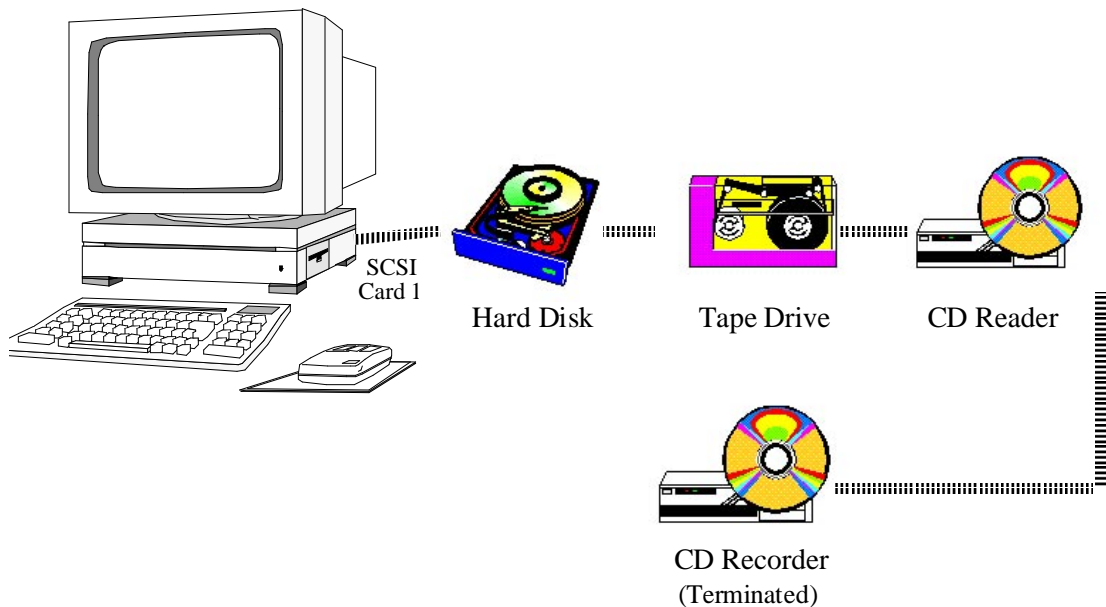
Sample Configuration

The following is a sample configuration of various devices:

<u>PC Version</u>:

Device	Configuration
Adaptec 1540C/1542C SCSI Adapter #0	Port Address: 330 IRQ: 11 DMA 5 SCSI ID: 7 SCSI Parity Checking: Enabled DMA Transfer Rate: 5.0 MB/Sec. Host Adapter SCSI Termination: Enabled
SCSI Hard Disk	SCSI Adapter 0; SCSI ID 1
CD-ROM Reader	SCSI Adapter 0; SCSI ID 2
Tape Drive	SCSI Adapter 0; SCSI ID 3
Adaptec 1540C/1542C SCSI Adapter #1	Port Address: 334 IRQ: 12 DMA 6 SCSI ID: 7 SCSI Parity Checking: Enabled DMA Transfer Rate: 5.0 MB/Sec. Host Adapter SCSI Termination: Enabled
CD-ROM Recorder	SCSI Adapter 1; SCSI ID 1

<u>SUN OS 4.1.X and Solaris 2.X Version</u>:

Device	Configuration
SCSI Hard Disk	SCSI ID 0
CD-ROM Reader	SCSI ID 6
Tape Drive	SCSI ID 4
CD-ROM Recorder	SCSI ID 5

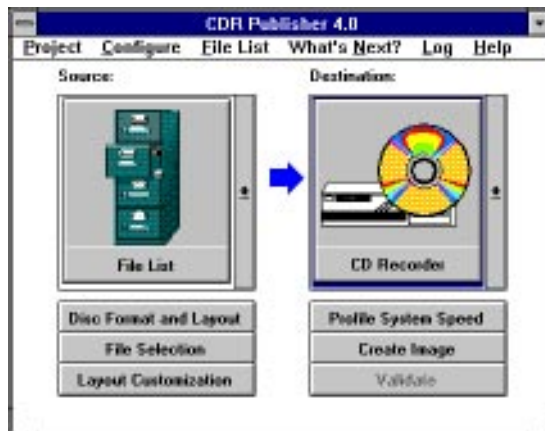# Using CDR Publisher

Starting CDR Publisher

PC Version:

To start CDR Publisher, double click the CDR Publisher icon in the `program manager`.

SUN OS 4.1. X and Solaris 2.X Version:

To start CDR Publisher issue the following command:

   % **cdrpub**

CDR Publisher will first validate the license, then display the Main Window shown as below:


The Main Window consists of several components: Menu Bar, Source Selection Window, Destination Selection Window, NextStep Arrow, and Action buttons.

Managing Projects

CDR Publisher records all configurations, parameters and lists during a session. This enables the user to easily store and retrieve any customization and optimization options of any functions CDR Publisher supports. Each instance of the customization is recorded as a Project.

The project creation, saving and restoring functions can be accessed through the Project menu button.
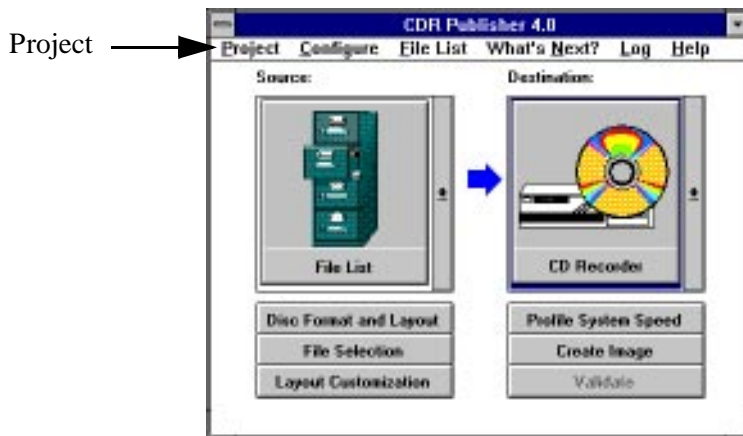
Project ——→

Configure Hardware Information

After creating a new project or loading a previously saved project, it is important to make sure that the hardware information loaded into CDR Publisher is the hardware setup of the current computer user. To be sure, invoke the Hardware Information Window by selecting Configure: Hardware Info menu item.
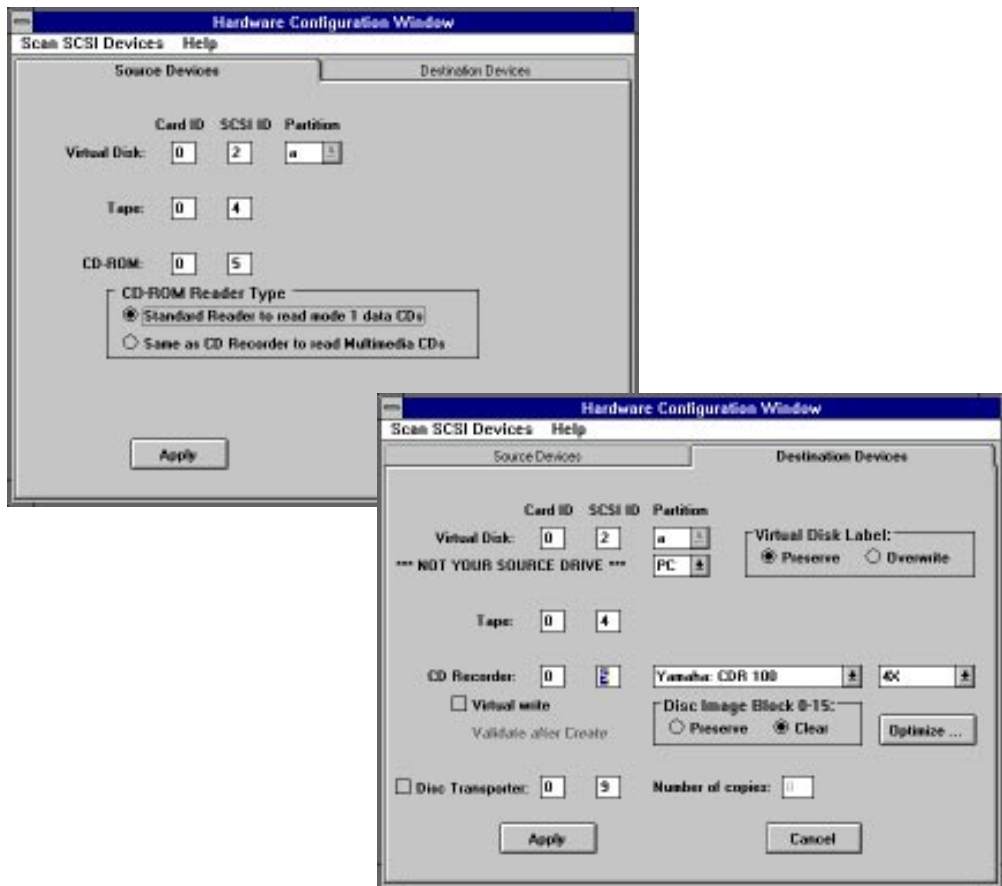

Select the Card ID and SCSI ID that match the corresponding source and destination devices.

Scanning SCSI Devices

If you need assistance in finding out what devices are available on the SCSI chain or to obtain details about the firmware revision of your CD-ROM recorder, select `Scan SCSI Devices` on the menu.
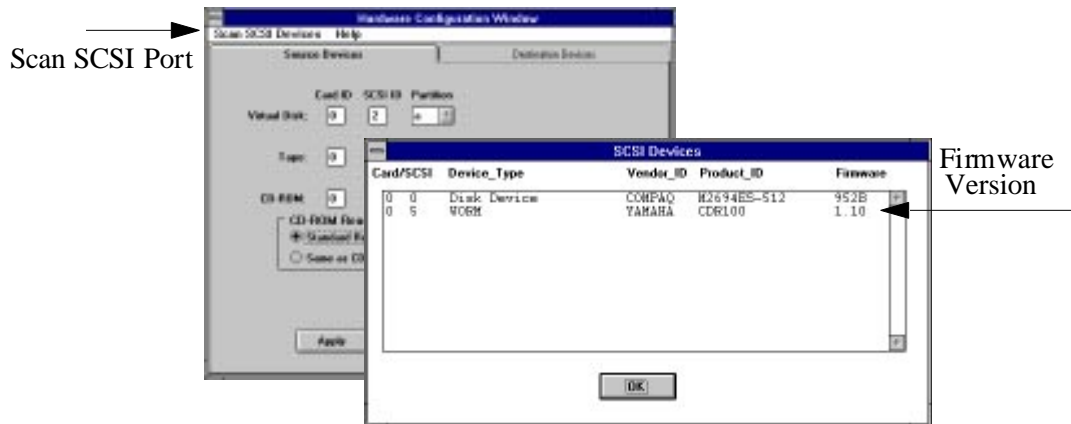
The following describes additional features of CDR Publisher.
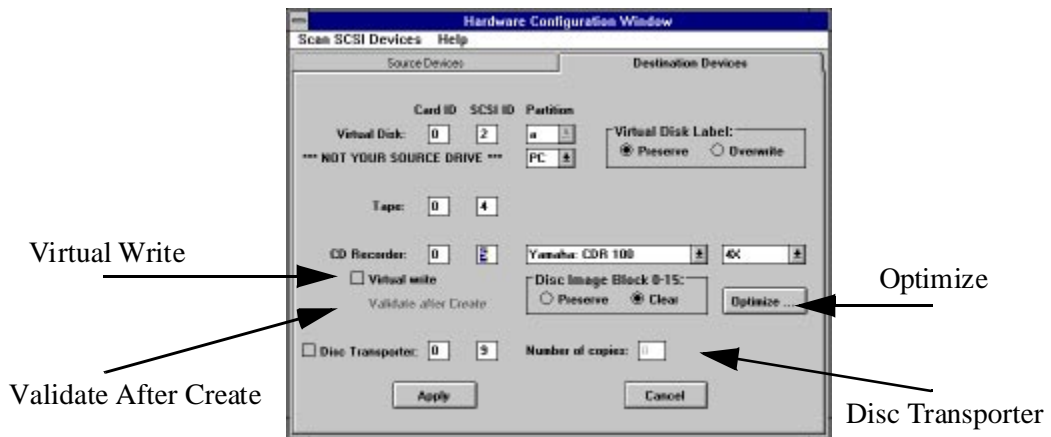
Virtual Write

If you would like to test the communication between your computer and the CD-ROM recorder, you may simulate the write process by turning on `Virtual Write` button. For more information about Virtual Write please reference "Virtual Write" on page 69.

Validate After Write

If you would like the recorder to automatically validate the CD-ROM with the Source Device after a Data image is written, select `the Validate After Write` button. The Validate After Write feature is available when the destination is a CD-ROM recorder and the source device is Virtual Disk or Image File.

Disc Transporter

If you have a Kodak Disc Transporter, you may create upto 75 CD-ROMs in an automated fashion. Select the SCSI ID and number of CDs you wish to create. Refer to "Optimize Data Transfer Speed to CD-ROM Recorder" on page 108 for further details.

Optimize

This feature allows the end user to optimize the data transfer rate between the system and the CD-ROM recorder. In order to understand this feature please refer to "Optimize Data Transfer Speed to CD-ROM Recorder" on page 108.

Next Step Arrow

CDR Publisher is designed for both novice and advanced users. The NextStep Arrow is a tool to guide the novice users about what to do next.
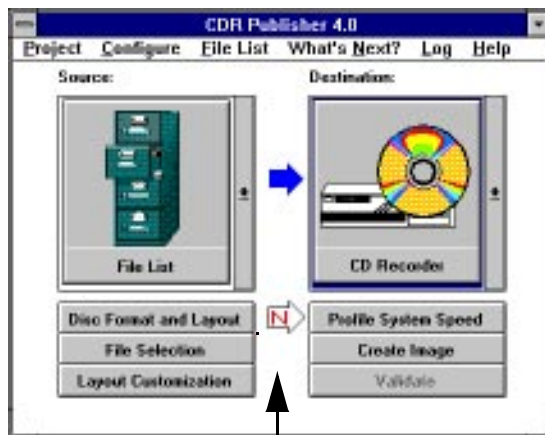
Next Step Arrow

After the user selects the Source and Destination, CDR Publisher will activate and deactivate some buttons indicating to the user what operations are available at each stage of CD-ROM development. With this informative Graphical User Interface, CDR Publisher further assists the novice user about what to select if there is more than one button activated with the NextStep Arrow.

For the advanced user, you may turn off the NextStep Arrow by deselecting the `What's Next` option from the top menu.

Create Image with Different Methods

The CDR Publisher supports many methods of creating a CD-ROM image with various source and destination devices. With the Source and Destination Selection subwindows in the Main Window, the user may easily create or copy CD-ROM images across different media for different purposes. The following are a list of possible scenarios:

Create a CD with Image On-the-Fly

Step	Source	Destination	Purpose
1	File List	CD Recorder	Create a CD-ROM image directly to a CD-ROM Recorder

This method allows the end user to create the CD-ROM directly from the source files. It is very useful when the user wishes to create an archive of the files from the system and directly record it to the recorder.

Although using this method is most straight forward, there are limitations.

Using this method, CDR Publisher will scan the source files, compose the image, extract the contents of the files and write out to the CD ROM recorder in one step. Depending on the speed of your system, the number of files, how large the files are, and how fragmented the files are on the file system, your system may not be able to sustain the data transfer rate your recorder requires. If your system is not able to sustain the data transfer rate, you will record a bad CD.

We highly recommend that you review the section "Sustainable Data Transfer Rate" on page 68 for additional details.

Step	Source	Destination	Purpose
1	File List	Image File	Create a CD-ROM image and store it as an image file.
2	Image File	CD Recorder	Create a premaster from the image file at high recording speed.

This method allows the end user to create the CD-ROM in two steps. First, record the CD-ROM image to an Image File, then record the image to the CD-ROM recorder. It is very useful when the user wishes to record multiple copies of the CD-ROMs with one standardized CD-ROM image.

Although using this method has many benefits, there are also limitations.

Using this method, the CD-ROM image will be created first. CDR Publisher will then need only to move the created image from a file to the CD-ROM recorder. This will allow user to record at a higher speed. However, because CDR Publisher is still extracting the created image from a file system, it still needs to access the files through the Operating System. If the Image File is fragmented across the file system, performance will be compromised.

We highly recommend that you review the section "Sustainable Data Transfer Rate" on page 68.

Develop a CD-ROM using Virtual Disk

Step	Source	Destination	Purpose
1	 File List	 Virtual Disk	Create a CD-ROM image to virtual disk. Use the virtual disk to verify image and optimize disc layout.
2	 Virtual Disk	 CD Recorder	Create a premaster by copying the Virtual Disk Image to a CD-ROM Recorder.

This method is what we recommend.

This method also allows the end user to create the CD-ROM in two steps. First record the CD-ROM image to a hard disk, then record the image to the CD-ROM recorder. It is very useful when the user wishes to record multiple copies of the CD-ROM with one standardized CD-ROM image.

This method is the safest, the only limitation is that the end user must use an extra SCSI hard disk drive.

Using this method, the CD-ROM image will first be created onto a raw partition of the hard disk drive. All the data will be in contiguous blocks. CDR Publisher will need only to move the created image from the hard disk to the CD-ROM recorder. This allows the user to access the data at the **<u>highest</u>** speed and record at maximum speed without concern about data transfer speed.

The Virtual Disk also has the advantage of being mounted back as a CD-ROM reader so that the user may test the CD-ROM image before recording to the CD-ROM recorder.

Step	Source	Destination	Purpose
1	 CD Reader	 CD Recorder	Create a backup of the original CD-ROM or Mix your favorite music CD.

You may backup your CD ROM using the CD to CD backup feature. Please reference the section "Duplicating CD-ROMs" on page 92.

Create an Image with a File List

The user will use this function to select a list of files to be recorded into a CD-ROM image. This process can be easily accomplished by selecting three Action buttons in the following sequence:

Step 1. Disc Format and Layout

Step 2. File Selection

Step 3. Create Image
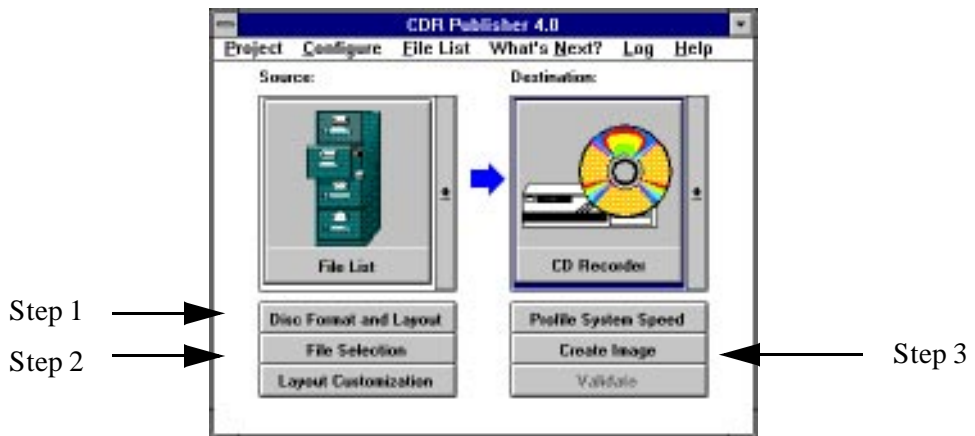
Once the user has selected the Disc Format and Layout button, the Format and Layout Window will be displayed.

