

CDRWIN - CDROM Recording Tools

[Record Disc](#)

[Copy Disc](#)

[Tools](#)

[Table of Contents](#)

[Settings](#)

[Unlock](#)

[Advanced Topics](#)

[Supported Devices](#)

[Windows 95 Tips](#)

[Frequently Asked Questions](#)

[Contact Information](#)

Record Disc

Description

This dialog is used to record a new session/disc in disc-at-once recording mode. You must load a valid cuesheet file before recording can begin. This file can either be written by you (see [How to write a CUE SHEET file](#)) or generated automatically for an existing disc by the [Copy Disc](#) dialog.

Controls

CDROM Recorder

Select a CDROM recorder device from this list. The selection will only be valid until you close the dialog. To select a new permanent default, click on the “Devices” button to activate the [Settings](#) dialog.

Recording Information

Information about the currently loaded CUE SHEET is displayed in this area.

Recording Options

Open New Session - Opens a new session on the disc after writing the current session. This keeps the disc “open”, allowing more sessions to be added in the future. All sessions after the first one must be written with track-at-once recording (you can not write multiple sessions with disc-at-once recording). *Note: Some recorders do not support this feature.*

Test Mode - Sets the recorder in write emulation mode. This disables the recording laser, so that the blank disc is not actually written to. This option can be used to test your hardware for proper operation without wasting a disc. *Note: On most recorders, you are required to eject the disc and reload it between a test recording and an actual recording.*

Speed - Sets the recording speed.

Eject Disc at Completion - Ejects the disc when recording has completed.

Beep at Completion - Causes an audible beep to be issued when recording has completed.

Disc Transporter

Enables or disables use of the Kodak disc transporter device.

Load Cue Sheet...

Click on this button to activate the cuesheet file selection dialog. You must load a valid cuesheet before you can start a recording.

Disc Layout...

Click on this button to activate the [Disc Layout](#) dialog.

Start Recording

Click on this button to start the recording process.

Restore Defaults

Click on this button to restore the default settings for this dialog. Note: If you want to permanently save these settings, then you must select “Save Settings” afterwards.

Save Settings

Click on this button to save the current settings in the Windows 95/NT registry.

Close

Click on this button to close the dialog and return to the main toolbar.

Help

Click on this button to activate the Windows help system and load this topic.

Disc Layout

Description

This dialog is used to display the disc layout of the currently loaded cuesheet. It also allows you to save the layout to a text file for future reference.

Controls

Disc Information

Disc details from the loaded cue sheet file are displayed in this area.

Track/Index Information

Track and index details from the loaded cue sheet file are displayed in this area.

Save

Click on this button to save the disc layout information to a text file.

Close

Click on this button to close the dialog.

Help

Click on this button to activate the Windows help system and load this topic.

Copy Disc/Tracks/Sectors

Description

This dialog is used to...

- Copy an entire disc
- Copy one or more tracks
- Copy a range of data/audio sectors

Controls

CDROM Reader

Select a CDROM reader device from this list. The selection will only be valid until you close the dialog. To select a new permanent default, click on the "Devices" button to activate the [Settings](#) dialog.

COPY DISC

Select this option to copy the entire disc.

COPY TRACKS

Select this option to copy one or more tracks.

COPY SECTORS

Select this option to copy a range of data/audio sectors.

Sector Settings

Start/End - Enter the starting and ending sector as either a "logical block address" (LBA) or as a time value in minutes, seconds, and frames (MM:SS:FF). *Note: The first track starts at 00:02:00 and there are 75 frames per second.*

Datatype - Select the sector datatype/blocklength from this list.

Reading Speed

Audio - Select the audio reading speed from this list.

Data - Select the data reading speed from this list.

Note: Not all CDROM drives can change their reading speed.

Track Selection

Select All - Selects all tracks to be copied.

Clear - Clears all selected tracks.

Invert - Inverts the selection of tracks to be copied.

Track Selection Grid - To select a track for copying, click on one of the grid squares with the left mouse button (to clear a selection, just click on it again). You can also display information about a track by clicking on it with the right mouse button.

Scroll Up/Down - If the disc has more than 25 tracks, these controls are used to view tracks that are not currently displayed in the grid.

Audio Track Settings

Transfer

CDDA (2352) - Use this option when copying any standard audio track/disc.

CD+G (2448) - Use this option when copying any CD+G (Karaoke) track/disc.

Jitter Correction - See [Frequently Asked Questions](#) for more information.

Automatic - The software will automatically choose the best setting for the selected CDROM reader.

Enabled - Explicitly enables the "jitter correction" algorithm.

Disabled - Explicitly disabled the "jitter correction" algorithm.

Data Track Settings

Mode1 Transfer

Data (2048) - Select this option to copy just the user data of each sector.

Raw (2352) - Select this option to copy raw Mode1 data sectors (includes all headers and error correction codes)..

Mode2 Transfer

Form1 (2048) - Not implemented yet.

Mixed (2336) - Select this option to copy both Form1 and Form2 data sectors.

Raw (2352) - Select this option to copy raw Mode2 data sectors (includes all headers and error correction codes).

See [Recommended Transfer Settings](#) for more details.

Subcode Options

Analyze Mode

Auto - Automatically selects the best analyze mode for the device. If the device supports the reading of subcodes, then the "Some" option is selected. Otherwise, the "Fixed" option is selected.

Fixed - The first two seconds of all audio tracks will be encoded as a pregap without actually analyzing the subcode (this option is mainly used if your CDROM drive does not support the reading of subcodes).

None - Disables all subcode analysis.

Some - Only the pregaps (Index 0) of each track will be analyzed.

All - All subcodes will be analyzed. This option is only useful for discs that contains indexes greater than one (extremely rare). *Note: This operation is very slow since the entire disc must be read.*

Threshold - Specifies the maximum pregap length that is likely to be encountered. The default setting of 300 is sufficient for 99.9% of all discs (the higher the number, the more time it will take to analyze the pregaps).

Read MCN/ISRC - Select this option to read the "media catalog number" and track ISRC codes. This information is stored in the subcode of each track. *Note: This operation is very slow (approximately 2 seconds per track).*

Next >

Click on this button to proceed to the next step in the copy operation (this activates the [Copy Settings](#) dialog).

Close

Click on this button to close the dialog and return to the main toolbar.

Help

Click on this button to activate the Windows help system and load this topic.

Refresh TOC

Click on this button to reload the disc's table-of-contents and update the screen.

Restore Defaults

Click on this button to restore the default settings for this dialog. Note: If you want to permanently save these settings, then you must select "Save Settings" afterwards.

Save Settings

Click on this button to save the current settings in the Windows 95/NT registry.

Recommended Transfer Settings

By default, this software copies raw 2352 byte data sectors (which includes the header, user data, and error correction codes). While this can give you an exact copy of the disc, some CDROM drives are not very good at reading raw data sectors and errors can occur (and it takes more harddisk space to store the disc image). In many cases it is much better to copy just the user data, and let the CD recorder regenerate the header and error correction codes when the new disc is written. Using a transfer setting other than 2352 will read just the user data on both MODE1 (2048 bytes) and MODE2 discs (2336 bytes). This should increase the reliability of reading and writing all MODE1 discs. MODE2 discs are a little more difficult to deal with because they can contain two variations of sectors known as FORM1 and FORM2.

