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{button Help Topics,Contents()}



GEAR main window

The GEAR Program Window is the main window of the GEAR application. From here you can access all of GEAR's functions and tools. The project bar and the device bar help you create and record a DVD/CD project fast and efficient. The menu and the toolbar buttons provide direct access to a number of specific functions and tools such as the disc-information dialog and the jukebox control dialog.

Loading files:

Drag and drop the files from the Explorer pane into the Project pane.

Changing the size of the panes:

1. Move the mouse pointer over the bars that divide the panes. The mouse pointer changes to a resize pointer.
2. Drag the bars to resize the panes .(left click and hold, then move pointer to drag).

{button Help Topics,Contents()}



File menu commands

The File menu offers the following commands:

<u>New GEAR Project</u>	Creates a new GEAR project.
<u>Open GEAR Project</u>	Opens an existing GEAR project.
<u>Close GEAR Project</u>	Closes an opened GEAR project.
<u>Append Session</u>	Appends a session to a CD-R disc.
<u>Delete GEAR Project</u>	Deletes a GEAR project.
<u>Generate log file</u>	Generate log file (GEAR Pro only).
<u>Run batch file</u>	Run batch file (GEAR Pro only).
<u>Run GEAR command</u>	Run GEAR command (GEAR Pro only).
<u>Exit</u>	Exits GEAR.

{button Help Topics,Contents()}



Edit menu commands

The Edit menu offers the following commands:

<u>Create new folder</u>	Create new directory in GEAR image.
<u>Rename file</u>	Rename file in GEAR image.
<u>Delete</u>	Delete file in GEAR image.
<u>Select all</u>	Select all files in the Explorer window.
<u>Restore files/dirs</u>	Restore (copy) files from the GEAR images to the system.
<u>Copy selection to project image.</u>	Copy selected files from the Explorer window to the GEAR image.
<u>Import VIDEO_TS files only)</u>	Import VIDEO_TS files into a DVD Video image (GEAR Pro DVD only)
<u>Play</u>	Create a new track in the GEAR image
<u>Declick</u>	Declicks the audio track.
<u>Normalize</u>	Normalizes the audio track
<u>Create new track</u>	Creates a new track.
<u>Up one level</u>	Go one level up in the Explorer tree.

{button Help Topics,Contents()}}



View menu commands

The View menu offers the following commands:

<u>Large icons</u>	Shows large icons in the project.
<u>Small icons</u>	Shows small icons in the project.
<u>List</u>	Shows a list of the files in the project.
<u>Details</u>	Shows a detailed list of the files in the project.

{button Help Topics,Contents()}}



Project menu commands

The Project menu offers the following commands:

<u>Volume properties</u>	Displays the properties of the volume.
<u>Current track properties</u>	Displays the properties of the track.
<u>Convert volume to physical</u>	Converts the volume to a physical image.
<u>Convert current track to physical</u>	Converts the track to a physical image.
<u>Verify volume</u>	Verifies the volume.
<u>Verify current track</u>	Verifies the track.

{button Help Topics,Contents()}



Recorder menu commands

The Recorder menu offers the following commands:

<u>Eject caddy/Open tray</u>	Ejects the tray or caddy of the selected recorder.
<u>Close tray</u>	Closes the tray of the selected recorder
<u>Disc information</u>	Displays the information of the current inserted disc.
<u>Copy CD/DVD</u>	Starts the CD/DVD copier.
<u>Write GEAR project</u>	Writes the project to a disc
<u>Test write GEAR project</u>	Test writes the project to a disc
<u>Fixate disc</u>	Fixates a non fixated disc.
<u>Erase disc</u>	Erases a CD-RW disc
<u>Settings</u>	Launches the property dialog of the Recorder.

{button Help Topics,Contents()}



Jukebox menu commands

The Jukebox menu offers the following commands:

Jukebox control_____Launches the jukebox controller.

Settings_____Launches a property dialog of the Jukebox.

{button Help Topics,Contents()}}



Tape menu commands

The Tape menu offers the following commands:

Write GEAR project Launches the jukebox controller.

Restore tape files Restores files from tape.

Settings Launches a property dialog of the Tape

{button Help Topics,Contents()}



Options menu commands

The Options menu offers the following commands:

Preferences Launches the general preferences dialog.

Harddisk Launches a property dialog of the Harddisk.

{button Help Topics,Contents()}



Window menu commands

The Window menu offers the following commands, which enable you to arrange multiple views of multiple documents in the application window:

Refresh Refreshes the explorers.
Show project bar Shows/hides the project bar.
Show device bar Shows/hides the device bar.
Show log Shows/hides the log window.

{button Help Topics,Contents()}



Help menu commands

The Help menu offers the following commands, which provide you assistance with this application:

Index _____ Offers you an index to topics on which you can get help.

Using help _____ How to use the help.

About GEAR _____ Displays the version number of this application

```
{button Help Topics,Contents()}
```




New GEAR project command (File menu)

Use this command to create a new GEAR project. Select the type and size of the new project and give the project a name you want to create.

You can open projects with the Open command.

Shortcuts

Toolbar: 

Keys: Ctrl+N

{button Help Topics,Contents()}



Open GEAR project command (File menu)

Use this command to open an existing GEAR Project.

The following options allow you to specify which file to open:

Look in

Select the folder in which GEAR stores the project that you want to open.

File Name

Type or select the filename you want to open. This box lists files with the extension you select in the List Files of Type box.

List Files of Type

Select the type of file you want to open:

GEAR Volumes (*.vol).

External images (*.*)

You can create new projects with the New command.

Shortcuts

Toolbar:


Keys: Ctrl+O

{button Help Topics,Contents()}

 **Close command (File menu)**

Use this command to close your project. You can also close a document by using the Close button the project bar.

Shortcuts


Toolbar: 
Keys: Ctrl+S

{button Help Topics,Contents()}

 **Append command (File menu)**

Use this command to append data to an existing multi-session closed CD-R(W).

Shortcuts


Toolbar: 
Keys: Ctrl+P

{button Help Topics,Contents() }

 **Delete command (File menu)**

Use this command to delete your project.

Shortcuts

Toolbar: 

```
{button Help Topics,Contents() }
```



Generate Log command (File menu)

Use this option to create a log file. GEAR stores every action and its result into this file.

Shortcuts

Keys: Ctrl+L

{button Help Topics,Contents()}}

 **Run Batch command (File menu)**

Use this command to run GEAR batch and log files.

Shortcuts

Keys: Ctrl+B

{button Help Topics,Contents()}

 **Run GEAR Command command (File menu)**

Use this option to run GEAR commands.

Shortcuts

Keys: Ctrl+R

{button Help Topics,Contents()}



Exit command (File menu)

Use this command to end your GEAR session. You can also use the Close command on the application Control menu. Or click once on the cross icon in the topright of the application.

Shortcuts

- Mouse: Double-click the application's Control menu button.
Click once on the cross in the topright of the application.
- Keys: Alt+F4

{button Help Topics,Contents()}

 **Create new folder command (Edit menu)**

This command creates a new folder in the current folder in your project.

```
{button Help Topics,Contents()}
```



Rename file command (Edit menu)

This command renames the current selected file in your project.

```
{button Help Topics,Contents()}
```


 **Delete command (Edit menu)**

This command deletes current selected files, directories or tracks.

{button Help Topics,Contents()}



Select all command (Edit menu)

This command selects all items in your project.

```
{button Help Topics,Contents()}
```

 **Restore files/dirs command (Edit menu)**

This command restores files/folders from your image.

```
{button Help Topics,Contents()}
```



Copy selection to project command (Edit menu)

This command copies your selection from the explorer to your project.

```
{button Help Topics,Contents()}
```



Import VIDEO_TS files command (Edit menu)

This command imports your VIDEO_TS folder into the DVD-Video project.

{button Help Topics,Contents()}

 **Play command (Edit menu)**

This command plays the current selected audio track in your project.

```
{button Help Topics,Contents()}
```

 **Declick command (Edit menu)**

This command declicks your current selected audio track in your project.

```
{button Help Topics,Contents()}
```



Normalize command (Edit menu)

This command normalizes your current selected audio track in your project.

{button Help Topics,Contents()}

 **Create new track command (Edit menu)**

This command creates a new track in your project.

```
{button Help Topics,Contents()}
```



Up one level command (Edit menu)

This command selects one level up in your tree in your project or explorer.

```
{button Help Topics,Contents()}
```



Large icons (View menu)

This command shows files, folders and tracks as large icons.

```
{button Help Topics,Contents()}
```



Small icons (View menu)

This command shows files, folders and tracks as small icons.

```
{button Help Topics,Contents()}
```

 **List (View menu)**

This command shows files, folders and tracks in a list.

```
{button Help Topics,Contents()}
```



Details (View menu)

This command shows files, folders and tracks in a detail view.

```
{button Help Topics,Contents()}
```

 **Volume properties (Project menu)**

This command shows the properties of your volume.

```
{button Help Topics,Contents()}
```

 **Current track properties (Project menu)**

This command show the properties of your current selected track.

```
{button Help Topics,Contents()}
```




Convert volume to physical (Project menu)

This command converts your volume to a physical image.

```
{button Help Topics,Contents()}
```



Convert current track to physical (Project menu)

This command converts your currently selected track to a physical file.

{button Help Topics,Contents()}

 **Verify volume (Project menu)**

This command verifies your volume.

{button Help Topics,Contents()}

 **Verify current track (Project menu)**

This command verifies your current track.

```
{button Help Topics,Contents()}
```

 **Eject caddy/Open tray (Recorder menu)**

This command opens your tray or ejects your caddy from your current selected device.

{button Help Topics,Contents()}

 **Close tray (Recorder menu)**


This command closes the tray of you current selected device.

```
{button Help Topics,Contents()}
```

 **Disc information (Recorder menu)**

This command retrieves the information of the inserted disc of the current selected device.

Shortcuts

Toolbar: 

{button Help Topics,Contents() }

 **Copy CD/DVD (Recorder menu)**

This command copies a CD with the currently selected device.

Shortcuts

Toolbar:



{button Help Topics,Contents()}

 **Write GEAR project (Recorder menu)**

This command writes the GEAR project with the current selected device.

{button Help Topics,Contents()}



Test write GEAR project (Recorder menu)

This command test writes the GEAR project with the current selected device.

```
{button Help Topics,Contents()}
```

 **Fixate disc (Recorder menu)**

This command fixates a unfixated disc inserted in the currently selected device.

{button Help Topics,Contents()}

 **Erase disc (Recorder menu)**

This command erases an erasable disc in the currently selected device.

{button Help Topics,Contents()}



Settings (Recorder menu)

This command launches the currently selected device properties.

```
{button Help Topics,Contents()}
```



Jukebox control (Jukebox menu)

This command launches the jukebox controller.

```
{button Help Topics,Contents()}
```



Settings (Jukebox menu)

This command launches the jukebox properties.

```
{button Help Topics,Contents()}
```

 **Write GEAR project (Tape menu)**

This command writes the GEAR project to tape.

