CDRWIN – CDROM Recording Tools
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Getting Started

Main Toolbar

After starting CDRWIN, the main toolbar will appear on the screen… This is the launching point for all operations within the software. If you hold your mouse cursor over any of the icons, a message will be displayed telling you what operation is controlled by each icon.

- **Record Disc -** Used to record a new CD-R disc using a cuesheet and image file(s) on your harddrive. This screen can also be used to make additional copies of any disc that was previously copied to your harddrive using the "Extract Disc" screen.

- **Backup Disc -** Used to backup an existing disc to your CDROM recorder. Discs can be either copied to a temporary image file and then recorded, or copied directly to the recorder "on the fly".

- **Extract Disc/Tracks/Sectors -** Used to perform all disc extraction operations to an image file. This includes copying the entire disc, copying one or more tracks, or copying a range of sectors. If the entire disc is being copied, then CDRWIN will also create a cuesheet file for you automatically. There are many advanced options on this screen for doing virtually any type of copy operation supported by your hardware.

- **File Backup and Tools -** Used to backup directories/files from your harddrive to an ISO9660 compatible disc. This screen is also used to perform other miscellaneous disc operations (such as finalizing a disc, erasing a disc, etc.).

- **Devices and Settings -** Used to select the devices and settings that will be used by the software.

- **Table of Contents -** Used to display the table-of-contents (TOC) of an existing disc.

- **CD-TEXT Editor** - This icon will activate the graphical CD-TEXT editor, which will let you input all of the information to be encoded onto a CD-TEXT enhanced disc. This is a relatively new feature that was added to the audio disc specification by Sony/Philips. Only a few CDROM recorders support this feature and you will also need one of the newer CD players that support CD-TEXT to display the information. *NOTE: The CD-TEXT editor will eventually become part of the more advanced "graphical cuesheet editor" which we are developing for a future version.*

- **Sector Viewer -** Used to display individual data sectors on a disc (advanced users only).

- **Help -** Activates the online help file.

- **Unlock Program -** Unlocks the software using the keys supplied to you.

- **Exit Program -** Closes the toolbar window and exits the program.

Windows 95/98 Setup

1) Open the "Control Panel" folder and click on the "System" icon.

2) Select the "Device Manager" tab.

3) Click on the CDROM icon to display the list of CD reader/writer devices on your system.

4) For each device in the list...
    Select the device.
    Select the "Settings" tab.
    Enable the "Disconnect" option.
    Disable the "Auto insert notification" option.
    Click on "OK"

Windows NT Setup

Make sure that "Auto insert notification" is disabled. If it's not, you can disable it by changing the following value in the system registry to zero.

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Cdrom\Autorun=0
```

Windows 95/98 ASPI Drivers

If you have an Adaptec SCSI card and are unable to run our software under Windows 95/98, then download and install the latest drivers from Adaptec's FTP site...

```
ftp://ftp.adaptec.com/pub/BBS/win95/win95mpd.exe
ftp://ftp.adaptec.com/pub/BBS/win95/aspi32.exe
```

If you do not own an Adaptec SCSI card or wish to use an IDE drive or recorder, then you can get the required ASPI drivers from the following FTP sites...

```
ftp://ftp.tardis.ed.ac.uk/users/psyche/cdrom/drivers/aspiw95.exe
ftp://grc.com/aspi_me.exe
```

The following files will be installed/updated on your system...

```
WINDOWS\SYSTEM\ASPIENUM.VXD
WINDOWS\SYSTEM\WINASPI.DLL
WINDOWS\SYSTEM\WNASPI32.DLL
WINDOWS\SYSTEM\IOSUBSYS\APIX.VXD
```

Windows NT ASPI Drivers

If you have an Adaptec SCSI card and are unable to run our software under Windows NT, then download and install the latest drivers from Adaptec's FTP site...

```
ftp://ftp.adaptec.com/pub/BBS/winnt/aspi32.exe
```

If you do not own an Adaptec SCSI card or wish to use an IDE CDROM drive or recorder, then you can get the required ASPI drivers from the following FTP site...

```
ftp://grc.com/aspi_me.exe
```

The following files will be installed/updated on your system...