Here are our recommendations on the transfer settings to use depending on the type of data disc being copied and the CD recorder being used to write the new disc...

| MODEL | MODE1 | MODE2 |
|-----------|-------|-------|
| HP | 2352 | 2352 |
| JVC | 2048 | 2336 |
| OLYMPUS | 2048 | 2352 |
| PANASONIC | 2048 | 2352 |
| PHILIPS | 2352 | 2352 |
| PINNACLE | 2048 | * |
| RICOH | 2352 | 2352 |
| SONY | 2048 | 2352 |
| TEAC | 2048 | 2352 |
| YAMAHA | 2048 | 2352 |

* = Pinnacle RCD5040 - 2336
Pinnacle RCD4X4 - 2352

WARNING: You must use a transfer setting of 2352 when reading any data disc that is to be recorded on an HP, Philips, or Ricoh recorder. These models do not support the writing of cooked data sectors in disc-at-once recording mode.

WARNING: You must use a transfer setting of 2352 when reading any mixed mode disc (both data and audio) that is to be recorded on the Teac CD-R50S, Pinnacle RCD4x4, JVC XR-W2020, or S&F 2006PLUS. These models do not support writing tracks with different block lengths in disc-at-once recording mode.

WARNING: You must use a transfer setting of 2048 (Mode1) or 2336 (Mode2) when reading any data disc that is to be recorded on the Pinnacle RCD5040 or JVC XR-W2010. These models do not support the writing of raw data sectors in disc-at-once recording mode.

Copy Settings

Description

This dialog is used to set the destination, file format, recording options, and other miscellaneous options for the copy operation. NOTE: All recordings are done in disc-at-once recording mode.

Controls

Copy to Image File - Copies the disc, track(s), or sectors to an image file on your harddrive (if the "Copy Disc" option has been selected, then a cuesheet file will also be generated with the same name as the image file, but with the extension ".CUE").

Copy to Image File and Record - Same as above, but this option will also record a new disc after the copy to your harddrive has been completed.

Copy to CD Recorder - Copies the entire disc directly to a CDROM recorder (on the fly). Warning: Please read [Copying discs on-the-fly](#) before attempting this operation.

CDROM Recorder - Select a CDROM recorder device from this list. The selection will only be valid until you close the dialog. To select a new permanent default, click on the "Devices" button to activate the [Settings](#) dialog.

Image File - Use this editbox to select an image filename (you can also specify a complete pathname including a device and directory, such as C:\TEST\IMAGE.BIN). If the "Copy Disc" option has been selected, then a cuesheet file will be created automatically with the same directory/name, but with the extension ".CUE". **Warning:** Long filenames are allowed for the image and cuesheet filenames, but the directory name and filename must not contain any spaces.

Image File Options

File Format

INTEL - Writes the file in Intel binary format (least significant byte first).

MOTOTOLA - Writes the file in Motorola binary format (most significant byte first).

WAVE - Writes the file in WAVE format (44.1KHz 16-bit stereo). This option is only valid when reading audio tracks or sectors.

AIFF - Writes the file in AIFF format (44.1KHz 16-bit stereo). This option is only valid when reading audio tracks or sectors.

MPEG - This option is not implemented yet.

Name Files Sequentially (valid for "Copy Tracks" operation only). Select this option to uniquely name each image file with a sequential number starting at 1. For example, if you are copying two tracks with the image filename TRACK.WAV, then the files will be named TRACK01.WAV and TRACK02.WAV. If you do not select this option, then the files will be named using the corresponding track number. For example, if you are copying tracks 5 and 8, then the files will be named TRACK05.WAV and TRACK08.WAV.

Overwrite Existing - Select this option to automatically overwrite any existing image or cuesheet file. Otherwise, you will be prompted to overwrite any files that already exist.

Delete at Completion - Select this option to automatically delete the image file and cuesheet file at the completion of the recording operation. This option is only valid when "Copy to Image File and Record" has been selected.

Reading Error Options

Read Retry Count - The number of times to retry a failed read command. Note: Most CDROM drives automatically retry failed reads at least three times, so this setting may have no effect on being able to read a bad disc.

On Error

Abort - The copy operation will be aborted if any unreadable sector is found.

Ignore - Replace the unreadable sector with another unreadable sector and continue reading the disc. This option is only applicable to raw data sectors (for non-raw sectors, this option is identical to "Repair"). *Note: Some recorders do not support the writing of unreadable data sectors (they will be corrected before being written to the disc).*

Repair - Replace the unreadable sector with a readable one (the sector will contain all zeros) and continue reading the disc.

Recording Options

Open New Session - Opens a new session on the disc after writing the current session. This keeps the disc "open", allowing more sessions to be added in the future. All sessions after the first one must be written with track-at-once recording (you can not write multiple sessions with disc-at-once recording). *Note: Some recorders do not support this feature.*

Test Mode - Sets the recorder in write emulation mode. This disables the recording laser, so that the blank disc is not actually written to. This option can be used to test your hardware for proper operation without wasting a blank disc. *Note: On most recorders, you are required to eject the disc and reload it between a test recording and an actual recording.*

Speed - Selects the recording speed.

Eject Disc at Completion - Ejects the disc when recording has completed.

Beep at Completion - Causes an audible beep to be issued when recording has completed.

Finish

Click on this button to start the actual copy operation.

< Back

Click on this button to close the dialog and return to the previous step.

Restore Defaults

Click on this button to restore the default settings for this dialog. *Note: If you want to permanently save these settings, then you must select "Save Settings" afterwards.*

Save Settings

Click on this button to save the current settings in the Windows 95/NT registry.

Help

Click on this button to activate the Windows help system and load this topic.

Copying discs on-the-fly

There are a number of potential problems when copying discs on-the-fly (compared to copying the disc to your harddrive first). When attempting to use this feature for the first time, the “Test Mode” recording option should be selected to check the compatibility of your hardware.

- Many CDROM drives cannot be used to copy audio discs on-the-fly. They are either too slow or read audio in a manner that is not consistent with the slower data rate required by the recorder. Enabling “jitter correction” can solve the latter problem, but this is not guaranteed on all readers. Note: When copying audio discs, we recommend using a high quality reader such as the Plextor 12Plex or 12/20Plex.
- The data/audio reading speeds must be set to a value greater than the recording speed. We recommend using a reading speed that is twice as fast as the recording speed. Warning: Do not use a reading speed any higher than is needed. Setting too high a reading speed can cause problems especially when reading audio.
- Another major problem with some readers is “disc spindown time”. Since copying on-the-fly uses disc-at-once recording, the first 2 to 3 minutes is spent by the recorder writing the leadin track. During this period of inactivity, some readers will spindown (stop) the disc. After the leadin track has been written, the software will then start reading the data from the disc. This will cause the reader to start spinning the disc again. However, this time delay can cause a “buffer underrun” condition to occur, which will ruin the disc. This problem is affected by a number of variables, including the recording speed, size of the recorder cache, and the time it takes for the reader to spin the disc back up to speed.