{button Help Topics,Contents()}



Restore tape files (Tape menu)

This command retrieves the image from the tape.

```
{button Help Topics,Contents()}
```



Settings (Tape menu)

This command launches the tape properties.

```
{button Help Topics,Contents()}
```

 **Preferences (Options menu)**

This command launches the preferences dialog.

```
{button Help Topics,Contents()}
```

 **Harddisk (Options menu)**

This command launches the harddisk options dialog.

```
{button Help Topics,Contents()}
```

 **Refresh (Window menu)**

This command refreshes the currently selected window/pane.

```
{button Help Topics,Contents()}
```



Show project bar (Window menu)

This command shows/hides the project bar.

```
{button Help Topics,Contents()}
```



Show device bar (Window menu)

This command shows/hides the device bar.

```
{button Help Topics,Contents()}
```



Show log (Window menu)

This command shows/hides the log window.

```
{button Help Topics,Contents()}
```




Index command (Help menu)

Use this command to display the opening screen of Help. From the opening screen, you can jump to step-by-step instructions for using GEAR and various types of reference information.

Once you open Help, you can click the Contents button whenever you want to return to the opening screen.



Using Help command (Help menu)

Use this command for instructions about using Help.

 **About command (Help menu)**

Use this command to display the copyright notice and version number of your copy of GEAR.

This is the GEAR about box and provides specific information about your version of GEAR as well as the registration information.



How to create a CD/DVD

1. Create a project
2. Load the project contents
3. Change the recorder settings
4. Testwrite a project
5. Write a project

{button Help Topics,Contents()}



How to create a CD/DVD project

1. Select a GEAR project in the GEAR project bar.
2. Click Create. The Create Project window appears.
3. Enter a name for the project. GEAR automatically provides the extension.
4. Select the disc size .
5. Click Create to close the dialog and create the new project.

You are now ready to [load the project contents](#).

{button Help Topics,Contents()}



How to create a DVD-Video


1. Select the "New DVD-Video(ISO/UDF)" in the project bar.
2. Press the "Create" button in the project bar.
3. Give your DVD-Video project a name and select the required size.
4. Press the create button in the "Create project" dialog.
5. Now you will see the GEAR DVD-Video import selection dialog. Please select a directory to import the VIDEO_TS files from.
6. Press the "Ok" button and your DVD-Video files will be imported into your project.
7. You are now ready to write a Disc or Tape.

You can also import the VIDEO_TS directory afterwards by selecting "Import VIDEO_TS files" in the Edit menu or by right-click with your mouse on your DVD-Video project and select "Import VIDEO_TS files" from the popup menu.

{button Help Topics,Contents()}}



How to load the project contents

1. If necessary click the open project button  in the toolbar to open a project.
2. In the Explorer pane, select the files you want to load, then drag them into the GEAR Project.
3. Continue to select and load files for the project until your project is finished.

Before you continue to test and write the project, you must first [check the recorder settings](#).

{button Help Topics,Contents()}



How to change the recorder settings

1. Click the Settings button in the Device bar.
2. Select recording settings you want to use.
3. Click OK to confirm the selected settings.

You are now ready to test and write the project to CD.

See also:

[Multi-Session Discs](#)

[Virtual Image vs. Physical Image](#)

[Recording methods](#)


{button Help Topics,Contents()}



How to testwrite a project

Note: Make sure the recorder settings are correct.

To test before writing:

1. If necessary click the open project button  in the toolbar to open a project.
2. Choose your recorder in the Device bar.
3. Insert a CD-R in your CD-recorder or a DVD-R in your DVD-Recorder.
4. Click Test. A GEAR dialog appears.
5. Click Yes if you want to write the project after a successful test.

If the test fails, GEAR displays a warning and does not begin recording.


{button Help Topics,Contents()}



How to write a project

Note: Make sure the the recorder settings are correct.

To write a project:

1. If necessary click the open project button  in the toolbar to open a project.
2. Insert a CD-R in your CD-recorder or a DVD-R in your DVD-Recorder.
3. Choose your CD-recorder in the Device bar.
4. Click Write.

Back to [How to create a CD/DVD?](#)

{button Help Topics,Contents()}




How to create an Audio CD

The following procedure explains how to create an Audio CD from wave files and/or Audio tracks.

To create an Audio CD:

1. Select Audio CD as Type in the GEAR project bar.
2. Click Create to create a new project.
3. Enter a name for the new project. GEAR automatically provides the extension.
4. Choose the maximum project size.
5. Click Create to close the dialog and create the new audio CD project.
6. In the Explorer Window, locate and select the files you want to load, then drag them into your Project Window. GEAR supports several audio file formats like wave files (*.WAV) and MP3 files (*.MP3). You will see that a new Audio track is created automatically for the files you drag into your Project Window. You can drag more than one file in an audio track if the track is selected. Select the GEAR volume if you want to create a new track for the file you drag into the project window.

Note: You can copy tracks from an audio CD directly into your project. To do this:

- 6a. Load an audio CD in your recorder.
 - 6b. Click the CD View button  in the toolbar. The disc information appears in the explorer window.
 - 6c. Select a session to display the tracks of the audio CD.
 - 6d. Drag and drop the tracks you want to copy from the CD information window to your Audio project window. GEAR will create a physical image on your hard disk of all these tracks.
7. Continue to select and load files for the project until your Audio CD is finished. You can also drag files to the GEAR window from the Explorer or desktop.
 8. If you want to change the pause between the tracks, right click the tracks in the Project tree and select properties. You can change the pause in the Settings tab. There is always a 2 second pause before the first track.


Now you are ready to check the recorder settings and write the project to CD-R(W).

{button Help Topics,Contents() }



How to append data to a multi-session disc

To append data to a multi-session disc:

1. Insert an appendable disc into the recorder. This is a recordable disc that has been closed as multi-session.
2. Select 'Append Session' from the File menu, or click the Append button  in the toolbar.
3. The Append dialog now appears. By default the last recorded session is automatically selected for appending the new session to.
4. If necessary, select the session and track to append the new session to and click OK.

Note: If the same recorder has been used to create or append to the disc, it could be that the image file still exists. In that case GEAR will display a message. Click Yes to overwrite the volume.

5. GEAR will now examine the previous session on the disc and read its directory structure. GEAR will then create a new volume that can be written to the disc as a new session. When GEAR has finished reading the data and creating the volume, you can add new data to the volume simply by drag and drop. It is also possible to remove files. Be aware that by removing a file, you only delete the entry, and the data are not erased on the disc.
6. After you have copied and/or removed files, you can proceed to testing and writing to actually write the new session to the disc. Only the changes will be written to the disc.

Please note that every time you write a new session, an additional 15MB is added to the disc, for the LEAD IN and LEAD OUT area of each session. This is known as the multi-session overhead.

{button Help Topics,Contents()}



How to use GEAR's tools

1. [How to get discinformation](#)
2. [How to erase a CD-RW](#)
3. [How to copy a CD/DVD](#)

{button Help Topics,Contents()}




How to test and write a project

1. [How to test before writing](#)
2. [How to write a project](#)
3. [How to create a physical image](#)
4. [How to verify a project](#)

{button Help Topics,Contents()}



How to test before writing

1. If necessary click the open project button  in the toolbar to open a project.
 2. Choose your recorder in the device bar.
 3. Insert a disc in your CD/DVD-Recorder.
 4. Click Test. A GEAR dialog appears or choose Test write GEAR Project in the Recorder menu.
 5. Click Yes if you want to write the project after a successful test.
- If the test fails, GEAR displays a warning and does not begin recording.

Note: Make sure the the recorder settings are correct.

See also:

[How to write a project](#)


[How to create a physical image](#)

[How to verify a project](#)

{button Help Topics,Contents()}



How to write a project

1. If necessary click the open project button  in the toolbar to open a project.
2. Insert a CD-R in your CD-recorder.
3. Choose your CD-recorder in the Device bar.
4. Click Write.

Note: Make sure the the recorder settings are correct.

See also:

[How to test before writing](#)

[How to create a physical image](#)

[How to verify a project](#)

{button Help Topics,Contents()}



How to create a physical image?

1. Open the project you want to create a physical image for.
2. Right click on the volume in the project pane
3. Select Convert to physical.
4. A physical image of your project is being made.

As GEAR creates the physical image, the status is reported in the GEAR log window. If physical files already exist for the project, you are prompted to overwrite them.

Note: To use a physical image enable the 'Use physical image' check box in [the Recorder Settings](#).

See also:

[How to test before writing](#)

[How to write a project](#)

[How to verify a project](#)

[Virtual image vs. physical image](#)

{button Help Topics,Contents()}



Virtual image vs. physical image

Before you can write data to CD/DVD-R you must first collect and order the data that need to be recorded. There are several ways to go about this.

Virtual Image

Whenever you create a project in GEAR, a virtual image is created. This is an administration file which contains all the necessary information about the files you want to store on disc. This includes the directory structure to be used on the disc and the location of the files on your hard disk. When you start copying your data onto the CD-R, the virtual image controls the actual recording process by loading the files from your hard disk in the correct order and by writing each file to the right place on the compact disc.

Physical image

Sometimes you may want to use a physical image, a bit-to-bit copy of the disc you are about to write. You should use this method when the transfer rate for recording has to be increased. The obvious disadvantage is that you need a lot of free disk space.

See also:

[How to create a physical image](#)

{button Help Topics,Contents()}



How to verify a project?

1. With the project you want to verify open, choose Verify from the project menu.
2. Update the project by reloading the reported files and directories. As GEAR verifies the track or project, the status of the verification is reported in the GEAR information window.

{button Help Topics,Contents()}



Select the appropriate CD/DVD

Type of project	DVD/CD type	Settings
DVD	ISO/UDF	Verify after write advised
Archiving & backup of data	CD-ROM	Multi Session preferred
Audio only	CD Audio	Disc at Once preferred
Audio collection	CD Audio or CD Track List	Disc at Once preferred
Multi Media	CD-ROM XA	
Combining ISO/XA and DA	Mixed mode 1 (ISO) or 2 (XA)	
Photo CD	External image	Predefined format= XA mode 2 (type 4)
CD-I	External image	Predefined format= CDI mode 2 (type 10/7)
Video CD	External image	Predefined format= XA mode 2 (type 4)
External Image	Ext. image (1 file) or CD Track list (>1 file)	Track list requires disc at once
Replicating a CD	depends on track type(s) of original	Disc at once preferred

See also:

[Project Data Capacity](#)

{button Help Topics,Contents()}



How to create a DVD-Tape

The hybrid ISO/UDF type is most suited for the creation of DVDs.

To create a DVD-Tape:

1. Create an ISO/UDF project.
2. Select a tape device in the device bar.
3. Click Settings to check the tape settings.
4. Click Write.
5. Follow the instructions to prepare the tape unit for recording. When the unit is ready, click OK.
When GEAR has finished writing, a premaster tape is ejected.
The tape can now be sent to a DVD mastering and replication plant.

Note: You can write a ISO/UDF project to CD-R(W) for future compatibility.

See also:

[How to create a CD/DVD project](#)

[Hybrid ISO/UDF projects \(GEAR Pro DVD only\)](#)

{button Help Topics,Contents()}



Hybrid ISO/UDF projects (GEAR Pro DVD only)

A Hybrid ISO/UDF project is mainly used for creating large images for DVD-R discs or DVD premaster tapes. It always consists of one ISO/UDF track. The Hybrid ISO/UDF project is created to ISO/UDF standards with error-checking capabilities (EDC/ECC codes). This is referred to as Hybrid MODE 1 format.

