

# Sound Forge<sup>®</sup> 9

Professional Digital Audio Production Suite

Revised April 3, 2007

After Sound Forge software is installed and you start it for the first time, the registration wizard is displayed. This wizard offers easy steps that allow you to register the software online with Sony Media Software. Alternatively, you may register online at <http://www.sony.com/mediasoftware> at any time.

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# Chapter 1 Introduction

## Introducing Sound Forge software

Thank you for purchasing Sound Forge® software and for your continued support of the Sony Media Software family of products. The software provides you with the powerful features you have come to expect, as well as a number of new features designed to make digital audio editing quick and easy.

## Sample files

Throughout the manual, you will find references to six sample audio files. The manual directs you to use these files as you experiment with different Sound Forge features. These files are installed in the same folder as the application:

- Drumhit.pca
- Fill.pca
- Loop.pca
- Musicbed.pca
- Saxriff.pca
- Voiceover.pca

The files are in Perfect Clarity Audio® (PCA) format, a Sony Media Software proprietary lossless audio compression format.

## System requirements

The following lists the minimum system requirements for using Sound Forge:

- 500 MHz processor
- 128 MB RAM, 256 MB recommended
- 150 MB hard-disk space for program installation
- Microsoft® Windows® 2000 SP4, Windows XP, or Windows Vista™
- Microsoft Windows®-compatible sound card
- CD-ROM drive (for installation from a CD only)
- Supported CD-Recordable drive (for CD burning only)
- DirectX® Media 9.0c or later (version 9.0c included on application disc)
- Microsoft .NET Framework 1.1 (included on application disc)
- Microsoft® Internet Explorer 5.1 or later to view online help (included on application disc)

## Installing Sound Forge software

The install utility, setup.exe, located on the Sound Forge application disc, creates the necessary folders and copies all files required to operate Sound Forge software.

**Note:** The Sound Forge application requires Microsoft DirectX 9.0c or later and Internet Explorer 5.1 or later. The setup program alerts you if either is not detected on your system and prompts their installation from the Sound Forge application disc.

1. Place the Sound Forge application disc in the drive. The setup screen is displayed (if AutoPlay is enabled for your CD-ROM or DVD-ROM drive).

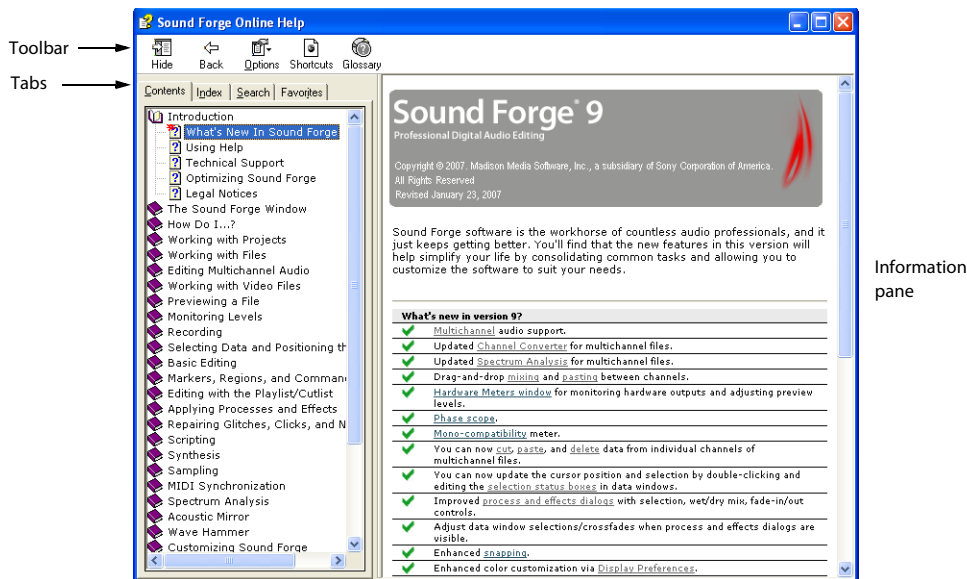
**Note:** If you have disabled the drive's AutoPlay feature, click the **Start** button and choose **Run**. Type D:\setup.exe, where D is the drive letter of your CD or DVD drive, and follow the on-screen prompts to complete the installation.

2. Click **Install**, and follow the on-screen prompts to install the appropriate version of Sound Forge for your computer.



## Getting help

To access online help, choose **Contents and Index** from the **Help** menu or press F1.

**Note:** To view online help, Internet Explorer 5.1 or later must be installed on your system. If you purchased the Sound Forge boxed version, Internet Explorer version 5.1 is included on your application disc.



The following table describes the four tabs of the Online Help window.

Tab	Description
Contents	Provides a list of available help topics. Click a closed book (  ) to open the pages, and then click on a topic page (  ).
Index	Provides a complete listing of the help topics available. Scroll through the list of available topics or type a word in the Type in the keyword to find box to quickly locate topics related to that word. Select the topic and click the <b>Display</b> button.
Search	Allows you to enter a keyword and display all of the topics in the online help that contain the keyword you have entered. Type a keyword in the Type in the word(s) to search for box and click the <b>List Topics</b> button. Select the topic from the list and click the <b>Display</b> button.
Favorites	Allows you to keep topics that you revisit often in a separate folder. To add a topic to your favorites, click the <b>Add</b> button on the <b>Favorites</b> tab.

## Help on the Web

Additional Sound Forge information is available on the Sony Media Software Web site. From the **Help** menu, choose **Sony on the Web**, and choose the desired location from the submenu. The software starts your system's Web browser and attempts to connect to the appropriate page on the Sony Web site.



## Chapter 2 Learning the Sound Forge Workspace

This chapter provides a detailed overview of Sound Forge® toolbars and controls.

### Using the mouse

The following table defines the mouse-related terms used throughout this manual.

Mouse Term	Description
Pointing	Moving the mouse pointer over an item.
Clicking	Pointing to an item and quickly pressing and releasing the left mouse button. If there is no left or right specification, left-clicking is implied.
Right-clicking	Pointing to an item and quickly pressing and releasing the right mouse button. Right-clicking is frequently used to display shortcut menus.
Double-clicking	Identical to clicking, but instead of pressing and releasing the mouse button once, it is done twice in quick succession. Double-clicking always indicates the left mouse button.
Triple-clicking	Identical to clicking, but instead of pressing and releasing the mouse button once, it is done three times in quick succession. Triple-clicking always indicates the left mouse button.
Toggle-clicking	Clicking the right mouse button while holding down the left mouse button. This is used to toggle options and is a shortcut for drag-and-drop editing and using the Magnify tool.
Shift-clicking	Holding down the Shift key while clicking the mouse. Shift-clicking is typically used to skip dialogs and quickly repeat operations.
Ctrl-clicking	Holding down the Ctrl key while clicking the mouse. Ctrl-clicking is used to modify the operation of a normal click.
Dragging	Holding down the left mouse button while moving the mouse pointer and releasing the mouse at the desired location. Dragging is used to quickly move sections of data between windows, as well as to adjust sliders, scrollbars, and faders.
Slow-dragging	Holding down the right and left mouse buttons while adjusting sliders and faders increases the resolution of the movement. This is useful when making fractional adjustments to parameters.

**Tip:** Once you are familiar with Sound Forge basics, you may want to use mouse and keyboard shortcuts. For more information, see [Shortcuts](#) on page 253.

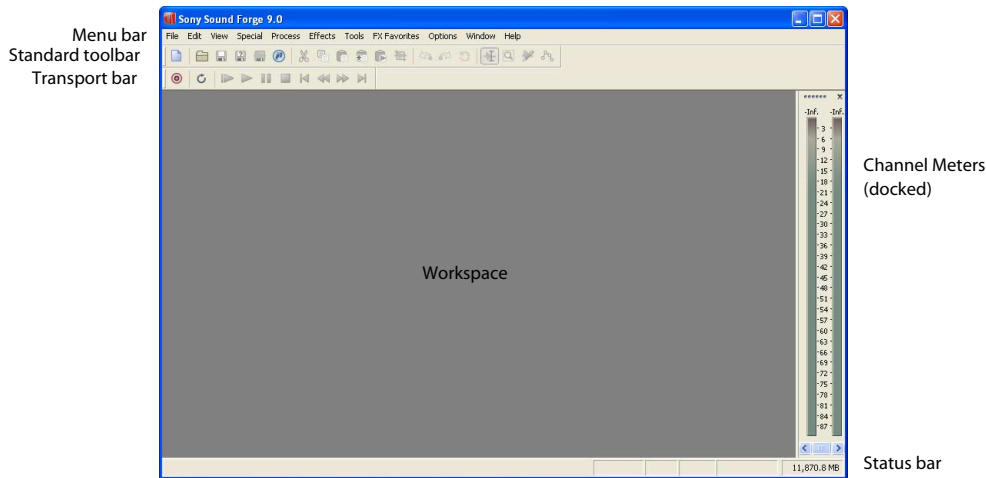
### Using the mouse wheel

The following table describes the available mouse wheel functionality you can use to navigate audio files.

Mouse Functionality	Description
Wheel Up	Zoom in horizontally
Wheel Down	Zoom out horizontally
Ctrl+Wheel Up	Zoom in vertically
Ctrl+Wheel Down	Zoom out vertically
Shift+Wheel Up	Scroll left (in 10ths of screen width)
Shift+Wheel Down	Scroll right (in 10ths of screen width)
Ctrl+Shift+ Wheel Up	Cursor left or current selection point left (if there is a selection)
Ctrl+Shift+ Wheel Down	Cursor right or current selection point right (if there is a selection)

## The main window

When you start the application, the main window is displayed. The main window's workspace is where you perform all audio editing.



## Main window components

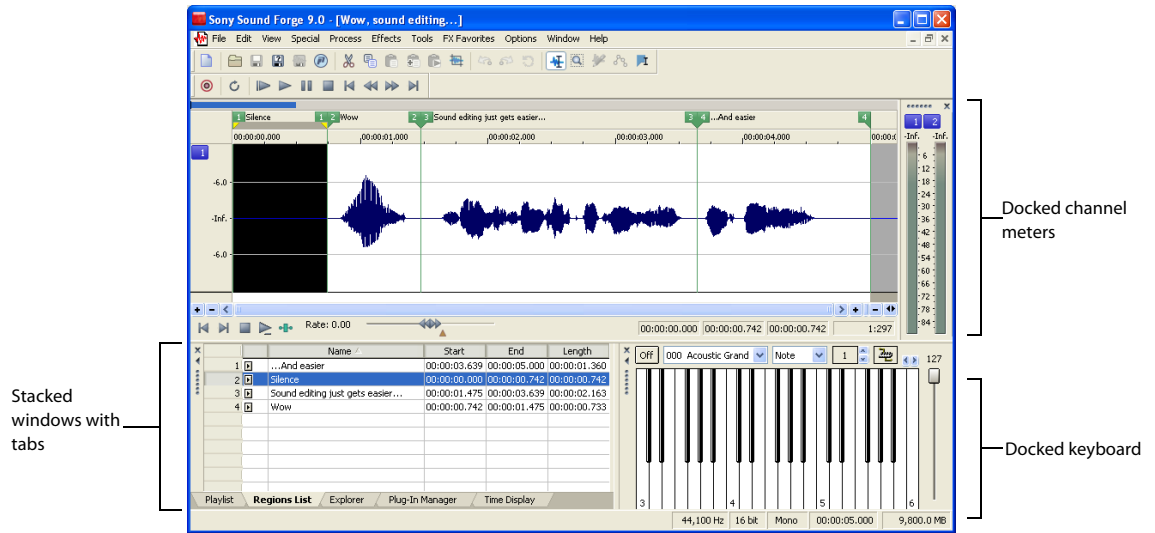
The following table describes the major components of the main window.

Component	Description
Menu bar	Displays the menu headings for the available functions.
Standard toolbar	Provides quick access to some of the most common tasks in the application (pg. 27).
Transport bar	Provides quick access to basic audio transport functions (pg. 27).
Status bar	Help and processing information appears on the left side. The boxes on the right side display the playback sample rate, bit depth, channel configuration, length of the active data window, and total free storage space (pg. 83). With the exception of the free storage space box, you can edit these boxes by double-clicking or right-clicking them. When no data windows are open, only the free storage space box contains a value.
Workspace	This is the area located behind the data windows. Audio selections dragged to the workspace automatically become new data windows. Windows such as the Regions List and Playlist can be docked along the edges of the workspace.
Channel Meters	Displays the level of the output audio signal. These meters can be toggled on/off by choosing Channel Meters from the View menu. Right-clicking the channel meters displays a shortcut menu that allows you to precisely configure the appearance of the meters.



## Floating and docking windows

With the many features in Sound Forge software, it is easy for the workspace to become cluttered. Docking windows allows you to keep more windows open while maintaining a greater degree of organization. You can choose to float or dock the windows listed in the **View** menu, including the Regions List, Playlist, and Time Display windows.



### Docking a window

1. Drag a window to the edge of the workspace. The outline of the window changes shape as you approach the edge.
2. Release the mouse. The window docks against the edge of the workspace.

### Preventing a window from docking

Press **Ctrl** while dragging a window to prevent it from docking in the workspace.

**Tip:** You can choose to reverse this behavior so that windows will not dock unless you press **Ctrl**. From the **Options** menu, choose **Preferences**, and clear the **Allow floating windows to dock** check box on the **General** tab.

### Floating a window

Drag the handle of a docked window away from the edge of the workspace so that it is a floating window.



## Hiding the window docking area

You can double-click the separator between the workspace and window docking area to hide the docking area. You can also use the following shortcut keys to manage the workspace:

Shortcut key	Description
F11	Show/hide window docking area at bottom of workspace.
Shift+F11	Show/hide windows docked on left/right sides of workspace.
Ctrl+F11	Show/hide all docked windows.

## Window Docking Area (F11)

### Explorer window (Alt+1)

The Explorer window is used to find, preview, and open media files. From the **View** menu, choose **Explorer** to show or hide the Explorer window.

### Regions List window (Alt+2)

The Regions List window contains all regions and markers that exist in the active data window. From the **View** menu, choose **Regions List** to show or hide the Regions List window.

### Playlist window (Alt+3)

The Playlist window is used to arrange regions for playback. From the **View** menu, choose **Playlist** to show or hide the Playlist window.

### Video Preview window (Alt+4)

The Video Preview window shows the video frame at the current cursor or play position. From the **View** menu, choose **Video Preview** to show or hide the Video Preview window.

### Time Display window (Alt+5)

The Time Display window displays the current cursor or play position. From the **View** menu, choose **Time Display** to show or hide the Time Display window.

### Channel Meters window (Alt+6)

Sound Forge software provides peak and VU/PPM (peak program) meters that you can use to monitor your audio levels.

From the **View** menu, choose **Channel Meters** to show or hide the channel meters.

### Undo/Redo History window (Alt+7)

The Undo/Redo History window allows you to see all of your edit operations. From the **View** menu, choose **Undo/Redo History** to show or hide the Undo/Redo History window.

### Spectrum Analysis window (Alt+8)

The Spectrum Analysis window allows you to examine the fundamental frequency and overtones present in a recording. From the **View** menu, choose **Spectrum Analysis** to show or hide the Spectrum Analysis window.

### Plug-In Chainer window (Alt+9)

The Plug-In Chainer window allows you to link up to 32 DirectX and VST plug-ins into a single processing chain. From the **View** menu, choose **Plug-In Chainer** to show or hide the Plug-In Chainer window.

### Plug-In Manager window (Ctrl+Alt+0)

The Plug-In Manager window displays your plug-ins in a tree view like Windows Explorer. From the **View** menu, choose **Plug-In Manager** to show or hide the Plug-In Manager.

### Keyboard window (Ctrl+Alt+1)

The Keyboard window allows you to control internal or external synthesizers and samplers from Sound Forge software. From the **View** menu, choose **Keyboard** to show or hide the Keyboard window.

### Script Editor window (Ctrl+Alt+2)

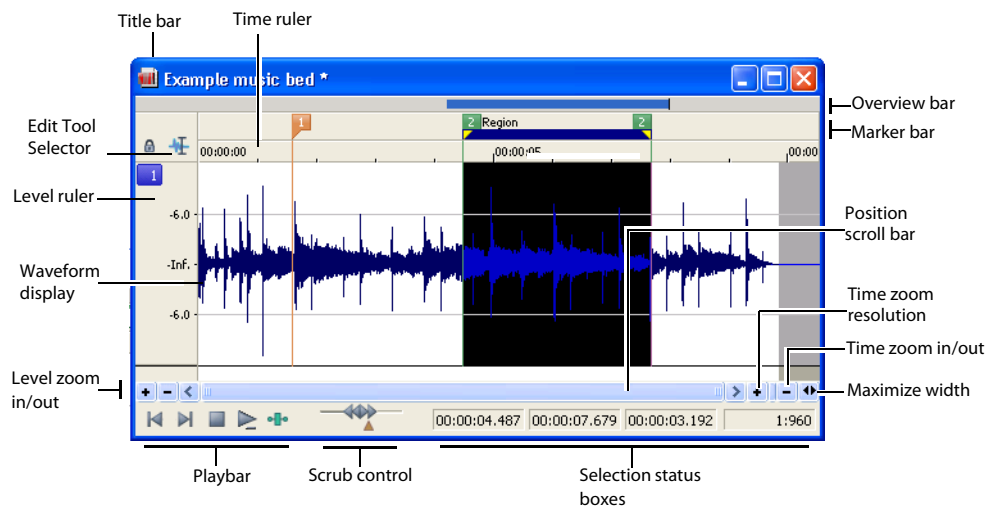
The Script Editor window can be used to open, create, edit or run scripts. From the **View** menu, choose **Script Editor** to show or hide the Script Editor window.

### Hardware Meters window (Ctrl+Alt+3)

The Hardware Meters window allows you to monitor hardware outputs and adjust preview levels. From the **View** menu, choose **Hardware Meters** to show or hide the Hardware Meters window. *For more information, see [Using the hardware meters on page 92](#).*

## The data window

Data windows contain audio data (as a waveform) as well as a number of controls and commands used to edit and process audio.



## Data window components

Component	Description
Title bar	Displays the file name. If title information is included in the summary of a file, it appears here instead of the file name. Double-click to maximize and restore the window.
Level ruler	Displays the amplitude of the waveform. Right-click to display the level ruler shortcut menu. Drag to shift the view up/down when zoomed in vertically.
Time ruler	Displays the current location in the data window. Right-click to display the time ruler shortcut menu. Drag to scroll the data window.
Marker bar	Displays the position of region end points, loop end points, and markers. You can place, name, and position markers and regions anywhere in the data window. These informational tags can serve as cues or reminders highlighting important events in your project. Right-click a marker or region tag to display a shortcut menu. Drag to edit a tag's position. Double-click anywhere within a region to select it.
Edit Tool Selector	Toggles through the Edit, Magnify, and Pencil tools. Right-click to display a shortcut menu that allows you to display or hide data window elements.
Playbar	Contains audio transport buttons, including Go to Start, Go to End, Stop, Play Normal, Open/Play Plug-In Chainer, Play as Cutlist, and Play as Sample. For more information on the playbar, please see page 25.
Selection status boxes	Displays the beginning, end, and length of a selection. If no selection exists, only the cursor position displays. Double-click the leftmost box to edit the current cursor position or selection start position. Double-click either of the other two boxes to edit the selection end position or the selection length. Right-click to display the status format shortcut menu.
Waveform display	Displays a graphical representation of an audio file. The horizontal axis represents time, and the vertical axis represents amplitude. Right-click within this display to open the waveform display shortcut menu.
Scrub control	Scrolls playback of your project at varying speeds.
Position scroll bar	Scrolls forward/backward through an audio file to display sections of the file not visible in the current area of the waveform display.
Overview bar	Allows for quick navigation and playback of any part of an audio file. The overview bar also indicates the portion of the waveform currently depicted in the waveform display, as well as the selected region. Click to move the cursor. Double-click to center the cursor in the waveform display. Right-click to start or pause playback. Drag to activate the audio event locator.
Time zoom resolution	Specifies the number of samples of data represented by each horizontal point on the screen. This determines the length of time displayed in the data window. Smaller resolution values display less time.
Time zoom in/out	Changes the zoom resolution for the time (horizontal) axis.
Level zoom in/out	Changes the zoom resolution for the level (vertical) axis.
Maximize width	Resizes the data window to maximize its size within the workspace.

## Displaying data window components

You can customize the appearance of individual data windows.

1. From the **File** menu, choose **Properties** or press Alt+Enter. The current file's Properties dialog is displayed.
2. Click the **Display** tab.
3. Display/hide specific components by selecting/clearing the corresponding check boxes.
4. Select the **Save as the default for all new windows** check box if you want to set the new configuration as the default data window display.
5. Click **OK**.

**Tip:** Right-click the Edit Tool Selector (upper-left corner of data window) to display or hide components for the selected data window.

## Arranging data windows









You can use the commands on the Window menu to arrange data windows in the Sound Forge workspace..

**Tip:** Press Ctrl+Tab to switch forward through the open windows, or press Ctrl+Shift+Tab to switch backward through the open windows.



Command	Description
New Window	Creates a new data window
Cascade	Arranges all open data windows so they overlap with the title bar of each window remaining visible.
Tile Horizontally	Arranges all open data windows top to bottom with no overlapping. <b>Note:</b> This command affects only non-minimized windows.
Tile Vertically	Arranges all open data windows left to right with no overlapping. <b>Note:</b> This command affects only non-minimized windows.
Arrange Icons	Arranges minimized data windows at the bottom of the workspace.
Minimize All	Minimizes all open data windows.
Restore All	Restores all minimized windows to their previous window size and position.
Close All	Closes all open data windows.
Window List	Switches focus to another data window.

## Playbar

The playbar is located in the bottom-left corner of a data window. You can use the playbar to navigate and play audio files in a variety of ways.

	Go to Start: moves the cursor to the start of the file.		Play Plug-In Chainer: previews the audio processed through plug-ins when the Plug-In Chainer window is open. If there is a selection, plays from the beginning of the selection to the end of the selection. If the Plug-In Chainer window is not open, the Open Plug-In Chainer button (  ) appears instead.
	Go to End: moves the cursor to the end of the file.		Play as Cutlist: plays the file with the regions in the cutlist omitted. This button appears only if you treat the playlist as a cutlist.
	Stop: stops playback and returns the cursor to its position prior to playback.		Play as Sample: plays the file with the sustaining and release loops repeating the specified number of times. This button appears only if you have defined a sample loop.
	Play Normal: plays from the cursor to the end of the file. If there is a selection, plays from the beginning of the selection to the end of the selection.		



## Current playback mode

When you play a file from the playbar, a small horizontal line appears beneath the selected **Play** button's icon . This indicates the current playback mode, which is the mode used when you click the transport bar **Play**  button. *For more information, see [Transport toolbar](#) on page 27.*

## Changing the current playback mode

To change the current playback mode, click a playbar button or press X.

## Optional Backward and Forward buttons

You can choose to display **Rewind**  and **Forward**  shuttle controls on the playbar. From the **Options** menu, choose **Preferences**, and select the **Show shuttle controls on Data Window transport** check box on the **General** tab.

## Toolbars

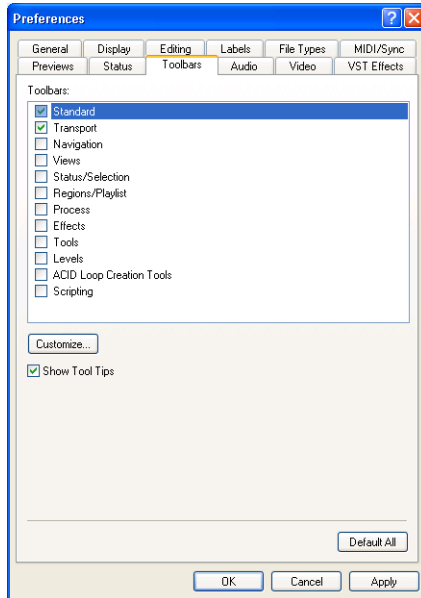
Sound Forge toolbars contain buttons used to quickly execute many of the program's commands and functions. Toolbars can be dragged throughout the workspace, docked, resized, hidden, and customized.

You can use the Toolbars tab in the Preferences dialog to specify which toolbars you want to display. Perform either of the following actions to display this tab:

- Choose **Preferences** from the **Options** menu and click the **Toolbars** tab.
- From the **View** menu, choose **Toolbars**.

### Displaying a toolbar

1. From the **View** menu, choose **Toolbars**. The Preferences dialog appears with a list of available toolbars.
2. To display a toolbar, select the corresponding check box and click **OK**.



Select a check box to display a toolbar.

Click **Customize** to add, remove or rearrange buttons on a toolbar.

### Customizing a toolbar

1. From the **View** menu, choose **Toolbars**. The Preferences dialog appears with a list of available toolbars.
2. Select the check box and the toolbar name for the toolbar that you want to customize.
3. Click **Customize**. The Customize Toolbar dialog is displayed.
4. Use the controls in the Customize Toolbar dialog to add, remove, or rearrange the buttons on the selected toolbar. Click **Reset** to restore the toolbar to its default setting.
5. Click the **OK** button.

### Docking a toolbar




















When you drag a floating toolbar to any edge of the main screen, the toolbar docks on that edge.

### Floating a toolbar

When you drag a docked toolbar away from an edge, the toolbar becomes a floating toolbar.











## Standard toolbar

The Standard toolbar displays by default when you start the application. The buttons on this toolbar provide quick access to many common commands.

	New: creates a new data window.		Play Clipboard: plays the audio on the clipboard.
	Open: displays the Open dialog.		Trim/Crop: removes all data from the file that is not currently selected. This command has no effect if there is no selected data. This command does not copy data to the clipboard.
	Save: saves the current audio data.		Undo: reverses the last edit operation.
	Save As: saves the current file with a new name or format.		Redo: reverts the previously undone edit operation.
	Render As: renders the current project file to a media file.		Repeat: repeats the last operation. This command can be used with most processing functions. The previous operation's parameters are repeated. To specify new parameters, hold Shift and click this button.
	Publish: opens the Publish Setup wizard so you can upload your media file to the Web.		Edit Tool: selects the Editing tool.
	Cut: removes selected audio data and places it on the clipboard. This command has no effect if there is no selection.		Magnify Tool: selects the Magnify tool.
	Copy: copies selected audio data to the clipboard. This command has no effect if there is no selection.		Pencil Tool: selects the Pencil tool.
	Paste: inserts a copy of the clipboard data at the current insertion point. If there is a selection, this command replaces the selected data with the clipboard data.		Envelope Tool: selects the Envelope tool.
	Mix: mixes a copy of the clipboard data with the current audio file. The mix start point is either the cursor point or the start or end of the selection in the destination data window.		

















## Transport toolbar

The transport toolbar also displays by default and contains basic audio transport buttons.

	Record: records data to a new or existing data window.		Stop: stops playback and returns the cursor to its prior position.
	Loop Playback: toggles Loop Playback mode on and off.		Go to Start: moves the cursor to the start of the file.
	Play All: plays the entire file from beginning to end, regardless of cursor position, selection, or playlist.		Rewind: moves the cursor backward in the current file.
	Play: plays the file in current playback mode (Play Normal, Play Plug-In Chainer, Play as Cutlist, or Play as Sample).		Forward: moves the cursor forward in the current file.
	Pause: pauses playback and maintains the cursor at its current position.		Go to End: moves the cursor to the end of the file.


## Navigation toolbar

The Navigation toolbar contains buttons used to navigate within the current data window.

	Zoom In Full: magnifies the selected area to a 24:1 ratio.		Go To: displays the Go To dialog and allows you to quickly move the cursor to a specific point in a file.
	Zoom Normal: resets the audio data to its original magnification.		Cursor Center: centers the display with the cursor displayed in the center of the data window.
	Zoom Selection: maximizes the selection vertically and horizontally.		Cursor to Selection Start: moves the cursor to the beginning of the selection.
	Custom Zoom 1: sets the audio data to a custom time magnification level.		Cursor to Selection End: moves the cursor to the end of the selection.
	Custom Zoom 2: sets the audio data to a custom time magnification level.		Center Sustaining Start: moves the cursor to the beginning of the sustaining loop.
	Insert Marker: drops a marker at the current cursor position.		Center Sustaining End: moves the cursor to the end of the sustaining loop.
	Mark In: marks the "in" point of a new selection.		Center Release Start: moves the cursor to the beginning of the release loop.
	Mark Out: marks the "out" point of a new selection.		Center Release End: moves the cursor to the end of the release loop.

## Views toolbar














The Views toolbar contains buttons used to store and retrieve data window views.

	Toggles views 1-8 between setting and restoring.		Stores and recalls specific selection views.
-----------------------------------------------------------------------------------	--------------------------------------------------	-----------------------------------------------------------------------------------	----------------------------------------------








## Status/Selection toolbar

The Status/Selection toolbar contains buttons used to specify a file's status format and control snapping functions.

	Samples: changes the status format to Samples.		SMPTE EBU: changes the status format to SMPTE EBU (25 fps).
	Time: changes the status format to Time.		SMPTE Non-Drop: changes the status format to SMPTE Non-Drop (29.97 fps, Video).
	Seconds: changes the status format to Seconds.		SMPTE Drop: changes the status format to SMPTE Drop (29.97 fps, Video).
	Time and Frames: changes the status format to Time and Frames.		SMPTE 30: changes the status format to SMPTE 30 (30 fps, Audio).
	Absolute Frames: changes the status format to Absolute Frames.		Auto Snap to Zero: forces the ends of selections to the nearest zero-crossing.
	Measures and Beats: changes the status format to Measures and Beats.		Auto Snap to Time: forces the ends of selections to the nearest whole time division on the time ruler.
	SMPTE Film Sync (24 fps): changes the status format to SMPTE Film Sync (24 fps).		

## Regions/Playlist toolbar

The Regions/Playlist toolbar contains the **Regions List** and **Playlist** buttons as well as buttons corresponding to synchronization commands and status displays.

	Regions List: displays the Regions List.		Generate MIDI Timecode: configures the software to send MIDI timecode through the MIDI output port. The MIDI output port is specified on the MIDI/Sync tab of the Preferences dialog.
	Playlist: displays the playlist.		Pre-Queue for MIDI Timecode: opens the wave device and preloads data for the next region to be played from the playlist.
	Trigger from MIDI Timecode: configures the software to be triggered by MIDI commands received through the MIDI input port. The MIDI input port is specified on the MIDI/Sync tab in the Preferences dialog. For more information, see <a href="#">Turning on MIDI input synchronization</a> on page 196.		

## Playlist Position display





















Displays the current playback position of an audio file being played from the playlist. Right-clicking this box displays a shortcut menu that allows you to specify a new format.

## Sync Status display

Allows you to monitor the status of incoming/outgoing MIDI commands.


















## Process toolbar

The Process toolbar contains buttons corresponding to all commands located in the **Process** menu.

	Auto Trim/Crop: removes silence and automatically fades in/out the end-points of each phrase.		Insert Silence: inserts user-configurable silence into audio files.
	Bit-Depth Converter: converts a file to a different bit depth.		Invert/Flip: inverts (or flips) the polarity of the current selection.
	Channel Converter: converts between mono and multichannel formats. Can also intermix the channels of a file to create panning effects.		Mute: mutes the current selection.
	DC Offset: changes the baseline of an audio file.		Normalize: normalizes the loudness of an audio file.
	Graphic EQ: opens Sony Media Software's XFX Graphic EQ.		Pan/Expand: creates custom pans, expands, and mixes.
	Paragraphic EQ: opens Sony Media Software's XFX Paragraphic EQ.		Resample: creates a copy of the audio file with a new sample rate.
	Parametric EQ: opens Sony Media Software's XFX Parametric EQ.		Reverse: reverses the current selection.
	Graphic Fade: creates user-configurable fades.		Smooth/Enhance: opens Sony Media Software's XFX Smooth/Enhance tool.
	Fade In: fades-in the selection.		Time Stretch: opens Sony Media Software's XFX Time Stretch tool.
	Fade Out: fades-out the selection.		Volume: adjusts the volume of an audio file.


