Data CD Format and Layout Window

The `Data CD Format and Layout Window` is now displayed, as shown in the
example below:
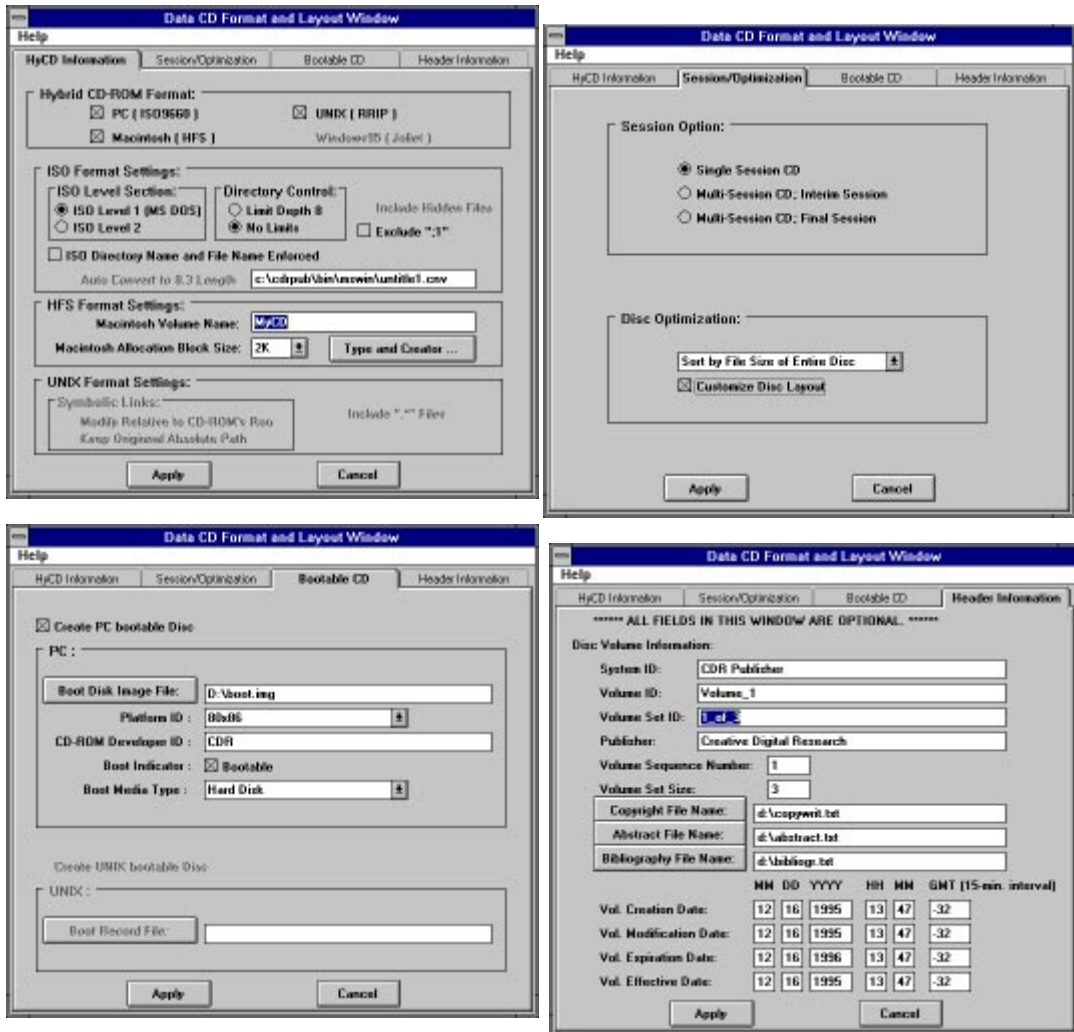
There are several ways to configure the CD-ROM image format. You may customize the disc
format and layout or use the default values. After you have done so, select the Apply button.

Data CD-ROM Formats

Although many computer systems support reading information from CD-ROMs, the CD-ROM drivers built into the various Operating Systems support different CD-ROM formats. The following is a summary:

Operating System	ISO 9660 Level 1	ISO 9660 Level 2	Rock Ridge Extension	HFS	Joliet
MS Windows 3.1, Windows for Workgroups	Yes				
MS Windows NT 3.51	Yes				Future Release
MS Windows 95	Yes				Yes
Macintosh OS 7.1, 7.5				Yes	
Sun; SunOS 4.1.X	Yes		Yes		
Sun; Solaris 2.X	Yes		Yes		
Silicon Graphics, IRIX 5.X	Yes		Yes		
HP, HP/UX 9		Yes	Must not contain		
HP, HP/UX 10 and above	Yes		Yes		
IBM AIX 9	Yes				
IBM AIX 10	Yes				

Based on the desired platform your CD-ROM will be accessed on, you should create the CD-ROM with the format that matches that platform.

As different Operating Systems begin to support different CD-ROM standards, Creative Digital Research will continue to enhance CDR Publisher to support the new formats.

HyCD Information

Select the desired CD-ROM format you wish to create for target platforms. Select multiple formats for creating hybrid CD-ROM for PC, Macintosh and UNIX platforms. Configure the options for the specific formats.

Press `Apply` once you have completed your configuration.

Session/Optimization

Select single session for recording simple CD-ROMs. For a more detailed description of creating multisession CD, reference "Multisession Recording" on page 90.

Select `Preserve Original Order` on the `Disc Optimization` selection. For a more detail description of optimizing and customizing CD-ROM layout, reference "Optimize Disc Layout" on page 87.

Bootable CD

The bootable CD section allows the user to create bootable PC and UNIX CD-ROMs. Please reference "Creating a Bootable CD-ROM" on page 102 for additional details.

Header Information

The user can customize the CD-ROM header to provide a reference on the CD-ROM to be created. All fields are optional. Modify the fields and press `Apply` button.

File Selection

Press the File Selection button in the Main Window to invoke the File Selection Window.
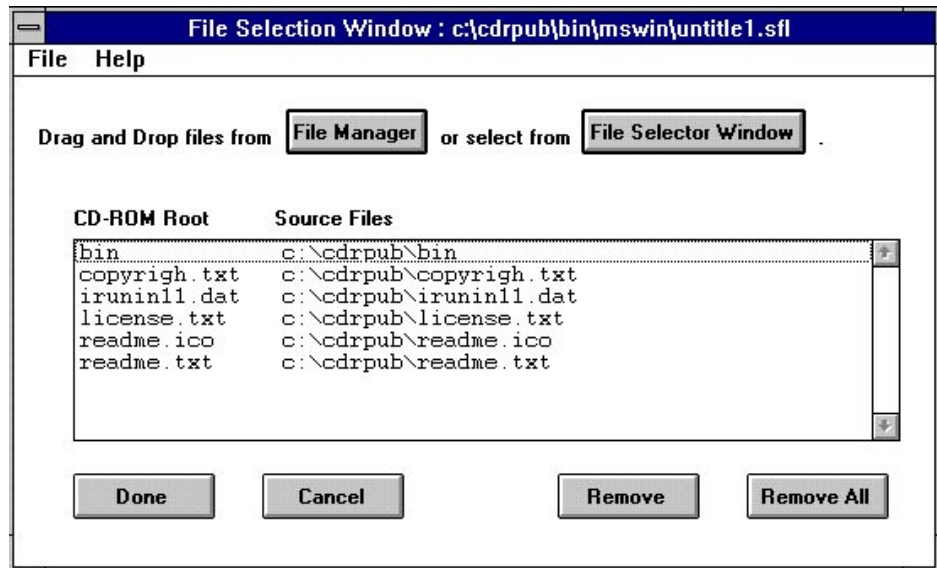
This window allows the user to compose a list of directories and files that will be recorded into a CD-ROM image.

There are two ways of selecting files, using the `File Manager` or using the `File Selector Window`.

Using File Manager Window

1. Press the `File Manager` button to invoke `File Manager`. Resize the windows so both windows are in view.

2. Drag and drop files and directories from the `File Manager` to the `File Selector Window`.

Invoke File Manager

Drag and Drop
Selected files

Using File Selector Window

3. Press the `File Selector Window` button.

4. To add a directory into the file list, press once on the directory name in the Directory sub-window, then press the Add button. All of the d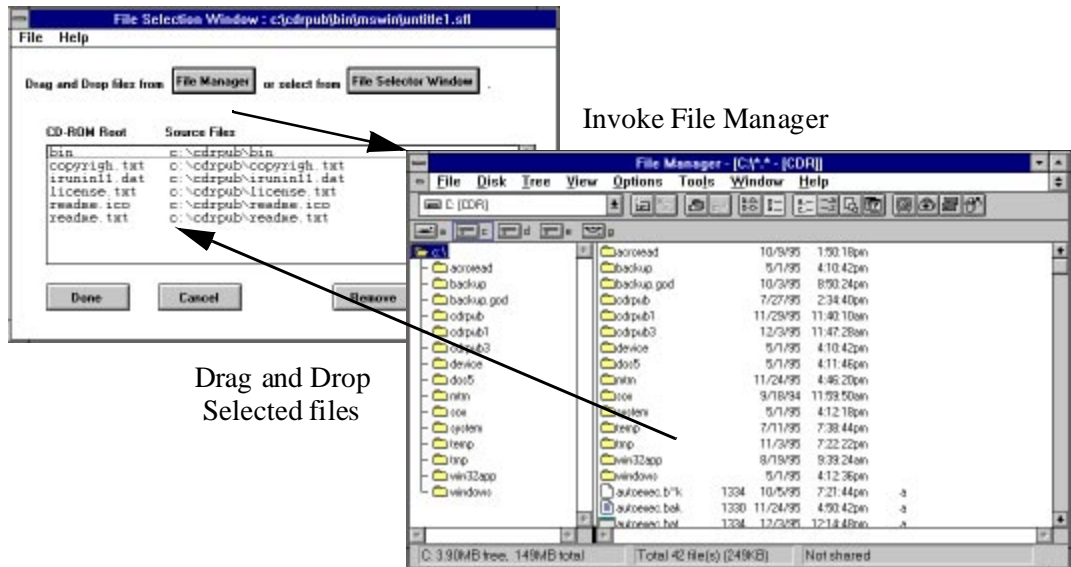irectories and files under the selected directory will be recorded into the image with the directory located at the root of CD-ROM.

5. To add the entire content of a directory, press once on the directory name in the Directory subwindow, then press the `Add All` button. All of the files and directories at the first level of the selected directory will be placed at the root of the CD-ROM image.

6. To add a file, choose the file name in the File subwindow and press the Add button or double click.

Invoke File Selection Window
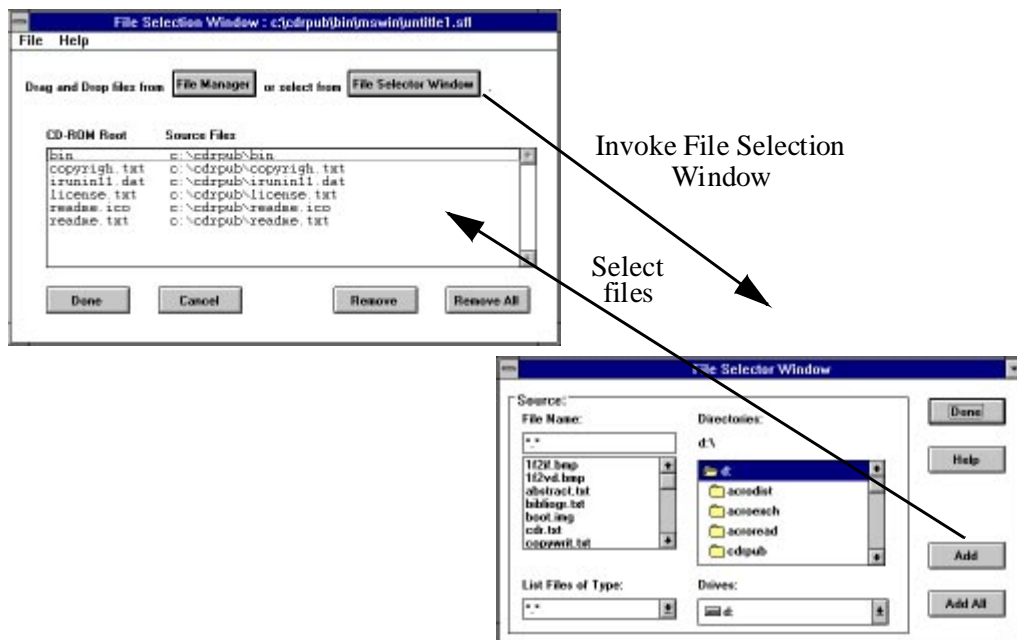
Select files

The list of files and directories selected will be accumulated into the File List subwindow. After making the selection, the user can use the File menu feature to save the list for later reference or update.

Press the Done button to complete the file selection process.

Profile System Speed

You may profile your system speed to determine whether you system is fast enough to sustain data transfer speed. You may skip this step if you already know the result from previous uses.

Create Image

Once the file list is selected, the user may select the destination device from the Main Window, then press the Create Image button to begin building the image. A status window will pop up and display the current status, time elapsed and estimated completion time for user's reference.

Create an Audio CD

Before an Audio CD can be created, you must prepare the audio data to be recorded. CDR Publisher offers a tool to convert your existing audio files to a variety of formats for previewing and recording.

Audio Conversion Tool

The audio conversion tool, Soxwin, is a program that will convert different types of audio formats. Before sending the audio file to the CD-ROM recorder, you must convert the existing audio format into Audio CD Raw format for your CD-ROM recorder.

Soxwin supports conversion of the following audio formats:

- For CD Audio Raw format: cdr
- For Windows WAVE format: wav
- For SUN Microsystems Audio format: au
- For SGI and Macintosh Audio format: aiff

Invoke Soxwin by selecting the Soxwin icon from the CDR Publisher program group.
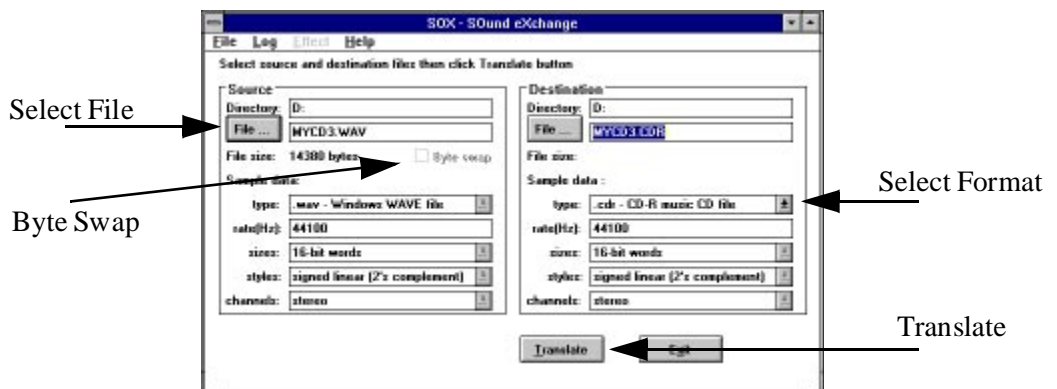
If you are using a Philips, HP, or Plasmon recorder, select Byte Swap for conversion.

Select the Source, Destination file names and the corresponding conversion type and press the Translate button.

Record the Audio CD

Creating an audio CD is very similar to creating a data CD as described previously. This process can be easily accomplished by selecting three Action buttons in the following sequence:

Set the Source device as Track File and Destination device as CD-ROM recorder.

Step 1. Disc Format and Layout

Step 2. Track Selection and Layout Customization

Step 3. Create Image
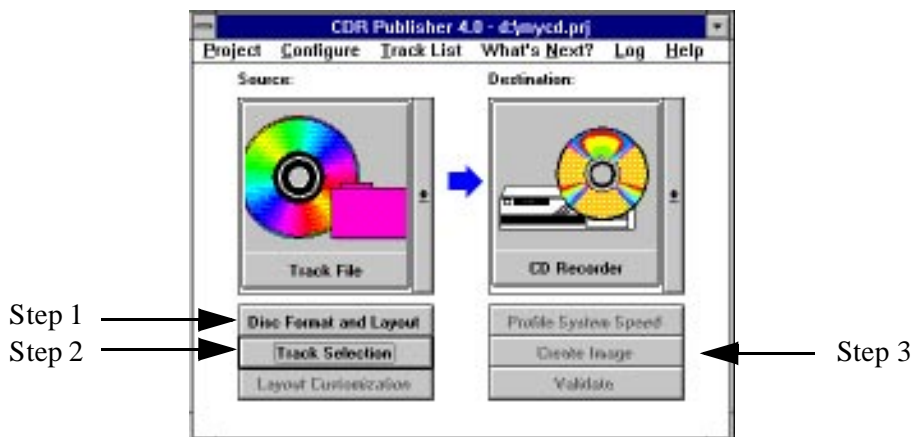
Once the user has selected the Disc Format and Layout button, the Multimedia Format and Layout Window will next be displayed.

Multimedia Format and Layout Window

The `Multimedia Format and Layout Window` is now displayed, as shown in the example below. Please note that this window is very different from the `Format and Layout Window` for Data CDs:
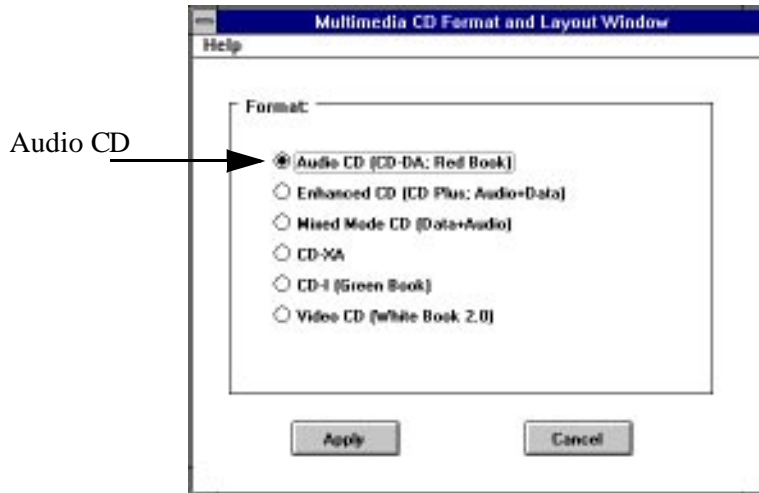
Audio CD →

There are several ways to configure the CD-ROM image format. Select the Audio CD format and press the Apply button.

Track Selection

Press the Track Selection button in the Main Window to invoke the Track Selection Window.This window allows the user to compose a list of data, audio and video files that will be recorded into a CD-ROM.

Audio Track →

There are two ways of selecting Track Files, using the `File Manager` or using the `Import` function.

- Use the `File Manager` to select individual Data, Audio and Video Tracks you have created.
- Use the `Import` function to select the Data, Audio and Video Tracks you have previously extracted from another CD-ROM. For more information on extracting individual tracks from a CD, please read the section on "Duplicating CD-ROMs" on page 92.