It is possible to write a CD-R in ISO/UDF format. However, this option is only useful for future compatibility with DVD drives. The UDF part of the CDs in this format cannot be read on a CD-reader.

The temporarily output files of a ISO/UDF track with the extension .udf and .lvid are written to the GEAR working directory. Do not delete or edit these files manually; this results in a corrupt and useless project.

Disc sizes ISO/UDF

CD-R	2 minutes	20 Mb
CD-R	3 minutes	28 Mb
CD-R	6 minutes	50 Mb
CD-R	18 minutes	158 Mb
CD-R	23 minutes	200 Mb
CD-R	63 minutes	553 Mb
CD-R	74 minutes	650 Mb
CD-R	76 minutes	668 Mb (overburning)
CD-R	80 minutes	703 Mb
CD-R	82 minutes	721 Mb (overburning)
CD-R	90 minutes	800 Mb
CD-R	99 minutes	870 Mb
DVD-R/DVD-Tape*	428 minutes	3.95 GB
DVD-R/DVD-Tape*	509 minutes	4.7 GB
DVD-R/DVD-Tape*	922 minutes	8.5 GB
DVD-R/DVD-Tape*	1844 minutes	17 GB

Note * The 428, 509, 922 and 1844 minutes image sizes are only available for DVD volumes. These disc sizes are used for DVD-R discs and DVD premaster tapes.

{button Help Topics,Contents()}



How to work with CD-Rewritable

1. [How to create a CD-RW](#)
2. [How to erase a CD-RW](#)

{button Help Topics,Contents()}



How to get disc information?

1. Insert a disc into the recorder.
 2. Click On the discinfo button in the toolbar.
- The GEAR Information window appears.

{button Help Topics,Contents()}



How to create a CD-RW?

To create a CD-RW you need a recorder that supports this feature.

Otherwise the procedure is exactly the same as for [How to create a DVD/CD](#)

{button Help Topics,Contents()}}



How to create a project using an external image

1. Select External image as GEAR project.
2. Click Open. The Open External image dialog appears.
3. Locate the external image you want to open, then click Open. The External Image Parameters dialog appears.
4. Choose a format from the Image Type drop-down list. You can select one of the predefined formats or choose User-defined image type from the Image Type drop-down list.
5. Click OK. A new volume with the track named 'External track' is opened in the project window.

Now you can test and write the project to the CD-R(W), DVD-R(W), DVD-Ram or Tape.

See also:

[Predefined formats](#)

{button Help Topics,Contents()}



How to erase a CD-RW?

Note: Once erased the contents of a CD-RW cannot be recovered.


1. Insert the CD-RW you want to erase.
2. Click on the erase button in the toolbar.

The complete CD-RW will be erased. You can now reuse the CD-RW for new projects.

{button Help Topics,Contents()}



How to copy a CD/DVD?

In GEAR you can easily copy single session data and audio discs with the Copy CD/DVD button  on the toolbar.

The source disc will be read by the CD/DVD recorder or a CD/DVD ROM drive, and written to a temporary file on the hard disk. There must be a partition on the hard disk with enough free disk space to store a copy ('image') of the whole source disc. If not, Copy CD/DVD won't be able to copy the CD/DVD.

Please note that if the DVD is copy protected, the reader drive will give a read error indicating a copy protection error.

If the user chooses to make multiple copies the same source disc image will be used for every copy.

{button Help Topics,Contents()}



What you should know about...?

1. [CD/DVD the basics](#)
2. [CD Rewritable](#)
3. [Virtual Image vs. Physical Image](#)
4. [Multi session versus Single session](#)
5. [Glossary](#)
6. CD types
 - [CD-ROM projects](#)
 - [Multi-Session Discs](#)

{button Help Topics,Contents()}



Context Help command

Use the Context Help command to obtain help on some portion of GEAR. When you choose the Toolbar's Context Help button, the mouse pointer will change to an arrow and question mark. Then click somewhere in the GEAR window, such as another Toolbar button. The Help topic will be shown for the item you clicked.

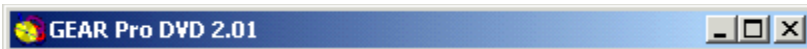
Shortcut

Keys: SHIFT+F1

{button Help Topics,Contents()}



Title bar



The title bar is located along the top of a window. It contains the name of the application and document.

To move the window, drag the title bar. **Note:** You can also move dialog boxes by dragging their title bars.

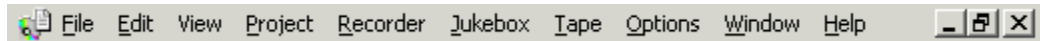
The title bar contains the following elements:

- Application control-menu button
- Name of the application
- Name of the project
- Type of the project
- Size of the project
- Minimize button
- Restore button
- Maximize button
- Close button

{button Help Topics,Contents()}



Menu bar



The menubar is located underneath the title bar. It contains all menus which contain every function GEAR has. To activate a menu simply click on it or use the Alt+(correspondening key).

The GEAR menu bar contains the following elements:

Document control-menu button

File menu

Edit menu

View menu

Project menu

Recorder menu

Jukebox menu

Tape menu

Options menu

Window menu

Help menu

Minimize project button

Restore project button

Maximize project button

Close project button

{button Help Topics,Contents()}

Toolbar

You can access different actions/tools from the toolbar like:

1. Create a new project
2. Open an existing project
3. Append data to existing CD-RW
4. Close a project
5. Delete a project
6. Retrieve disc information
7. Erase a CD-RW
8. Copy a CD
9. Testwrite a project
10. Write a project
11. Write a project to tape
12. Control the jukebox
13. Switch to the explorer view
14. Switch to the disc information view
15. Go one level back
16. Context sensitive help

{button Help Topics,Contents()}

 **Scroll bars**

Displayed at the right and bottom edges of the document window. The scroll boxes inside the scroll bars indicate your vertical and horizontal location in the document. You can use the mouse to scroll to other parts of the document.

```
{button Help Topics,Contents()}
```

Size command (System menu)

Use this command to display a four-headed arrow so you can size the active window with the arrow keys.



After the pointer changes to the four-headed arrow:

1. Press one of the DIRECTION keys (left, right, up, or down arrow key) to move the pointer to the border you want to move.
2. Press a DIRECTION key to move the border.
3. Press ENTER when the window is the size you want.

Note: This command is unavailable if you maximize the window.

Shortcut

Mouse: Drag the size bars at the corners or edges of the window.

{button Help Topics,Contents()}

Move command (System menu)

Use this command to display a four-headed arrow so you can move the active window or dialog box with the arrow keys.



Note: This command is unavailable if you maximize the window.

Shortcut

Keys: CTRL+F7

{button Help Topics,Contents()}

 **Minimize command (System menu)**

Use this command to reduce the GEAR window to an icon.

Shortcut

Mouse: Click the minimize icon on the title bar.
Keys: ALT+F9

{button Help Topics,Contents()}

Maximize command (System menu)

Use this command to enlarge the active window to fill the available space.

Shortcut

Mouse: Click the maximize icon on the title bar; or double-click the title bar.
Keys: CTRL+F10 enlarges a document window.

{button Help Topics,Contents()}}



Close command (System menus)

Use this command to close the active window or dialog box.

Double-clicking a Control-menu box is the same as choosing the Close command.

Note: If you have multiple windows open for a single document, the Close command on the document Control menu closes only one window at a time. You can close all windows at once with the Close command on the File menu.

Shortcuts

Keys: CTRL+F4 closes a document window.
 ALT+F4 closes GEAR.

{button Help Topics,Contents()}

 **Restore command (Control menu)**

Use this command to return the active window to its size and position before you chose the Maximize or Minimize command.

{button Help Topics,Contents()}



GEAR Aspi driver for Windows NT4 and Windows 2000

GEAR now supports a new GEARAspi driver (GEARAspi.DLL) for Windows NT and Windows 2000. An update of the cdrom.sys driver is not necessary anymore.

For Windows 95, 98 and ME GEAR uses drivers (AFL.DLL and AFL.VxD) licensed from Asimware Inc.

The appropriate drivers are automatically installed when you install GEAR.

{button Help Topics,Contents()}



New Graphical User Interface

The graphical user interface of GEAR Pro (DVD) has been changed into a more user friendly look and feel. The editors are now integrated within the main window. The new user interface offers one powerful editor for all CD and DVD formats instead of the three editors in GEAR 4.x.

The upper pane of the editor offers a full Explorer window within the GEAR main window, using a special new ActiveX component.

In the editor window (lower pane), the layout of the CD/DVD image is also represented as a Windows Explorer view (tree view). Easy drag and drop of files and directories from the explorer window to the image window is supported. Many new and powerful operations are available in the image window with a right mouse click.

GEAR now offers improved feedback and animations during all time consuming actions (drag & drop, CD/DVD recording, CD/DVD/tape writing, CD reading/copying, CD-RW erasing, etc.).

For users familiar with the GEAR 4.x interface, a Project Toolbar, Device Toolbar and Log Window is shown as part of the main window. However, these can be made hidden also.

Every device type (recorder, tape, jukebox) now has its own menu.

The device settings are improved and have more options. SCSI/IDE driver settings can still be changed if no devices were found.

Many dialogs have been improved (formatting settings, disc info, append, jukebox).

{button Help Topics,Contents()}



CD-Rom support

Besides CD/DVD recorders, GEAR now also supports CD/DVD-ROM drives for CD/DVD copying, and data and audio extraction.

In the new Copy CD Dialog you can select CD/DVD ROM drives as source.

Extraction of data and audio tracks is possible from the Disc Information dialog, or from the Track View (see Track View button in the Toolbar)

{button Help Topics,Contents()}



Context sensitive help system

GEAR's new context sensitive help system provides you with context sensitive help. Just press F1 or the help button.

```
{button Help Topics,Contents()}
```



Cyclic Buffering System

GEAR's was already a reliable product, but it just got better. Our cyclic buffering system, now also available with the new GEARAspi.DLL driver for Windows NT and 2000, increases recording performance and reliability dramatically.

{button Help Topics,Contents()}



CD-ROM recorder settings

Make sure the following settings are used:

Recording method - Track At Once

Verify after Write - enabled

Multi Session - disabled

Fixate Disc After Write – enabled

{button Help Topics,Contents()}



Multi-session recorder settings

Make sure the following settings are used:

Recording Method - Track-at-Once

Verify after Write - enabled

Multi Session - enabled

Fixate Disc After Write – enabled

{button Help Topics,Contents()}



The options commonly used are:

1. CD-ROM for data.
2. CD-Audio for music.
3. CD-ROM XA for multi-media.
4. Mixed Mode for CD-ROMs with audio and data tracks.
5. External image for images made with other formatting software.

{button Help Topics,Contents()}



Which disc size?

Choose the disc size that matches the CD-R you will be using. The disc size you choose here is also the maximum size of the project you are about to create.

When writing to CD-R(W) you can choose between 18, 63, 74 and 80 minutes.

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3DO

A CD-ROM-based system in the same market segment as CD-I. Based on a RISC processor for optimum graphical performance.

 **Access time**

The time a CD-ROM drive or hard disk needs to read and transfer data from disc to the target computer.