## Effects toolbar

The Effects toolbar contains buttons corresponding to all Sound Forge built-in XFX™ plug-ins.

	Acoustic Mirror: adds environmental coloration to your existing recordings.		Flange/Wah-Wah: mixes a modulated delay signal with the original signal.
	Amplitude Modulation: applies a sinusoidal or square-shaped periodic gain to the input signal.		Gapper/Snipper: removes/inserts sections of silence at regular intervals to create unusual effects.
	Chorus: simulates multiple audio sources from a single sound.		Noise Gate: removes signals below a set amplitude threshold.
	Multi-Tap Delay: creates a delay with up to eight delay-taps spaced anywhere within 2.5 seconds of the original sound.		Pitch Bend: creates a modified sound envelope that corresponds to increasing or decreasing the pitch of a sound file over time.
	Simple Delay: adds a delayed copy of the audio signal to the file.		Pitch Shift: changes the pitch of a selection with or without preserving the duration of the file.
	Distortion: simulates the overloading of an amplifier.		Reverb: simulates the acoustics of different environments.
	Graphic Dynamics: applies compression, expansion, and limiting to affect the dynamic range of an audio file.		Vibrato: creates periodic pitch modulation in an audio file.
	Multi-Band Dynamics: allows compression and limiting to be placed on up to four different frequency bands.		Wave Hammer: acts as a classic compressor and volume maximizer.
	Envelope: forces the amplitude envelope of a waveform to match a specified envelope shape.		

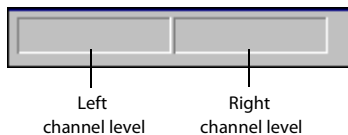
## Tools toolbar

The Tools toolbar contains buttons corresponding to commands in the **Tools** menu.

	Extract Audio from CD: extracts audio from CD and opens for editing.		Audio Restoration: removes clicks and background noise associated with vinyl records.
	Burn CD: writes the selected audio track to CD.		Crossfade Loop: mixes audio occurring before the loop start point into the end of the loop to smooth transitions.
	Auto Region: creates regions in an audio file according to rapid sound attacks or a specified time interval.		Sampler: allows you to transfer samples to/from the Sound Forge application.
	Extract Regions: extracts all file regions and saves them as individual files.		DTMF/MF Tones Synthesis: generates dial tones used by telephone companies.
	Clip Detect: performs clip detection on the current file or selection.		FM Synthesis: uses frequency modulation and additive synthesis to create complex sounds from simple waveforms.
	Find: searches for clicks and pops, volume levels, or silent breaks in an audio signal.		Simple Synthesis: generates a simple waveform of a given shape, pitch, and length.
	Interpolate: replaces selected audio with interpolated audio data based on the selection's beginning and end samples.		Statistics: displays statistics corresponding to the current file or selection.
	Replace: replaces selected audio data with previous adjacent data.		Preset Manager: backs up and transfers user-configured presets from effects, processes, and plug-ins.
	Copy Other Channel: replaces selected audio with a corresponding selection from the opposite channel.		





## Levels toolbar

The Levels toolbar displays the audio levels in the left and right channels in the user-specified format. You can right-click to choose the format from a shortcut menu.



## ACID Loop Creation Tools toolbar

The ACID Loop Creation Tools toolbar contains buttons corresponding to commands used when creating audio loops for Sony's ACID® family of products. *For more information, see [Creating loops for ACID software on page 217](#).*

	Edit ACID Properties: displays the Edit ACID Properties dialog.		Shift Selection Left: shifts the current selection to the left so the current start point becomes the end point.
	Edit Tempo: calculates the musical tempo (beats per minute) based upon the current selection.		Shift Selection Right: shifts the current selection to the right so the current end point becomes the start point.
	Double Selection: doubles the size of the current selection.		Rotate Audio: moves the current selection to the opposite end of the file.
	Halve Selection: divides the current selection in half.		Selection Grid Lines: toggles the selection grid line display on/off.

## Tempo window

The ACID Loop Creation Tools toolbar also contains a Tempo window that appears to the right of the toolbar buttons. This window calculates and displays the ACID project's tempo as if the current selection represents a complete measure.

## Scripting toolbar

The Scripting toolbar allows you to show, hide, or activate the Script Editor and display the Batch Converter window.



Script Editor: Allows you to create, edit, or run scripts.



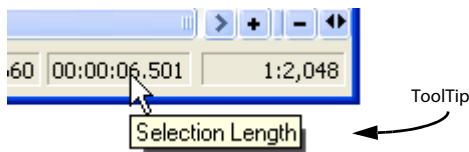
Batch Converter: Allows you to modify and manipulate multiple audio files without having to process each file individually.

---

## ToolTips

### Using ToolTips

Hovering the mouse pointer over a button or status bar box for longer than one second displays a small text box adjacent to the pointer. This text, called a ToolTip, is a brief description of the item's function. Using ToolTips is an effective way to quickly familiarize yourself with features.



### Turning off ToolTips

1. From the **View** menu, choose **Toolbars**. The Preferences dialog is displayed.
2. Clear the **Show ToolTips** check box and click **OK**.

## Command descriptions

When you click and hold a menu item or a button in a toolbar, a brief description of the command appears in the lower-left corner of the status bar. If you release the mouse button outside of the menu item or toolbar, the command is not executed.

## Keyboard shortcuts

The Keyboard map allows you to customize the keyboard shortcuts available in the Sound Forge interface. You can access the Keyboard map by choosing **Customize Keyboard** from the **Options** menu.

## Monitoring levels in digital audio

The Sound Forge channel meters display peak levels during playback. Use the meters to monitor levels and ensure no clipping occurs in your file.

### Decibels

The standard method for digital metering is to use the maximum possible sample value as a reference point. This value is referred to as 0 dB. Decibels are used to represent fractions logarithmically. In this case, the fraction is: sample amplitude divided by the maximum possible amplitude. The actual equation used to convert to decibels is:  $\text{dB} = 20 \log (\text{amplitude}/32,768)$

To illustrate this, consider a sine wave with a peak amplitude of 50% of full scale. Inserting the values in the appropriate places yields  $20 \log (0.50) = -6.0$  dB. Each time a signal's amplitude is divided by two, its dB value is decreased by 6 dB. Likewise, doubling the amplitude of a signal increases its dB value by 6 dB. Dividing the sine wave until its peak amplitude is equal to 1 produces lowest peak dB possible, -90.3 dB.

Why are dBs used when talking about audio? Decibels are typically used when dealing with sound pressure levels because of the vast range of sound (about 120 dB) that the human ear can perceive. It's also easier to say -90 dB than 0.000030 (1/32,768).

## Digital versus analog levels

When recording to an analog medium such as magnetic tape, recording engineers typically try to keep VU (volume unit) meters as close to zero as possible. This ensures a high signal-to-noise ratio while preserving adequate headroom to keep the tape from saturating and distorting. In addition, occasional peaks above 0 do not cause problems because the tape saturation point is not an absolute.

However, this is not true in the digital realm, where amplitudes are stored as discrete numbers instead of continuous variables. The flexible recording ceiling of analog is replaced by the absolute maximum sample values of digital audio. Stored signals must never have a value above these maximums, as the wave peaks are literally clipped. This clipping adds audible distortion and though it can go unnoticed, it can also ruin an entire project. Therefore, sample with the understanding that digital audio has absolutely no headroom.

## Setting digital audio levels

Because digital audio has no headroom, setting the sampling level becomes critical. If the loudest section of the audio is identified in advance, the recording level should be set so that the peak is as close to 0 dB as possible to maximize the dynamic range of the digital medium. If the loudest section of audio is unknown, allow 3 to 6 dB of headroom for unexpected peaks.

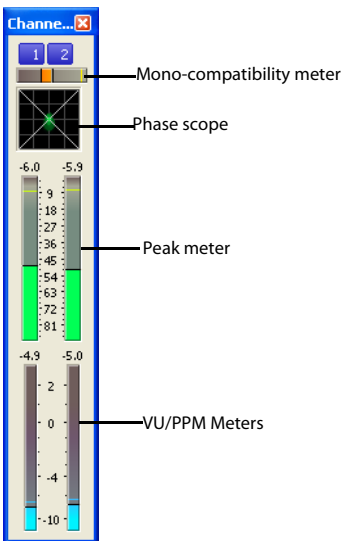
**Tip:** From the **Tools** menu, choose **Find** and use the *Find dialog* to identify the largest peak in your file.

## Using the channel meters

From the **View** menu, choose **Channel Meters** to open or close the channel meters. By default, Sound Forge software provides peak meters that you can use to monitor your audio levels. You can also choose to display VU/PPM (peak program) meters, a phase scope, and a mono-compatibility meter.

The peak meters display instantaneous levels during playback to help you determine the loudest level in your audio signal and whether the signal is clipping.

To prevent clipping, keep an eye on your peak meters. Peak levels should never exceed 0 dB. You can use the **Status** tab in the Preferences dialog to calibrate the VU/PPM meters to their associated levels on the peak meters and adjust the VU meters' sensitivity.



## Showing or hiding the Channel Meters window

From the **View** menu, choose **Channel Meters** to open or close the channel meters. You can dock the Channel Meters window on any edge of the Sound Forge workspace.

## Showing or hiding meters

You can display a peak meter, VU/PPM, a phase scope, and mono-compatibility meter for each channel. To toggle the display of each meter, right-click the Channel Meters or Hardware Meters window and choose a command from the shortcut menu.

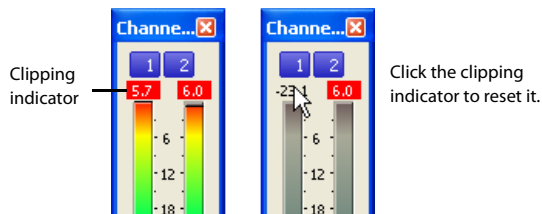
A check mark is displayed to indicate which meters are currently visible.

- For more information about VU/PPM meters, please see [Using the VU meters on page 35](#).
- For more information about phase scopes, please see [Using phase scopes on page 36](#).
- For more information about mono-compatibility meters, please see [Using the mono-compatibility meters on page 37](#).

## Resetting clipping indicators

When audio levels are too high, clipping can occur. A red indicator appears at the top of the meter to show when audio is clipping. Do any of the following to reset the indicator:

- From the **Options** menu, choose **Channel Meters**, and then choose **Reset Clip** from the submenu.
- Click to reset the indicator, or right-click the meters and choose **Reset Clip** from the shortcut menu.



You can also detect and mark clipped audio using the detect clipping tool. For more information, see [Detecting and marking clipping on page 98](#).

## Changing the meters' display resolution

The peak meters display levels in dB FS. To change the resolution of the meters, do either of the following:

- From the **Options** menu, choose **Channel Meters**, choose **Peak Range** from the submenu, and then choose a display range.
- Right-click the channel meter, choose **Peak Range** from the submenu, and then choose a display range.

**Note:** Choosing a wide range allows you to see low-level signals at the expense of precision display at high levels.

## Changing the meters' display options

You can choose whether labels, peaks, and valleys are displayed in the meters and whether the meters are displayed on top of other windows when they are not docked.

Do either of the following to change the meters' display options:

- From the **Options** menu, choose **Channel Meters**, and then choose a command from the submenu.
- Right-click the meters and choose a command from the shortcut menu.

Command	Description
Expand Meters	Toggles expanded-width meters. Turning off expanded meters can conserve screen space.
Interleave Meters	Toggles interleaved or stacked display of VU/PPM meters with the corresponding channel meters.
Show Labels	Toggles the meter level labels on and off.
Hold Peaks	When selected, the highest peak levels are represented by a thin line on the meter.
Hold Valleys	When selected, the lowest peak levels are represented by a thin line on the meter.
Always on Top	When this command is selected, the channel meters will always be displayed above any other windows.

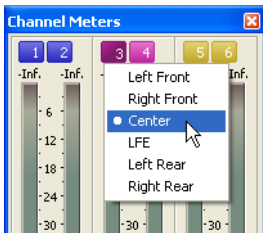
To change the layout of the meters in the Channel Meters window, right click the meters, choose **Layout** from the shortcut menu, and then choose a command from the submenu.

Command	Description
Horizontal/Vertical/Auto	Choose a command to change the orientation of the meters in the Channel Meters window.
Narrow Width	Toggles narrow- or normal-width meters. Using narrow meters can conserve screen space.
Interleave Peak/VU	Toggles interleaved or stacked display of VU/PPM meters with the corresponding channel meters.

### Routing channels to hardware outputs

You can change channel assignments from the **Audio** tab in the Preferences dialog or the Channel Meters window (for more information, see [Audio tab on page 248](#)). Changing the setting in either location updates your preferences and affects all open data windows.

To change a channel's output device using the Channel Meters window, click the channel number and choose a new output port from the menu:



### Using the VU meters

You can display volume unit (VU) and peak program (PPM) meters in the Channel Meters and Hardware Meters windows to help you determine the perceived loudness of your audio signal (peak program meters provide faster response times to volume increases than VU meters). *For more information on the channel meters, see [Using the channel meters on page 33](#). For more information the hardware meters, please see [Using the hardware meters on page 92](#).*

VU/PPM meters are especially helpful when you're mastering: comparing two audio files' VU/PPM readings will help take the guesswork out of matching levels

Right-click the Channel Meters or Hardware Meters window and choose **Show VU/PPM** from the shortcut menu to toggle the display of the VU/PPM meters.

VU/PPM readings should fall near the 0 (or reference) mark. 0 VU is merely a reference level, and your signal may exceed 0 VU. To prevent clipping, keep an eye on your peak meters. Peak levels should never exceed 0 dB. You can use the **Status** tab in the Preferences dialog to calibrate the VU/PPM meters to their associated levels on the peak meters and adjust the VU meters' sensitivity. *For more information, see [Status tab on page 247](#).*

### Choosing a VU or PPM scale

To change the scale of the meter, choose **Channel Meters** from the **Options** menu, choose **VU/PPM Scale**, and then choose a setting from the submenu (you can also right-click the meter to set its options).

VU and PPM scales are most useful for displaying the average volume of the signal: the meter represents the RMS average level during playback, and their attack and decay are not as sensitive as the peak meter.

PPM scales are useful for monitoring peak levels. The meters use a fixed integration time (5 or 10 ms) that is sensitive to increases in volume, but the meters are less sensitive to decreases in volume than the VU scales, which produces less meter activity and decreased eyestrain.

Item	Description
Traditional VU	The traditional VU meter is displayed with a scale of -10 dB to +2 dB. 0 dB on the VU meter equals 4 dBu.
Extended VU	The extended VU meter is displayed with a scale of -30 dB to +8 dB. 0 dB on the VU meter equals 4 dBu.
Logarithmic VU	Displays the meters in a logarithmic scale (like the Sound Forge peak meters) instead of the linear scales traditionally associated with VU meters.

Item	Description																
UK PPM	The UK peak program meter (also known as a BBC meter) is a Type II meter and is displayed with a scale of 1 to 7, which corresponds to a range of -12 to 12 dBu: <table border="1"> <thead> <tr> <th>UK Marks</th> <th>dBu</th> </tr> </thead> <tbody> <tr> <td>7</td> <td>12</td> </tr> <tr> <td>6</td> <td>8</td> </tr> <tr> <td>5</td> <td>4</td> </tr> <tr> <td>4</td> <td>0</td> </tr> <tr> <td>3</td> <td>4</td> </tr> <tr> <td>2</td> <td>8</td> </tr> <tr> <td>1</td> <td>-12</td> </tr> </tbody> </table>	UK Marks	dBu	7	12	6	8	5	4	4	0	3	4	2	8	1	-12
UK Marks	dBu																
7	12																
6	8																
5	4																
4	0																
3	4																
2	8																
1	-12																
EBU PPM	The EBU peak program meter is a Type II meter and is displayed with a scale of -12 to +12, which corresponds to -12 dBu to 12 dBu. 0 on the EBU PPM equals 0 dBu. The EBU PPM and UK PPM respond identically to increases in volume, but the EBU PPM decays more slowly.																
DIN PPM	The DIN peak program meter is a Type I meter and is displayed with a scale of -50 dB to +5 dB, which corresponds to -44 dBu to 11 dBu. 0 dB on the DIN PPM equals 6 dBu.																
Nordic PPM	The Nordic peak program meter is a Type I meter and is displayed with a scale of -42 dB to +12 dB, which corresponds to -42 dBu to 12 dBu. 0 dB on the Nordic PPM equals 0 dBu.																

### Adjusting the VU meters' sensitivity

Unlike peak meters — which read instantaneous changes in your audio signal — the VU/PPM meters read a portion of the signal and calculate the average level. The size of the signal that the meters read is determined by the meters' integration time.

To set the amount of data surrounding the cursor that will be used to calculate levels in the VU meters, specify a value in the VU meter integration time box on the **Status** tab of the Preferences dialog.

The PPM scales use a fixed integration time:

Scale	Integration time
UK PPM	10 ms
EBU PPM	10 ms
DIN PPM	5 ms
Nordic PPM	5 ms

### Changing the meters' display resolution

The VU/PPM meters display levels in dB VU. To change the resolution of the meters, perform either of the following steps:

- From the **Options** menu, choose **Channel Meters**, choose **VU/PPM Scale** from the submenu, and then choose a display range.
- Right-click the channel meter, choose **VU/PPM Scale** from the submenu, and then choose a display range.

Choosing a wide range allows you to see low-level signals at the expense of precision display at high levels.

### Showing labels

Right-click the meters and choose **Show Labels** from the shortcut menu to toggle the meter dB markings on and off.

### Holding peaks and valleys

Right-click the meters to access the **Hold Peaks** and **Hold Valleys** commands in the shortcut menu.

- Choose **Hold Peaks** to display a marker on the meters indicating the highest reading.
- Choose **Hold Valleys** to display a marker on the meters indicating the lowest reading.

### Using phase scopes

You can display a phase scope in the Channel Meters and Hardware Meters windows to find phase cancellation among the channels in an audio file. *For more information on the channel meters, see [Using the channel meters](#) on page 33. For more information the hardware meters, please see [Using the hardware meters](#) on page 92.*

Right-click the **Channel Meters** or **Hardware Meters** window and choose **Show Phase Scope** from the shortcut menu to toggle the display of the phase scope.




To change the display, right-click the Channel Meters or Hardware Meters window, choose **Phase Scope Style** from the shortcut menu, and then choose a setting from the submenu:


Style	Description
Lissajous - XY Plot	Displays the right and left channels plotted along the X and Y axes of the graph.
Lissajous - Rotated	Displays the right and left channels plotted along the X and Y axes of the graph. This setting is identical to the Lissajous - XY Plot setting, but the graph is rotated 45 degrees.
Polar - Linear Plot	Displays the right and left channels plotted vertically on the graph.
Polar - Circular Plot	Displays the right and left channels plotted on a circular graph.

## Using the mono-compatibility meters

You can display a mono-compatibility meter in the Channel Meters and Hardware Meters windows to detect correlations or differences between the channels of a file that can cause phase cancellation when downmixing to mono. *For more information on the channel meters, see [Using the channel meters](#) on page 33. For more information the hardware meters, please see [Using the hardware meters](#) on page 92.*

Right-click the Channel Meters or Hardware Meters window and choose **Show Mono-Compatibility Meter** from the shortcut menu to toggle the display of the mono-compatibility meter.

When the channels are similar, the right (or top) half of the meter is illuminated: 

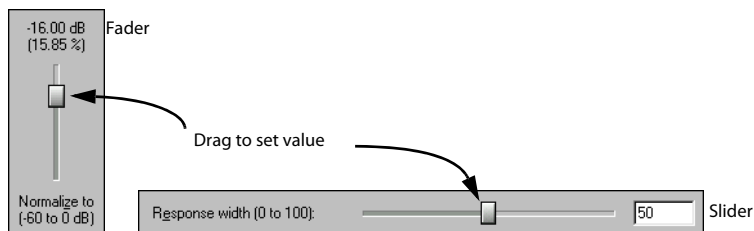
When the channels exhibit phase cancellations, the left (or bottom) half of the meter is illuminated: 

## Controls

A major step in mastering Sound Forge software is becoming familiar with the controls used to set and adjust feature parameters, including faders, sliders, and envelope graphs.

### Faders and sliders

Faders and sliders are frequently used to edit effect and process parameters. To use either control, drag the control to the desired position and release.



### Resetting fader and slider values

Double-click to return the control to its default value.

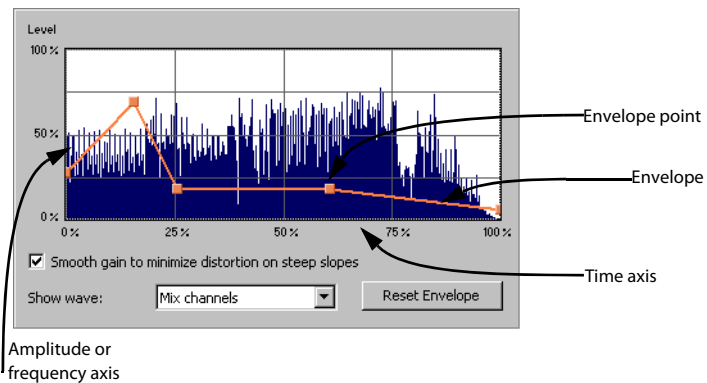
## Fader and slider shortcuts

There are numerous keyboard shortcuts available when using faders and sliders.

If you want to	Then use the following shortcuts
Change the value in small increments	↑ ↓ ← → -or- Hover the mouse over the fader or slider control and press Ctrl while moving the mouse wheel.
Change the value in larger increments	Page Up and Page Down -or- Hover the mouse over the fader or slider control and move the mouse wheel.
Set the control to its maximum and minimum values respectively	Home and End

## Envelope graphs

Envelope graphs are used to configure the shape of frequency or amplitude envelopes applied to audio waveforms.



### Understanding the envelope graph

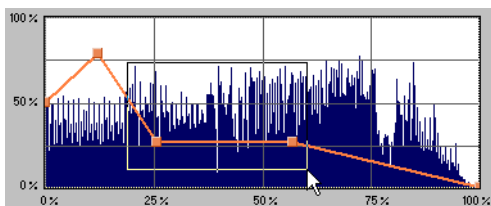
To use the envelope graph, you must first understand what it represents. In the previous example, the horizontal axis represents time, with the leftmost point representing the start of the selection and the rightmost point representing the end of the selection. The vertical axis represents either amplitude or frequency, depending upon the operation.

### Moving an envelope point

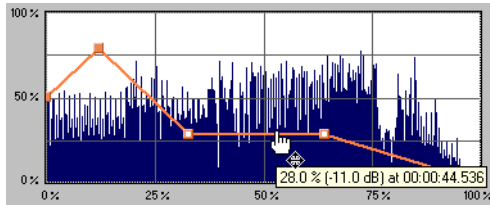
1. Drag an envelope point to a new position.
2. Release the mouse button. The point is repositioned and the envelope adjusts.

### Moving multiple envelope points

1. Starting in an unused area of the envelope graph, drag the mouse to create a selection box containing all points to be moved.



2. Release the button. The selected envelope points are displayed with a white square center.
3. Drag any of the selected envelope points to the desired position. The pointer displays as a multi-directional arrow and the selected points move together.
4. Release the mouse button. The entire envelope graph adjusts.



Reposition multiple envelope points

### Changing the fade curve between two points

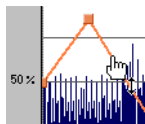
To change the type of fade between two envelope points, right-click an envelope segment and choose a fade type (Linear Fade, Fast Fade, Slow Fade, Smooth Fade, Sharp Fade, and Hold) from the shortcut menu.

### Selecting or clearing all envelope points

Press Ctrl+A to select or clear all envelope points.

### Adding an envelope point

1. Hover over the envelope.



Place the pointer on the envelope and double-click to add a point.

2. Double-click the mouse. A point is added to the envelope graph and can be positioned as needed. *For more information, see [Moving an envelope point](#) on page 38.*

### Deleting an envelope point

Right-click the point to be deleted and choose **Delete** from the shortcut menu. The point is deleted and the envelope adjusts.

### Delete all points

Delete all envelope points by clicking the **Reset Envelope** button.

### Displaying the waveform on an envelope graph

Certain envelope graphs (such as in the Graphic Fade dialog) allow you to view the audio waveform on the graph. If the selection is small, the waveform automatically displays. Otherwise, selecting an option from the **Show wave** drop-down list displays the waveform.

### Displaying multichannel waveforms

The **Show Wave** drop-down list allows you to specify how multichannel files display in the envelope graph.

## Multichannel files

When a data window displays a multichannel file, all channels are shown at the same time.

### Working with multichannel files

When playing, editing, or processing multichannel files, you can select a single channel or all channels. However, certain processing tasks cannot be performed on an individual channel of a multichannel file. *For more information, see [Single-channel editing on page 42](#), or [Editing Multichannel Audio on page 91](#).*

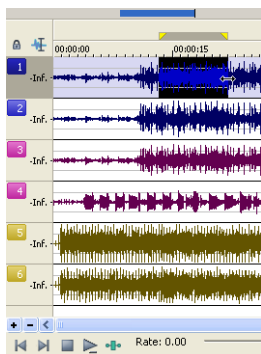
### Selecting data in multichannel files

When editing a multichannel file, you can use the mouse to select data simply by clicking and dragging in a data window. There are several options for data selection in multichannel files.

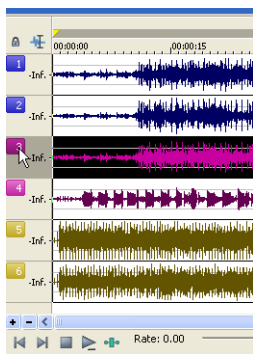
1. Open a multichannel file.
2. Select the Edit tool by choosing **Tool** from the **Edit** menu and **Edit** from the submenu.

**Tip:** Press **Ctrl+D** or click the **Edit Tool** button  on the Standard toolbar.

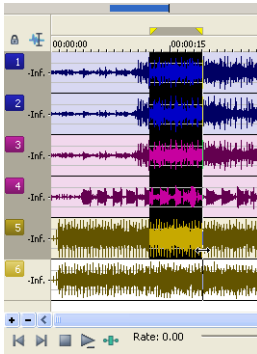
3. Select the data:
  - Drag within a channel to select that channel only.



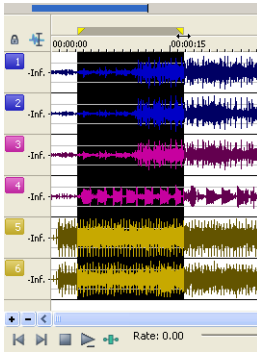
- Double-click a channel number to select the entire channel.



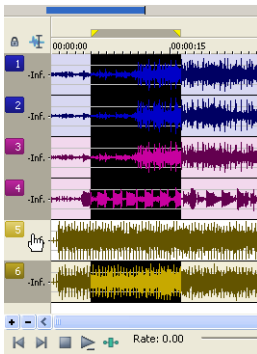
- Drag across channels to select multiple channels.



- Drag along the divider between channels (or the loop bar above the ruler) to select all channels.



- Hold Ctrl and click a channel to add or remove it from the current selection.









### Toggling channel selections

Once you place the cursor or create a selection in a multichannel file, you can cycle through channel options by pressing Tab.

### Previewing channels

The single channel selection option allows you to preview channels in a multichannel file individually.

1. Open a multichannel file and select all data.
2. Click the **Play Normal** button . All channels play. Click the **Stop** button .
3. Press Tab. The first channel is selected.
4. Click the **Play Normal** button . Only the first channel plays. Click the **Stop** button .
5. Press Tab. The second channel is selected.
6. Click the **Play Normal** button . Only the second channel plays. Click the **Stop** button .

## Single-channel editing

You have the ability to cut, copy, and paste data in single channels of a multichannel file. However, channel lengths must always remain equal in multichannel files. *For more information on cutting, copying, and pasting data, see [Editing audio](#) on page 57.*

## Chapter 3 Getting Started

The Sound Forge® digital audio editing tool is for users from all musical backgrounds. It is an extremely deep program, containing features that may only be required by the most advanced or specialized users. Nonetheless, a firm grasp of Sound Forge basics is essential. This chapter is designed to provide you with information on Sound Forge fundamentals.

### Creating a project

You can use Sound Forge project files to organize and work with your media files nondestructively. When you save a project file, two things are created: a .frg file and a subfolder that contains your media file and all of the temporary files created while working on your project. This file is not a multimedia file, but is used to render the final file after editing is finished. When you copy, cut, paste, and otherwise edit your project, the process is nondestructive—meaning you can edit without worrying about corrupting your source files. Within the project file, you can also undo any past operations, including those occurring before your last save. Once you are finished working with a project file, you can save your work to a media file using the **Render As** option on the **File** menu.

**Note:** To use the advanced undo/redo capabilities mentioned above, you must have the **Allow Undo past Save** check box selected on the **General** tab of the **Preferences** dialog. To access the **Preferences** dialog, choose **Preferences** from the **Options** menu.

1. From the **File** menu, choose **Save As** to save the current data window to a project file. The **Save As** dialog is displayed.
2. Using the **Save in** drop-down list, locate the folder where you want to save the project.
3. From the **Save as type** drop-down list, choose **Sound Forge Project File (\*.frg)**.
4. In the **File name** box, enter a name for the file.
5. Click the **Save** button. A .frg file is created with the name you specified, and a folder with a similar name (**projectname\_frg**, for example) is created in the same location for the temporary files.

**Important:** The associated project folder created by this process should not be deleted, as this will cause your project file to be unusable.

## Getting media files

The software can open a variety of audio and video files. There are two main methods for locating, previewing, and opening media files:

- From the **File** menu, choose **Open** to display the Open dialog.
- From the **View** menu, choose **Explorer** to display the Explorer window.

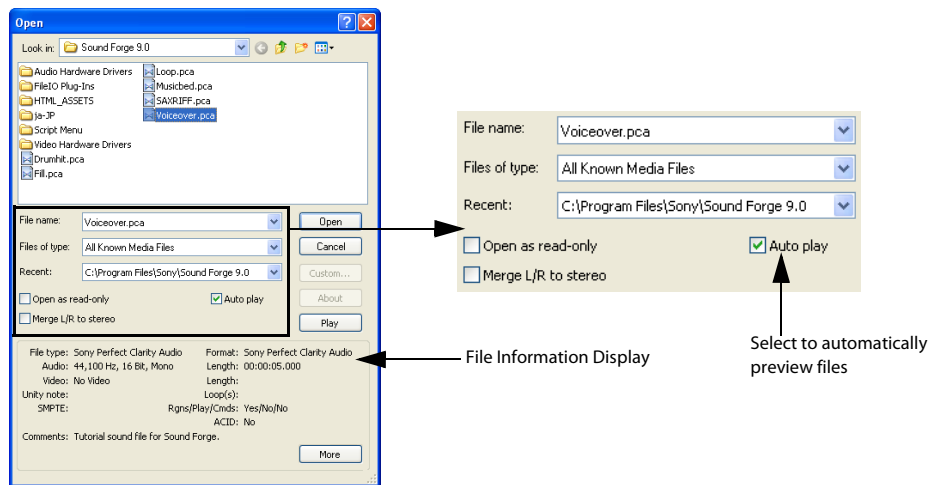
These methods are explained in greater detail in the following sections.