Using File Manager Window

1. Press the `File Manager` button to invoke `File Manager`.

2. Drag and drop Raw Audio files (*.CDR) from the `File Manager` to the `File Selection Window`.

3. Press `Done` button to invoke the `Track Files Customization` Window.

Invoke File Manager

Drag and Drop
Selected files
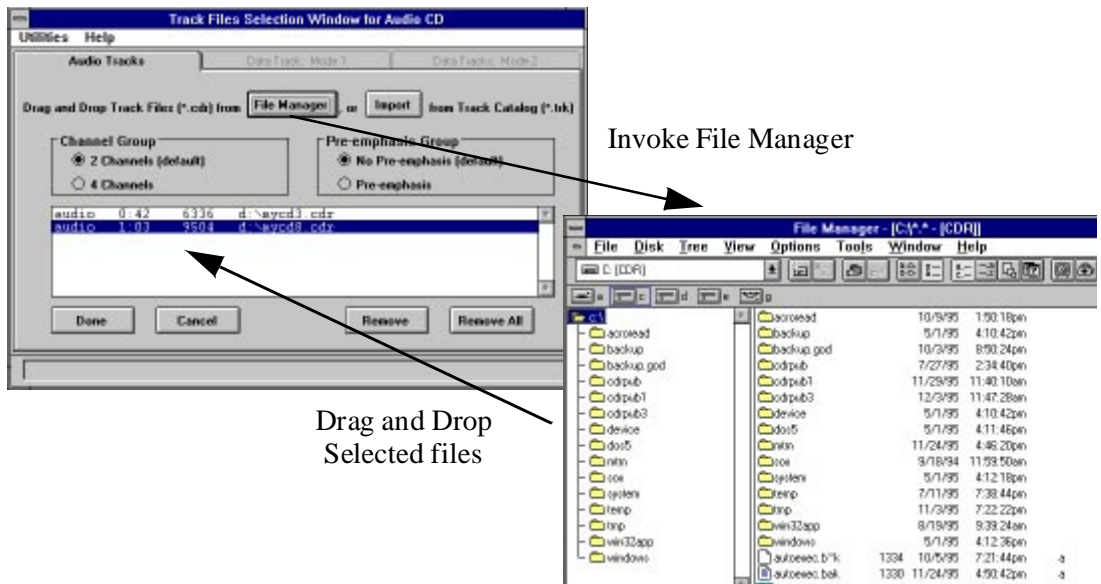
Using Import Function

1. Press the `Import` button.

2. Select the CD-ROM file name that you have extracted. All of the Track Files for the CD-ROM will be loaded into the proper subwindows.

3. Press the `Done` button to invoke `Track Files Customization` window.

Invoke File Selector

Import Selected CD-ROM
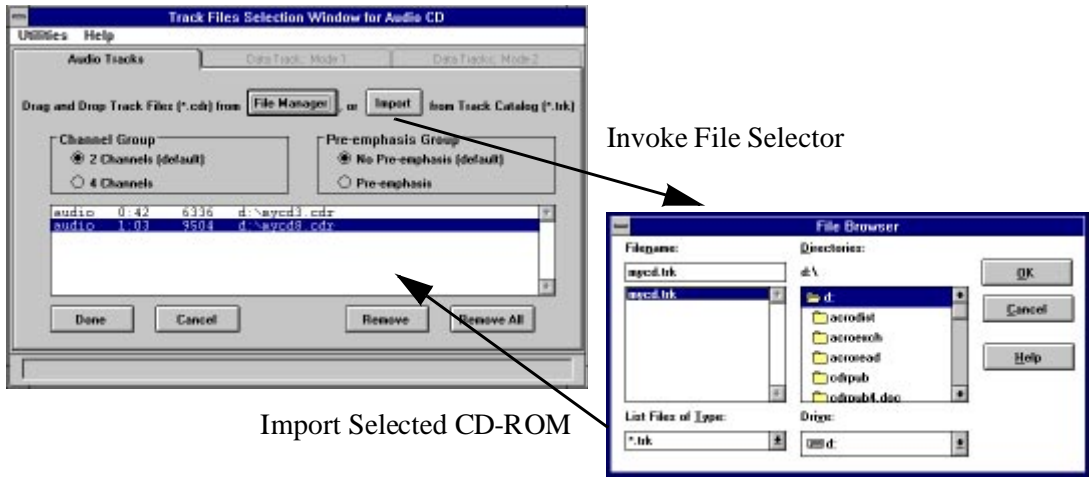
Channel Group and Pre-emphasis Group

Once individual tracks are selected, the user may configure individual tracks to be 2 channels or 4 channels, no pre-emphasis or pre-emphasis. If the tracks are imported from another CD, the original information will be preserved. If you do not know which one to use, select the default.

To see the current setting for a particular track, select the desired track and view the settings. Modify the configuration by first selecting the track desired and then setting the configuration for the track. Do so with each track that you wish to modify.

Select Track

Configure

Track Files Customization Window

Based on the initial CD-ROM format you have selected as the first step, CDR Publisher will organize the individual tracks to match the CD-ROM format you desire automatically.

You may modify the CD-ROM layout further by using the editing buttons.

Edit Layout

Finalize CD

Finalize Disc Entry
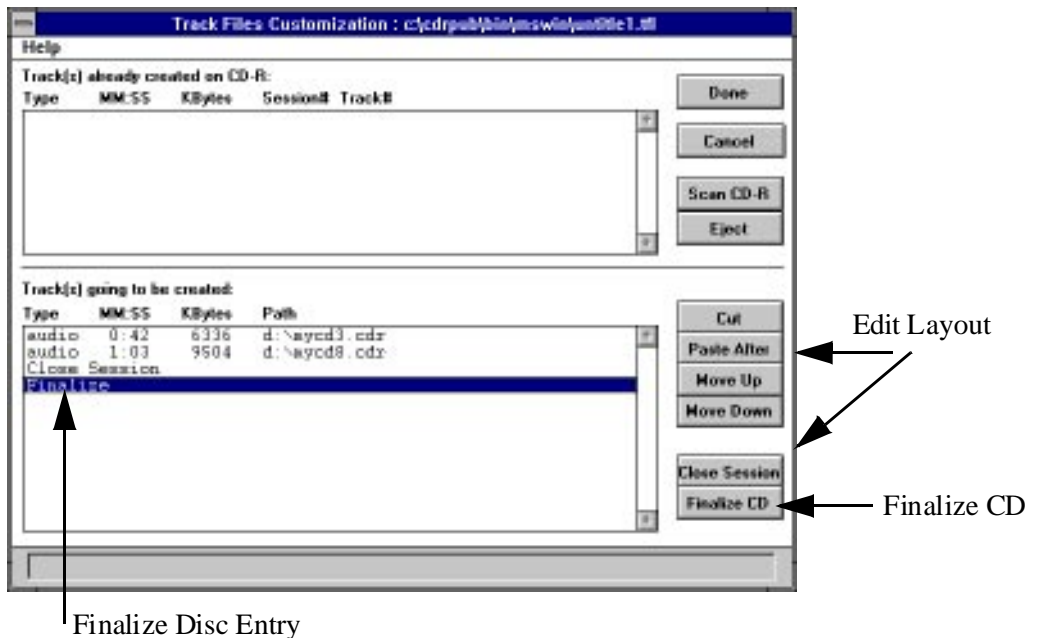
Finalize CD

If you would like to record a set of audio tracks and later append additional audio tracks, do not Finalize the CD. You may select the `Fix Disc` entry in the destination subwindow and press the `Cut` button to remove the Finalize command.

If you would like to complete the recording of the CD and allow both computers and audio players to play back the CD you have created, Finalize the CD. You may add the `Finalize` command to the recorder by pressing the `Finalize CD` button.

Scan Tracks on an Existing Recordable CD

You may scan a CD-ROM in the CD-ROM recorder and find out information about the CD before adding new tracks. Press the `Scan CD-R` button to scan the destination CD.

Scan existing
CD recordable
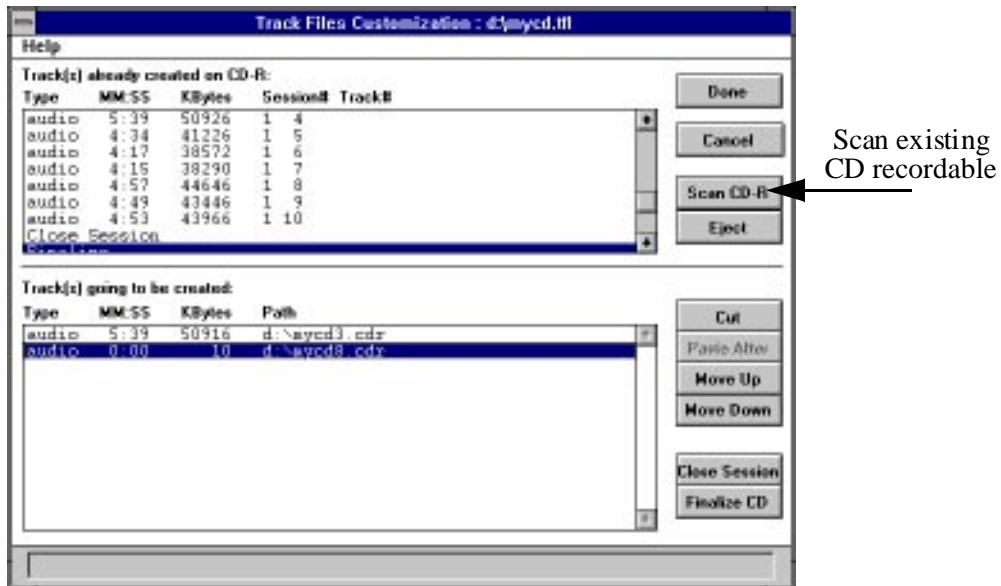
Once you are satisfied with the current selections and modifications, if any, press the `Done` button, then the `Create Image` button on the `Main Window` to append the selected tracks at the end of the existing tracks on the CD recordable.

Create a Multimedia CD

You can create a multimedia CD using a process similar to creating the audio CD as described in the previous section.

> Set the Source device as Track File and Destination device as CD-ROM recorder.

> Step 1. Disc Format and Layout.

> > Select the desired CD-ROM format.

Select Source
and Destination

Step 1. Select Format
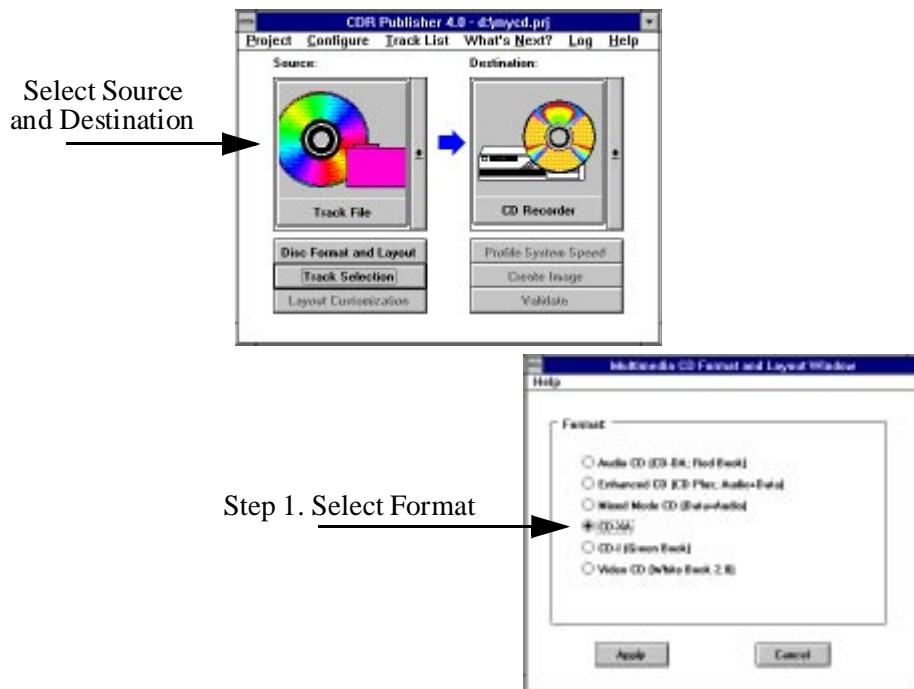
Step 2. Track Selection and Layout Customization.
  Select specific tracks and customize the layout.

Step 2.
 Select Data and
 Audio Tracks

Customize Layout

Step 3. Create Image

Step 3.
Create Image
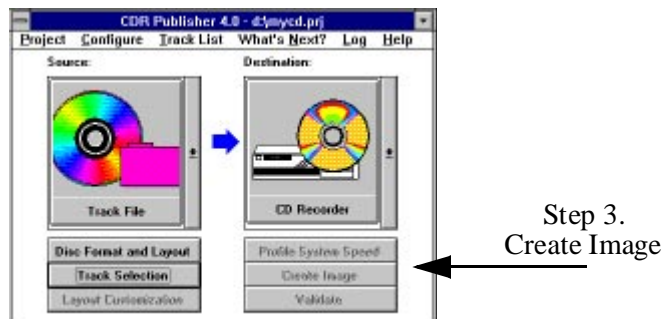
To obtain more information about various CD-ROM formats, refer to "Standards Reference"
on page 15.

Create a CD Plus or Mixed Mode CD

You can create a CD Plus CD or Mixed Mode CD using a process similar to creating the Multimedia CD as described in previous section.

Set the Source device as Track File and Destination device as CD-ROM recorder.
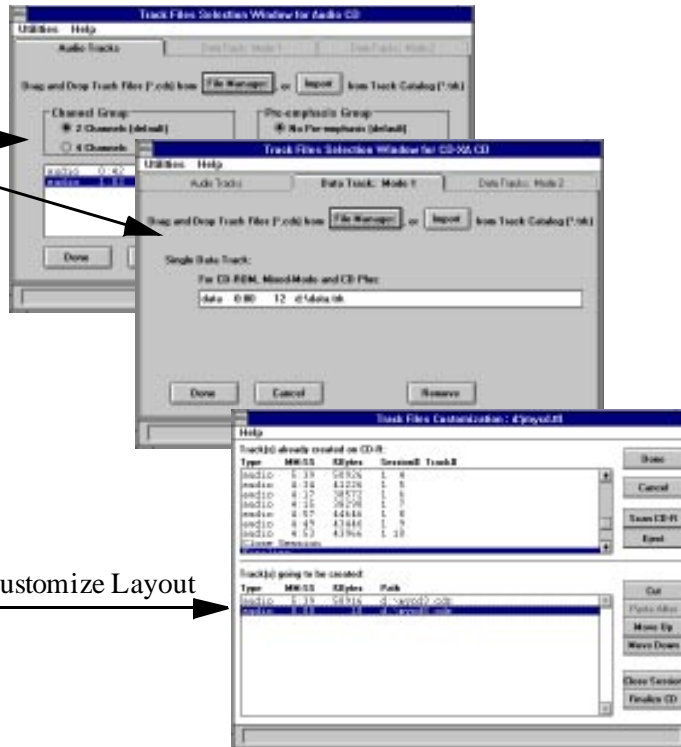
Step 1. Disc Format and Layout.

Select the CD Plus or Mixed Mode CD-ROM format.

Step 2. Track Selection and Layout Customization.

Select specific data track and audio tracks and press Done.

Based on the CD-ROM Format and Layout you have selected, CDR Publisher will perform the following:

CD Plus: Lay out audio tracks in original order, close session, add data track then Finalize CD.

Mixed Mode: Layout data track, add audio tracks then Finalize CD.

Step 3. Create Image

Create Image to a CD-ROM Recorder

CDR Publisher supports many recorders. Because each CD-ROM recording unit is different, special precautions must be taken when the destination device is to be a CD-ROM recorder.
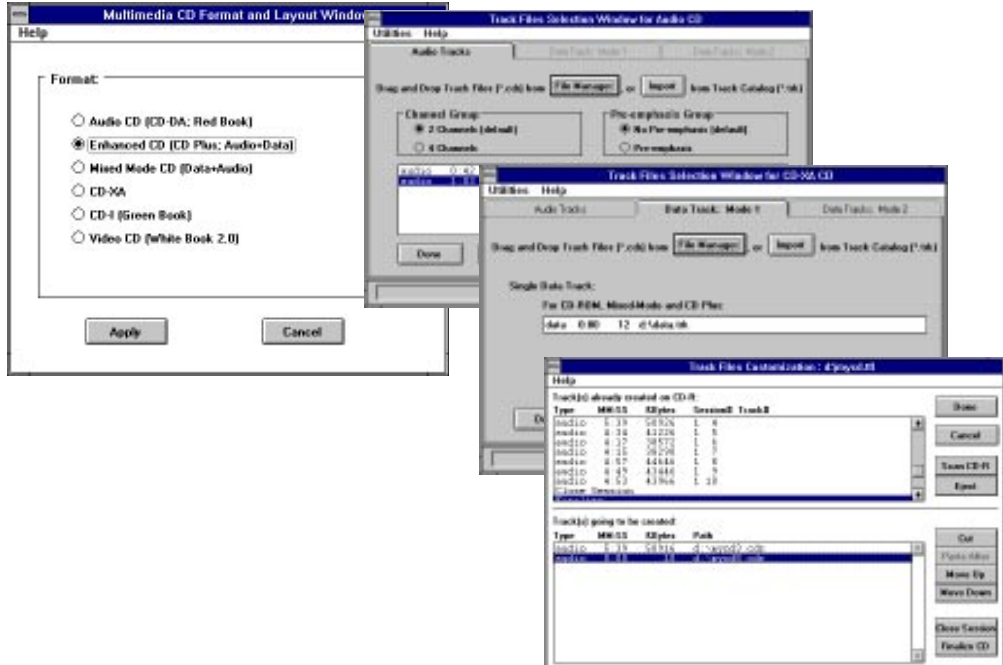
Sustainable Data Transfer Rate

Most CD-ROM recorders are very particular about the data and the order in which it is received. As the data files are read from the user's computer system and sent to the CD-ROM recorder, most recorders require that there be no interruption in the data stream.

If the data stream is interrupted, the CD-ROM recorder will automatically stop the recording process, and the recordable disc will be wasted.

CD-ROM recordable media is currently more expensive than other re-recordable media (i.e. tape, floppy discs, etc.), therefore Creative Digital Research considers it vital that the user understand the importance of testing before the recording process. If you test before actually recording the physical disc, your time, materials and other resources will not be subject to possible loss.

CDR Publisher provides two methods of eliminating the hazard of creating erroneous and unusable discs:

- The process of "Virtual Write"
- The process of "Profiling System Speed"

Virtual Write

The Virtual Write process is used to send data to the recorder without physically writing to a recordable disc. This process is dependent on the CD-ROM recorder supporting such a feature. The Philips CDD 521 Upgrade, Philips CDD 522, Philips 2000, Kodak PCD Writer 200 Plus, Kodak PCD 225, Kodak PCD 600, Yamaha CDE 100, Yamaha CDR 102, Sony CDW-900E, and Sony 920 CD-ROM recorders support this feature.

To engage the Virtual Write feature, toggle the Virtual Write selection in the Hardware Configuration, Destination Window.
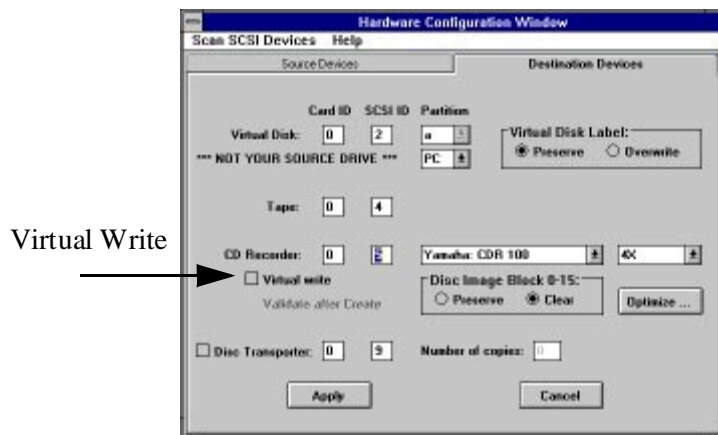
When the CD-ROM recorder is selected in the Destination Selection Window and the Virtual Write flag is activated, the recorder will be configured to perform the function.

Normally, as source images are sent to the CD-ROM recorder, the recorder will only process the data during Virtual Write without writing an actual disc. If the recorder reports that an error has occurred during this session, it is likely that your system or the source device is unable to keep up with the recorder's required speed. If there are no errors reported, the system should be able to perform actual disc recording without problem.