ActiveAudio

A type of Enhanced CD. ActiveAudio is one of the approaches developers have taken to solve the problems that occur when you combine digital and audio data on one CD-ROM. ActiveAudio information is organized in this way:

Digital data occupies the silence preceding track 1 (so called track 0)

Audio data occupies track 1 and up

 **Address**

The ID number of a device on the SCSI bus, or the location of a block of data in storage.

ADPCM

Adaptive Differential Pulse Code Modulation. A method of compressed audio data storage. Instead of storing the signal, the difference between signals is stored. This means that only four bits per sample rather than 16 bits per sample are needed.

For CD-I, levels A, B, and C are recognized. B and C are also used in CD-ROM XA. The sample frequencies used to measure the audio signals are 37.8 kHz and 18.9 kHz for levels B and C, respectively. This brings the band width (the maximum frequency to be reproduced) to 17 kHz and 8.5 kHz. For level A, these figures are 44.1 kHz and 20kHz. Using ADPCM, a 16-fold reduction in storage requirements can be achieved (level C, mono).



AIFF

Audio Interchange File Format. It is a full-featured audio file specification that allows many programs on multiple platforms to share standards for audio storage. Electronic Arts published the AIFF specification in 1985. It started as a digital music instrument specification. Over the years it has been enhanced to provide compressed digital sound (AIFC).



Alias records

The stored information that tracks the locations of a file and its alias as well as the pointers to those locations.



ANSI

American National Standards Institute. ANSI is a private, nonprofit membership organization that performs two functions:

Coordinates the United States' voluntary consensus standards system

Approves American National Standards

If you wish to contact ANSI, write or call: ANSI, 1430 Broadway, New York, NY 10018; (212) 354-3300.



ASCII

American Standard Code for Information Interchange. A coding scheme that represents characters numerically. Almost every manufacturer uses the same coding for the first 128 symbols in the ASCII table. Different tables exist for ASCII numbers 128 through 255.



Authoring

Working method for modeling information. Examples of authoring systems include word processors and spreadsheets on a PC, and multimedia workstations for combining sound, video, images and text for real-time audiovisual presentations.



Average seek time

The average time it takes to locate data and position the drive head to that location. Average seek time is measured in milliseconds.



AVI

Format for audio/video files defined by Microsoft for use under Windows. The limited compression means a fast computer system with a fast storage medium is required. AVI is not well suited for use with CD-ROM.

**BER**

Bit Error Rate. Defined as the number of correctly processed bytes before an erroneous bit is detected. For CD-ROM, the bit error rate is 10^{-12} .



Bit

The smallest unit of information. (Bit is a contraction of binary and digit.) A binary digit has a value of 0 or 1.



BLER

Block Error Rate. Compares the number of blocks with at least one error against the total number of blocks measured.



Block

The smallest "chunk" of memory accessed or transferred by a disk drive. Usually 512 bytes in size, it can be larger in multiples of 512. The number of bytes in a block is the same as block size.

**Blown session**

A CD-ROM recording session that is disrupted such that the recorder literally loses track, rendering the recording medium, a writable compact disc, unusable.



Buffer

A temporary storage area for data being transferred from one place in the computer system to another.



Byte

A symbol or character that consists of eight bits.



Cache

A temporary storage area for information used frequently by your system. You can set up cache in RAM or on your hard disk. Using cache speeds up system response by reducing the time it takes to locate requested information.



Caching

Used to store recently-requested information. On the next request for the same information, the system retrieves it from fast cache memory rather than from the slower medium.



CD

Compact Disc. A non-magnetic, polished metal disk with a protective plastic coating. Used to store digital information, which can be read by an optical scanning device that uses a high-intensity light source—a laser—and mirrors.

**CD-I**

Compact Disc Interactive. A system for presenting information such as text, images, and video, on a television screen. The standard is defined by Philips and Sony and described in the Green Book.



CD Plus

A type of Enhanced CD. CD Plus is one of the approaches developers have taken to solve the problems that occur when you combine digital and audio data on one CD-ROM. CD Plus takes a multisession approach:



CD Recorder

These drives, along with specialized mastering software, allow users to make their own compact discs.



CD-ROM

Compact Disk, Read-Only Memory. Data is stored as pits on a disc surface, which are read by a laser in the CD-ROM drive. The data can be read and copied; data cannot be erased; new data cannot be added.



CD-ROM XA

Compact Disc Read Only Memory Extended Architecture. The standard for CD-ROM to which a number of options from CD-I have been added. These include audio compression (ADPCM), multi-channel audio, file interleaving, user data (2336 bytes/sector), image compression, and so on.

A CD-ROM XA disc is a Mode 2 disc in which the data is located in Form 1 (2048 bytes/sector) or Form 2 (2336 bytes/sector).



CD standards

The physical aspects of different CD types defined by Philips and Sony. The logical file format used on CDs is described in the ISO-9660 standard. See Green Book, ISO-9660, Orange Book, Red Book, White Book, Yellow Book.



Central processing unit (CPU)

The brains or "central switching station" of any computer.



DAT

Digital Audio Tape. A 4mm tape format used for data storage.



Data capture

A method of converting data from non-electronic data carriers—paper, microfiche, artwork, and so on—into a form that allows processing by computer.



Data compression

A technique for removing unnecessary information from data. For example, a repeating sequence can be stored as a value and the number of times it's repeated.



Data error

Any discrepancy between the data recorded and the data read back.



Data transfer rate

A measure of how quickly data is supplied to the computer from the CD-ROM drive.



DDP

Disc Description Protocol. A CD sector level protocol designed to adequately describe a compact disc. A CD described using DDP can be reliably mastered. Some mastering and replication companies prefer the premaster tape with DDP.



Device driver

The software program that translates commands between the operating system and the SCSI Manager. It makes it possible for your system to talk to the devices attached to it.



Directory, folder

A file that contains information (name and location) about the files on a disk. Used in almost every storage medium (floppy, hard disk, CD-ROM).



Disc at once

A method by which a disc is written. A CD recorder first writes the lead in, then the track data, then the lead out. Link blocks are not inserted. Useful for audio-only discs that must be an exact copy of an image.



Drive, CD drive

The physical components necessary to read data from a CD.



Drive, hard disk

A data storage device that employs one or more rigid disks as the medium of storage.



DVD
Digital Video Disc or Digital Versatile Disc



DVI

Digital Video Interactive. A technology, developed by RCA and sold by Intel, that makes it possible to store compressed real-time audio and video, then play it back decompressed at the correct speed.



Dynamic

Marked by continuous change or activity. The data held in dynamic RAM cache is swapped out as new data is accessed. It is marked by continuous change and activity.



Dynamic RAM cache

A RAM cache that grabs and holds information as it is read by a computer. When full, dynamic RAM swaps out the oldest data with the newest data.



ECC/EDC

Error Correction Code/Error Detection Code. Information used by the drive hardware to detect and correct data errors caused by scratches or dirt on a disc. Optimizes data integrity.

CD-ROM uses only 2048 bytes of a sector of 2352 bytes for data storage. Header and synchronization information uses 12 and four bytes, respectively. The remaining 288 bytes are used for ECC and EDC information.



Electronic publishing

Publishing process in which electronic media such as CD-ROM, floppy disk, and so on, are used rather than printing on paper.



Encryption

A complex reordering of information so that it becomes illegible. Encryption and decryption are used together. some of the algorithms used are symmetrical, which means that double encryption restores the data to its original state.



Enhanced CD-ROM

Compact discs that combine digital and audio data on a single disc in a way that allows trouble-free use of the same disc on both an audio CD player and a CD-ROM drive.



Firmware

An often-used microprogram or instruction stored in ROM. Usually refers to the ROM-based software that controls a drive.



Form 1

A subformat of Mode 2. Defines the structure of a CD-ROM sector as follows: sync (12 bytes); header (4 bytes); subheader (8 bytes); data (2048 bytes); EDC (4 bytes); ECC (276 bytes).

This subformat is used for normal data files including Photo CD and Electronic Book.



Form 2

A subformat of Mode 2. Defines the structure of a CD-ROM sector as follows: sync (12 bytes); header (4 bytes); subheader (8 bytes); data (2324 bytes); EDC (4 bytes). This subformat is used for files where error correction is impossible due to real-time characters, that is, compressed audio or moving images.



Fragmentation

With use over time, the sectors of a file are written in different areas across the storage surface. This slows access time because the drive head must move to non-contiguous locations to read the contents of a file.



Gb

A Gigabyte according to ISO standards is 1000.000.000 bytes. In computer terminology a Gb is referred to as $1024 \times 1024 \times 1024 = 1,073,741,824$ bytes



Green Book

Defines the physical aspects of CD interactive (CD-I). See also standards.



Hard disk

A permanent storage medium for computer data based on a rotating disk with a magnetically sensitive layer. Information can be written on this and read again using a read/write head. Information can also be deleted.



HFS

Hierarchical File System. Used by Apple for floppy and hard disk and for CD-ROM. Apple also supports the ISO-9660 standard.



High Sierra

The predecessor of the ISO-9660 standard. Published by the CD-ROM Ad Hoc Advisory Committee, also known as the High Sierra Group, on May 28, 1986. Use of this standard is no longer recommended. ISO-9660 is preferred.



Input/output (I/O)

The communication flow between a computersystem and the devices attached to it.



Intelligent

Refers to a device capable of processing commands on its own.



Interface

The go-between that provides a common basis for communication between two otherwise incompatible devices.



Image

A virtual copy of the future CD-ROM disc stored on the hard disk. It is used for writing the final premaster tape and/or CD-R disc.



Index

A separate list of words or keys, sorted alphabetically or numerically along with a reference to their location in the text or the data base.



Interactive media

Media with which you interact to find information.



Interface

The point of contact between two systems. Interfaces can be items of equipment (e.g., SCSI interface between computer and CD-ROM player) or software modules (user interface).



ISO-13346

The new ISO standard for optical media based on a file system for write-once and rewritable media using non-sequential recording.



ISO-9660

The international standard defining the CD-ROM data format. The aims of the standard are to achieve interchangeability of discs and to optimize performance. It is the official standard to which all CD-ROM applications should conform.



JPEG

Joint Photographic Experts Group.


**Kb**

A Kilobyte according to ISO standards is 1000 bytes. In computer terminology a Kb is referred to as 1024 bytes.



Kb/s

Kilobytes per second.

 **LaserVision**
Video disc system.



Latency

The time, in milliseconds, it takes for the spinning disk platter to bring around the desired sector to where the read/write head can access it. Does not include head positioning time. Contributes to access time. (See Interleaving.)



Mastering

The process in which a glass master is produced for production of the stampers which are in turn used for replication of the CDs. The glass master contains photosensitive lacquer that's illuminated on a laser beam recorder (LBR). The data for mastering comes from a premaster tape.



Mb

A Megabyte according to ISO standards is 1000.000 bytes. In computer terminology a Mb is referred to as 1024 x 1024 bytes.



Mb/s

Megabytes per second.



Media

Another term for the CD platter, but more specifically the surface of the platter that holds the data.



Megabyte

One million bytes (actually 1,048,576).



MMF
Multimedia file.



Mode 1

Defines the structure of the CD-ROM sector as follows: sync (12bytes); header (4 bytes); data (2084 bytes); reserved (8 bytes); ECC (276 bytes); and EDC (4 bytes).



Mode 2

Defines the structure of the CD-ROM sector as follows: sync (12 bytes); header (4 bytes); subheader (8 bytes); remainder (2312 bytes) dependent on whether Form 1 or Form 2.