**Note:** To have pulldown fields automatically removed when opening 24 fps progressive-scan DV video files, select the **Allow pulldown removal when opening 24p DV** check box on the **Video** tab of the **Preferences** dialog. To open your 24p DV video files as 29.97 fps interlaced video (60i), clear this check box.

## Using the Open dialog

1. From the **File** menu, choose **Open**. The Open dialog is displayed.

**Tip:** Click the **Open** button .



The Open dialog contains several features that allow you to locate and open audio files. These features are detailed below.

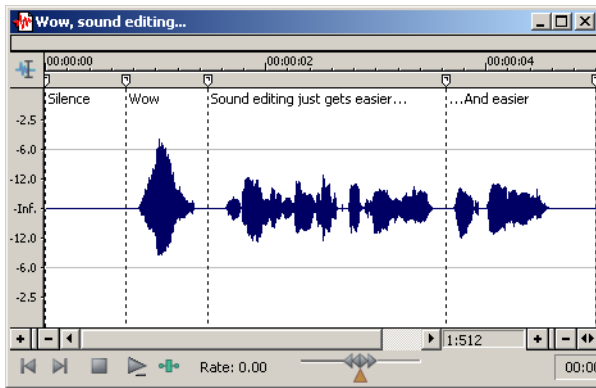
Feature	Description
Files of type	Use this drop-down list to specify the file format displayed in the system. A variety of file formats are supported. <b>Tip:</b> Choose the CD Audio (*.cda) option from this list to extract audio tracks from a CD.
Recent	Use this drop-down list to locate recently accessed folders.
Merge L/R to stereo	Select this check box and hold the Ctrl button while selecting two mono files in the browse window. The two mono files will be merged to the left and right channels of a new stereo file. The first file you select will be placed in the left channel, and the second file will be placed in the right channel. Compressed files are not supported for merging.
Auto play	Select this check box to automatically preview files as you select them in the Open dialog.

2. Locate and select a media file using the **Look in** drop-down list at the top of the dialog.
3. To preview the file before adding it to your project, click the **Play** button.

**Note:** If you have the **Auto play** check box selected, your file will automatically begin previewing when you select it.




4. Click **Open**. The file is opened and a data window containing the waveform is displayed.





### Using the Explorer window

In addition to using the Explorer window for locating, previewing and opening media, you can drag files or regions from the Explorer window to an open data window to paste or mix the data. Click the right mouse button while dragging to toggle mix and paste drag-and-drop modes. You can also extract audio from a CD.

### Previewing media

The Explorer window allows you to easily preview files before you open them. The Explorer window has a mini-transport bar with **Play**, **Stop**, and **Auto Preview** buttons . When you preview a file, its stream is sent to the channel meters on the main workspace (for audio files) or to the Video Preview window (for video files).

**Note:** To preview video files, you must have the Video Preview window open. To display the Video Preview window, choose **Video Preview** from the **View** menu.

1. Select a file in the Explorer window.
2. Click the **Play** button  to listen to the file.
3. Click the **Stop** button  or select a different file to stop previewing the file.

**Tip:** To automatically preview selected files, click the **Auto Preview** button  on the Explorer window's transport bar.

### Opening media

To open a media file into a new data window from the Explorer window, double-click the file. To open a media file in a specific data window, drag the media file from the Explorer window to the data window.

### Obtaining or editing CD information

If Sound Forge can access information about a track or CD (either from the file or CD itself or from a local cache), it automatically reads and displays this information when you insert a CD or browse your computer. However, if this information is not available, the software can retrieve information over the Internet from Gracenote® MusicID™.

Once Sound Forge obtains information from Gracenote MusicID, it is saved to a local cache so the information displays more quickly the next time the tracks are displayed.

If the software cannot connect to the Gracenote Media Database and the appropriate CD information is not available on your computer, the tracks are simply listed numerically. In this case, you can edit CD information and submit it to the Gracenote Media Database.

#### Notes:

- Using Gracenote MusicID requires an active Internet connection.
- For more information on using Gracenote MusicID, please refer to the Gracenote Web site at <http://www.gracenote.com/cddb2info/using.html>.

#### Locating matching CD information using Gracenote


1. Insert a CD in your drive.
2. Browse to the CD and click the **MusicID**  button in the Explorer window.

Gracenote MusicID attempts to obtain matching CD information and displays artist, album, and track data:

- If the service locates an exact match, this information is automatically displayed. No additional action is necessary.
  - If the service locates multiple possible matches, the Match dialog is displayed. Proceed to step 2.
3. Choose a method for completing the CD information:
    - If none of the possible matches is appropriate, click the **Submit New** button. The Gracenote MusicID Disc Information dialog is displayed, allowing you to complete information for the CD and submit it for inclusion in the Gracenote Media Database. For help on submitting CD information, click the **Help/Guidelines** button in this dialog. When you are finished typing information, click the **OK** button to submit your data.
    - Select the appropriate match from the list and click the **Accept Match** button. The artist, album, and track information is displayed based on your selection in the right side of the PC pane.

#### Editing and submitting CD information to Gracenote

If a CD is not currently part of the Gracenote Media Database, you can submit it for inclusion.

1. Insert a CD in your drive.
2. Browse to the CD and click the **MusicID**  button in the Explorer window. The Gracenote MusicID Disc Information dialog is displayed.
3. Use the Gracenote MusicID Disc Information dialog to edit information about the CD. For help on submitting CD information, click the **Help/Guidelines** button in this dialog.
4. When you are finished entering the information, click the **OK** button to submit it for inclusion in the Gracenote database.


#### Extracting audio from CD

The Explorer window allows you to easily extract audio from a CD into a data window. Each audio track on the CD is extracted into a separate data window.

1. Use the Explorer window to browse to and select your CD drive. The CD's audio tracks display in the right pane of the Explorer window.
2. Select the track(s) you want to extract.
3. Drag the track(s) to the main Sound Forge workspace. The software begins extracting the selected tracks into individual data windows.
4. To stop the extraction process, you can click the **Cancel** button on the status bar to stop the whole process or on the individual data windows to stop extracting a specific track.

**Tip:** To extract a single audio track into a new data window, double-click the track in the right pane of the Explorer window.

## Using Explorer views

You can control the information that is displayed in the Explorer window by clicking the **Views** button  and selecting a view. These options are explained below:

Item	Description
Tree View	Displays all of the available drives and folders that you may choose from to find files.
Region View	Displays any regions that have been defined in the selected media file.
Summary View	Displays a short description of the selected media file at the bottom of the Explorer window.
Details	Displays the file size, date and when the file was last created or last modified.
All Files	Displays all file types in the active folder.

## Peak files

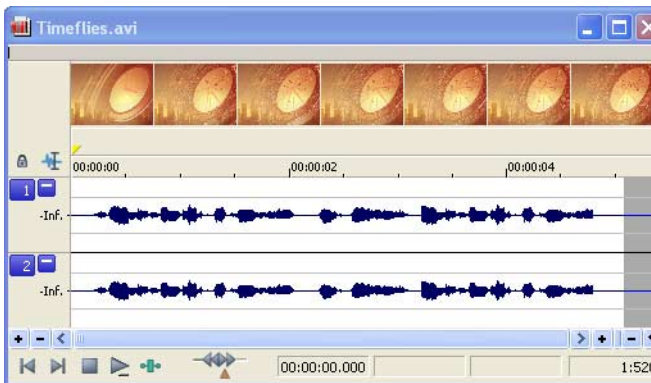
When you first open a file, the entire file is scanned and a peak file is created. The peak file is stored with the same name and in the same location as the audio file, but it is given an .sfk extension. This peak file is automatically updated whenever the original file is edited.

If you modify a file in another application, you can regenerate the peak file by choosing **Rebuild Peak Data** from the **Special** menu.

## Working with video files

The Sound Forge application has the ability to open and save many video file formats. The video files cannot be edited within the software, but this functionality allows you to attach, detach, and edit audio for the video. Once you've edited the audio, you can preview the audio and video together.

When you open a media file containing video, the data window displays the video portion in a video strip above the audio.



For more information, see [Working with Video](#) on page 223.

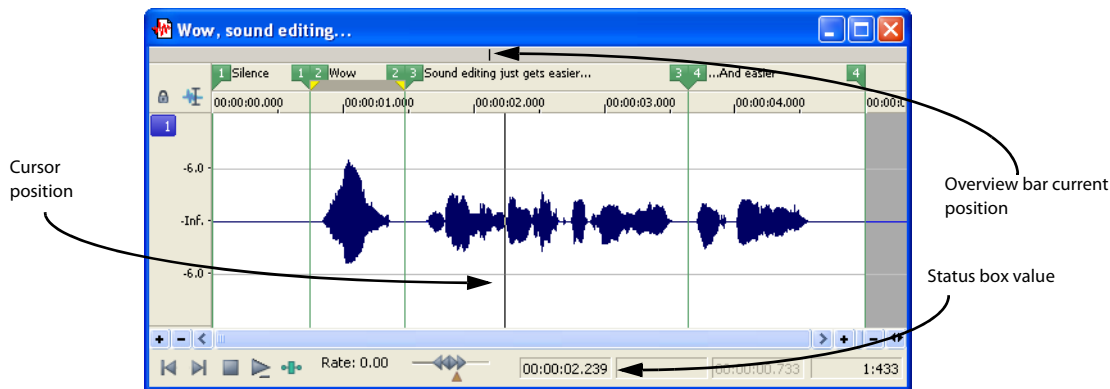
## Playing a file

After you open a file, you can play it by clicking the **Play All** button  on the transport bar. For more information, see [Transport toolbar on page 27](#).

## Viewing the current position

As a file plays, the current playback position is indicated in the data window in three ways:

- A cursor travels across the visible portion of the data window.
- The current playback position in relation to the entire file appears in the overview bar.
- The first selection status box in the playbar displays the current position in the user-specified format. For more information, see [Selecting status formats on page 65](#).




## Data window scrolling during playback

From the **Options** menu, choose **Scroll Playback** (or press F6) to enable automatic data window scrolling during playback. When the cursor moves off of the current window, it will quickly scroll to show another full window of data.

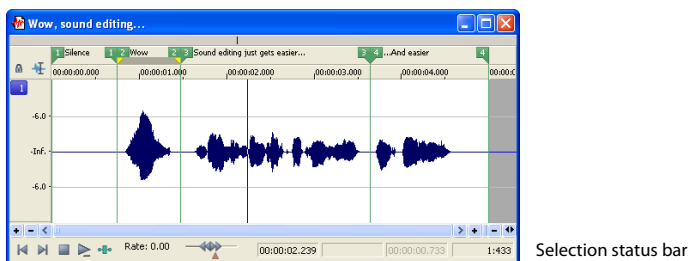
To enable smooth scrolling, select the **Scroll Smoothly** option from the **Options** menu (or press Shift+F6). When this option is selected, the cursor will slowly move back to the center of the display, and the wave data will scroll past it. This allows you to view upcoming data while the file is being played.

## Playing a file from a specified point

You can begin playback from any point in a file.

1. Click to position the cursor in the data window. A flashing cursor (spanning the height of the waveform display) is displayed.
2. Click the **Play** button  on the transport bar. The file plays from the cursor position.

If you do not hear playback, you may have inadvertently created a small selection. To determine if you created a selection, examine the status boxes in the bottom-right corner of the data window.




- If only the first box contains a value, there is no selection.
- If all three boxes contain values, a selection has been created. Clear the selection by clicking anywhere in the data window.

For more information, see [Viewing selection status on page 49](#).


## Playing in Loop Playback mode

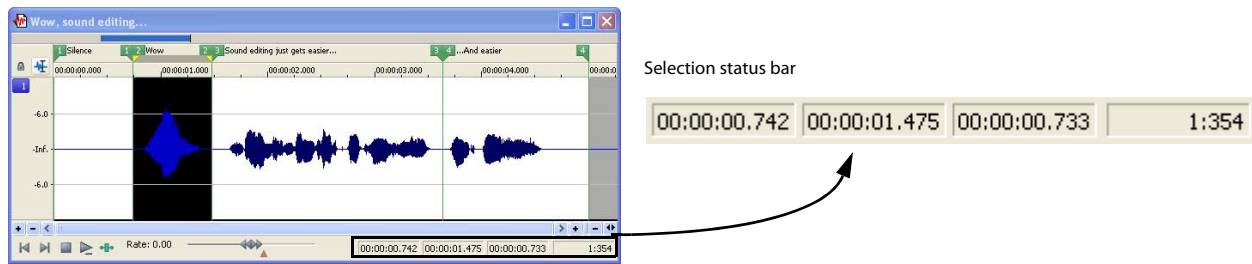
You can play an entire file or a selection in Loop Playback mode. In Loop Playback mode, the audio is played in a continuous loop.

Click the **Loop Playback** button  on the transport bar (or press Q) to turn Loop Playback mode on and off.

## Playing a selection

You can play specific portions of audio data by creating selections in the waveform display.

1. Drag the mouse within the data window. Notice that the waveform is selected as the mouse is dragged.
2. Click the **Play** button . Only the selection plays.



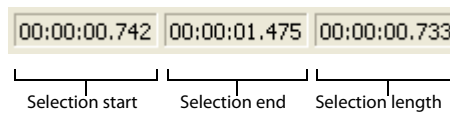
## Viewing selection status

When a selection exists, the boxes in the selection status bar in the bottom-right corner of the data window contain values. These values indicate the start, end, and length of the selection. Double-click a box to edit the value.

No selection



Selection

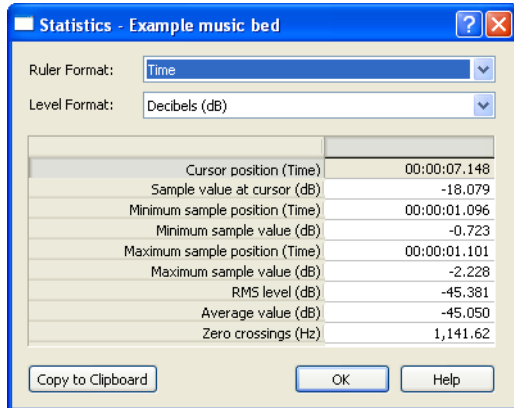


## Selecting the status format

You can display status values in any supported format. You can change the format by right-clicking and choosing a new format from the shortcut menu. For more information, see [Selecting status formats](#) on page 65.

## Viewing selection statistics

Choosing **Statistics** from the **Tools** menu displays a Statistics dialog showing information about the current selection or, if there is no selection, on the entire file.

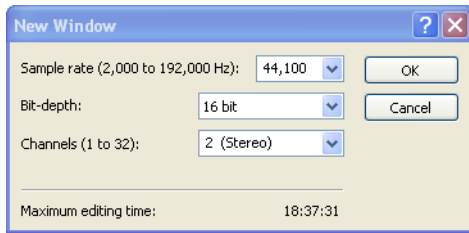


The following table describes all statistical categories displayed in the Statistics dialog.

Statistical Category	Description
Ruler Format	Choose a setting from the drop-down list to determine the format you would like to use for the Cursor position, Minimum sample position, and Maximum sample position. For more information, see <a href="#">Selecting status formats</a> on page 65.
Level Format	Choose a setting from the drop-down list to specify how the left- and right-channel levels at the cursor position will display. <ul style="list-style-type: none"> <li>• Values - Displays as an integer. The range is from -8388608 to 8388607 in 24-bit audio, -32768 to 32767 in 16-bit audio and -128 and 127 in 8-bit audio.</li> <li>• Decibels - Displays as decibels. A value of 0 dB corresponds to maximum absolute amplitude and negative infinity (-Inf.) corresponds to complete silence. In 16-bit audio, -90.3 dB is the lowest possible dB value (sample value of 1).</li> <li>• Percentages - Displays as a percentage ranging from -100 to 100 percent.</li> </ul>
Cursor position	The cursor position (in samples) from the start of the audio file.
Sample value at cursor	The actual number stored by a single sample. The maximum allowed sample value is often referred to as 100% or 0 dB.
Maximum/minimum sample position and sample value	The maximum and minimum sample values and the locations (in samples) where they occur. These values may help determine if clipping will occur in the audio file. These values can also be used to determine the noise level of a signal for use with Noise Gate (a built-in XFX plug-in installed with Sound Forge). For example, to determine the noise amplitude of a file, run Statistics on a region of noisy silence.
RMS level	The Root Mean Square of the sample values relative to the RMS value of a maximum-amplitude square wave (the loudest possible recording). On short intervals, this value relates to the volume level of the audio file. If used on a large selection with large volume variation, this value becomes less meaningful.
Average value	The sum of all sample values in the selected region divided by the number of samples. If this value is not zero, it usually indicates a DC offset in the recording process.
Zero crossings	The number of times per second that the waveform fluctuates from a negative to a positive value. This value can be used as a rough estimate of the frequency of the audio data for very simple waveforms.
Copy to Clipboard	Copies all contents of the Statistics window to the clipboard. This can be useful if you want to compare statistics of multiple files in a spreadsheet. Note: To copy specific data or cell, select the cells that you want to copy and press Ctrl+C.

## Creating a new data window

1. From the **File** menu, choose **New**. The New Window dialog is displayed.



2. Complete the New Window dialog:
  - a. From the **Sample rate** drop-down list, choose a sample rate.
  - b. From the **Bit-depth** drop-down list, choose a bit depth.
  - c. Choose a setting from the **Channels** drop-down list to select the number of channels stored in the file.

For more information, see [Editing file attributes](#) on page 83.
3. Click **OK**. A new data window with the specified attributes is displayed.

**Tip:** New windows are automatically named for you. You can customize this automatic naming feature to suit your needs. For more information, see [Customizing marker labeling](#) on page 97.

## Active data windows vs. inactive data windows

When multiple data windows are displayed on the workspace, only the window currently being edited is active, and all operations affect this window exclusively.



### Activating a window

To activate a data window, click anywhere within it. The title bar changes to the color defined as the active window color and the previously active window is deactivated.

**Note:** Choosing **Focus to Data Window** from the **View** menu also results in the focus being returned to the current data window.

## Copying data to a new file

You can create new audio files by copying data to a new data window.

1. Open an audio file and create a selection.
2. From the **Edit** menu, choose **Copy** (or click the **Copy** button ). The selection is copied to the clipboard.
3. Create a new data window. *For more information, see [Creating a new data window](#) on page 51.*
4. From the **Edit** menu, choose **Paste** (or click the **Paste** button ). The selected data is pasted in the new data window.

## Working with files

You can save a file in a variety of formats, including popular audio formats such as WAV and AIFF, and streaming media formats such as Windows Media® Audio and RealMedia™. You can save a file using a standard template, or you can customize the settings to suit your needs. Once you create custom settings, you can save those settings as a template.

You have the option to save all open files at once or to save all open files as a workspace file.

## Saving a file

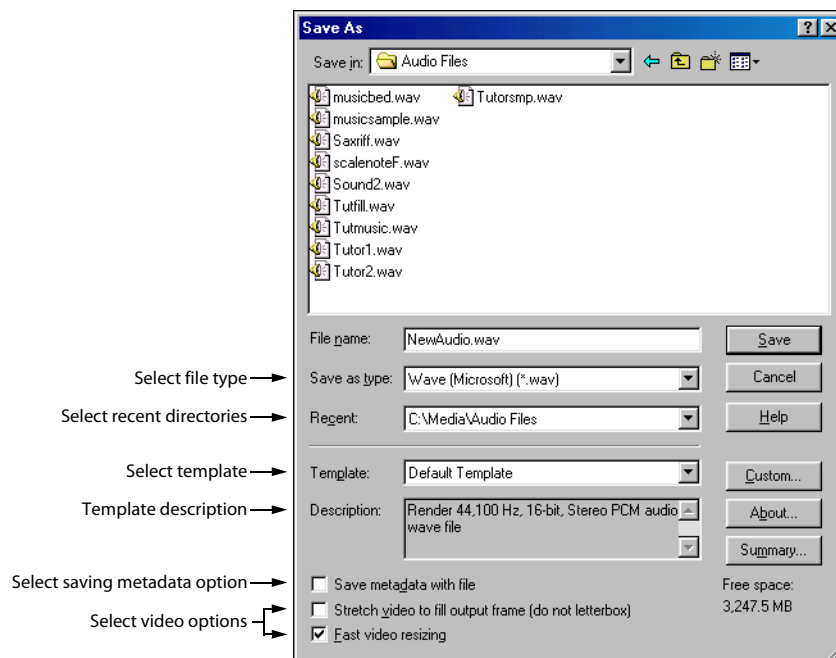
1. Click anywhere in the data window to select it.
2. From the **File** menu, choose **Save**.

**Note:** When saving a new file, the *Save As* dialog is displayed. If the file was previously saved, choosing **Save** automatically saves the file without your input.

## Using the Save As/Render As dialog

The *Save As* dialog allows you to save an audio file with a new name, in an alternate format, or with new attributes.

The *Render As* dialog allows you to render a file using a standard template, or you can customize the settings to suit your needs. Once you create custom settings, you can save those settings as a template.





1. Click anywhere in the data window to select it.
2. From the **File** menu, choose **Save As** to display the Save As dialog.

If you're working with a Sound Forge project file, you can use the Save As dialog to save your project to a different name or location. Choose **Render As** to save your project as a media file.

3. Select the folder where you want to save the file:
  - a. From the **Save in** drop-down list, choose a drive and folder.
  - or--
  - b. From the **Recent** drop-down list, choose a folder where you have previously saved files.
4. In the **File name** box, enter a name for the file or select a file in the browse window to replace the existing file.
5. From the **Save as type** drop-down list, choose a file format.

If the selected file type supports it, you can choose an encoding template from the **Template** drop-down list, or click **Custom** to create a new template. *For more information, see [Creating custom rendering settings](#) on page 54.*

If you know that the file format is unsupported, select **Raw Audio** and click the **Custom** button to display the Custom Template dialog, where you can specify format parameter. *For more information, see [Creating custom templates](#) on page 54.*

6. In the **Template** drop-down list, choose a setting that will be used to save your file, or click the **Custom** button to create a new template. *For more information, see [Creating custom templates](#) on page 54.*

#### Notes:

- When you convert from mono to stereo, the data will be stored in both channels. When converting from stereo to mono, the data from both channels will be mixed to a single channel.
- When determining bit rates, 1K=1024.

7. If you want to preserve metadata (such as embedded data from other applications, regions, markers, commands, playlist, and sampler information) in your file, select the **Save metadata with file** checkbox. For more information see [Using Markers, Regions, and the Playlist/Cutlist](#) on page 95, [Adding summary information](#) on page 88, and [Saving loop points](#) on page 221.

If the check box is not selected, the data will be ignored when you save the file.

**Note:** *If the file type selected in the Save as type drop-down list doesn't support metadata, you are prompted to save the metadata in an external file with an .sfl extension (using the same name as your media file). Metadata can be saved internally for the following file formats: MP3, Windows Media Format (WMA and WMV), WAV, WAV64, SFA, PCA, Scott Studios.*

8. If you are saving to a format with a different aspect ration than your source media settings, then select the **Stretch video to fill output frame (do not letterbox)** check box.

**Note:** *When this check box is not selected, black bars may appear at the top and bottom (letterboxing) or sides (pillarboxing) of the frame to preserve the aspect ration. For more information, see [Saving a video file](#) on page 228.*

9. If you see unacceptable video artifacts in the rendered video (these artifacts are most obvious with MPEG and streaming formats), then clear the **Fast video resizing** check box.


**Note:** *Turning this option off can correct the artifacts, but your rendering times will increase significantly. For more information, see [Saving a video file](#) on page 228.*

10. Click the **Save** button.

## Creating custom templates


If the file type you select supports it, you can create custom settings for saving files by clicking the **Custom** button.

**Note:** *If a file type supports custom templates, a **Custom** button displays next to the **Template** drop-down list after you choose the file type.*


When you click the **Custom** button, a Custom Template dialog is displayed. Adjust the settings for the different template properties as needed. For help on the different settings, click the **Help** button  or press Shift+F1.

When you are finished editing the template properties, click the **OK** button.

## Saving custom templates

You can save a custom template to use again by entering a template name in the **Template** box (in the Custom Template dialog) and clicking the **Save Template** button .

## Deleting custom templates

You can delete a custom template by selecting the template from the **Template** drop-down list (in the Custom Settings dialog) and clicking the **Delete Template** button .

## Creating custom rendering settings

The Custom Template dialog appears when you click **Custom** in the Render As dialog. You can use the Custom Template dialog to create custom encoding templates for many of the file formats available in the software.

1. From the **File** menu, choose **Render As**. The Render As dialog is displayed.
2. Choose your preferred file format from the **Save as type** drop-down list. If the format allows you to create custom settings, the **Custom** button becomes active.
3. Click **Custom**. The Custom Template dialog is displayed.
4. Make the appropriate setting changes for the chosen file format. For help on individual settings, click the **Help** button.

**Tip:** *To save the custom settings for future use, enter a name for the template in the **Template** box and click the **Save Template** button.*

5. Click **OK**. The Custom Template dialog closes.

## Saving all open audio files

Choosing **Save All** from the **File** menu automatically prompts you to save all open audio files on the current workspace.

**Note:** *Pressing Shift while choosing the **Save All** command automatically saves all open files without prompting you to approve each save.*

## Saving files as a workspace

To accommodate complex editing scenarios, you can save the entire workspace as an alternative to saving individual files. Workspaces are saved as Sound Forge Workspace (SFW) files. When you open a workspace file, all files are restored to their previous sizes, positions, and magnification. In addition, each file's current cursor position, custom views, and plug-ins in the Plug-In Chainer are restored. *For more information, see [Creating and using views](#) on page 82 and [Using the Plug-In Chainer](#) on page 160.*

### Saving the current workspace

1. From the **File** menu, choose **Workspace**, and choose **Save As** from the submenu. The Save Workspace dialog is displayed.
2. Browse to the folder where the file will be saved.
3. Enter a name for the file in the **File name** box and click **Save**.

### Opening a workspace

1. From the **File** menu, choose **Workspace**, and choose **Open** from the submenu. The Open Workspace dialog is displayed.
2. Browse to the folder containing the desired SFW file.
3. Select the desired file and click **Open**.

## Working with projects

Projects are new to Sound Forge software; however, if you've used ACID or Vegas software, then you'll be quite familiar with how to use Sound Forge projects. You should note that Sound Forge projects do function slightly different than ACID and Vegas projects.

A project file is not a multimedia file. It contains pointers to the original source files, so you can edit your project nondestructively without changing your source files. When you edit a Sound Forge project, you can undo edit operations even past your last save. *For more information, see [Using undo and redo on page 62](#).*

### Saving the project

1. Click anywhere in the data window to select it.
2. From the **File** menu, choose **Save As** to display the Save as dialog.
3. Select the folder where you want to save the file from one of the following locations:
  - From the **Save in** drop-down list, choose a drive and folder.
  - From the **Recent** drop-down list, choose a folder where you have previously saved files.
4. In the **File name** box, enter a name for the file or select a file in the browse window to replace the existing file.
5. From the **Save as type** drop-down list, choose **Sound Forge Project File (\*.frg)**. Sound Forge software creates a .frg file in the folder you specified and creates a subfolder to store your sound and temporary files.

**Note:** *Since a Sound Forge project contains all your original sound data plus all PCM temporary files, they can take some time to create.*

**Warning:** *Deleting a project's [filename]\_frg folder will break the project.*

## Saving the project path in the rendered file

1. Save your Sound Forge project. The project must be saved before you can embed the project reference in the rendered file.
2. Follow the steps in [Using the Save As/Render As dialog on page 52](#) to choose the file type and location for rendering your files and then select the **Save project as path reference in rendered media** check box.

**Note:** This check box will be unavailable if you did not save your project or if you are rendering using a third-party file-format plug-in.

3. Click **Yes** if you would like to open the file in a new window or click **No** if you would like to close the dialog and return to the Sound Forge window.

**Note:** If you modify the project file after rendering, the project data will no longer match the rendered file. To edit a project using a path reference, the project file and all media must be available on your computer.

## Editing a media file's source project

When your Sound Forge project uses source media files that are rendered with an embedded project path reference, you can easily open the source project in the associated application if you need to edit the media. By saving your project path reference when you render files in ACID, Sound Forge, or Vegas, you can quickly access the media from Sound Forge via the **Edit Source Project** shortcut menu.

**Note:** The project information in the rendered file is only a reference to a project file. If you modify the source project file after rendering, the project data will no longer match the rendered file. To edit a project using a path reference, the project file and all media must be available on your computer.

1. Right-click one of the following items:
  - the waveform in a data window
  - a media file in the Explorer window
2. From the shortcut menu, choose **Edit Source Project**. An ACID, Vegas, or Sound Forge window will open with the source project.

If you are editing a source project using a computer other than the computer where the project was created, then the editing computer must meet the following requirements:

- The software that was used to create the project must be installed and the project file extension (.acd, .acd-zip, .veg, or .frg) must be registered on the editing computer.
  - The editing computer must have the same version (or later) of the software as the computer where the project was created.
  - The project file must exist on the editing computer using the same file path as on the computer where the project was created.
  - The project's source media must exist on the editing computer. If the media files do not use the same file path as on the computer where the project was created, you will be prompted to choose a new folder or replacement files.
3. Edit the project as necessary.
  4. Render the edited project using the same name as the original media file and close the editing application.

**Note:** If you are editing an existing track, your project will automatically be updated with the latest rendered media file.

## Editing audio

New Sound Forge users should remember that even the most complex editing is derived from a few simple operations: copy, paste, cut, delete (clear), trim/crop, and mix. The following table provides a brief description of the basic editing operations.

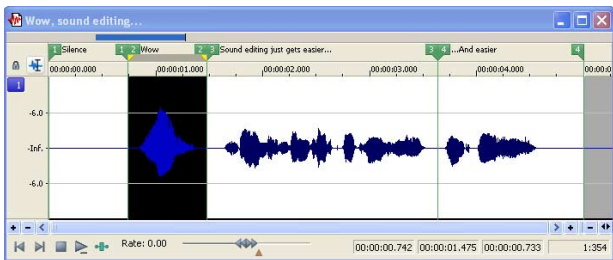
Editing Operation	Description
Copy	Copies data from the window to the clipboard.
Paste	Inserts the contents of the clipboard into the window at the current cursor position. If a selection exists in the data window, the pasted data replaces the current selection.
Cut	Deletes data from the window and copies it to the clipboard.
Delete (Clear)	Deletes data from the window, but does not copy it to the clipboard.
Trim/Crop	Deletes all data in the window with the exception of the selection.
Mix	Mixes data from the clipboard with the data in the current window, starting at the current cursor position or the start of the current selection.


## Copying

You can copy audio data from a data window to the clipboard without changing the original file. Once audio data is on the clipboard, you can paste it into existing files or use it to create new files.

### Copying data to the clipboard

1. Open the `Voiceover.pca` file. This file is located in the same folder as the application.
2. Create a selection containing "Wow."



3. From the **Edit** menu, choose **Copy** (or click the **Copy** button ). The selected data is copied to the clipboard, but the waveform is unchanged.

### Previewing clipboard contents

To preview the contents of the clipboard, choose **Clipboard** from the **View** menu, and choose **Play** from the submenu.

**Tip:** You can display detailed information on the size and attributes of the clipboard contents by choosing **Clipboard** from the **View** menu and **Contents** from the submenu.

### Recycling clipboard contents



Once audio data is on the clipboard, you can paste or mix it into an infinite number of windows. Data remains on the clipboard until you replace it with new data. Pasting

Once audio data is on the clipboard, you can paste or mix it into an existing data window or use it to create a new data window.