Tools

Description

This dialog is used to...

- Backup directories/files from your harddrive to an ISO9660 disc.
- Make a bootable CDROM disc (El Torito specification).
- Record an ISO9660 image file.
- Finalize a session/disc.
- Erase a disc (rewritable drives only).

Note: All recording operations in this dialog use "track-at-once" recording. The minimum track length allowed by the CDROM specification is four seconds (approximately 600 kilobytes).

Controls

Tool Selection - Select the required operation from this list.

Directory - Specifies the top level directory to be built into an ISO9660 image file.

Image File - Specifies the name of the ISO9660 image file to be built or recorded.

CDROM Recorder - Select a CDROM recorder device from this list. The selection will only be valid until you close the dialog. To select a new permanent default, click on the "Devices" button to activate the [Settings](#) dialog.

Directory Options

Recurse Subdirectories - Select this option to recursively process all directories and files below the specified top level directory.

Check Directory Depth - Select this option to make sure that the number of directory levels does not exceed eight, which is the maximum allowed by the ISO9660 specification. If you choose to ignore this limit, then the disc may not be readable under some operating systems.

Check Filenames - Not implemented yet.

Include Hidden Files - Include all files with the "hidden" attribute.

Include System Files - Include all files with the "system" attribute.

Include Archive Files Only - Only include files with the "archive" attribute.

ISO9660 Options

Long Filenames (Joliet) - Select this option to create a long filename (Joliet) compatible disc for Windows 95/NT. *Note: A Joliet disc contains both the short and long versions of all filenames, so that the disc will be compatible with older DOS and Windows 3.1 based systems.*

Generate Raw Sectors - Select this option to generates raw (2352 byte) sectors. This is useful if you want to write the ISO9660 image file to a CD recorder that will only accept raw data sectors in disc-at-once recording mode (Philips, HP, Ricoh, etc). *Warning: Do not use this option if you are going to record the image file with track-at-once recording.*

Advanced Options - Activates the ISO9660 advanced options dialog. See [Advanced ISO9660 Options](#) for more details.

Recording Options

Track Mode - Not implemented yet.

Disc Type - Specifies the disc type used for finalization. A disc should be finalized based on the type of the first track recorded to the disc. The "CDROM" type should be used when recording ISO9660 image files.

Speed - Sets the recording speed.

Write Postgap - Write a 150 block postgap at the end of the track. This option is highly recommended when recording any ISO9660 image file.

Test Mode - Sets the recorder in write emulation mode. This disables the recording laser, so that the blank disc is not actually written to. This option can be used to test your hardware for proper operation without wasting a disc. *Note: On most recorders, you are required to eject the disc and reload it between a test recording and an actual recording.*

Finalize Session/Disc - Finalize the current session after writing the track (the disc will not be readable on a regular CDROM drive until it is finalized).

Open New Session - Open a new session on the disc after finalizing the current session (this keeps the disc open, allowing more sessions to be added in the future).

Eject Disc at Completion - Ejects the disc when recording has completed.

Beep at Completion - Causes an audible beep to be issued when recording has completed.

Start

Click on this button to start the selected operation.

Close

Click on this button to close the dialog and return to the main toolbar.

Restore Defaults

Click on this button to restore the default settings for this dialog. *Note: If you want to permanently save these settings, then you must select "Save Settings" afterwards.*

Save Settings

Click on this button to save the current settings in the Windows 95/NT registry. *Note: This also saves the ISO9660 "Advanced Options".*

Help

Click on this button to activate the Windows help system and load this topic.

Multisession Discs

Building an ISO9660 image file for a multisession disc requires that the software know the starting block number (on the CD-R disc) where the image will be to. When writing the first session, this is not important because it always starts at block zero, but all other sessions could begin at any block on the disc.

In other words, you can **not** do the following...

```
"Build ISO9660 Image File"  
"Record ISO9660 Image File"  
"Build ISO9660 Image File"  
"Record ISO9660 Image File"
```

This will not work, because the second image will not be built knowing where it will be written on the disc. The destination disc must be analyzed before building the image to determine the starting block number.

When writing any multisession disc, you must use either the "Build and Record ISO9660 Image File" or the "Record Directories/Files to an ISO9660 Disc" option. Both of these options will analyze the existing CD-R disc before building the image file.

The bottom line is that an ISO9660 image file must be custom built for any disc that already has one or more sessions on it.

Note: This software is not capable of "linking" multiple sessions together. If you write more than one session to a disc, then you will only be able to access the files in the **last** session (all files from previous sessions will be inaccessible).

Warning: This software does not support the creating of multisession discs on any Pinnacle or JVC

recorder (except the Pinnacle RCD4x4).

Tips for "on the fly" recording...

Copying large numbers of small files directly to the CD recorder can easily result in a buffer underrun due to the overhead of opening and processing each file.

Use the "Test Mode" option to make sure that your system is fast enough to record a large number of small files.

Set the recording speed to 1X if your system is not fast enough to record at 2X or 4X.

Defragment your harddrive to reduce file processing time.

Use a faster harddrive that does not perform "thermal recalibration".

Warning: Any buffer underrun that occurs during recording will result in an unusable disc. Do not attempt to copy files that are currently open/locked by DOS, Windows, or another program... this will result in an error when the software attempts to open and copy the file.

ISO9660 - Advanced Options

Controls

Volume Descriptor

Volume Label - This string specifies the disc's volume label. This label is displayed by most device and directory utilities in DOS and Windows. The maximum length is 32 characters.

System ID - Maximum length is 32 characters.

Volume Set Name - Maximum length is 128 characters.

Publisher Name - Maximum length is 128 characters.

Preparer Name - Maximum length is 128 characters.

Application Name - Maximum length is 128 characters.

Copyright File - Maximum length is 37 characters.

Abstract File - Maximum length is 37 characters.

Bibliographic File - Maximum length is 37 characters.

Note: On Joliet discs, all of the above strings are limited to 1/2 of the specified lengths. All strings (except the Volume Label) are for documentation purposes only and are not actually used by any DOS or Windows software.

Dates/Times

Creation - Creation date of the volume (if this date is not specified, then the current system date/time will be used).

Modification - Modification date of the volume (if this date is not specified, then the current system date/time will be used).

Effective - Effective date of the volume.

Expiration - Expiration date of the volume.

Bootable Disc

Make Bootable Disc - Select this option to create a bootable disc (El Torito specification).

Image File Name - Specifies the "boot image" filename. Note: CDRWIN is not capable of creating this file, so please refer to [How to create a boot image file](#) before using this feature.

Media Emulation Type - Specifies the type of media to be emulated by the BIOS in your system or SCSI card. Valid types are 1.20Mb Floppy, 1.44Mb Floppy, 2.88Mb Floppy, Harddisk, and Custom.

