Operation Manual

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Operation manual by d.popow@musicandtext.com, introduction by Tom Wendt.

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Preface

Welcome and thank you for your decision to use ***CLEAN*** or ***CLEAN PLUS***. Using ***CLEAN***/***CLEAN PLUS***, your PC and your CD recorder, you can create your personal Audio CD or MP3-CD (Data CD) from other CD, vinyl or cassette recordings. ***CLEAN*** gives you the easy-to-use optimized high-quality tools that let you compile and even professionally restore the audio in the process.

The software of both products is identical. The only difference between ***CLEAN*** and ***CLEAN PLUS*** is, that the latter comes with a Phono PreAmp.

We assume that you have previously not been working as a restoration engineer or CD producer and we would therefore like to introduce you to some of the topics that pop up when the issues “Making music on your PC” and “Record player handling” are involved. Many years after the successful introduction of the CD many people will still know what a record is and how to handle it, but the specifics and the necessary technical devices for the best playback conditions might not be that clearly present in memory any more.

The path from the record player into your PC

You will surely have recorded music on your PC before. You own a sound card with good AD/DA converters and nothing was more simple than plugging the output of your CD player or CD-ROM drive into the input of your sound card and record music as a WAV file. The level could easily be adjusted and the sound of the WAV file met your expectations.

If – on the other hand – you wish to record music from a vinyl record this way, you definitely need a pre-amplifier. That is why ***CLEAN PLUS*** includes one.

Directly connecting your record player to your sound card would not give you a usable signal. Even if you could feed your sound card with a high level signal, the treble would be distorted and the signal would sound incomplete. The reason for this is that the record player only transfers a very low useful signal.

Another aspect is, that a record does not provide a well balanced frequency spectrum. Instead, it gives you a lot of treble and not much bass. This is the result of the technology used: a good sounding bass would produce strong record groove deflections that in turn would cause the stylus to jump to the next groove upon each bass drum hit.

For this reason the ***CLEAN*** Phono PreAmp has a special phono input, same as Hi-fi amplifiers. Besides providing the pre-amplification, this input is equipped with a special equalizer, optimized for record playback. The equalizer makes up for the effect of the “bent” frequency characteristics of the record by separately amplifying the treble and bass signal components.

If you have the program version that includes the Phono PreAmp, then you merely need to fetch your records from the cellar, connect record player and Phono PreAmp, install ***CLEAN*** and start to record.

- If you have the product version without the Phono PreAmp and wish to record from vinyl records, then you will have to dust off your old Hi-fi amplifier and connect the record player to its Phono socket and the sound card to its Tape or Aux out.
- If your Hi-fi amplifier is defect, then you need a dedicated pre-amp to bring the record player signal onto a frequency corrected Line level.
- Now you can transfer the music on your records into your computer with a sufficient level.

Vinyl needs care

CLEAN has restoration functions to remove rumble noise, clicks, crackles background noise and sibilants etc. from your music recordings. The algorithms used for these functions are equal in every aspect to high-quality studio devices. This technology will however only give you maximum results, if the source delivers the best possible signal-to-noise ratio. This means that you should carefully clean your records before you transfer the music into your computer. This will make sure that the groove does not contain dust that would otherwise lead to crackles.

❒ **If you use a cleaning fluid, you should definitely rinse your records with water (preferably the decalcified variant) as cleaning fluids have the effect to glue small dust particles into the record groove.**
Mineral water containing less mineral and sodium will also give you excellent results when you rinse your records after cleaning them.

The sound is distorted

Years of listening to CDs have trained our hearing to react sensitively to distortions. Some of the distortions that occur when you play back records are inherent in the medium itself.

The pick-up arm does not always have a strictly tangential position to the record groove. In addition, groove spacing decreases towards the center of the record. The physical circumstances can not be changed, but it is imperative that you make sure that the stylus is in a good state. If it is worn, you should get a new one.

If you have correctly connected the Phono PreAmp and the records rotate under a new stylus, you can now start to adjust the recording level of your sound card. Currently available sound cards generally offer a dynamic range and a signal-to-noise ratio of at least 80 dB.

As a record can only provide ca. 60 dB, your sound card will most probably be sufficient to produce good recordings on your PC. You should still only use ca. 85% of the theoretically possible recording level. This way, you do not run the risk to produce ugly sounding digital distortions caused by a too high level; or undesired noise, if you record more than 60 dB. These unwanted effects only make the work of the restoration algorithms harder and increase the deep-frequency rumble noise of the record player.

The hunt for the optimum level

One obstacle for many audio recordings on the computer is finding the right level adjustments. Sound cards do not always offer a reliable level display. In order to make the best possible setting for your system, you should use the same methods that are used in a professional recording studio:

Use test signals with an exactly defined level of 0 dB to adjust the wave channel and master levels of your sound card as well as that of other possibly used devices like DAT, MD or cassette recorders.

In the Calibrate directory on the ***CLEAN*** CD you can find the files 1kHz Tone.wav, 10 kHz Tone.wav, 80 Hz Tone.wav and 100 Hz Tone.wav. These sound files contain pure sinusoidal signals with an exact level of 0 dB.

❒ **Attention: The Test tones are very loud! Make sure that volume is reduced to a minimum on your monitoring system before you load and play back any of these tones. Do so to take care of your speakers, your ears and the good relations to your neighbours.**

You can use the cycle playback feature in ***CLEAN*** for continuous playback, then you don't have to start playback again and again.

While playing back one of the test tones, you can adjust the level of your complete system. First, you should use the Output faders in ***CLEAN*** to set the output volume in a way that your sound card does not overload.

❒ **The Windows MME driver only lets you control the output volume, if your sound card has a software mixer panel.**

You can also record the test tone with your DAT, MD or cassette recorder, if your sound card is connected to a stereophonic sound system. Use the input controls of these devices to set them to a maximum input of 0 dB. You should not change these settings later.

Have fun applying ***CLEAN*** to your favourite music.

The Steinberg Team

Using *CLEAN*

This section gives you a general overview on how to use ***CLEAN*** in practise. It also contains cross-references to the sections that hold the information about the respective issue.

The basic concept behind ***CLEAN*** is that you work on a CD Project. In order to use ***CLEAN*** you must therefore first create a new Project or load one that you have saved previously. A Project is a file that contains the complete data set of the CD you are about to create.

- **Start by double clicking the *CLEAN* icon on the desktop or in the Start menu.**
  You can also start ***CLEAN*** by dragging a Project file onto the icon.

- **Select "Create New Project" or "Open existing Project" in the dialog that appears.**
  Find more information on file handling on page 81.

- **Now you can either choose to use the IntelliAssistant to guide you through all preparations and automatically carry out the necessary steps, or proceed as described below.**
  Please find a description of how the IntelliAssistant works on page 9.

- **Import the desired Tracks as WAV or MP3 (will be converted into WAV format) files from CD or record them (e.g. from record or tape).**
  Find more information about these issues on page 12 (Importing Tracks from hard disk), page 13 (Importing Tracks from Audio CD), page 18 (Recording audio in ***CLEAN***) and on page 87 (Recording audio in WaveLab Lite).

- **By selecting an entry from a Category ("Cat.") pop-up menu, you can inform *CLEAN* about the source medium of each Track (cassette, record or CD).**
  This helps ***CLEAN*** to select the best possible restoration settings when you use the AutoClean function. See page 28.

- **During recording or later, you can let *CLEAN* automatically check the audio for silence and have it insert Markers. Markers can also be inserted manually. You can move and remove them.**
  Based on the Marker positions you can cut your Recordings into individual tracks and put them onto the Track list.
  Please look up "The Record Dialog" on page 18 and "The AutoMarker functions" on page 44.

- **You can now play back, name and sort the Tracks and determine the gap time (the length of the pause between any two Tracks).**
  Read about this on page 17 (playback), page 15 (naming and gap time) and on page 15 (sorting).

- **You can shorten Track lengths and define a fade-in and/or fade-out for each Track.**
  See “Setting the Track length – The Start and End Markers” on page 42. and “The Fade-in and Fade-out Markers” on page 43.

- **You can use a number of very powerful pro-quality tools for restoration, enhancement and mastering as well as internal and external effects to process the sound of each Track.**
  Processing can be done in real time, so that you can monitor the effect, or by calculating and creating a file. Find more information starting on page 26.

- **Using the AutoClean function, you can let *CLEAN* analyse audio for clicks, crackling and noise. You can preselect one of three restoration modes of different strengths. *CLEAN* analyses the audio and automatically adjusts the respective restoration effects accordingly. The five most important restoration effects provide Audition buttons which let you separately monitor the signal parts removed by each effect.**
  Please read more on page 28.

- **Using the audio editor WaveLab Lite, that’s part of the *CLEAN* package, you can define a specific noise finger print. This can then be used in *CLEAN* to remove this specific noise using the Finger Print DeNoiser.**
  Read more on page 29.

- **You want to improve the sound of a recording with a bland sound? You can let *CLEAN* analyse a better sounding reference Track that you play back via your sound card (e.g. from your computer’s CD drive) or that resides as a Wave file somewhere on your hard disk. Then you can apply the results of the analysis to the bland sounding files. Listen and wonder how!**
  Read more on page 32.

- **You want to bring your favourite music into the MP3 format? No problem with *CLEAN*. No matter if you record from CD, record or cassette, if you process your own music or imported MP3 files: *CLEAN* can turn it all into an MP3 file and it supports a whole range of different quality levels.**
  Find more information in the section “Exporting audio in MP3 format” on page 79.

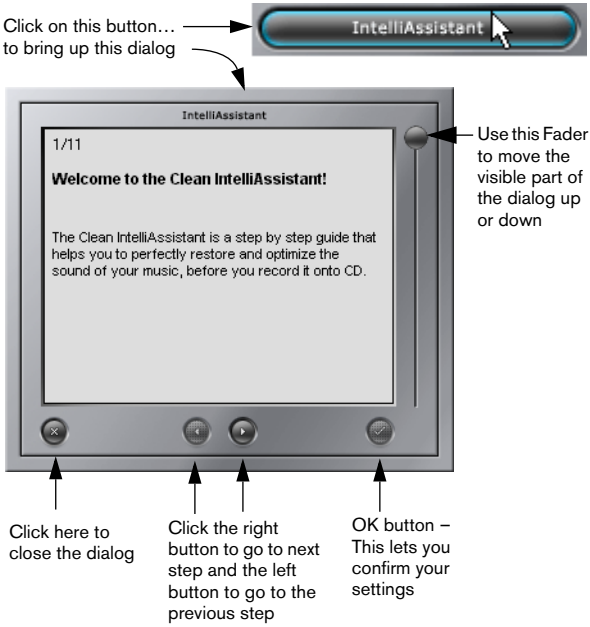
- ***CLEAN* lets you define the positioning of your speakers on-screen and add Surround sound quality to your CD tracks.**
  Read more on page 38.

- **Finally, you can use *CLEAN* to record the CD-R.**
  Find details on how to do this in the section “Exporting audio in MP3 format” on page 79.

The IntelliAssistant

This intelligent Assistant actively helps you make appropriate settings and automatically carries out all processing and recording onto CD. This lets you quickly and easily achieve good results.
Proceed as follows:

1. **Click on the IntelliAssistant button to bring up the IntelliAssistant dialog.**



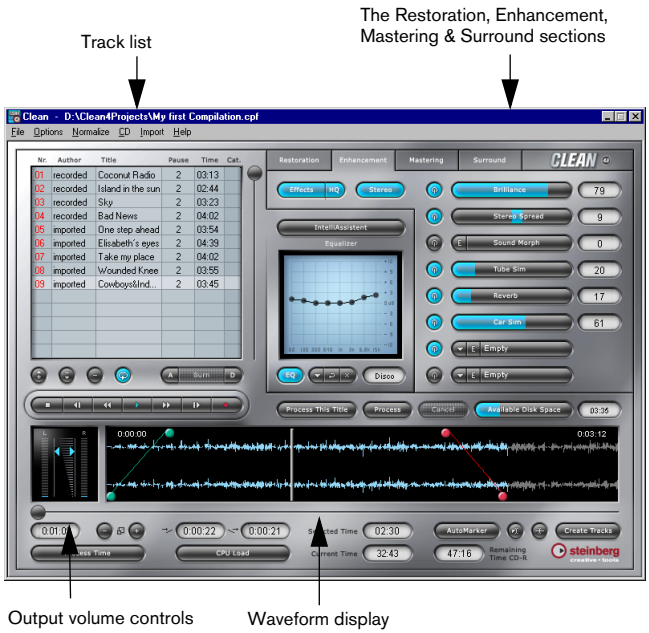
2. **Follow the instructions and make the desired settings.**
   CLEAN surrounds the program element, that you must use to make your next setting, with a red flashing frame.

3. **Confirm all actions by clicking the OK button. Then go to the next step.**

The *CLEAN* window

The ***CLEAN*** window is subdivided into a number of different areas. They represent the major functional groups within the program.

The most important of these are called Track list, the Restoration, Enhancement, Mastering and Surround sections as well as the Waveform display. They are described in the following sections of this manual.

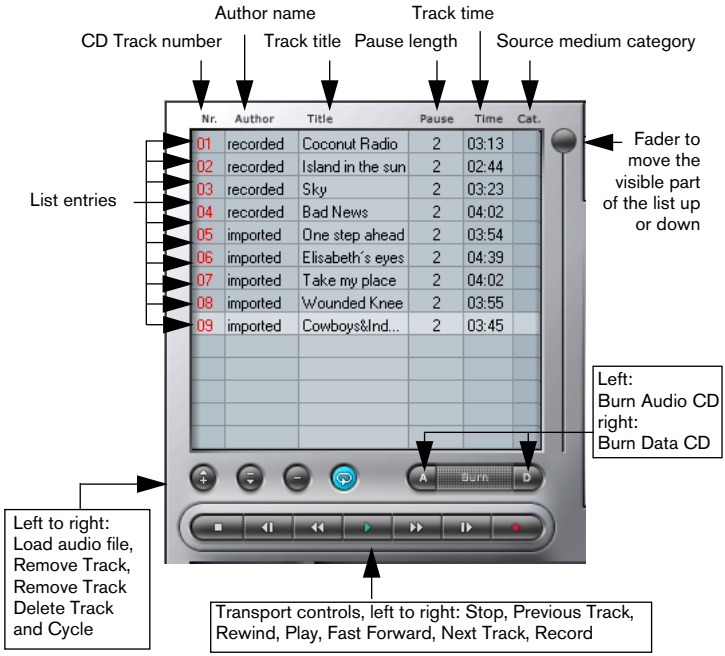


The ***CLEAN*** window

CLEAN has a number of additional controls and displays. Among these are the Volume and Equalizer controls, the AutoClean function, the Processing buttons as well as various displays.

Many ***CLEAN*** window elements are equipped with local Tool Tips, short explaining bits of text that pop up when you move the mouse cursor on the element and wait for a short while.

The Track list



The Track list is located in the upper left corner of the ***CLEAN*** window. You can use it to import, name, record and play back audio Tracks as well as change the order in which the Tracks are recorded onto CD-R.
This is also where Tracks are removed from a Project or even completely deleted from your hard disk. At the bottom of the Track list you can find a number of recording and playback functions.

All entries in the Track list – except for Time can directly be changed in the list.

The various functions are described on the following pages.

Importing Tracks from hard disk

CLEAN can import audio files in the WAV and MPEG1-Layer3 (generally called “MP3”) formats.

CLEAN can read files with a resolution of 16 bits and sample rates between 22.050 kHz and 96 kHz. It automatically converts them into the CD standard format (16 bits, 44.1 kHz).

MP3 files are automatically converted into WAV format. These files can then be processed in ***CLEAN*** as any other WAV files and be recorded onto CD-R.