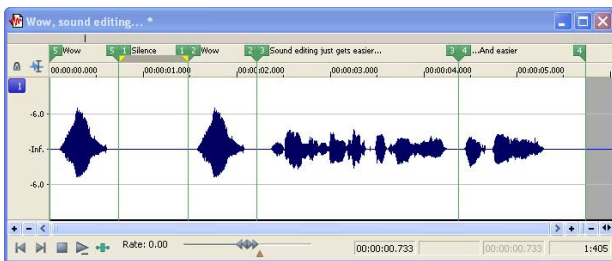
## Pasting data in an existing data window


### Notes:

- Pasting into a multichannel file will insert data to all channels — the channels in a multichannel file must always be equal in length. Silence is pasted to the unselected channel. If multiple channels were selected, the same data would be pasted to all selected channels, and silence would be pasted to the unselected channel. If no channels were selected, the same data would be pasted to all channels.
- Pasting data of different sample rates will cause the data in the clipboard to play at the same rate as the rate of the window in which the data is pasted.
- If any regions, markers, or loops are present in with the original sound data, they will also be pasted into the destination sound file. To turn this feature off, turn off the **Paste Events** command on the **Options** menu.


1. After you have cut or copied your data, move the cursor to the beginning of the Voiceover.pca file by clicking the **Go To Start** button  in the playbar. For more information on cutting or copying data, see [Copying](#) on page 57 or [Cutting](#) on page 59. For more information on the playbar, see [Playbar](#) on page 25.
2. From the **Edit** menu, choose **Paste** (or click the **Paste** button ). The clipboard data is inserted into the file and the data for “Wow” appears on the left side of the waveform.

**Note:** If there is a selection, the **Paste** command deletes the selected data before inserting.




3. To confirm that the data has been pasted into the file, click the **Play All** button . “Wow. Wow. Sound editing just gets easier and easier” plays back.

## Pasting by dragging and dropping a selection

1. Choose the Edit tool .
2. Drag the mouse in the data window to create a selection anywhere in Voiceover.pca.

**Tip:** If the **Always open dropped files in new window** check box on the **General** page of the **Preferences** dialog is cleared, you can also hold **Ctrl** while dragging a file (or region) from the **Explorer** window to a data window to paste sound data. When the check box is selected, dropping a file on the **Sound Forge** workspace always creates a new data window.

3. Hold **Ctrl** and drag the selection to the location where you want to paste the data. The cursor is displayed as a , and a vertical line is displayed to show you where the paste will occur.

**Tip:** When dragging a selection to paste sound data, drag up or down before moving the mouse left or right. Dragging left or right before moving the mouse vertically adjusts the selection length.

4. You can click the right mouse button while dragging to toggle mix and paste drag-and-drop modes.

## Pasting in a new data window

To use data from the clipboard to create a new data window, go to the **Edit** menu, choose **Paste Special**, and choose **Paste to New** from the submenu. A new window containing the clipboard data in a single step is created.

## Cutting

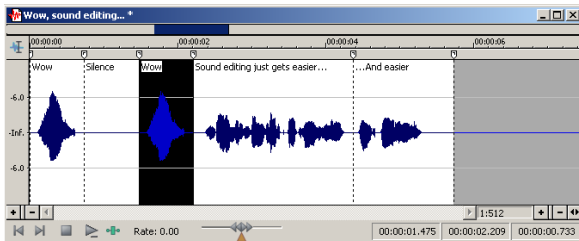
Cutting allows you to remove a section of sound data from a data window and store it on the clipboard until you paste or mix it into another file. Cutting sound data replaces the previous contents of the clipboard. When deciding between cut and copy, consider the following information:


- Copying data has no effect on the original file.
- Cutting data modifies the original file.

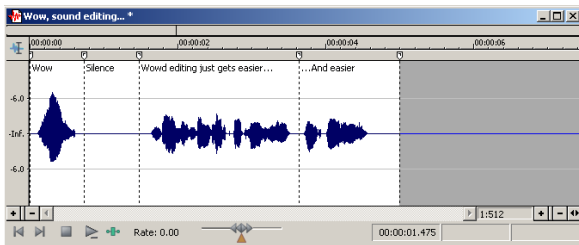
### Cutting data from a window


**Note:** If you cut data from individual channels of multichannel files, the waveform will contain silence at the end of the cut channel. The channels in a multichannel file must always be equal in length.

1. Create a selection containing the second “Wow” (there should be two if you are following the examples) in Voiceover.pca.



2. From the **Edit** menu, choose **Cut** (or click the **Cut** button ). The selected data is removed from the file and placed on the clipboard.



3. Click the **Play All** button (). “Wow. Sound editing just gets easier and easier” plays back.

### Previewing a cut

You can preview cuts prior to performing the edit. This option allows you to determine if you made the selection accurately and if the results are desirable by playing the data before and after the current selection.

1. Create a selection anywhere in Voiceover.pca.
2. From the **Edit** menu, choose **Preview Cut/Cursor** (or press Ctrl+K). The selection is ignored and the audio before and after the selection is played to allow you to preview the cut.

### Notes:

- To set the amount of pre- and post-roll that will be played when you preview a cut, choose **Preferences** from the **Options** menu and choose the **Previews** tab. Enter values in the **Pre-roll** and **Post-roll** boxes in the **Cut preview configuration** section of the dialog.
- If there is no selection, the playback will pre- and post-roll around the cursor position.

## Configuring cut pre-roll and post-roll lengths

Frequently, the default pre-roll and post-roll lengths are insufficient to evaluate the accuracy of an edit. For this reason, you can configure pre-roll and post-roll lengths.

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Previews** tab.
3. Configure the **Pre-roll** and **Post-roll** values in the **Cut preview configuration** area of the dialog and click **OK**.

## Deleting

Deleting a selection permanently removes it without placing it on the clipboard. To delete data, choose **Delete (Clear)** from the **Edit** menu (or press the Delete key).

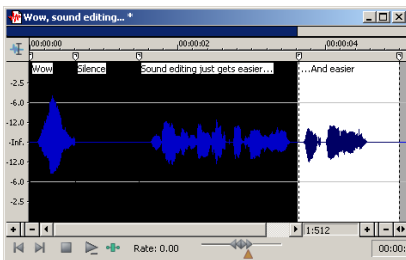
### Notes:

- If you delete data from individual channels of multichannel files, the waveform will contain silence at the end of the deleted channel. The channels in a multichannel file must always be equal in length.
- If the **Treat as Cutlist** command (available in the **Special** menu, **Playlist/Cutlist** submenu) is selected, deleting a selection creates a region in the Cutlist window, but does not remove the selection. For more information, see [Configuring the playlist as a cutlist](#) on page 111.

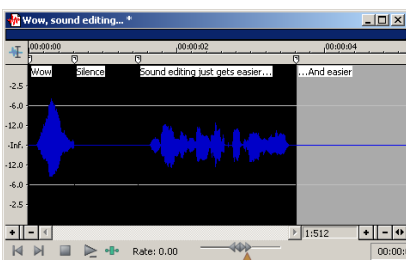
## Trimming/Cropping

Trimming allows you to retain a selection while deleting all surrounding data.

1. Create a selection containing “Wow, sound editing just gets easier” in Voiceover.pca, but do not select the second “and easier.”




2. From the **Edit** menu, choose **Trim/Crop** (or press Ctrl+T). Only “Wow, sound editing just gets easier” remains in the data window.



## Mixing

Mixing is a powerful editing function that allows you to mix a copy of the clipboard contents at the current cursor position.


### Mixing by dragging and dropping a selection

1. Open and play the Drumhit.pca file. The file contains a snare drum and crash cymbal sound.
2. Choose the Edit tool .



3. Drag the mouse over the data window to select the entire waveform.



**Tip:** If the **Always open dropped files in new window** check box on the **General** page of the **Preferences** dialog is cleared, you can also drag a file (or region) from the **Explorer** window to a data window to paste sound data. When the check box is selected, dropping a file on the **Sound Forge** workspace always creates a new data window. For more information, see [General tab](#) on page 240.

4. Drag the selection to the beginning of the **Voiceover.pca** file. The cursor is displayed as a , and a shaded selection box is displayed to show you where the mix will occur.

You can click the right mouse button while dragging to toggle mix and paste drag-and-drop modes.




**Tip:** When dragging a selection within the same data window, drag up or down before moving the mouse left or right. Dragging left or right before moving the mouse vertically adjusts the selection length.

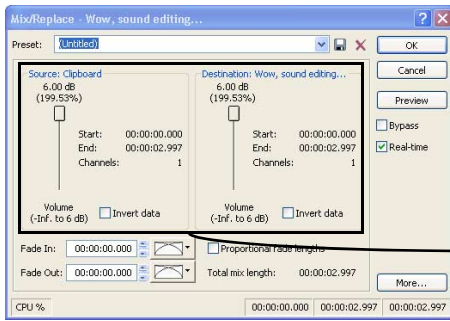
5. When you release the mouse button to drop the selection, the **Mix/Replace** dialog is displayed. Choose a setting from the **Preset** drop-down list, or adjust the controls as needed:

Item	Description
Source	<p>Drag the <b>Source</b> fader to adjust the volume of the selection you want to mix.</p> <p>Changing this setting has the same effect as dragging the sustain portion of the wet gain envelope in the data window. Select the <b>Invert Data</b> check box to invert the source audio at the baseline (reverse the phase). Inverting data can help match transitions and compare the phase relationship of the two sound files.</p>
Destination	<p>Drag the <b>Destination</b> fader to adjust the volume of the selection you want to mix over.</p> <p>Changing this setting has the same effect as dragging the sustain portion of the dry gain envelope in the data window. Select the <b>Invert Data</b> check box to invert the destination audio at the baseline (reverse the phase). Inverting data can help match transitions and compare the phase relationship of the two sound files.</p>
Fade In	<p>Type a value in the <b>Fade In</b> box (or use the spinner) to set the length of the fade in between the source and destination audio.</p> <p>Changing this setting has the same effect as dragging the attack portion of the envelope in the data window.</p> <p>Click the <b>Fade Curves</b> button  and choose a curve type from the menu to set the speed of the fade in.</p>
Proportional Fade Lengths	<p>Select the <b>Proportional fade lengths</b> check box if you want to specify fade lengths as a percentage of the selection.</p>
Fade Out	<p>Type a value in the <b>Fade Out</b> box (or use the spinner) to set the length of the fade out between the source and destination audio.</p> <p>Changing this setting has the same effect as dragging the attack portion of the envelope in the data window.</p> <p>Click the <b>Fade Curves</b> button  and choose a curve type from the menu to set the speed of the fade out.</p>
More	<p>Click to display additional controls at the bottom of the dialog that you can use to change the selection you want to process.</p>

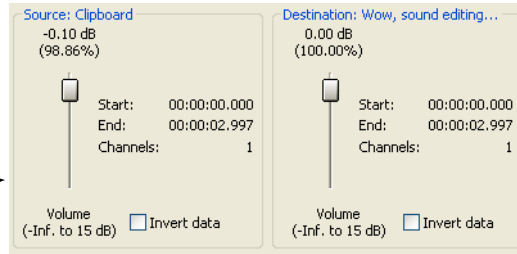
6. Click the **OK** button to apply the mix.

### Mixing audio from the clipboard

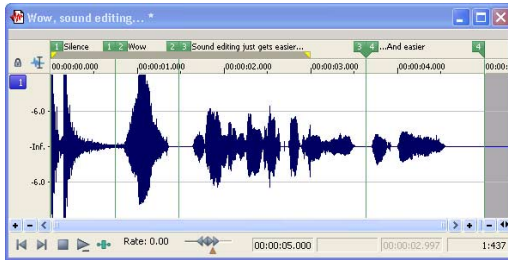
1. Open and play the **Drumhit.pca** file. The file contains a snare drum and crash cymbal sound.
2. Verify that the **Drumhit.pca** window is active and choose **Select All** from the **Edit** menu. The entire waveform is selected.
3. From the **Edit** menu, choose **Copy** (or click the **Copy** button .
4. Activate the **Voiceover.pca** data window and click the **Go To Start** button  on the playbar. The cursor moves to the start of the file.
5. From the **Edit** menu, choose **Paste Special**, and choose **Mix** from the submenu (or click the **Mix** button ). The **Mix/Replace** dialog is displayed.



Set both faders to 0dB



- Verify that the **Source** and **Destination** volume faders are set to 0 dB and click **OK**. The drum hit is mixed equally with the spoken passage.





Both waveforms are combined

Preview the file and notice that mixing does not change the length of the file.

## Using undo and redo

You can easily undo/redo edit operations, even prior to your last save operation.

- You can undo any edit operation by choosing **Undo** from the **Edit** menu (or click the **Undo**  button on the Standard toolbar).
- You can redo any undone edit operation by choosing **Redo** from the **Edit** menu (or click the **Redo**  button on the Standard toolbar).

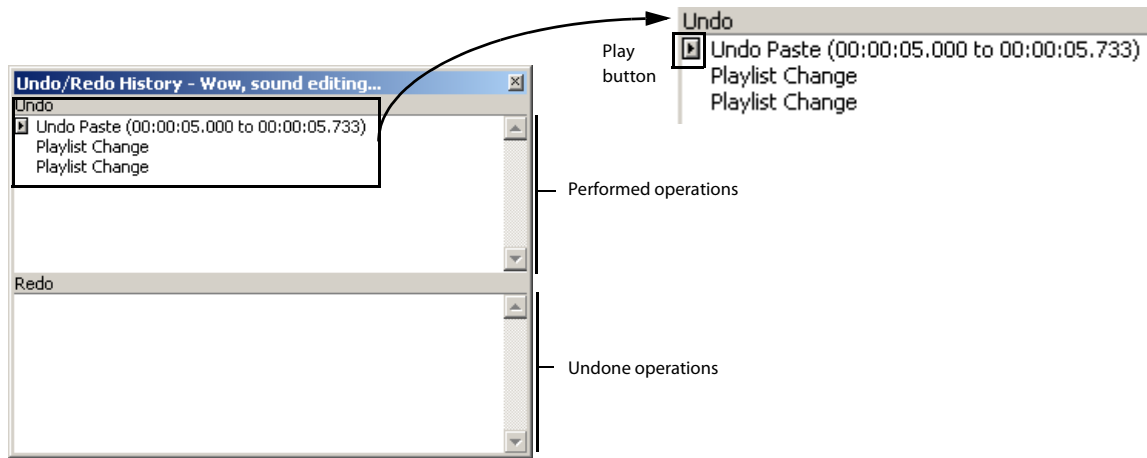
**Important:** The ability to undo past save is disabled by default. To enable this functionality, choose **Preferences** from the **Options** menu, click the **File** tab, and select the **Allow Undo past Save** check box. When this option is enabled, your undo/redo history is retained until you close the file or exit the software.

## Using the Undo/Redo History window

The Undo/Redo History window may seem confusing at first, but you will find it invaluable once you have mastered it. This window allows the audio file to be auditioned in various versions by undoing/redoing multiple operations.

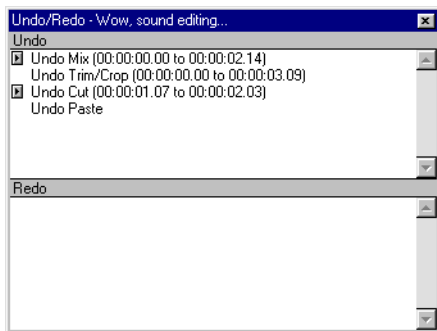
To display the Undo/Redo History window, choose **Undo/Redo History** from the **View** menu (or press Alt+7).

**Note:** The undo/redo history for an audio file is retained until you close the file or exit the software. If you want to retain undo/redo history indefinitely, you should work with a Sound Forge project (.frg) file.




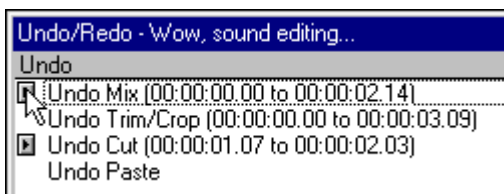
## Undoing and redoing

1. Verify that the Voiceover.pca data window is active and choose **Undo/Redo History** from the **View** menu. The Undo/Redo History window is displayed. If you have performed the previous procedures, the window should look like the figure below:

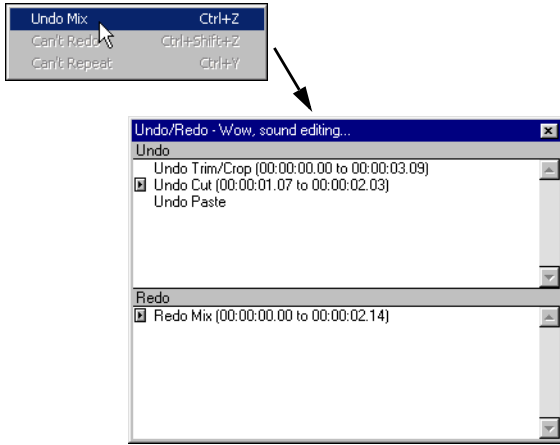




Notice that the **Mix** operation appears at the top of the **Undo** pane. The most recent operations always display at the top of the appropriate list.

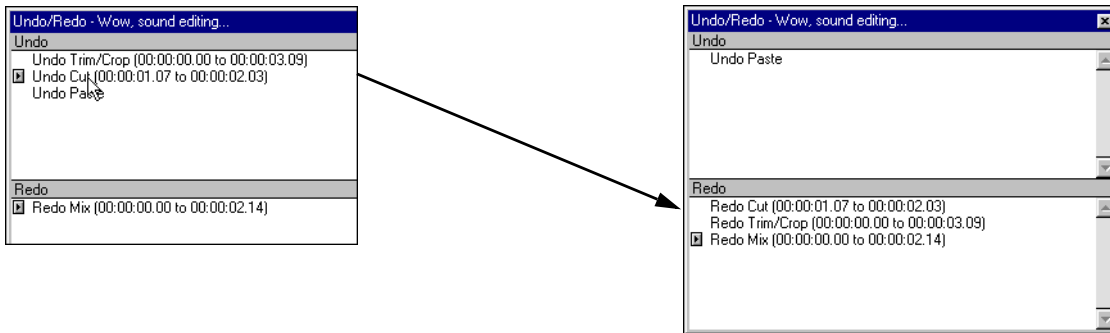
In the **Undo** pane, click the  corresponding to the **Mix** operation. The audio file plays without the drum track.



2. Select the **Mix** operation and choose **Undo** from the **Edit** menu. The drum track is extracted from the Voiceover.pca data window and the **Mix** operation moves to the **Redo** pane.



3. In the **Redo** pane, click the  corresponding to the **Mix** operation. The audio file plays with the mixed drum track.
4. Select the **Mix** operation again and choose **Redo** from the **Edit** menu. The drum track is remixed into the Voiceover.pca waveform and the **Mix** operation is returned to the **Undo** pane.
5. Select the **Trim/Crop** operation in the **Undo** pane and click . Only the **Mix** operation is undone and moved to the **Redo** pane. This is due to the fact that operations can only be undone or redone in the order originally performed.
6. Double-click the **Cut** operation in the **Undo** pane. The **Cut** and **Trim/Crop** operations are both undone in the waveform and moved to the **Redo** pane.



**Tip:** To quickly undo/redone operations in the **Undo/Redo History** window, double-click the operation.

### Clearing the Undo/Redo History for the current file

Clearing the current file's **Undo/Redo History** frees up disk space by deleting the file's temporary undo/redone files. However, deleting these temporary files prevents you from undoing changes made to the file since it was last saved (or beyond, if you have the **Allow Undo past Save** check box enabled on the **General** tab of the Preferences dialog). To clear the undo/redone history for the current file, go to the **Special** menu, choose **Undo/Redo History**, and choose **Clear** from the submenu.

**Note:** A file's undo/redone history is also automatically cleared when you close the file or exit the software.

### Clearing the Undo/Redo History for all open files

You can simultaneously clear the undo/redone history for all open files. Once again, however, you cannot undo any previous changes once these histories are deleted. To clear the undo/redone history for all open files, go to the **Special** menu, choose **Undo/Redo History**, and choose **Clear All** from the submenu.

## Selecting status formats

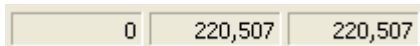
The status format determines how a file's position and length information is displayed. The following table briefly describes supported status formats (hh=hours, mm=minutes, ss=seconds, and ff=frames). For more information, see [SMPTE Timecode](#) on page 265.

Format name	Description	Format
Samples	Number of samples	Numbered (starting with zero)
Time	Hours, minutes, seconds, and milliseconds	hh:mm:ss.sss
Seconds	Seconds and fractions of seconds	sssss.sss (to three decimal places)
Time & Frames	Hours, minutes, seconds, and frames.	hh:mm:ss.ff
Absolute Frames	Frames and fractions of frames	Numbered (starting with zero, to three decimal places)
Measures & Beats	Measures, beats, and quarter beats	measures:beats.quarters
SMPTE Film Sync (24 fps)	SMPTE at 24 frames per second for synchronizing with film	hh:mm:ss:ff
SMPTE EBU (25 fps, Video)	SMPTE at 25 frames per second for European Broadcasting Union	hh:mm:ss:ff
SMPTE Non-Drop (29.97 fps, Video)	SMPTE at 29.97 frames per second	hh:mm:ss:ff
SMPTE Drop (29.97 fps, Video)	SMPTE at 29.97 frames per second using dropped frame numbers	hh:mm:ss:ff
SMPTE 30 (30 fps, Audio)	SMPTE at 30 frames per second	hh:mm:ss:ff

### Experimenting with status formats

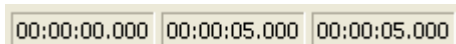
You can experiment with the `Voiceover.pca` file to see how status formats affect values in the selection status bar display boxes.

1. Open the `Voiceover.pca` file.
2. From the **Options** menu, choose **Status Format**, and choose **Samples** from the submenu.
3. Select all data in the `Voiceover.pca` window by choosing **Select All** from the **Edit** menu. Notice the selection status boxes.



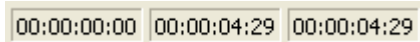
0 220,507 220,507

- The first selected sample is sample 0.
  - The last selected sample is 220,507.
  - The total number of samples in the selection is 220,507.
4. From the **Options** menu, choose **Status Format**, and choose **Time** from the submenu. Notice that status values change from samples to hours, minutes, and seconds.



00:00:00.000 00:00:05.000 00:00:05.000

5. From the **Options** menu, choose **Status Format**, and choose **SMPTE Non-Drop (29.97 fps, Video)** from the submenu. Notice that status values change to hours, minutes, seconds, and frames.



00:00:00:00 00:00:04:29 00:00:04:29

6. Experiment with each status format and make note of how each format displays.

#### Notes:

- Selecting a new format changes the status format for the current data window only.
- To quickly change a file's status format, right-click any of the data window's status display boxes and choose a new format from the shortcut menu.

### Configuring the Measures & Beats format

Choosing the **Measures & Beats** format allows you to specify the beats per minute and beats per measure values used to calculate measures and beats.

### Changing a file's beat values

1. From the **Special** menu, choose **Edit Tempo**. The Edit Tempo dialog is displayed.
2. Enter an appropriate value in the **Tempo in beats per minute** box.
3. Enter an appropriate value in the **Number of beats in a measure** box and click **OK**.

Alternately, you can make a selection in the file equal to one measure, and then enter the number of beats in the sample measure in the **Selection length in beats** box. The **Tempo in beats per minute** value is automatically calculated based on the selection length and number of beats.

### Changing the default beat values

The previous procedure changes the beat values for the current audio file only. Use the following steps to change the Sound Forge default beat values.

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Status** tab.
3. Enter an appropriate value in the **Default beats per measure** box.
4. Enter an appropriate value in the **Default beats per minute** box and click **OK**.

## Publishing to the Web

You can share your media file with others by publishing it to the Web from within the software. You can upload your file to ACIDplanet.com or another publishing provider. From the **File** menu, choose **Publish** and follow the instructions to set up your publishing provider(s) and upload your content.

## Exporting to CD Architect software

You can export your Sound Forge audio files directly to CD Architect 5.2 software.

### Exporting a single audio file

This feature allows you to add your Sound Forge audio files to the CD Architect timeline one file at a time.

1. Open the file that you want to add to your CD Architect project.
2. Click anywhere in the data window that you want to export to establish focus.
3. From the **File** menu, choose **Export to CD Architect**.
  - If CD Architect software is not running, the application will be started and the audio file will be added to the timeline and Media Pool of a new project.
  - If CD Architect software is running, the audio file will be added to the timeline and Media Pool of the open project.

**Note:** *A separate CD track will be created for each region in the media file.*

4. Use CD Architect software to edit your CD project as needed.

## Exporting all audio files

This feature allows you to add all of your open Sound Forge audio files to the CD Architect timeline.

1. Open the file that you want to add to your CD Architect project.
2. From the **File** menu, choose **Export All to CD Architect**.
  - If CD Architect software is not running, the application will be started and all open audio files will be added to the timeline and Media Pool of a new project.
  - If CD Architect software is running, all open audio files will be added to the timeline and Media Pool of the open project.
3. Use CD Architect software to edit your CD project as needed.

## Exporting to Net MD devices

You can export your Sound Forge audio files to your Net MD device.

1. From the **File** menu, choose **Export to Net MD**.
2. Type information about your project:
  - a. In the **Name of track** box, type the name you want to use to identify your audio file on your Net MD device.
  - b. In the **Name of artist** box, type the artist name you want to associate with this track on your device.
  - c. In the **Name of genre** box, type the genre you want to associate with this track on your device.
  - d. In the **Comment for track** box, type any comments you want to associate with this track on your device.
3. Click the **Export** button. Your project is converted to the appropriate format for your device and begins transferring when conversion is complete.

## Recovering files after a crash

If Sound Forge software terminates improperly, you can recover all open and unsaved audio files not opened in read-only mode. When a file is opened, it automatically creates temporary files that it uses to save any changes made to the file. The original file remains unchanged until it is saved. If the software terminates improperly, the temporary files remain on your hard drive and can be used to recover any unsaved changes made prior to the crash.

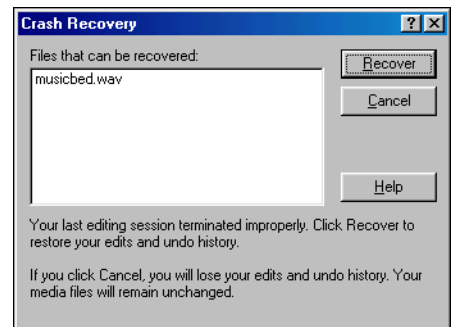
**Tip:** You can specify the folder used to store temporary files by choosing **Preferences** from the **Options** menu and designating a **Temporary files and record folder** location on the **General** tab.

### Recovering files

Click the **Recover** button to restore the changes and undo history for the files listed in the **Files that can be recovered** list.

### Deleting recovered files

Click the **Cancel** button to delete the temporary files. The original media files remain unchanged.







## Chapter 4: Navigating, Zooming, and Selecting

This chapter introduces some of the Sound Forge® navigation and selection features.

### Setting the cursor position

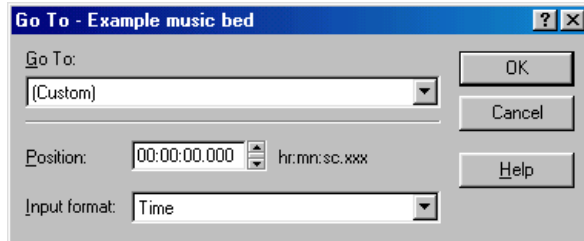
While you can click anywhere in the waveform to position the cursor, there are times when you may need to position the cursor more precisely. You can use the Go To dialog to move the cursor to a specific point in an audio file and center it in the data window.

**Tip:** You can also use a variety of keyboard shortcuts to position the cursor. For more information, see [Cursor movement](#) on page 256.

1. Choose **Go To** from the **Edit** menu.

**Tip:** You can also use the following methods:

- Right-click the waveform, choose **Cursor**, and choose **Go To** from the submenu.
- Press **Ctrl+G**.



2. Set the cursor position using one of the following methods:
  - From the **Go To** drop-down list, choose a preset.
  - From the **Input format** drop-down list, choose a format and enter an appropriate value in the **Position** box.
3. Click **OK**. The cursor is placed at the specified position in the data window.

### Previewing audio with pre-roll

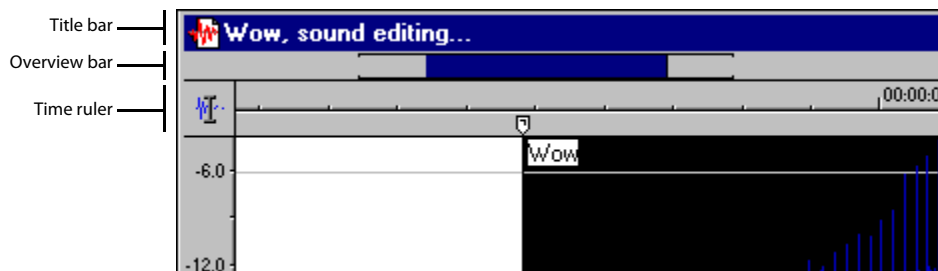
Many audio editing operations depend upon accurate placement of the cursor in the data window. The **Pre-roll to Cursor** command allows you to preview audio data leading up to the current cursor position. This command is extremely useful when recording punch-ins. For more information, see [Choosing a recording mode](#) on page 119.

A 1.5 second pre-roll is automatically designated. However, you can change this value if necessary. For more information, see [Configuring cut pre-roll and post-roll lengths](#) on page 60.

1. Place the cursor anywhere in the data window.
2. From the **Edit** menu, choose **Pre-roll to Cursor** (or press **Ctrl+Shift+K**). The Sound Forge software plays the audio leading up to the cursor and stops at the cursor.

## Using the overview bar

When navigating or editing a file, the overview bar changes to reflect the current position in the file.

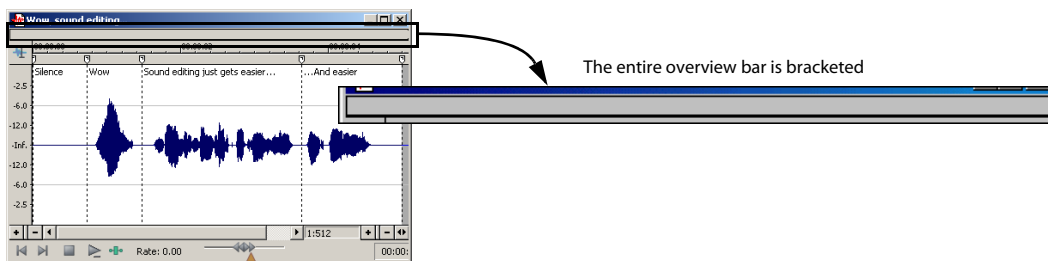


The overview bar represents the length of the entire file zoomed out to its maximum position. By observing the overview bar, you can determine the following items:

- The section of the audio file currently displayed in the data window.
- The location and size of a selection in relation to the audio file and data window.
- The current cursor location.

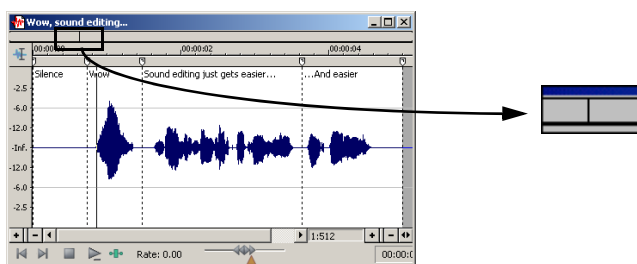
## Understanding the overview bar

1. Open the Voiceover.pca file and verify that the waveform display is zoomed completely out (1:512 in this case).

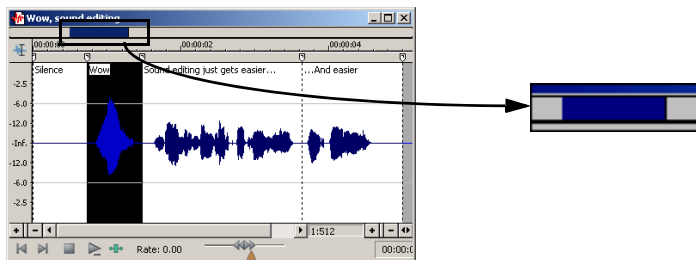



Notice that the entire overview bar is bracketed, indicating that the entire file appears in the data window.