```
WINNT40\SYSTEM\WINASPI.DLL
WINNT40\SYSTEM\WOWPOST.EXE
WINNT40\SYSTEM32\WNASPI32.DLL
WINNT40\SYSTEM32\DRIVERS\ASPI32.SYS
```

You must also make sure that you have the proper ATAPI device driver and that it is being started on your system at bootup...

> 1) Open the "Control Panel" folder and click on the "Devices" icon.
>
> 2) Find the ATAPI entry in the device driver list.
>
> 3) If the status is **not** set to "Started", then highlight the ATAPI entry and click on the "Startup..." button. Select either the "Boot", "System", or "Automatic" option.

Warning: The `ATAPI.SYS` driver for NT 4.0 Service Pack 3 has a bug that prevents our software from operating correctly with ATAPI CDROM devices. The fixed driver can be found at...

> `http://www.goldenhawk.com/support/bmnt4.zip`

Copy the new `ATAPI.SYS` driver into the `WINNT\SYSTEM32\DRIVERS` directory.

File/Disc Caching

We strongly recommend that you enable the <u>File/Disc Caching</u> feature on the <u>Devices and Settings</u> screen. This will greatly reduce the possibility of "buffer underruns" and also make efficient use of your CPU and other system resources.

Record Disc

Description

This dialog is used to record a new 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 when making a custom data or audio disc (see <u>How to write a CUE SHEET file</u>), or generated automatically for an existing disc by the <u>Extract Disc/Tracks/Sectors</u> dialog.

Note: This dialog is **not** used to make a copy of an existing CDROM disc (please refer to the help section for <u>Backup Disc</u>).

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 <u>Devices and Settings</u> 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 (MAX will select the maximum speed for the currently selected recorder device).
  Use Disc Transporter - Enables the use of the "Kodak Disc Transporter" (or other supported transporter device)   to make multiple copies of the same disc.

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

Load Tracks...
  Click on this button to activate the <u>Load Tracks</u> dialog. This is used to specify a list of audio or CD+G tracks (when making a compilation disc) to be recorded without having to write a cuesheet file. The order of the files in the list is the order that they will be recorded on the disc. You can use "drag and drop" to load files from the Windows Explorer or to change the order of the files in the list.

Disc Layout...
  Click on this button to activate the <u>Disc Layout</u> 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" too.

Save Settings
Click on this button to save the current settings in the Windows 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.

Load Tracks

Description

This dialog is used to load a list of files (tracks) for making AUDIO or CD+G compilation discs without having to write cuesheet file first. The order of the files in the list is the order that they will be recorded on the disc. You can also use "drag and drop" to load files from the Windows Explorer or to change the order of the files in the list.

Controls

Disc Type
 Selects the type of disc to be recorded (AUDIO or CD+G).

Add
 Click on this button to add a new file (track) to the end of the list.

Delete
 Click on this button to delete the currently selected file in the track list.

Clear
 Click on this button to clear all files from the track list.

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.

Backup Disc

Description

This dialog is used to backup an existing disc to your CDROM recorder. Discs can be either copied to a temporary image file (on your harddrive) and then recorded, or copied directly from your CDROM drive to the recorder.

This software will **not** copy…
- Multisession discs (including CD-Extra and Photo CDs).
- Discs with a data track stored in the extended pregap of the first audio track (very rare).
- Some CD-R discs that were written with track-at-once recording.

Controls

Backup Mode
> **Copy to Image and Record -** Select this option to copy the disc to a temporary image file on your harddrive and then record the disc automatically. This method is the safest way to copy a disc that may have errors or other problems. We recommend that you use this option until you become familiar with how this software operates.
> **Copy Directly to CD Recorder -** Select this option to copy the disc directly to the CD recorder (i.e. on the fly) without creating an image file first (please read <u>Copying discs on-the-fly</u> before attempting this operation).

Image Disk
> Used to select a disk (harddrive) for storing temporary image files of the disc being backed up. The drive's capacity and freespace are displayed to help you select a drive that has enough space to store the image file. At the end of the recording process, these temporary files will be automatically deleted.

CD Reader
> Used to select the CDROM reader containing the disc to be backed up. The selection will only be valid until you close the dialog. To select a new default reader, click on the browse button to activate the <u>Devices and Settings</u> dialog.

CD Recorder
> Used to select the CDROM recorder that will be used to write the new disc. The selection will only be valid until you close the dialog. To select a new default recorder, click on the browse button to activate the <u>Devices and Settings</u> dialog.

Transporter
> Used to select the "disc transporter" device that will be used to exchange your discs when making multiple copies. The selection will only be valid until you close the dialog. To select a new default transporter, click on the browse button to activate the <u>Devices and Settings</u> dialog.

Reading Options
> **Copy RAW Sectors** - When copying a disc with one of more data tracks, this option specifies whether the RAW reading mode should be used. When the RAW reading mode is enabled, all tracks will be read with a block length of 2352. If this option is not selected, then all Mode1 and Mode2 data tracks will be read with a block length of 2048 and 2336 respectively. See <u>Recommended Transfer Settings</u> for more details. *Note: This option has no affect when copying audio or CD+G tracks.*

> **Copy CD+Graphics** - Select this option to enable the copying of CD+G (Karaoke) discs. If you do not select this option when copying a CD+G disc, then the graphics information will be missing from the

backup. *Note: This option has no affect when copying data discs.*

Copy CD-TEXT - Select this option to copy the CD-TEXT information (titles, songwriters, composers, etc) from a CD-TEXT compatible audio disc (only a few CDROM drives and recorders support this feature). *Note: This option has no affect when copying data discs.*

Copy MCN/ISRC - Select this option to copy 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) and is not supported by all devices.*

Error Recovery
    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 audio or non-raw data sectors, this option is identical to "Replace"). *Note: Some recorders do not support the writing of unreadable data sectors (they will be corrected before being written).*
    Replace - Replace the unreadable sector with a readable one (the sector will contain all zeros) and continue reading the disc.

Jitter Correction
    Automatic - The software will automatically choose the best setting.
    Enabled - Explicitly enables the "jitter correction" algorithm.
    Disabled -   Explicitly disables the "jitter correction" algorithm.

Subcode Analysis
    Auto - Automatically selects the best analysis mode for the selected CD reader. If the device supports the reading of subcodes, then the "Quick" 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 CD reader does not support the reading of subcodes).
    Disable -   Disables all subcode analysis.
    Quick - Only the pregaps (Index 0) of each track will be analyzed. This option is recommended for over 99% of the discs that you are likely to encounter.
    Full - All subcodes on the disc will be analyzed. This option is only useful for discs that contain index numbers greater than one (extremely rare). *Note: This operation is very slow since every sector on the disc must be read and analyzed.*

Audio Speed - Select the audio reading speed from this list.

Data Speed - Select the data reading speed from this list.

Read Retry Count - Specifies the maximum number of times to retry a failed read operation. This feature is not supported by all CDROM devices.

Subcode Threshold - Specifies the maximum pregap length that is likely to be encountered. The default setting of 300 is recommended for over 99% of the discs that you are likely to encounter (the higher the number, the more time it will take to analyze 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 Only - 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 - Sets the recording speed (MAX will select the maximum speed supported by the currently selected CD recorder).

Number of discs to backup - Selects the number of original discs that you wish to backup. You will be prompted to insert the next original disc at the appropriate time.

Number of copies of each disc - Selects the number of copies that you wish to make of each original disc. You will be prompted to insert the next blank disc at the appropriate time.

Disc Transporter Mode - Enables the use of the "Kodak Disc Transporter" (or other supported transporter device)   to make multiple copies of the same disc.

Start
Click on this button to start the extract operation.

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.

Eject Disc
Click on this button to eject the disc from the currently selected CDROM reader.

Load Disc
Click on this button to load the disc (close the tray) on the currently selected CDROM reader. *Note: This option will not work on caddy based devices.*

Restore Defaults
Click on this button to restore the default screen 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 screen settings in the Windows registry.

Extract Disc/Tracks/Sectors

Description

This dialog is used to…
- Extract an entire disc (creates both image and cuesheet files).
- Extract one or more tracks
- Extract a range of data/audio sectors
- Check a disc for readability only

This software will **not** copy…
- Multisession discs (including CD-Extra and Photo CDs).
- Discs with a data track stored in the extended pregap of the first audio track (very rare).
- Some CD-R discs that were written with track-at-once recording.

Controls

Extract Mode
Disc Image/Cuesheet - This option is used to extract the entire disc to an image file and automatically create a cuesheet.

Select Tracks - This option is used to extract one or more tracks from the disc. The "Track Selection" grid is used to select the tracks to be copied.

Select Sectors - This option is used to extract a range of data/audio sectors from the disc. The "Sector Selection" options are used to select which sectors are to be copied.

Read Disc Only - This option is used to check the entire disc for readability (no image file is created). Any reading errors will be reported.

CD Reader
Used to select the CDROM reader containing the disc to be copied. The selection will only be valid until you close the dialog. To select a new default reader, click on the browse button to activate the Devices and Settings dialog.

Image Filename
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 you have selected the "Disc Image/Cuesheet" option,   then a cuesheet file will also be created with the same name, but with the extension ".CUE".

File Format - Used to select the format of the image file.
AUTOMATIC - The software will select the file format automatically based on what type of data is being copied. When copying audio, the default file type is WAVE. For all other operations, the default file type is INTEL.

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.

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.

Name Sequentially - Select this option to uniquely name each image file with a sequential number starting at 1. For example, if you are copying tracks 5 and 8 using the image filename `TRACK.WAV`, then the two files created 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. Using the above example, the two files created will be named `TRACK05.WAV` and `TRACK08.WAV`.

Sector Selection

Start/End - Specifies 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 Options

Copy RAW - When copying a disc with one of more data tracks, this option specifies whether the RAW reading mode should be used. When the RAW reading mode is enabled, all tracks will be read with a block length of 2352. If this option is not selected, then all Mode1 and Mode2 data tracks will be read with a block length of 2048 and 2336 respectively. See <u>Recommended Transfer Settings</u> for more details. *Note: This option has no affect on audio or CD+G tracks.*

Copy CD+G - Select this option to enable the copying of CD+G (Karaoke) discs. If you do not select this option when copying a CD+G disc, then the graphics information will be missing from the image file. *Note: This option has no affect on data discs.*

Copy CD-TEXT - Select this option to copy the CD-TEXT information from a CD-TEXT compatible audio disc (only a few CDROM drives and recorders support this feature). *Note: This option has no affect on data discs.*

Copy MCN/ISRC - Select this option to copy 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) and is not supported by all devices.*

Error Recovery

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

Ignore - Replace any unreadable sector with another unreadable sector and continue reading the disc. This option is only applicable to raw data sectors (for audio or non-raw data sectors, this option is identical to "Replace"). *Note: Some recorders do not support the writing of unreadable data sectors.*

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

Jitter Correction

Automatic - The software will automatically choose the best setting.

Enabled - Explicitly enables the "jitter correction" algorithm.

Disabled -   Explicitly disables the "jitter correction" algorithm.

Subcode Analysis

Auto - Automatically selects the best analysis mode for the selected CD reader. If the device supports the reading of subcodes, then the "Quick" 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 CD reader does not support the reading of subcodes).
Disable - Disables all subcode analysis.
Quick - Only the pregaps (Index 0) of each track will be analyzed. This option is recommended for over 99% of the discs that you are likely to encounter.
Full - All subcodes on the disc will be analyzed. This option is only useful for discs that contain index numbers greater than one (extremely rare). *Note: This operation is very slow since every sector on the disc must be read and analyzed.*

Audio Speed - Select the audio reading speed from this list.

Data Speed - Select the data reading speed from this list.

Read Retry Count - Specifies the maximum number of times to retry a failed read operation. This feature is not supported by all CDROM devices.

Subcode Threshold - Specifies the maximum pregap length that is likely to be encountered. The default setting of 300 is recommended for over 99% of the discs that you are likely to encounter (the higher the number, the more time it will take to analyze the disc).

Eject
Click on this button to eject the disc from the currently selected CDROM reader.

Load
Click on this button to load the disc (close the tray) on the currently selected CDROM reader. *Note: This option will not work on caddy based devices.*

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

Start
Click on this button to start the extract operation.

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.

Restore Defaults
Click on this button to restore the default screen 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 screen settings in the Windows registry.

Recommended Transfer Settings

General Information

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 only 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.

Transfer Mode Restrictions

WARNING: You must use the "Copy RAW Sectors" option when reading any data disc that is to be recorded on the following CD recorders. These models do not support the writing of non-raw data sectors in disc-at-once recording mode.