Warning: Do not use the "Harddisk" emulation type... this option has not been fully implemented yet.

Developer Name - Specifies the name of the developer that created this boot disc. This option can be any string up to 24 characters long.

Load Segment - Specifies the load segment for the initial boot image. If this value is zero, then the system will use the traditional segment of 07C0 (hex). If this value is non-zero, then the system will use the specified segment.

Load Sector Count - Specifies the number of sectors that the system will store at the Load Segment during the initial boot procedure.

Bootable Discs

A bootable disc is just an extension of the standard ISO9660 disc. The only difference is the inclusion of a "sector-by-sector image" of a floppy or harddisk, which is then emulated by your system to behave like the original media it was made from. When your system is booted, the following will happen...

- The system BIOS will scan your CDROM drives for a bootable disc.
- If the bootable disc was created with one of the "floppy" emulation types, then the CDROM drive will become drive A:, while the existing drive A: will become drive B: (if the system already has a B: drive, then it will become inaccessible).

- If the bootable disc was created with the “harddisk” emulation type, then the CDROM drive will replace the existing C: drive.

The floppy or harddrive image on the disc is responsible for booting the PC and loading the necessary CDROM drivers needed to access the ISO9660 files on the disc. The simplest example would be an MSDOS boot floppy with CONFIG.SYS and AUTOEXEC.BAT files which load the required CDROM drivers (including MSCDEX).

Note: Your system or SCSI card must have a BIOS that supports "Bootable CDROM" to use one of these discs (you do not need this BIOS to create a bootable disc, only to use one). You will usually have to change your BIOS settings to enable this support.

Note: Describing how to use the “Custom” emulation type is beyond the scope of this help file. Creating a custom boot image requires extensive knowledge on the BIOS and how to boot a PC.

How to create a boot image file

CDRWIN is not capable of creating the “boot image file” which will be written to the ISO9660 image file. However, this file can be easily made with a disk editor utility, such as “Norton Utilities” DISKEDIT.EXE (available for both DOS and Windows 95).

Before using DISKEDIT, you must first create a boot floppy that functions exactly the way you want it to work when it is written to the CDROM. Try booting your PC with the disk to make sure that it functions properly and loads the correct drivers to access the CDROM drives.

Using “Norton Utilities” DISKEDIT.EXE

Start DISKEDIT.EXE from the MS-DOS command prompt.

Select “Drive” from the “Object” menu. Choose the drive that is to be converted to an image file and click on “OK”.

Select “Physical Sector” from the “Object” menu. Click on “OK”.

Select “Write Object To” from the “Tools” menu.

Select “To a File” and click on “OK”.

Choose a filename and click on “OK”.

“Norton Utilities” is a registered trademark of Symantec Corporation

How to create a "CD Extra" disc

“CD Extra” discs are multisession discs that contain one or more audio tracks in the first session and one data track in the second session. These discs are useful because a normal audio CD player will see the CD as an audio disc and a CDROM drive will see the CD as a data disc (since a multisession compatible drive always sees the last session on the disc first). These type of discs are usually created for multimedia applications.

There is no CDROM recorder (that we know of) that will allow you to write both sessions in disc-at-once recording mode, so the second session must be written in track-at-once recording mode (some recorders will not allow you to write any additional sessions after the first DAO session).

How to create a “CD Extra” disc

Write a cuesheet file for the audio tracks that will be recorded in the first session (see [How to write a CUE SHEET file](#)).

Select the “Record Disc” icon on the main toolbar.

Load the cuesheet file and record the first session (audio tracks) to the blank disc. You must select the “Open New Session” option, so that you will be able to record a second session (if this option cannot be selected, then your recorder is not capable of making a CD Extra disc with this software). See [Record Disc](#) for more information.

Select the “Tools” icon on the main toolbar.

Record the second session (data track) using either the “Build and Record ISO9660 Image File” or the “Record Directories/Files to an ISO9660 Disc” option. Note: Do not use the “Open New Session” option, since this will be the last session on the disc. See [Tools](#) for more information.

Table of Contents

Description

This dialog is used to display a disc's table-of-contents.

Controls

CDROM Reader

Select a CDROM reader device from this list. The selection will only be valid until you close the dialog. To select a permanent default, use the [Settings](#) dialog.

Devices

Click on this button to access the [Settings](#) dialog.

Disc Information - Details about the disc are displayed in this area.

Number of Sessions - Displays the total number of sessions on the disc. *Note: This feature has not been implemented yet and always displays one (1).*

Number of Tracks - Displays the total number of tracks in all sessions.

Total Disc Time - Displays the disc's total running time in minutes, seconds, and frames.

Media Catalog Number - Displays the disc's catalog or UPC number. *Note: The MCN is rarely used on commercial discs.*

Track Information - The disc's table-of-contents is displayed in this area.

Track - Specifies the track number (1 to 99). *Note: Track numbers can start at a number other than one, but all numbers must be sequential after the first track.*

Type - Specifies the track type (Audio, Data, Mode1, or Mode2).

MM:SS:FF - Specifies the starting time of the track in minutes, seconds, and frames.

LBA - Specifies the starting "logical block number" of the track.

Copy Permitted - Specifies whether the "digital copy permitted" subcode flag is set or not.

Pre Emphasis - Specifies whether the "pre-emphasis" subcode flag is set or not.

Four Channel - Specifies whether the "four channel audio" subcode flag is set or not.

ISRC - Displays the track's "International Standard Recording Code". *Note: The ISRC is only valid for audio tracks and is rarely used on commercial discs.*

Read Data Mode

Select this option to enable the reading of all data track modes (select Refresh to reload the table-of-contents).

Read MCN/ISRC

Select this option to enable the reading of MCN and ISRC codes (select Refresh to reload the table-of-contents). *Note: This operation is very slow (approximately 2 seconds per track).*

Refresh

Click on this button to reload the disc's table-of-contents and update the screen.

Close

Click on this button to close the dialog and return to the main toolbar.

Help

Click on this button to activate the Windows help system and load this topic.

Settings

Description

This dialog is used to select the default hardware devices. You can also display the capabilities of the selected CDROM reader and writer.

Controls

CDROM Reader

Select a CDROM reader device from this list. The selection will become the default CDROM reader if you click on the OK button to exit the dialog.

CDROM Recorder

Select a CDROM recorder device from this list. The selection will become the default CDROM recorder if you click on the OK button to exit the dialog.

Disc Transporter

Select a Disc Transporter device from this list. The selection will become the default Disc Transporter if you click on the OK button to exit the dialog.

Device Information

Click on this button to display information about the selected CDROM reader and recorder.

Rescan SCSI Bus

Click on this button to rescan the SCSI bus and refresh the device lists. Note: This option has not been implemented yet.

OK

Click on this button to save the current device selections and close the dialog.

Cancel

Click on this button to close the dialog without saving the selections.

Help

Click on this button to activate the Windows help system and load this topic.