❒ **You can also export files in MP3 format! Find more information in the section “Exporting audio in MP3 format” on page 79.**

Proceed as follows to import a piece of audio, that is available as a mono or stereo WAV or MP3 file, into the Track list:

1. **Click on the “Import” button or select “Import WAV/MP3 file” from the Import menu.**
   A file selector opens.

2. **Select the desired WAV or MP3 file, then click “Open”.**
   The file is imported and displayed in the Track list.

CLEAN transforms monophonic 16 Bit/44.1 kHz format files into a stereophonic files of the same format and checks whether enough space is available on your hard disk to save the file.

If you import MP3 files, they will automatically be converted. During conversion, the Process Time indicator informs you about the current state of the conversion.

You can also import several WAV or MP3 files in one go:

- **Hold down the [Ctrl] key on your computer keyboard while selecting the files with the mouse.**
  To import several files that are adjacent to each other in the file selector, hold down [Shift] on your computer keyboard and click on the first and the last file of the desired block.

❒ **Importing Tracks in *CLEAN* is not limited to the total playing time of an Audio CD (up to 80 minutes). You rather can exceed this time limit, e.g. to save your restored audio data onto a DAT cassette (longer playing time) instead of on CD.**

Drag and Drop

You can also use Drag and Drop to drag WAV and MP3 files from the Desktop, “My Computer” window or Windows Explorer into the Track list:

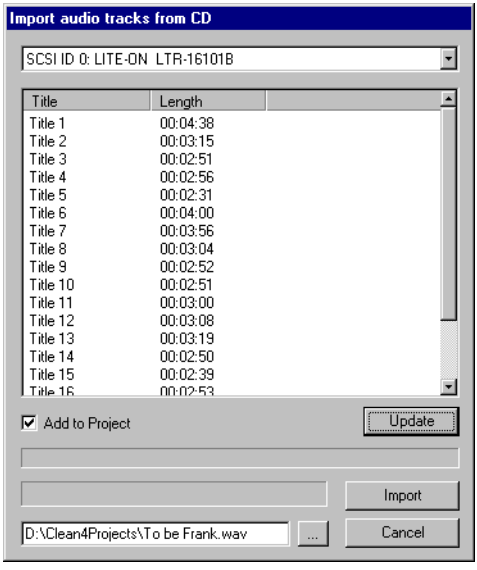
- **Find the desired file, click on it and drag it into the Track list while you continue to hold down the mouse button.**
  MP3 files will automatically be converted.

❒ **Project files can also be opened by using Drag and Drop, see page 81.**

Importing Tracks from Audio CD

You can use ***CLEAN*** to directly import audio from any Audio CD. The data is saved as a WAV file, i.e. a digital copy of the imported Track is saved onto your hard disk. There is no D/A conversion, thus no loss in quality. This method of directly reading the audio data from CD is often called grabbing. Proceed as follows:

1. **Open the Import menu and select “Import Tracks from CD…”.**
   A dialog opens.



The “Import audio tracks from CD” dialog

2. **Select the CD-ROM drive from which you wish to import the audio Tracks in the pop-up menu on the top left of the dialog.**
   If you only have one CD-ROM drive installed in your computer system, you can of course only select that here.

3. **Insert an Audio CD in the selected drive.**
   The Tracks on the CD appear in a list in the middle of the dialog.

4. **Select one or several Tracks for import onto your hard disk by clicking on them.**
   Selecting works similar as in the Windows Explorer:
   Hold down the [Ctrl] key on your computer keyboard, if you wish to select several Tracks that are not adjacent in the list.
   To select several adjacent Tracks in the list, hold down [Shift] on your computer keyboard and click on the first and the last Track of the desired block.

❒ **You can directly add more Tracks to an open Project. Use the "Add to project" function in the "Import Tracks from CD…" dialog for this purpose. The files that you import with this method are stored in the same directory as the previously imported files for this Project.**

5. **Input a file name and a path for the imported WAV file(s). If you add files to an already open Project, this will not be necessary.**
   To do this, click on the small grey button with the three dots, next to the "Cancel" button in the dialog. When you first open the dialog, its standard path setting is C:\track.wav).

6. **Start importing by clicking on the "Import" button.**
   Imported files are directly added to the Track list.

7. **Close the dialog by clicking "Cancel".**

Changing the entries in the Track List

To edit the entries Author, Title and Pause in the Track list:

- **Double click the entry that you wish to edit, enter the desired changes by typing on your computer keyboard and confirm by pressing [Return].**
  Preset Pause time – the length of the pause between two Tracks on the CD – is 2 seconds. You can change this to a value between 0 and 4 seconds. Higher values will automatically be corrected to 4 seconds.

To edit the Category entry:

- **Right-click into the "Cat." column to bring up a pop-up menu and select one of the three symbols (CD, vinyl record, cassette) or "Nothing" to inform the program about the source medium of the respective Track.**
  This helps ***CLEAN*** to select the best possible restoration settings when you use the AutoClean function or use the IntelliAssistant.

CD Text Information

All entries in the Author and Title columns are recorded onto CD as CD Text, which is supported by some players which show this information during playback.

Changing the Track order in the list

CLEAN playback must be stopped when you change the Track order. Do this:

- **Simply drag the desired Track to its new position. To do this, click on the Track that you wish to move, hold down the mouse button and move the mouse pointer to the slot where the Track should wind up.**
  A white line indicates the upper rim of the moved Track.

❒ **Track time can be changed by using the Markers in the Waveform display. This is described in the section "Setting the Track length – The Start and End Markers" on page 42.**

Moving the visible part of the Track list

If the Track list contains more than 14 Tracks, you can use the fader to the right of the list to move the visible part.

Removing a Track from the Track list

When Playback is stopped, you can remove a Track from the Track list, without deleting its WAV file from your hard disk.

- **Select the file in the list and click the “Remove” button below the Track list or press the [Delete] key on your computer keyboard.**

Deleting a Track

You can also remove a Track from the Track list and delete its WAV file from your hard disk.

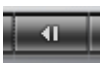
- **Select the file in the list, then click the “Delete” button below the Track list.**

❒ **Deleting is an irreversible action! If you delete a file, it is lost and can not be recovered!**

Recording and Playback functions

❒ **To use the Recording and Playback functions, you must first create a Project or load one from disk.**

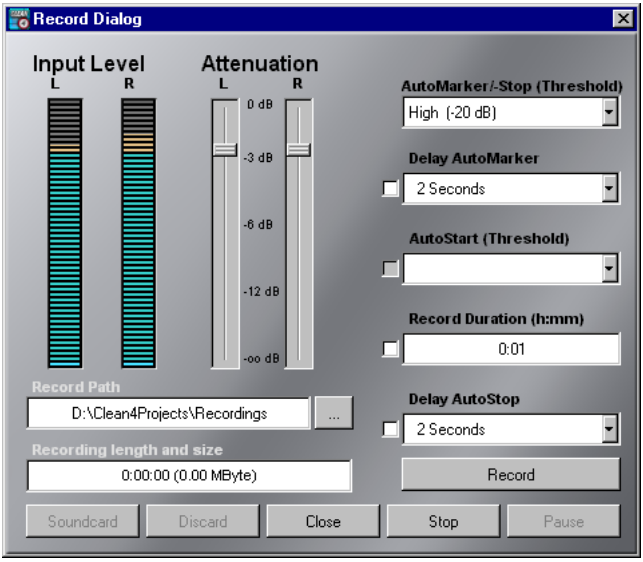
Except for the Record button, these buttons essentially work in the same way as those on your cassette recorder or CD player. Here's what each button does:

This button	is called:	If you click on it…
	Stop	…playback stops.
	Play	…playback starts.
	Rewind	…you move the current playback position backwards in time.
	Previous Track	…you select the previous Track in the Track list.
	Fast Forward	…you move the current playback position forward in time.
	Next Track	…you select the next Track in the Track list.
	Record	…the Record dialog will be opened where you can make several recording settings, and start and stop recording. The details are described below.
	Cycle playback	…and the button is displayed in blue, playback of the current Track is repeated indefinitely. Attention: this button actually is an On-/Off switch! If the button is switched off (shown in grey), the complete Track list will be repeated.

Except for the Record and Cycle buttons, all buttons always affect the Track that is selected in the Track list!

The Record Dialog

The Record dialog opens when you click on the Record button. Recording any analog signal from record, audio cassette etc. is done in this dialog.



Here you find buttons to start or stop the actual recording and a Pause button to set ***CLEAN*** into "record ready" mode. You can also control whether recording should start or stop automatically as soon as the input signal reaches or falls below a certain level. You can let the program automatically insert a Marker if the level falls below a certain minimum level.

The individual functions:

Input level meters These two "LED" meters display the level of the signal that arrives at ***CLEAN***'s input. It is a good idea to set the input level so that level peaks reach the yellow "LED" area but never the red segment at the top. If the signal is too low, you will record noise, if it is too high, it will clip drastically and not sound good.

Input level faders	These Faders can be used to attenuate the signal that arrives at ***CLEAN***'s input. The signal might have already been set at the source outside the computer or by the Mixer-software of your sound card. Find additional information in the next two sections ("The Sound card dialog" and "Setting Record and Playback volume").
Record Path	Here you can define the path under which your recordings are stored on your hard disk. If you click on the button with the three dots, you can define the path using a file selector.
Recording length and size	As soon as recording starts, the length of the recording in hours, minutes and seconds is displayed here. The value in brackets shows the actual size of the recorded file.
AutoMarker/-Stop (Threshold)	If the AutoMarker or AutoStop function (see below) is checked – means active – and the level of the recorded song falls below the value set here, ***CLEAN*** will automatically stop recording or insert a Marker into the waveform.
Delay AutoMarker	This function is active if the check mark is visible to the left of the pop-up menu. If this function is active, you can select a delay time in the pop-up. When the signal falls below the Threshold defined under AutoMarker/-Stop (Threshold), the program waits for the time-span defined here before it inserts a Marker. This may be useful if the song ends with a long decay. Markers are used to let ***CLEAN*** automatically cut a longer recording into separate Tracks.
AutoStart (Threshold)	This function is active if the check mark is visible to the left of the pop-up menu. If this function is active, ***CLEAN*** will automatically start recording, as soon as the source signal has a higher level than the one set here.
Record Duration (h:mm)	This function is active if the check mark is visible to the left of the field. Instead of using the AutoStop function (see below) to stop recording, you can insert a time value in this field after which recording is stopped automatically. You can set a recording length in hours and minutes. The maximum value is 2 hours. This function is not available, if you have activated Delay AutoStop.
Delay AutoStop	This function is active if the check mark is visible to the left of the pop-up menu. Activate this function and select a time value. When the signal falls below the Threshold defined under AutoMarker/-Stop (Threshold), the program waits for the time-span defined here before it stops recording. This may be useful if the song ends with a long fade-out. This function is not available, if you have defined a Record Duration.
Record	Clicking on this switch will immediately start recording.
Stop	Click on this button to stop recording.

Pause	By clicking on the Pause button, you set ***CLEAN*** into "record ready" mode. The button flashes to indicate this. If you have activated the AutoStart or AutoStop functions mentioned above, recording will automatically be started or stopped.
Close	Click on this button to close the dialog.
Discard	If you click on this button, the last recording that you have made since you have opened the dialog this time will be deleted from disk.
Soundcard	Click on this button to open the Soundcard dialog which is described next.

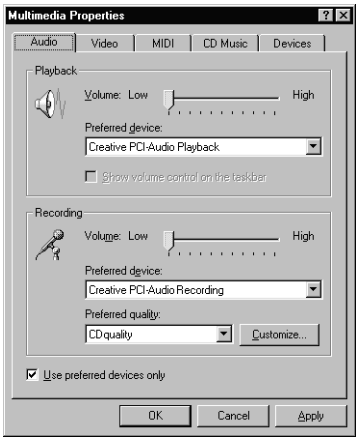
❒ **As an alternative, you can also use WaveLab Lite (comes on the *CLEAN* CD) for recording audio, as this extremely fast Audio Editor offers additional functions. Find more details on page 87.**

What can I do if recording does not work immediately?

CLEAN uses the hardware (and its active ports) selected in Windows' Multimedia Properties control panel.

If you e.g. wish to use a Soundblaster AWE 64 sound card for recording, this card must previously (in most cases during card installation) have been selected as "Preferred device" in the Multimedia Properties control panel.

1. **To check this, open the My Computer window on your Windows desktop.**
2. **Open the Control Panels folder and double-click the Multimedia icon.**
   The Multimedia Properties dialog opens.

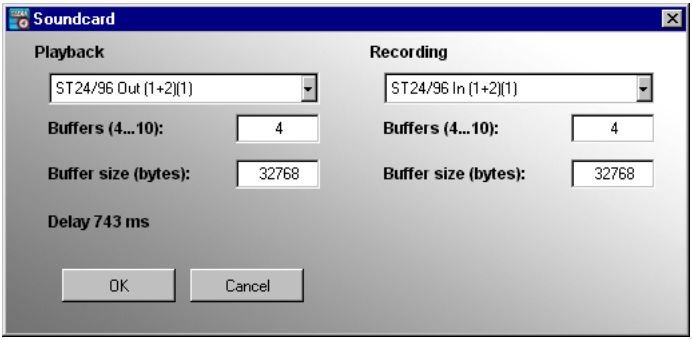


3. **Select the "Audio" tab (which is normally immediately visible) and check what's selected in the "Preferred device" pop-up menu. If you have more than one audio card installed in your system, then select the desired device in this pop-up.**

- **If you wish to find out whether the Line input of the Soundblaster card in our example is active, you will have to open its audio mixer panel.**

❒ **Please find more information about the sound card that you use in its hardware and software documentation.**

The Soundcard dialog



This dialog is used to select the sound card inputs and outputs that you use with ***CLEAN*** and to which you have connected an external analog sound source like e.g. the combination of record player and Phono PreAmp and your monitoring equipment.

The sound card is used for analog/digital conversion.

- **Open the pop-up menus to select the desired inputs and outputs.**

  Depending on the sound card you use, you may be able to set the number of buffers and their size below the two pop-up menus. The resulting latency time (delay caused by the time needed for signal processing) will be displayed.

  If you click “OK”, you confirm your settings and close the dialog.

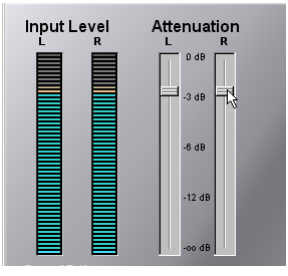
  If you click “Cancel”, you cancel your settings and leave the dialog with grace.

Setting Record and Playback volume

Record volume

When you use ***CLEAN*** to record audio onto your hard disk, this is what happens:

- The audio signal from an external source (like e.g. the Phono PreAmp) arrives at the input of your sound card where it is converted from an analog to a digital signal.
- The input to the analog/digital (A/D) converter of the sound card is either controlled by a Mixer software, that came with your sound card or by the Mixer in the Windows Multimedia control panel.
- No matter which one you use, it is in one of these Mixers where you can cause or prevent a distorted signal. It is therefore very important that you play back the signal to be recorded and use the level indicators of the Mixer or your ears to get a sufficient, but undistorted signal into the computer.
- After the A/D converter stage, the signal finally arrives at ***CLEAN***'s internal input and you can use the ***CLEAN*** "Input" faders and level indicators to control the actual recording level. The only thing that you have to keep in mind is that the "Input" faders in ***CLEAN*** can only attenuate the signal as it has already passed the input of the sound card. If the signal has already been distorted at the sound card input, pulling down ***CLEAN***'s "Input" fader will only attenuate a distorted signal.