Refer to the "Increase System Performance" section for information and instructions concerning ways in which to increase the data transfer rate if there are problems.

Profile System Speed

The Virtual Write process requires support from the CD-ROM recorder. If the user's recorder does not support this feature, the user may use a second method to help eliminate making erroneous discs by using the Profile System Speed feature.

By selecting the Profile System Speed button from the Main Window, CDR Publisher will test the data accessing speed on the device selected in the Source Selection Window. For example, if the source is File List, CDR Publisher will test the speed of creating a CD-ROM image on-the-fly. If the source is a Virtual Disk, Tape Drive or Image File, CDR Publisher will profile the data accessing speed of the corresponding device.

Once the function is selected, the Status Window will appear and indicate what tasks CDR Publisher is performing.

The user may wait until the entire source is read and obtain the complete analysis. The user can also select the Review Result button during the profiling and obtain the analysis from the tests so far performed.
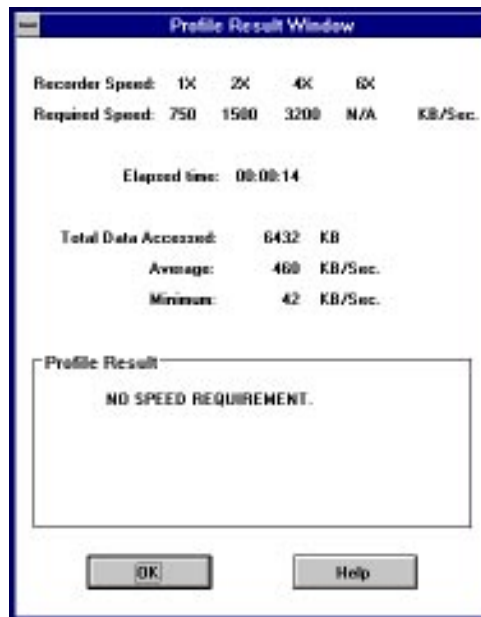
Increase System Performance

It is necessary to increase the data transfer rate only if the user is creating an image to a CD-ROM recorder. Using other devices as destinations will not have any speed requirement.

There are several methods the user can attempt in order to increase the system performance and sustain the data transfer speed that the CD-ROM recorder requires. The following are some suggestions:

Single Process Recording

Allow CDR Publisher to be the only program that the user is running during the recording process. By suspending or removing other programs, CDR Publisher will be able to obtain a faster response from the computer system.

Recording at a Lower Speed

Some CD-ROM recorders support recording at both low and high speeds. By configuring the CD-ROM recorder to record at a lower speed, the required data transfer rate will be reduced. In this way, the computer system may be able to satisfy a lessor requirement.

The user may reduce the recording speed in the Hardware Configuration Window.

Image On-The-Fly vs. Copy Image

Creating a CD-ROM from a File List directly onto a CD-ROM recorder is called "Image On-The-Fly". This process requires CDR Publisher to organize the entire CD-ROM image in computer memory and send the data to the recorder. In order to sustain the required data transfer rate, the computer must be fast enough to process all the data and keep up with the data transfer.

Due to the varying characteristics of different computer systems, some are unable to achieve this level of performance.

As an alternative, CDR recommends that the user first compose a CD-ROM image and send the data to an Image File or Virtual Disk as its destination. Then, copy the image from the Image File or Virtual Disk to the CD-ROM recorder.

Defragment Disk (for PC only)

On a PC, after a hard disk has been used for some time, it is possible that files stored there are no longer laying on contiguous tracks. This will cause the computer to access several parts of the hard disk for one piece of data, resulting in slower accessing time. An easy solution to this is to run the `defrag` command in DOS 6.2 or the `speedisk` command in Norton Utility to defragment the disk drive.

Enhance Computer System

One of the easiest methods of increasing data transfer rate is to upgrade your computer hardware. CDR recommends that the computer system should have at least 8 MB of internal memory and a large amount of swap area.

On UNIX based systems, you may increase the swap by adding a swap file in `/etc/fstab`. On MS Windows systems, increase the size of the Virtual Memory from the `Control Panel`'s 386 Enhanced icon.

If the system is a PC, it is recommended to have the CD-ROM recorder as the only device on a SCSI adapter card and place other SCSI devices on a separate SCSI adapter card. Using this method will enhance the data transfer speed between the source device and the CD-ROM recorder.

Creating Hybrid CDs

This chapter will describe how you can create Hybrid CD-ROMs.

What is a Hybrid CD

A Hybrid CD-ROM integrates information from different computer platforms onto a single CD-ROM. When the CD-ROM is being used in the specific computer platform, the information specific to the platform can be utilized to the fullest.

For example, using CDR Publisher, you may create a CD-ROM that contains PC, Macintosh and UNIX formats. All information on the CD-ROM can be accessed by PC, Macintosh and UNIX systems.


- When the CD-ROM is placed into a PC, the PC will recognize the ISO 9660 format and allow user to access all the data on the CD-ROM.

- When the CD-ROM is placed into a Macintosh, the Macintosh will recognize the HFS format. The user may access programs and data through the Macintosh point and click interface. All resource forks and data forks are preserved.

- When the CD-ROM is placed into a UNIX system, the UNIX system will recognize the Rock Ridge Extension format. Long file names, device files, symbolic and hard links, deep directories and permissions are all preserved.

All integrated data are shared on the single CD-ROM. There is no partition of the CD-ROM or duplication of data.

For each platform you select, there will be a minimal space overhead used to store the references for the particular platform.

Make a Hybrid CD

Creating a Hybrid CD is fairly straight forward. Once you have decided what kind of CD-ROM you would like to create, select the combination you desire in the `Disc Format and Layout Window`.

PC Format   Mac Format   UNIX Format
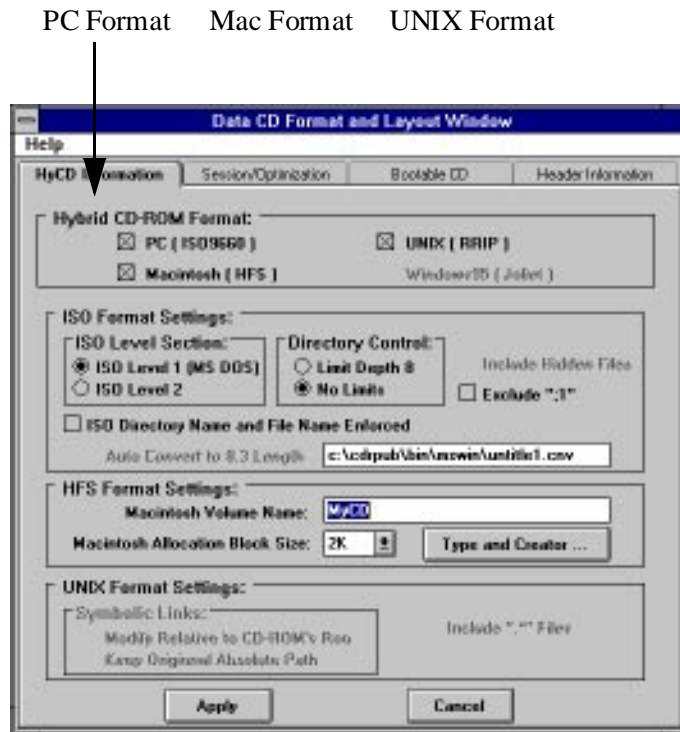
Mapping File Type and File Creator for Macintosh

When you are building a Macintosh HFS CD-ROM, it is desirable to map the PC or UNIX source files with signatures recognizable by the Macintosh. These signatures are called File Type and File Creator. The signature is very useful when you have an application that runs on different platforms and you would like to have the application share the same data recorded on the CD.

For example, you may place a set of HTML files for the World Wide Web on a CD for distribution. Any users can then simply invoke the PC, Mac or UNIX version of the Web browser to read the information on CD.

CDR Publisher provides a default table for users to map various types of files into Macintosh File Type and File Creator. The table may be edited by pressing the `Type and Creator` button in the `Format and Layout Window`. With the file extension specified, any files with the specified file extension will be mapped to Macintosh with the specified file type and creator.


Configure File Type and Creator
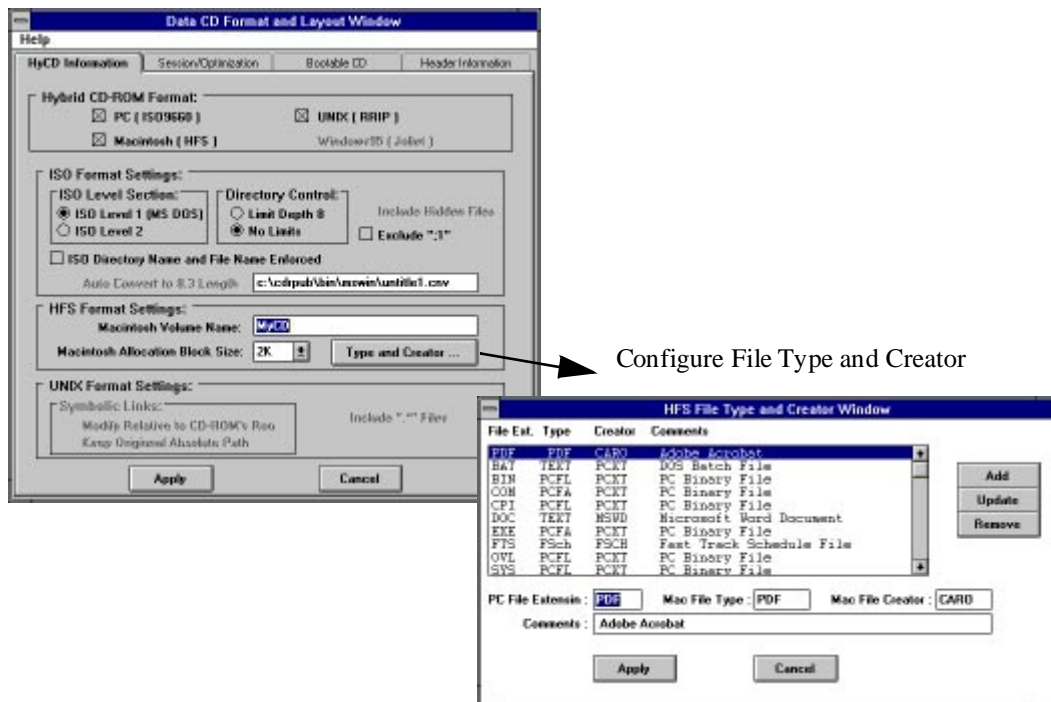
Moving Data Onto Your System

It is sometimes necessary to move computer data from other computer platforms onto your computer system. In order for CDR Publisher to create proper Hybrid CD-ROMs, you must use the following instructions to move information from other computer platforms to your computer system. Then use the CDR Publisher on your computer system to create the desired Hybrid CD-ROM.

PC Version
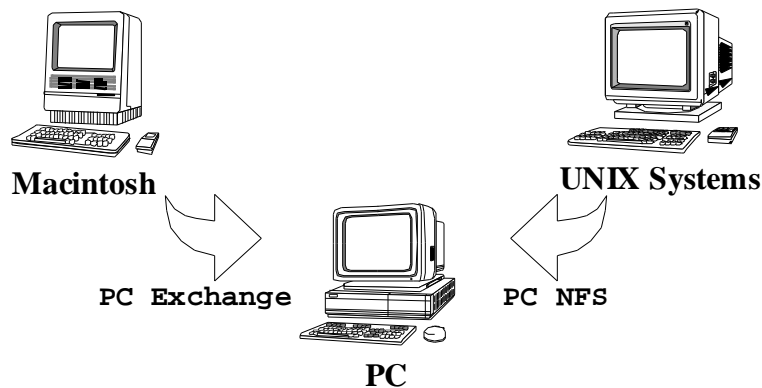
Creating a PC Exchange Disk

Use `AFDISK` from Adaptec or `BFDISK` from Buslogic or other similar programs to partition the hard disk drive. Low level format the drive, create a partition under one gigabyte, then logical format the drive using the DOS FORMAT program.

Please note that if you are using the Adaptec SCSI controller, press `<Cntl>` A during system boot up to configure the controller. **<u>Disable</u>** the **System Boot (INT 19h) Controlled by Host Adapter BIOS** feature before you run AFDISK.

The PC hard disk that you have formatted will be mountable on a Macintosh system with the PC Exchange driver.

Note

CDR has found that some hard disks are not capable of being used as a PC Exchange disk. This is due to the limitation of the Macintosh PC Exchange driver. Some users have found that using ZIP drives solves this limitation. CDR is attempting to find other solutions or work arounds for this deficiency.

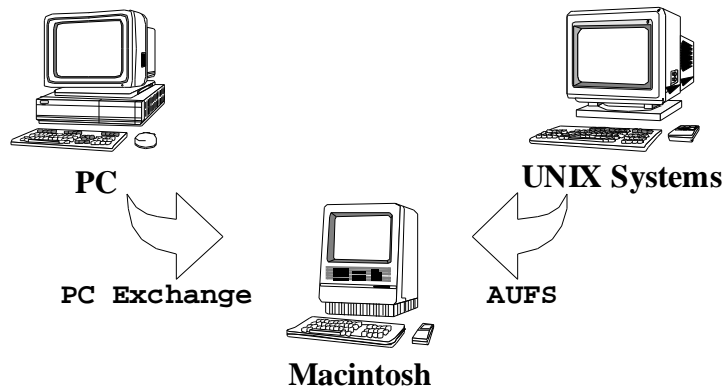**Getting Data from Macintosh:**
1. Create a PC Exchange disk if necessary.
2. Connect a PC formatted floppy or SCSI hard disk to a Macintosh system.
3. Use the <u>PC Exchange</u> program to copy the files you need onto the floppy or SCSI hard disk drive. Do not use any other conversion program.
    2.1 PC Exchange is available on Macintosh System 7.5, or as a separate Apple Utility for Macintosh System 7.1 or older.
    2.2 If you are using a PC formatted floppy, you may access the floppy through the PC Exchange `PC Floppy Disk` Icon.
    2.3 If you are using a PC formatted SCSI hard disk drive, access the PC Exchange program in the Control Panel.
        • Open the PC Exchange Control Panel,
        • Click Options,
        • Select the DOS format SCSI device from the list that appears,
        • Click OK and restart the Macintosh.
        • Once the Macintosh is started, the icon of the DOS SCSI device will appear on the desktop for your access.
3. Move the floppy or hard disk drive back to your PC and include the data from Macintosh as part of your source in the `File Selection Window` of CDR Publisher.

Getting Data from UNIX Systems:

You may access your files using a network based system; i.e. PC NFS.

File Name and Permissions Limitations:

Please note that because PC NFS in Windows 3.1 changes the file names and permissions to match the PC environment, source files accessed from PC NFS will contain the PC file names rather than the UNIX file names. Therefore, the CD-ROM image created will reflect the PC style file names and permissions. Updated versions of PC NFS for Windows NT and Windows 95 will support long file names and eliminate this deficiency.

Macintosh Version

PC

UNIX Systems

PC Exchange

AUFS

Macintosh

Getting Data from PC:

1. Copy all of your data onto a PC formatted floppy or SCSI hard disk and connect it to a Macintosh system.
2. Use PC Exchange program to access the files you need on the floppy or SCSI hard disk drive.
   2.1 PC Exchange is available on Macintosh System 7.5, or as a separate Apple Utility for Macintosh System 7.1 or older.
   2.2 If you are using a PC formatted floppy, you may access the floppy through the PC Exchange PC Floppy Disk Icon.
   2.3 If you are using a PC formatted SCSI hard disk drive, access the PC Exchange program in the Control Panel.
      • Open the PC Exchange Control Panel,
      • Click Options,
      • Select the DOS format SCSI device from the list that appears,
      • Click OK and restart the Macintosh.
      • Once the Macintosh is started, the icon of the DOS SCSI device will appear on the desktop for your access.
3. Include the data from the PC as part of your source in the `File Selection Window` of CDR Publisher.
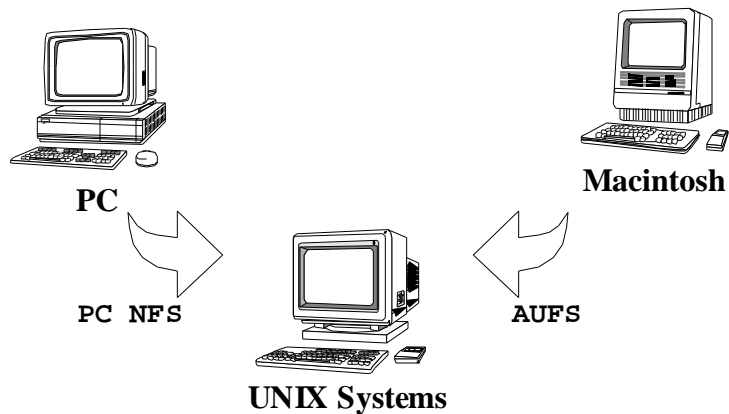
Getting Data from UNIX Systems:

> You may access your files using an AppleTalk File Protocol UNIX File Server (AUFS); i.e. Columbia AppleTalk Package (CAP) obtainable from anonymous ftp at `rutgers.edu`.

UNIX Versions

PC

Macintosh

PC NFS

AUFS

UNIX Systems

Getting Data from PC:

> You may access your files using a network based system; i.e. PC NFS.

Getting Data from Macintosh:

> You may access your files using an AppleTalk File Protocol UNIX File Server (AUFS); i.e. Columbia AppleTalk Package (CAP) obtainable from anonymous ftp at rutgers.edu.

Allocation Block Size

Whenever a user creates a hybrid CD incorporating Macintosh HFS, the integrated CD-ROM image will be bound by the limitations of the Macintosh HFS file system structure.

The Macintosh HFS file system uses a **volume bitmap** to keep track of the available space on storage media. Since the volume bitmap can only keep track of <u>at most</u> 65,535 allocation blocks for user's data, the user must select a block size adequate for the user to store all of the data. If the block size is too small, the user will not be able to fit all of the data into the available number of allocation blocks. If the number block size is too large, the user will waste a lot of storage space. A good number to try first is 10K per block. The user may adjust the size upward or downward according to get the correct fit.

To enable the user to have maximum control over this Macintosh HFS limitation, CDR Publisher allows the user to create Hybrid CDs using different allocation block sizes in the `Format and Layout Window`. The user can try different values in order to get the optimal results.

Allocation
Block Size
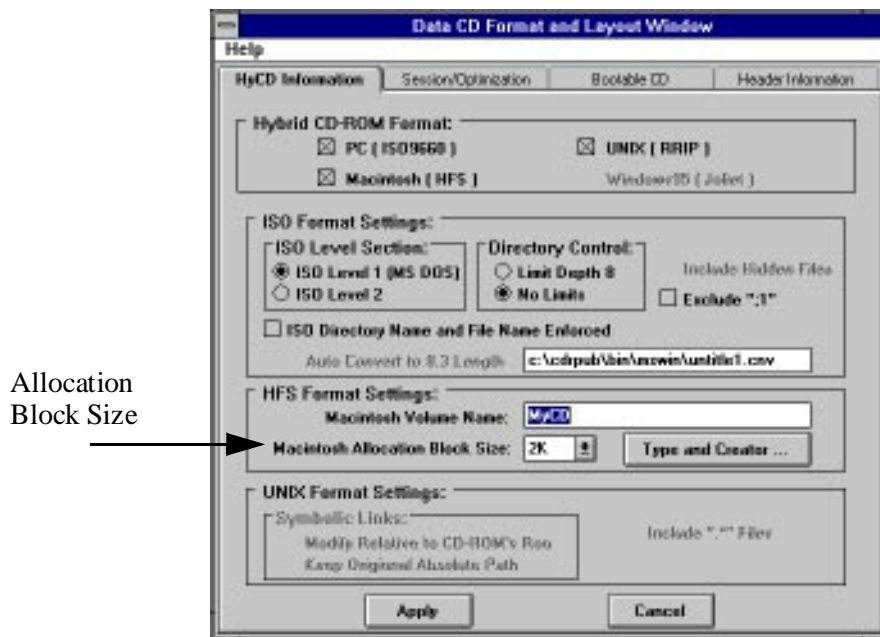
Using Virtual Disk

CDR Publisher provides a powerful, yet easy-to-use, tool for the user to validate the CD-ROM image and optimize disc access. This is accomplished through the use of a "Virtual Disk".