Mount

To appear on the Desktop. To show an icon on-screen.

**MPC**

Multimedia PC with a CD-ROM drive. Defined by Microsoft. An MPC application will work on an MPC computer.



MPEG

Motion Picture Experts Group. A standard compression method for motion video. The ISO standard used by Philips in their CD-I players. The algorithm used (discrete cosine transform) makes an extremely high rate of compression possible (200:1). MPEG video and audio encoding form the basis for video-CD.



Multisession

An ISO standard CD-ROM format often referred to as "Orange book" that allows additional information to be added to a writable CD-ROM disc that has already been written to once.



Multivolume CDROM

A CD-ROM with more than one mountable volume on it. In the instance where some of the volumes are in formats other than Apple's HFS, using the Mounting feature in CDT will allow you to see the icons of all mountable volumes.



OEM

Original Equipment Manufacturer. A company that manufactures a piece of hardware or software that is modified or reconfigured by a value-added reseller and sold (usually) under the reseller's brand name.



Orange Book

Specifies the physical aspects of CD-recordable media. The first part of the book describes CD-MO (magneto optical) system and the second part describes CD-WO (write once) system. The CD recorders and CD-R media are all based on the CD-WO standard. See also standards.



OSTA

Optical Storage Technical Association is a non profit corporation that is promoting the use of optical technology, optical drives, media and peripherals. GEAR Software is an OSTA associate



Overhead

The incidental command processing time that is necessary to complete a task.



Partition

A portion of a storage area allocated to a particular use or user.



PCM

Pulse Code Modulation. A technique for converting analog audio into CD digital audio.



Peripheral

A device that is attached to the computer, either directly or via the bus.



Physical image

The actual bit-to-bit copy of the future CD-ROM disc, without ECC and EDC information. Usually a physical image can be as large as 600MB and will demand a lot of hard disk space (all data will be present in the original files and once more in the image file).

If an image consists of multiple tracks, a separate image file is created for each track. However, GEAR allows you to make an application without the need for so much hard disk space by using a virtual image, which is just an administration of the image structure.



Platter

The rigid disk that is used for storing data on hard disk drives.



Premaster tape

The tape that CD manufacturers use to create the CD-ROM master, which is used to make the actual CD-ROMs. The premaster tape is written from the image in the format as specified by the CD-ROM manufacturer (possibly in DDP format).



Proprietary

Vendor-unique technology or devices that are incompatible with other products in the industry.



Read ahead

Similar to buffering, except Read Ahead can read ahead to the next expected data. This prepares data for the CPU's next request, speeding up access time.



Red Book

A book (with a red binder) that defines the physical aspects of digital audio CDs (CD-DA). See also Green Book, Orange Book, standards, White Book, and Yellow Book.



Replication

The process of producing identical copies of a CD-ROM from a stamper or matrix.



Retrieval

Term for locating information in databases. Retrieval takes place on the basis of indexes present.

 **SCSI ID**

A device's unique address on the SCSI bus, referred to as its ID, or identification.



SCSI interface

Small Computer Standard Interface. (Pronounced scuzzi.) An industry standard for the interface between computers and peripherals.



SCSI manager

The SCSI Manager is part of the Operating System that provides the interface between a program, such as a driver or formatter, and the actual hardware SCSI port.



Sector

A piece of data (a number of bytes) on disc. The size is 2352 bytes. CD-ROM uses 2048 bytes for data storage. Header and synchronization information uses 12 and 4 bytes, respectively. The remaining 288 bytes are used for ECC and EDC information. The 2 KB of data in every sector can be divided into logical blocks of 512, 1024, or 2048 bytes. Every sector on a CD-ROM disc has a unique address by which it can be accessed.



Seek time

The time it takes the read/write head to move back and forth in search of the appropriate track. Seek time does not include latency or command overhead. (See Access Time.)



Session

One contiguous, spiraling string of data written to, or stamped into, a disc. There may be more than one session on a disc. A track is a portion, possibly all, of a session. A session may contain many tracks, but a track may not contain a session.

 **SGML**

Standardized General Markup Language. An ISO standard that uses tags to add structure to information, usually text. Various structural components are indicated within the information, e.g., title, subtitles, paragraphs, footnotes, and cross references.



Single-session

Refers to standard CD-ROM discs where multisession format is not present.



Stamping

Manufacturing data into a disc (as opposed as writing data to a writable disc).



Standards

Green Book: The CD-I, CD interactive, standard. Operating system and playback hardware specifications for mixed mode CD-ROMs.

Orange Book: Standard for write-once (multisession) CD. A Sony/Philips collaboration that details physical and optical characteristics of Compact Disc Write Once media, and hybrid ROM/WO discs, which have read-only and write once areas on the same disc. This technology is becoming increasingly cost effective. Discs for recording use gold as a substrate metal instead of the aluminum employed by mass-market stamped discs, but may employ both.

Red Book: Standard for normal audio CD. Refers to the specifications for the compact audio disc format developed by Philips and Sony. It is the standard format of commercial audio CDs. When a disc conforms to the Red Book standard, it will usually have "digital audio" printed beneath the disc logo.

In 1983 a consortium of Philips (N.V.) and Sony drafted a comprehensive document to thoroughly define the Compact Disc Digital Audio standard. This document, named for the color of its cover, describes the physical dimensions, optical characteristics, and logical organization, including the table of contents, track, and audio stream formats of a compact disc. This is the seminal compact disc document, from which all subsequent standards are derived.

White Book: Standard for Video CD. JVC, Matsushita, Sony, and Philips coauthored this specification, also known as the "Video CD Standard." This remains a nascent technology, waiting for CD-ROM technology and the right marketing approach.

Yellow Book: Standard for CD-ROM. A standards document that builds on the Red Book Standard allowing for the presence of data tracks on a CD. The Yellow Book standard specifies that CD-ROM must encode the first track as data. In addition to the two layers of error correction outlined in the Red Book, data is further protected by a third layer of error detection and correction for added security.

When a disc conforms to Yellow Book standard, it usually will say "data storage" beneath the disc logo.



Static

Having no motion. Being at rest. The data held in Static RAM cache is the first data accessed up to the limit of the cache. It does not change as new information is accessed. It has no motion. It is at rest.



Subcode

Information (time, text, graphical, or MIDI) stored together with audio on a CD and spread across eight channels (PQRSTUUVW). P and Q contain the time information shown on the display of an audio CD player.



Thermal recalibration

The process of recalculating the positions of data on a hard disk platter as those positions shift due to the platters expansion under the heat of operation.



Track

A CD-ROM disc can contain more than one track. Tracks are implemented sequentially (like a CD audio disc). If a CD-ROM contains multiple tracks, the data part is always stored in the first track and the audio parts (in the case of a mixed mode CD-ROM) are stored in the following tracks.



Track 1 problem

An audio player, when given digital data on track 1, might do a number of things:

Skip it

Refuse to play it

Play silence

Play the data (sounds like static)

When you attempt to play data on your audio equipment, you are likely to damage your speakers



Transfer rate

The speed at which information can be transferred. Usually expressed in terms of KB per second. A standard CD-ROM drive is rated at 150KB/second. A double speed player can handle 300KB/second.



UDF

The Optical Storage Technology Association (OSTA) has defined the Universal Disk Format (UDF) as a subset of ISO13346 in order to maximize data interchange, creating a flexible format that is eminently suited for incremental write (see below). Although UDF is not an official standard, it has since become a de-facto standard for the industry.

 **Unicode**

Coding of character sets making use of 2 bytes. ASCII is a subset of unicode.



Virtual image

Making a CD-ROM image usually requires an exceptional amount of hard disk space; all data is present in the original files and duplicated in the CD-ROM image. GEAR lets you make an application, without the need for so much hard disk space by producing a virtual image that is just an administration of the image structure.

The software keeps a record of the files to be included in the final application. Simulation and writing of the final premaster tape or CD-R is done using this volume administration, thereby eliminating the need for a lot of expensive hard disk capacity.

A CD-ROM can contain multiple tracks in which case multiple virtual tracks are created; an administration is kept for every track of the CD-ROM.



Virtual track
See virtual image.



Volume

The CD-ROM term for a complete CD-ROM disc. In case of very large databases, multiple discs can be issued forming a volume set. When a mixed-mode disc is made, a volume will contain multiple tracks.



VTOC

Volume Table of Contents. This is the portion of the CD-ROM disc that contains basic information about the disc, such as its name, copyright information, pointers to various blocks of data, whether the disc is a member of a multi-volume set, dates, version, numbers, etc.



White Book

Specifies the physical aspects of video CDs. See also standards.



Yellow Book

Defines the physical aspects of CD-ROM. A special extension of this book describes CD-ROM XA (compact disc extended architecture). See also standards.



Predefined formats

When working with external images you must indicate which type of image will be used. You can choose any of the following predefined formats

Type	Image Type Format	External Volume Type
1.	CD-ROM Mode 1 (ISO etc.), sector size 2048	Standard ISO, HFS, or CDTV image
2.	CD-ROM Mode 1 (ISO etc.), sector size 2352	Standard ISO with EDC/ECC codes
3.	CD-ROM Mode 1 (ISO etc.), sector size 2352, scrambled sectors with 2 seconds pre-gap	ISO with EDC/ECC codes, pre-gap, and scrambled
4.	CD-ROM XA Mode 2, sector size 2336	Standard XA or EB XA
5.	CD-ROM XA Mode 2, sector size 2352	Standard XA with EDC/ECC codes
6.	CD-ROM XA Mode 2, sector size 2352, scrambled sectors with 2 seconds pre-gap	XA with EDC/ECC codes, pre-gap, and scrambled
7.	CD-I Mode 2, sector size 2336	Standard CD-I without EDC/ECC codes
8.	CD-I Mode 2, sector size 2352	Standard CD-I with EDC/ECC codes
9.	CD-I Mode 2, sector size 2352 with 2 seconds pre-gap	Standard CD-I with pre-gap, and EDC/ECC
10.	CD-I Mode 2, sector size 2352, scramble sectors with 2 seconds pre-gap	CD-I with EDC/ECC codes, pre-gap and scrambled; uses the same output format as that of most CD-I authoring tools
11.	Standard CD digital audio (44.1kHz, 16 bit, stereo)	Red Book audio
12.	Tracklist file	

Keep in mind the following about image types:

1. The size of the pre-gap should always be two seconds (150 sectors). Scrambled images must contain sync, header, and EDC/ECC code information.
2. Unscrambled images can be accepted with a 2,352 sector size without the sync, header, and EDC/ECC filled in.
3. The byte order of audio files must be the same byte order used by the computer running the GEAR software. If this is not the case, you can use the generic option MSBAudio= in the Gear Preferences file to make GEAR swap the audio bytes for all tracks.
4. With LSB audio default, if MSBAudio=TRUE, each track will be swapped by GEAR. Audio files should not contain any sound header. If sound headers are not removed or cleared, they will cause a sharp click in the resulting audio track on the CD. Audio files should contain only 16-bit samples and must be stereo (one sample for the left channel and one sample for the right channel) sampled on 44.1kHz.
5. The external image files option lets you select one file only. If the external/foreign

image consists of more than one file, use track list files.

```
{button Help Topics,Contents()}
```



Project Data Capacity

The following table shows the data capacity for each disc size and track type:

Type	Size	ISO and ISO/UDF	XA and CD-I	CD Audio
CD-R(W)	18 min.	158 Mb	180 Mb	181 Mb
CD-R(W)	63 min.	553 Mb	631 Mb	635 Mb
CD-R(W)	74 min.	650 Mb	741 Mb	746 Mb
CD-R(W)	80 min.	703 Mb	802 Mb	807 Mb
DVD-R	428 min.	3.95 GB		
DVD-R	509 min.	4.7 GB		

The following table shows the sector data capacity for each track type:

Track type	Sector data capacity
ISO	2048 bytes
XA and CD-I	2336 bytes
CD Audio (DA)	2352 bytes

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CD-ROM projects

The CD-ROM type is used for recording computer data and always consists of one ISO track. A GEAR CD-ROM project is created to ISO standards with error-checking capabilities. This is referred to as MODE 1 format (yellow book).