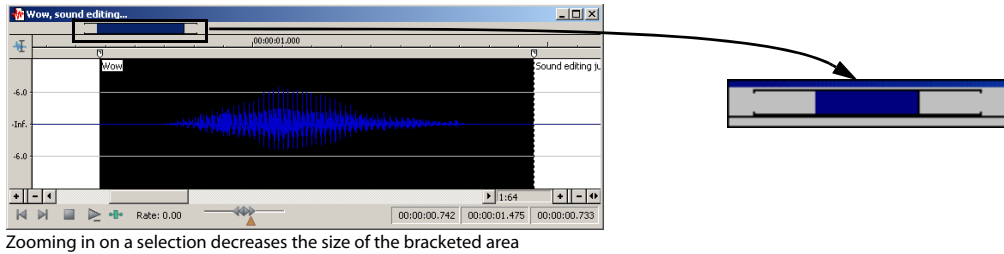
2. Place the mouse pointer over the word "Wow," and click. A small vertical marker, representing the cursor, appears in the overview bar.



3. Create a selection containing the word "Wow." A shaded block, sized in relation to the size of the selection within the entire audio file, appears in the overview bar.




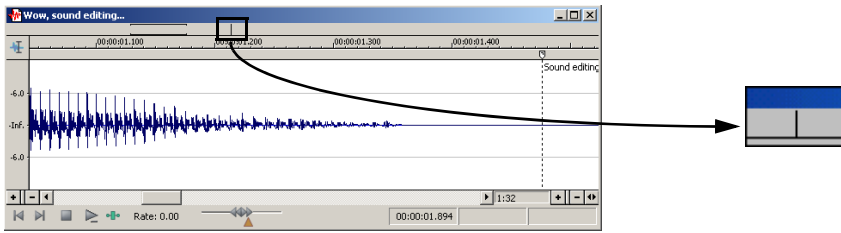
4. Click the **Zoom In** button  twice. The bracketed area in the overview bar becomes incrementally smaller as less of the waveform appears in the data window.



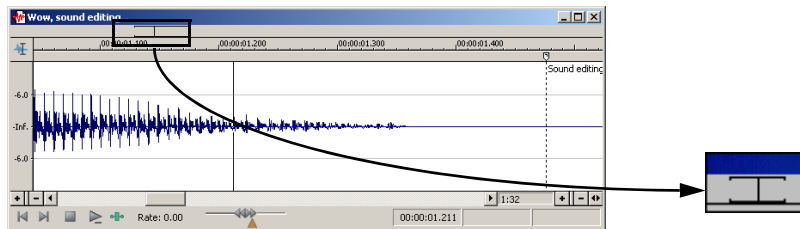
However, the selection remains the same size and does not move. This allows you to quickly locate a selection, even when another section of an audio file is displayed.

### Navigating in the overview bar

1. Open the Voiceover.pca file.
2. Click the **Zoom In** button  until you reach a 1:32 zoom ratio.
3. Click outside the bracketed region in the overview bar. The cursor position changes, but the cursor is located beyond the scope of the data window.



4. Double-click anywhere in the overview bar. The cursor position updates and centers in the data window.



### Playing audio in the overview bar

To make navigating a file from the overview bar easier, you can start audio playback from the overview bar.


1. Open the Voiceover.pca file.
2. Right-click the overview bar. Playback of the file begins from the cursor location.
3. Right-click the overview bar again. Playback pauses.
4. Right-click the overview bar once more and immediately left-click at several random positions in the overview bar. Each time you click the mouse in the overview bar during playback, the cursor jumps to the new location and playback continues. The feature is useful for quickly navigating a file and locating general events.

## Scrubbing


Scrubbing is a type of timeline playback that gives you precise control over the speed and direction of playback. Both linear and logarithmic scale scrubbing are allowed.

**Tip:** Choose a setting from the **JKL/shuttle speed** drop-down list on the **Editing** tab of the **Preferences** dialog to control the scrub speed and range when using the keyboard or multimedia controllers.

### Scrubbing with the scrub control slider

The scrub control slider , located at the bottom of the data window, can be dragged back and forth. The farther from the center that the slider is dragged, the faster the playback, both forward and in reverse.

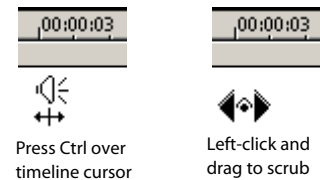


**Note:** You can also drag the **Normal Rate** indicator , which is located below the scrub control, to adjust playback speed or double-click **Rate** and type a playback rate.

### Scrubbing on the timeline

You can scrub the project by using the timeline.

1. Position the cursor on the timeline, hover the mouse pointer over the cursor and press Ctrl. The mouse pointer changes to a speaker icon.
2. Left click and drag the mouse left or right to scrub the timeline. The cursor changes again to a pan/scrub icon.



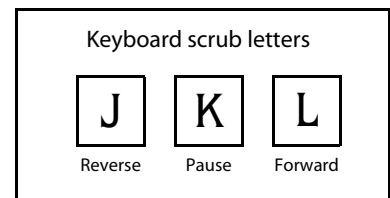
### Scrubbing with the keyboard

Three letters (JKL) are used as a keyboard scrub control.

- Press J for reverse playback. Press again to accelerate the playback rate.
- Press L for forward playback. Press again to accelerate the playback rate.
- Press K to pause playback.

There are several ways to adjust the playback speed:

- Hold K while pressing J or L to emulate a shuttle knob mode.
- Press K+J to turn the knob to the left or K+L to turn the knob to the right.
- Press K again or Space to return to normal mode.



### Scrubbing with the audio event locator

Dragging the mouse within the overview bar initiates playback of small audio loops adjacent to the cursor position. This is not technically a scrub function, but it serves a similar purpose. It allows you to audition brief audio segments and quickly locate specific events within a file. Playback stops when the mouse button is released.

### Configuring the audio event locator

You can set the amount of pre-roll and loop duration for the audio event locator.

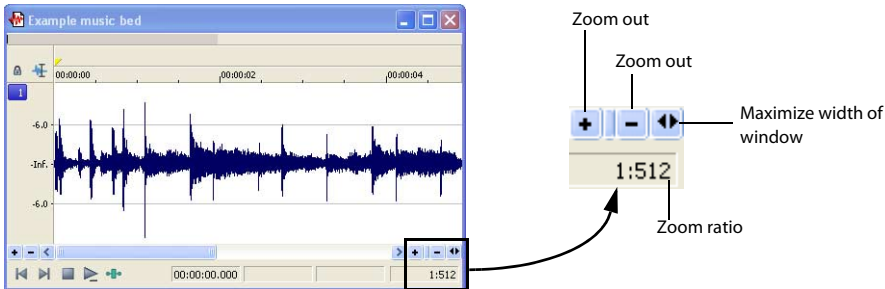
1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Previews** tab.
3. In the **Audio event locator** section, edit the **Pre-roll** and **Loop time** values as desired and click **OK**.

## Zooming and magnifying

Since there are considerably more samples in a sound file than horizontal points (pixels) on the screen, many data samples must be represented by each horizontal point when audio data displays in the data window. Depending upon the editing operation, you may want to view the entire file at once or a small portion of data in greater detail. For this reason, you can utilize two varieties of zooming: time ruler zooming and level ruler zooming.

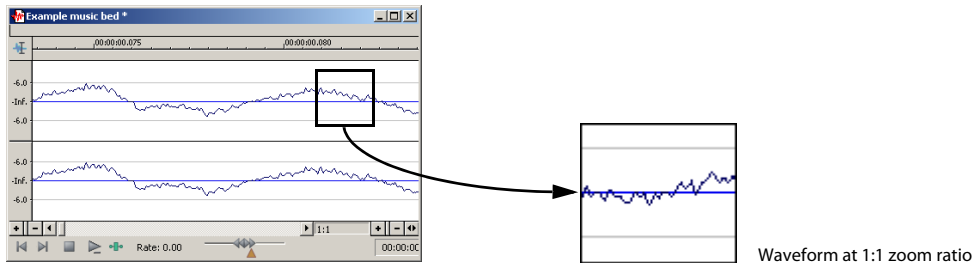
### Zooming the time ruler (horizontal)

The current time ruler magnification ratio appears in the lower-right corner of the data window above the status boxes.



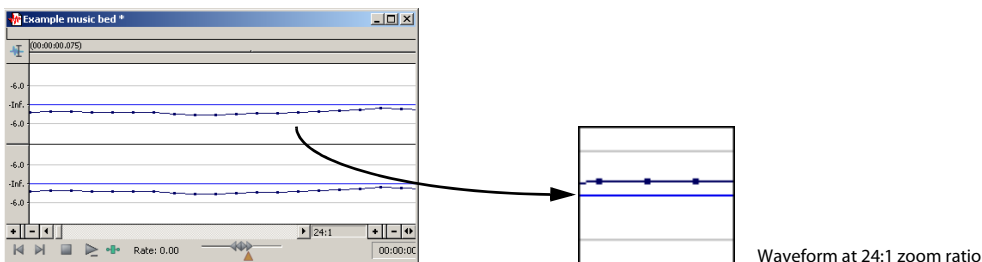
### Understanding the zoom ratio

The zoom ratio determines the number of samples represented by each horizontal point on the screen. The zoom ratio is a value of X:Y, where X is the number of horizontal points and Y is the number of samples. If the ratio is 1:1, each point on the screen represents one sample. At this zoom ratio, a brief but detailed selection of time is displayed.



Conversely, if the zoom ratio is 1:1024, 1,024 samples are represented by each point on the screen and a greater length of time is displayed.

For very precise editing, you may want to zoom in more tightly than a 1:1 ratio. Sound Forge allows up to a 24:1 ratio, where 24 points on the screen represent one sample. This high level of zoom may be useful when editing with the Pencil tool. *For more information, see [Repairing audio glitches manually with the Pencil tool on page 134](#).*



## Changing the zoom ratio

To edit the zoom ratio, use the **Zoom In/Out** spin control located adjacent to the zoom ratio display.

- Clicking the plus/minus buttons increases/decreases the zoom ratio by single-step increments.
- Dragging the spin control increments the zoom ratio quickly in the corresponding direction.

### Notes:

- When a file is opened, the horizontal magnification is set to the value specified by the **Normal zoom ratio** setting in the **Display** tab in the **Preferences** dialog. To access the **Preferences** dialog, choose **Preferences** from the **Options** menu.
- Right-clicking the waveform display allows you to quickly access time ruler zoom commands from the shortcut menu.

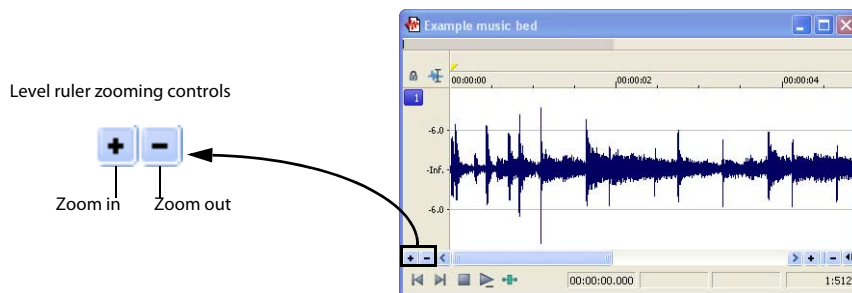
## Using zoom time commands

If you prefer using commands, you can control the time magnification from the **View** menu. The following table briefly describes the available time zoom commands. You can access these commands from the **View** menu by choosing **Zoom Time** and choosing the desired command from the submenu.

Command	Description
In Full	Increases the zoom ratio to represent each audio sample with 24 screen pixels (24:1 zoom ratio).
Normal	Returns the file to its default zoom ratio.
Out Full	Changes the zoom ratio to display the entire file within the data window.
Selection	Changes the zoom ratio to maximize the display and center the selection within the data window.
Custom Zoom X:Y	Sets the zoom ratio to a custom setting. For more information, see <a href="#">Using custom zoom settings</a> on page 75.

## Zooming the level ruler (vertical)

Zooming along the level ruler displays a larger vertical waveform and allows for more precise editing at low audio amplitudes.



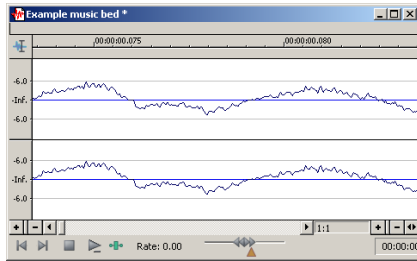
## Changing the level zoom

To edit the level ruler zoom, use the **Zoom In/Out** spinner control located above the playbar.

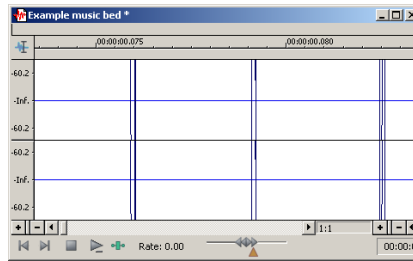
- Clicking the plus/minus buttons increases/decreases the level ruler zoom by single-step increments.
- Dragging the spin control increments the level ruler zoom quickly in the corresponding direction.

At high zoom levels, only low-level samples are visible because the peaks of the waveform move beyond the vertical scope of the data window. Consider the following data windows.

Level zoom out maximum



Level zoom in maximum



Both data windows display the same audio file at a 1:1 zoom ratio. The window on the left shows the level ruler zoomed to its maximum out position. The window on the right shows the level ruler zoomed to its maximum in position. Notice that wave peaks clearly visible in the left window are out of display range in the right window.

### Using zoom level commands

If you prefer using commands, you can control the level magnification from the **View** menu. The following table briefly describes the three available zoom level commands. You can access these commands from the **View** menu by choosing **Zoom Level** and choosing the desired command from the submenu.

Command	Description
Out Full	Decreases the zoom level to minimize the display of the file's amplitude.
Window	Changes the level zoom to display the entire waveform amplitude in the data window.
Selection	Maximizes the display of the selection (vertically and horizontally) in the data window.

### Formatting the level ruler

You can configure the level ruler to display in decibels or percent by right-clicking the ruler and choosing **Label in Percent** or **Label in dB** from the shortcut menu.

### Using custom zoom settings



You can create two custom time zoom settings for quick access to time magnification levels that you use frequently.

#### Creating custom zoom settings

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Display** tab.
3. Select time magnification settings from the **Custom zoom ratio 1** and **Custom zoom ratio 2** drop-down lists.
4. Click **OK**.

#### Zooming to custom settings

From the **View** menu, choose **Zoom Time**, and choose a custom zoom setting from the submenu.

**Tip:** You can also click a **Custom Zoom** button  or  on the Navigation toolbar or press 1 or 2 on the numeric keypad.

## Using zooming shortcuts

### Zooming to a selection

1. Create a selection. If no selection is created, this function is not available.
2. Right-click the waveform and choose **Zoom Selection** from the shortcut menu. The minimum zoom ratio that allows the full selection to display in the window is calculated, and the selection is then zoomed and centered in the data window.

**Note:** To reverse this function, right-click the waveform, choose **Zoom**, and choose **Out Full** from the submenu.

### Zooming the window

Right-click the level ruler and choose **Zoom Window** from the shortcut menu. The maximum zoom level that allows the loudest portion of the selection to display in the window is calculated and the entire sound file is adjusted.

**Note:** To reverse this function, right-click the level ruler and choose **Zoom Out Full** from the shortcut menu.

### Zooming out full

To quickly display all data in a data window, right-click the waveform, choose **Zoom**, and choose **Out Full** from the submenu. This command sets the zoom ratio and zoom level to the lowest values required to display all data in the window.

**Note:** To reverse this function, go to the **View** menu, choose **Zoom Time**, and choose **Normal** from the submenu.

### Zooming in full

To quickly set the zoom factor to its maximum magnification, right-click the waveform and choose **Zoom In Full** from the shortcut menu. The maximum magnification available is 24:1.


**Note:** To reverse this function, right-click the waveform and choose **Zoom Normal** from the shortcut menu.


## Optimizing time and level ruler scaling

To optimize both the time ruler and level ruler display of a selection, double-click the level ruler. Double-clicking the level ruler a second time restores both displays to their default levels.

## Using the Magnify tool

The Magnify tool provides an additional way to magnify a section of an audio file. You can access the Magnify tool in three ways:

- From the **Edit** menu, choose **Tool**, and choose **Magnify** from the submenu.
- Click the **Magnify Tool** button  on the Standard toolbar.
- Click the Edit Tool Selector in the upper-left corner of the data window until the Magnify tool is displayed.

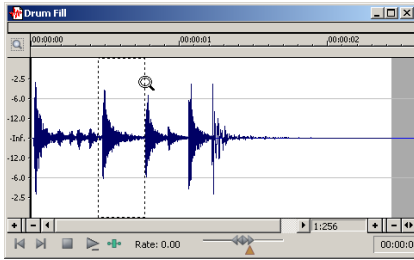
When you select the Magnify tool, the cursor displays as . You can use this tool to create a selection box indicating how audio data is magnified. By using the Magnify tool and toggle-clicking the mouse, you can toggle between time zoom, level zoom, and simultaneous time/level zoom. For more information, see [Using the mouse](#) on page 19.

### Zooming the time ruler with the Magnify tool

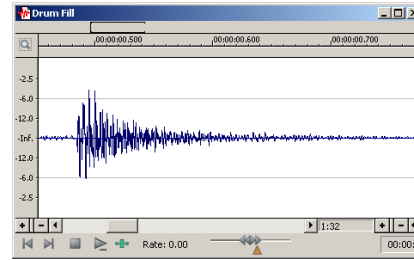
1. Drag the Magnify tool on the waveform to make a small selection box.
2. Toggle-click the mouse until the selection box is the same height as the data window.



3. Drag the Magnify tool to create a time zoom selection and release the mouse button. The zoom ratio of the selection increases.



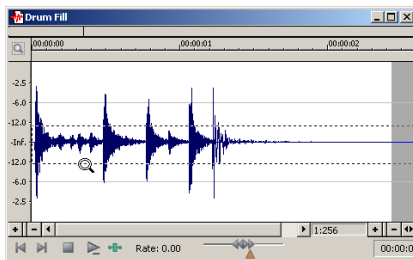
Selection box spans the height of the window



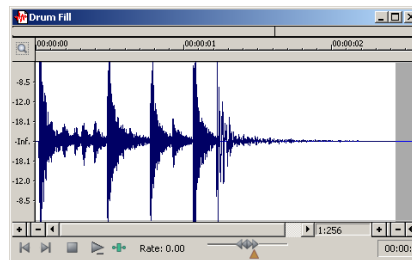
The selection is time zoomed

### Zooming the level ruler with the Magnify tool

1. Drag the Magnify tool on the waveform to make a small selection box.
2. Toggle-click the mouse until the selection box is the full width of the data window.
3. Drag the Magnify tool to create a level zoom selection and release the mouse button. The zoom ratio of the selection increases.



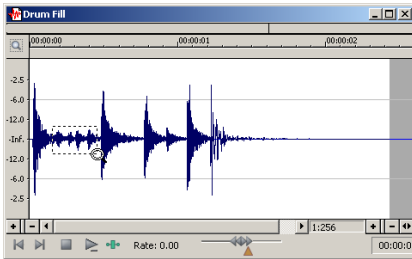
Selection box spans the width of the window



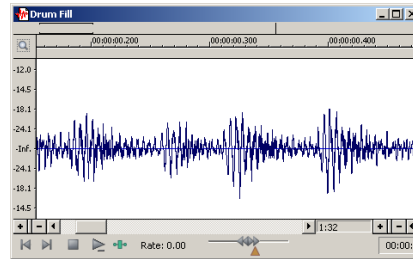
The selection is level zoomed

## Zooming both time and level with the Magnify tool

1. Drag the Magnify tool on the waveform to make a small selection box.
2. Toggle-click the mouse until the selection displays as a box.
3. Drag the Magnify tool to create a time/level zoom selection and release the mouse button. The level zoom and time zoom of the selection increase.



Selection displays as a box



The selection time and level are zoomed

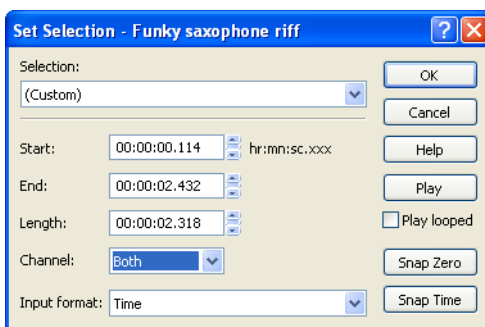
## Selecting audio using start and end values

You can select audio by dragging the mouse or by using keyboard shortcuts (pg. 257). For the sake of accuracy, however, it is often useful to create selections by entering specific start and end point values. The Set Selection dialog allows you to create selections in this way or by choosing a preset selection from the **Selection** drop-down list.

1. From the **Edit** menu, choose **Selection**, and then choose **Set** from the submenu (or press Ctrl+Shift+D). The Set Selection dialog is displayed.
2. From the **Input format** drop-down list, choose the format to be used for creating the selection. The values in the **Start**, **End**, and **Length** boxes change to reflect the specified format.
3. Configure the selection by entering appropriate values in the **Start** and **End** or the **Start** and **Length** boxes.
4. If you are working with a stereo file, choose **Left**, **Right**, or **Both** from the **Channel** drop-down list, or, for a multichannel file, type the appropriate channel number(s) in the **Channel** box.
5. Click **OK**.

## Using the Set Selection dialog

The following sections briefly describe additional controls located in the Set Selection dialog.



Control	Description
Play	Clicking <b>Play</b> plays the current selection.
Play looped	Selecting the <b>Play looped</b> check box allows you to play the selection in Looped Playback mode.
Snap Zero	Clicking <b>Snap Zero</b> forces the <b>Start</b> and <b>End</b> values of the selected area to the next zero-crossing.
Snap Time	Clicking <b>Snap Time</b> forces the <b>Start</b> and <b>End</b> values of the selected area to a whole time division as designated by the markings on the data window's time ruler.

## Zero-crossing preference

When using a **Snap-Zero** command, you can configure the application to snap to positive slope, negative slope, or either slope zero-crossings.

1. From the **Options** menu, choose **Preferences**, and click the **Editing** tab.
2. From the **Snap to zero-crossing slope** drop-down list, choose the desired slope and click **OK**.

## Selecting audio during playback

You can create selections during playback using the **Mark In** and **Mark Out** commands. These commands place temporary markers in the data window, which are then used to create a loop region. While you can place these markers by choosing **Mark In** and **Mark Out** from the **Special** menu, the keyboard equivalents are more useful.

1. Play the audio file in the current data window.
2. During playback, press **I** where the selection will begin.
3. Press **O** where the selection will end. A loop region is created using the in and out points you identified.

## Fine-tuning a selection

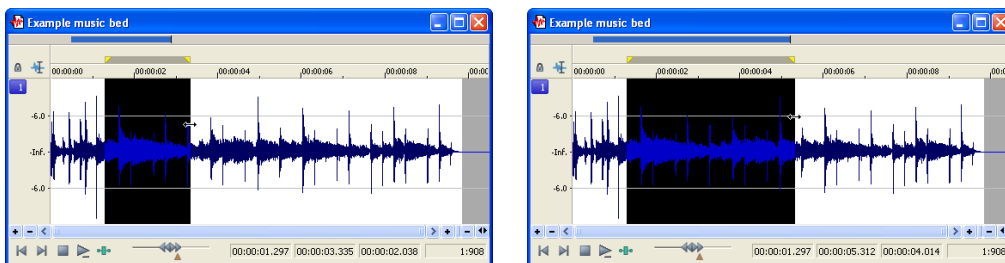
After creating a selection, you may discover that the start or end point has not been positioned properly. In cases like this, you can try to reselect the data, but it can be difficult to accurately create selection points. For this reason, you have a number of tools designed to help you fine-tune selections.

If you find that the selection jumps unexpectedly as you fine-tune it, snapping may be turned on. *For more information, see [Understanding snapping on page 80](#).*

## Adjusting a selection with the mouse

You can fine-tune selection start and end points by dragging the edge of the selection to a new location.

1. Open a file and create a selection in the waveform.
2. Position the mouse pointer over one of the selection edges. The pointer displays as a bi-directional arrow  $\leftrightarrow$ .
3. Drag the selection edge to a new position.



Drag the edge of the selection to a new position.

4. Release the mouse button. The selection updates.

## Adjusting a selection with the keyboard

Using the keyboard, you can quickly and accurately select data or update a selection. *For more information, see [Selecting data on page 257](#).*

## Restoring a selection

If you lose a selection while editing, you can restore it by choosing **Toggle Selection** from the **Special** menu or by pressing **Backspace**.

## Understanding snapping

If, when extending a selection, the end points seem to “jump” to a different position, an auto snap option is turned on.

### Turn snapping on or off

From the **Options** menu, choose **Enable Snapping** to turn snapping on or off. When snapping is enabled, objects will snap to the following points:

- The cursor
- Time selection edges

You can also choose to snap events to grid divisions, markers, or zero crossings.

### Snapping to the grid

When snapping is enabled, you can also choose to have objects snap to whole time divisions as designated by the marks on the time ruler above the data window.

From the **Options** menu, choose **Snap to Grid** to toggle snapping to grid lines.

**Tip:** To change the resolution of the grid, choose **Status Format** from the **Options** menu and then choose a setting from the submenu (or right-click the time ruler and choose a format from the shortcut menu).

### Snapping to markers

When snapping is enabled, you can also choose to have elements in the data windows snap to markers.

From the **Options** menu, choose **Snap to Markers** to toggle snapping for the following marker types:

- Markers
- Regions
- Command markers

For more information, see [Using Markers, Regions, and the Playlist/Cutlist](#) on page 95.

### Snapping to zero-crossings

When snapping is enabled, you can also choose to have elements in the timeline snap to zero-crossings.

From the **Options** menu, choose **Snap to Zero Crossings** to toggle snapping to zero crossings.

**Tip:** To turn **Snap to Zero Crossings** on and off, press Ctrl+B.

### Snapping the current selection

From the **Edit** menu, choose **Selection**, and then choose a command from the submenu to force the edges of the current selection to the points you choose. Snapping helps you align your selection with items in the data window.

**Note:** If you want to use snapping when positioning the cursor and making selections, you can use the commands on the **Options** menu to enable snapping and set snapping options.

The **Selection** submenu commands are explained below:

Command	Description
Snap to Grid	<p>This option forces both edges of a selection to a whole time division as designated by the marks on the time ruler above the data window.</p> <p><b>Tips:</b></p> <ul style="list-style-type: none"><li>You can also press T.</li><li>To change the resolution of the grid, choose <b>Status Format</b> from the <b>Options</b> menu and then choose a setting from the submenu (or right-click the time ruler and choose a format from the shortcut menu).</li></ul>
Snap Edge to Grid	<p>This option forces the active edge of a selection to a whole time division as designated by the marks on the time ruler above the data window.</p> <p>The active edge of a selection is defined by the blinking cursor. Press Home or End to change the active edge.</p> <p><b>Tips:</b></p> <ul style="list-style-type: none"><li>You can also press Shift+T.</li><li>To change the resolution of the grid, choose <b>Status Format</b> from the <b>Options</b> menu and then choose a setting from the submenu (or right-click the time ruler and choose a format from the shortcut menu).</li></ul>
Snap to Zero	<p>This option forces both edges of a selection to the next zero-crossing of the waveform. Performing edits at zero-crossings reduces the possibility of introducing glitches in your sound file.</p> <p><b>Tips:</b></p> <ul style="list-style-type: none"><li>You can also press Z.</li><li>The <b>Editing</b> tab in the Preferences dialog allows you to choose whether this is a negative, positive or any zero-crossing.</li></ul>
Snap Edge to Zero	<p>This option forces the active edge of a selection to the next zero-crossing of the waveform. Performing edits at zero-crossings reduces the possibility of introducing glitches in your sound file.</p> <p>The active edge of a selection is defined by the blinking cursor. Press Home or End to change the active edge.</p> <p><b>Tips:</b></p> <ul style="list-style-type: none"><li>You can also press Shift+Z.</li><li>The <b>Editing</b> tab in the Preferences dialog allows you to choose whether this is a negative, positive or any zero-crossing.</li></ul>
Extend to Next Zero	<p>This option forces both edges of a selection to the next zero-crossing of the waveform. Performing edits at zero-crossings reduces the possibility of introducing glitches in your sound file.</p> <p><b>Tips:</b></p> <ul style="list-style-type: none"><li>You can also press Z.</li><li>The <b>Editing</b> tab in the Preferences dialog allows you to choose whether this is a negative, positive or any zero-crossing.</li></ul>
Extend Edge to Next Zero	<p>This option forces the active edge of a selection to the next zero-crossing of the waveform. Performing edits at zero-crossings reduces the possibility of introducing glitches in your sound file.</p> <p>The active edge of a selection is defined by the blinking cursor. Press Home or End to change the active edge.</p> <p><b>Tips:</b></p> <ul style="list-style-type: none"><li>You can also press Shift+Z.</li><li>The <b>Editing</b> tab in the Preferences dialog allows you to choose whether this is a negative, positive or any zero-crossing.</li></ul>

## Disabling auto-snapping at high magnifications

When editing an audio file displayed at a high magnification, you may wish to turn off snapping to time or zero-crossings. This allows you to position a selection's start and end points exactly where you choose.

1. From the **Options** menu, choose **Preferences**, and click the **Editing** tab.
2. Select the **Disable auto-snapping below 1:4 zoom ratios** check box and click **OK**.

## Creating and using views

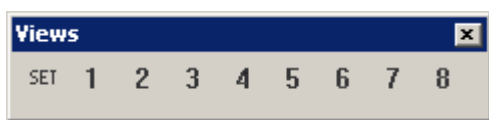
Views are used to save and recall selections, zoom ratios, and waveform display positions. The Sound Forge software can retain eight different views for any audio file, each containing any or all of the following elements:

- Selection
- Cursor position
- Magnification
- Position scroll bar placement

**Tip:** Views are discarded when you close the file. To save views with a file, save the file as part of a workspace. For more information, see [Saving files as a workspace](#) on page 54.


### Displaying the Views toolbar

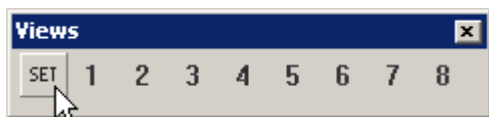
1. From the **View** menu, choose **Toolbars**.
2. Select the **Views** check box and click **OK**. The Views toolbar is displayed.



Views toolbar

### Creating views

1. Open the Voiceover.pca file and create a selection containing "Wow."
2. Click the **Set** button  on the Views toolbar. A view can now be created.







Click the Set button

3. Click . The selection is saved as view 1 and  is underscored to indicate that a view was created.



The 1 button is underscored to indicate that a view was created.

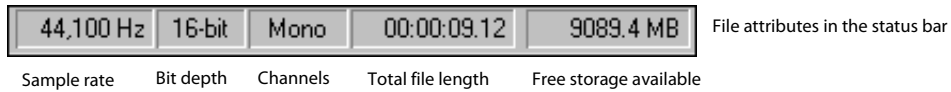
4. Create a new selection anywhere in the audio file, preferably at an increased magnification.
5. Click the **Set** button  followed by . The selection is saved as view 2.
6. Click . The view 1 selection is displayed.
7. Click . The view 2 selection is displayed.