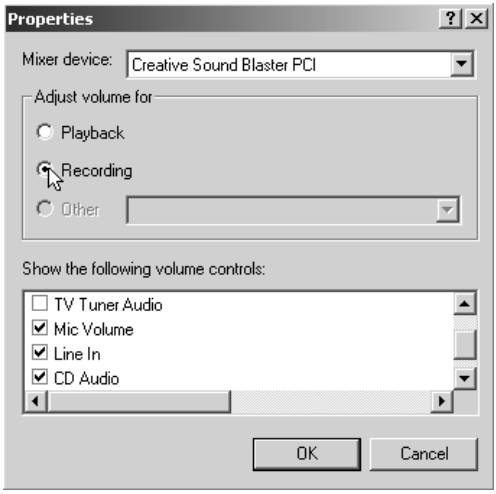


Input level faders and display in ***CLEAN***'s Record dialog.

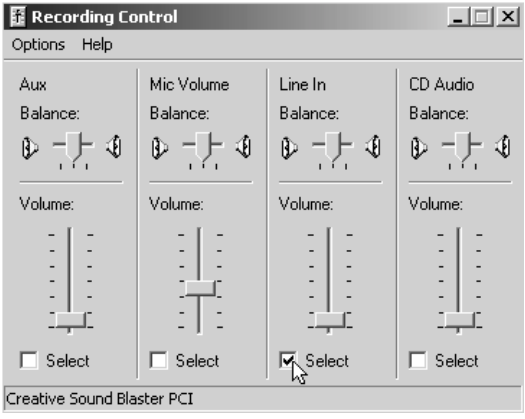
Before you use ***CLEAN*** for recording from vinyl or cassette, you should check the Recording Control settings of your audio card. The sound source and recording level settings are very important for a successful recording. Proceed as follows:

1. **Open the Mixer application of your audio card: On the Start menu on the Programs submenu, select Accessories. From the submenu that appears, select Entertainment, then Volume Control.**
   The Volume Control dialog opens.

2. **On the Options menu in this dialog, select “Properties“.**
The Properties dialog opens.



3. **In the “Adjust volume for” section of the dialog, activate the Recording option and click “OK“.**
The Recording Control dialog opens.



4. **Specify the audio source by activating the Select checkbox in the Line In section of the dialog.**
   Use the fader in this section to accurately predefine the recording level. You can later fine tune this setting from within the program.

5. **Connect the desired sound source (a cassette recorder or a record player with PreAmp or PreAmp/Equalizer) with the corresponding socket of your audio card (usually marked in red) and activate playback of the source signal.**
   Now you can start with the actual recording.

6. **Use the Input fader and level meter in *CLEAN*, and listen carefully to the recording to set a sufficient level without distortion.**
   This means that during recording, the input level indicators should do most of their "jumping" within the yellow part of the indicator, without reaching the red part. You can adjust the level of audio files when the recording is finished. Find more information on page 48, page 82 and page 91.

Playback Volume

CLEAN's "Output" faders control Playback volume, i.e. the volume actually output via your sound card's out socket.

The actually recorded level of the file on your hard disk remains unchanged unless you change it by processing the Track data.

When you move one of the two handles of the "Input" or "Output" fader pair with the mouse, the other handle of each pair will follow automatically.

CLEAN Output level faders

If you wish to set each fader in a pair individually, proceed as follows:

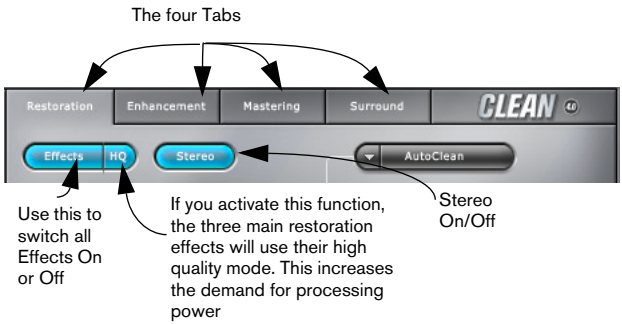
- **Press [Alt] and move the desired fader handle using the mouse.**

Both fader pairs can separately be reset to their original values:

- **Press [Ctrl] and click on one of the faders of the desired fader pair.**

The four Effect sections

CLEAN has four different effect sections: Restoration, F/X and Surround. Four Tabs, similar to those found in many Windows dialogs, are visible at the top of the ***CLEAN*** window. You can use these Tabs to switch the upper right part of the window to display any of the four Effect sections.



Three buttons with general functions are available on all four Tabs:

- By clicking on the general “Effects” On/Off switch, you can switch all active effects On or Off in one go.
- Using the “HQ” button, you let ***CLEAN*** use other calculation methods for the three main restoration effects – DeClicker, DeCrackler and DeNoiser. These ‘algorithms’ will in many cases give you better results, but will also consume a lot more of the calculating power that your computer has to offer.
- The “Stereo” switch is used to switch between stereophonic and monophonic audio playback.

Except for the Surround setting, which is globally used for all Tracks within one Project, each Track in the Track list can individually be processed with the effects. It is therefore possible that you only apply a slight Stereo Spread effect on Track 1, but use the DeClicker and the DeCrackler on the next Track. ***CLEAN*** automatically memorizes the effect settings that you make. If you change from one Track to another, ***CLEAN*** resets the effect parameters to the last state memorized for this Track.

Things the effects have in common

All ***CLEAN*** effects combine extremely simple handling with excellent quality. Except for VST plug-ins (see page 34), the Sound Morph effect (see page 32), which provide their own editing windows, and the Surround effect (see page 38) all effects are controlled in the same way, in spite of their totally different effect on the audio material:

- Each effect can be activated/deactivated by clicking on its On/Off switch and you can use its fader to control effect intensity. Depending on the type of effect, values between 0 (no effect) and 100 (full effect) or -50 and + 50 are available.

❒ **As always, when using effects and aiming for a professional result, you should apply the effect intensity individually and purposely. Be as careful as possible when using the restoration section, otherwise you risk that besides noise and clicks you also remove relevant parts of the useful signal. This means, if in doubt: less is more!**

Fader Reset

- **To reset a fader to its default setting, press [Ctrl] on your computer keyboard and click on the respective fader.**

Copy and Paste Effect settings

You can use a key command to copy the effect settings from one Track to another Track. Proceed as follows:

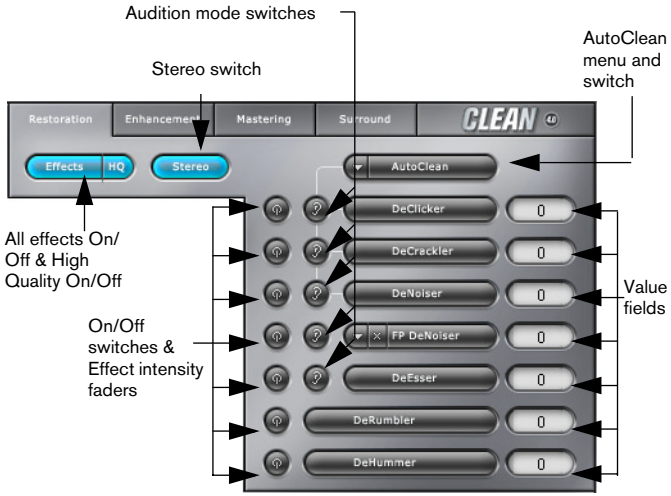
1. **In the Track list, select the Track whose settings you wish to copy. Simultaneously press [Ctrl] and [C] on your computer keyboard.**
2. **Now select the Track to which you want to apply the effect settings and simultaneously press [Ctrl] and [V].**

Inputting values from your computer keyboard

Instead of using its fader, you can set an effect by inputting the desired value into the numeric field to the right of the corresponding fader.

- **To do this, double click on the respective field and input the value from your computer keyboard.**

The Restoration section



The Restoration section

- **Click on the Restoration Tab to make this section visible.**

  The Restoration section contains seven effects. You can use the first five effects to fight clicks, crackles, background noise, predefined noise and sibilants. The other two effects are used to remove rumble noise and mains hum.

  Audition mode switches are available for the first five effects which lets you control exactly which signal parts will be removed by the effect.

  The AutoClean function in ***CLEAN*** helps you by analysing individual Tracks and proposing the best possible settings for the restoration effects DeClicker, DeCrackler and DeNoiser. In its pop-up menu you can predefine the processing intensity ("Light", "Medium", "Heavy"). After the analysis process, ***CLEAN*** automatically adjusts the effects to proposed values.

  You can test the result by playing back the Track and make your own adjustments, if necessary.

  Here's a short description of what the individual effects do:

DeClicker

The DeClicker removes single short clicks, as they are often found on vinyl records. Such clicks can also occur during recording. Then they are often caused by digital drop outs or by electrical devices (refrigerators, neon tubes, etc.) that are connected to the same electrical circuit.

DeCrackler

Other than the DeClicker the DeCrackler concentrates on constant background crackles. These are often audible when you play shellac or vinyl records, but can e.g. also be produced by equipment of inferior quality.

DeNoiser

This "classic" DeNoiser removes regular background noise as it often occurs on old tape recordings. It can also drastically reduce noise caused by hardware effects and mixing desks.

FP DeNoiser

This is a DeNoiser that works based upon predefined fingerprint presets.

The FP DeNoiser comes with 20 presets that cover often occurring types of noise. It has 20 additional preset slots that you can use for your own presets.

You can create your own Noise fingerprint presets, if ***CLEAN*** and the WaveLab Lite audio editor program, that is part of the ***CLEAN*** package, are installed on the same computer.

Proceed as follows:

1. **Start WaveLab Lite and load the audio file that you wish to edit or another file that contains the same type of noise.**
2. **In the waveform displayed in the Wave window, select a region which only contains the noise that you wish to remove, but no useful signal.**
3. **Open the File menu and select "Save selection as noise fingerprint".**
   A dialog appears where you can store the preset into one of twenty preset slots and name it. As soon as you have completed your settings and confirmed them by clicking "Save", the preset will be available in ***CLEAN***.

❒ **You can even create fingerprint presets when *CLEAN* is active!**

DeEsser

The DeEsser can be used to remove sibilants from the signal, that may occur on some vinyl record and tape recordings. Use the Audition mode switch to make sure, you don't remove any parts of the useful signal.

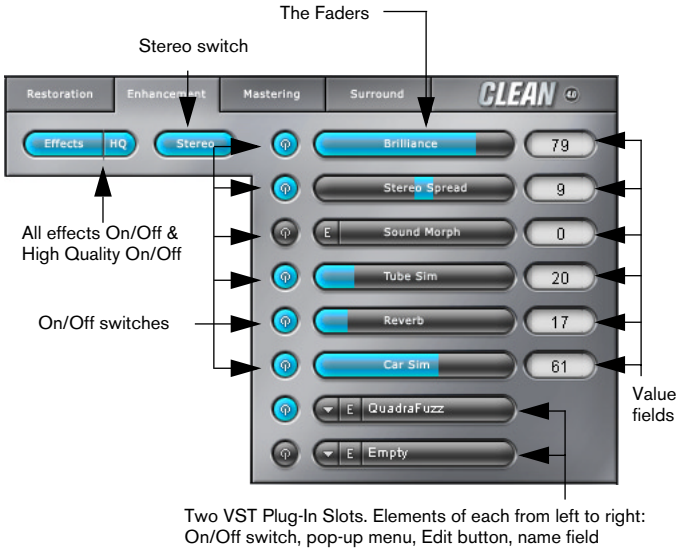
DeRumbler

This subsonic filter cuts off the frequencies below 20 Hz and therefore the noise caused pick-up needle and groove when a record is played back.

DeHummer

This useful function lets you remove a mains hum noise of 50 Hz (as is typical in Europe) or 60 Hz (as is typical in the U.S.A.) from the signal. In the DeHummer frequency pop-up located in the Preferences dialog, that you can open from the Options menu, you can define whether you want a 50 Hz or 60 Hz mains hum removed.

The Enhancement section



The Enhancement section

- **Click on the Enhancement Tab to make this section visible.**

  The Enhancement section contains eight effects. You can use the first six to increase the harmonic content of a recording, widen the stereo basis, copy the filtering characteristics of your favourite recording and apply it to other recordings. You can simulate a tube amplifier and its positive impact on the sound, add reverb and optimize you audio for playback in a car.

  In addition, you can load and edit two VST compatible plug-in effects. VST is a widespread plug-in standard. Hundreds of VST effects are available.

  Here's what the individual effects do:

Brilliance

This effect will add second and third harmonics to the sound that you process with it. It thus expands the harmonic content of the sound, which will in effect get more brilliance and a better presence.

Stereo Spread

The stereo effect of audio material retrieved from older media does not always meet the expectations: Maybe someone recorded his or her first own demo tapes without a sound engineer, or maybe a vinyl record suffered from the many times it was played. The Stereo Spread effect will help to overcome the resulting "narrow" sound. Stereo Spread widens the stereo basis of the signal, thereby making the material significantly more transparent and giving it a more open sound.

❒ **Please note that the mono compatibility of the signal might suffer if you make extensive use of Stereo Spread. In a worst case scenario this could mean that instruments could completely vanish from the Mix when the audio file is played back in mono. If mono compatibility is important for you, you should use the Stereo switch in the top right corner of all Effects sections to test whether the signal is still mono compatible.**

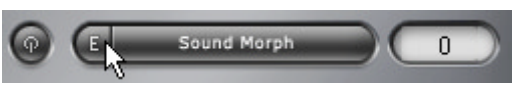
Sound Morph

Sound Morph can be used to drastically improve recordings that have a bland sound.

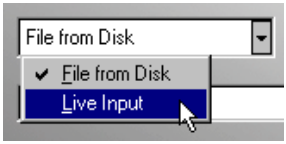
You let Sound Morph perform its miracle by feeding it with an excellent sounding piece of audio (preferably of the same musical style).
Sound Morph will analyse the audio and – based on the results of the analysis – will create a set of effect settings that you can then apply to the dull sounding Track.

All of this can be done by simply selecting the files and pressing a few buttons. Proceed as follows:

1. **In *CLEAN*'s Track list, select the file that you wish to improve sound-wise.**
2. **In the F/X section, activate the Sound Morph effect by clicking on its On/Off button so that it lights up. Then click on the "E" (Edit) button on the Sound Morph fader.**



3. **A dialog opens. There is a pop-up menu on its left side. Here you must select a source for the audio analysis.**
   The audio to be analysed can either be a Wave file (file extension.wav) on your hard disk or a Live input signal that is played back via your sound card (e.g. a CD track that you play back from your computer's CD drive.



4. **Click the "Analyse" button to analyse the reference audio.**
   In the display below the "Analyse" button the word "Busy" will appear and flash.

❒ **You don't necessarily have to let Sound Morph analyse a complete piece of audio, but you can. Experiment! It´s worth the effort.**

5. **To stop the analysis process, press the "Done" button. Then close the dialog by clicking the "Close" button.**
   Now you can apply the results of the analysis to any or all Tracks of your current Project by setting the Sound Morph fader for each Track.

❒ **It is a good idea to play back the processed file and let your ears decide, how much its frequency characteristics should be changed.**

Tube Sim(ulation)

This effect simulates the results that using a good Tube Amplifier can have on the signal.

- The signal gets a more warm and smooth sound.
- The signal sounds slightly compressed and harmonic.

Reverb

This effect simulates Track playback in a room. The proportion between original signal and room signal always remains the same.

What you change by using the fader is the size and type of the room and therefore its reverb characteristics.

Car Sim(ulation)

You can use this effect to process Tracks in way that they sound better when played back via a car stereo system.

What this effect essentially does, is to compress and filter the signal so that frequencies, that would otherwise be cancelled out by the driving noise, remain audible.