```
Grundig CDR100IPW
Hewlett Packard 4020, 6020, 7100, 7200
Kodak PCD225, PCD600
Memorex CDW-620
Mitsubishi CDW226
Mitsumi CR-2401TS
Philips CDD522, CDD2000, CDD2600
Philips OmniWriter
Plasmon CDR4220
Plextor PX-R24CS
Ricoh RO-1420C, MP6200S/6201S
Wearnes CDR-432, CDR-632
```

WARNING: You must use the "Copy RAW Sectors" option when reading any mixed mode disc (a disc with both data and audio) that is to be recorded on the following CD recorders. These models do not support writing tracks with different block lengths in disc-at-once recording mode.

```
JVC XR-W2020/2022/2626
Pinnacle RCD4X4
Smart&Friendly 2006PLUS
Teac CDR50S
```

WARNING: You must **not** use the "Copy RAW Sectors" option when reading any data disc that is to be recorded on the following CD recorders. These models do not support the writing of raw data sectors in disc-at-once recording mode.

```
JVC XR-W2010/2012
Pinnacle RCD5040
```

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.

NOTE: The "disc spindown" problem can be solved for a majority of reader/writer combinations by enabling the File/Disc Caching feature on the Devices and Settings screen. This will not work for all recorders due to the way that some models buffer data at the start of a disc-at-once recording operation.

File Backup and 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/discs only).

Note: This dialog is **not** used to make backups of existing CDROM discs. Please refer to the <u>Backup Disc</u> dialog.

Controls

Backup/Tool Operation - Select the required operation from this list.

Directories to Backup - Specifies the list of directories to be built into an ISO9660 image file. You can add directories to the list with either the "Add…" button or by using "drag and drop" to load directory names from the Windows Explorer. The "Delete" and "Clear" buttons can be used to delete one name from the list or clear the entire list.

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 <u>Devices and Settings</u> dialog.

Directory Options
> **Preserve Full Pathnames** - Select this option to preserve the full pathname of every directory specified in the "Directories to Backup" list. If this option is not selected, then the pathnames will be truncated to the root directory of each entry. *Note: If more than one directory has been specified in the list, then you will probably want to have this option selected.*
> **Recurse Subdirectories** - Select this option to recursively process all directories and files below the specified directories in the list.
> **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.
> **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 95/98/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.*
> **Disable Version Numbers** - The ISO9660 specification requires that a version number string be appended to all filenames. This requirement can cause incompatibilities with certain operating systems, so this option will disable the use of version numbers.

Disable DOS Compatibility - Select this option to allow the use of non-DOS compatible filenames. The software currently converts all DOS filenames (8.3 format) to uppercase. This option will disable this conversion and allow filenames with lowercase letters.

Advanced Options - Activates the ISO9660 advanced options dialog. See Advanced ISO9660 Options for more details.

Recording Options

Track Mode - Specifies the track mode (MODE1 or MODE2) that the ISO9660 image file is to be written with. *Note: The MODE2 option is used only for special applications and is not supported by some recorders.*

Disc Type - Specifies the disc type that is used when finalizing/closing a disc. A disc should be finalized based on the mode of the first track recorded to the disc. If the first track on the disc was written in MODE1 format, then "CDROM" should be selected. If the first track was written in MODE2 format, then "CDROM-XA" should be selected.

Speed - Selects 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 option 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).

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".

Save Settings

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

Help

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

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.
    Abtract 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.

Import Session
    Import Previous Session - Select this option to import all files from the previous session on the CD-R disc. This will allow you to add additional files to your disc and still be able to access all files that were written in previous sessions.
    Preserve volume descriptor strings - Select this option to preserve all of the volume descriptor strings (volume label, system ID, etc.) from the previous session. *Note: If this option is selected, then all strings entered on the "Volume Descriptor" tab will be ignored.*
    Duplicate Directory Options - This option specifies what action the software should take when a duplicate directory name is found between the imported directories and any new directories being backed up .
    Duplicate File Options - .This option specifies what action the software should take when a duplicate filename is found between the imported files and any new files being backed up.

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 <u>How to create a boot image file</u> 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.

Table of Contents

Description

This dialog is used to display a disc's table-of-contents and CD-TEXT information.

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 Devices and Settings dialog.

Devices
Click on this button to access the Devices and 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.
DCP - Specifies whether the "digital copy permitted" subcode flag is set or not.
PRE - Specifies whether the "pre-emphasis" subcode flag is set or not.
4CH - 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 TOC
Click on this button to reload the disc's table-of-contents and update the screen.

Display CD-TEXT
Click on this button to display a disc's CD-TEXT information. *Note: CD-TEXT is only supported by a few CDROM drives and discs.*

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.

CD-TEXT Editor

Description

This dialog is used to define all of the information that will be recorded onto a CD-TEXT enhanced audio disc. Please refer to How to create a CD-TEXT disc for more information. *Note: CD-TEXT is a relatively new feature and only a few CD recorders support this.*

Controls

Disc Text - Used to input CD-TEXT information about the disc itself.
    Language - Specifies the language being used for all text (only the "English" language is supported at this time).
    Character Set - Specifies the character set being used for all text (only the "ASCII" character set is supported at this time).
    Genre - Specifies the disc's genre type (rock, pop, classical, etc.) and a text description.
    Identifier - Specifies the disc's identification number (catalog number, SKU number, etc.).

Track Text - Used to input CD-TEXT information about each track on the disc.
    Track Count - Specifies the total number of tracks on the disc. Note: Even if the track count is zero, you can still enter information about the disc itself.
    Display Track # - Specifies the number of the current track being displayed on the screen. Track #0 is used to input information about the disc itself and tracks #1 to #99 are used to input information about the individual tracks (songs) on the disc.
    Title - Specifies the title of the track.
    Performer - Name of the track's performer.
    Songwriter - Name of the track's songwriter.
    Composer - Name of the track's composer.
    Arranger - Name of the track's arranger.
    Message - A custom user-defined text message for the track.
    UPC / ISRC - Specifies the UPC or ISRC for the disc or track.

New
    Clears all CD-TEXT information on the screen.

Open
    Opens a previously saved CD-TEXT file (default extension is .CDT).

Save
    Saves your changes to a binary encoded CD-TEXT file (default extension is .CDT).

Close
    Closes the editor and brings you back to the main toolbar.

Help
    Activates the Windows help system and loads this topic.

Sector Viewer

Description

This dialog is used to view individual data sectors on a disc.

Controls

CDROM Reader
Select a CDROM reader device from this list.

Devices
Click on this button to access the <u>Devices and Settings</u> dialog.

Sector #
Selects the number of the sector to be viewed.

Read Sector
Reads the selected sector from the disc.

Close
Closes the viewer and brings you back to the main toolbar.

Help
Activates the Windows help system and loads this topic.

Devices and Settings

Description

This property sheet is used to…
- Select your default CDROM reader, recorder, and transporter devices.
- Display the list of supported features for each device.
- Display information about the SCSI and IDE adapters on your system.
- Select file/disc caching options.
- Select other miscellaneous default options.

Property Pages

Readers

Select a CDROM reader device from this list. The selection will become the default CDROM reader if you click on OK to exit the dialog. This page also displays the features that are supported by each device.

Recorders

Select a CDROM recorder device from this list. The selection will become the default CDROM recorder if you click on OK to exit the dialog. This page also displays the features that are supported by each device.

Transporters

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.

Adapters

Displays information about the SCSI and IDE adapters on your system.

Global Adapter Settings

Maximum Buffer Size - Specifies the maximum buffer size to be used when reading or writing from all CDROM devices. The software defaults to 64K byte buffers, but some IDE/SCSI adapters or drivers do not support buffers this large (the error "Buffer too big" will be displayed).
Enable software support for Logical Unit Numbers - This option will enable software support for SCSI "logical unit numbers". If may also be necessary to enable LUNs in the SCSI card and/or drivers. Note: Logical Unit Numbers are rarely used and it is highly unlikely that you will ever use this option.

Disks

Displays information about all of the fixed and removable disks on your system (removable drives are listed only if a piece of media is currently loaded). Information includes the volume label, filesystem type, and capacity/freespace (in megabytes).

Caching

Selects the file/disc caching options. Please see File/Disc Caching for more detailed information about this very important performance feature.

File/Disc Caching Options

Enable Caching - Enables the caching feature.
Enable Debug Log - Enables the debugging log file. This option should only be used if you are having a major problem with the caching feature (the debug information will be written to the file

`C:\THREAD.LOG`). Please contact Golden Hawk Technology before using this option.
Cache Size - Selects the size of the cache in megabytes (the minimum size is 1Mb and the maximum size is 32Mb).
Full to Empty Ratio - Selects the percentage of the cache that must be read before the cache is filled again. Example: If the ratio is set to 85% / 15%, then the cache will be filled to 100%, wait for 15% of the data to be read, and then be filled to 100% again (this cycle will repeat over and over again until there is no more data to be cached). This algorithm is much more efficient then trying to keep the cache completely full all of the time.