Unlock

Description

This dialog is used to unlock the software from demonstration mode.

Controls

Name

Enter the supplied registration name here. You must enter this information **exactly** as written, including all spaces and upper/lowercase letters.

Company / Email

Enter the supplied company name or Email address here. You must enter this information **exactly** as written, including all spaces and upper/lowercase letters.

Unlock Key

Enter the supplied unlock key.

Check Key

Enter the supplied check key.

Unlock

Click on this button after you have entered all of the required information. If any of the information was entered incorrectly, then an error message will be displayed.

Cancel

Click on this button to cancel the unlock operation.

Help

Click on this button to activate the Windows help system and load this topic.

Advanced Topics

[How to write a CUE SHEET file](#)

[How to copy a disc](#)

[How to copy tracks from one or more discs](#)

[How to create a "CD Extra" disc](#)

[How to create a boot image file](#)

Supported Devices

CDROM Recorders

Creative CDR4210
Grundig CDR100IPW
Hewlett Packard 4020i
Hewlett Packard 6020i/es/ep
Hightech CD-R2000
JVC XR-W2001
JVC XR-W2010/2012
JVC XR-W2020/2022/2626
Kodak PCD200
Kodak PCD225
Kodak PCD600
Memorex CDW-620 (Rewritable)
Mitsumi CR-2401TS
Olympus CDS615E
Olympus CDS620E
Olympus CDS630E *
Panasonic CW-7501
Philips CDD521 *
Philips CDD522
Philips CDD2000
Philips CDD2600
Philips OmniWriter (Rewritable)
Pinnacle RCD1000
Pinnacle RCD5020
Pinnacle RCD5040
Pinnacle RCD4X4
Pioneer DW-S114X
Plasmon RF4100 *
Plasmon CDR4220
Plasmon CDR4240
Plextor PX-R24CS
Ricoh RO-1420C
Ricoh MP6200S/6201S (Rewritable)
Smart & Friendly 2001
Smart & Friendly 2004
Smart & Friendly 2006 *
Smart & Friendly 2006PLUS
Smart & Friendly 4000
Smart & Friendly 4006
Sony CDU920S
Sony CDU924S
Sony CDU926S *
Teac CDR50S
Wearnes CDR-432
Wearnes CDR-632
Yamaha CDR100
Yamaha CDR102
Yamaha CDR200
Yamaha CDR400
Yamaha CRW2260
Yamaha CRW4260

NOTE: * = does not support disc-at-once recording

CDROM Readers

Matsushita CR-504
Matsushita CR-505
Matsushita CR-506
Matsushita CR-507
Matsushita CR-508
Matsushita CR-606
Matsushita CR-8004
Matsushita CR-8012
NEC MultiSpin 3X
NEC MultiSpin 4X
NEC MultiSpin 6X
NEC MultiSpin 8X
NEC MultiSpin 16X
Pioneer DR-U10X
Pioneer DR-U12X
Pioneer DR-U24X
Plextor 4Plex
Plextor 4Plex Plus
Plextor 6Plex
Plextor 8Plex
Plextor 12Plex
Plextor 12/20Plex
Plextor 14/32Plex
Sony CDU-55S
Sony CDU-76S
Sony CDU-415
Teac CD-56S
Teac CD-516S
Toshiba 3401
Toshiba 3401
Toshiba 4100
Toshiba 4101
Toshiba 5901
Toshiba 5901
Toshiba 3501
Toshiba 3601
Toshiba 5201
Toshiba 5301
Toshiba 5401
Toshiba 3701
Toshiba 5601
Toshiba 5701
Toshiba 5801

CDROM Disc Transporters

Kodak Disc Transporter

Windows 95 Tips

Check the settings for all CDROM devices...

- 1) Open the "Control Panel" folder and click on the "System" icon.
- 2) Select the "Device Manager" tab.
- 3) Click on the CDROM icon.
- 4) For each CDROM device in the list...
 - Select the device.
 - Select the "Settings" tab.
 - Disable the "Auto insert notification" option.
 - Enable the "Disconnect" option.
 - Enable the "Sync data transfer" option.
 - Click on "OK"

File Caching...

The following tip can greatly improve CDROM recording performance under Windows 95. This could prevent buffer underruns and other common problems from occurring.

By default, Windows 95 does excessive file caching. This is a waste of CPU time, memory, and possibly disk space, since you will never go back and use anything in the cache.

To fix this problem, do the following...

- 1) Open the file SYSTEM.INI with a text editor
(this file will usually be found in C:\WINDOWS or C:\WIN95).
- 2) Find the section of the file called "[vcache]".
- 3) Add the following lines **after** the "[vcache]" line.

```
minfilecache=512
maxfilecache=4096
```
- 4) Save the file changes.
- 5) Reboot your PC.

Frequently Asked Questions

When I start disc-at-once recording, my system appears to hang for a couple of minutes. Why does this happen?

When using disc-at-once recording mode on all recorders (except any Philips compatible recorder), you may notice that your system appears to hang (i.e. no disk activity) soon after recording begins. Don't panic! This is completely normal. Let me explain why... When you start a DAO recording, the recorder will start accepting data until its internal cache becomes almost full. At this point, it "disconnects" itself from the SCSI bus and starts to write the leadin track automatically. Writing the leadin takes approximately 90 seconds (at 2x speed). Once the leadin has been written, the recorder "reconnects" itself to the SCSI bus and starts writing the first user track beginning with the data that it had buffered prior to writing the leadin. Disk activity will then resume normally. As soon as the last user track has been written, the recorder will once again disconnect itself to write the leadout track and the system will appear to hang again. Some recorders do not exhibit this behavior because it is the responsibility of the application program to write the leadin and leadout tracks. Disconnect and reconnect are features of the SCSI protocol. It allows a device to stop using the SCSI bus during very long operations, so that other devices may use it.

What is "jitter correction"?

When digital audio is read from a CDROM drive, most drives are not capable of positioning the laser at the precise beginning of the data that you are trying to read. This is because there is no extra information in an audio sector to indicate where the sector starts (as there is in a data sector). Because of this positioning error, the drive will either miss a certain number of bytes at the beginning of a sector or read duplicate bytes from the end of the previous sector. The jitter correction algorithm in this software compensates for these positioning errors through the use of overlapped I/Os and a sector comparison scheme.

The only drives that absolutely require jitter correction (to insure a perfect copy) are those made by Toshiba. All other drives supported by this software only require that the audio data be read fast enough to keep the drive's internal buffer from overflowing as it streams data off of the disc. If you are using a very fast drive such as the Plextor 6Plex, then your system might not be able to keep up with the fast transfer rate and a buffer overflow will occur. In these rare cases, you will need to enable jitter correction to compensate for this heavy load. Some drives, such as the Plextor 8Plex and 12Plex have automatic jitter correction built into the firmware.

Note: It is not harmful to explicitly enable jitter correction for any CDROM drive. The worst that will happen is that the audio will be read slower due to the overlapped I/Os.