The VST effect slots

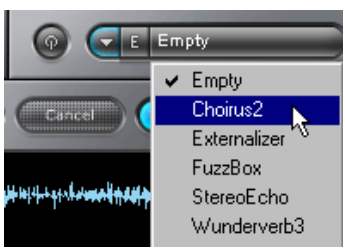
CLEAN has two effect slots that you can use to load any effect plug-in that is compatible with the widely used VST plug-in standard. Virtually hundreds of plug-ins with a great variety of functions are available on the market. Check your music dealer, the Steinberg web site or the internet.

For VST plug-ins to be accessible from within ***CLEAN***, they must be stored in a Vstplugins folder that resides within the ***CLEAN*** folder.

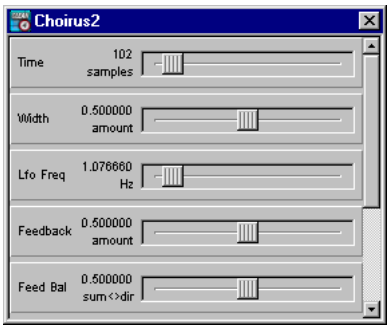
❒ **When you create the folder, make sure to exactly name it: Vstplugins, otherwise the plug-ins will not be found.**

Proceed as follows to use a VST plug-in:

1. **Activate the On/Off switch so that it lights up. Open the pop-up menu by clicking on the downward pointing arrow. Then select the desired plug-in.**

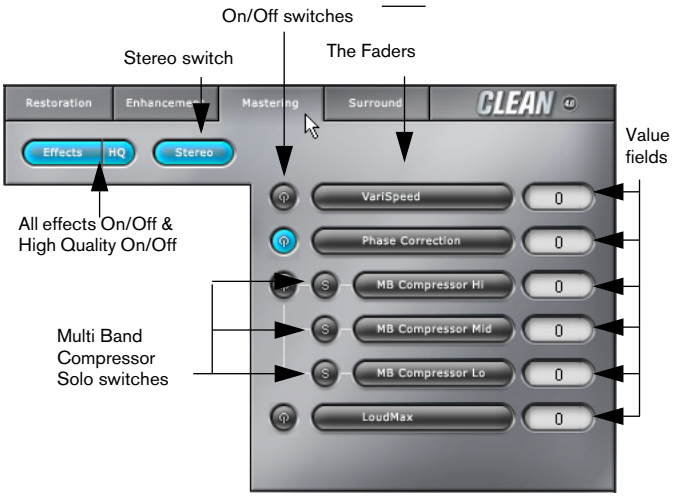


2. **Click on the “E” button to bring up the Edit window of the plug-in where you can make the desired settings.**
   Most VST plug-ins have their own Edit window, few don’t. For the latter type, ***CLEAN*** creates a simple edit dialog.



Two different Edit windows.

The Mastering section



The Mastering section

In the professional audio sector, the process of optimizing and finalizing audio before it is transferred to production is called Mastering.

- **Click on the Mastering Tab to make this section visible.**

The Mastering section contains four effects. These can be used to change the playback speed and with it the pitch, correct certain phase errors, compress and thereby level out the signal peaks in different frequency bands and increase the average volume of a recording.

Here's what the individual effects do:

Vari Speed

This effect lets you change the tempo and with it the pitch of a Track. Vari Speed works in real time and re-samples the audio. You can pitch a Track up or down by up to two semitones. Its tempo will change accordingly. You can therefore use this effect to correct false tempi or pitches caused by the differing basic playback speed of different Cassette recorder models. DJs will also find Vari Speed handy to adjust the tempo or the pitch of two recordings that they wish to play one after another.

Phase Correction

This is especially useful when you record Tracks from old tapes. If the angle between the tape head of your recorder and the tape (azimuth) is not entirely correctly adjusted, the playback signal suffers. It is either strong on one channel and weak on the other, doesn't have sufficient treble or the treble seems to come and go.

Try this effect to improve the material that you have. It does not perform miracles but can help to improve the quality.

Multi Band Compressor

The Multi Band Compressor is levelling out peak levels. These are attenuated which decreases the dynamic bandwidth, thus the difference in level between the loud and the soft levels. This makes it possible to increase the average level and reduce the risk of digital clipping.

In the Multi Band Compressor, the signal is divided into three fixed frequency ranges ("Hi", "Mid" and "Lo"), which are processed separately. This improves the flexibility and sound quality considerably.

You can test the effect the Compressor has on each frequency range by using one of the three Solo buttons.

Loud(ness) Max(imizer)

This is a very special effect. You can use it to increase the average volume of a recording.

Imagine, you have recorded a Track that contains music with a wide dynamic range. That is, the music contains a few very loud parts, but also very low parts. During recording, you have taken great care that the few loud peak signals did not cause distortion.

Now you find that – compared to the peaks – the rest of the music is not loud enough. Try Loud Max to level out the different levels. It will make the material sound more dense.

Where and how you should use this effect depends on the type of music and your taste. If a wide dynamic range is part of the musical character of a recording – as is often the case with classical music – then you should either refrain from using Loud Max or only use it subtly.

The Surround section

The Surround section

- **To bring up this section click on the Surround Tab in the top right of the *CLEAN* window.**
  The Surround section can be used to create stereo compatible Surround recordings. In other words: Here you can turn a normal stereo recording into a Surround recording with spatial sound characteristics which can also be played back via a normal stereo system.
  First a little theory:

  Same as all widely used Surround formats, ***CLEAN***'s Surround format intends for a left, right and center speaker, each controlled via a separate channel. In stereo format, the two speakers left and right do by the way also create a "front center phantom signal".

  Two more speakers, that are controlled via a common fourth channel, are arranged in the rear of the listener. For compatibility with conventional technology, the four channels are combined as a stereo signal. To do this, the Surround signal is being phase-shifted and placed in both stereo channels.

  The center signal is created by combining the stereo channel signals.
  The surround channel signal is reverse phase-shifted, then added to both stereo channels and isolated during the decoding process. When played back via a conventional stereo system without decoder, the Surround signal parts are cancelled out to ensure stereo compatibility.

Using the Surround section

The settings described hereafter can be used to adapt Surround playback to your individual monitoring setup. It is after all not uncommon that speakers can not be positioned in the optimal places for practical reasons. This can be taken into account with this method.

1. **Switch on the Surround section.**
   The switch is located in the top right of the Surround section.

2. **Use the Surround level fader at the bottom left of the Surround section to distribute the volume level between the front and rear speakers.**
   This is graphically indicated by a red rim.

3. **Drag the individual speaker symbols to positions that correspond to the desired or available monitoring positions. To do this, click on each speaker symbol, hold down the mouse button and move the mouse to the desired position. Then let go of the mouse button.**
   When you drag, the distances in meters and the angle values in degrees between the speakers and the listener are displayed for all speakers.

❒ **The Surround settings do always apply globally to the whole Project.**

The distance between the listener and the speakers can be set to values ranging from one to ten meters. You can define the maximum possible distance in the Preferences dialog on the Options menu. In this dialog, you can also switch the measurement unit used to define the speaker distances from meters to feet and inch.

The Equalizer

CLEAN includes an 8-band Graphic Equalizer with fifteen fixed and fifteen user-definable Presets.

The Equalizer is located in the middle of the ***CLEAN*** window below the IntelliAssistant.

You can separately set each of its eight filter bands. By moving one of the triangular fader handles up or down, you increase or decrease the level of the corresponding frequency band within the overall signal by up to +/- 12 dB.

The Equalizer section

You can also make Equalizer settings by positioning the mouse cursor onto the Equalizer display, pressing the mouse button and dragging the mouse.

You do thus draw in a new Equalizer curve.

The "EQ" button, located below the Equalizer section, is used to switch the Equalizer On or Off.

If you click on the downward pointing arrow head next to it, a pop-up menu appears, where you can select any of the available Equalizer Presets.

The fifteen Presets on the left side of the menu are fixed. The Presets that you create yourself will wind up on the right side of the menu.

The name of the currently active Preset is always displayed in the field to the right of the "X" button.

Creating an Equalizer Preset

To create your own Preset proceed as follows:

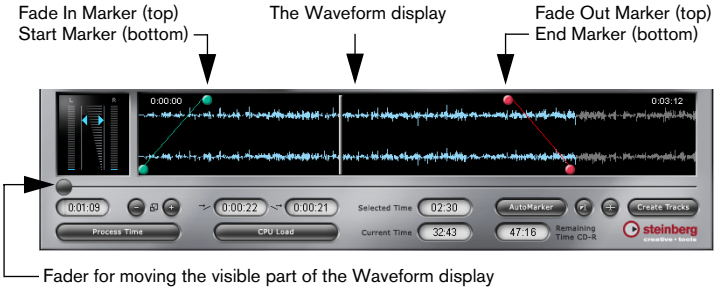
1. **Activate the Equalizer by clicking on the “Equalizer” button.**
2. **Start playback and move the Equalizer faders up or down until you’ve got the sound right.**
3. **Double click on the name field to the right of the “X” button and name your Preset.**
4. **Click on the “Return” symbol button.**
   The right part of the pop-up menu opens.
5. **Click on the desired slot where your new Preset should wind up.**
   If the slot already holds a Preset, this will be overwritten.

Deleting an Equalizer Preset

If you wish to delete any of your Presets, proceed like this:

1. **Click on the “X” button.**
   The right part of the pop-up menu opens.
2. **Click on the Preset that you wish to delete.**

The Waveform display



Controls, upper row from left to right:
Current Track Time, Zoom out, Zoom in, Fade in, Fade out, Time selected within Track, Automarker Analysis switch, New Marker, Delete Marker, Create Tracks function.

Controls, lower row from left to right:
Processing Time, CPU Load, Accumulated time of all Tracks together, Remaining time still available on an 80 minutes CD-R.

The Waveform display shows a graphic waveform of the Track that is currently selected in the Track list. It is in this display, where you can determine where the Track starts and ends as well as whether it should have a fade in or fade out, and the length of that.

Setting the Track length – The Start and End Markers

- **Drag the green Start Marker (the lower dot on the left side) with the mouse to determine a new start position. This might e.g. be useful if the starting point of the audio file is not identical with the acoustic starting point.**
- **You can determine the end of the audio file in a similar fashion: Use the mouse to drag the red End Marker (the lower dot on the right side) to the desired position.**
  The "Selected time" display informs you about the current length of the Track, as defined by the Start and End Marker settings.
- **To reset all Markers to the edges of the waveform, hold down the [Ctrl] key and click on the Waveform display with the left mouse button.**

❒ **The Start and End Markers disappear, once an imported Track or one that you have recorded with *CLEAN* has been processed or manually been set to "ready" status – see "Processing the Tracks" on page 46. If you manually set a Track to "ready" status by clicking its Track number with the right mouse button, then its Marker and Fade-in/out settings are not being used as nothing has been processed. You can of course re-define the Start/ End Markers and the Fade-in/ out Markers for each Track at any time. To do so, click on its Track number with the right mouse button. If it was processed or manually set to "ready" status before, – indicated by the green color of its Track number – then it will be set back into "not processed" status – indicated by a red Track number.**
Effects can be applied on the same Track many times.

The Fade-in and Fade-out Markers

You can use the Fade in and Fade out Markers to gradually increase (fade in) and/or decrease (fade out) the volume within a definable time frame at the beginning and at the end of the audio file.

- **To fade in a Track, drag the Fade in Marker (the upper green dot on the left side) to the right until the fade in has the required length.**
  The length of the fade in hours/minutes/seconds is shown in the "Fade in" field.

- **If you want to fade out a Track, drag the Fade out Marker (the upper red dot) to the left until the fade out has the required length.**
  The "Fade out" field below the Waveform display informs you about the exact length of the fade in hours/minutes/seconds.

  Instead of creating fades with the mouse, you can set them by inputting the desired value into the "Fade In" and "Fade Out" fields below the Waveform display.

- **To do this, double click on the respective field and input the value from your computer keyboard.**
  Values must be input in the format hours:minutes:seconds.

- **To reset all Markers to the edges of the waveform, hold down the [Ctrl] key and click on the Waveform display with the left mouse button.**

❒ **You can use the "Undo" function on the Options menu to undo the last 100 Fade in/Fade out Marker changes.**

Zoom – Changing the size of the displayed Waveform

- **If needed, you can use these two buttons to zoom in or out on the waveform in the Waveform display. As an alternative, you can also use the [+] and [-] keys on your computer keyboard.**
  When you have set a high magnification, the waveform might not be completely visible in the Waveform display. Then you can use the slider under the display to move the visible part of the waveform.
- **To change the zoom factor dynamically, position the mouse cursor within the Waveform display, hold down [Shift] and drag up or down.**
- **To make the whole Track visible, hold down [Alt] and click once within the Waveform display.**

The AutoMarker functions

Material that has already been recorded can also be split into individual Tracks later. This can be done both automatically and manually. The four AutoMarker buttons on the lower right-hand side of the Waveform display can be used to insert, delete and edit Markers as well as for splitting the audio material into individual Tracks. The “AutoMarker” and “Create Track” functions analyse the audio data based on the settings that you make in the “Preferences” dialog of the Options menu.

Button	Function
	The selected audio Track is analysed for silence. Analysis follows the settings that you have made in the “Preferences” dialog of the Options menu.
	A new Marker is inserted at the current playback position. This function can also be used during playback.
	The last selected Marker is deleted. This Marker has a different colour than the others. If you hold down [Shift], all Markers are deleted.
	The current audio Track is split into individual Tracks according to the settings you have made in the “Preferences” dialog of the Options menu and Track list and Waveform display are updated.

Markers can also be inserted manually (with the mouse or by pressing the [Insert] key), moved (with the mouse) and deleted (by clicking on them with the right mouse button).

Markers in the Waveform display. The last selected Marker is on the right.

Available disk space

This display informs you how much space you have left on your hard disk. The yellow bar represents the relative space on the storage medium that you have selected under “Select temp file directory” in the File menu (see page 81). In the field next to it you can see how much space is left in terms of hours/minutes/seconds.

❒ **Importing Tracks in *CLEAN* is not limited to the total playing time of an Audio CD (up to 80 minutes). You rather can exceed this time limit, e.g. to save your restored audio data onto a DAT cassette (longer playing time) instead of on CD.**

Processing the Tracks

Before you can actually turn your selection of Tracks into an Audio CD, ***CLEAN*** must calculate the effect settings you have made and create a new audio file that includes them.

There's one exception: if you wish to burn unchanged Tracks to CD-R, then you can manually set them to "ready" status.

All Tracks that are ready to be recorded onto CD have a green Track number. You can even re-define the Start/End and Fade in/out Markers after the Tracks have been processed. See page 43.

- **To process the currently selected Track, please click on the "Process this Title" switch, located below the EQ section in the *CLEAN* window. If you wish to process the complete Project, click on the "Process" switch. If you wish to interrupt processing for any reason, just click the "Cancel" switch.** The data that has already been written to the disk during the processing will automatically be deleted.

❒ **Calculating the effect data needs additional hard disk space. Make sure that enough free space is left on your hard disk: For each Track to be calculated, you will need as much additional free space as the Track already uses on the disk.**

You can also use ***CLEAN*** to burn unchanged Tracks onto CD-R:

- **If you right-click on a Track number, the number will change to green ("ready" status) and the corresponding original Track can be recorded onto a CD without having been processed by *CLEAN*. To set all Tracks into "ready" status without processing them, hold down [Ctrl] on the computer keyboard and click on any Track number.**

❒ **The "ready" status of a Track can at any time be re-defined by clicking on it with the right mouse button. A red Track number indicates that the Track has not been processed, a green number that it has or has manually been set to "ready" status.**

The Process Time display

During the processing, this display informs you how long it will presumably take until ***CLEAN*** finishes processing the current Track.

Current Time and Remaining Time CD-R

These two displays at the bottom of the ***CLEAN*** window are meant to facilitate your overview of the current Project.