CPU Priority Level - Selects the CPU priority level of the caching thread. For 99% of all systems, the "Normal" setting is more than adequate.

Defaults
Selects miscellaneous default options.

Recording Completion Options
Eject Disc - .Ejects the disc from the recorder after all recording operations.
User Notification - Selects the notification option.
Sound File - Selects the sound file to be played. Note: If this file does not exist or is not a valid sound file, then the sound will simply not play (no error message will be displayed).

Image File Options
Overwrite Existing - Select this option to automatically overwrite any existing image or cuesheet file being created by the software. Otherwise, you will be prompted to overwrite any files that already exist.

OK
Click on this button to save the current settings on all property pages and close the dialog.

Cancel
Click on this button to close the dialog without saving any settings.

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

File/Disc Caching

Description

File/Disc caching (also known as "cyclic buffering") is the most important performance feature that has been added to CDRWIN this year. It will greatly reduce the possibility of "buffer underruns" and also make more efficient use of your CPU and other system resources. On most systems, you will not be restricted from running other programs while a disc recording is in progress (even at 4x recording speed). Now you can use your word processor, Internet browser, or other favorite application while your disc records safely in the background…

Important Note: The performance of the cache is determined by the speed of your CPU, harddrives, SCSI adapters, and other critical system components. Don't expect miracles when using non-Pentium systems, old harddrives, or ISA based SCSI cards (especially when recording at 4x speed).

Cache Settings

Enable Caching - Enables the caching feature.

Enable Debug Log - Enables the debugging log file. This option should only be used if you are having a major problem with the caching feature (the debug information will be written to the file `C:\THREAD.LOG`). Please contact Golden Hawk Technology before using this option.

Cache Size - Selects the size of the cache in megabytes (the minimum size is 1Mb and the maximum size is 32Mb).

Recommended cache size based on the amount of memory on your system…

System Memory	Recommended Cache Size
16 Mb	Disable
32 Mb	1 to 2 Mb
64 Mb	2 to 4 Mb
128 Mb	4 to 8 Mb
256 Mb	8 to 16 Mb

Warning: Do **not** use a cache that is larger than the recommended sizes. This can cause performance problems that are worse than not using the cache at all.

Full to Empty Ratio - Selects the percentage of the cache that must be read before the cache is filled again. Example: If the ratio is set to 85% / 15%, then the cache will be filled to 100%, wait for 15% of the data to be read, and then be filled to 100% again (this cycle will repeat over and over again until there is no more data to be cached). This algorithm is much more efficient then trying to keep the cache completely full all of the time.

CPU Priority Level - Selects the CPU priority level of the caching thread. For 99% of all systems, the "Normal" setting is more than adequate.

Unlock Program

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 backup files from your harddrive

How to copy tracks from one or more discs

How to create a CD-EXTRA disc

How to create a CD-TEXT disc

How to create a boot image file

How to backup files from your harddrive
(how to create an ISO9660 disc)

The following procedure will allow you to backup files from your harddrive onto an ISO9660 compatible disc.

ISO9660 is the international file system standard for CDROMs. Any disc created in this format will be readable by any operating system that supports this standard.

Step #1

Select the <u>File Backup and Tools</u> icon from the main toolbar.

Step #2

Select the "Build and Record and ISO9660 Image File" from the "Operation" list.

Step #3

Build the "Directories to Backup" list. Directories can be added to the list by either clicking the "Add…" button or by using "drag and drop" to load directory names from the Windows Explorer. *Note: The maximum number of separate directory names that can be added to the list is 100.*

Step #4

Select a temporary ISO9660 image filename. This file can be placed in any directory (preferably not in one of the directories that you are backing up) and its name is not important. As soon as the recording has been completed, you can either delete this file from your harddrive or use it in the future to record another disc (with the "Record ISO9660 Image File" operation).

Step #5

Select the required "Directory Options" (the software is shipped with the most common options already selected)…

Preserve Full Pathnames - Select this option to preserve the full pathname of every directory specified in the "Directories to Backup" list. If this option is not selected, then the pathnames will be truncated to the root directory of each entry. *Note: If more than one directory has been specified in the list, then you will probably want to have this option selected.*
Recurse Subdirectories - Select this option to recursively process all directories and files below the specified directories in the list.
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.
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.

Step #6

Select the required "ISO9660 Options" (the software is shipped with the most common options already selected)…

Long Filenames (Joliet) - Select this option to create a long filename (Joliet) compatible disc for Windows 95/98/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.*
Disable Version Numbers - The ISO9660 specification requires that a version number string be appended to all filenames. This requirement can cause incompatibilities with certain operating

systems, so this option will disable the use of version numbers.

Disable DOS Compatibility - Select this option to allow the use of non-DOS compatible filenames. The software currently converts all DOS filenames (8.3 format) to uppercase. This option will disable this conversion and allow filenames with lowercase letters.

Advanced Options - Activates the ISO9660 advanced options dialog. See Advanced ISO9660 Options for more details.

Step #7

Select the required "Recording Options" (the software is shipped with the most common options already selected)…

Track Mode - Specifies the track mode (MODE1 or MODE2) that the ISO9660 image file is to be written with. *Note: The MODE2 option is used only for special applications and is not supported by some recorders.*

Disc Type - Specifies the disc type that is used when finalizing/closing a disc. A disc should be finalized based on the mode of the first track recorded to the disc. If the first track on the disc was written in MODE1 format, then "CDROM" should be selected. If the first track was written in MODE2 format, then "CDROM-XA" should be selected.

Speed - Selects 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 option 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).

Step #8

Put the writable disc into your recorder and click on the "Start" button.

Open New Session

When writing any session on the disc (including the first one), you must decide at that point whether you might want to add more sessions to the disc in the future. If you do, then you must select the "Open New Session" option at the time the current session if being written (you can not wait until next time to open the new session). Otherwise, the disc will be permanantly "closed" and no other sessions can be added.

Importing Previous Sessions

When adding a new session to a disc, you have the option of "importing" the previous session, so that the files from both the previous session and the new session will be visible on the final disc. If you do not select this option, then only the files from the new session will be visible. This option is located on the Advanced ISO9660 Options dialog.

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 written 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.

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" operation. Both of these will analyze the existing CD-R disc to determine the correct starting block number before building the ISO9660 image file. In other words, do not use the "Record ISO9660 Image File" operation when writing the second (or higher) session on a disc. This would result in an unreadable disc.

Recording directories "on the fly"

By selecting the "Record Directories/Files directly to an ISO9660 disc" option, you can backup files directly to the disc without creating an image file first. However, copying large numbers of small files directly to the recorder can easily result in a buffer underrun due to the overhead of opening and processing each file "on the fly".

One or more of the following actions may be necessary to eliminate buffer underrun problems…

- 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.

How to copy tracks from one or more discs

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

Copy the tracks from your discs (to files on your harddrive)…

- Load an audio or CD+G disc into your currently selected CDROM reader device.

- Select "Extract Disc/Tracks/Sectors" from the main toolbar.

- Click on the "Select Tracks" option and use the "track selection grid" to choose the tracks that you want to copy. If you are copying tracks from a CD+G disc, then you must also select the "Copy CD+G" option (under "Reading Options").

- Select the "Name Sequentially" option.

- Enter a complete directory and filename into the "Image Filename" editbox, such as `C:\TRACKS\TEST` (the directory must already exist). Note: If you are copying more than one track, then each track will be written to a group of sequentially numbered files, such as `TEST01.WAV`, `TEST02.WAV`, `TEST03.WAV`, etc. (CD+G files will be created with the `.BIN` extension).

- Click on "Start".

Repeat all of the above steps for each disc that you wish to copy tracks from. Remember to use a different directory and/or filename for each disc so that you don't create more than one file with the same name (all names must be unique).

You can now select one of the following methods to record the disc… The "Load Tracks" method was designed specifically for novice users, while the "Cuesheet" method should only be used by advanced users who are more familiar with the software and the concept of cuesheets.

LOAD TRACKS METHOD…

Record the new disc…

- Select "Record Disc" from the main toolbar.

- Select the CDROM recording device.

- Load a blank disc into the recorder.

- Click on the Load Tracks   button to activate the track selection dialog.

- Use this dialog to specify a list of AUDIO or CD+G files. The order of the files in the list is the order that they will be recorded on the disc. You can use "drag and drop" to load files from the Windows Explorer or to change the order of the files in the list. When you have finished loading your tracks, click on OK.

- Click on "Start Recording" to record the disc.

CUESHEET METHOD…

Step #1

Write a cuesheet file (see <u>How to write a CUE SHEET file</u>) 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 cuesheet file for AUDIO discs…

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

For CD+G discs, all file types must be changed from WAVE to BINARY, all file name extensions must be changed from `.WAV` to `.BIN`, and all track types must be changed from AUDIO to CDG as illustrated below…