## Chapter 5 Changing File Attributes and Formats

This chapter deals with the supported file attributes and formats in Sound Forge® software and discusses file summary information.

### Editing file attributes

When you open or create a file, its attributes display in the first four boxes of the status bar at the bottom of the Sound Forge workspace. The file attributes are sample rate, bit depth, channels, and length.



With the exception of the file length, you can edit audio file attributes in the Properties dialog or from the status bar.

### Editing attributes in the Properties dialog

You can edit file attributes in the Properties dialog.

1. From the **File** menu, choose **Properties**. The Properties dialog is displayed.

**Tip:** You can also access the Properties dialog by performing either of the following actions:

- Right-click the waveform display and choose **Properties**.
- Press **Alt+Enter**.

2. Click the **Format** tab.
3. Edit the file attributes as needed and click **OK**.



### Editing attributes in the status bar

You can quickly edit individual file attributes from the status bar using either of the following methods:

- Right-click the status value to be changed and choose a new value from the shortcut menu.
- Double-click the status value to be changed and type a new value in the edit box.

## Changing the sample rate

The sample rate is the number of samples per second, measured in hertz (Hz), used to record audio. You can specify sample rates from 2,000 Hz to 192,000 Hz. Typical sample rates are stored as presets in the **Sample rate** drop-down list. In addition, you can increase or decrease the sample rate of an existing audio file.

1. Open and play the Voiceover.pca file.

**Note:** This file is located in the same folder as the application.

2. Right-click the **Sample Rate** status box and choose **48,000** from the shortcut menu.
3. Play the file. Notice that the pitch is higher and the duration is slightly shorter.
4. Right-click the **Sample Rate** status box and choose **8,000** from the shortcut menu.
5. Play the file. Notice that the pitch is lower and the duration is longer.

Changing the sample rate of a file also changes the pitch and duration. To change the sample rate of a file while preserving its duration and pitch, use the **Resample** command. For more information, see [Resample](#) on page 154.

## Changing the bit depth

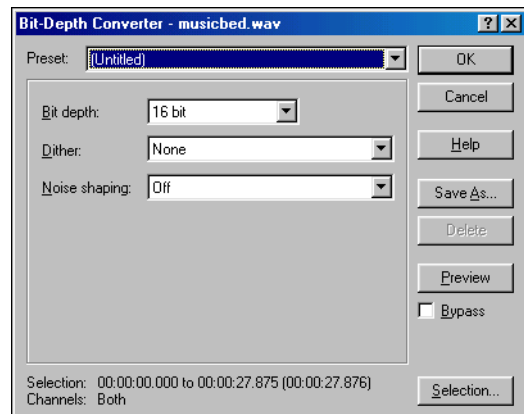
Bit depth refers to the number of bits used to represent a sound. You can increase or decrease a file's bit depth.

### Increasing bit depth

Increasing the bit depth does not improve the quality of a file, but it allows subsequent processing to be performed with increased precision.

1. Open a file with a small bit depth.
2. From the **Process** menu, choose **Bit-Depth Converter**. The Bit-Depth Converter dialog is displayed.
3. From the **Bit depth** drop-down list, choose a larger value and click **OK**.

**Note:** When increasing a file's bit depth, the **Dither** and **Noise shaping** controls should be set to **None** and **Off**, respectively.



### Decreasing bit depth

To maximize storage space, larger sound files (24- and 16-bit) are frequently converted to smaller (16- and 8-bit) files. However, representing a sound file at a decreased bit depth results in audible distortion referred to as quantization error.

1. Open a 16-bit file.
2. From the **Process** menu, choose **Bit-Depth Converter**. The Bit-Depth Converter dialog is displayed.
3. From the **Bit depth** drop-down list, choose **8 bit**.
4. If desired, choose an option from the **Dither** drop-down list. For more information, see [Dither](#) on page 85.
5. If desired, choose a **Noise shaping** type. For more information, see [Noise shaping](#) on page 85.
6. Click **OK**.

**Note:** There are no rules regarding maintaining audio quality when decreasing bit depth. Experiment with the **Dither** and **Noise shaping** controls to determine the optimum settings for each audio file.



## Understanding dither and noise shaping

You can adjust **Dither** and **Noise shaping** settings when decreasing a file's bit depth.

### Dither

The **Dither** value determines the randomness of the dither (generated noise) used to mask quantization distortion resulting from conversion to a lower bit depth. This drop-down list requires you to select from several shapes, each of which roughly describes the pattern that would be produced if you plotted a graph with the dither amplitude on the X-axis and the probability of the dither values on the Y-axis.

As is frequently the case when working with audio, you should experiment with dither values to yield the best results. However, keep the following information in mind:

Setting	Description
Half Rectangular	Eliminates distortion resulting from conversion to a lower bit depth, but the noise level is more likely to be dependent on the signal. This setting uses a maximum dither noise amplitude of 0.5 LSB (least significant bit).
Rectangular	Identical to <b>Half Rectangular</b> , but with a maximum dither noise amplitude of 1 LSB (least significant bit).
Triangular	Eliminates distortion products as well as any noise floor modulation, but results in a slightly higher noise level. The option typically works well in conjunction with noise shaping. For more information, see <a href="#">Noise shaping on page 85</a> .
Highpass Triangular	Behaves like triangular dither, but shifts its noise into higher frequencies. This is typically the best option when used in conjunction with noise shaping. For more information, see <a href="#">Noise shaping on page 85</a> .
Gaussian	Does not perform as well as Rectangular and Triangular dither, but may be suitable for certain audio.

### Noise shaping

The **Noise shaping** value determines the aural positioning of quantization noise. Using this control, you can shift the noise into audio registers that are less perceptible to human hearing. This lowers the perceived noise floor and creates the illusion of cleaner audio.

- **High-pass contour** noise shaping attempts to push all quantization noise and error into high frequencies.
- **Equal-loudness contour** noise shaping attempts to push the noise under an equal-loudness type of curve.

### Noise shaping dangers

Noise shaping places quantization noise near the audio's Nyquist frequency, a value equal to one-half of the file's sample rate. Consider the following information:

- A file with a sample rate of 44.1 kHz has a Nyquist frequency of 22.05 kHz (at the high end of human hearing). Applying noise shaping to this file results in audio perceived to be cleaner than it actually is.
- A file with a sample rate of 22 kHz has a Nyquist frequency of 11 kHz (well within the sensitive range of human hearing). Applying noise shaping to this file results in audio that is perceived to be noisier than it actually is. Ironically, this defeats the entire purpose of noise shaping.

For this reason, we do not recommend using noise shaping on files with sample rates less than 44.1 kHz.

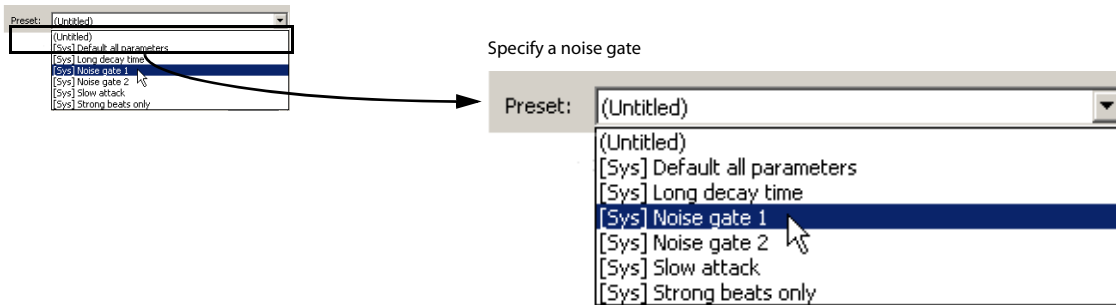
### Minimizing quantization error

There are at least three methods of minimizing quantization error when decreasing a file's bit depth: noise gating, compression, and normalization.

## Noise gating

Frequently, low-level signals become noise when a file's bit depth is decreased. For this reason, it is preferable to have complete silence between sounds in an audio file.

1. From the **Effects** menu, choose **Noise Gate**. The Noise Gate dialog is displayed.



2. Choose a noise gate preset from the **Preset** drop-down list and click **OK**. A noise gate is applied to the audio, negating its low-level signals.

## Compressing

Decreasing the dynamic range of a sound file makes it easier to represent with decreased bit depth.

1. From the **Effects** menu, choose **Dynamics**, and choose **Graphic** from the submenu. The Graphic Dynamics dialog is displayed.
2. Choose a preset with a small amount of compression (2:1 or less) from the **Preset** drop-down list and click **OK**.

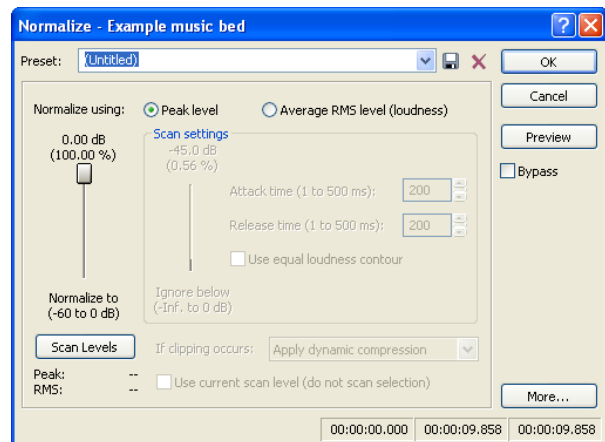
## Normalizing

Normalizing a file prior to decreasing its bit depth ensures that the entire dynamic range is used. In addition, normalization lowers the signal-to-noise ratio.

1. From the **Process** menu, choose **Normalize**. The Normalize dialog is displayed.
2. Select the **Peak level** radio button.
3. Set the **Normalize to fader** to 0 dB (peak) and click **OK**.

## Applying compression and normalization simultaneously

1. From the **Process** menu, choose **Normalize**. The Normalize dialog is displayed.
2. Select the **Average RMS level** radio button.
3. Specify **Apply dynamic compression** in the **If clipping occurs** drop-down list and click **OK**.



## Converting mono/stereo channels

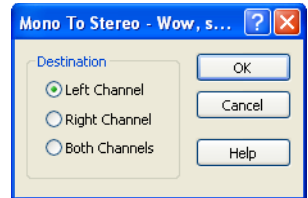
You can convert mono files to stereo or stereo files to mono. To perform quick channel conversion without specifying the mix, use the **Format** tab on the Properties dialog or right-click the **Channels** box in the status bar and choose **2 (Stereo)** or **1 (Mono)** from the shortcut menu.

### Converting from mono to stereo

1. Open the `Voiceover.pca` file. This file is located in the same folder as the application.
2. Right-click the **Channels** box in the status bar and choose **Stereo** from the shortcut menu. The Mono To Stereo dialog is displayed.
3. Select the **Left Channel** radio button and click **OK**. The mono data is placed in the upper half of the data window (left channel) and silence is placed in the right channel.

For more information, see [Specifying the audio destination](#) on page 87.

4. Play the file. "Wow, sound editing just gets easier and easier" plays in only the left channel.



**Tip:** If your sound card supports only mono data, stereo files can be played by specifying the Sound Mapper as the playback device. To do this, choose **Preferences** from the **Options** menu. Click the **Audio** tab and specify **Microsoft Sound Mapper** from the **Audio device type** drop-down list.

### Specifying the audio destination

The **Destination** radio buttons in the Mono To Stereo dialog allow you to specify where the mono audio data is placed in a stereo file. The following table describes the available data destinations.

Destination	Description
Left Channel	The mono data is placed in the left channel. The right channel is set to silence.
Right Channel	The mono data is placed in the right channel. The left channel is set to silence.
Both Channels	The mono data is copied into both channels.

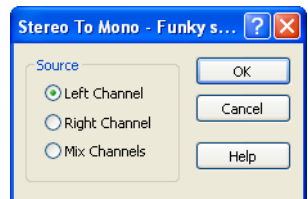
### Converting from stereo to mono

1. Open the `Saxriff.pca` file.

**Note:** This file is located in the same folder as the application.

2. Right-click the **Channels** status box (indicating **Stereo**) and choose **Mono** from the shortcut menu. The Stereo To Mono dialog is displayed.
3. Select the **Mix Channels** radio button and click **OK**. The left and right channels combine into a mono channel.

For more information, see [Specifying the audio source](#) on page 87.



### Specifying the audio source

The **Source** radio buttons in the Stereo To Mono dialog allow you to specify what stereo data is used to create the mono file. The following table describes the available data sources.

Source	Description
Left Channel	Mono data is taken only from the left channel of the stereo file.
Right Channel	Mono data is taken only from the right channel of the stereo file.
Mix Channels	Mono data is created by mixing both channels of the stereo file.

## Using the Channel Converter

You can also use the Channel Converter to convert files between mono and multichannel formats. Using the Channel Converter provides the added flexibility of independent level settings for each channel, thereby allowing you to intermix the channels of a multichannel file to create pan effects. To use this tool, choose **Channel Converter** from the **Process** menu. *For more information, see [Channel Converter](#) on page 145.*

## Converting file formats

The previous sections have described changing a file's sample rate, bit depth, and channel configuration. You can also convert a file's format and compression settings.

To demonstrate this, open the Voiceover.pca file and choose **Save As** from the **File** menu. Notice the **Save as Type** and **Template** drop-down lists. *For more information, see [Using the Save As/Render As dialog](#) on page 52.*

Option	Description
Save as type	When the Save As dialog is displayed, the <b>Save as type</b> drop-down list defaults to the Sound Forge project file (.frg) format. However, using the <b>Save as type</b> drop-down list, you can specify any supported file type.
Template	The Template drop-down list provides standard settings for saving your audio file. If the templates do not match your particular needs, click the Custom button to create custom settings.

## Adding summary information

Specific audio file types allow you to store text fields of summary information in addition to the audio and video data. File types offering this feature include WAV, AVI, ASF, and RealMedia™ file formats. You can view and edit these text fields.

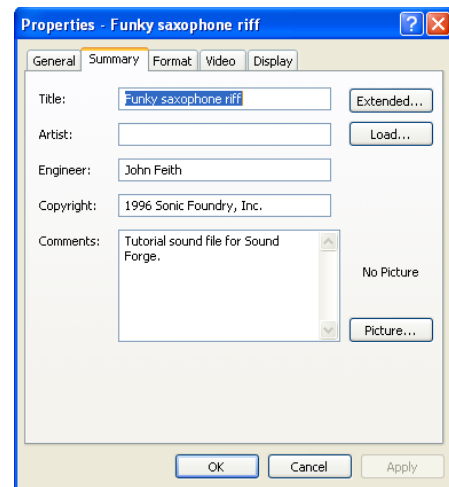
### Viewing and editing summary information

The **Summary** tab is used to view and edit the summary information stored in the file.

1. From the **File** menu, choose **Properties**. The Properties dialog is displayed.
2. Click the **Summary** tab.
3. Edit the summary information as needed and click **OK**.

### Viewing extended summary information

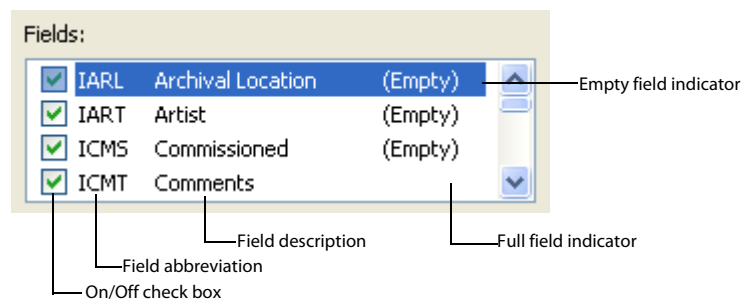
1. From the **File** menu, choose **Properties**. The Properties dialog is displayed.
2. Click the **Summary** tab. The Summary dialog is displayed.
3. Click the **Extended** button. The Extended Summary dialog is displayed. The dialog is divided into two sections: the **Fields** pane and the **Contents** pane.



### The Fields pane

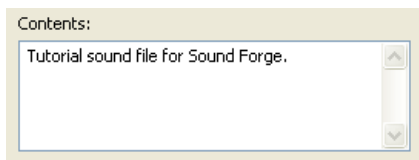
The **Fields** pane displays the following components for each available field:

- A check box to turn the field on or off.
- The abbreviation of the field type.
- A short description of the field.
- An indication of the field's current status.



## The Contents pane

Located immediately below the **Fields** pane, the **Contents** pane displays the current contents of the selected field.



## Editing extended summary information

1. Select the field to be edited in the **Fields** pane. Its contents display in the **Contents** pane.
2. Enter the new information in the **Contents** pane and click **OK**.

## Turning summary fields on and off

Adjacent to each field in the **Fields** pane is a check box used to turn the corresponding field on and off when saving files in applicable formats.

**Note:** *If a field is turned on but contains no information, it is not saved with the file.*

## Setting new default summary information

Clicking the **Default** button in the Extended Summary dialog saves the text in the summary fields as a default setting. This default summary information is used when you create a new file or when you click the **Load** button in the Properties dialog for an existing file.

**Tip:** *The **Creation date** field (ICRD) is always filled with the current date for new files.*

## Saving summary information

You can save files containing summary information that have been edited in Sound Forge software with or without summary information.

1. From the **File** menu, choose **Save As**. The Save As dialog is displayed.
2. Select the **Save metadata with file** check box and click **OK**.

**Note:** *If you save to a file type that doesn't support metadata, this check box is unavailable.*

## Including additional embedded information

Some file formats allow non-text data (such as embedded bitmaps and metafiles) to be embedded in files. If you use the Sound Forge software to edit a file containing data created in another application, Sound Forge software tracks the embedded data and places it back in the file when it is saved in its original format.

## Saving additional embedded information

To save additional embedded information, choose **Save As** from the **File** menu and select the **Save metadata with file** check box. If the file type does not support metadata, you are prompted to save the metadata in an external file with an **.sfl** extension.

### Removing additional embedded information

To save a file without additional embedded information, choose **Save As** from the **File** menu and clear the **Save metadata with file** check box.

## Chapter 6 Editing Multichannel Audio

With Sound Forge 9, you can edit multichannel audio files in the same way you've always worked with mono or stereo files.

Sound Forge supports multichannel files in the following formats:

- Wave (.wav)
- Video For Windows (.avi) – specifically DV, SDI
- Material Exchange Format (.mxf)

**Note:** MXF files require a video stream. If you want to save an audio-only file to MXF format, you must first attach a video stream. For more information, see [Attaching video to an audio file](#) on page 226. When working with MXF files, the number of channels in your source media must match the number of output channels specified by the rendering template. If necessary, use the Channel Converter before rendering.

Render format	Number of channels
DV MXF	Always contains 4 audio channels. You can use the <b>Channels</b> drop-down list on the <b>Audio</b> tab of the Custom Template dialog to choose how many channels will be filled with audio. For example, if you choose <b>2</b> from the <b>Channels</b> drop-down list, the rendered file will contain 4 audio channels: two channels will contain audio, and two channels will contain silence.
IMX MXF	Always contains 8 audio channels. You can use the <b>Channels</b> drop-down list on the <b>Audio</b> tab of the Custom Template dialog to choose how many channels will be filled with audio. For example, if you choose <b>2</b> from the <b>Channels</b> drop-down list, the rendered file will contain 8 audio channels: two channels will contain audio, and six channels will contain silence.
HD MXF	Can contain 2 or 4 audio channels. You can use the <b>Channels</b> drop-down list on the <b>Audio</b> tab of the Custom Template dialog to choose how many channels will be rendered. For example, if you choose <b>2</b> from the <b>Channels</b> drop-down list, the rendered file will contain only 2 audio channels.

- Dolby AC-3 (.ac3) (AC-3 is available as a render format only)
- Windows Media Audio/Video (.wma or .wmv)
- ATAC (.oma)

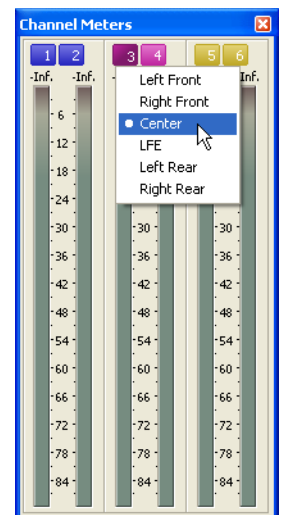
### Routing channels to hardware outputs

If you're working with multichannel files and have a sound card with multiple outputs, Sound Forge provides you with a great deal of flexibility in routing the channels to the outputs on your sound card: you can route each channel to a separate output, or you can route all the stereo pairs to a single set of outputs to simulate a stereo downmix.

The Hardware Meters window displays a meter and gain fader for each enabled output port. For more information, see [Using the hardware meters](#) on page 92.

You can change channel assignments from the **Audio** tab in the Preferences dialog or the Channel Meters window. Changing the setting in either location updates your preferences and affects all open data windows. For information about using the **Audio** tab of the Preferences dialog to enable and map channels, please see [Audio tab](#) on page 248.

To change a channel's output device using the Channel Meters window, click the channel number and choose a new output port from the menu.

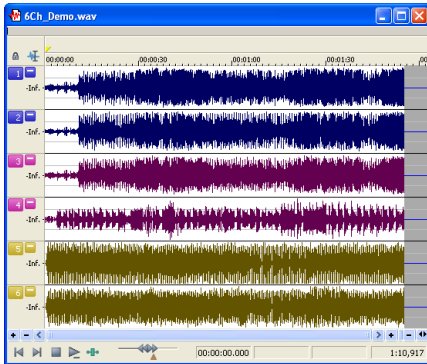


## Opening and editing multichannel audio files




If you've used Sound Forge to edit stereo files before, you already know everything you need to know to edit multichannel files.

You can open multichannel audio files just like any other supported media type. *For more information, see [Getting media files](#) on page 44.*

When you open the file, you'll notice that the data window displays the channels as stereo pairs:



You can then edit the file just as you would any mono or stereo file.

Click the **Minimize** button  to reduce the height of individual channels, or click the **Restore** button  to restore a channel's height. Hold **Shift** while clicking a **Minimize** button  to minimize all channels except the one you clicked.

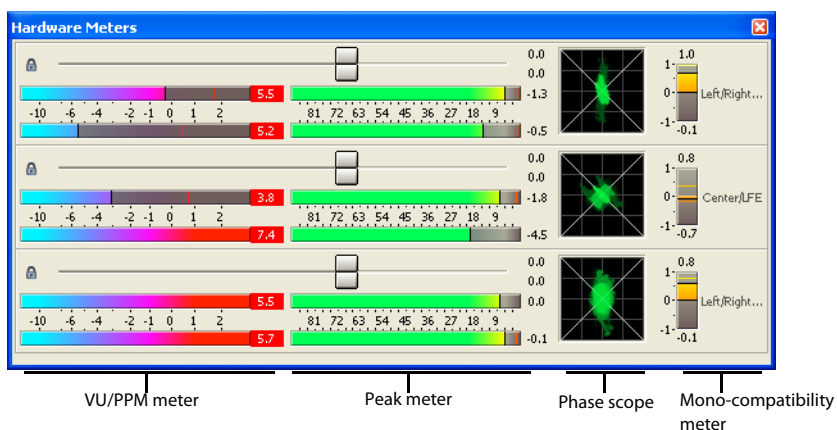
**Tip:** You can use the **Display** tab in the *Preferences* dialog to change the colors used to represent each channel.

## Recording multichannel audio files

With Sound Forge, you have the ability to record multichannel audio if your hardware supports this feature. *For more information, see [Playing back recorded audio](#) on page 120.*

## Using the hardware meters

From the **View** menu, choose **Hardware Meters** to toggle the display of the Hardware Meters window. You can use this window to adjust the levels of your audio device's hardware outputs for monitoring and to view a peak meter, VU/PPM meter, phase scope, and mono-compatibility meter.






## Adjusting output levels

The Hardware Meters window displays a gain fader for each output that is enabled on the **Audio** tab of the Preferences dialog (for more information, see [Audio tab on page 248](#)). You can use these faders to adjust preview levels.

**Important:** *The faders in the Hardware Meters window are used to control preview volume only. If you want to mix channel levels, use the Volume or Envelope plug-in.*

Drag to adjust the volume of the channel. Double-click the center of the thumb to reset the fader to 0.0 dB.

If the right and left channels are set differently, you can double-click either thumb to force the other channel to match it.

Click the Lock/Unlock Fader Channels button  to lock (gang) the faders so the left and right channels will always move together. Click again to unlock the faders.

**Tip:** *Hold Shift while dragging a fader to temporarily override the current state of the Lock/Unlock Fader Channels button: if the button is turned off, you can hold Shift to drag the faders in locked mode; if the button is selected, hold Shift to drag the faders independently.*

## Showing or hiding meters

You can display a peak meter, VU/PPM, a phase scope, and mono-compatibility meter for each hardware output. To toggle the display of each meter, right-click the Hardware Meters window and choose a command from the shortcut menu.

A check mark is displayed to indicate which meters are currently visible.

*For more information about peak meters, please see [Using the channel meters on page 33](#).*

*For more information about VU/PPM meters, please see [Using the VU meters on page 35](#).*

*For more information about phase scopes, please see [Using phase scopes on page 36](#).*

*For more information about mono-compatibility meters, please see [Using the mono-compatibility meters on page 37](#).*



## Chapter 7: Using Markers, Regions, and the Playlist/Cutlist

This chapter describes the use of markers, command markers, the Regions List, and the playlist/cutlist. These tools allow you to tag and organize audio data and make audio editing more efficient. The Sound Forge® application can save marker, Regions List, and playlist/cutlist information as metadata in most file types. You also have the option of saving the Regions List and playlist/cutlist to an external file. *For more information, see [Using the Save As/Render As dialog on page 59](#).*

### Why use markers, regions, and the playlist?

There are at least four reasons for you to master the use of these features:

- Rapid navigation
- Added effects for streaming media
- Multiple versions of edits
- MIDI synchronization and triggering

#### Rapid navigation

The most obvious use of the Regions List is for dissecting an audio file into multiple regions. Once created, regions can be selected and played in the data window. You are also able to tag important time positions with markers. This allows you to navigate large files and locate important audio events.

#### Added effects for streaming media

Command markers allow you to add interactivity to media streamed over the Internet by inserting metadata into streaming media files. As your file plays, any number of other actions can be triggered, including opening a Web page in a browser or displaying caption text.

#### Multiple versions of edits

The playlist and cutlist allow you to try out different edits before committing to them. You can add regions to the playlist or cutlist and then rearrange and audition them endlessly without requiring the software to perform an edit on the file.

Another advantage is that you can quickly save regions organized in the playlist or cutlist as a new file based on the finished arrangement.

#### MIDI synchronization and triggering

You can trigger regions created in Sound Forge software using MIDI or SMPTE timecode. This feature is used for synchronizing audio files to sequencers, MIDI controllers, or any other time-based media. For example, a MIDI trigger can be assigned to an audio file in the software and triggered by a sequencer along with other MIDI instruments. *For more information, see [Triggering region playback on page 236](#).*

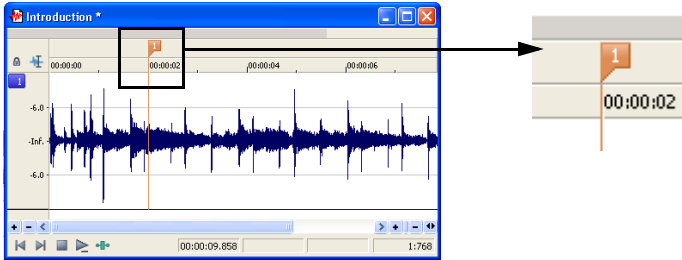
You can also assign SMPTE times to special effect audio files. This allows you to match audio to the action on the screen.

## Using markers

A marker is a tag placed in an audio file that is used as a reference point. Markers make navigating a file easier and more efficient. Markers can be quickly selected from the list in the Go To dialog. Also, markers are displayed in the Regions List for quick playback.

### Inserting markers

1. Click to position the cursor in the waveform.
2. From the **Special** menu, choose **Insert Marker** (or press M during playback). A marker is placed in the waveform at the exact location of the cursor.
3. If you want to name the marker, right-click the tag and choose **Rename** from the shortcut menu. Type a name for the marker in the edit box and press Enter.




### Inserting markers during playback

To insert markers in real time during playback, press M.

### Inserting markers during recording

To insert markers during recording, click the **Drop Marker** button  in the Record dialog or press M. *For more information, see [Inserting markers while recording](#) on page 141.*

### Naming or renaming markers

Right-click the marker tab  and choose **Rename** from the shortcut menu. Type the name of the marker in the edit box and press Enter when you're finished.

—or—

Double-click to the right of the marker and type a name in the edit box.

## Customizing marker labeling

You can set Sound Forge to automatically label new markers as they are created.

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Labels** tab.
3. In the **Marker labels** area, adjust the labeling controls as desired:


Control	Description
Label Markers	Select this check box if you want Sound Forge to automatically name markers when you insert them during playback or recording.
Prefix	Type a prefix in the box if you want Sound Forge to assign a name to new markers when you insert a marker during playback or recording. Clear the box if you do not want to include a prefix (if you want to number markers only, for example).
Use counter and start at	Select this check box and type a number in the box if you want Sound Forge to number new markers when you insert a marker during playback or recording.
Insert leading zeros in field width of	Select this check box and specify a field width if you want to use leading zeros in marker names when you insert a marker during playback or recording. For example, if you specify a field width of 3, markers numbered 1 to 99 would be numbered 001 to 099.

4. Click **OK** to close the Preferences dialog.

## Changing the marker position


You can change a marker's position by dragging it to a new location or by updating its position to the current cursor location. You can also enter precise values to move a marker to a specific location.

### Changing the marker position using drag-and-drop



1. Drag the marker tab  to a new position on the data window ruler.
2. Release the mouse button. The marker is dropped at its new location.

**Note:** Markers will snap to other markers, regions, and command markers. Hold **Shift** while dragging to override snapping.



## Deleting markers

Right-click the marker tab  and choose **Delete** from the shortcut menu.


### Deleting all markers and regions

Right-click in the marker bar, choose **Markers/Regions**, and choose **Delete All** from the submenu. All markers  and regions  are removed.


### Deleting all markers within the selected area

Right-click above the loop region, choose **Markers/Regions**, and choose **Delete All in Selection** from the submenu. All markers  and regions  in the selected area are removed.


## Previewing a marker

Click a marker's **Play** button  in the Regions list.

—or—

1. Right-click the marker tag  and choose **Edit** from the shortcut menu. The Edit Marker/Region dialog is displayed.
2. Click the Play button.

## Triggering a marker using MIDI commands

1. Right-click the marker tag  and choose **Edit** from the shortcut menu. The Edit Marker/Region dialog is displayed.
2. Choose a trigger type from the **Trigger** drop-down list.
3. In the **Channel** box, specify the MIDI input channel for triggering.
4. In the **Note** box, specify the MIDI note that will trigger marker playback. This value can be entered as a MIDI note value such as C4 or as a MIDI note number such as 60.

### Notes:

- If the **Trigger from MIDI Timecode** command (**Options>MIDI In/Out submenu**) is selected while using this dialog, you can auto-complete the **Channel** and **Note** values by pressing a key on your MIDI keyboard.
- Triggers in the **Regions List** function differently from triggers specified in the **MIDI Triggers** dialog and the **Playlist**. When using triggers in the **Playlist**, **Regions List**, or **MIDI Triggers** dialog, be aware that they can interact to create unexpected results. Sound Forge software first looks at the **MIDI Triggers**, then the **Regions List**, and then the **Playlist** when determining what to do when a MIDI command is detected. If you only want to use the triggers in the **Regions List**, turn off all the triggers in the **MIDI Triggers** dialog and the **Playlist**.