- The "Current Time" display shows the total time of all Tracks that are currently in the Track list. If the total time exceeds the recording time available on the CD-R, then the value is displayed in red.
- The "Remaining Time CD-R" display informs you how much free space is left on the CD-R. If the total time of all Tracks in the Track list exceeds the total available time on the CD-R, the surplus time is displayed as a negative value.

- **In this case, use the Start and End as well as the Fade in and out Markers to shorten longer Tracks.**

CPU Load

Processing the effects in real time puts a heavy workload on the processor. How many effects ***CLEAN*** can actually calculate during playback, depends on the power of your computer processor (CPU). The "CPU Overload" display shows you how much of the available processor power is consumed by the current calculations. The more to the right the "CPU Overload" bar moves, the greater the workload for the CPU. If the bar completely fills the display, then the processor has reached its peak performance. As a result, audio file playback will suffer from interruptions and clicks.

You should then deactivate single effects until the "CPU Overload" bar returns to a normal position again and there are no interruptions during playback.

❒ **How you can use all effects without having a powerful processor is described on page 84.**

Maximum Level by Normalizing

While analog systems generally show a relatively tolerant behaviour when fed with signal peaks higher than 0 dB, a digital system for technical reasons responds to levels above 0 dB by creating very unpleasant distortions, called digital clipping.

Digital recordings with a very low level – on the other hand – suffer from a low resolution and therefore from background noise.

The solution to the problem consists of two components:

- **When recording, you should make sure that the recorded signal has a sufficient level. This, however, should never exceed 0 dB, as that would result in a distorted signal.**
- ***CLEAN* has three Normalize functions that you can use to optimize the level of a recorded signal.**

  The Normalize function searches an audio file for its highest peak level. It then calculates the difference between the highest dB value it found and 0 dB (the highest level possible before distortion starts to occur). Finally, Normalize raises the level of the complete audio file by the level difference it found.

  Normalize can of course not differentiate between background noise and useful signal, but it adds no noise itself. If you thus normalize an audio file that already has a fairly sufficient level, you will often notice that it still got more punch.

  The recording is simply louder after Normalizing. The Normalize function is also useful to bring the levels of several Tracks into line that you want to put on one CD-R.

❒ **We recommend that you only use the Normalize function after you have completed processing *CLEAN*'s effect settings. If you would normalize first, then the highest level in your audio file would already have a value of 0 dB. As some effects are likely to further increase the level, this would inevitably lead to ugly sounding digital distortions. Therefore please keep in mind: process first – then normalize!**

Normalizing one or all Tracks

This is how you normalize one Track in your Track list:

1. **Select the desired Track in the Track list by clicking on it.**
   The corresponding line in the Track list will be highlighted.

2. **Select "Normalize selected Track" on the Normalize menu.**
   A dialog box appears, where you can confirm the action by clicking "Yes" or cancel it by clicking "No". If you click "Yes", the calculation starts immediately.

This is how you normalize all Tracks in your Track list:

- **Select "Normalize all Tracks" on the Normalize menu.**
  A dialog box appears where you can confirm the action by clicking "Yes" or cancel it by clicking "No". If you click "Yes", the calculation starts immediately.

Meta Normalizing all Tracks

The Meta Normalizing function can be used to create an equal average loudness for all Tracks in the current Project. If you don't use this function and record Tracks onto CD that have a different loudness, you must adapt the volume setting to the loudness of the currently played Track. You can prevent this by using Meta Normalizing.

- **Select "Metanormalize all Tracks" on the Normalize menu.**
  The function starts immediately. The calculations can take some time. When they are finished, am alert informs you accordingly.

❒ **This functions should be the last you use before recording onto CD.**

Recording the CD-R

CLEAN provides two different CD formats for recording: Audio CD and Data CD.

- CDs in audio format contain audio data – e.g. music – and can be played back in Audio CD players or CD-ROM drives.
- Data CDs in ISO format (i.e. CD-ROMs) can contain different data formats – e.g. MP3 files. The funny thing is that the files may very well be audio files. But here, they are stored in a way that a computer operating system recognizes them, but most Audio CD players don't. Some DVD and MP3 hardware players are able to play back Data CDs. You can e.g. use this format to create extensive compilations of your MP3 files.

Creating an Audio CD

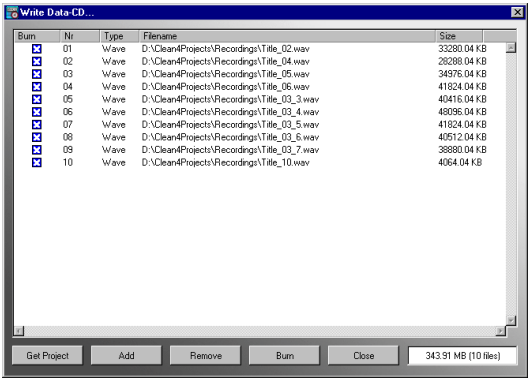
When you have prepared all files in your current project by using the processing and possibly the normalizing functions or if you have not processed and instead manually set them to "ready" status, then you can now record them onto CD.

- **To do this, open the CD menu and select "Write Audio CD-R...".**
  This opens a dialog, as described in the section "The Write Dialog for the CD Project" on page 51.

Creating a Data CD

Proceed as follows:

1. **In the CD menu, select "Write Data CD...".**
   The corresponding dialog opens.



2. **Use the buttons at the bottom of the dialog to add the desired files.**

3. **If you also wish to add the files listed in the track list, click the "Get Project" button.**
   This doesn't change the CD format to Mixed Mode. Instead, the files are simply added as computer files.

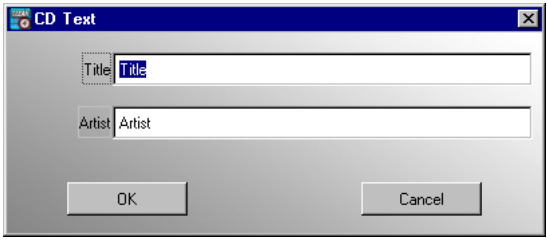
❒ **If you close the dialog before writing the CD, the list will be deleted.**

The total file size of all files in the list is displayed in the lower right corner of the dialog. Make sure that it doesn't exceed the space that is available on the empty CD-R in your CD recorder.

4. **If necessary, switch on the CD recorder.**

5. **If you have edited the list as desired, you can click the "Burn" button to start the CD writing process.**
   This opens the dialog "Write virtual Disc" where you can make additional settings for the writing process.

The Write Dialog for the CD Project



When you select "Write Audio CD-R…" on the CD menu, the "CD Text" dialog will be displayed first, and you can insert a CD title and the artist's name.

When you have done this and clicked on "OK", the "Write virtual Disc" dialog appears. This can also be opened by clicking the "Burn" button in the dialog "Write Data CD…".

Here you can make all the necessary settings for the CD to be recorded.

Setting	Description
Write	The CD writing process is started.
Close	The dialog is closed.
Settings	This opens a dialog where you can make settings for your CD recorder. The contents of this dialog depends on the CD recorder used.
Disc Info	If a CD-R is in the CD recorder, you can use this to get information about its size and available space.
Write Speed	Here you can select a Write speed supported by your CD recorder.
Write method	Here you can select a write method supported by your CD recorder. If you want to write a “real” audio CD, select “Disc at Once“. If you want to write several sessions on one CD, select “Track at Once“.
Closing method	Here you can select a closing method.
Simulation	Here you define, if and how a simulation is performed before the actual writing process. Simulating the writing process lets you find out whether the writing process will be successful, or if problems might occur.

Write to hard disk first	If this function is active (ticked), then the writing program first writes an image file onto your hard disk (which must have enough free space to hold the file). An image file has the advantage that the data to be recorded doesn't have to be converted into CD format during recording, as this is done when the image file is created. The actual burning (recording) procedure will therefore be faster and performed with greater reliability and less risk of malfunction.
Default	Click on this button to save the current dialog settings as default. The next time you open the dialog, they will automatically be set.
Advanced	If you click the "Advanced" button, the dialog is extended downwards and you get access to five tabs. These let you make a number of additional settings for the writing process.

The dialog “CD and Burner Info…“

When you select “CD info…” on the CD menu, the “CD and Burner Info…” dialog appears.

In the left part of the dialog you will get information about the medium in your CD recorder. Here the number of tracks and sessions and the free disc space are displayed.

In the right part of the dialog you will find information about the selected CD recorder. You can see, for example, if your CD recorder supports the DAO (“Disc-at-Once”) CD writing method. In this mode, the entire disc is written in one pass, without ever turning off the recording laser. DAO support is required if you want to write Audio CDs.

In this part of the dialog you can also verify, if your CD recorder supports ISRC codes. The so-called “International Standard Recording Code” was introduced by the IFPI (International Federation of the Phonographic Industry) and is an identification that is only used on CDs intended for commercial distribution.

Here you can also find out if an UPC code (“Universal Product Code”) is written. This code is a thirteen-digit catalog number which identifies the disc.

Furthermore, you can see if a CD text and a CD index can be written and if the writing process can be simulated first.

If you insert a new recordable CD, click on the Refresh button to update the dialog.

Creating CD Labels

The Label Editor allows you to design and print custom labels for your projects. You can design separate layouts for front, inside, back and disk labels. Both text information and a wide range of image file formats can be imported and edited in various ways.

About Variables and Templates

Every project has a default set of "variables", text that consists of a short code string plus a value. Variables provide information about a project, such as track titles, personal data etc. There are basically two types of variables: factory and user editable.

Factory variables automatically provide information based on the contents of a project, and user editable variables can be customized to suit the current project.

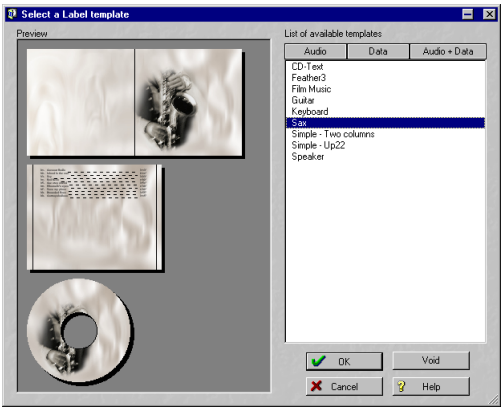
- Templates are ready-made layouts that will use the information provided by the variables.
- You can freely customize the properties of a template layout by using the Label Editor. Add new images or other objects, delete or edit existing objects etc.

❒ **The settings of the *CLEAN* track list are automatically inserted in the Label Editor.**

Selecting a Template

The first thing you do before the Label Editor is opened is to select a template. As mentioned previously, templates provide some information based on the current project, and have ready-made layouts:

1. **Open the project you wish to create CD Labels for.**
2. **Select the “Label Editor” option from the Options menu.**
3. **A dialog appears, allowing you to select a Template for your project.**



To the right in the dialog there is a list of available templates, divided into three groups “Audio”, “Data” and “Audio + Data”. By clicking on the corresponding button at the top of the list the available templates for the selected project type are shown. To the left in the dialog, preview images of the front, back and the disk labels are shown.

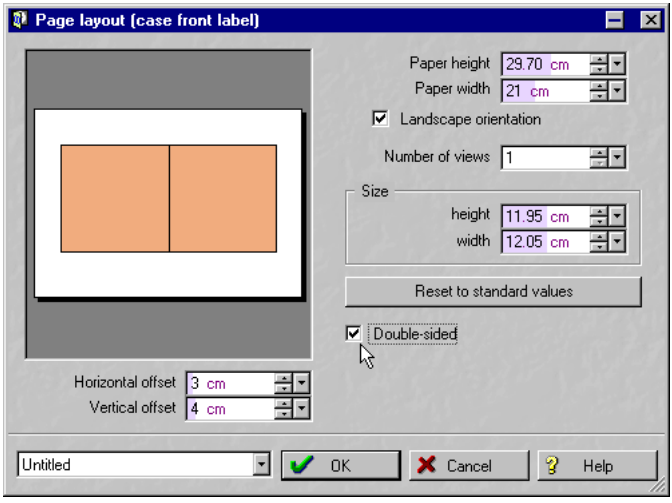
4. **Select a template, and click OK.**
   The Label Editor window opens, displaying the CD case front label.

- **If you do not wish to use any template you can select “Void” in this dialog.**
  This will open the Label Editor with empty labels, allowing you to build your own labels from scratch by adding objects, specifying backgrounds, etc.
- **You can also save user templates.**
  This is described on page 69.

Using the Label Editor

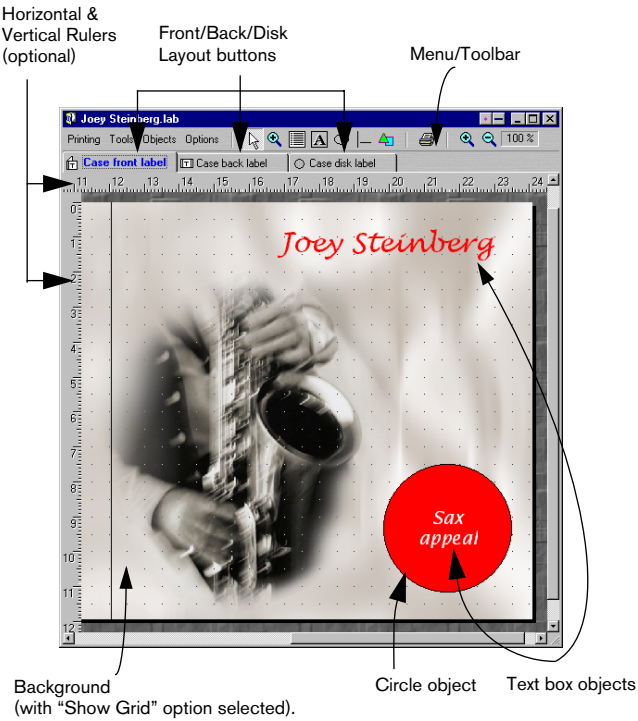
The Label Editor always displays one of the three available views or pages: the Front, Back or Disk label. You switch between these pages by selecting the corresponding tabs below the Menu/Toolbar. The layout is completely independent for each page.

- **Please note that the Front Label can either be single or double-sided.** This option is set in the Page Layout dialog on the Printing menu, see page 72.



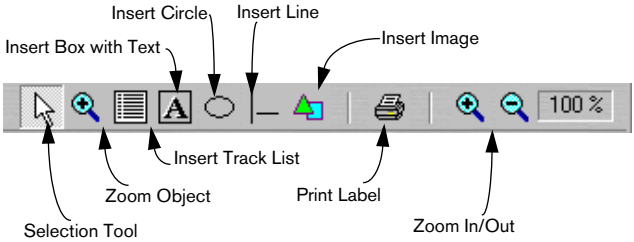
About the Label Editor Window

The Label Editor displays a frame with the selected label (Front, Back or Disk) layout. Layouts are made up of editable objects. Objects can be either images, text boxes, lines or circles. You can also select either an image or color as background for the layout as a whole.