Why can't I backup all of my discs?

We do not claim that this software will backup every CDROM on the market, as it was not tested with every disc that you might own. Please do not call or send Email because you have one or two discs (out of dozens) that will not copy. This software will continue to be improved in the future.

This software will not copy...

- Multisession discs.
- Discs with multiple data tracks that are not in the same mode (Mode1 or Mode2).
- Discs with a data track stored in the extended pregap of the first audio track.
- Some CD-R discs that were written with track-at-once recording.

This software will also not defeat the **boot protection scheme** on any game console disc (Playstation,

Saturn, 3DO, etc). Please do not contact us regarding the defeating of the boot protection scheme. We will not answer any questions on this subject.

Who manufactured my CDROM recorder?

JVC

JVC XR-W2001 / XR-W2010 / XR-W2020
Pinnacle RCD1000 / RCD5020 / RCD5040
Smart & Friendly 2006PLUS

Matsushita

Creative CDR4210
Panasonic CW-7501 / CW-7502
Plasmon CDR4240

Philips

Grundig CDR100IPW
Hewlett Packard 4020i / 6020i
Kodak PCD200 / PCD225
Mitsumi CR-2401TS
Philips CDD521 / CDD522 / CDD2000 / CDD2600
Plasmon RF4100 / CDR4220
Wearnes Peripheral CDR-432 / CDR-632

Sony

Olympus CDS615E / CDS620E / CDS630E
Smart & Friendly 2001 / 2004 / 2006
Sony CDW900E / CDU920S / CDU924S / CDU926S

Teac

Pinnacle RCD4X4
Teac CDR50S / CDR55S

Yamaha

Smart & Friendly 4000 / 4006
Yamaha CDR100 / CDR102 / CDR200 / CDR400

Miscellaneous

Kodak PCD600
Pioneer DW-S114X
Plextor PX-R24CS
Ricoh RO-1420C
Ricoh 6200S / 6201S
Sanyo CRD-R24S

How to copy a disc

STEP ONE

Load the disc that you wish to copy into your CDROM drive.

Select "Copy Disc" from the main toolbar.

Select the CDROM reader from the device list.

Select the "Data/Audio Track Settings" (see [Recommended Transfer Settings](#)).

Select the "Subcode Options" and "Reading Speeds".

Click on "Next >" to proceed to the next step.

Note: When copying any disc that has audio tracks (especially some game discs), always use the "Auto" or "Some" subcode option. If you don't, then the audio tracks on some game discs may not play properly.

STEP TWO

Select the "Copy to Image File and Record" option. This will copy the disc to your harddrive and then automatically record a new disc. You will be prompted to insert a blank disc into the recorder before recording actually begins.

Select the CDROM recorder from the device list.

Select the destination "Image File" name. You can also select the "Delete Files at Completion" option to automatically delete the image file after recording has completed. *Warning: This file could need as much as 750 megabytes of disk space.*

Click on "Finish" to start the actual copy operation.

How to copy tracks from one or more discs

The following procedure will allow you to create an AUDIO or CD+G disc that is composed of tracks from one of more discs...

STEP ONE

Load an audio disc into your CDROM drive.

Select "Copy Disc" from the main toolbar.

Click on "Copy Tracks" and use the "track selection grid" to choose the tracks to copy. (if you are copying tracks from a CD+G disc, then you will must also select the CD+G option in the "Audio Track Settings" box).

Click on "Next >"

Select the "Name Sequentially" option.

Enter a filename into the "Image File" editbox (such as TEST). Each track will be written to a sequentially named file... TEST01.WAV, TEST02.WAV, TEST03.WAV, etc (CD+G image files will be created with the .BIN extension).

Note: All files will be written to the default CDRWIN directory. To change this, click on the "Browse..." button and change the default directory/folder ("Save Settings" will save the selected default directory).

Repeat all of the above steps for each disc that you wish to copy tracks from. Remember to use a different directory or filename each time so that you don't attempt to create more than one file with the same name.

STEP TWO

Write a cuesheet file (see [How to write a CUE SHEET file](#)) that specifies the order in which the tracks are to be recorded. The files will be recorded "back to back" with no additional gaps between them. Here is an example cue sheet...

```
FILE C:\CDRWIN\TEST01.WAV WAVE
  TRACK 01 AUDIO
  INDEX 01 00:00:00
FILE C:\CDRWIN\TEST02.WAV WAVE
  TRACK 02 AUDIO
  INDEX 01 00:00:00
FILE C:\CDRWIN\TEST03.WAV WAVE
  TRACK 03 AUDIO
  INDEX 01 00:00:00
```

Note: For CD+G discs, all file types must be changed from WAVE to BINARY, all file name extensions must be changed from .BIN to .WAV, and all track types must be changed from AUDIO to CDG. For example...

```
FILE C:\CDRWIN\TEST01.BIN BINARY
  TRACK 01 CDG
  INDEX 01 00:00:00
```

STEP THREE

Record the new disc...

Select "Record Disc" from the main toolbar.

Select a CDROM recorder.

Load a blank disc into the recorder.

Click on "Load Cue Sheet" and select the cuesheet file created in STEP TWO.

Select the appropriate recording options.

Click on "Start Recording".

How to write a CUE SHEET file

The cuesheet file is the *heart* of disc-at-once recording. This file defines all of the files to be recorded and the starting time of each track/index. This file gives you complete control over the layout of the disc. You can control the spacing between tracks, plus define subindexes, pregaps, postgaps, media catalog numbers, and ISRCs.

Cuesheet files are standard text (ASCII) files. They can be written with any text editor or word processor such as “WordPad”, “Notepad”, “Microsoft Word”, “DOS EDIT”, etc. However, you must make sure that you save all cuesheet files in “Text” format (do not save in document or any other non-text format). The recommended file extensions are either “.CUE” or “.TXT”.

Note: If you expect to use this software to its fullest extent, then you must learn how to write (or at least understand) cuesheet files. After you've written one or two cuesheets, you will find that they are extremely powerful and easy to use.

[Command Syntax](#)

[Examples](#)

[Common Problems](#)

Command Syntax

CATALOG

FILE

TRACK

INDEX

FLAGS

PREGAP

POSTGAP

ISRC

REM

CATALOG Command

Description:

This command is used to specify the disc's "Media Catalog Number". It will typically be used only when mastering a CDROM for commercial production.

Syntax:

```
CATALOG <media-catalog-number>
```

Examples:

```
CATALOG 1234567890123  
CATALOG 8340218374610
```

Rules:

The catalog number must be 13 digits long and is encoded according to UPC/EAN rules. This command can appear only once in the CUE SHEET file (it will usually be the first line, but this is not mandatory).

FILE Command

Description:

This command is used to specify a data/audio file that will be written to the recorder.

Syntax:

```
FILE <filename> <filetype>
```

Parameters:

filename - Filename (can include device/directory)

filetype - Filetype

The following filetypes are allowed...