Warning:

Please note that a Virtual Disk is <u>not</u> your source hard disk drive. It is an extra Hard Disk separate from all of your source disks.

Contents Of The Virtual Disk Will Be Overwritten By Your CD-ROM Image.

A Virtual Disk can be configured by setting the Virtual Disk SCSI IDs in the Source and Destination Selection Window of the Hardware Configuration Window.
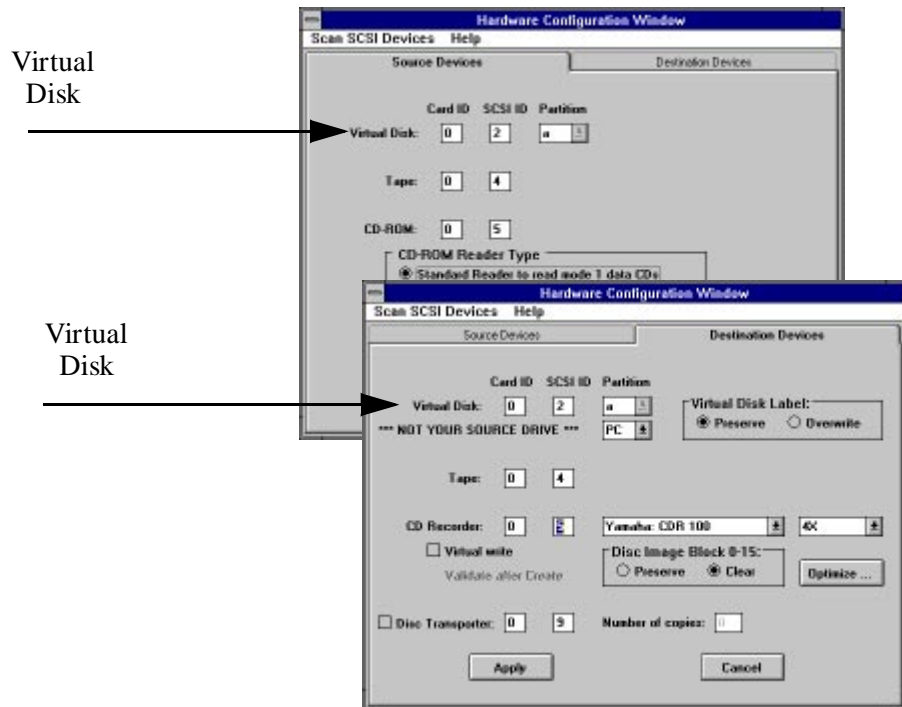
Creating a PC Virtual Disk

Using a PC formatted SCSI hard disk, select `PC` as Virtual Disk Type in the Destination Selection Window, and create the Virtual Disk.

Warning:

Do not use a partition of your source disk. You must use a complete SCSI hard disk drive for your Virtual Disk.

After creating a CD-ROM image and placing it on Virtual Disk, the user can mount it back by using the following commands:

1. In the `config.sys` file, add the following line:

   DEVICE=<**directory path**>\CDRSIM.SYS /D:<**name**>/Hm:n
   where m = SCSI adapter ID and n is SCSI ID.

   For example, define the Virtual Disk on SCSI ID 5 to be `CDR000`:
   DEVICE=C:\CDRPUB\CDRSIM.SYS /D:CDR000 /H0:5

2. In `autoexec.bat` file, add the following line:

   MSCDEX /D:<**name**> /L:<**drive**>
   (where name must match the name entry in `config.sys`)

   For example, mount the Virtual Disk `CDR000` as drive G:
   C:\DOS\MSCDEX /D:CDR000 /L:G

   It is only necessary to perform this setup once to access the Virtual Disk.

3. Reboot

4. Use the Virtual Disk by accessing drive G.

Creating a Mac Virtual Disk

Using a Macintosh formatted SCSI hard disk, connect it to the PC. Select Mac as Virtual Disk Type in the Destination Selection Window, and create the Virtual Disk.

After creating a CD-ROM image and placing it on Virtual Disk, the user can connect the Mac Virtual Disk back to the Macintosh system. Restart the Macintosh and the Virtual Disk will be mounted automatically.

Hybrid CD Virtual Disks

Depending on the CD-ROM Format you have selected in the Format and Layout Window, both PC Virtual Disks and Mac Virtual Disks may already contain a hybrid CD-ROM image. To create a CD-ROM that contains the hybrid CD image, connect either type of Virtual Disk back to the PC. Select Virtual Disk as source and CD Recorder as destination, then press the Create Image button. CDR Publisher will detect both types of the hybrid Virtual Disk images and create the hybrid CD-ROM automatically.

Creating a UNIX Virtual Disk

Silicon Graphics Version:

On SGI systems, if you wish to create a mountable Virtual Disk, you must use the entire hard disk drive rather than a partition of a hard disk as a Virtual Disk.

Partition the hard disk using the "fx" command. Use the default setting to partition the drive as an "Option Drive". Now you may use the hard disk as a Virtual Disk.

After a CD-ROM image has been written, use the following command to mount it back.

1. As the root user, mount the disk partition using the mount command.

   For example, mount Virtual Disk with SCSI ID 2:

   % **mount -t iso9660 /dev/scsi/sc0d2l0 /CDROM**

2. Use the Virtual Disk by accessing directory /mnt.

3. To unmount the Virtual Disk, use the unmount command:

   % **umount /CDROM**

Note:

CDR has found some incompatibility with the CD-ROM driver on IRIX 5.X not able to support certain types of hard disk drive. The user will see a "Device Busy" error when he/she issues the mount command. Creative Digital Research is working with the Silicon Graphics development team to find a work around to this deficiency.

SUN OS 4.1.X Version:

On Sun systems, if you wish to create a mountable Virtual Disk, you may use a partition of a hard disk as a Virtual Disk. After a CD-ROM image has been written, use the following command to mount it back.

1. As the root user, mount the disk partition using the mount command.
   For example, mount Virtual Disk with SCSI ID 2 partition b:
   > % **mount -rt hsfs /dev/sd2b /mnt**
2. Use the Virtual Disk by accessing directory /mnt.
3. To unmount the Virtual Disk, use the unmount command:
   > % **umount /mnt**

Solaris 2.X Version:

1. As the root user, mount the disk partition using the mount command.

   For example, mount Virtual Disk with SCSI ID 2 partition b:
   > % **mount -r -F hsfs /dev/dsk/c0t2d0s1 /mnt**

2. Use the Virtual Disk by accessing directory /mnt.

3. To unmount the Virtual Disk, use the unmount command:
   > % **umount /mnt**

Optimize Disc Layout

Background

Although there have been many improvements on the data transfer speed of most CD-ROM readers (1x, 2x, 4x drives), the readers are still relatively slow when they are trying to move the reader head to locate a specified data. Furthermore, a CD-ROM reader is also more efficient when it is accessing the inner track of a CD-ROM than when it is accessing the outer track.

Therefore, to increase the throughput of a reader, the user can optimize the CD-ROM layout by applying the following techniques:

- Minimize the movement of the CD-ROM reader head by placing small files together. In this way, the reader head does not need to skip over large amounts of data in order to get to a small one.

- Move the frequently used files to the beginning of the CD-ROM image.

Optimization Feature

CDR Publisher provides the user with an easy method of optimizing the CD-ROM image. It organizes the underlying CD-ROM image layout while preserving all of the files and directory structure of the original source. At the user level, there are no visible differences as to where the files are. However, a read process on an optimized disc may be twice as fast without any hardware upgrade.

There are several methods which can be used to optimize a CD-ROM image. To select a method, choose the desired option in the Data Format and Layout Window.

Optimization

Customization
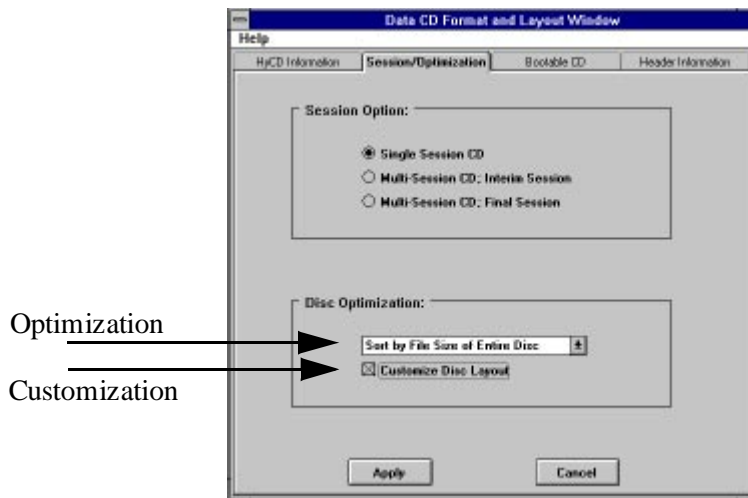
You may organize the entire disc so that the files are arranged according to their sizes. With the smaller files at the beginning of the disc image, the throughput will increase due to less reader head movement.

The "Sort by Entire Disc" option is a very useful optimization method when the CD-ROM image does not contain many individual files and directories, for example, a database CD.

If the CD-ROM image contains many files and directories, the user can assign the optimization to be performed in the individual directory. All of the files under each directory will be ordered according to its size. As stated above, throughput will increase because the reader head movements are reduced.

Customization Feature

In order for the user to achieve an even better throughput, CDR Publisher allows the user to further customize the disc layout. The user can do so by selecting the option in the Disc Format and Layout Window.

If the option is selected, during the process of creating a CD-ROM image from the File List source, a Customization Window will be displayed:
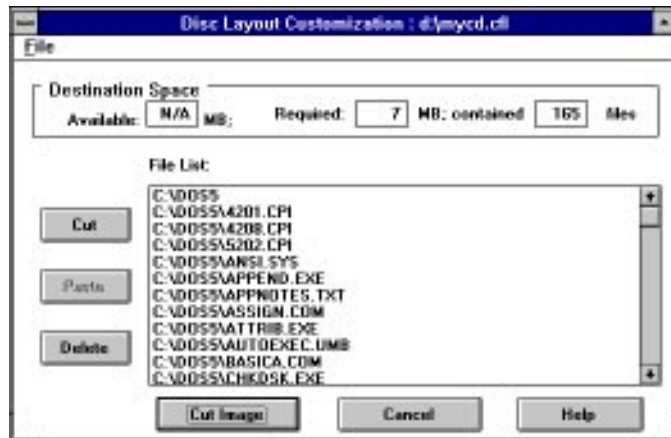
Put the file list in order as you choose to have the image or disc created. Use the File menu to save or restore your work. Upon completion, press the Apply button. An image with a disc layout of your specifications will be created.
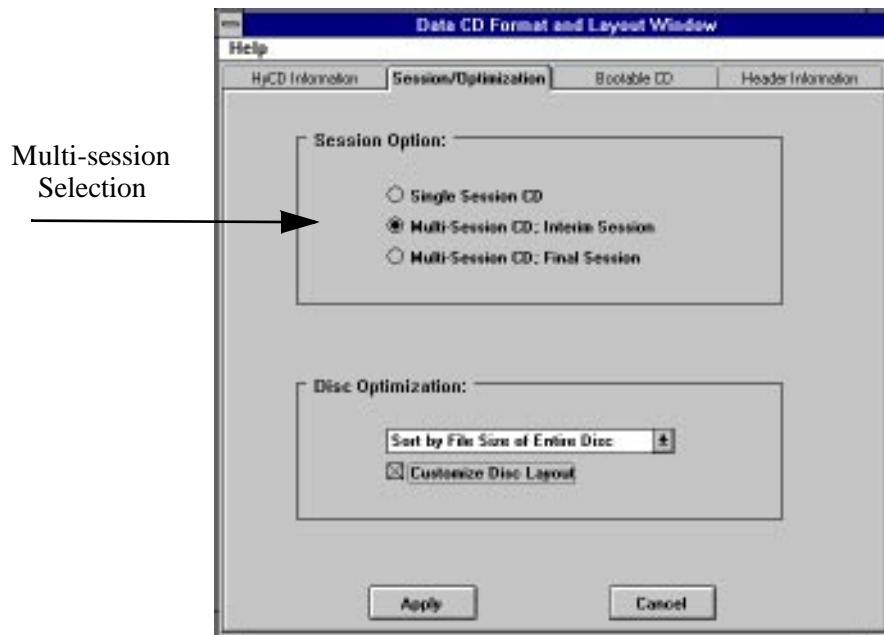
Multisession Recording

CDR Publisher supports multisession recording. Multisession recording allows a user to incrementally add information onto a CD-ROM recordable disc. The benefit is that the user is not forced to fill a complete CD-ROM disc at one time and may append additional information onto the disc over a period of time.

The user must begin the multisession recording with interim sessions and complete it with a final session. The user also must use a multisession-capable recorder in order to record in multisession.

To create a multisession disc, configure your recorder in the `Format and Layout`, `Session/Optimization Window` to record `Interim Sessions` and write the CD-ROM images onto the recorder:

Multi-session
Selection

The user may repeatedly append CD-ROM images as sessions onto the CD-ROM recordable disc. At the last session, change the recording selection to `Multisession: Final Session` in order to complete the disc.

Caution:

Please note that although multisession is supported by many CD-ROM recorders and CD-ROM readers, major operating system vendors like Microsoft, SUN, and SGI do not support multisession data discs with their Operating Systems.

In order to develop a cross-platform CD-ROM, it is recommended that the user create a single session CD-ROM. This way, the CD-ROM created can be easily read and accessed on different computer systems.

Duplicating CD-ROMs

Sometimes it is necessary to backup a CD-ROM while preserving its original formats or mix an audio CD with your favorite songs. Because there are many CD-ROM formats, Creative Digital Research has implemented many features allowing you to backup your valuable CDs.

There are two steps to creating a backup CD-ROM. First, you must scan the original CD to find out what format it is. Second, copy the original CD-ROM content to another CD.

Scan the Original CD

Depending on the type of CD-ROM reader available, you may be able to scan the original CD to determine the content of the CD. Creative Digital Research has tested many readers and found that most of the CD-ROM reader are capable of reading only Data CDs -- Mode 1, Data CD. However, in order to identify all physical characteristics of a multimedia/multisession CD-ROM, we recommend that you use your CD-ROM Recorder to scan the original CD.

Different CD-ROM recorders support different features. To obtain a list of these features, please review `CD Recorder Features` from the `Help` menu.

1. Configure the hardware to reflect the use of the CD-ROM recorder as a CD-ROM reader.

Set SCSI ID as same as CD Recorder

Configure Reader Type
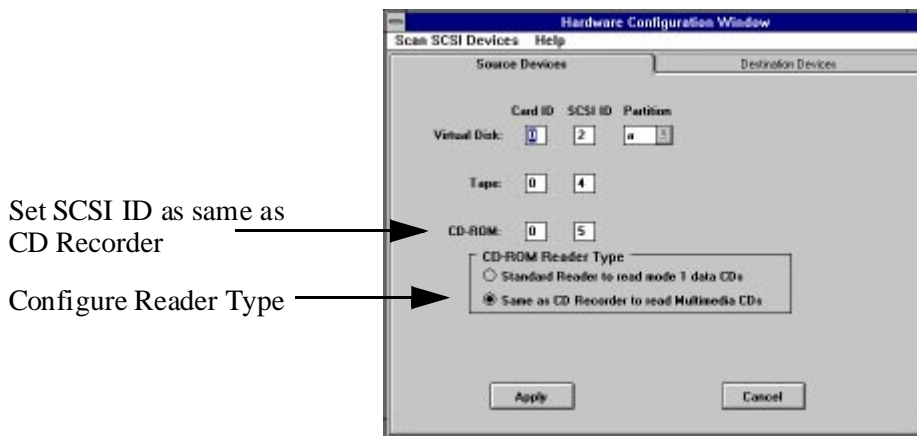
2. Select CD-ROM reader as `Source in the Main Window`, and press `Track Selection` button.

3. Scan the CD by pressing the `Scan` button in the `Track Selection Window`. Read the content in the `Source Window`.

Select Source ——————→

Invoke Track
Selection Window ——————→

Scan Disc ——————→

CD Source Window ——————→
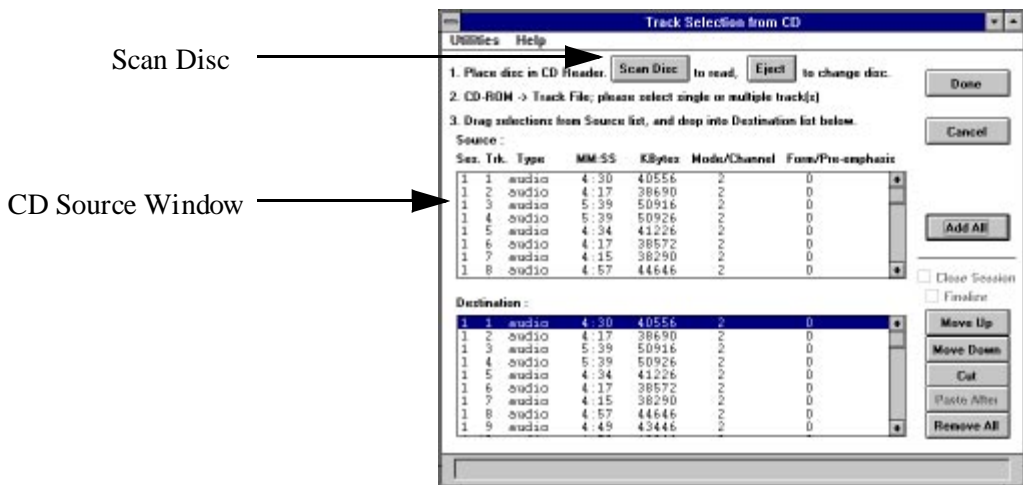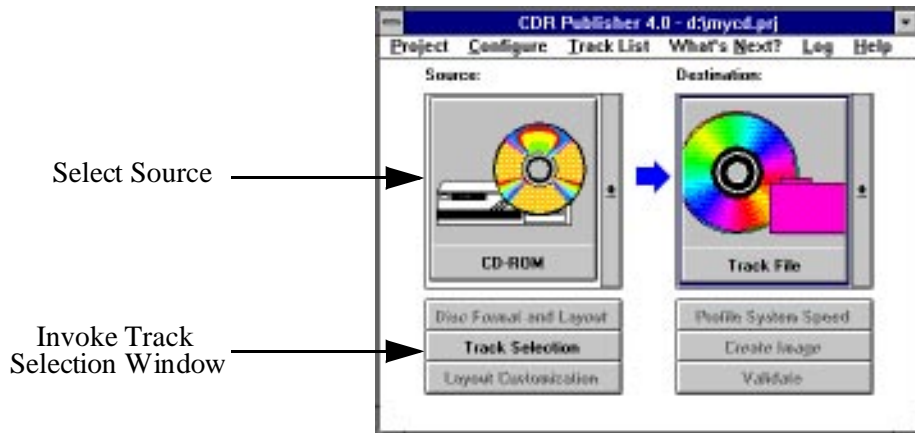
• If the source CD-ROM only contains a single Mode 1 Data Track, you may use a standard CD-ROM reader to read the data track.