## Using markers to create regions

Once you have placed markers in a waveform, you can use them to create regions. For more information, see [Inserting regions based on marker positions](#) on page 103.

## Detecting and marking clipping

The clip indicators in the channel meters help you determine whether clipping occurs in your file, and you can use the **Find** command to find audio that matches levels you specify. For more control, however, you can use the detect clipping tool.

From the **Tools** menu, choose **Detect Clipping** to scan a selection of audio for clipping and add markers where clipping occurs.

Markers can be quickly selected from the list in the **Go To** dialog. Also, markers are displayed in the **Regions List** for quick playback.

1. Select the audio you want to scan.
2. From the **Tools** menu, choose **Detect Clipping**. The Detect Clipping dialog is displayed.
3. Choose a setting from the **Preset** drop-down list or adjust the controls as necessary.
  - a. Drag the **Threshold** slider to determine the sound level you want to find.
  - b. Set a value in the **Clip Length** box to specify how many sequential samples must meet the **Threshold** setting to constitute clipping.
4. Click the **OK** button.

The selection is scanned and a marker is added whenever there are a number of sequential samples (determined by the **Clip Length** setting) with the same value above the **Threshold** setting.

**Tip:** Use **Detect all clip-related plateaus** from the **Preset** drop-down list to detect clipped peaks that may exist in your file after decreasing the levels in the file. You can then use the **Pencil** tool or the **Clipped Peak Restoration** tool in the **Sony Media Software Noise Reduction** plug-in to restore the clipped peaks.

## Using command markers in streaming media files

Command markers add interactivity to media streamed over the Internet by inserting metadata into streaming media files. As your file plays, any number of other actions can be programmed to occur. These commands are a part of the Windows Media Audio, Windows Media Video, and RealMedia streaming formats. Most frequently, these actions add text or open a related Web site.

Command markers can also indicate when an instruction (function) occurs in a WAV file being used in a radio broadcast environment (Scott Studios data). The following two sections define the markers for both streaming media and Scott Studios files.

### Notes:

- While streaming, media files can be played on any hard drive, CD-ROM, or DVD-ROM. They require a special streaming media server (provided by your ISP) to stream properly across the Internet.
- Windows Media Player 9 and later will ignore metadata commands unless the **Run script commands when present** check box is selected on the **Security** tab of the player's Preferences dialog. Be sure to instruct your audience to select this check box before playing your file.

## Defining streaming media commands

In a streaming media file, command markers can be used to display headlines, show captions, link to Web sites, or any other function you define. Some command types are exclusive to either the Windows Media files or RealMedia files.

Command	Player type	Description
URL	Windows Media and RealMedia	Indicates when an instruction is sent to the user's internet browser to change the content being displayed. With this command, you enter the URL that displays at a specific time during the file's playback.
Text	Windows Media	Displays text in the captioning area of the Windows Media Player located below the video display area. You enter the text that displays during playback.  <b>Note:</b> To view captions during playback in Windows Media Player 9 or later, choose <b>Captions and Subtitles</b> from the Windows Media Player <b>Play</b> menu, and then choose <b>On if Available</b> from the submenu.
Title	RealMedia	Displays the entered text on the media player's title bar.  <b>Note:</b> When rendering Windows Media files, title information is based on the settings on the Summary tab of the Sound Forge Project Properties dialog or the Index/Summary tab of the Custom Template dialog. The summary information from the Project Properties dialog will be used if information has been specified in both places.  To view this information during playback, choose <b>Now Playing Options</b> from the Windows Media Player <b>View</b> menu and select the items you want to display.
Author	RealMedia	Displays the entered text (Author's name) when a user selects <b>About This Presentation</b> from the RealPlayer shortcut menu.  <b>Note:</b> When rendering Windows Media files, author information is based on the settings on the Summary tab of the Sound Forge Project Properties dialog or the Index/Summary tab of the Custom Template dialog. The summary information from the Project Properties dialog will be used if information has been specified in both places.  To view this information during playback, choose <b>Now Playing Options</b> from the Windows Media Player <b>View</b> menu and select the items you want to display.
Copyright	RealMedia	Displays the entered copyright information when a user selects <b>About This Presentation</b> from the RealPlayer's shortcut menu or <b>Properties</b> from the Windows Media Player shortcut menu.  <b>Note:</b> When rendering Windows Media files, copyright information is based on the settings on the Summary tab of the Sound Forge Project Properties dialog or the Index/Summary tab of the Custom Template dialog. The summary information from the Project Properties dialog will be used if information has been specified in both places.  To view this information during playback, choose <b>Now Playing Options</b> from the Windows Media Player <b>View</b> menu and select the items you want to display.

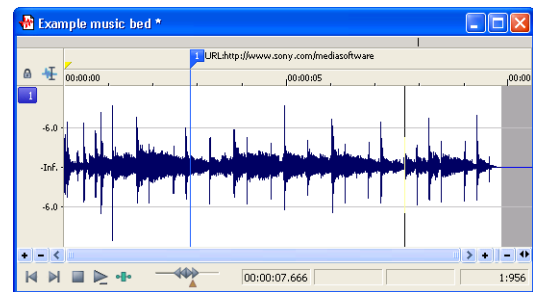
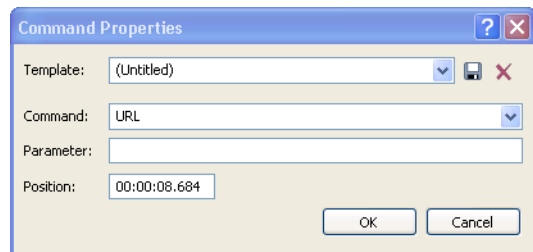
## Defining Scott Studios data commands

For WAV files using Scott Studios data, command markers can be used to define information about the WAV file.

Command	Description
SCOTT EOM	Calculates when the next queued clip starts playing in a Scott Studios system. For more information, please refer to your Scott Studios documentation.
SCOTT Cue In	Sets the beginning of a file in a Scott Studios system without performing destructive editing. For more information, please refer to your Scott Studios documentation.

## Inserting command markers

1. Position the cursor where you want to place the command marker.
2. From the **Special** menu, choose **Insert Command** (or press C). The Command Properties dialog is displayed.
3. Complete the Command Properties dialog:
  - a. From the **Template** drop-down list, select a custom template. For more information, see [Saving command properties as a custom template on page 100](#).
  - b. From the **Command** drop-down list, select the type of command you wish to create or type a custom command.
  - c. Enter parameters to define the behavior of the command in the **Parameter** box.
  - d. Specify the timing of the command in the **Position** box. This value is automatically set to the current cursor position.
4. Click **OK**. The new command marker appears in the data window.




## Editing command properties

Right-click a command marker and choose **Edit** from the shortcut menu to open the Command Properties dialog and edit the marker.

## Saving command properties as a custom template

If you plan to use a command more than once, you can save command properties as a template. You can then reuse the command properties by selecting the template from the **Template** drop-down list.


1. Create a command and complete the Command Properties dialog.
2. Click in the **Template** box and enter a name for the template.
3. Click the **Save Template** button .

**Tip:** Your metadata command templates are saved in the `cmdtemp.xml` file in the Sound Forge program folder. You can edit this file directly to modify your templates.

## Moving the cursor to a command marker

Click the command marker to place the cursor at the current command marker position.

## Deleting command markers

1. Place the mouse pointer on the command marker. The pointer changes to a hand icon .
2. Right-click to display a shortcut menu.
3. From the shortcut menu, choose **Delete**. The command marker is removed.



## Using regions

Regions identify ranges of time and provide a way to subdivide an audio file. A region is defined as the area between two region tags. Regions can function as semi-permanent time selections that can be saved with the file. For example, regions can be used to indicate sections of projects such as choruses or verses, or they can be used to make notes in the project. You can also add regions to the playlist and use regions to create new files.

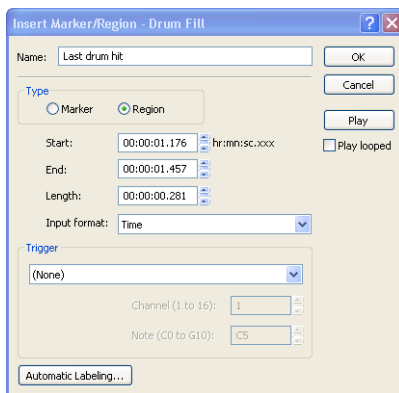
The Regions List window contains all of the regions and markers that exist in the active data window.

## Inserting regions

You can use multiple methods of inserting regions including a menu command, drag-and-drop, a time ruler shortcut, and a keyboard shortcut. The following sections briefly describe the methods of creating regions. To work through these procedures, use the Fill.pca file. This file is located in the Sound Forge folder.

### Inserting regions using menu commands

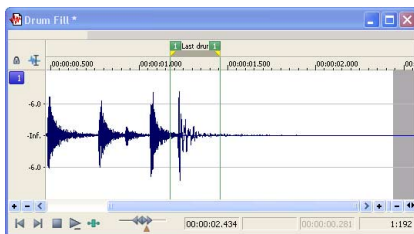
1. Open the Fill.pca file.
2. From the **View** menu, choose **Regions List**. The Regions List is displayed. *For more information, see [Using the Regions List](#) on page 106.*
3. Create a selection containing the final drum hit near the end of the waveform display.
4. From the **Special** menu, choose **Insert Region** (or press R). The Insert Marker/Region dialog is displayed.



5. Enter a name for the region in the **Name** box and click **OK**. The selection appears in the Regions List.

	Name	Start	End	Length
1	Last drum hit	00:00:01.176	00:00:01.457	00:00:00.281

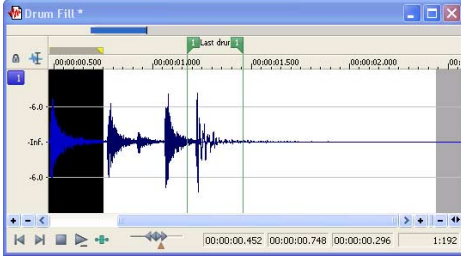
In addition, notice that region tags now display in the data window. These tags indicate the region's name and position within the original file.



## Inserting regions using drag-and-drop

One of the easiest ways to insert a region is to drag a selection from a data window into the Regions List.

1. Create a selection containing the opening drum roll in Fill.pca.




2. Drag the selection from the data window to the Regions List. The Insert Marker/Region dialog is displayed.
3. Name the region and click OK.

## Inserting regions using the time ruler shortcut

1. Create another selection in the waveform display.
2. Right-click the time ruler and choose **Insert Marker/Region** from the shortcut menu. The Insert Marker/Region dialog is displayed.
3. Name the region and click OK.

## Inserting regions using the keyboard

1. Create a selection in the waveform display.
2. Press R. The region is inserted and numbered region markers  are placed at the start and end of the selected area.
3. Name the region and click OK.

## Inserting regions automatically

In addition to the previously described methods, you can also insert regions automatically.

## Inserting regions while recording

The most efficient way of inserting regions is to do it while recording your audio. This is especially useful when working on a project that you will piece together from multiple takes. To create regions while recording, specify **Multiple takes creating Regions** from the **Mode** drop-down list in the Record dialog. *For more information, see [Multiple takes creating Regions](#) on page 135.*

**Tip:** *Regions are automatically named for you while recording. You can customize this automatic labeling feature. For more information, see [Customizing marker labeling](#) on page 97.*

## Inserting regions based on rapid sound attacks

1. Open the Fill.pca file.
2. From the **Tools** menu, choose **Auto Region**. The Auto Region dialog is displayed.
3. Clear the **Build regions using the current tempo** check box if it is selected.

- Specify a preset from the **Preset** drop-down list or configure a new setting using the dialog's active parameters shown in the table below.

Parameter	Description
Attack sensitivity	Determines the sensitivity of the attack-detection algorithm to rapid volume increases.
Release sensitivity	Determines the minimum decrease in sound level required to create a region end point.
Minimum level	Determines the threshold audio level required to create a new region.
Minimum beat duration	Specifies the minimum length, in seconds, that must elapse before a new region can be created.
Use release point for end of region	Requires a region end when the sound level drops by the factor specified by the Release sensitivity value.

- Click **OK**. Regions are inserted in the audio file based on the dialog parameters.

**Note:** All regions created using the *Auto Region* tool are automatically added to the *Regions List* and *playlist*.

### Inserting regions based on musical time intervals

When you select the **Build regions using the current tempo** check box in the *Auto Region* dialog (**Tools>Auto Region**), regions are inserted according to the current beats per minute setting. You can change a file's tempo information (including the measures, beats, and beats per minute settings) by choosing **Edit Tempo** from the **Special** menu. For more information, see [Changing a file's beat values on page 75](#).

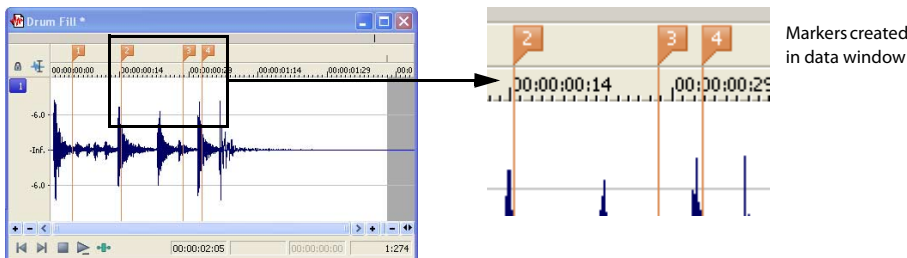
- Open the *Musicbed.pca* file.

**Note:** This file is located in the same folder as the application.

- From the **Tools** menu, choose **Auto Region**. The *Auto Region* dialog box is displayed.
- Select the **Build regions using the current tempo** check box.
- Enter desired values in the **Measures** and **Beats** boxes:
  - To create a region on every beat, set **Measures** to 0 and **Beats** to 1.
  - To create a region at every measure, set **Measures** to 1 and **Beats** to 0.
- Click **OK**. Regions are created in the data window based on the **Measures** value, the **Beats** values, and the current beats per minute setting.


### Inserting regions based on marker positions

- Open the *Fill.pca* file.
- Play the file and drop several markers using the **M** key.



- From the **Special** menu, choose **Regions List**, and choose **Markers to Regions** from the submenu (or right-click the **Regions List** and choose **Markers to Regions** from the shortcut menu). You are prompted to verify whether the markers should be used to create regions.
- Click **Yes**. Regions are created and added to the **Regions List**.

## Naming or renaming a region

Right-click the starting region marker  and choose **Rename** from the shortcut menu. Type the name of the region in the edit box and press Enter when you're finished.

—or—

Double-click to the right of the region marker and type a name in the edit box.

## Customizing region labeling

You can set Sound Forge to automatically label new regions as they are created.

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Labels** tab.
3. In the **Region labels** area, adjust the labeling controls as desired:

Control	Description
Label Regions	Select this check box if you want Sound Forge to automatically name regions when you insert them.
Prefix	Type a prefix in the box if you want Sound Forge to assign a name to new regions when you insert one. Clear the box if you do not want to include a prefix (if you want to number regions only, for example).
Use counter and start at	Select this check box and type a number in the box if you want Sound Forge to number new regions after you insert one.
Insert leading zeros in field width of	Select this check box and specify a field width if you want to use leading zeros in region names when you insert one. For example, if you specify a field width of 3, regions numbered 1 to 99 would be numbered 001 to 099.

4. Click **OK** to close the Preferences dialog.


## Selecting a region

Right-click the starting or ending region marker  and choose **Select Region** from the shortcut menu. The region is highlighted.

—or—


Double-click the start or end region marker. The region is highlighted.

## Moving a region



1. Drag the desired region tag  to a new position. Both associated region tags are highlighted.
2. Release the mouse button. The region's values update in the Regions List.

**Tip:** To move both region tags at once, press **Alt** while dragging.



## Deleting a region

Right-click the region marker  and choose **Delete** from the shortcut menu.


## Deleting all markers and regions

Right-click above the loop region, choose **Markers/Regions**, and choose **Delete All** from the submenu. All markers  and regions  are removed.

## Deleting all markers and regions within the selected area

Right-click above the loop region, choose **Markers/Regions**, and choose **Delete All in Selection** from the submenu. All markers  and regions  in the selected area are removed.

## Previewing a region

Click a region's **Play** button  in the Regions list.

—or—

1. Right-click the region tag and choose **Edit** from the shortcut menu. The Edit Marker/Region dialog is displayed.
2. Click the Play button.

## Splitting regions


Splitting a region divides an existing region at the current cursor position, producing two separate regions.

1. In the Regions List window (**View>Regions List**), select the region you want to split.
2. Position the cursor where you want the split to occur.
3. From the **Special** menu, choose **Regions List**, and choose **Split** from the submenu (or right-click a region in the Regions List window and choose **Split** from the shortcut menu).

### Notes:

- If the cursor is placed within the region you're splitting, the region will be split at the cursor position.
- If the cursor is placed outside the region you're splitting, a new region will be created from the closest edge of the original region to the cursor position.

## Triggering a region using MIDI commands

1. Right-click the region tag  and choose **Edit** from the shortcut menu. The Edit Marker/Region dialog is displayed.
2. Choose a trigger type from the **Trigger** drop-down list.
3. In the **Channel** box, specify the MIDI input channel for triggering.
4. In the **Note** box, specify the MIDI note that will trigger region playback. This value can be entered as a MIDI note value such as C4 or as a MIDI note number such as 60.

### Notes:

- If the **Trigger from MIDI Timecode** command (**Options>MIDI In/Out** submenu) is selected while using this dialog, you can auto-complete the **Channel** and **Note** values by pressing a key on your MIDI keyboard.
- Triggers in the Regions List function differently from triggers specified in the MIDI Triggers dialog and the Playlist. When using triggers in the Playlist, Regions List, or MIDI Triggers dialog, be aware that they can interact to create unexpected results. Sound Forge software first looks at the MIDI Triggers, then the Regions List, and then the Playlist when determining what to do when a MIDI command is detected. If you only want to use the triggers in the Regions List, turn off all the triggers in the MIDI Triggers dialog and the Playlist.

## Using markers to create regions

Once you have placed markers in a waveform, you can use them to create regions. For more information, see [Inserting regions based on marker positions](#) on page 103.

## Locking loop and region lengths

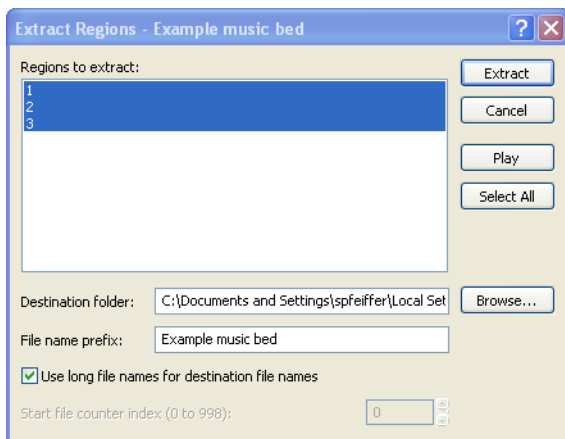
From the **Options** menu, choose **Lock Loop/Region Length** to force the length of a region to remain constant when changing the start or end time of a region or loop.

When this option is not selected, you can hold the Alt key while dragging region markers to lock the length of a region. To move a loop without changing its length, drag the bar between the loop markers.

## Creating new files from regions

You can quickly create a new file from each region in a file. Each region is named by appending a numerical value to a user-specified prefix.

1. Open an audio file and create several regions in it.
2. From the **Tools** menu, choose **Extract Regions**. The Extract Regions dialog appears and all current regions appear in the **Regions to extract** pane.
3. Select the regions to be extracted.



4. If the path in the **Destination folder** box is not appropriate, click the **Browse** button and browse to the desired destination folder.
5. Enter the desired prefix in the **File name prefix** box.
6. If desired, clear the **Use long file names for destination file names** check box and enter an appropriate numeric value in the **Start file counter index** box.

**Note:** Clearing the **Use long file names for destination file names** check box forces file names to conform to the 8.3 naming convention.

7. Click **Extract**.

## Using the Regions List


The Regions List contains information pertaining to all regions in the current data window. The Regions List information can be saved as metadata in most file types. You also have the option of saving the Regions List to an external playlist file.

### Displaying the Regions List

1. Open the Voiceover.pca file.
2. From the **View** menu, choose **Regions List** (or press Alt+2). The Regions List for Voiceover.pca is displayed.

## Working with the Regions List



By default, the Regions List displays the following information for each region in the current data window:

- A small **Play** button  dedicated to the region.
- The name of the region.
- The region's start point.
- The region's end point.
- The region's length.



		Name	Start	End	Length
1		Silence	00:00:00:00	00:00:00:22	00:00:00:22
2		Wow	00:00:00:22	00:00:01:14	00:00:00:21
3		Sound editing just gets easier...	00:00:01:14	00:00:03:19	00:00:02:04
4		...And easier	00:00:03:19	00:00:04:29	00:00:01:10

## Changing region order

By default, the Regions List displays regions in alphabetical order by name, but you may also specify an alternate order by clicking the column heading to sort in ascending  or descending  order.

## Saving a Regions List file

You can save a file's Regions List to an external file. This offers the flexibility of using multiple Regions Lists for the same audio file.

1. From the **Special** menu, choose **Regions List**, and choose **Save As** from the submenu (or right-click the Regions List and choose **Save As** from the shortcut menu).
2. Use the Save Regions/Playlist As dialog to specify a folder and filename.
3. Click **Save**.

## Opening a Regions List file

Importing a Regions List file offers the flexibility of using multiple Regions List files for the same audio file. Opening a new Regions List file clears the current Regions List. Make sure you have saved the current Regions List before continuing.

1. From the **Special** menu, choose **Regions List**, and choose **Open** from the submenu (or right-click the Regions List and choose **Open** from the shortcut menu).
2. Use the Open Regions/Playlist dialog to locate an existing file.
3. Specify the type of regions you want to import from the **Files of type** drop-down list:
  - Choose **Playlist File (.sfl)** to import a Sound Forge regions/playlist file.
  - Choose **Session 8 File (.prm)** to import a file that supports both Session 8 and Sound Forge regions.
  - Choose **Windows Media Script File (.txt)** to import a file that includes Windows Media script commands.
  - Choose **Wave File (.wav)** to import markers and regions from another audio file.
4. Click **Open**.

## Copying the Regions List to the clipboard

Editing a Regions List in a text editor allows you to make an annotated list that you can print for reference.

From the **Special** menu, choose **Regions List**, and then choose **Copy onto Clipboard** (or right-click the Regions List and choose **Copy onto Clipboard** from the shortcut menu). The list is copied to the Windows clipboard.

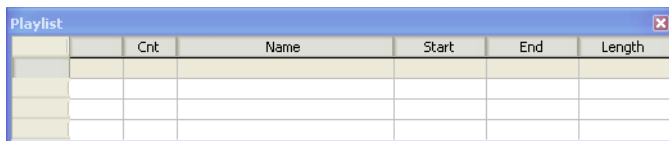
## Using the playlist

Once you create regions, you can arrange them in the playlist. Unlike the Regions List, which displays its contents in alphabetical or chronological order, the playlist displays and plays its regions in a user-specified arrangement. In addition, you can rearrange and audition regions endlessly in the playlist without performing a destructive edit when you save the file.

As with the Regions List, you can save the playlist information as metadata in most file types. You also have the option of saving the playlist to an external playlist file.

### Displaying the playlist

1. Open the Voiceover.pca file.
2. From the **View** menu, choose **Regions List** (or press Alt+2). The Regions List window for Voiceover.pca is displayed.
3. From the **View** menu, choose **Playlist** (or press Alt+3). The Playlist window for Voiceover.pca is displayed.



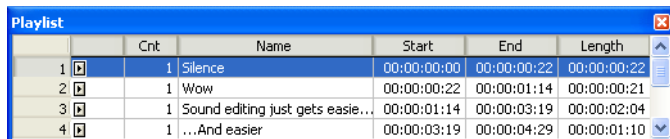
The screenshot shows a window titled "Playlist" with a table that is currently empty. The table has six columns: "Cnt", "Name", "Start", "End", and "Length".

	Cnt	Name	Start	End	Length

Notice that the file contains regions, but the playlist is empty. You must add regions to the playlist before arranging them.

### Understanding the playlist display

When you add a region to the playlist, its appearance is similar to its appearance in the Regions List, with the exception of the **Count (Cnt)** column. Located to the left of the **Name** column, the **Count (Cnt)** column displays the number of times the corresponding region plays before the playlist proceeds to the next region.



The screenshot shows a "Playlist" window with four rows of data. Each row has a number in the first column, a "Cnt" column with the value "1", a "Name" column, a "Start" column, an "End" column, and a "Length" column. The regions are: 1 Silence, 2 Wow, 3 Sound editing just gets easie..., and 4 ...And easier.

	Cnt	Name	Start	End	Length
1	1	Silence	00:00:00:00	00:00:00:22	00:00:00:22
2	1	Wow	00:00:00:22	00:00:01:14	00:00:00:21
3	1	Sound editing just gets easie...	00:00:01:14	00:00:03:19	00:00:02:04
4	1	...And easier	00:00:03:19	00:00:04:29	00:00:01:10

### Adding regions to the playlist

You can add regions from the Regions List to the playlist using commands or drag-and-drop. You can also add regions to the playlist directly from the data window.

#### Adding regions to the playlist using commands

1. Select a region in the Regions List.
2. From the **Special** menu, choose **Playlist/Cutlist**, and choose **Add** from the submenu (or right-click a region in the Regions List window and choose **Add to Playlist** from the shortcut menu). The region is added to the playlist.

#### Adding regions to the playlist using drag-and-drop

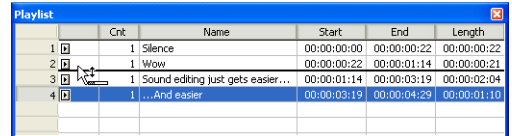
1. Select a region in the Regions List.
2. Drag the region into the playlist.
3. Release the mouse button.



## Arranging the playlist

### Moving regions

Once you have added regions to the playlist, you can arrange them using drag-and-drop.



	Cnt	Name	Start	End	Length
1	1	Silence	00:00:00:00	00:00:00:22	00:00:00:22
2	1	Wow	00:00:00:22	00:00:01:14	00:00:00:21
3	1	Sound editing just gets easier...	00:00:01:14	00:00:03:19	00:00:02:04
4	1	...And easier	00:00:03:19	00:00:04:29	00:00:01:10

### Replicating a region in the playlist

A major advantage of arranging the playlist is the ability to repeat a region in multiple places without actually copying the audio data. This feature is called replicating.

1. Right-click the region to be replicated and choose **Replicate** from the shortcut menu. The region is replicated in the playlist.
2. Drag the replicated region to its new position in the playlist.

**Tip:** You can also replicate a region by holding **Ctrl** while dragging the region to a new position in the playlist.

### Deleting a region from the playlist

You can delete regions from the playlist without affecting the audio file.

1. Select the region that you would like to delete.
2. From the **Special** menu, choose **Playlist/Cutlist**, and then choose **Delete** from the submenu (or right-click the Playlist window and choose **Delete** from the shortcut menu).

### Changing region order

Click the column heading to sort the results in ascending  or descending  order based on the column's contents.

### Editing a playlist/cutlist region

You can edit a Playlist/Cutlist region by typing new values in the **Cnt**, **Start**, **End**, **Length**, and **Name** boxes or you can select a box and press **Enter** to display the Edit Playlist dialog.

### Displaying the Edit Playlist dialog

The Edit Playlist dialog allows you to specify the number of times a playlist/cutlist region will be played, set up MIDI triggers, and establish pre-roll.

**Note:** You must add regions to your playlist before you can display the Edit Playlist dialog.

Perform one of the following actions to open the Edit Playlist window:

Option	Action
Option I	From the <b>Special</b> menu, choose <b>Playlist/Cutlist</b> , and then choose <b>Edit</b> from the submenu to edit the selected region in the Playlist window.
Option II	Right-click a playlist region and choose <b>Edit</b> from the shortcut menu.
Option III	Select a region in the Playlist window and press <b>Enter</b> .

## Repeating a region during playlist playback

You can specify the number of times a region repeats during playlist playback.

Type a value in the **Cnt** box in the Playlist window (or use the **Play Count** box in the Edit Playlist dialog) to specify the number of times the playlist region will repeat before playing the next region.

## Using stop points

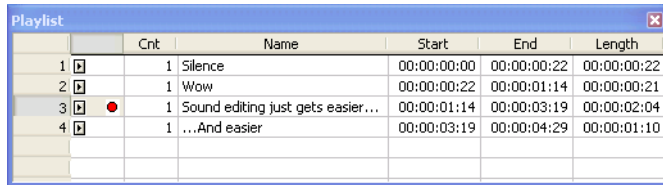
You can attach stop points to regions in the playlist. When a stop point is encountered during playback, the corresponding region is repeated the number of times specified by the **Count** value and playback is halted.

## Creating a stop point

Perform one of the following actions to set the stop point for a playlist:

Option	Action
Option I	Right-click a region in the Playlist window and choose <b>Stop Point</b> from the shortcut menu.
Option II	Select a region in the Playlist window and press <b>*</b> . (Not on the numeric keypad.)
Option III	Select the <b>Stop point</b> check box in the Edit Playlist dialog to stop playback with the selected region.

A check mark appears adjacent to the command in the shortcut menu and a stop point (indicated by a red circle) appears in the playlist.



**Note:** When you play your playlist, it will continue to play through the regions until it encounters a stop point. This is useful when triggering playback from incoming MIDI or timecode and you only want certain sections of the playlist to be played at a time.


## Deleting a stop point

Perform one of the following actions to remove the stop point for a playlist:

Option	Action
Option I	Right-click a region in the Playlist window and choose <b>Stop Point</b> from the shortcut menu.
Option II	Select a region in the Playlist window and press <b>*</b> . (Not on the numeric keypad.)
Option III	Select the <b>Stop point</b> check box in the Edit Playlist dialog to stop playback with the selected region.

The corresponding check mark is cleared from the shortcut menu and the stop point (indicated by a red circle) is removed from the playlist.

## Playing from the playlist

The playlist displays the sequential order in which regions play. To play a region, click the corresponding **Play** button . Playback begins with the selected region and continues through the end of the playlist, playing a region multiple times when instructed by the **Count** value.


**Note:** Playback is interrupted if a stop point is present. For more information, see [Using stop points](#) on page 110.

## Creating a new file from the playlist


After you have auditioned and arranged all regions in the playlist, you can create a new file based on the playlist arrangement. To create a new file from the playlist, right-click the playlist and choose **Convert to New** from the shortcut menu.

**Note:** If the original file has both audio and video components (such as an AVI file), the new file created from the playlist contains the audio portion only.

## Configuring the playlist as a cutlist

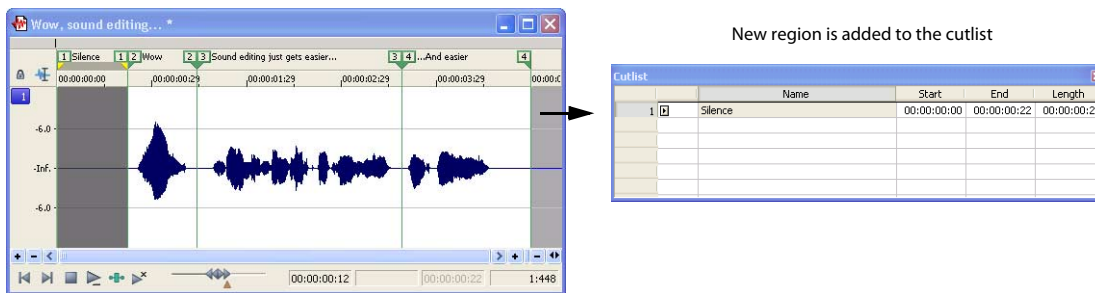
When trimming lengthy recordings, configuring the playlist as a cutlist can sometimes decrease editing time. In Play as Cutlist mode, the original file is played, but all regions placed on the cutlist are ignored. Click the **Play as Cutlist** button  on the playbar to enter Play as Cutlist mode.