```
FILE C:\TRACKS\TEST01.BIN BINARY
    TRACK 01 CDG
    INDEX 01 00:00:00
FILE C:\TRACKS\TEST02.BIN BINARY
    TRACK 02 CDG
    INDEX 01 00:00:00
FILE C:\TRACKS\TEST03.BIN BINARY
    TRACK 03 CDG
    INDEX 01 00:00:00
```

Important Note: The above cuesheets are just examples. Your cuesheet could look completely different depending on the directories and filenames that you used when you copied the tracks to your harddrive.

Step #2

Record the new disc…

- Select "Record Disc" from the main toolbar.

- Select the CDROM recording device.

- Load a blank disc into the recorder.

- Click on "Load Cue Sheet" and select the cuesheet file that you created in **Step #1**.

- Select the appropriate recording options.

- Click on "Start Recording" to record the disc.

How to create a CD-EXTRA disc

Description

‶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 <u>How to write a CUE SHEET file</u>).

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 <u>Record Disc</u> 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 <u>File Backup and Tools</u> for more information.

How to create a CD-TEXT disc

Step #1

Create a CD-TEXT file with the graphical <u>CD-TEXT Editor</u>. The editor is used to input all of the custom text strings that will appear on the recorded audio disc. *Note: CD-TEXT is a relatively new feature and only a few CD recorders support this.*

Step #2

Modify your cuesheet file (see <u>How to write a CUE SHEET file</u>) to specify the location of the CD-TEXT file that you created in Step #1.

For example, if you currently have the following cuesheet for your audio disc…

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

…then you must modify it to include the CDTEXTFILE command as specified below…