- If the source CD-ROM contains Audio tracks (CDDA), Mode 2 Data Tracks or others, you must use the CD-ROM Recorder as a Reader to extract each multimedia track.

Copy CD-ROM

Copying a Data CD

If the original CD is a Mode 1 Data CD-ROM, you may use a standard CD-ROM reader to read the information and directly write to a CD-ROM recorder. Otherwise, scan the disc first.

1. Configure the `Hardware Configuration Window` to match the hardware connected.
2. Select CD-ROM Reader as Source and CD-ROM Recorder as Destination
3. Press Create Image.

User's Guide   *CDR Publisher*
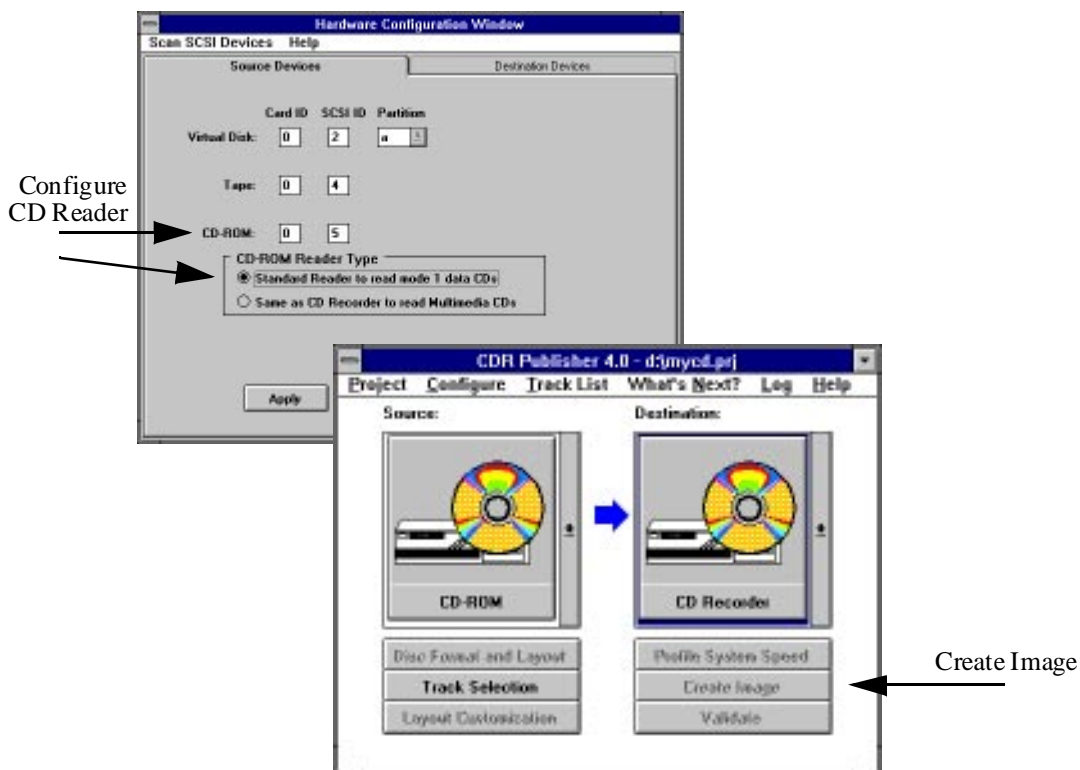
Copying a Multimedia CD

If the original CD is a multimedia CD-ROM, you must use a CD reader that supports extracting multimedia tracks or a CD-ROM recorder as a reader to extract the desired multimedia tracks. For users with one CD-ROM recorder, perform a two step process; extract the individual tracks to a `Track File` first, then copy from the `Track File` back to the CD-ROM recorder.

Before you begin, please make sure you have enough disk space to store all of the data from the CD.

1. Configure the `Hardware Configuration Window` to match the hardware connected.

2. Select CD-ROM Reader as Source and Track File as Destination.

1. Configure CD Reader

2. Select Source and Destination
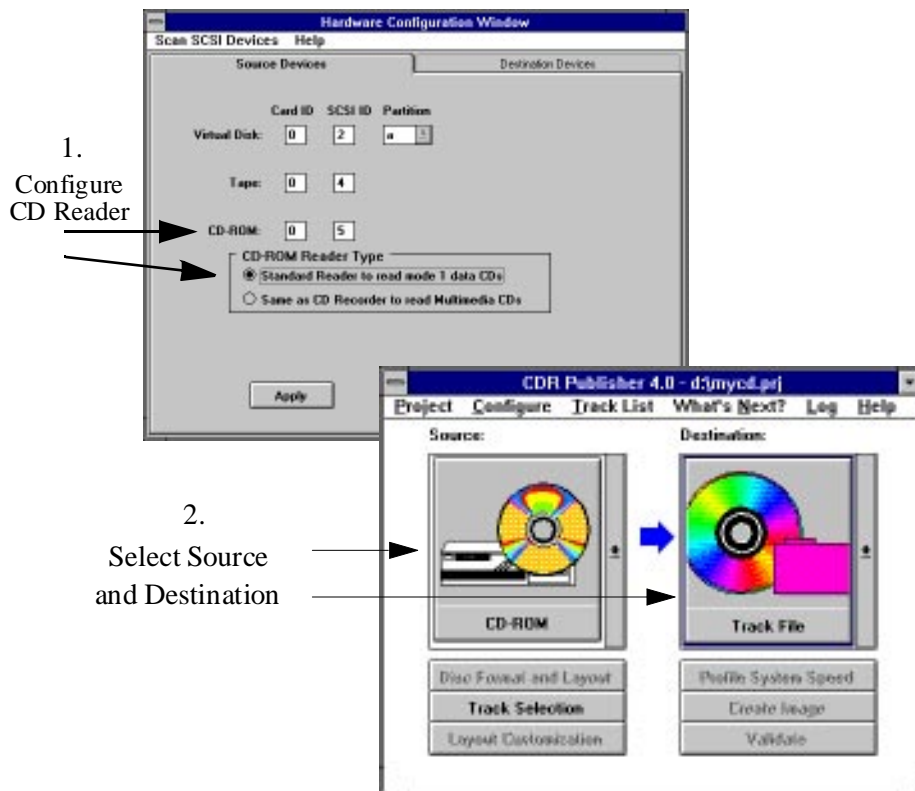
3. Scan the original CD and select the desired tracks by pressing the `Add All` button or Drag and Drop the selected tracks from `Source` to `Destination List Box` subwindow

4. Pess the `Done` Button and type in CD-ROM Title..

3. Scan Disc

Select, Drag & Drop

Add All

4. Done
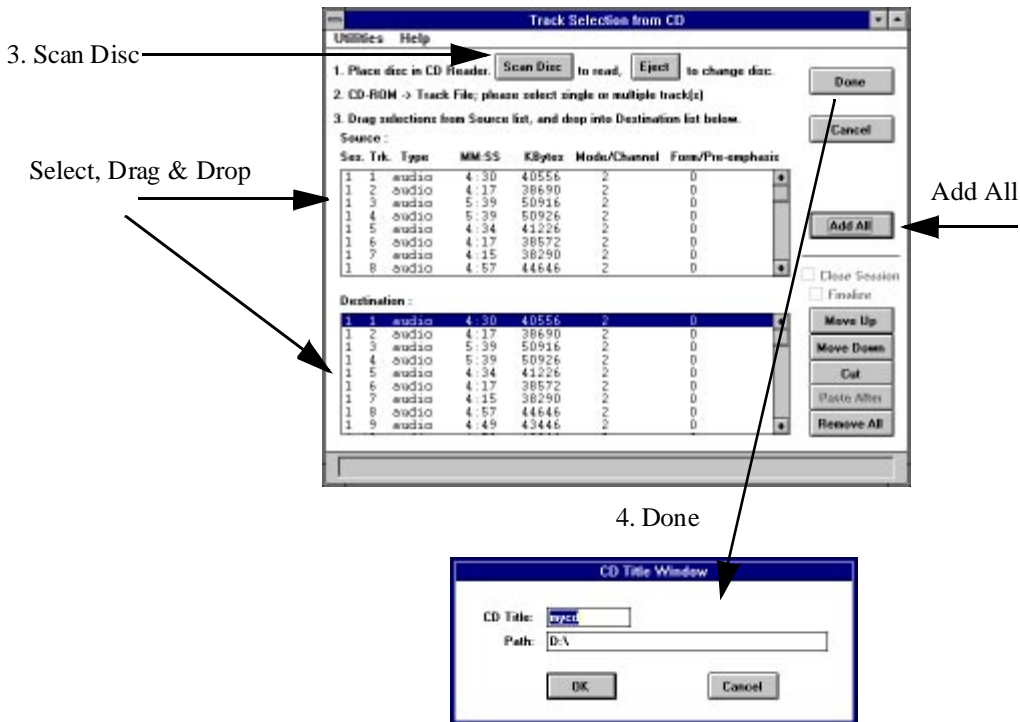
5. Press `Create Image` button to extract the selected tracks to Track Files.
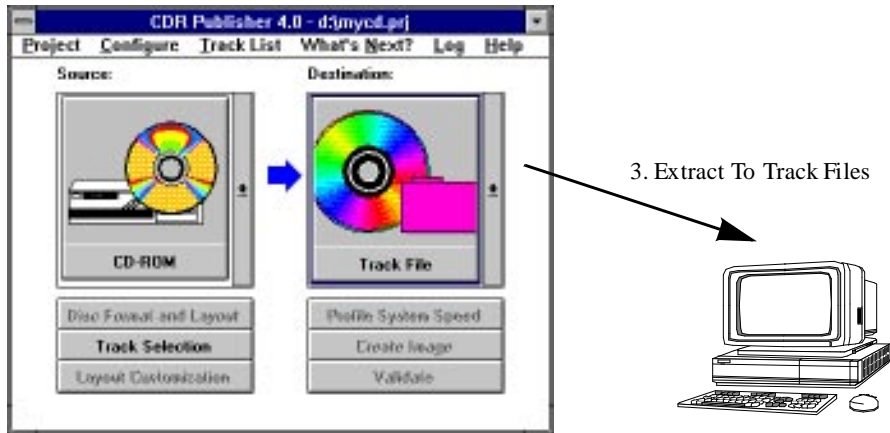
6. Once the extraction is completed, select `Track File` as source and `CD Recorder` as destination in the `Main Window`.
7. Select CD-XA in the `Multimedia CD Format and Layout Window` to retain the original format.
8. Press `Track Selection` button on the Main Window to invoke the Track Files Selection Window.
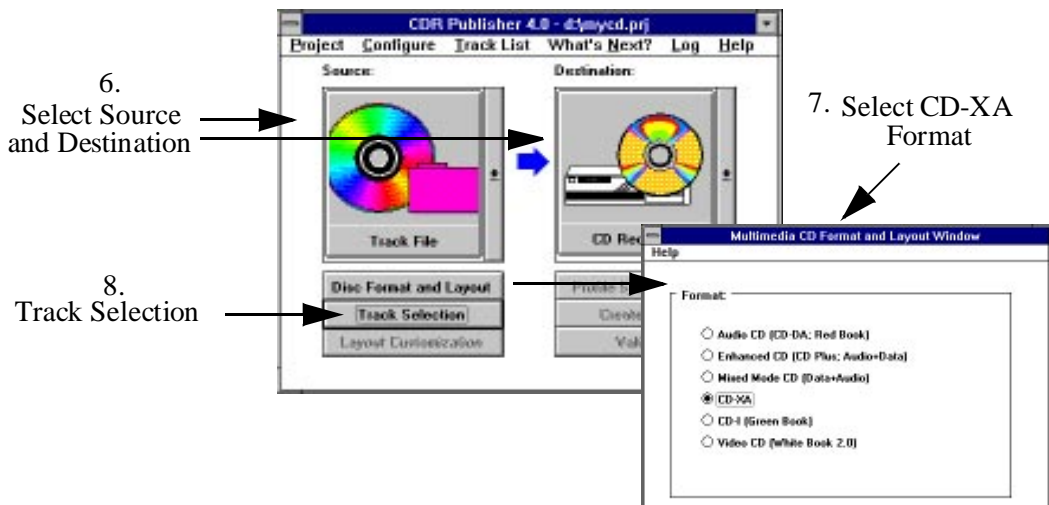
9. Press the `Import` button and enter the CD Titles with file name ends with `.trk` which you have just extracted, the `Track File customization Window` will appear.

10. Press `Done` on `Track File Customization Window` to accept default.

11. Begin the recording process by pressing `Create Image` button on the `Main Window`.

9. Import Tracks
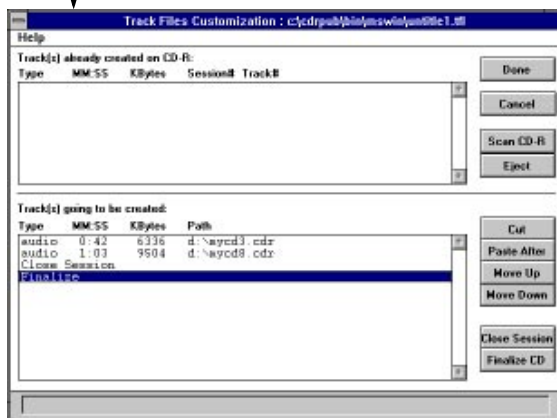
10. Done

If you have one CD-ROM reader that supports extracting multimedia tracks and a CD recorder, or if you have two CD-ROM recorders, you may apply the same procedure described above to directly extract from one recorder and record to another.

Step 1. Select Tracks

Step 5. Create Image

Step 2. Scan Disc

Step 3. Add All

Step 4. Done as Default
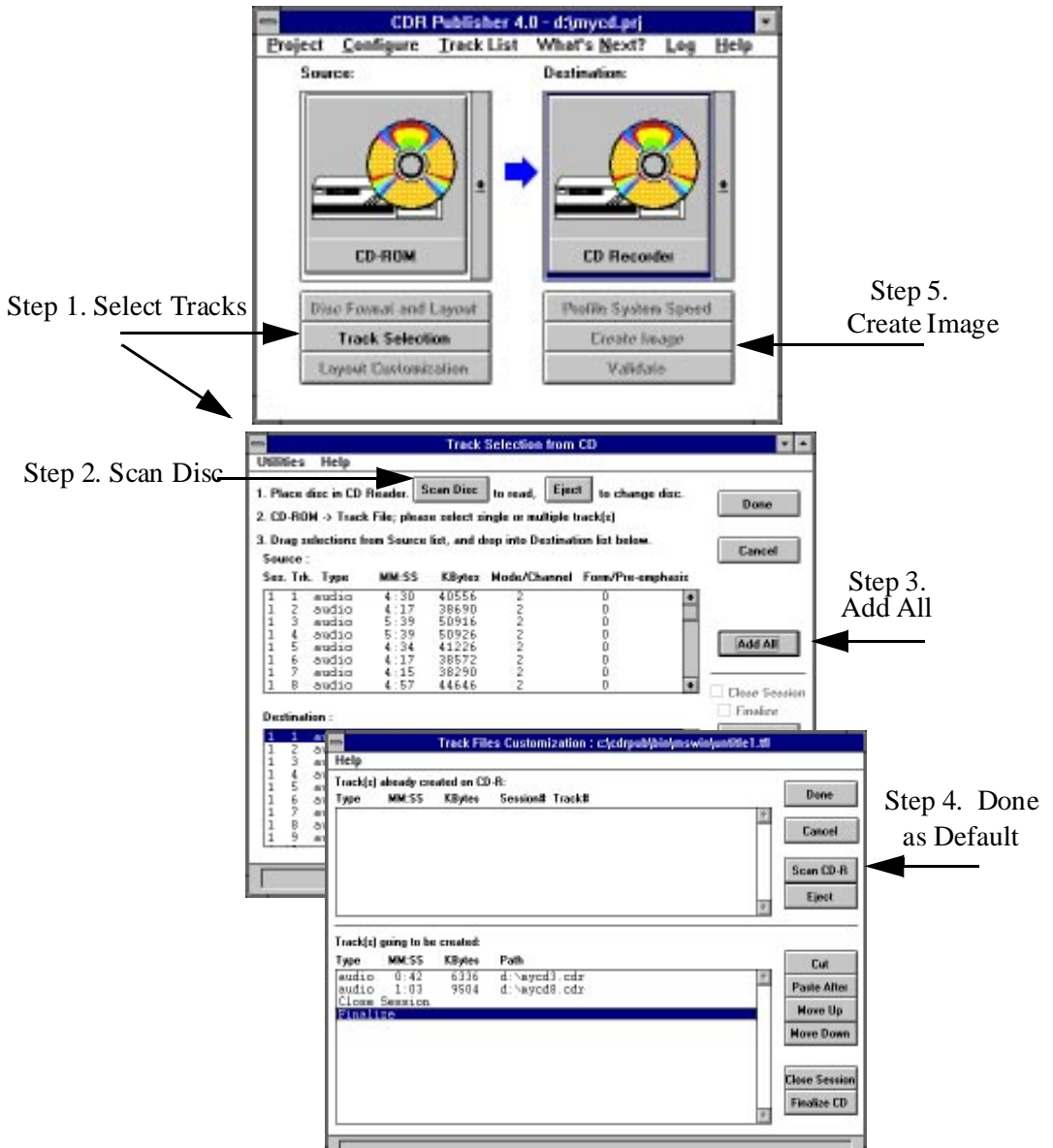
Mixing Your Favorite Audio CD

You may mix your favorite Audio CD by following the previous instructions to scan the original CD, select and extract the desired audio tracks and record to a new CD.

You may record several audio tracks from one CD and later append additional audio tracks or record all the audio tracks in one step. To enable additional recording after the current audio tracks, make sure the `Finalize CD` option is **not** selected. To disallow additional recording after the current one, `Close Session` and Finalize the disc.
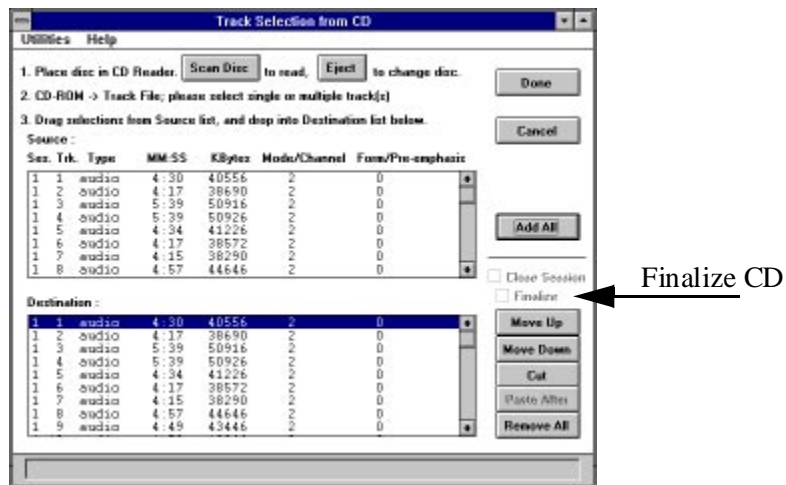
Creating Native UNIX UFS, EFS, and Windows NT CD-ROMs

Sometimes it is necessary to create a Native UNIX File System CD-ROM. On Sun, it is UFS. On Silicon Graphics, it is EFS. On Windows NT, it is NTFS. It is important to understand that UFS, EFS, and NTFS are specific to Sun, Silicon Graphics, and Windows NT respectively. They are all read-writable file systems that are not optimized for read-only information access.

An alternative is to create a "standard" UNIX CD-ROM -- ISO 9660 + Rock Ridge Extension (RRIP) or an ISO CD-ROM (ISO Level 2). ISO with RRIP will preserve all of the UNIX features: long file names, deep directory trees, symbolic links, permissions, etc. ISO level 2 will preserve all of the long file names for the PC environments.