BINARY- Intel binary file (least significant byte first)

MOTOTOLA - Motorola binary file (most significant byte first)

AIFF - Audio AIFF file (must be 44.1KHz 16-bit stereo)

WAVE - Audio WAVE file (must be 44.1KHz 16-bit stereo)

Examples:

```
FILE C:\CDR\TRACK2.WAV WAVE
```

```
FILE C:\CDR\TRACK1.ISO BINARY
```

Rules:

FILE commands must appear before any other command except CATALOG.

Note: For AUDIO files only, if the length of the file is not an exact multiple of 2352 bytes, then the last sector will be padded with zeros.

TRACK Command

Description:

This command is used to start a new TRACK.

Syntax:

```
TRACK <number> <datatype>
```

Parameters:

number - Track number (1-99)

datatype - Track datatype

The following datatypes are allowed...

| | |
|------------|-----------------------------|
| AUDIO | - Audio/Music (2352) |
| CDG | - Karaoke CD+G (2448) |
| MODE1/2048 | - CDROM Mode1 Data (cooked) |
| MODE1/2352 | - CDROM Mode1 Data (raw) |
| MODE2/2336 | - CDROM-XA Mode2 Data |
| MODE2/2352 | - CDROM-XA Mode2 Data |
| CDI/2336 | - CDI Mode2 Data |
| CDI/2352 | - CDI Mode2 Data |

Supported datatypes and blocksizes by recorder model...

| | AUDIO 2352 | AUDIO 2448 | MODE1 2048 | MODE1 2352 | MODE2 2336 | MODE2 2352 |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|
| JVC | Yes | No | Yes | No | Yes | No |
| OLYMPUS | Yes | No | Yes | Yes | Yes | Yes |
| PANASONIC | Yes | Yes | Yes | Yes | Yes | Yes |
| PHILIPS | Yes | No | No | Yes | No | Yes |
| PINNACLE | Yes | No | Yes | No | Yes | No |
| RICOH | Yes | No | No | Yes | No | Yes |
| SONY | Yes | No | Yes | Yes | Yes | Yes |
| YAMAHA | Yes | Yes | Yes | Yes | Yes | Yes |

Examples:

```
TRACK 1 MODE1/2048
```

```
TRACK 20 AUDIO
```

Rules:

All track numbers must be between 1 and 99 inclusive. The first track number can be greater than one, but all track numbers after the first must be sequential. You must specify at least one track per file.

INDEX Command

Description:

This command is used to specify indexes (or subindexes) within a track.

Syntax:

```
INDEX <number> <mm:ss:ff>
```

Parameters:

`number` - Index number (0-99).

`mm:ss:ff` - Starting time in minutes, seconds, and frames (75 frames/second) . *Note: All times are relative to the beginning of the current file.*

Example:

```
INDEX 01 00:00:00  
INDEX 05 02:34:50
```

Rules:

All index numbers must be between 0 and 99 inclusive. The first index must be 0 or 1 with all other indexes being sequential to the first one. The first index of a file must start at 00:00:00.

INDEX 0 Specifies the starting time of the track "pregap".

INDEX 1 Specifies the starting time of the track data. This is the only index that is stored in the disc's table-of-contents.

INDEX > 1 Specifies a subindex within a track.

FLAGS Command

Description:

This command is used to set special subcode flags within a track. These flags are rarely used on any discs made today.

Syntax:

```
FLAGS <flags>
```

Parameters:

`flags` - Specifies one or more track flags.

The following flags are allowed...

| | |
|-----|--------------------------|
| DCP | - Digital copy permitted |
| 4CH | - Four channel audio |
| PRE | - Pre-emphasis |

Example:

```
FLAGS DCP  
FLAGS 4CH PRE
```

Rules:

The FLAGS command must appear after a TRACK command, but before any INDEX commands. Only one FLAGS command is allowed per track.

Note: There is a fourth subcode flag called "DATA" which is set for all non-audio tracks. This flag is set automatically based on the datatype of the track.

PREGAP Command

Description:

This command is used to specify the length of a track pregap. The pregap is generated internally by DAO. No data is consumed from the current data file.

Syntax:

```
PREGAP <mm:ss:ff>
```

Parameters:

mm:ss:ff - Specifies the pregap length in minutes, seconds, and frames.

Examples:

```
PREGAP 00:02:00
```

Rules:

The PREGAP command must appear after a TRACK command, but before any INDEX commands. Only one PREGAP command is allowed per track.

POSTGAP Command

Description:

This command is used to specify the length of a track postgap. The postgap is generated internally by DAO. No data is consumed from the current data file.

Syntax:

```
POSTGAP <mm:ss:ff>
```

Parameters:

mm:ss:ff - Specifies the postgap length in minutes, seconds, and frames.

Example:

```
POSTGAP 00:02:00
```

Rules:

The POSTGAP command must appear after all INDEX commands for the current track. Only one POSTGAP command is allowed per track.

ISRC Command

Description:

This command is used to specify a track's "International Standard Recording Code" (ISRC). It will typically be used only when mastering a CD for commercial disc production.

Syntax:

```
ISRC <code>
```

Examples:

```
ISRC ABCDE1234567
```

Rules:

The ISRC must be 12 characters in length. The first five characters are alphanumeric, but the last seven are numeric only. If it is used, the ISRC command must be specified after a TRACK command, but before any INDEX commands.

REM Command

Description:

This command is used to put comments in your CUE SHEET file.

Syntax:

```
REM <comment>
```

Example:

```
REM This is a comment
```

Rules:

None.

Example Cue Sheets

EXAMPLE #1 - Audio disc from a single data file with no "pause areas" between tracks.

```
FILE C:\MYAUDIO.WAV WAVE
  TRACK 01 AUDIO
    INDEX 01 00:00:00
  TRACK 02 AUDIO
    INDEX 01 05:50:65
  TRACK 03 AUDIO
    INDEX 01 09:47:50
  TRACK 04 AUDIO
    INDEX 01 15:12:53
  TRACK 05 AUDIO
    INDEX 01 25:02:40
  TRACK 06 AUDIO
    INDEX 01 27:34:05
  TRACK 07 AUDIO
    INDEX 01 31:58:53
  TRACK 08 AUDIO
    INDEX 01 35:08:65
```

EXAMPLE #2 - Audio disc from multiple data files (one track per file) with no "pause areas" between tracks.

```
FILE C:\TRACK1.WAV WAVE
  TRACK 01 AUDIO
    INDEX 01 00:00:00
FILE C:\TRACK2.WAV WAVE
  TRACK 02 AUDIO
    INDEX 01 00:00:00
FILE C:\TRACK3.WAV WAVE
  TRACK 03 AUDIO
    INDEX 01 00:00:00
FILE C:\TRACK4.WAV WAVE
  TRACK 04 AUDIO
    INDEX 01 00:00:00
```

The files will be recorded continuously with no gaps between them. However, if any file is not an exact multiple of the CDROM sector size (2352 bytes), then the last sector will be automatically padded with zeros. This could result in a gap between tracks with a maximum length of 1/75th second.