```
CDTEXTFILE "C:\TRACKS\TEST.CDT"
FILE "C:\TRACKS\TEST01.WAV" WAVE
   TRACK 01 AUDIO
   INDEX 01 00:00:00
FILE "C:\TRACKS\TEST02.WAV" WAVE
   TRACK 02 AUDIO
   INDEX 01 00:00:00
FILE "C:\TRACKS\TEST03.WAV" WAVE
   TRACK 03 AUDIO
   INDEX 01 00:00:00
```

Important Note: The above cuesheets are just examples. Your cuesheet could look completely different depending on the directories and filenames that you used.

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).

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 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".

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How to write a CUE SHEET file

Description

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 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).

CDTEXTFILE Command

Description:

This command is used to specify the name of the file that contains the encoded CD-TEXT information for the disc. This command is only used with files that were either created with the graphical CD-TEXT editor or generated automatically by the software when copying a CD-TEXT enhanced disc.

Syntax:

```
CDTEXTFILE <filename>
```

Parameters:

`filename` – Filename (can include device/directory). If the filename contains any spaces, then it must be enclosed in quotation marks.

Examples:

```
CDTEXTFILE C:\TEST\DISC.CDT
CDTEXTFILE "C:\LONG FILENAME.CDT"
```

Rules:

If your recorder does not support CD-TEXT, then this command will be ignored.

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). If the filename contains any spaces, then it must be enclosed in quotation marks.

`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
FILE "C:\PROGRAM FILES\LONG FILENAME.WAV" WAVE
```

Rules:

FILE commands must appear before any other command except <u>CATALOG</u>.

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.

PERFORMER Command

Description:
This command is used to specify the name of a perfomer for a CD-TEXT enhanced disc.

Syntax:
```
PERFORMER <performer-string>
```

Parameters:
peformer-string – Name of performer. If the string contains any spaces, then it must be enclosed in quotation marks. Strings should be limited to 80 character or less.

Examples:
```
PERFORMER "The Beatles"
```

Rules:
If the PERFORMER command appears before any TRACK commands, then the string will be encoded as the performer of the entire disc. If the command appears after a TRACK command, then the string will be encoded as the performer of the current track. *Note: If your recorder does not support CD-TEXT, then this command will be ignored.*

SONGWRITER Command

Description:

This command is used to specify the name of a songwriter for a CD-TEXT enhanced disc.

Syntax:

SONGWRITER <songwriter-string>

Parameters:

songwriter-string – Name of songwriter. If the string contains any spaces, then it must be enclosed in quotation marks. Strings should be limited to 80 character or less.

Examples:

SONGWRITER "Paul McCartney"

Rules:

If the SONGWRITER command appears before any TRACK commands, then the string will be encoded as the songwriter of the entire disc. If the command appears after a TRACK command, then the string will be encoded as the songwriter of the current track. *Note: If your recorder does not support CD-TEXT, then this command will be ignored.*

TITLE Command

Description:

This command is used to specify a title for a CD-TEXT enhanced disc.

Syntax:

```
TITLE <title-string>
```

Parameters:

`title-string` – Title of disc or track. If the string contains any spaces, then it must be enclosed in quotation marks. Strings should be limited to 80 character or less.