Basic Object handling in the Label Editor

The Label Editor Tools



Tools can be selected in three ways:

- From the Tools menu
- By clicking the corresponding icon on the Menu/Toolbar
- By right-clicking in the background area (not an object), and selecting from the context menu that appears

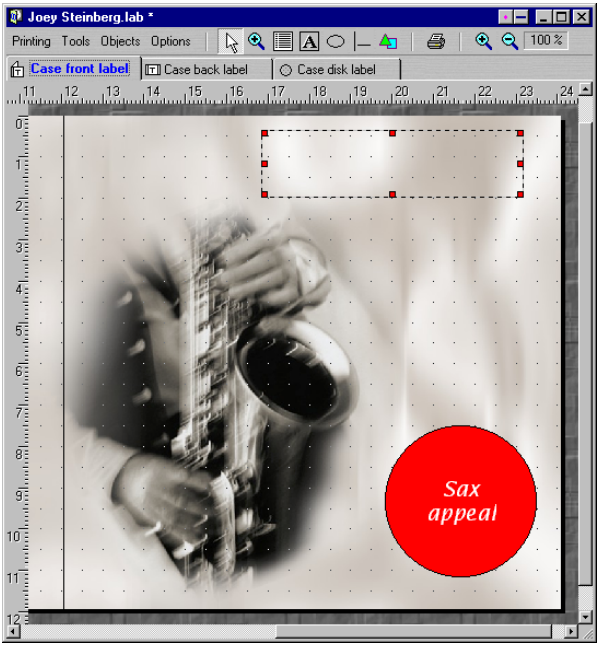
The following Tools are available:

Tool	Description
Selection Tool	Used to select, resize or move objects.
Zoom Object & Zoom In/Out	This is used to zoom in on a selected object, keeping it in view. The Zoom In/Out zooms the layout as a whole in or out. You can go back to normal magnification (1:1) by selecting “Zoom 100%” from the Options menu.
Insert Track List	This will produce an automatically generated Track List, based on the tracks belonging to the current project.
Insert box with text	Creates a text box object.
Insert Circle	This will insert a circle or ellipse object.
Insert Line	This will insert line objects.
Insert Image	This will insert an Image.
Set background color... (menu only)	Allows you to define a color for the background of the layout.
Set background image... (menu only)	Allows you to define an image for the background of the layout.

Selecting Objects

Clicking an object with the Selection tool selects it.

- Selected objects are indicated by a dotted outline, and square “handles”, which can be used to scale the size of the object.
- To select several objects, hold down [Shift] or [Ctrl] and click. Selected objects can be deselected by [Shift]-clicking.
- When several objects are selected, one of the objects will always have “focus”. This is indicated by red handles. You can move the focus to any of the selected objects by [Ctrl]-clicking.



Two objects selected, with the upper having the focus.

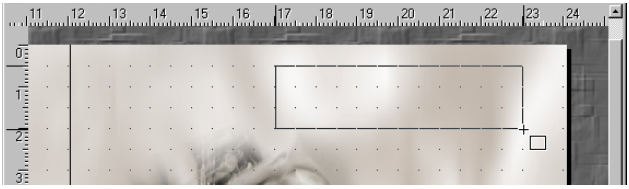
Resizing Objects

- **If you click on a handle of a selected object, the pointer changes to a double arrow, indicating the directions you can drag.**
  Images or circle objects will be scaled, whereas dragging the handles of text box objects will resize the size of the box, not the text itself.

- **You can also right-click an object and select "Edit position and size..." from the context menu.**
  A dialog appears, allowing you to edit size (width and height) numerically, in cm/mm.

Inserting new Objects

- **Inserting new objects is done by selecting the corresponding tool, and clicking and dragging in the layout.**
  When you release the mouse button, a dialog appears, allowing you to define basic properties for the inserted object. Note that this does not apply to Image objects, where instead a standard file dialog appears. The Edit Properties dialog is also selectable from the Objects menu and by right-clicking objects and selecting the corresponding option from the context menu. See page 63 for a description of the various items available in the Edit Properties dialogs.



Inserting a text box object.

Deleting Objects

To delete objects, simply select them and use the [Delete] key.

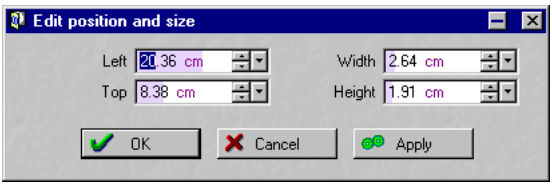
Copy/Move Object

If you manually move an object with the right mouse button pressed, a small pop-up menu appears when you release the button allowing you to either select to copy the object to the new position or to move it there.

Positioning Objects

There are several methods you can use to position objects:

- **Manually**
  You can drag objects using the Selection tool.
- **Automatically in relation to the layout frame**
  By right-clicking an object, you can automatically center the placement of an object either horizontally or vertically by selecting the corresponding item from the context menu.
- **Automatically in relation to other selected objects**
  See page 67.
- **Numerically**
  If you select “Edit position and size...” from the Objects (or context) menu, a dialog opens where you can position the object (selected with focus) numerically. You specify the position from the left side and the top of the layout frame, in cm/mm. Click “Apply” to apply the position change without closing the dialog.



About the Grid, Rulers and Magnetize Options

On the Options menu, you will find two items, “Show grid” and “Show rulers”. If these are ticked, the background of the layout will show a grid consisting of little dots, and also vertical and horizontal rulers that show the current position of the mouse pointer. Both these items help you to position objects with fine precision in the layout. The grid spacing can be specified in the Preferences dialog on the Options menu.

You can also use Magnetize so that objects will snap either to grid positions, to other objects or to the frames limits (or all three), by selecting the corresponding Options menu item.

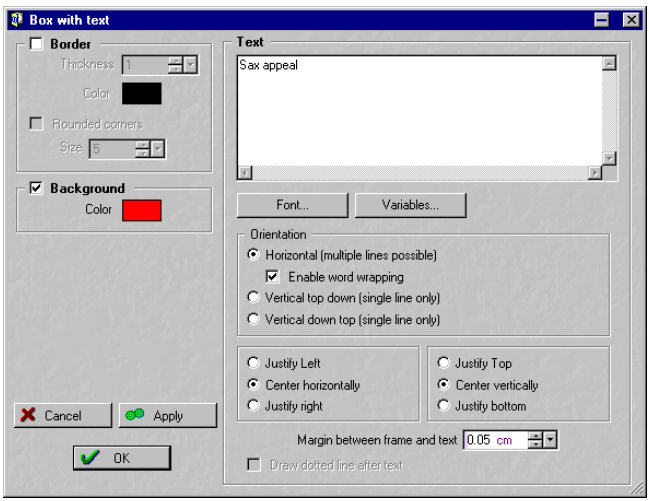
About the Edit Properties Dialog

The Edit Properties dialog can be opened in three ways:

- By selecting an object and selecting “Edit properties…” from the Objects menu.
- By right-clicking an object and selecting the same item from the context menu.
- By double-clicking an object.

The contents of the dialog vary depending on the object type.

Text Box Properties



The following properties can be set for a Text box object:

Property	Description
Border Options	Here you can define whether or not the Text box should have a border surrounding it, and to set the thickness of the border. In addition, the Text box corners can be rounded. The Size of the rounded corners can also be set, the higher the number the rounder the corners will be.
Background Color	Sets the background color of the Text box. By clicking in the Color field, a standard color dialog appears where you can pick a color.
Text Field	This is where you type in the text that will appear in the Text box.
Font...	This opens a standard font dialog, where you can select font type, text format, text color, and text size etc.

Property	Description
Text Orientation	Here you can set the orientation of the text. Select between Horizontal, Vertical top down, or Vertical down top. In addition you can set whether the text should “wrap” or not. If text wrap is on the text orientation will adapt according to the size of the text box.
Text Justification	This allows you to set the text justification, i.e. the position of the text in the text box. It can be centered horizontally, or justified to the left or right sides. It can also be centered vertically, or justified to the top or bottom of the text box.
Text Margin	Allows you to set the margin between the text box frame and the text.
Draw dotted line after text	If you select left justification and deactivate the option “Enable word wrapping”, there is an additional option to draw a dotted line after the text, which is otherwise greyed out.
Variables...	If you select this, you can pick a defined variable and enter this code in the text box. If you for example have defined a variable for the name of a composer, you can select this variable in the dialog and then chose either “Import Code” or “Import actual text”. In both instances, the composer name will appear in the text box. The difference is that if you later redefine the variable, the text imported as code will automatically change for every instance it is used in this project, whereas importing as text will not reflect any changes made to the variable. If you click “Edit”, the Edit Text Variables dialog opens, allowing you to edit and define user variables. This is described on page 70.

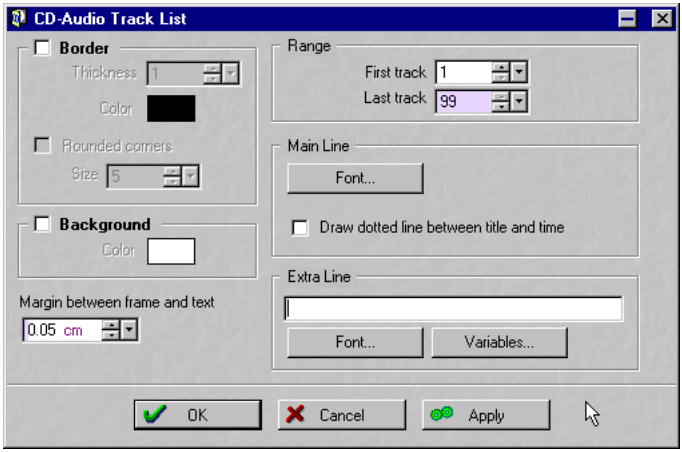
- **Note: If you have used the “Import Code” function for an object, you can choose whether the actual code or the resulting text will be shown in the Label Editor.**
  This is done by selecting the corresponding item on the Options menu.

Circle Properties

The Circle/Ellipse properties dialog can set the following parameters:

Property	Description
Border Options	Here you can define whether or not the Circle should have a border line surrounding it, and to set the thickness of the border line.
Background Color	Sets the background color of the Circle. By clicking in the Color field, a standard color dialog appears where you can pick a color.

CD Track List Properties



The CD Track list is auto-generated by variables, taking the information from the tracks included in the project.

The CD Track List Edit Properties dialog has the following options:

Property	Description
Border Options	Here you can define whether or not the Track list should have a border line surrounding it and set the thickness of the border line. In addition, the Track list corners can be rounded. The Size of the rounded corners can also be set, the higher the number the rounder the corners will be.
Background Color	Sets the background color of the Track list. By clicking in the Color field, a standard color dialog appears where you can pick a color.
Range	This allows you to define the First and last Track numbers to be included in the generated list.
Main Line	Here you can set the option of drawing a dotted line between the title and the track time, and to define the style of the text (see Font... below).
Extra Line	Here you can either write in extra information manually, or pick a variable (see Variables... below). You can set up a different text style for the extra line (see Font... below).
Text Margin	Allows you to set the margin between the Track list frame, and the text.

Property	Description
Font...	This opens a standard font dialog, where you can select font type, text format, text color, and text size etc. for the Main or Extra line.
Variables...	If you select this, you can pick a defined variable and enter this code in the Track list. If you for example have defined a variable for the name of a composer, you can select this variable in the dialog and then chose either “Import Code” or “Import actual text”. In both instances, the composer name will appear in the Track list. The difference is that if you later redefine the variable, the text imported as code will automatically change for every instance it is used in this project, whether importing as text will not reflect any changes made to the variable. If you click “Edit”, the “Edit Text Variables” dialog opens, allowing you to edit and define the user variables. This is described on page 70.

- **Note: If you have used the “Import Code” function for an object, you can choose whether the actual code or the resulting text will be shown in the Label Editor.**
  This is done by selecting the corresponding item on the Options menu.

Image Properties

This opens a standard file dialog, where you can navigate to the image you would like to import. The supported image formats are:

- BMP/JPEG/PCX/PNG/PSD/TGA/TIF and TIFF/WMF/EMF

Line Properties

Here you can define the thickness and the color of the line.

The Objects Menu

The Objects menu can be selected from the Menu/Toolbar, or opened by right-clicking an object (context menu). The items on the Objects menu are greyed out if no object is selected.

If an object is selected, the following Object menu items are available:

Item	Description
Edit properties...	See page 63.
Edit position and size...	See page 62.
Edit display condition…	This allows you to decide whether an object will be displayed or not, depending on whether a given variable is empty or not.
Bring to front	This brings any object that is partially obscured by another overlapping object to the front.
Send to back	This sends any object that partially or completely overlaps another object to the back.
Center horizontally	Centers a selected object horizontally in the layout.
Center vertically	Centers a selected object vertically in the layout.
Lock movement	This locks the position of the selected object.
Select all	Selects all objects.
Select all with the same size	Selects all objects with identical dimensions to the selected object.

If several objects are selected when opening the Objects menu, the following additional items are selectable:

Item	Description
Apply same properties as focused object	This item allows you to apply properties from the focused object to all of the selected objects of the same type.
Space evenly horizontally	This distributes the selected objects horizontally, using the top center handle as a guide. This means that the top center handle in each selected object will be exactly the same distance from each other horizontally.
Space evenly vertically	This distributes the selected objects vertically, using the side center handle as a guide. This means that the side center handle in each selected object will be exactly the same distance from each other vertically.
Place under each other	This will place all selected objects directly under each other.

Item	Description
Align with focused object (several items)	These menu items will align selected objects to the position of the focused object. You can select to align to any side (left/right/top/bottom), or to the horizontal or vertical center of the object with the focus.
Resize as focused object (several items)	These menu items will resize all selected objects to either the same size as the focused object or to the same width or height as the focused object.
Group/Ungroup	This will group all selected objects to each other, so that they will act as one object when selected or moved (keeping the relative positions to each other). Ungroup deselects the grouping.

About Label Sets

You can save as many Label sets as you like for a project. However, whenever you open the Label Editor, a new Label set opens which is untitled and only contains the auto-generated data.

Whenever you have edited layouts in the Label Editor, you will be asked to save it as a Label Set if you close the Label Editor or exit the program without first having saved your changes. If you don't save, any changes are gone forever.

- **It is important to note that any work performed in the Label Editor is not saved with the project – it has to be saved separately as a Label Set.**
- **Saved Label sets (with the extension *.lab) contain all the layout work performed in the Label Editor.**
  It is, however, undynamic. This means that if you have added to or changed the Project, these changes will not be reflected in the saved Label Set, unless you save it as a user template (see below).

Saving a Label Set

To save a Label Set, simply select "Save" or "Save As..." from the File menu with the Label Editor open and as the active window (on top).

Opening a Label Set

To open a saved Label Set, select "Open..." from the File menu.

Saving a Label set as a User Template

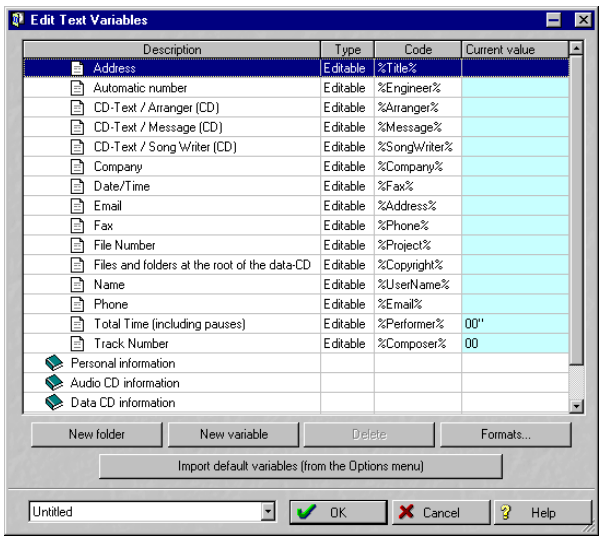
If you have saved a Label set, it can be displayed on the list of available templates in the "Select a Label Template" dialog. Label Templates are simply Label sets that reside in designated subfolders in the ***CLEAN*** program folder. The path to the Label template folders (starting from the main ***CLEAN*** program folder) is "Presets\Label\Templates\". Here you will find three folders: "Audio\AudioData\Data. Place (or save directly) a Label set in the appropriate folder. It will now appear as a new template next time you open the "Select a Label Template" dialog.

Defining User Variables

Apart from the auto-generated data such as CD information, date and time etc., you can define a number of user editable variables that are local to the project you are working on. Once you have defined a set of user variables, this is saved with the current project. To define user variables, proceed as follows:

1. **Open the project you wish to set user variables for.**

2. **Select “Default text variables...” from the Options menu.**
   This opens a dialog containing a list of folders similar to the structure in Windows Explorer.