When you create a new project, several volume administration files are created in your current working directory/folder. Do not delete or edit the files in this directory/folder manually; this might result in a corrupt and useless project.

Disc sizes CD-ROM

CD-R	2 minutes	20 Mb
CD-R	6 minutes	50 Mb
CD-R	18 minutes	158 Mb
CD-R	63 minutes	533 Mb
CD-R	74 minutes	650 Mb
CD-R	80 minutes	703 Mb
CD-R	99 minutes	870 Mb

Note *When writing computer data to CD you are advised always to enable Fixation and Verify after Write to make sure the files can be read.*

See also:

[How to create a project](#)

{button Help Topics,Contents()}



Multi-Session Discs

By appending a multi-session disc, you can add data to the disc. One of the sessions on the previously-recorded disc is used as the basis for a new image. The contents of the image is edited and finally, the image is written to the CD-R disc. The virtual image contains the same folder/file structure as the session and is displayed in the image window.

Readability and multi-session support

Some CD-ROM or CD-Recorder drives or drivers do *not* support multi-session. If so, the disc is not accepted, or only the data of the first session is visible.

To check if the CD is correctly recorded, you can try to append a new track. If the data in the GEAR Editor is correct, either your CD-ROM driver software or your CD-ROM player does not support multi-session. Contact your dealer or search the Internet for a CD-ROM driver update.

See also:

[How to append data to a multi-session CD](#)

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CD-Rom XA projects

XA (eXtended Architecture) is a format that allows you to interleave two or more different CD track types, such as audio and video. Interleaving is necessary if the recorded tracks need to be synchronized during playback, as is the case in multi-media applications. For example, with a mixed mode disc, the laser-reading head has to jump back and forth between widely separated tracks to play back audio and video data. This slows down the application significantly. When you use interleaving, the laser-reading head can pick up video, then move smoothly to the next amount of audio and so on, providing real-time playback.

Choose XA to write the following formats: CD-ROM XA, EB, MMCD, Photo CD, and VideoCD.

Disc sizes CD-ROM XA:

CD-R	2 minutes	20 Mb
CD-R	6 minutes	50 Mb
CD-R	18 minutes	180 Mb
CD-R	63 minutes	631 Mb
CD-R	74 minutes	741Mb
CD-R	80 minutes	802 Mb
CD-R	99 minutes	870 Mb

Note Playing XA interleaved files requires an XA decoder card.

See also:

[Pre-interleaved files](#)

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Pre-interleaved files

GEAR assumes that the selected files are pre-interleaved. Make sure the files you are loading are pre-interleaved files. Non-pre-interleaved files you load this way are useless on the resulting CD-R disc. A pre-interleaved file must have a 2336 byte sector size with a subheader field filled in. This subheader field is copied, together with other information, to the GEAR administration file. Normally the subheader is not included in a file and the subheader information is generated by GEAR.

Back to [CD-Rom XA projects?](#)

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Audio projects

To create an Audio project, you need hard disk files that represent audio.

GEAR supports the following formats:

- Red Book audio
- Wave files (*.wav)
- MP3 files

Depending on the audio package you are using, the audio file may or may not contain a sound header. However, audio files should not contain sound headers when written to CD. If sound headers are not removed or cleared, they will cause a sharp click in the resulting audio track on the CD. GEAR removes the header automatically for wave files (*.wav).

Disc sizes Audio

CD-R	2 minutes	20 Mb
CD-R	6 minutes	50 Mb
CD-R	18 minutes	181 Mb
CD-R	63 minutes	653 Mb
CD-R	74 minutes	746 Mb
CD-R	80 minutes	807 Mb
CD-R	99 minutes	870 Mb

See also:

[Audio file requirements](#)

[How to create an Audio CD](#)

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Audio file requirements

The files must always fulfill the following requirements, which are specified in the Red Book:

- The sample frequency must be 44.1kHz.
- Audio must be stereo (one sample for the left channel and one sample for the right channel) sampled on 44.1kHz.
- Each sample must contain 16 bits.
- The byte order must be the same as the byte order used by your computer; if it is not, you can use the generic option MSBAudio (in gear.ini) to make GEAR swap the audio bytes for all tracks.

Note The Philips CDD522 reads audio in MSB format while the Yamaha CD-R100 reads audio in LSB format.

For example, LSB audio is the default for DOS and Windows. If you want GEAR to swap byte order, set MSBAudio=True in the GEAR.INI file. The default for Macintosh is MSB Audio. To have GEAR swap the byte order, set MSBAudio=False in the GEAR.INI file.

You can load up to 99 audio tracks in your project. If audio tracks are combined on a disc with an ISO or XA track, you can create up to 98 tracks. The CD audio type is suited for CD Digital Audio.

Back to [Audio projects?](#)

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Track lists

If you have a Disc at Once compatible recorder you can create a CD using a CD Track List. The CD Track List should contain all the tracks you want to record.

You create the CD Track List in:

- any plain ASCII editor.

Note Place the track list and track contents in the same folder. Use the Run Command dialog in GEAR to create a disc with a track list.

The track list file contains one or more lines where each line specifies a track of the CD-ROM (you can use a full path). Each line should contain a file specification and a track type specification. You can also specify the length of the pause between two tracks.

For example, to write a mixed-mode image one that contains mode 1 or mode 2 data you can specify the following lines in a track list file

```
/IMAGE.DAT      /1
/AUDIO.2        /11
/MUSIC/AUDIO.3  /11   {No return after last line.}
  ||
track path name      image type number
```

The following few lines is an example of a track list file (EXAMPLE.TLF) with user-defined track types:

```
/MYIMAGE/DISCTRAX.001  DA
/MYIMAGE/DISCTRAX.002  DA          -P:0
/MYIMAGE/DISCTRAX.003  DA          -P:300
/MYIMAGE/DISCTRAX.004  DA          +P:150          L:1000
/MYIMAGE/DISCTRAX.004  DA          -P:0             O:1000
{No return after last line.}
```

Note Be sure to leave a space between the track name and image type.

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Append Dialog

This dialog displays information about the CD you will append data to.

```
{button Help Topics,Contents()}
```



CD/DVD the basics

A mass-produced CD/DVD (recognizable by its silver color), for example an Audio CD or a CD-ROM, is a non-magnetic, polished metal disc which is used to store digital information. Tiny indentations have been pressed in this disc, which are called pits. In a CD/DVD drive this disc is scanned by means of a laser beam. Because the pits reflect the light from the laser differently than the rest of the surface, the drive can interpret surface and pits as binary information; ones and zeros. The information on such a disc can only be read; no data can be added (or deleted) afterwards.

What makes a recordable disc, such as a CD-R or DVD-R (which is currently being developed), different from an ordinary CD/DVD is a layer of organic dye that has been added to a perfectly smooth reflective surface. In the CD/DVD recorder a laser beam is used to burn a pattern in the organic dye. When you place the disc in the CD/DVD-drive, these burns cause changes in the reflection of the laser light in much the same way as do the pits on a manufactured disc. Any CD/DVD-drive can therefore read the information you write on a recordable disc. Once written, these burns cannot be deleted. Each part of the disc can therefore be used only once. You can, for instance, use recordable discs to create premaster discs that can be used to mass-produce CDs/DVDs in a mastering and replication plant.

The information on a Rewritable disc (CD-RW or DVD-RAM) can be erased to make place for new data. The surface of such a disc can be smoothed by means of a separate, high intensity laser beam in the recorder, preparing the disc for reuse. In this way a CD-RW or DVD-RAM can be used many times.

See also:

[DVD disc capacity](#)

[Applications](#)

[DVD-R and DVD-Ram](#)

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DVD disc capacity

The ever increasing need to store very large amounts of data on a portable medium has led to the development of the Digital Versatile Disc (DVD). A DVD, although the same size as a CD, can hold 4.7 - 17 Gb of data, compared to the 650 Mb that a CD can hold. For this reason it is now widely regarded as the successor of the CD.

The increase in storage capacity of DVD has first of all been made possible by enhancing the density of the disc, which brought the capacity to 4.7 Gb. However, DVDs will in time also become available in double sided and dual layer versions. The effects of these innovations on DVD disc capacity are shown in the table below:

	Single Sided	Double Sided
Single Layer	4.7 Gb	9.4 Gb
Dual Layer	8.5 Gb	17 Gb

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 **Applications**

DVD is the right format for applications in the fields of:

1. Video: DVD-VIDEO disc can hold a movie (and its sound track) of approximately 133 minutes, providing a resolution that surpasses current S-VHS standards.
2. Audio: DVD-AUDIO will put an end to the limitations of music CDs and provide the listener with playback sound of a quality that closely approaches that of a live performance.
3. Multi-media: DVD-ROM will greatly facilitate the use of real video, high resolution graphics and truly interactive scripts in multi-media productions, effectively eliminating any restrictions to the size of such applications.

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DVD-R and DVD-Ram

The next step in DVD-technology is DVD-Recordable (DVD-R), DVD-ReWritable and DVD-Rewritable (DVD-RAM).

DVD-R, DVD-RW and DVD-RAM will be fully compatible with DVD-VIDEO and DVD-ROM formats, including a disc capacity of 4.7 Gb. This will make DVD-R(W) the best choice for archiving purposes (including DIS applications) and the creation of multi-media productions. DVD-RAM discs will offer computer users 2.6 Gb of re-usable storage space on each side (5.2 Gb for double sided discs), providing them with maximum storage flexibility.

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UDF and ISO 13346

The way files are organized on a DVD/CD is determined by the file system, which defines, for example, the number of levels in a directory tree or the length and format of the file names. A standard file system ensures the exchange of data between different platforms. The file system used to store data on CD (ISO 9660) proved to be inadequate to make full use of the storage potential of DVDs. To remedy this, the new ISO 13346 standard for optical media was developed. The Optical Storage Technology Association (OSTA) has further refined ISO 13346 in order to maximize data interchange, creating a flexible format that is eminently suited for incremental writing. The resulting format is called Universal Disc Format (UDF). Although it is not an official standard, UDF has since become a de-facto standard for the industry. (For more information on OSTA and its work you can visit the organization's website at www.osta.org.) Besides creating DVDs in ISO/UDF, GEAR DVD allows you to create hybrid ISO 9660 / UDF CDs being backward compatible with ISO 9660.

Note: Although UDF is more focused on incremental writing, it can also be used with Track at Once and Disc at Once.