Examples:

```
TITLE "The Beatles - Abbey Road"
TITLE "Here Comes the Sun"
```

Rules:

If the TITLE command appears before any TRACK commands, then the string will be encoded as the title of the entire disc. If the command appears after a TRACK command, then the string will be encoded as the title of the current track. *Note: If your recorder does not support CD-TEXT, then this command will be ignored.*

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 <u>TRACK</u> command, but before any <u>INDEX</u> 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 data is generated internally by CDRWIN. 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 <u>TRACK</u> command, but before any <u>INDEX</u> 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 data is generated internally by CDRWIN. 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 <u>INDEX</u> 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 <u>TRACK</u> command, but before any <u>INDEX</u> 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          Note: All times are relative to beginning of current file
  TRACK 06 AUDIO
    INDEX 01 02:31:40
  TRACK 07 AUDIO
    INDEX 01 06:56:13
  TRACK 08 AUDIO
    INDEX 01 10:06:25
```

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 data that is written as a result of any PREGAP command is always generated internally by CDRWIN (the data is not consumed 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.

EXAMPLE #11 - Audio disc with CD-TEXT titles.

```
TITLE      "Nirvana - Nevermind"
PERFORMER  "Nirvana"
SONGWRITER "Lyrics by Kurt Cobain / Music by Nirvana"
FILE "D:NIRVANA.BIN" BINARY
  TRACK 01 AUDIO
    TITLE "Smells Like Teen Spirit"
    INDEX 00 00:00:00
    INDEX 01 00:00:37
  TRACK 02 AUDIO
    TITLE "In Bloom"
    INDEX 00 05:01:67
    INDEX 01 05:02:32
  TRACK 03 AUDIO
    TITLE "Come As You Are"
    INDEX 00 09:16:63
    INDEX 01 09:17:25
  TRACK 04 AUDIO
    TITLE "Breed"
    INDEX 01 12:56:22
  TRACK 05 AUDIO
    TITLE "Lithium"
    INDEX 00 15:59:35
    INDEX 01 16:00:17
  TRACK 06 AUDIO
    TITLE "Polly"
    INDEX 00 20:16:38
    INDEX 01 20:17:15
  TRACK 07 AUDIO
    TITLE "Territorial Pissings"
    INDEX 00 23:11:17
    INDEX 01 23:14:17
  TRACK 08 AUDIO
    TITLE "Drain You"
    INDEX 01 25:37:10
  TRACK 09 AUDIO
    TITLE "Lounge Act"
    INDEX 01 29:21:02
```

```
TRACK 10 AUDIO
  TITLE "Stay Away"
  INDEX 00 31:57:40
  INDEX 01 31:57:72
TRACK 11 AUDIO
  TITLE "On A Plain"
  INDEX 00 35:29:40
  INDEX 01 35:30:35
TRACK 12 AUDIO
  TITLE "Something In The Way"
  INDEX 00 38:44:55
  INDEX 01 38:46:62
```

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.

Supported Devices

CDROM Recorders (SCSI)

```
Creative CDR4210
Grundig CDR100IPW
Hewlett Packard 4020
Hewlett Packard 6020
Hightech CD-R2000
JVC XR-W2010/2012
JVC XR-W2020/2022/2626
JVC XR-2042
Kodak PCD200
Kodak PCD225
Kodak PCD600
Matsushita CW-7501
Matsushita CW-7502
Matsushita CW-7503
Memorex CDW-620
Mitsubishi CDW226
Mitsumi CR-2401TS
Olympus CDS615E
Olympus CDS620E
Philips CDD522
Philips CDD2000
Philips CDD2600
Philips OmniWriter
Pinnacle RCD5020
Pinnacle RCD5040
Pinnacle RCD4X4
Pioneer DW-S114X
Plasmon CDR4220
Plasmon CDR4240
Plasmon 480
Plextor PX-R24CS
Plextor PX-R412C
Plextor PX-R820T
Plextor PX-W4220T
Plextor PX-W8220T
Ricoh RO-1420C
Ricoh 6200S/6201S
Ricoh 7040S
Smart & Friendly 2001
Smart & Friendly 2004
Smart & Friendly 2006PLUS
Smart & Friendly 4000
Smart & Friendly 4006
Smart & Friendly 4012
Smart & Friendly CD-RW 226
Smart & Friendly CD-R8020
Sony CDU920S
Sony CDU924S
Sony CDU948S
Teac CD-R50S
```

```
Teac CD-R55S
Teac CD-R56S
Teac CD-R58S
Traxdata CDRW2260 PRO
Traxdata CDRW4260 PRO
Traxdata CDR4120 PRO
Wearnes CDR-432
Wearnes CDR-632
Yamaha CDR100
Yamaha CDR102
Yamaha CDR200
Yamaha CDR400
Yamaha CRW2260
Yamaha CRW4260
Yamaha CRW2216S
Yamaha CRW4416S
Yamaha CRW6416S
```

CDROM Recorders (IDE / ATAPI)

```
Acer CRW6206A
Hewlett Packard 7100/7200/7500/8100/8200
LG/Goldstar CED-8041B/8042B/8043B/8045B
Matsushita CW-7582
Memorex CRW-1622
Memorex CDRW-2216
Memorex CD-RW2224
Memorex CD-RW4224
Memorex CDRW-4420
Mitsumi CR-4801TE
Mitsumi CR-4802TE
Philips CDD3610
Philips CDD3801
Ricoh 6200A
Ricoh 7040A
Smart & Friendly CD-RW2224
Sony CRX100E/CRX110E/CRX120E
Traxdata CDRW2260 PLUS
Wearnes CDRW-622
Yamaha CDR401
Yamaha CRW4001
Yamaha CRW4261
Yamaha CRW2216E
Yamaha CRW4416E
```

CDROM Readers (SCSI)

```
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
Pioneer DR-U03S
Pioneer DR-U06S
Pioneer DVD-303S
Plextor 4Plex
Plextor 4Plex Plus
Plextor 6Plex
Plextor 8Plex
Plextor 12Plex
Plextor 12/20Plex
Plextor 14/32Plex
Plextor 17/40Plex
Sony CDU-55S
Sony CDU-76S
Sony CDU-415
Sony CDU-625
Teac CD-56S
Teac CD-516S
Teac CD-532S
Toshiba 3401
Toshiba 3501
Toshiba 3601
Toshiba 3701
Toshiba 3801
Toshiba 4100
Toshiba 4101
Toshiba 5201
Toshiba 5301
Toshiba 5401
Toshiba 5601
Toshiba 5701
Toshiba 5801
Toshiba 6201
Toshiba 6401
```

CDROM Disc Transporters