- **Only the variables in open folders (marked as “Editable” in the Type column) can be edited.**

3. **To define a value for a default variable, for example Copyright or personal information, double-click in the Current Value column for the relevant description.**
   A text box opens where you can type in the relevant information.

4. **Click OK when done.**

Saving Variable Sets as Presets

Clicking the name field pop-up at the bottom of the window opens a menu which allows you to save sets of Label variables as Presets. You can then switch between different presets of already "filled in" variables. A Preset could typically represent the information belonging to a client you work with regularly, for example. Naturally, the auto-generated variables will still adapt to the current project as usual.

Creating new Variables

You can create a new variables, and define a value for them. The new variable will automatically be put in the currently selected folder (or in the folder with a currently selected variable). Proceed as follows:

1. **Either create a new folder by clicking the "New Folder" button, or select a folder that you would like to add a new variable to.**
   If you chose the former option, select the new folder.
2. **Click the "New Variable" button.**
   A new editable variable appears in the selected folder.
3. **Double-click in the Description column beside the new variable to open a text box where an appropriate description can be typed in.**
   For example "Producer".
4. **Double-click in the Current Value column to enter the relevant information for the new variable, i.e. the name of the producer.**
5. **To create a code that can be used to refer to the variable in the Label Editor, type in an appropriate name beginning and ending with "%" in the Code column.**
   To use the earlier example, this could then be written %Producer%.
6. **Click OK when done.**

Printing CD Labels

You print your CD labels directly from the Label Editor, either on standard paper or on specialized CD label papers (usually available in computer peripheral stores, etc.).

Calibrating the Printer

If you are printing on specialized CD label paper, it is very important that the printer is "calibrated", that is, the measurements in the program (for margins, positioning, etc.) must be exactly the same as the actual results you get when printing. This is not as important when you print on standard papers (since the printouts then don't have to fit exactly in specific positions on paper).

To calibrate the printer, select "Calibrate printer" from the Printing menu in the CD Label Editor. Then follow the steps in the dialog that appears.

❒ **You only need to do this once (unless you switch to another printer).**

Setting up Page Layouts

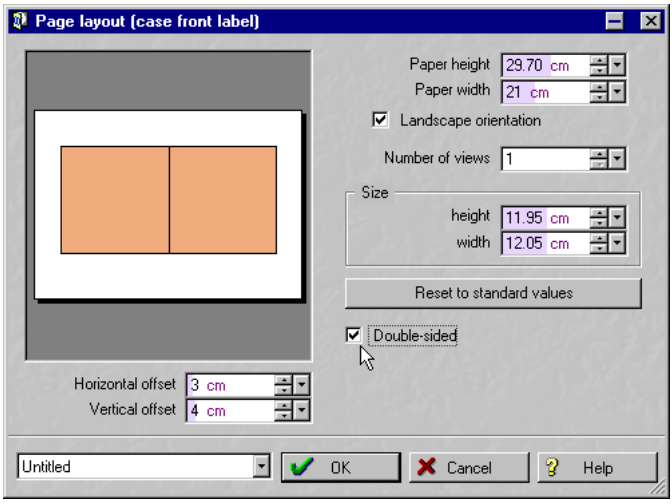
The Page Layout dialog contains various settings relating to how the page layout will be printed. It's important to note that you make Page Layout settings individually for each one of the three label types (case front, case back and disc label). These are also printed individually.

❒ **If you are using specialized CD label papers, these will typically come with a measurement sheet, showing the exact size and positioning of the labels. You will probably want to use this when setting up the page layouts for the first time.**

Case front label

Proceed as follows:

1. **Select the case front label by clicking on its tab.**
2. **Select "Page layout" from the Printing menu.**
   The Page layout dialog for the case front label appears.



3. Make the appropriate settings:

Setting	Description
Paper height/width	This is where you specify the size of the paper used in the printer.
Landscape orientation	Allows you to specify the orientation of the papers: “lying down” (Landscape) or “standing up”.
Number of views	Lets you print more than one instance of the label on the same paper. For example, if you are printing the case front label on standard paper, you can usually fit two views on the same paper (depending on the paper size), which may be useful if you are making several copies and want to save paper.
Size	This is the size of the label. Usually, you should keep the default values (set to fit a standard “jewel CD case”). If you have adjusted the values, you can bring back the standard size by clicking the “Reset to standard values” button.
Double-sided	When this is activated, the label will include both the front and the inside of the front cover label. Note: You will probably have to use Landscape printing to fit a double-sided layout on paper (depending on the paper size). After printing a double-sided front cover, you need to fold the paper at the correct position.

Setting	Description
Offsets	These settings determine the positioning of the label on the printed page. This is important when you are printing on specialized CD label paper. Note: If you are printing multiple views, you make independent Offset settings for each view. To make settings for a view, you first need to select it by clicking on its object in the preview display above the Offset values. A selected view is indicated by a coloured object in the display.

4. **If you like, you can save your settings by using the pop-up menu in the lower left corner.**
   This is especially useful if you have made settings for printing to specialized CD label paper. Once you have set everything up OK, you can save your settings for use next time you need to print labels. Saved settings are accessed by using the "Explore presets…" item on the same pop-up menu.

- **You can also store settings temporarily, which is handy when experimenting with different layout settings.**
  To restore a temporarily stored setting, use the Restore items on the pop-up.

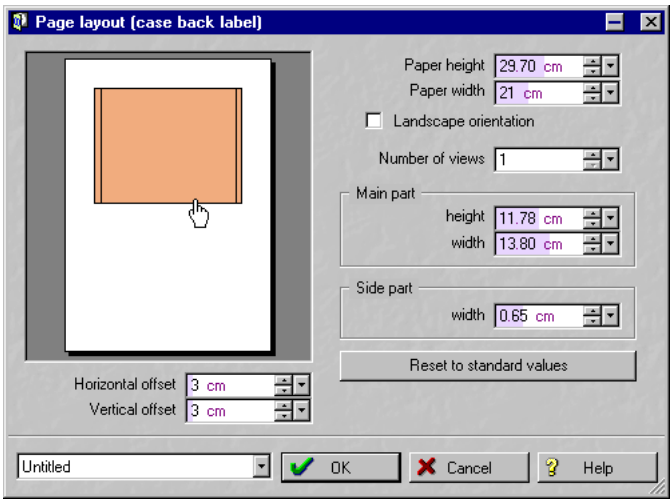
5. **When all settings are made, click OK to close the dialog.**

Case back label

Proceed as follows:

1. **Select the case back label by clicking on its tab.**

2. **Select “Page layout” from the Printing menu.**
   The Page layout dialog for the case back label appears.



3. **Make the appropriate settings:**

Setting	Description
Paper height and width	This is where you specify the size of the paper used in the printer.
Landscape orientation	Allows you to specify the orientation of the papers: “lying down” (Landscape) or “standing up”.
Number of views	Lets you print more than one instance of the label on the same paper.
Main part	This is the size of the main part of the back label. Usually, you should keep the default values (set to fit a standard “jewel CD case”). If you have adjusted the values, you can bring back the standard size by clicking the “Reset to standard values” button.
Side part	Allows you to specify the width of the side labels. Again, usually you should keep the default values.

Setting	Description
Offsets	These settings determine the positioning of the label on the printed page. This is extra important when you are printing on specialized CD label paper. Note: If you are printing multiple views, you make independent Offset settings for each view. To make settings for a view, you first need to select it by clicking on its object in the preview display above the Offset values. A selected view is indicated by a coloured object in the display.

4. **Use the pop-up menu in the lower left corner to save your settings, store/restore settings temporarily, etc.**
   See above.

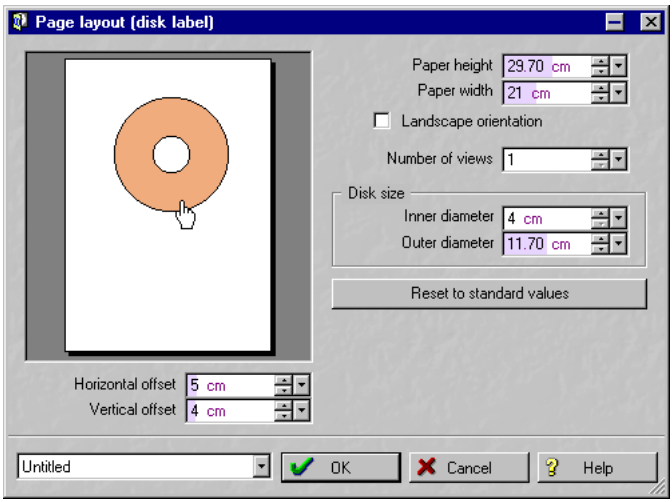
5. **When all settings are made, click OK to close the dialog.**

Disc label

Proceed as follows:

1. **Select the disc label by clicking on its tab.**

2. **Select “Page layout” from the Printing menu.**
   The Page layout dialog for the disc label appears.



3. **Make the appropriate settings:**

Setting	Description
Paper height and width	This is where you specify the size of the paper used in the printer.
Landscape orientation	Allows you to specify the orientation of the papers: “lying down” (Landscape) or “standing up”.
Number of views	Lets you print more than one instance of the label on the same paper.
Disc size	Allows you to specify the inner and outer diameter of the disc label. Clicking the “Reset to standard values” button sets the values to the most commonly used label size.

Setting	Description
Offsets	These settings determine the positioning of the label on the printed page. This is extra important when you are printing on specialized CD label paper. Note: If you are printing multiple views, you make independent Offset settings for each view. To make settings for a view, you first need to select it by clicking on its object in the preview display above the Offset values. A selected view is indicated by a coloured object in the display.

4. **Use the pop-up menu in the lower left corner to save your settings, store/restore settings temporarily, etc.**
   See above.

5. **When all settings are made, click OK to close the dialog.**

Printing

Again, printing is done independently for the three label types. However, there are two settings that are global for all three label types:

1. **Pull down the Options pop-up menu and select "Preferences".**
   The Label editor preferences dialog appears.

2. **Use the "Printing" checkboxes to determine whether the frames around the labels should be printed, and whether cut markers should be printed (making it easier to cut out the labels from the printed paper).**

Now, you are ready to print:

3. **Select one of the label types by clicking its tab.**

4. **Select "Print" from the Printing menu in the Label Editor window.**
   The Print Label dialog appears, allowing you to make printer settings, preview the result and specify a number of copies.

5. **Click Print.**

6. **Select the next label type by clicking on its tab, and proceed from step 3 above.**

Exporting audio in MP3 format

CLEAN can also export audio in MP3 format.

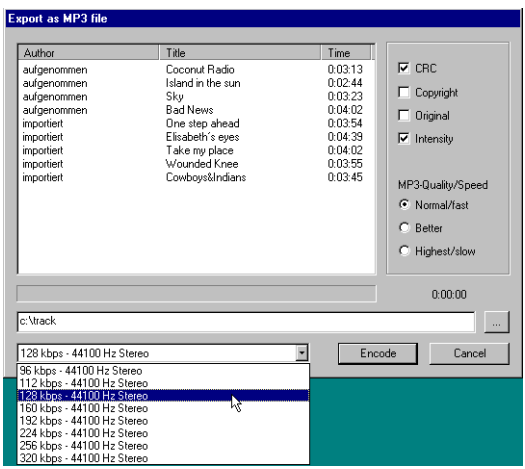
❒ **You can use *CLEAN* to decode an unlimited number of MP3 files. For license reasons, encoding audio data into MP3 format is limited to 20 encoding processes. An MP3 Update that allows unlimited encoding can be purchased from Steinberg.**

You can thus record or import music from other media/formats (CD, record, cassette, WAV or MP3 file), process it with ***CLEAN*** and save it as MP3 file.

CLEAN supports a whole range of MP3 quality options. The MP3 processing in ***CLEAN*** is based on the original technology of the Fraunhofer Institute.

Proceed as follows to save Tracks in MP3-Format:

1. **Open the Export-Dialog by selecting "Export audio track as MP3 file…" in the File menu or by pressing [Ctrl]-[M].**



2. **In the list, select the Track(s) that you wish to export and make the necessary settings (see below).**

3. **Click on "Encode".**
   The program will start to encode the data and create the desired MP3 files.

MP3 Options

CRC	This is an abbreviation for Cyclic Redundancy Checksum. If CRC is active, then the program adds checksums to the file. These do e.g. enable an MP3 Player to solve smaller data glitches that might have happened somewhere during data transfer. The checksum information helps to reconstruct the data.
Copyright	If this is active, a copyright bit per data frame is inserted into the data stream.
Original	If this is active, the program inserts a bit into the data stream that indicates that this Track is an original. This can be used to distinguish otherwise identical Tracks.
Intensity	By activating this function, encoding takes place in the form of an intensity stereophony file. A distinct feature of this form of stereophony is, that the spatial perception in the higher frequency range is determined by direction and magnitude. That is why only this information is encoded for each of these frequency bands.
MP3-Quality/ Speed	You can use these three options to apply one of three available quality levels for encoding in each of the available bit rates (see below). “Normal” is sufficient for many applications. The options “Better” and “Highest” should be used for processing classical or other music with rich harmonic content. True in this case, as in most: for the best you will have to wait the longest.
Bit Rate pop-up	In this menu at the bottom of the dialog you can set the desired bit rate. 96 kbps is mostly sufficient for voice recordings. If you wish to send music via the Internet, try 128 kbps. Values between 192 and 256 result in CD-like quality. The setting 320 kbps creates very high quality.

The Menus

This section contains a short description of all items on the ***CLEAN*** menus.

The File menu	
New Project…	Selecting this item creates an empty new Project. In the dialog that opens, select the directory in which you want to save the Project and give the new Project a name.
Open Project…	Selecting this opens a previously saved Project from hard disk. A project can also be opened using Drag & Drop; a previously open Project will then automatically be saved.
Save Project	This item lets you save the current Project under the name and path that you have specified when creating it.
Save Project as…	This lets you save the currently open Project under a new file name and path.
Remove WAV file	Select this menu item to remove the currently selected WAV file from the Project. This does not delete the file on the hard disk!
Delete WAV file	Select this function to remove the currently selected WAV file from the Project and delete it from your hard disk. A safety dialog will appear. If you confirm the action, the respective file will be deleted on the hard disk and can not be recovered!
Export Audio Track as WAV…	If you select this item, the currently selected Track in the Track list will be saved to disk as a WAV file. You can specify a new name and path for it.
Export Audio Track as MP3 file…	This lets you save Tracks as MP3 files. Select the desired Tracks, encoding quality and other MP3 parameters in the dialog that opens and set up the desired path under which the data is stored.
Export Track list as…	This lets you save the Track list entries as an ASCII file (text only) under a name and path of your choice.
Select temp file directory…	You can use this item to determine the directory in which ***CLEAN*** saves the processed files (those that are written onto the CD-R).
Recent Project	Here you can open the recently used projects.
Quit	Selecting this will terminate the program.

The Options Menu	
Undo (Start/End and Fade in/Fade out Markers)	This is a multiple Undo function. The last 100 changes that you have made to the Marker positions can be cancelled, one by one.
Mono playback	Here you can set which channel should be used for monophonic playback.
Soundcard settings…	Opens a dialog where you can select a sound card for recording and playback as well as the number and size of its buffers.
Preferences…	This is where you define which maximum level and how many seconds of it should be considered as silence. Here you can also set the distance available for speaker positioning to values between 1 and 10 meters and the unit type to meters or inches. You can select one of two Equalizer types and set the automatic Pause length between two Tracks (0 to 4 seconds).