In the UNIX environment, if you are distributing CDs that need to be accessed by the boot prompt, then you will need to create an UFS or EFS CD. However, if you are distributing software and data CDs, you can optimize the data access with ISO+RRIP CDs.

With the standard CD, your data can be accessed on ALL the UNIX, PC and Mac computers; not limited to only Sun, Silicon Graphics, or Windows NT.

To create the UFS, EFS, or NTFS CD-ROM on Sun or Silicon Graphics systems, take a hard disk that is formatted with the native file system, create the image to the Virtual Disk, and use it as the source Virtual Disk. Copy the entire disk image onto the CD recorder.

Building Silicon Graphics EFS CDs

If you are using the `mkdisc` program on a Silicon Graphics system to create EFS image files, follow these steps to create an EFS disc:

1. Concatenate the header file and the EFS image into one file.

   ```
   % cat xxx.vh yyy.efs > zzz.img
   ```

2. Use `zzz.img` as an `Image File` and create the CD-ROM.

Creating a Bootable CD-ROM

CDR Publisher allows the user to create a bootable CD-ROM. There are two types of bootable CDs. One for PC and one for UNIX. The user may select the type of bootable CD from the `Data CD Format and Layout Window`.

Bootable PC Disc

Bootable UNIX Disc
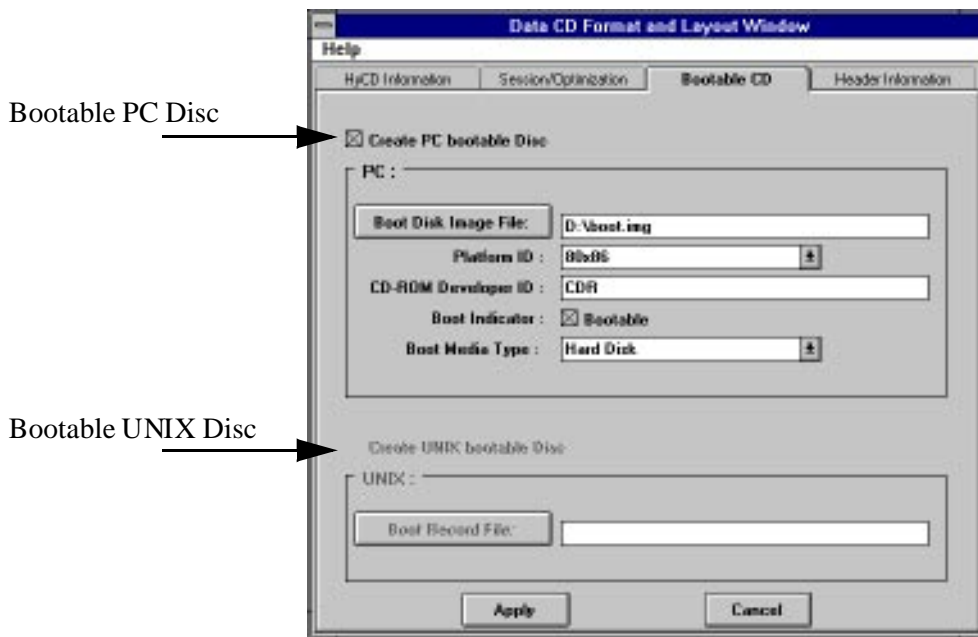
Creating PC Bootable CD

Creating a PC bootable CD is a two step process. First the user must prepare a Bootable Image, then create an integrated CD-ROM containing the Bootable Image.

Step 1. Creating A Bootable Image

A bootable image may come from a floppy disk or a hard disk. CDR Publisher supports extracting the bootable image from a SCSI device into a Image File. This Image File then can be integrated into a CD-ROM image. Follow these steps to create a Bootable CD for PC.

1. Select `Virtual Disk` as Source and `Image File` as Destination in the Main window.
2. Configure the Virtual Disk to match the bootable SCSI hard disk drive in the `Hardware Configuration Window`.
3. Create the Image File containing the Bootable Image.
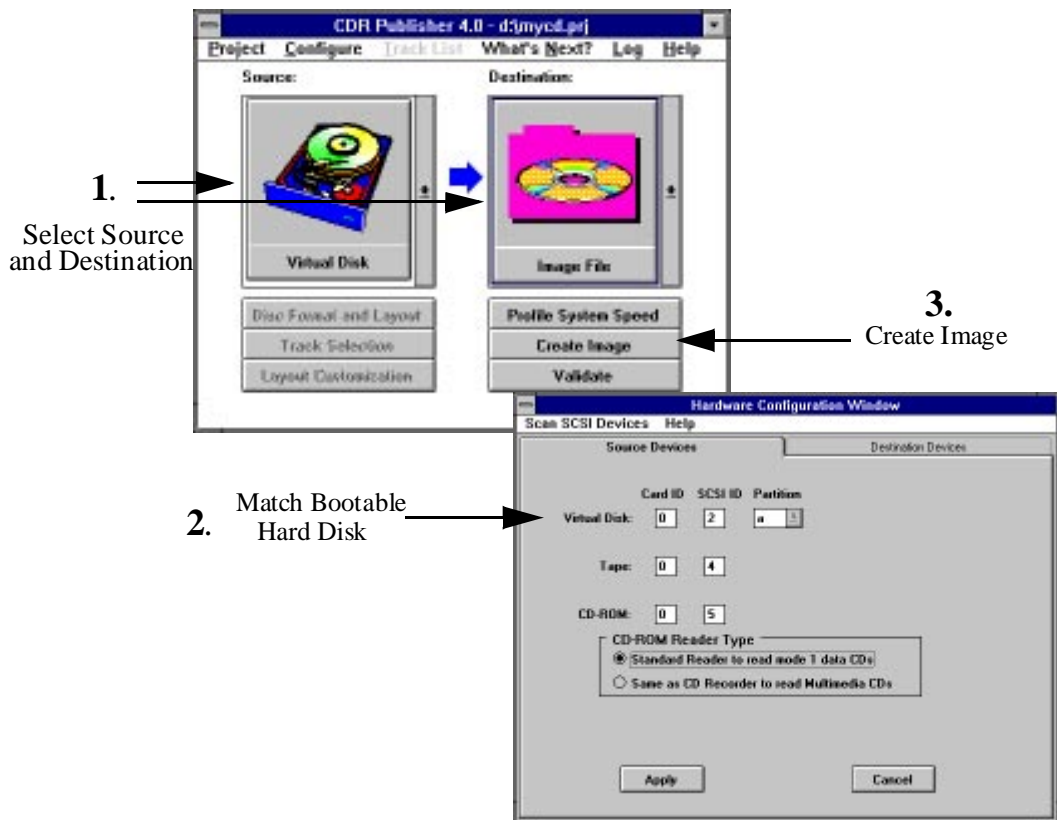
Step 2. Creating the Bootable CD

1. Enter the file name of the boot instructions in the `Boot Disk Image File` field of the `Bootable CD Window`. Type in the file name or press the `Boot Disk Image File` button to select the file from your system.

1.
Select Boot File
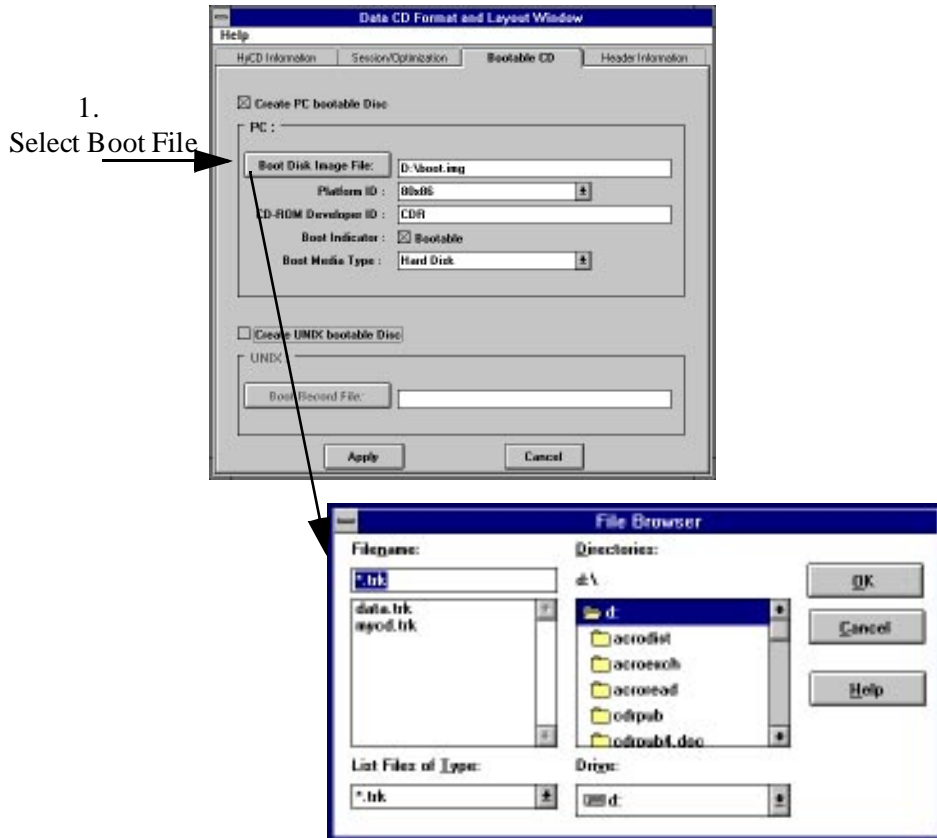
2. Select the files to be recorded to the CD in the CD-ROM section using the `File Selec-tion Window`.

3. Press `Create Image` in the `Main Window` to create the Bootable CD.

4. Once the CD is created, you will be able to boot the CD-ROM from an updated BIOS or SCSI controller that supports booting from CD-ROM.

2.
Select Files

3.
Create Image
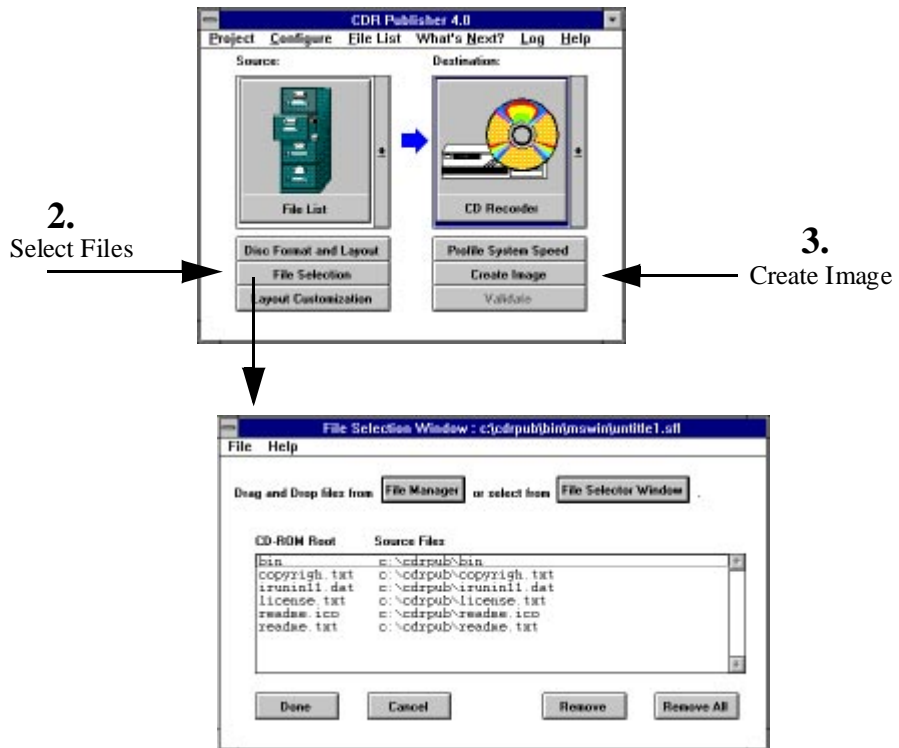
Creating UNIX Bootable CD

Creating a UNIX bootable CD is a single step process. The boot instructions will be written to the first 32K (block 0-15) of the CD-ROM.

Enter the file name of the boot instructions in the `Boot Record File` field of the `CD Header Information Window`. Type in the file name or press the `Boot Disk Image File` button to select the file form your system.

Boot File

x

x

Note:

Please note that a standard CD-ROM begins its information from the 16th block so it has block 0-15 cleared. Because we now have boot instructions in block 0-15, it is essential that you preserve this information when you write to the CD recorder. Make sure you `Preserve block 0-15` in the `Hardware Configuration Window`.
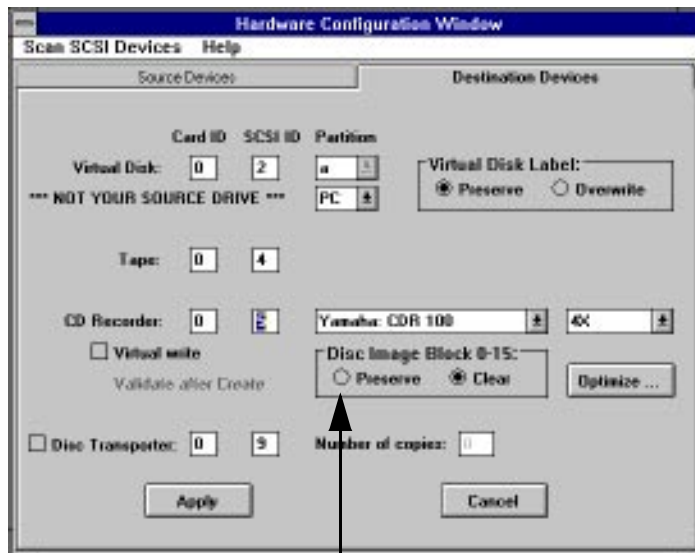
Preserve Boot Block

Please note further that UNIX Bootable CDs are incompatible with hybrid CDs that include Macintosh HFS format. Therefore, you can not create a UNIX bootable CD if you have Macintosh HFS format selected in the `Format and Layout Window`.

Optimize Data Transfer Speed to CD-ROM Recorder

Multi-Buffer I/O

Because the CD-ROM recorder requires a sustained data transfer rate for creating CD-ROMs, it is essential that the CDR Publisher can maintain the data gathering rate with the data consumption rate of the CD recorder. This is why we have developed a Multi-Buffer Input / Output System.

The CDR Publisher incorporates a multi-buffer I/O scheme for reading and writing all data. It has two parameters that the user can tune for optimal performance. The parameters are Buffer Number and Buffer Size. Buffer Number is the total number of individual buffers, and Buffer Size is the amount of data being held in each buffer.

Before we explain how Buffer Number and Buffer Size are being used, let us first understand the way CDR Publisher works. There are two stages that CDR Publisher goes through to output the data to the CD-ROM recorder.

Stage 1: Read the source data and fill the entire buffer that the CD-ROM recorder has before writing to the recorder.

Send the write command to the recorder to begin the recording process.

Stage 2: Perform repetitive read-data-from-source and write-data-to-recorder process.

In Stage 2, different computer platforms process data differently; some use non-blocking I/O, some use blocking I/O. Therefore, the user will get different performance results on different computer platforms.

Balancing Time and Resources

In general, the user may modify the default values to increase the data transfer rate by using the extra system memory or resources. The user may try to balance the Buffer Number and Buffer Size based on the following criteria:

1. Try to match the recorder memory size by increasing the Buffer Number and the Buffer Size without running out of system's physical memory. If you must, you can use Virtual Memory (PC) or Swap Space (UNIX).

   You must keep in mind that Virtual Memory or Swap Space is slower than Physical Memory.

2. Buffer Size must be a number that is supported by your recorder and your platform.

   For example, the maximum buffer size for PC is 64K.

3. The time it takes to fill each buffer must be shorter than the time it takes for the recorder to write the data out to the CD.

   For example, if your buffer size is too large, by the time the computer system fills it, your CD recorder will have already exhausted its internal buffer.

4. Different buffer sizes work well in different scenarios.

   For example, if there are a few large size files in contiguous hard disk sectors, it will take a very short time to fill large buffers. On the other hand, if there are many small size files fragmented across different sectors, it will take a very long time to fill large buffers.

   The `Image On-The-Fly` process requires reading many files while writing to the recorder, whereas the `cdrcp.exe` process requires reading one continuous image from the source device.

Fine Tuning

The user is encouraged to experiment with both parameters, Buffer Number and Buffer Size. We recommend that the user activate the `Virtual Write` feature during experiment eliminating the possibility of recording bad CDs. If you begin to have communication problems with the CD-ROM recorder, reset the values by pressing the `Default` button.

Using Kodak Disc Transporter

CDR Publisher supports the Kodak Disc Transporter enabling user to record multiple copies of CD-ROMs unattended.

Simply configure the SCSI ID of the Disc Transporter and the number of copies you would like to have in the `Hardware Configuration window`. Once the Source device is selected in the `Main Window`, the Kodak Disc Transporter will work with the recorder to create all the specified copies unattended.
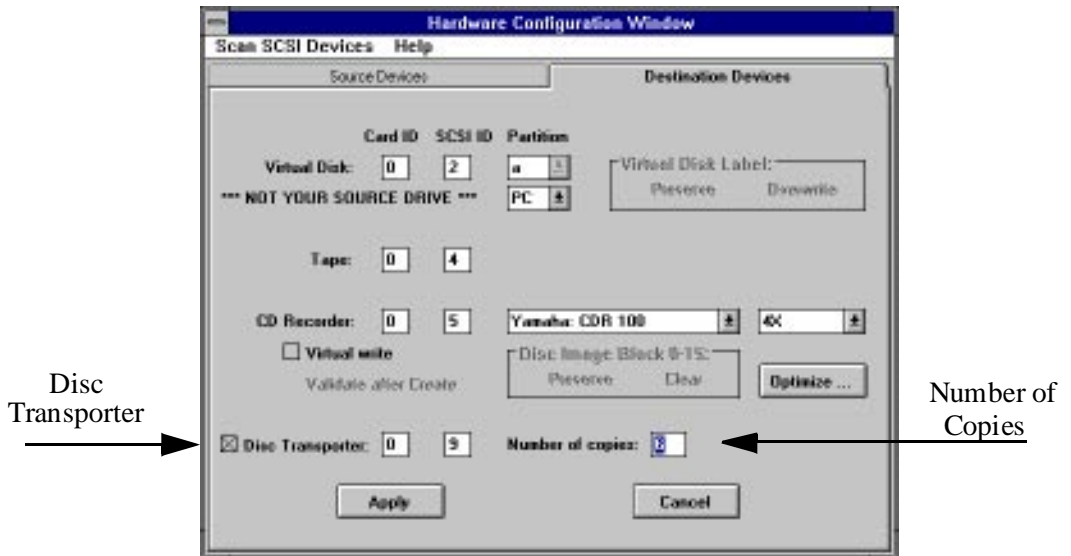
Reference

The Main Window

The `Main Window` consists of several components: `Menu Bar`, `Source Selection Window`, `Destination Selection Window`, and action buttons.
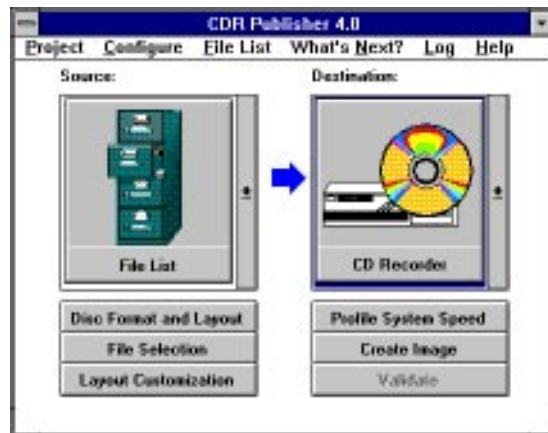
The following is a table that describes the menu items, buttons and their functions.