```
Kodak Disc Transporter
```

Windows 95/98 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"

Windows 95 Caching (do not do this for Windows 98)…

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.

File/Disc Caching…

We strongly recommend that you enable the file/disc caching feature on the Devices and Settings screen. This feature will greatly reduce the possibility of "buffer underruns" and also make efficient use of your CPU and other system resources.

Frequently Asked Questions

How do I display the current version of the software?

Click on the small icon in the upper-left corner of the main toolbar with the **right** mouse button and select "About CDRWIN" from the menu.

How do reset all of the settings in the software back to default values?

Click on the small icon in the upper-left corner of the main toolbar with the **right** mouse button and select "Delete Saved Settings" from the menu.

I have a 20x, 24x, 32x, 36x, or 40x speed CDROM drive, but the software says that the maximum reading speed is much less. Why doesn't your software support the faster reading speeds?

The manufacturers of all 20x to 40x speed CDROM drives are not telling you the complete truth when it comes to their specified reading speeds. Any drive that is listed as having a maximum speed above 16x uses a reading mode known as **CAV** (constant angular velocity), as opposed to the **CLV** (constant linear velocity) mode that was used in earlier models. CAV drives only read at the specified maximum speed at the **extreme outside** of the disc (which rarely happens). If the disc you are reading is only half full to begin with, then it will never be read at the maximum speed. The reading speed at the inside of the disc is approximately 60% slower than reading at the outside. For example… A 24x drive will read data at 10x near the beginning of the disc, 18x speed in the middle of the disc, and 24x at the very end of the disc (assuming that it is 100% full).

The maximum reading speed listed by our software is the speed of the drive at the inside of the disc, not the outside (which is a much more realistic number). So, a 24x drive will have its maximum reading speed listed as 10x, not 24x. No matter what the software says is the maximum reading speed (which may not be correctly listed for some ATAPI drives), selecting "MAX" will always set the drive to the maximum speed that it is capable of.

Plextor is one of the only manufacturers that reports the true speed of their drives. Some of their recent model names (12/20Plex, 14/32Plex, and 17/40Plex) correctly specify both the inside and outside reading speeds.

Note: The maximum speeds listed by almost all drives is for **data** tracks only!! These speeds almost never apply to how fast the drive will read audio. Many drives that read data at 20x speed or higher may only read audio at 6x or less.

I want to backup a CD+G (Karaoke) disc. What CDROM recorders and drives support this?

The following CDROM recorders will write CD+G discs…
```
    CREATIVE   CDR4210 *
    HP         8100/8110
    PANASONIC  CW-7501 *
    PLASMON    CDR4240 *
    PLEXTOR    PX-R412C (not recommended due to bugs)
    PLEXTOR    PX-R820T (not recommended at this time)
    SONY       CRX100E/CRX110E
    YAMAHA     All Models **
```

*   Records CD+G at 1x speed only and is not capable of reading CD+G.
** All Yamaha models can read CD+G except the CDR100 and CDR102.

The following CDROM drives will read CD+G discs…
```
PLEXTOR    4Plex Plus
PLEXTOR    8Plex
PLEXTOR    12Plex
PLEXTOR    12/20Plex
PLEXTOR    14/32Plex
PLEXTOR    17/40Plex (not recommended at this time)
SONY       76S (not recommended)
SONY       415 (only works well at 1x reading speed)
```

I want to backup a disc that contains CD-TEXT information. What CDROM recorders and drives support this?

The following CDROM recorders will read/write CD-TEXT discs…
```
HP         8100/8110
SONY       CRX100E/CRX110E
```

The following CDROM drives will read CD-TEXT discs…
```
PLEXTOR    17/40Plex
```

I own a Panasonic 7501 recorder and when I try to copy a disc "on the fly", the software says that this operation is not supported. Will your software ever support this feature?

For technical reasons, this feature will never be supported. The Panasonic 7501 recorder is not compatible with how our software was written for all other models.

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 jittter 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?

There are literally tens of thousands of CDROM titles on the market and we simply can not guarantee that our software will copy all of them.

This software will **not** copy…
  • Multisession discs (including CD-Extra and Photo CDs).
  • Discs with a data track stored in the extended pregap of the first audio track (very rare).
  • Some CD-R discs that were written with track-at-once recording.

This software will also not defeat the **copy protection scheme** on any game disc (PlayStation, Saturn, PC, etc).   Please do not ask us how to defeat any type of copy protection scheme. We will not answer any questions on this subject because too many people are making illegal copies of these discs.

Who manufactured my CDROM recorder?

JVC
```
   JVC XR-W2001 / XR-W2010 / XR-W2020 / XR-W2042
   Pinnacle RCD1000 / RCD5020 / RCD5040
   Smart & Friendly 2006PLUS
   Smart & Friendly CD-RW226
   Smart & Friendly CD-RW2224
```

Matsushita
```
   Creative CDR4210
   Panasonic CW-7501 / CW-7502 / CW-7582
   Plasmon CDR4240
   Plasmon 480
```

Philips
```
   Grundig CDR100IPW
   Hewlett Packard 4020i / 6020i / 7100
   Kodak PCD200 / PCD225
   Mitsumi CR-2401TS
   Philips CDD521 / CDD522 / CDD2000 / CDD2600 / CDD3610
   Plasmon RF4100 / CDR4220
   Traxdata CDRW2260 PLUS
   Wearnes Peripheral CDR-432 / CDR-632
```

Plextor
```
   Plextor PX-R24CS
   Plextor PX-R412C
   Plextor PX-R820T
```

Ricoh
```
   Philips Omniwriter
   Memorex CDW-620
   Mitsubishi CDW226
```

```
    Ricoh RO-1420C
    Ricoh 6200S / 6201S

Sony
    Hewlett Packard 8100
    Olympus CDS615E / CDS620E / CDS630E
    Smart&Friendly 2001 / 2004 / 2006
    Sony CDW900E / CDU920S / CDU924S / CDU948S

Teac
    Pinnacle RCD4X4
    Teac CD-R50S / CD-R55S / CD-R56S
    Traxdata CDR4120 PRO

Yamaha
    Smart&Friendly 4000 / 4006
    Traxdata CDRW2260 PRO
    Traxdata CDRW4260 PRO
    Yamaha CDR100 / CDR102
    Yamaha CDR200 / CDR400
    Yamaha CRW2260 / CRW4260
```

Contact Information

Technical support and free upgrades are free to all registered users for one year from the date of purchase.

Full ordering information can be found on the following web page…
> http://www.goldenhawk.com/ordering/

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

Toll-Free Ordering
> 877-423-7946 (for orders only!)

Technical Support
> 603-429-1027

FAX
> 603-429-0073

Web Page Address
> www.goldenhawk.com

Email Address
> support@goldenhawk.com

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