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External/foreign images

The following project types are always processed as external images:

1. CD-I Most CD-I authoring tools generate a complete CD-I image, including EDC/ECC pregap and scrambling (GEAR type 10). This is done because these tools need to emulate the CD-I image. The second best optimal format is CD-I mode 2 with sector size 2336 (GEAR type 7).
2. Photo CD Photo CD images are always in XA format—CD-ROM XA mode 2 size 2336 (GEAR type 4) for external photo CD images.
3. Video CD Video CD images are always in XA format—CD-ROM XA mode 2 size 2336 (GEAR type 4).

An external/foreign image refers to any image you have created using another authoring or formatting package, such as CD-I, 3DO, or VideoCD. You cannot edit an external image in GEAR. However, you can use GEAR to write an external image to a CD-R disc or a premaster tape. Before you write an external image, you must select it and define its parameters.

See also:

[Predefined formats](#)

[How to create a project using an external image](#)

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 **Tracks**

Data is written to DVD/CD in tracks. Each track contains a separate set of data. For example, a track on a DVD-ROM or CD-ROM usually consists of different files. An Audio track, on the other hand, always contains one single audio file. The maximum number of tracks a CD-R can contain is 99, regardless of the number of sessions or the type of tracks on the disc.

See also:

[Track types in GEAR](#)

[Combining track types](#)

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Track types in GEAR

For the various CD-formats that GEAR supports, a few basic track types are used:

- ISO/UDF the appropriate format for DVDs. GEAR does support writing to CD-R in ISO/UDF format, but this is mainly for reasons of future compatibility. Currently there are no readers available which support ISO/UDF CDs.
- ISO a track type pre-eminently suited for recording computer data (CD-ROM). This format always consists of 1 track.
- XA a track type used for CD-ROM XA, EB, Photo CD, Video CD and multi-media applications. It always consists of 1 track.
- DA a track type for digital audio. This format allows for 1 - 99 tracks. If audio tracks are combined on a disc with an ISO or XA track, a maximum of 98 audio tracks can be used (see below, Combining Track Types).

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Combining track types in GEAR

When you are creating a disc, you might want to combine different track types. This is called Mixed Mode.

The following track combinations are possible:

- 1 ISO track and up to 98 Audio tracks
- 1 XA track and up to 98 Audio tracks

The first two combinations can be repeated for each session (Multi Volume or Multi Session), although the maximum number of tracks for the whole disc is always 99.

If you add an audio track to a multi-session disc, only a multi-session player can play this audio track. Most audio CD players cannot handle multi-session audio discs. To get round this problem you can use a structure called CD Extended or CD Plus. The first session of such CD-Rs have multiple audio tracks and the subsequent sessions are used for data. An audio player only recognizes the first session (i.e. the audio tracks) whereas a multi-session CD-ROM player recognizes both audio tracks and data tracks.

Note When recording multiple audio tracks only, you should not create a multi-session disc.

See also:

[How to create a CD/DVD project?](#)

Go back to [Tracks?](#)

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CD-Rewritable

GEAR supports writing to CD-ReWritable discs. CD-Rewritable (CD-RW) is a new CD technology enabling you to erase recorded information and write new data in its place. You can use a CD-RW recorder to write both CD-RW discs and CD-R discs. Only CD-RW discs can be erased, however.

With GEAR you can erase the whole CD-RW, a feature every CD-RW drive supports. Erasing the last track or overwriting a specific packet of an incrementally written disc will be supported by GEAR as soon as these features are implemented in CD-RW recorders.

To read a CD-RW disc you need a CD-RW recorder or a multi-read drive, which can read CD-ROM, CD-R and CD-RW discs.

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Tracks

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See also:

[Track types in GEAR](#)

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Track types in GEAR

For the various CD-formats that GEAR supports, a few basic track types are used:

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- XA** A track type used for CD-ROM XA, EB, Photo CD, Video CD and multi-media applications. It always consists of 1 track.
- DA** A track type for digital audio. This format allows for 1 - 99 tracks. If audio tracks are combined on a disc with an ISO or XA track, a maximum of 98 audio tracks can be used.

See also:

[Tracks](#)

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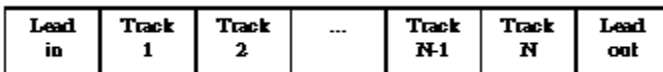


Multi session versus single session

A session is a recorded segment of a compact disc that contains one or more tracks (data or audio) preceded by a lead-in and closed by a lead-out. When you record a session, the lead-in and lead-out contain information about the recorded data, such as a table of contents. You can record a disc either in one or in several sessions. The method you decide to use depends on the capacity required and the function of the recording. Single Session recording uses the available CD-R space much more efficiently. Multi Session, on the other hand, is much more flexible and enables you to use your disc more than once:

Single Session

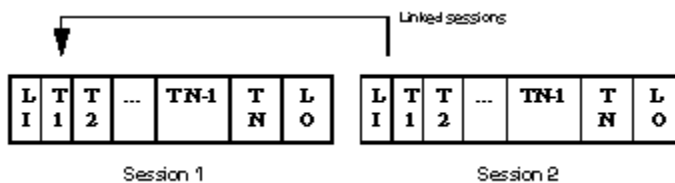
Single-session refers to discs that contain data written during one session. When all the tracks are written, the disc is fixated by writing the lead-in and lead-out. Once you fixate a single-session disc, you can add no more data to the disc. The following illustrates a single session CD.



Multi-Session

If you want to write only limited amounts of data at a time you need to create a multi-session disc. The data recorded in each session is linked, allowing a newer session to refer to data in an older session. When you want to append a session to a multi-session disc, GEAR reads back the last session on the disc and creates a virtual image of it. This image can then be used like any other image to add, delete and update data. If you delete information from a session, the old data is not actually deleted, but only the reference to the data. This means the old file can no longer be read. When you write the new session to the disc, only the changes are written.

The structure of a multi-session disc may look like this:



A true multi-session CD-ROM drive will automatically skip to the most recent session and present all linked sessions as one. As a user you will never be aware of the number of sessions on the disc. This makes Multi Session especially suitable for document archiving or regular updates of catalogs. A drawback of this method is the large data overhead required for each session: 15 Mb.

See also:

[Multi-Volume](#)

{button Help Topics,Contents()}



Multi-Volume

Multi-volume writing is a variation on multi-session writing. When you write a multi-volume disc, each session or project on the disc is independent and has no reference to other projects on the disc. Only on a Mac OS, you can read each project as a separate CD. Windows based operating systems do not support the reading of multi-volume discs.

See also:

[Multi session versus Single session](#)

{button Help Topics,Contents()}



Recording methods

When a recorder is writing data to a disc, it cannot wait for the data like a tape unit can, for example. The data buffer of the recorder must *always* contain data.

You can stop the transfer of data to the recorder at specific points only. These points are determined by the method used to write the disc—disc at once, track at once, or in incremental write. At these points—end of disc, end of track, or end of packet—the recorder finalizes the writing of data and you can resume writing at a later time.

Note *If the recorder cannot finalize the disc because it runs out of data unexpectedly, the CD-R disc is wasted and cannot be reused. This is referred to as a buffer underrun. Therefore the data transfer rate to a CD recorder is very important.*

See also:

[Track At Once and Disc At Once](#)

[Incremental Write](#)

[Cyclic vs. double buffering](#)

{button Help Topics,Contents()}



Track at once and disc at once

Nearly all CD recorders on the market support Disc at Once and Track at Once writing of CDs. When you use a track-at-once recorder, the recorder first writes the track data and then finalizes the disc by writing a lead in and lead out. Track at once is particularly useful for multi-session writing. *Only* track-at-once recorders can write multi-session discs.

When you use a disc-at-once recorder, the recorder starts by writing the lead in, then the track data, then the lead out. Link blocks are not inserted. Disc at once is useful for audio-only discs and discs that should be an exact copy of the original.

Disc at once recording

A compact disc consists of one or more 'tracks'. On an audio CD, each song on the CD is placed in a separate track. On a CD-ROM the data is placed in a single track. Some CD's (called Mixed Mode CDs) contained a single data track followed by a number of audio tracks. The first CD Recorders were only able to write an entire disc in one go from beginning to end. This method of recording is called Disc At Once (DAO). The disadvantage of this method of writing is that no data can be added to the CD at a later date (Multi Session). For this purpose, Track-at-once recording was created.

Track at once recording

A compact disc consists of one or more 'tracks'. On an audio CD, each song on the CD is placed in a separate track. On a CD-ROM the data is placed in a single track. Some CD's (called Mixed Mode CD's) contained a single data track followed by a number of audio tracks.

When CD-R was created, a method was devised to let users add more data to a CD. This is called Multi-Session recording. To be able to do this, one must be able to write a single data track to a CD and at a later date write another. For this purpose, Track At Once recording was created.

The major disadvantage to Track-at-once recording is when recording CD's containing audio tracks. Although a CD recorder's laser is very precise, it is not precise enough to start recording at an exact spot on the CD. The result is that there is an overlap where the laser stopped writing one track and started writing the next. The place spots on the CD where this overlap occurs is called a link-area. These link-areas are unreadable. On a CD-ROM, this is no problem because a CD-ROM drive will never attempt to read in this area. However this is not the case with an audio CD resulting in a 'tick' during playback. To avoid these 'ticks' one can use Disc At Once recording.

See also:

[Recording methods](#)

[Incremental write](#)

[Cyclic vs. double buffering](#)

{button Help Topics,Contents()}



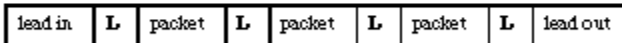
Incremental Write

Incremental write allows you to divide a data track into small amounts of data called packets (typically 64 Kb - 1Mb) and write each data packet separately to CD-R disc. Each packet will use some extra disc space for data overhead. The amount of overhead depends on the size of the packet and is on average about 15%.

The following illustration shows the difference between writing Track at Once and incrementally:



Track at once



Incremental write

In between the writing of packets, there are virtually no data rate constraints. This means that writing can be interrupted for an unlimited amount of time, which decreases the risk of buffer underruns when writing large amounts of data to CD.

Incremental write can be used in different ways:

on the *logical* level, fixed packet writing can either be combined with UDF, which is eminently suited for incremental writing or it can be combined with another file system such as ISO 9660, or a combination of both.

on the *physical* level, the [Orange Book standard](#) offers you the option use a fixed packet size or a variable packet size. The advantage of fixed packets is that they eliminate the risk of buffer underruns. Variable packet size, which differs with the size of the files to be written, offers more backward compatibility. GEAR uses fixed packet writing as the formatting process for this method is the same as with the other writing methods. Fixed packet writing can also be used in combination with multi-session writing.

Note A special driver is required to read incrementally-written discs. Currently, most CD-ROM readers on the market cannot read an incrementally-written disc. This means that in all probability a disc written in fixed packets can only be read with the recorder type that was used to write it (GEAR only supports it for the Philips CDD2000 and CDD2600).