The CD menu	
CD info…	Checks the size of the CD-R.
Write Audio CD-R…	Selecting this item opens a dialog where you can make a number of settings concerning your CD recorder and start the writing process. Find more detailed information in the section “Exporting audio in MP3 format” on page 79.
Write Data CD…	Selecting this item opens a dialog where you can assemble the list of files that you wish to record onto CD. Here you can also make settings for your CD recorder and start the writing process. Find more detailed information in the section “Creating a Data CD” on page 50.

The Normalize menu	
Normalize selected Track	This function finds the highest peak level in the Track that is currently selected in the Track list and optimizes it to a level of 0 dB. The rest of the Track is optimized in equal proportion.
Normalize all Tracks	This function finds the highest peak level within each Track in the Track list and optimizes that to a level of 0 dB. The rest of each Track is optimized in equal proportion.

❒ **Please read and respect all copyright information on the CDs or web sites from which you load Tracks!**

The Import menu

Import WAV/MP3 file…	You can either select this item to import one or several WAV or MP3 files into the current Project or use Drag & Drop to achieve the same. MP3 files are automatically converted into WAV format.
Import Tracks from CD…	Selecting this item lets you load ("grab") audio data directly from Audio CDs. The data is saved as WAV files. It is a digital copy that is written to your hard disk as an audio file. A/D or D/A conversion which could downgrade audio quality does not take place.

The Help menu

Steinberg on the Internet	If you have Internet access, a modem and a browser software, selecting this item will connect you directly with Steinberg's Web Site.
Steinberg Service on the Internet	If you have Internet access, a modem and a browser software, selecting this item will connect you directly with Steinberg's Service Web Site.
About *CLEAN*	Some information about ***CLEAN*** and the people who contributed to it.

Working with a less powerful system

One of ***CLEAN***'s advantages is that you can pre-listen to the effect of its restoration and effect functions in real time before you start to process the actual data and create a file. The time-consuming calculation process is therefore only necessary when you are satisfied with the settings you have made.

Pre-listening, however, puts a heavy burden on your processor. It can therefore happen that pre-listening to the effect of all effect modules in simultaneous action is not possible with your particular system. Especially the restoration algorithms do need a lot of calculating power. Depending on the processor type that is installed on your computer, it is therefore possible that you might only be able to simultaneously pre-listen to a combination of – say – the DeNoiser and the Stereo Spread effect: When switching on an additional effect, it might happen that the bar in the "CPU load" display moves into Overload and playback starts to stutter.

In order to be able to use all effect modules to process one or all Tracks on a less powerful computer, please proceed as follows:

Let's assume you want to denoise and decrackle recordings from old records first and then optimize them using the Loud Max effect, but your computer already went on strike when you switched on the DeNoiser.

1. **In this case, first only switch on the DeCrackler and search for the ideal settings for each Track that you wish to work on.**
2. **Click the "Process" switch.**
   CLEAN will now send all audio files that you have prepared this way through the DeCrackler and it writes the resulting new files into the CD-R file directory.
3. **Now deactivate the DeCrackler, activate the DeNoiser, make the desired settings for each Track in that and activate "Process" again.**
4. **Repeat the procedure for each effect module that you wish to use until you are satisfied with the result.**
   You can and should of course continue to try and simultaneously use several effects. Most effects do need considerably less processing power than DeClicker, DeCrackler and DeNoiser.

   Another possibility to get an impression of the effect of several modules, run on a less powerful system at the same time, is to use the "Stereo" switch. The real time effect calculation of a monophonic signal needs considerably less processing power than calculating a stereophonic signal.

- **Set the "Stereo" switch to Off, i.e. to Mono.**

❒ **When you write a CD-R with *CLEAN* the data is always recorded in stereo. The setting of the "Stereo" switch is irrelevant to the writing process.**

Using WaveLab Lite

As already mentioned in the section “The Record Dialog” on page 18, you have received WaveLab Lite together with ***CLEAN***. WaveLab Lite is a powerful and extremely fast Audio Editor.

In ***CLEAN***, the emphasis lies on restoration sound optimization, Surround sound, MP3 and Audio CD creation.

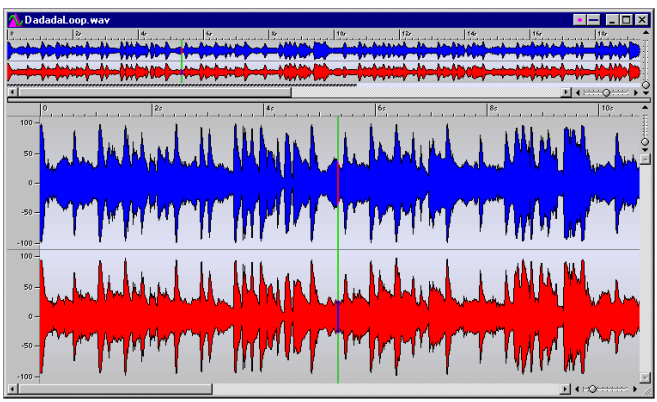
WaveLab Lite has its main focus on recording, cutting, optimizing levels, audio clip compilation, crossfades and Mastering including effect editing. This is work that – in the best of cases – you carry out before you start to restore your recordings with ***CLEAN***.

This manual section tries to point your attention to the great possibilities that WaveLab Lite offers for the preparation of audio for further processing with ***CLEAN***. This section only scratches the surface. We recommend, you dig deeper by reading the WaveLab Lite manual. It contains a full description.

The WaveLab Lite Work Environments

The three most important work environments within WaveLab Lite are the Wave window, the Audio Montage and the Master Section.

Wave window



Whether you load audio from hard disk, record something in WaveLab Lite or simply drag an audio file into the WaveLab Lite window, the corresponding audio file will always be displayed in a Wave window.

The window has two window panes. The upper pane is mainly used for overview. In the lower pane you can select parts of the waveform, apply tools, edit the audio data, etc.

The Master Section

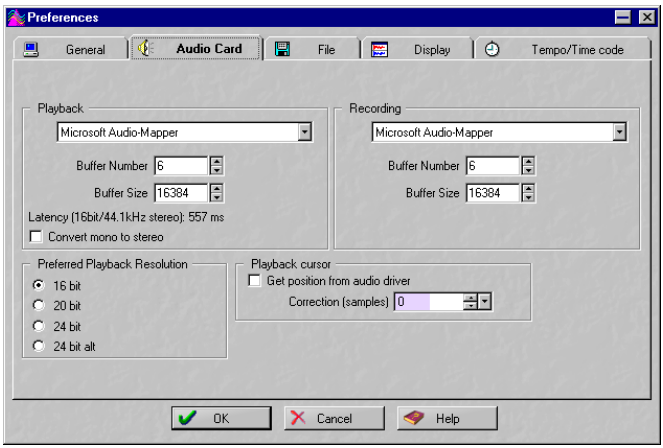
The Master Section is the “heart” and is mainly used to prepare recordings for final mastering (CD, etc). But this section is not limited to this area only. It allows you to creatively process recordings, whether they are complete mixes or individual tracks in a multi channel recording.

The pop-up menus on its left side can be used to load and apply effects. In the Audio Montage window you can then let WaveLab Lite calculate Clips plus effects and create one or several new audio files.

Recording audio in WaveLab Lite

Before you use WaveLab Lite to record for the first time, make sure that you have selected the right audio hardware. If you own several audio cards or maybe even a Multi I/O card, then select the desired audio input.

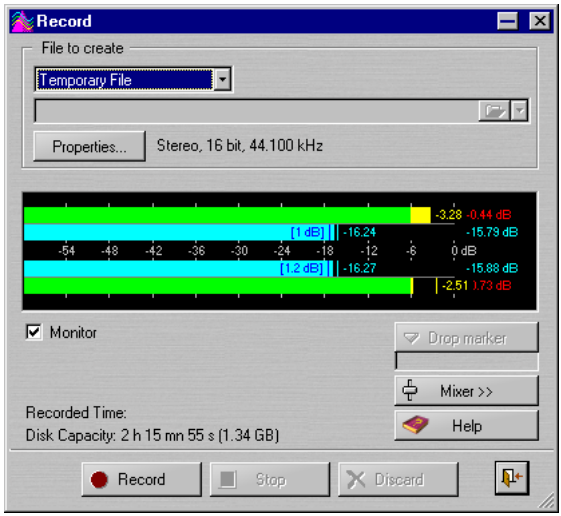
1. **To do this, open the Options menu and select the item “Preferences”. Then click the “Audio Card” tab.**



2. **Please check the items selected in the “Recording” and “Playback” pop-up menus and correct them, if necessary.**
   If the selected input and output devices are okay, close the dialog by clicking on “OK”.

3. **To prepare WaveLab Lite for recording, click the Record button in WaveLab Lite’s Transport window.**
   As an alternative, you can simply push the [x] key in the numeric block on your computer keyboard. This key is called [*] on some keyboards.

You will now see the Record dialog:



4. **Please make sure that the little box below the level indicator display is checked as in the picture above. Only then WaveLab Lite will switch into its Monitor mode where you can make level settings for your sound card prior to recording.**

5. **Also make sure that the Attributes field shows the following setting: Stereo, 16 Bit, 44.100 (Hz), as *CLEAN* only supports this file format. If the field shows a different setting, click the "Attributes" button and make the appropriate settings.**

6. **When you set the level, make sure that the signal – except for the occasional peak – does not remain in the red part of the level indicator. If you don't, digital distortion might occur. On the other hand, the signal should not generally fall below the yellow part, as this could lead to a loss in sound quality, depending on the quality of your audio hardware (the side noise of the card could become louder than the useful signal).**
   The Peak Level indicator informs you about the highest peak signal that has occurred since you have opened the dialog or since you last clicked its reset button.

❒ **Please make sure that Peak levels never exceed 0 dB!**

7. **Depending on the sound card you use and its drivers, you might be able to directly access its Mixer from the Record dialog. To do so, click on the "Mixer" switch.**
   If this doesn't work, WaveLab Lite will show an alert and you will have to separately launch the sound card mixer application.

8. **When you have set the recording level, click the Record button in the Record dialog.**
   The "Recorded Time" and "Disk Capacity" indicators at the bottom of the Record dialog will reflect the fact that WaveLab Lite has started recording.

9. **Click the Stop button in the Record dialog to stop recording.**
   In the background, WaveLab Lite installs a new window with a waveform representation of the recording.

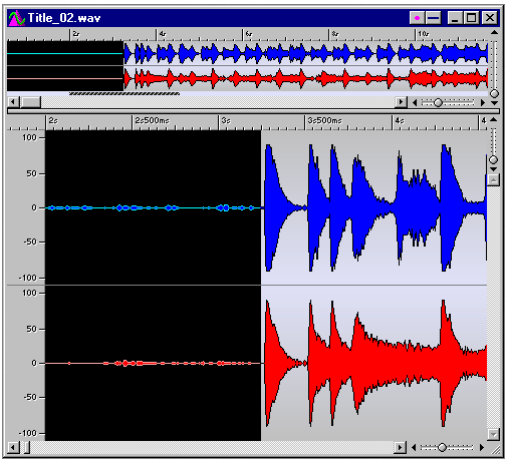
10. **You can now leave the Record dialog by clicking on the "Close" button (the small open door).**
    The newly recorded audio file is named "Untitled 1". Before you start to work on the file, you should first name it and save it to disk by selecting "Save As…" in the File menu.

11. **To listen to the file, simply click the Play button (the button with the small green triangle) on the Transport bar.**

Cutting audio files

A recording usually contains a few seconds of silence before and after the actual audio. These silent seconds unnecessarily waste precious space on your hard disk, the more, as it is extremely simple to create a pause between the Tracks in ***CLEAN*** without having to invest one single extra byte on your hard disk. In WaveLab Lite you can easily remove the silent parts of your recording:

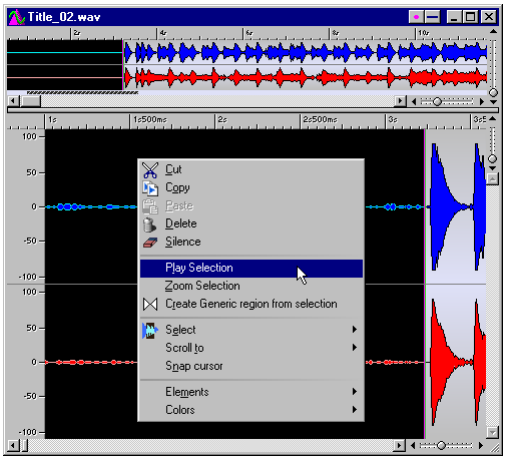
- **Simply use the mouse to select the "empty" part of the recording so that it looks like this:**



- **You can change the beginning and end of the selection at any time: Position the mouse cursor at the start or end of the selected block, hold down the left mouse button and drag the mouse to change the size of the selection.**

❒ **Please make sure not to cut off a part of the useful signal, e.g. a soft Intro or a fading out reverb, by separately monitoring the selection.**

- **To monitor the selection, click into the Wave window with the right mouse button and select "Play selection" in the pop-up menu that becomes visible.**



- **To remove the selected block, press the [Backspace] key on your computer keyboard.**

  All actions in WaveLab Lite can be reversed by selecting “Undo” in the Edit menu. You can also “undo the undo” by selecting “Redo” in the Edit menu.

Normalizing files in WaveLab Lite

To achieve the best possible quality in a digital audio recording environment it is important to make full use of the available dynamic range. One way to do that is to make sure that the maximum peak level of a recording reaches – but not exceeds – 0 dB. It can be very difficult to achieve this manually, as peaks exceeding 0 dB cause digital distortion. Therefore it is common to set the recording level in a way that the peak signals stop short a few dB below 0 dB. After recording, the program calculates the difference between the maximum peak level and 0 dB and the complete file is increased in level by the resulting amount. This procedure is called “Normalizing”.

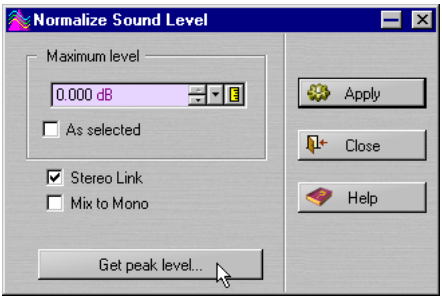
If the maximum peak level in the file was e.g. -4 dB, then the complete file will be increased in level by +4 dB.

As this is a purely mathematical procedure, no unwanted side-effects (like background noise) occur. Background noise that was already present in the recording before normalizing remains in the recording and is of course also amplified.

In spite of the possibility to normalize later, it is therefore a good idea to make sure that the signal has a sufficient level when recording.

1. **To normalize a file in WaveLab Lite, select the complete waveform by pressing [Ctrl]+[A] on your computer keyboard or selecting "Select All" in the Edit menu.**

2. **Select "Normalize…" in the Level menu.**
   This dialog will appear:



3. **Make sure that "Maximum level is set to 0 dB (which is the default setting), then click "Apply".**
   WaveLab Lite will start calculations and a few moments later display the normalized file in the Wave window. You can now save the file.

❒ **Normalizing to 0 dB does not always make musical sense. A ballad, for instance, might not need the same punch as a Rock Track. When you process classical music, it is especially important to respect the dynamic changes that the composer intended.**

Converting the Sample rate

Sometimes you may wish to process a file with ***CLEAN*** that was originally recorded with a sample rate of 48 kHz instead of 44.1 kHz. In this case it is necessary to convert the sample rate to 44.1 kHz.

1. **Load the file in WaveLab Lite and select it (key command [Ctrl]+[A]).**
2. **Now select "Convert sample rate…" from the Process menu.**
3. **In the dialog that appears, click on 44.1 kHz and start the conversion by clicking on "OK".**

❒ **Remember to save the file after processing!**

Find out more about the many useful functions in WaveLab Lite by reading its documentation – available in the Adobe Acrobat Reader format (PDF) on the ***CLEAN*** program CD!