EXAMPLE #3 - Audio disc using multiple data files (multiple tracks per file) with no "pause areas" between tracks.

```
FILE C:\TRACK1.WAV WAVE
  TRACK 01 AUDIO
    INDEX 01 00:00:00
  TRACK 02 AUDIO
    INDEX 01 05:50:65
  TRACK 03 AUDIO
    INDEX 01 09:47:50
  TRACK 04 AUDIO
    INDEX 01 15:12:53
FILE C:\TRACK2.WAV WAVE
```

```

TRACK 05 AUDIO
  INDEX 01 00:00:00
TRACK 06 AUDIO
  INDEX 01 02:31:40
TRACK 07 AUDIO
  INDEX 01 06:56:13
TRACK 08 AUDIO
  INDEX 01 10:06:25

```

Note: All times are relative to beginning of current file

EXAMPLE #4 - Audio disc with "pause areas" between tracks.

```

FILE C:\MYAUDIO1.WAV WAVE
TRACK 01 AUDIO
  INDEX 01 00:00:00
TRACK 02 AUDIO
  INDEX 00 05:49:65 ; 1 second pregap
  INDEX 01 05:50:65
TRACK 03 AUDIO
  INDEX 00 09:45:50 ; 2 second pregap
  INDEX 01 09:47:50
TRACK 04 AUDIO
  INDEX 00 15:09:53 ; 3 second pregap
  INDEX 01 15:12:53

```

The pause areas are written with data from the current file. It is not required that this data be "digital silence" (all zeros).

The first track always begins with a mandatory two second pregap. This is required by the CDRom specification and is generated automatically by the software.

EXAMPLE #5 - Using the PREGAP command.

```

FILE C:\MYAUDIO1.WAV WAVE
TRACK 01 AUDIO
  PREGAP 00:01:00 ; adds an additional one second to
  INDEX 01 00:00:00 ; the first track pregap.
FILE C:\MYAUDIO2.WAV WAVE
TRACK 02 AUDIO
  PREGAP 00:02:00
  INDEX 01 00:00:00
FILE C:\MYAUDIO3.WAV WAVE
TRACK 03 AUDIO
  PREGAP 00:01:00
  INDEX 00 00:00:00
  INDEX 01 00:01:00

```

The pregaps that are written as a result of the PREGAP command are always generated internally by DAO. They do not consume data from the current file. It is possible to mix the source of the pregaps as shown in TRACK 03... one second of pregap will be generated internally and another second will be consumed from the file. All pregaps that are generated internally contain "digital silence" (all zeros).

EXAMPLE #6 - Using the CATALOG, ISRC, and INDEX commands.

```

CATALOG 3898347789120
FILE C:\MYAUDIO1.WAV WAVE
TRACK 01 AUDIO

```

```
ISRC ABCDE1234567
INDEX 01 00:00:00
INDEX 02 02:00:00
INDEX 03 04:00:00
FILE C:\MYAUDIO2.WAV WAVE
TRACK 02 AUDIO
ISRC XYZZY0000000
INDEX 01 00:00:00
TRACK 03 AUDIO
ISRC 123456789012
INDEX 00 03:00:00
INDEX 01 03:02:00
INDEX 02 05:34:32
INDEX 03 08:12:49
INDEX 04 10:01:74
```

EXAMPLE #7 - Single track DATA disc (cannot be used for Philips compatible recorders).

```
FILE C:\MYDATA.ISO BINARY
TRACK 01 MODE1/2048
INDEX 01 00:00:00
POSTGAP 00:02:00 ; Must add postgap to track!
```

EXAMPLE #8 - Single track DATA disc (using a RAW image file).

```
FILE C:\MYDATA.RAW BINARY
TRACK 01 MODE1/2352
INDEX 01 00:00:00
POSTGAP 00:02:00 ; Must add postgap to track!
```

EXAMPLE #9 - Mixed-mode Disc (one data track and three audio tracks).

```
FILE C:\MYDATA.ISO BINARY
TRACK 01 MODE1/2048
INDEX 01 00:00:00
POSTGAP 00:02:00
FILE C:\MYAUDIO.WAV WAVE
TRACK 02 AUDIO
PREGAP 00:02:00
INDEX 01 00:00:00
TRACK 03 AUDIO
INDEX 01 05:50:65
TRACK 04 AUDIO
INDEX 01 09:47:50
```

EXAMPLE #10 - Mixed-mode Disc (two data tracks and four audio tracks).

```
FILE C:\MYDATA1.ISO BINARY
TRACK 01 MODE1/2048
INDEX 01 00:00:00
FILE C:\MYDATA2.ISO BINARY
TRACK 02 MODE1/2048
INDEX 01 00:00:00
POSTGAP 00:02:00
FILE C:\TRACK1.WAV WAVE
TRACK 03 AUDIO
```

```
PREGAP 00:02:00
INDEX 01 00:00:00
FILE C:\TRACK2.WAV WAVE
TRACK 04 AUDIO
INDEX 01 00:00:00
FILE C:\TRACK3.WAV WAVE
TRACK 05 AUDIO
INDEX 01 00:00:00
FILE C:\TRACK4.WAV WAVE
TRACK 06 AUDIO
INDEX 01 00:00:00
```

Note: You must have a PREGAP (minimum of 2 seconds) between the last data track and the first audio track.

Common Problems

INDEX TIMES - Track times are specified in minutes, seconds, and frames (e.g. 02:48:25). There are 75 frames per second. If you are using a WAVE file editor to get your audio track times, it probably doesn't display the times in this format, so you will have to convert them. Most editors display time in either 30 frames per second or in hundredths/thousandths of a second.

TRACKS LESS THAN 4 SECONDS LONG - The CDROM specification does not allow any tracks or indexes (other than index zero) to be less than four seconds long. This software will warn you about any tracks that violate this rule. Most recorders will refuse to write a CD with this violation.

PREGAPS GREATER THAN 3 SECONDS LONG - Some recorders will refuse to record a disc with any pregaps that exceed three seconds in length. On the first track, you automatically get a pregap of two seconds, which is required by the CDROM spec. Unless you are doing something very unusual, you should never need to extend the pregap of the first track (i.e. don't use the PREGAP command on the first track).

FILE DATA LENGTH IS NOT A MULTIPLE OF THE CDROM SECTOR SIZE - If you are using an audio (WAV) file where the length of the data is not an exact multiple of the CDROM sector size (2352), then the last sector will be padded with zeros when it is written to the recorder. This can cause a tiny "tick" between tracks. If you are making a disc from a live recording that has been broken up into several files, then you must make sure that each file is an exact multiple of the CDROM sector size. Otherwise, there will not be a perfectly seamless transition between tracks.

Contact Information

Technical support is free to all registered users for one year...

Golden Hawk Technology
125 Indian Rock Road
Merrimack, NH 03054
USA

Phone : 603-429-1027
FAX : 603-429-0073
Web : www.goldenhawk.com
Email : jarnold@goldenhawk.com

If you have any problems to report, please include as much detail about your system as possible.