See also:

[Recording methods](#)

[Track At Once and Disc At Once](#)

[Cyclic vs. Double buffering](#)

{button Help Topics,Contents()}



Cyclic vs. Double buffering

Writing a CD is a continuous process. That means that once the process has been started it cannot be stopped without ruining the disc. In our case that means that when burning a CD, the recorder must always have some data to write. If the system were to ever run out of data the recording will fail. CD Recorders do not accept the data directly but read it from a built in memory buffer. This buffer is usually about 1MB in size. When writing the disc, the recording software must continuously fill this buffer. It can be compared to keeping a bathtub full of water after the plug has been pulled. If at any time the buffer should 'run dry', the recording will fail. This is called a [Buffer Underrun](#).

To increase the reliability of the recording process, GEAR has two options:

Double Buffering.

Two large buffers are created in memory. While one of the buffers is being filled by GEAR, the other buffer is being emptied into the recorder's own buffer. The major drawback is that the total buffer size is limited to 128Kb (2x 64Kb).

Cyclic Buffering

In this scheme, a much larger amount of buffers are created (approximately 96 buffers of 32Kb on a 16Mb system). The advantage is that each buffer can be filled more quickly and that GEAR no longer has to wait for the recorder to fill a buffer. This dramatically increases the reliability of the recording process.

See also:

[Recording methods](#)

[Track At Once and Disc At Once](#)

[Incremental Write](#)

{button Help Topics,Contents()}

A buffer underrun can be caused by a number of reasons. Another program may inhibit the recording software from accessing the drive or the drive may be too slow. When such a problem occurs, the software must start writing to the recorder's buffer again before it has been emptied. To extend the time the software has, most programs create their own buffers. Once the recorder's buffer is full, the software will continue to fill its own buffers. In the event the software is interrupted, the recorder's buffer will continue to be filled using the software's buffers. This will usually provide enough extra time to avoid disaster.



Project defaults

When loading files into a CD/DVD-ROM project, GEAR uses a number of filters, converters and constraints to make sure the project will conform to the ISO9660, UDF or other applicable standard. They also provide you with the means to filter out certain types of files while copying a directory tree. This dialog allows you to set the defaults for these values. Changes made here will not effect projects created before the changes were made. The values used for a selected project can be set in the [Current project settings dialog.](#)

{button Help Topics,Contents()}}



Default Label Settings

The primary volume descriptor is found on every CD-ROM at sector 16. This record provides computer systems access to the files on the CD by providing information about the CD's filesystem.

The primary volume descriptor also contains a number of text fields that describe the CD and provide information necessary for using and indexing the CD. This dialog allows you to provide GEAR with default values used when creating CD projects. Changes made here will not effect projects created before the changes were made.

The values used for a selected project can be set in the [Current CD/DVD label Settings dialog](#)

{button Help Topics,Contents()}



Preferred Working Directory Selection

Most users will provide GEAR with a directory or dedicated drive where it can store its project administration, copied track data and other files. This dialog will allow you to specify that drive and/or directory.

{button Help Topics,Contents()}



Current CD/DVD label

The primary volume descriptor is found on every CD/DVD at sector 16. This record provides computer systems access to the files on the CD/DVD by providing information about the CD's/DVD's file system.

The primary volume descriptor also contains a number of text fields that describe the CD/DVD and provide information necessary for using and indexing the CD/DVD. This dialog allows you to edit these fields.

The default values for these fields can be set in the [Default CD/DVD label preferences dialog](#)

{button Help Topics,Contents()}



Append preferences

When using CD-R, most users will use standard multi-session conventions. GEAR is designed to append data following these conventions without any user interaction. However there are moments when you may wish to have some form of control over this process. This dialog lets you select GEAR's data appending mode.

```
{button Help Topics,Contents()}
```



Current project settings

When loading files into a CD/DVD-ROM project, GEAR uses a number of filters, converters and constraints to make sure the project will conform to the ISO9660, UDF or other applicable standard. They also provide you with the means to filter out certain types of files while copying a directory tree. This dialog allows you to set these values.

The default values for these fields can be set in the [Project defaults dialog](#).

{button Help Topics,Contents()}

Project information

In this tab GEAR provides you with the general information on the project.

See also:

[Project settings](#)

{button Help Topics,Contents()}



Project settings

In this tab you can specify the media catalog code that can be used as reference for the CD/DVD you are going to produce.

See also:

[Project information](#)

{button Help Topics,Contents()}



Data track information

In this tab GEAR provides you with the general information on the selected data track.

{button Help Topics,Contents()}



Data track current CD/DVD label Settings

The primary volume descriptor is found on every CD/DVD at sector 16. This record provides computer systems access to the files on the CD/DVD by providing information about the CD's/DVD's file system.

The primary volume descriptor also contains a number of text fields that describe the CD/DVD and provide information necessary for using and indexing the CD/DVD. This dialog allows you to edit these fields.

The default values for these fields can be set in the [Default CD/DVD label preferences](#) dialog

{button Help Topics,Contents()}



Current project settings

When loading files into a CD-ROM project, GEAR uses a number of filters, converters and constraints to make sure the project will conform to the ISO9660 or other applicable standard. They also provide you with the means to filter out certain types of files while copying a directory tree. This dialog allows you to set these values.

The default values for these fields can be set in the [Project defaults dialog](#).

{button Help Topics,Contents()}



Audio track information

In this tab GEAR provides you with the general information on the track.

{button Help Topics,Contents()}



Audio track settings

After loading tracks and/or files into your audio project, this tab is used to specify the pause, ISRC and several attributes for the selected track.

{button Help Topics,Contents()}



Common CD/DVD-Recorder Settings

CD/DVD Recorders can write CDs/DVDs using a number of different methods and speeds. This dialog will allow you to edit the most common CD/DVD Recorder settings.

{button Help Topics,Contents()}

Advanced recorder settings

CD Recorders can write CD's using a number of different methods and speeds. This dialog will allow you to edit the more advanced CD Recorder settings.

{button Help Topics,Contents()}

 **SCSI Interface Settings (CD/DVD Recorder)**

GEAR can use a number of drivers and RAM buffering schemes to access your CD/DVD-Recorder. This dialog will allow you to select a driver/scheme and to optimize your system performance.

{button Help Topics,Contents()}



Tape settings

GEAR provides you with a number methods of ordering your data on a premaster-tape. When writing to tape, it is sometimes necessary for the user to specify some specific information about the data being written such as its sector-size and if the data needs to be scrambled. This dialog will allow you to provide GEAR with this information.

{button Help Topics,Contents()}



Tape settings DVD control data

GEAR provides you with a number methods of ordering your data on a premaster-tape. When writing to tape, it is sometimes necessary to specify some specific information such as the lead in data. This dialog will allow you to provide GEAR with this information.

{button Help Topics,Contents()}



General tape settings

When writing your data to a premaster-tape; GEAR provides you a number of options and tools to customize your tape recording. This dialog will allow you to set the most common tape options.

{button Help Topics,Contents()}



Customer settings

When a tape is written, 'tp_ident.txt' and 'wo_ident.txt' files are created. These files contain necessary information to identify the tape and its contents. The customer specific information can be set by using this dialog.

{button Help Topics,Contents()}

 **SCSI interface settings (tape)**

GEAR can use a number of drivers and RAM buffering schemes to access your tape drive. This dialog will allow you to select a driver/scheme and to optimize your system performance.

{button Help Topics,Contents()}



SCSI interface settings (Hard drive)

GEAR can allow you to place your CD project onto a SCSI hard drive and then use that project to record a CD. This method of writing provides the highest performance but requires a dedicated SCSI hard drive. GEAR can use a number of drivers and RAM buffering schemes to access your hard drive. This dialog will allow you to select a driver/scheme and to optimize your system performance.

{button Help Topics,Contents()}



Jukebox control dialog

A jukebox or medium changer is a robotic unit that can store and automatically load CD's into a CD-ROM player or a CD Recording unit. This dialog will provide you access to your jukebox's robotics and allow you to manipulate the discs in your jukebox.

{button Help Topics,Contents()}



Jukebox settings

Because jukeboxes are often configured for a specific use, it is important that GEAR has specific information to be able to work with it. This dialog will allow you to specify your jukebox's configuration.


{button Help Topics,Contents()}



Disc information

Because there are so many different kinds of CD's, it is often necessary to examine a disc before we append to it or copy tracks from it. This dialog will provide you with information about the CD currently loaded in your CD Recorder.

Viewing disc information

1. Click the disc information button  on the toolbar to display the disc information in a separate dialog. You can also click on the CD view button



to display the same disc information in the GEAR program window.

2. Select a session to display the tracks in the session. A right mouse click displays a menu with options for the selected session or track(s). The options in the menu allow you to copy specified tracks to hard disk or append data to a track.

{button Help Topics,Contents()}



Advanced append dialog

When appending data to a previously recorded CD, GEAR may sometimes need you to provide it with information necessary to create the new project. What information is needed depends on the type of disc and the selected append setting. This dialog is used by GEAR to retrieve that information.

{button Help Topics,Contents()}




Run command dialog

You can run any GEAR toolkit command from the Run Command Dialog. See the manual for information on the available commands.

```
{button Help Topics,Contents()}
```

Erase dialog

You can erase a CDR-W with the erase button  in the toolbar . A total erase will delete all information on the CDR-W. A quick erase will delete the lead in and the program memory area (table of contents).

{button Help Topics,Contents() }



Copy CD/DVD dialog

You can copy a CD/DVD with the disc copy button in the toolbar. GEAR can copy single session data and audio discs. The source disc will be read by the CD/DVD-Recorder and written to a temporary file on hard disk. There must be a partition on the hard disk with enough free disk space to store a copy ('image') of the whole source disc.

If you choose to make multiple copies, the same source disc image will be used for every copy

See also:

[How to copy a CD/DVD](#)

{button Help Topics,Contents()}



External image dialog

When copying a CD or using a CD authoring package, the result is one or more files containing the CD content. Because it is not created by GEAR we call such a file an external image. GEAR is capable of writing any type of external image including customized images. After selecting an external image, this dialog is used to let you specify the type of image stored in the selected file.

{button Help Topics,Contents()}



Technical Support

GEAR Software offers a wide variety of information on our web site to help you fully benefit from your GEAR products. Please refer to our web site (<http://www.gearsoftware.com/>) for complete on-line help, support and contact information, or you are welcome to e-mail us at support.us@gearsoftware.com (United States) or support.eu@gearsoftware.com (Europe).

Important: We recommend that you try contacting your local supplier for assistance before calling GEAR Software. Please have your [Support form](#) completely filled in and within easy reach before calling.

{button Help Topics,Contents()}



Support form (Please fill in this form before calling for assistance).

{button Print,Print()}

Customer information

Name :
Company :
Tel. :
FAX :

Product

Operating system: Windows 95/98/2000, Windows NT 4.0 Server / Client.

Reg. no. : G

Product version : Click 'About GEAR ...' in the Help menu for version information.

: **v.A.** **GA-** **-OE** Check the sticker on the back of the CD Box

Recorder

Manufacturer :
Model & type :
Firmware :

SCSI controller (Controller card 1) (Controller card 2)

Manufacturer : :
Model & type : :
Driver version : :

System information

Mainbord type :
CPU brand & speed :

Project information

Project size in Mb :
No. of tracks / files :
Recording speed :
Reading speed :

Error

Error message text :

Error code :

Occurrences :

When did it occur:

Description :

How often the error has occurred.

GEAR function being performed when the error occurred.

Description of the problem.

CD-R brand & type :

CD-R color :

Color of the unlabeled side (green, gold or blue)

{button Help Topics,Contents()}