Menu Bar

<p style="text-align:center">Menu Bar Table</p>

Selection	Item	Function
Project	New	Start a new project with all parameters set to default. A project contains all configurable parameters including hardware settings, disc settings, file list selected, etc. Each user may have his own customized configuration for different hardware and discs.
	Load	Load a previously-saved project.
	Save	Save all settings to a project.
	Save As	Copy the current project settings to another project.
Configure	Hardware Info	Configure CDR Publisher to match the already-installed hardware.
	Disc Format and Layout	Configure Disc format. Configure Disc volume header. Optimize disc layout for faster access.
File List	Selection	Select the files to be included into the disc image.
	Customization	Organize the file layout to obtain optimal access to disc.
What's Next		Turn on or off the Next Step Arrow assistance.
Log		Display any messages from CDR Publisher.
Help		Quick reference to CDR Publisher functions.

Source Selection Window

The Source Selection Window is a pull-down window that specifies from where the information is to be read.

Source Selection Table

Icon Selection	Function
File List	Read from a list of files selected by the user.
CD Reader	Read from a CD-ROM reader.
Track File	Read from a set of files containing multimedia tracks.
Virtual Disk	Read from a hard disk containing a CD-ROM image.

Source Selection Table

Icon Selection	Function
Image File	Read from a data file containing a CD-ROM image.
Tape	Read from a tape drive containing a ANSI-formatted CD-ROM image.

Destination Selection Window

The `Destination Selection Window` is a pull-down window that specifies where the information is to be recorded.

Destination Selection Table

Icon Selection	Function
CD Reader	Write to the CD-ROM recorder specified in the Hardware Configuration menu item.
Track File	Write to a set of multimedia track files.
Virtual Disk	Write to a hard disk containing a CD-ROM image.

Destination Selection Table

Icon Selection	Function
Image File	Write to a data file containing a CD-ROM Image.
Tape	Write to a tape drive containing a ANSI-formatted CD-ROM image.

Action Buttons

Action buttons provide a simple and direct method of guiding the user to perform multiple tasks with a single push of a button.

Action Button Table

Button Selection	Function
Disc Format and Layout.	Invokes the `Disc Format and Layout Window` for the user to customize the disc characteristics and information
File Selection or Track Selection	Allows the user to select the list of files to be placed into the disc image.
Layout Customization	Allows the user to further customize the disc layout in order to optimize the data accessing speed on the disc. This option is available only if the user has already created a disc image using `File List` in the current or previous project. This option is also only available when a list of tracks are selected.
Profile System Speed	Profile the data transfer rate of the source selected. This is useful to determine whether the source device will be able to sustain the data transfer rate that a CD-ROM recorder requires to record a CD-ROM successfully.
Create Image	Create a CD-ROM image based on the selections defined in the `Source and Destination Window`.
Validate	Compare the image based on the selections defined in `Source and Destination Window`.

Hardware Configuration Window

The Hardware Configuration Window allows the user to configure CDR Publisher to correspond with the external hardware connected. It also enables the user to configure the hardware to support advanced operations.
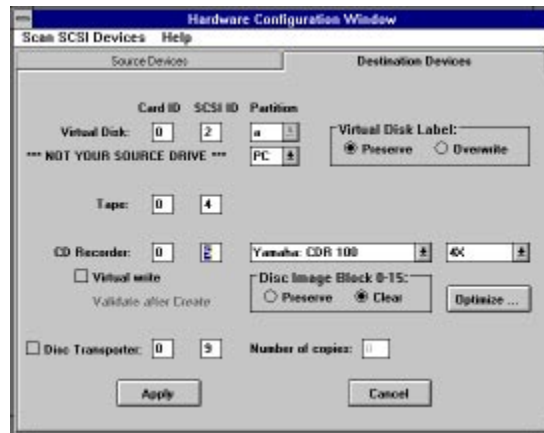
The following is a table describing each entry in the window:

Hardware Configuration Table

Selection	Function
Scan SCSI Devices	Utility to scan the SCSI port and find out which devices are connected to a specific SCSI port.
Source Devices Destination Devices	Match the Card ID and the SCSI ID of the external devices connected. On the PC Version, the user can create a Virtual Disk for PC or Mac by selecting the Virtual Disk Type.
Virtual Disk	Match the Card ID and the SCSI ID of the virtual disk connected. On the PC Version, the user can create a Virtual Disk for PC or Mac by selecting the Virtual Disk Type. On Sun Version only, Virtual Disk can be on a partition. On other platforms, Virtual Disk must be the entire disk drive.
Virtual Disk Label	This option only applies when Destination is a Virtual Disk. Preserve: CDR Publisher will skip the first 0-15 blocks (32 KB) of the hard disk before writing CD-ROM Image. This will prevent overwriting the Disk Label information which contains hard disk characteristics and partition information. If the user has overwritten the disk label, the user may re-create one using the `format` command on Sun or a low level format program on PC. Overwrite: Create a complete CD-ROM image from the Source. Default is set to Preserve.
CD-ROM Reader Type	Select Standard for using a standard reader to read the CD-ROM. Select Same as Recorder to use recorder as a reader for reading CD-ROM

Hardware Configuration Table

Selection	Function
CD Recorder Configuration	Configure CD-ROM Recorder and its functionality. **Manufacturer:** Match the device connected. **Record Speed:** Select the recording speed of the recorder. **Virtual Write:** Perform simulated write without physically writing to the disc. **Validate After Create:** After creating the CD-ROM image, validate the content of the recorded CD-ROM with the orgional Source device. This option only works with Virutal Disk or Image File as the Source Device.
Disc Image Block 0-15	This option is useful to users who wish to create bootable CD-ROM discs, or make a copy of CD-ROMs that are not ISO format. This option applies to all Destination devices. No matter where the source data comes from, the Preserve option will copy the first 32 KB of the source. The Clear option will fill the first 32 KB of the destination image with zeros. Default is set to Clear.
Optimize	Optimize data transfer rate of CDR Publisher for sending data from host system to CD-ROM recorder.

Data CD Format and Layout Window

HyCD Information Window

The `HyCD Information Window` allows the user to select and customize the CD-ROM format.
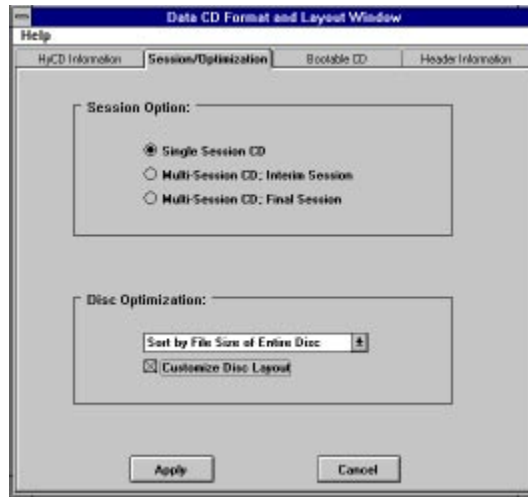
Disc Format and Layout Table

Entry	Selection	Description
CD-ROM Image Format	PC; ISO 9660	PC; CD-ROM Format This format should be used for creating CD-ROMs to be viewed under MS DOS. Less restrictive ISO format that allows directory names to contain "." and allows file names to contain special characters. The entry for ISO Directory and File Name Enforced option will not be selected. The Directory Control option will be set to Limit Depth to 8.
	Macintosh; HFS	Macintosh Hierarchical File System. This format should be used for creating CD-ROMs for Apple Macintosh and Power Mac based systems. The entry for ISO Directory and File Name Enforced option will be inactive. The Directory Control option will be inactive.
	UNIX; RRIP	ISO 9660 with Rock Ridge Extension. This format should be used for creating CD-ROMs for UNIX based systems. The entry for ISO Directory and File Name Enforced option will be inactive. The Directory Control option will be set to No Limit. The ISO area will be built based on ISO Level 1 standard.
ISO Directory and File Name Enforced		If selected, directory and file names will be converted automatically to the ISO standard. A record of the original names and converted names will be saved into the Conversion File specified.

Disc Format and Layout Table

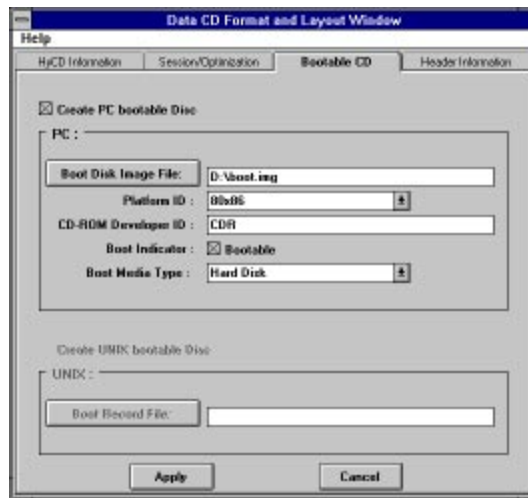| Entry	Selection	Description
Allocation Block Size		The user can select the size of the allocation block for Macintosh HFS file systems.
Include "." Files		If the image is ISO 9660 with RRIP, file names beginning with a period, ".", will automatically be included.
		If the image is ISO 9660, user may decide whether to include these UNIX special files. If selected, these file names will be converted automatically.
Symbolic Link	Relative	CDR Publisher will convert the symbolic links to reference the file relative to the root directory of the CD-ROM image. This is useful to create CD-ROM images that will function independently of where they are mounted.
	Absolute	Do not change the symbolic links.
Include Hidden Files		This option will work only on MS Windows version. On the PC, there are files with attributes set as hidden files. With this option turned on, all of the hidden files will be extracted and placed on the CD-ROM image. If the option is not selected, hidden files will not be placed on the CD-ROM image.

Session and Optimization Window

Session/Optimization Table

Entry	Selection	Description
Session Selection	Single Session	**Single Session:** Create a CD-ROM disc with one complete session. No additional sessions can be added. This format is recommended if you wish to create discs that can be read on all CD-ROM readers.
	Multisession; Interum	**Multisession, Interim:** Append a new session to the CD-ROM recordable disc. The disc must be either a blank disc or contain other interim sessions. This format is recommended if you wish to create discs that can only be read with CD-ROM readers that support multisession.

Session/Optimization Table

Entry	Selection	Description
	Multisession; Final	**Multisession, Final:** Append a last session to the CD-ROM recordable disc. No additional sessions can be added.
Optimization	Preserve Original Order	No change.
	Sort by File Size of Entire Disc	Create the disc image in ascending order, based on the file size of entire disc.
	Sort by File Size of Each Directory	Create the disc image in ascending order, based on the file size of individual directory.
Customization	Customize Disc Layout	The user may choose to perform additional customization after applying the automatic optimization. If this flag is turned on, the Customization Window will pop up during the image creation process.

Bootable CD Window

Bootable CD Table

Type	Entry	Description
PC Bootable Disc Information	Boot Disc Image File	File name that contains the bootable image.
	Platform ID	Select the platform which the bootable image supports: 80x86, Power PC or Mac
	CD-ROM Developer ID	Author identifier
	Boot Indicator	Select for bootable image.
	Boot Media Type	Select No Emulation if image is a executable program. Select Hard Disk as default.
UNIX Bootable Disc Information	Boot Record File	The file specified will be recorded to the first 16 sectors (32K bytes) of the CD-ROM image.

Header Information Window

The Header Information Window provides the user with an opportunity to customize the information that will be recorded on the CD-ROM image.

All entries in this table are optional. The following table describes each entry listed in the window:

Disc Header Information Table

Type	Entry	Description
Entries	System ID	The computer system identifier for which the boot sectors are specified.
	Volume ID, Volume Set ID	The names of the corresponding disc volume.
	Publisher	The name of the publisher.
	Volume Sequence Number, Volume Set Size	The number that this disc belongs to in a set of discs; i.e., 2 of 5.

Disc Header Information Table

Type	Entry	Description
	Copyright File Name, Abstract File Name, Bibliography File Name	File names. Please specify whole path name. These files are optional and should be placed on the root directory of the CD-ROM image. Once specified, these files will be automatically placed in the selected file list.
	Volume Creation Date Volume Modification Date Volume Expiration Date Volume Effective Date	Dates. Default is the disc creation date for all fields except the Expiration Date. The Expiration Date field has a default of Creation Date, plus one year.
Buttons	Accept all changes	Press the `Apply` button.
	Abandon all changes	Press the `Cancel` button.

File Selection Window

The File Selection Window consists of a selected File List Window and action buttons.

Selected
File List

File Selection Window

The File Selection Window consists of a selected File List Window and action buttons.

Selected
File List →

File Selection Window

The File Selection Window consists of a selected File List Window and action buttons.
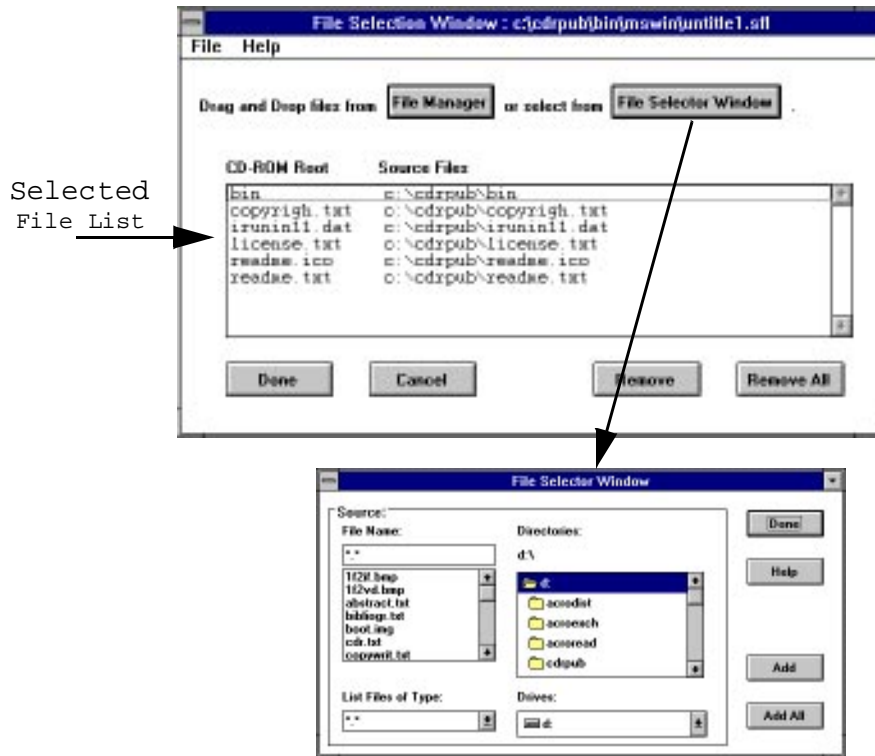
Selected
File List

Menu Bar

Selection	Item	Function
File	New	Start a new list of files.
	Load	Load a previously saved file list.
	Save	Save selected file list.
	Save As	Copy the current selected file list to another file list.

Action Buttons

Buttons	Function	Procedure
Directory Display Window, Add All	Select a source directory to be the top of CD-ROM image. Include all the files and directories under the source directory to the CD-ROM image.	Move mouse to the Directory Display Window, select a directory, then press the Add All button.
directory Display Window, Add	Add a directory into the selected file list.	Move mouse to the Directory Display Window, select a directory, then press the Add button.
File Display Window, Add	Add a file into the selected file list.	Move mouse to the File Display Window, select a file, then press the Add button.
File LIst Window, Remove	Remove a file or directory already selected.	Select the file or directory in the Selected File List Window, then press the Remove button.
File List Window, Remove All	Remove all of the selected files.	Press the Remove All button.
Done	Accept all changes.	Press the Done button.
Cancel	Abandon all changes.	Press the Cancel button.

Multimedia CD Format and Layout Window

`Multimedia CD Fromat and Layout Window` allows you to select which type of CD-ROM you wish to create. Detailed description of various types of CD-ROM formats can be obtained form the sources listed in the "Standards Reference" on page 15.
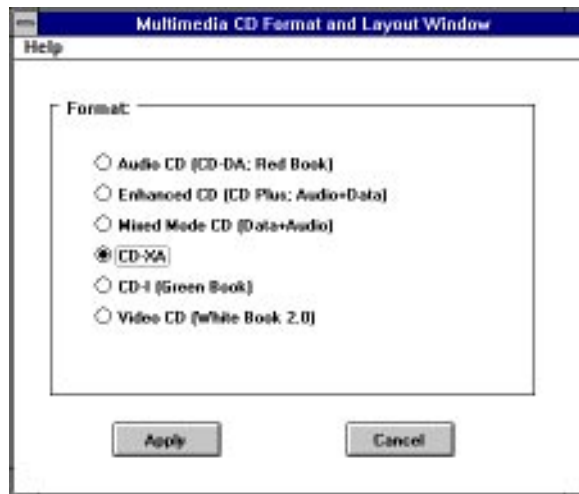
Appendix

Appendix A: Quick Start

Source, Destination, Create Image:

The following is an example of how the user can easily create a CD-ROM image with CDR-Publisher. Follow these steps:

1. Create a project.

- Select menu item: Project; New.

- Enter a project name; i.e. `test`

    `test.prj` will be created in the user's current directory.

2. Select Configure; Hardware Info menu item.

- Fill in the device names that correspond to the hardware devices you have connected to your system.

3. Select File List in the Source Selection Window.

4. Select Image File in the Destination Selection Window.

5. Press File Selection button.

- Select a directory in the Directory Display Window then select the Add button.

- Press the OK button.

6. Press Create Image button.

- Enter the image file name and press OK.

CDR Publisher will now take the files in the selected directory and create a CD-ROM image file.

Once you have created an image, you may copy the image to other devices. For example, you can copy the image you have just created to a tape device by taking the following actions:

1. Select the Image File icon in the Source Selection Window.

2. Select the Tape Drive icon in the Destination Selection Window.

3. Press the Create Image button.

Appendix B: Operation Hints

ALL Versions

Look and Feel

The graphics in the manual may look a little different from the appearance on the screen on different platforms. However, all fields should match exactly.

Time Needed to Create CD-Rom Image

The time required to create a CD-ROM image from the File List is proportional to the number of files you have selected. If you have a large number of small files, the image creation time will be longer than if you have small number of large files.

Furthermore, if you perform the Directory/File Name Enforce operation and/or Auto Conversion operation, the image creation process will be slowed down.

Swap Space / Virtual Memory

If you have many files in your CD-ROM image, increase your virtual memory swap space for optimal performance.

CD-ROM Recorder

We have found that under certain situations you must reset the CD Recorder:

- if you run into a hardware communication problem,

- if you cancel the CD recording process, even if it is virtual write,

- if you have performed a virtual write operation on a Philips Recorder that supports Virtual Write.

Reset the recorder as follows:

1. Turn it off. Wait for 10 seconds.
2. Turn it back on.
3. Open the tray and leave the blank CD-ROM in.

When you record to disc, the tray will close automatically to indicate proper communication between the driver and the Recorder.

Compatibility with Older Versions of Philips and Kodak Recorders

The older versions of Philips and Kodak Recorders do not support Virtual Write. So, if your Philips recorder does not have a "CDD 521 Upgraded" sticker on the tray door, it probably does not support the Virtual Write function. Please turn off the Virtual Write flag in `Hardware Configuration Window` for any CD-ROM recording.

Exabyte Tape Drive

After placing the tape into the tape drive, wait until the on-line light is ready before proceeding with the desired operations.

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