### Treating the playlist as a cutlist

1. From the **View** menu, choose **Playlist**. The Playlist window is displayed.
2. Right-click the playlist and choose **Treat as Cutlist** from the shortcut menu. A check mark appears adjacent to the command in the shortcut menu and the cutlist displays. The **Play as Cutlist** button  appears in the playbar.

### Adding regions to the cutlist

1. Open the Voiceover.pca file and the cutlist.
2. Select the "Silence" region and drag it to the cutlist (or press Delete). The region is added to the cutlist and the selection area in the waveform display is shaded.



3. Click the **Play Cutlist** button  on the data window's playbar. The file plays with the cutlisted region omitted.

## Creating a new file from the cutlist

Once all superfluous regions are placed in the cutlist, you can create a new audio file and Regions List from the remaining region. From the **Special** menu, choose **Playlist/Cutlist** and choose **Convert to New** from the submenu (or right-click the cutlist and choose **Convert to New** from the shortcut menu).

## Deleting all cutlist regions

1. Select a region in the Playlist/Cutlist window. If the window is not visible, press Alt+3.
2. From the **Special** menu, choose **Playlist/Cutlist** and then choose **Delete** from the submenu (or press Delete).

## Reverting to playlist function

To use the cutlist as a playlist again, right-click the cutlist and choose **Treat as Cutlist** from the shortcut menu. The check mark is cleared from the corresponding command in the shortcut menu and the playlist function is restored.

## Saving a playlist/cutlist file

You can save a file's playlist/cutlist to an external file. This offers the flexibility of using multiple playlists for the same file.

1. From the **Special** menu, choose **Regions List** or **Playlist/Cutlist**, and choose **Save As** from the submenu (or right-click the playlist/cutlist and choose **Save As** from the shortcut menu).
2. Use the Save Regions/Playlist dialog to specify a folder and filename.
3. Click **Save**.

## Opening a playlist/cutlist file

Importing a playlist file offers the flexibility of using multiple playlists for a file. Opening a new playlist file clears the current playlist. Make sure you have saved the current playlist before continuing.

1. From the **Special** menu, choose **Playlist/Cutlist**, and choose **Open** from the submenu (or right-click the playlist/cutlist and choose **Open** from the shortcut menu).
2. Use the Open Regions/Playlist window to browse to an existing regions file.
3. Specify the type of file you want to import from the **Files of Type** drop-down list:
  - Choose **Playlist File (.sfl)** to import a Sound Forge regions/playlist file.
  - Choose **Session 8 File (.prm)** to import a file that supports both Session 8 and Sound Forge regions.
  - Choose **Windows Media Script File (.txt)** to import a file that includes Windows Media script commands.
  - Choose **Wave File (.wav)** to import markers and regions from another sound file.
4. Click **Open**.

## Copying the playlist/cutlist to the clipboard

Editing a playlist/cutlist in a text editor allows you to make an annotated list that you can print for reference.

From the **Special** menu, choose **Playlist/Cutlist**, and then choose **Copy onto Clipboard** (or right-click the playlist/cutlist and choose **Copy onto Clipboard** from the shortcut menu). The list is copied to the Windows clipboard for use with a text editor.

## Chapter 8: Recording, Extracting, and Burning

This chapter describes the processes for recording audio, extracting audio from a CD, and writing audio to a CD in Sound Forge® software.

### Recording audio

Sound Forge has two central methods for recording: manual (normal) and automatic. In normal recording, you choose your settings and control your recording session while you're sitting at your PC. With automatic recording, you can choose your settings and set your trigger parameters for recording automatically—whether you're at your PC or not. Sound Forge also allows you to record multichannel audio if your audio device supports multiple inputs.

### Specifying recording and playback options

#### Basic audio preferences

From the **Options** menu, choose **Preferences** and select the **Audio** tab to specify recording and playback options. *For more information, see [Basic audio preferences](#) on page 248.*

#### Advanced audio preferences

The Advanced Audio Configuration dialog allows you to view information about and adjust settings for the playback or recording device selected on the Preferences window (from the **Options** menu, choose **Preferences**) **Audio** tab. To view advanced preferences, click the **Advanced** button. *For more information, see [Advanced audio preferences](#) on page 249.*

## Recording manually

You can record into an existing window or create a new window at the time of recording. If you have an audio device that supports multiple inputs, you can use Sound Forge to perform multichannel recording.

### Tips:

- *Sound Forge is not a multitrack editor — check out our Vegas and ACID family of products for full multitrack recording and editing. You can use multichannel recording to create surround audio or capture field recordings.*
- *If you experience gapping or glitching when recording multichannel audio, try increasing your buffer size. You can increase the **Record buffering** setting on the **Audio** tab of the Preferences dialog or click the **Advanced** button on the **Audio** tab of the Preferences dialog to increase your device's buffers.*

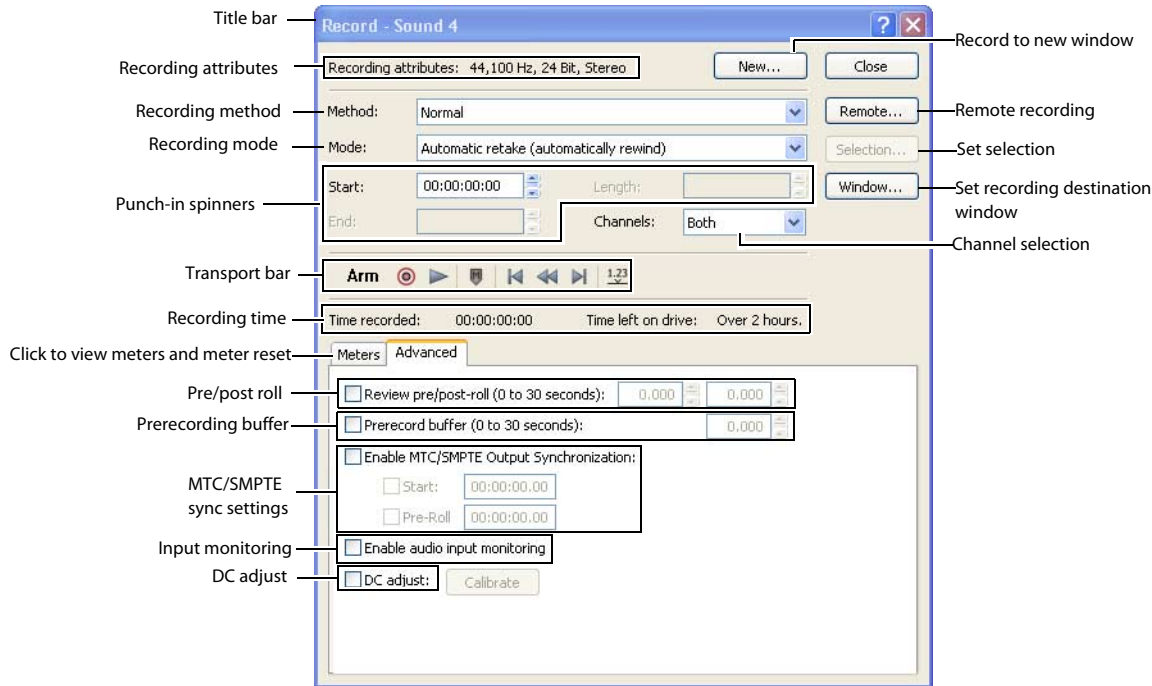
1. Connect your audio sources to your sound card's inputs. *For more information on connecting audio sources, please refer to your sound card's user documentation.*
2. Enable your recording inputs:
  - a. From the **Options** menu, choose **Preferences**, and click the **Audio** tab.
  - b. Choose your recording device from the **Audio device type** drop-down list.
  - c. Click the **Record** tab.
  - d. Select the **Enable** check box for each input you want to enable for recording, and then select a radio button to assign the input to an audio channel.

In the following example, the signal from Analog in 1 is recorded to channel 1, Analog in 2 is recorded to channel 2, and so on.

	Enable	1	2	3	4	5
Analog out 1	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analog out 2	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analog out 3	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analog out 4	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Analog out 5	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Analog out 6	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analog out 7	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analog out 8	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- e. Click **OK** to close the Preferences dialog and save your changes.

3. From the **Special** menu, choose **Transport**, and then choose **Record** from the submenu. The Record dialog is displayed.



**Tip:** You can also open the Record dialog by clicking the **Record** button  on the transport bar or pressing **Ctrl+R**.




- From the **Method** drop-down list, choose **Normal**.
- Choose the destination data window for your recording. By default, the application records into the active data window. If this is not where you want to record, use one of the following methods to prepare for recording:

If	Then
You want to record into a different data window	Click the <b>Window</b> button and choose a data window from the <b>Record destination window</b> drop-down list. Click <b>OK</b> to return to the Record dialog.
You want to record into a new window	Click the <b>New</b> button in the Record dialog and specify the attributes (sample rate, bit depth, and channels) for the new file. Click <b>OK</b> to return to the Record dialog.

**Note:** The maximum number of channels recorded depends on the data window where you're recording. For example, if you enabled six inputs on the **Record** tab in *Audio preferences*, you need to record into a six-channel data window to record all six inputs. If you record to a stereo data window, only two inputs will be recorded.

To route inputs to channels in the data window, click a channel number and choose a new input port from the menu.


To determine which inputs are recorded, type a value in the **Channels** box. For example, you could type 1-4 to record channels 1 through 4, or type 1, 3, 4 to record only channels 1, 3, and 4.

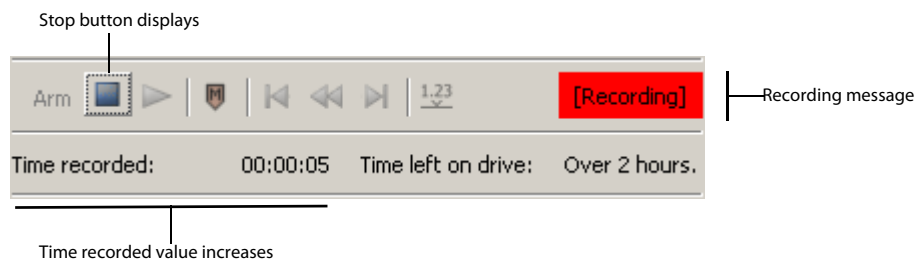
- Choose a recording mode from the **Mode** drop-down list. For more information, see [Choosing a recording mode on page 119](#).
- If necessary, set a start time, duration, or end time for your recording. By default, recording will begin at the current cursor position. To record to a different cursor position, use one of the following methods:
  - Type a new cursor position in the **Start** field. If you chose the **Punch In** recording option in the **Mode** drop-down list, you can also type values in the **End** or **Length** fields to define your recording period.
  - Click the **Go To** button  and change the cursor position. Click **OK** to return to the Record dialog. For more information, see [Setting the cursor position on page 69](#).
- To determine which inputs are recorded, type a value in the **Channels** box. For example, you could type 1-4 to record channels 1 through 4, or type 1, 3, 4 to record only channels 1, 3, and 4.
- Click the **Arm** button  to have recording begin as soon as possible after you click the **Record** button .
 


Arming Sound Forge software prior to recording opens the wave device and loads all recording buffers in order to minimize the amount of time between clicking the **Record** button and when the recording starts. This optional step can allow for more accurate takes when recording in Punch-In mode.
- If desired, click the **Advanced** tab and select the **Prerecord buffer** check box and specify the amount of time to buffer prior to recording when the software is armed for recording. A prerecording buffer helps to ensure you won't miss a perfect take if you're a bit slow to click the **Record** button.
 

When you click the **Record** button, recording begins and the sound data in the buffer is committed to disk. For example, if you set a 15-second buffer, recording effectively begins 15 seconds before you click the **Record** button.

**Note:** The prerecord buffer is unavailable in punch-in mode.

- If necessary, select the **DC Adjust** check box and calibrate the DC offset adjustment. For more information, see [Adjusting for DC offset on page 119](#).
- Click the **Record** button  in the Record dialog (or press Alt+R). Recording begins.



13. Click the **Stop** button  to stop recording.
14. Click the **Close** button to close the Record dialog.

## Recording automatically

In addition to the normal recording method, there are three automatic recording methods: Time, Threshold, and MIDI Timecode. These recording methods enable you to trigger recording to begin automatically, using a specified device, with no intervention necessary, using a timer, by detecting when audio exceeds a set threshold, or when MIDI timecode is detected.

When you're using threshold-triggered recording, you can choose to record continuously: set a buffer size, and the recorded audio will fill the buffer, discarding the oldest data as new data is recorded. If you want to save data from the buffer, you can save it to disk.

You can set up multiple automatic recording sessions to take place at different times, and set a session's recurrence level for one time, daily, or weekly. For your recording sessions to take place, the Sound Forge application must be started and armed for recording.

## Triggering by time

1. From the **Special** menu, choose **Transport**, and then choose **Record** from the submenu.

**Tip:** You can also click the **Record** button  on the transport bar or press Ctrl+R.



2. From the **Method** drop-down list, choose **Automatic: Time**.
3. Choose the destination data window for your recording. By default, the software records into the active data window. If this is not where you want to record, use one of the following methods to prepare for recording:

If	Then
You want to record into a different data window	Click the <b>Window</b> button and choose a data window from the <b>Record destination window</b> drop-down list. Click <b>OK</b> to return to the Record dialog.
You want to record into a new window	Click the <b>New</b> button in the Record dialog and specify the attributes (sample rate, bit depth, and channels) for the new file. Click <b>OK</b> to return to the Record dialog.


**Note:** The maximum number of channels recorded depends on the data window where you're recording. For example, if you enabled six inputs on the **Record** tab in Audio preferences, you need to record into a six-channel data window to record all six inputs. If you record to a stereo data window, only two inputs will be recorded.


To route inputs to channels in the data window, click a channel number and choose a new input port from the menu.


To determine which inputs are recorded, type a value in the **Channels** box. For example, you could type 1-4 to record channels 1 through 4, or type 1, 3, 4 to record only channels 1, 3, and 4.

4. From the **Mode** drop-down list, choose a recording mode. For more information, see [Choosing a recording mode](#) on page 119.
5. Use the **Time Options** tab at the bottom of the Record dialog to set the timer:
  - a. Click the **Add** button  to create a timer setting. The Record Timer Event dialog is displayed.
  - b. Type a name in the **Name** field to create a name to identify the preset.
  - c. Choose a setting from the **Recurrence** drop-down list to indicate whether you want to record one time only or repeat the selected recording day and time at a regular interval.
  - d. Use the **Start date**, **Start time**, and **Duration** boxes to indicate when you want to start and stop recording.
  - e. Click **OK** to close the dialog and return to the Record dialog.
6. Select a timer setting and click the **Arm** button  in the Record dialog when you're ready to start the timer.

If you want to edit a timer setting, select it and click the **Edit** button  to display the Record Timer Event dialog.

If you want to remove a timer setting, select it and click the **Delete** button .

If you want to remove all past timer settings, click the **Remove All Past Events from List** button .

7. To end timed recording, click the **Stop** button .
8. Click the **Close** button to close the Record dialog.



## Triggering by a set threshold

When you're using threshold-triggered recording, you can choose to record continuously: set a buffer size, and Sound Forge software will record to fill the buffer, discarding the oldest data as new data is recorded. If you want to save data from the buffer, you can save it to disk.

1. From the **Special** menu, choose **Transport**, and then choose **Record** from the submenu.

**Tip:** You can also Click the **Record** button  on the transport bar or press Ctrl+R.




2. From the **Method** drop-down list, choose **Automatic: Threshold**.
3. Choose the destination data window for your recording. By default, the software records into the active data window. If this is not where you want to record, use one of the following methods to prepare for recording:

If	Then
You want to record into a different data window	Click the <b>Window</b> button and choose a data window from the <b>Record destination window</b> drop-down list. Click <b>OK</b> to return to the Record dialog.
You want to record into a new window	Click the <b>New</b> button in the Record dialog and specify the attributes (sample rate, bit depth, and channels) for the new file. Click <b>OK</b> to return to the Record dialog.

**Note:** The maximum number of channels recorded depends on the data window where you're recording. For example, if you enabled six inputs on the **Record** tab in *Audio preferences*, you need to record into a six-channel data window to record all six inputs. If you record to a stereo data window, only two inputs will be recorded.

To route inputs to channels in the data window, click a channel number and choose a new input port from the menu.

To determine which inputs are recorded, type a value in the **Channels** box. For example, you could type 1-4 to record channels 1 through 4, or type 1, 3, 4 to record only channels 1, 3, and 4.

4. From the **Mode** drop-down list, choose a recording mode. For more information, see [Choosing a recording mode](#) on page 119.
5. Use the **Threshold Options** tab at the bottom of the Record dialog to set the audio levels at which recording will start and stop:
  - a. Drag the **Threshold** fader to set the audio level at which recording will begin.
  - b. Drag the **Release** slider to set the amount of time the audio level should be below the **Threshold** setting before recording will stop.
  - c. Select the **Automatically rearm after record** check box if you want to continue monitoring audio levels and recording until you click the **Stop** button .
6. Click the **Arm** button  in the Record dialog. Recording will begin when the audio signal meets the threshold level and will stop after the level falls below the threshold for the specified release time.
7. To end audio monitoring and recording, click the **Stop** button .
8. Click the **Close** button to close the Record dialog.

## Setting a prerecord buffer for threshold recording


On the **Advanced** tab at the bottom of the Record dialog, select the **Prerecord buffer** check box and type a value in the edit box to maintain a set amount of time in a buffer when Sound Forge software is armed for recording. A prerecording buffer helps to ensure you won't miss a perfect take if you've set the threshold a bit too high.

When the prerecording buffer is enabled, recording begins when the audio input reaches the threshold level and the sound data in the buffer is committed to disk. For example, if you set a 15-second buffer, recording effectively begins 15 seconds before the input reaches the set threshold level.

## Triggering by MIDI timecode




**Note:** You can specify a MIDI input port in the **MIDI/Sync** tab in the Preferences dialog (from the **Options** menu, choose **Preferences**). For more information, see [Synchronizing with other devices](#) on page 120.

1. From the **Special** menu, choose **Transport**, and then choose **Record** from the submenu.

**Tip:** Click the **Record** button  on the transport bar or press Ctrl+R.










2. From the **Method** drop-down list, choose **Automatic: MIDI Timecode**.
3. Choose the destination data window for your recording. By default, the software records into the active data window. If this is not where you want to record, use one of the following methods to prepare for recording:

If	Then
You want to record into a different data window	Click the <b>Window</b> button and choose a data window from the <b>Record destination window</b> drop-down list. Click <b>OK</b> to return to the Record dialog.
You want to record into a new window	Click the <b>New</b> button in the Record dialog and specify the attributes (sample rate, bit depth, and channels) for the new file. Click <b>OK</b> to return to the Record dialog.

4. From the **Mode** drop-down list, choose a recording mode. For more information, see [Choosing a recording mode](#) on page 119.
5. Use the **MIDI Timecode Options** tab at the bottom of the Record dialog to set the MIDI timecode interval you want to record:
  - a. Select the MIDI timecode start check box and type a value in the edit box to indicate the timecode location when recording will begin.
  - b. Select the MIDI timecode end check box and type a value in the edit box to indicate the timecode location when recording will end. If you don't indicate a stop time, recording will continue until you click the Stop button  to stop recording.
6. Click the **Arm** button . Recording will begin when Sound Forge software detects the timecode specified in the MIDI timecode start box and will stop when the software detects the timecode specified in the MIDI timecode end box.
7. To end recording, click the Stop button .
8. Click the **Close** button to close the Record dialog.

## Choosing a recording mode

You can choose any of several recording modes in the Record dialog's **Mode** drop-down list:

Mode	Description
Automatic retake (automatically rewind)	<b>Automatic retake</b> mode is the easiest method of recording. Recording begins at the position displayed in the <b>Start</b> box when you click the <b>Record</b> button  and continues until you click the <b>Stop</b> button  . When you stop recording, the start position resets to the beginning of the take, allowing for immediate review and retake. <b>Note:</b> Automatic retake is the default mode when recording into an empty data window or when recording with no data selected in the current data window.
Multiple takes creating Regions	<b>Multiple takes creating Regions</b> mode allows you to record several takes with each take defining a region in the Regions List. Recording begins at the position displayed in the <b>Start</b> box when you click the <b>Record</b> button  and continues until you click the <b>Stop</b> button  . When you stop recording, the stop position becomes the start position for the next take, which can be recorded immediately. <i>For more information, see <a href="#">Using the Regions List on page 106</a>.</i>
Multiple takes (no Regions)	<b>Multiple takes (no Regions)</b> mode also allows several takes to be recorded without these takes being defined as regions. Like the previous mode, recording starts at the position displayed in the <b>Start</b> box when you click the <b>Record</b> button  and continues until you click the <b>Stop</b> button  . When you stop recording, the stop position becomes the start position for the next take, which can be recorded immediately.
Create a new window for each take	<b>Create a new window for each take</b> is similar to <b>Multiple takes creating Regions</b> , but creates a new data window for each take. This is useful when recording audio data in which you will save each take as an individual file.
Punch-In (record a specific length)	<b>Punch-In</b> mode is used to record over a specific selection in an existing data window. Specifying Punch-In activates the <b>Start</b> , <b>End</b> , and <b>Length</b> boxes. Recording begins at the position displayed in the <b>Start</b> box when you click the <b>Record</b> button  and continues until one of the following occurs: <ul style="list-style-type: none"><li>• You click the <b>Stop</b> button .</li><li>• The cursor in the data window reaches the position displayed in the <b>End</b> box.</li><li>• The length of the recorded data equals the value in the <b>Length</b> box.</li></ul> Punch-In mode makes it possible to record over a specific section of audio without the risk of affecting the remainder of the audio file. You can preview the punch-in region by clicking the <b>Play</b> button  . <b>Note:</b> Punch-In is the default mode when recording with a selection in the data window.

## Adjusting for DC offset

Use the Record dialog's **DC adjust** check box to compensate for DC offsets generated by your system's sound card during recording. A DC offset of approximately 30 dB is not uncommon for sound cards (even with very low noise floors) and this displays in the record meter as -60 dB. This does not mean that the system is losing 30 dB of resolution, but for the meters to accurately display ranges to -90 dB, you must calibrate the **DC adjust**.

## Calibrating the DC adjustment

Before using the DC adjust feature, you must calibrate it for the selected recording device.

1. Select the **DC adjust** check box. The **Calibrate** button activates along with displays labeled **Left** and **Right**.

DC adjust:  Set the DC adjust check box to activate the **Calibrate** button



2. Click the **Calibrate** button. Sound Forge software listens to the selected recording device and calculates the offset.

## Recalibrating the DC adjustment

If you have multiple sound cards, you should recalibrate the **DC adjust** each time you select a new recording device. Certain sound cards must also be recalibrated each time the sample rate changes or when switching between mono and multichannel recording.

**Tip:** You can recalibrate at any time, even during recording. However, it is preferable to perform recalibration with silence at the record inputs.

## Playing back recorded audio

Audition your recorded audio by playing it back in the Record dialog. Click the **Play** button  to begin playback and click the **Stop** button  to end playback. You can use the other buttons on the mini-transport bar in the Record dialog to navigate to different locations in the file.



## Adjusting pre/post-roll for punch-in and automatic retake recording playback

Once you have recorded a punch-in or an automatic retake, you can audition it with user-configured pre-roll and post-roll to evaluate the performance. This option allows you to indicate the amount of sound data that should be played preceding or following your recorded take when you review your takes. Reviewing with pre- and post-roll helps you review your takes in context.

1. Select the **Review pre/post-roll** check box in the Record dialog. The two corresponding boxes become active.
2. Enter appropriate pre-roll and post-roll values in the respective boxes.

Review pre/post-roll (0 to 30 seconds):


**Note:** *In Automatic retake mode, the post-roll control is unavailable.*

3. Click the **Play** button . The punch-in segment plays with the configured pre-roll and post-roll.

**Note:** *Regardless of the data window's current status format, pre-roll and post-roll values are measured in seconds.*

## Synchronizing with other devices

Sound Forge software can generate MTC/SMPTE synchronization while recording.

1. From the **Options** menu, choose **Preferences**, and click the **MIDI/Sync** tab.
2. On the **MIDI/Sync** tab, choose the trigger device from the **Input** drop-down list and click the **OK** button.
3. From the **Options** menu, choose **MIDI In/Out**, and then choose **Generate MIDI Timecode** from the submenu to enable MIDI timecode output.
4. Click the Record button .
5. Click the **Advanced** tab at the bottom of the Record dialog.
6. Select the **Enable MTC/SMPTE Output Synchronization** check box.
7. Select the **Start** check box and specify the time you want to start recording.
8. Select the **Pre Roll** check box and type a value in the edit box to begin SMPTE output at a specified time before recording.
9. Click the **Close** button.

## Monitoring audio input

The input meters in the **Meters** tab at the bottom of the Record dialog show the level of the incoming signal. For recording purposes, the incoming audio should remain primarily in the yellow, only occasionally entering the red.

### Enabling the recording meters

Recording meters are displayed in the **Meters** tab at the bottom of the Record dialog so you can check your input level before recording.

Click the **Meters** tab at the bottom of the Record dialog to display recording meters, and then select the **Monitor** check box to enable the recording meters. The peak meters represent the volume of the recording input. For best results, the peak level should be somewhere in the yellow range with an occasional red: you want your input to be as loud as possible without clipping.

You can display a peak meter, VU/PPM, a phase scope, and mono-compatibility meter for each channel. To toggle the display of each meter, right-click the **Meters** tab in the Record dialog and choose a command from the shortcut menu. A check mark is displayed to indicate which meters are currently visible.

For more information about the VU/PPM meters, please see [Using the VU meters on page 35](#).

For more information about the phase scopes, please see [Using phase scopes on page 36](#).

For more information about the mono-compatibility meters, please see [Using the mono-compatibility meters on page 37](#).

You can work with the record input meters in much the same way you do with other meters in the application. *For more information, see [Monitoring levels in digital audio on page 32](#).*

#### Tips:


- Click the **Reset** button (or press Alt+T) to reset clip indicators or held peaks or valleys.
- Right-click the meters and choose a setting from the shortcut menu to change the meters' scale.
- If you are going to decrease the bit depth of your sound file after recording, it is particularly important that you record with the loudest possible levels. High recording levels ensure that you will use the maximum possible dynamic range in the converted file.

### Enabling input monitoring

Click the **Advanced** tab at the bottom of the Record dialog and select the **Enable audio input monitoring** check box if you want to route the audio received by the input device to the current output device.

**Note:** This check box is available only when the **Monitor** check box is enabled.

### Inserting markers while recording

Click the **Drop Marker** button  in the Record dialog's mini-transport bar (or press M) to insert a marker in the data window during recording.

You can then use the **Markers to Regions** command to convert markers into regions. *For more information, see [Inserting regions based on marker positions on page 103](#).*

### Automatically labeling windows and regions

Files and regions can be automatically named for you as you record. This automatic labeling feature is particularly useful when recording in **Multiple takes creating Regions** mode or **Create a new window for each take** mode. *For more information, see [Choosing a recording mode on page 119](#).*

Right-click the Record dialog and choose **Automatic Labeling** from the shortcut menu to access the Automatic Labeling dialog. *For more information, see [Customizing region labeling on page 104](#).*

## Changing blinking status

The **Recording** message located to the right of the mini-transport bar in the Record dialog can display within a flashing or solid red frame.

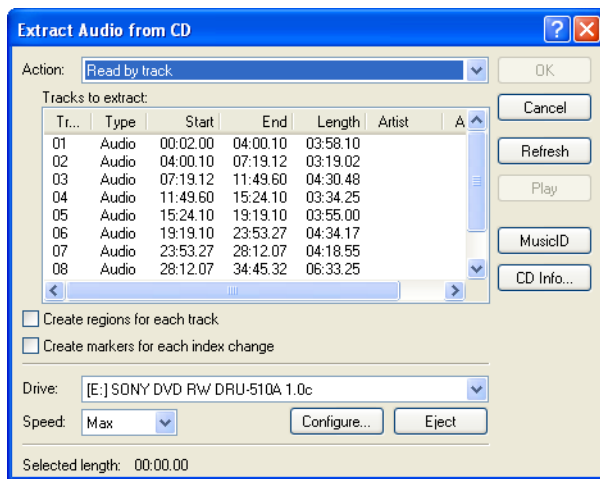
To toggle between the blinking status settings, right-click the Record dialog and choose **Blinking Status** from the shortcut menu. A check mark displays adjacent to the command to indicate that the frame is configured to flash.

## Extracting audio from CDs

You can extract data from CD and open tracks in the Sound Forge workspace.

**Tip:** Double-click a *.cda* file in the Explorer window (or drag it to the workspace) to extract a CD track without opening the Extract Audio from CD dialog. You can also extract audio from the Open dialog by choosing CD Audio (\*.cda) from the **Files of type** drop-down list in the Open dialog.

1. Insert a CD in the drive.
2. From the **File** menu, choose **Extract Audio from CD**. The system's drive(s) are identified. The Extract Audio from CD dialog is displayed. If the system is equipped with multiple CD-ROM or DVD-ROM drives, you must select the desired drive from the **Drive** drop-down list near the bottom of the dialog.



3. From the **Action** drop-down list, choose the method you want to use for extracting the CD audio:

Method	Description
Read by track	Use this option to select the tracks you want to extract from the CD. Each track is extracted into a unique data window.
Read entire disc	Use this option to automatically extract all tracks on the disc. The entire CD is extracted into a single data window.
Read by range	Use this option to extract audio from a specified range of time. Type appropriate values in the Start and End (or Length) boxes. The range of audio is extracted into a single data window.

4. If you choose **Read by track** or **Read by range** from the **Action** drop-down list, select the tracks or time range you want to extract.

**Note:** Click **Play** to preview your selection. During playback, the button changes to a **Stop** button.

5. Select extraction options as needed:
  - Select the **Create regions for each track** check box to add each extracted track to the file's Regions List.
  - Select the **Create markers for each index change** check box to place markers in the extracted file at all points where indices occur in the original track.
6. From the **Drive** drop-down list, choose the CD drive that contains the CD from which you want to extract audio.

7. Click the **MusicID** button if you want to obtain CD information using Gracenote MusicID.  
If CD information is not available, you can click the **CD Info** button to display a dialog box where you can edit the CD information and submit it for inclusion in the Gracenote Media Database. *For more information, see [Obtaining or editing CD information](#) on page 45.*
8. From the **Speed** drop-down list, choose the rate at which you want to extract audio. If you experience gapping or glitching, decrease the speed or click **Configure** and adjust the **Audio extract optimization** setting.

**Note:** *To eject the CD at any time prior to beginning the extraction process, click the **Eject** button.*

9. Click **OK**. The data extraction from the CD begins, and a progress meter is displayed.

### Previewing CD tracks

In the Extract Audio from CD dialog, select a track and click the **Play** button to preview a track prior to extracting it from the CD. To end the preview, click **Stop**.

### Refreshing the Extract Audio from CD dialog

Click the **Refresh** button after you insert a new CD in the system's CD-ROM or DVD-ROM drive. This allows you to view the contents of the new CD without closing and reopening the Extract Audio from CD dialog.

### Burning CDs

You can write audio to CD if your system is configured with a supported CD-R/RW drive and the necessary drivers. CDs are burned using the track-at-once method, meaning that additional tracks can be added to the CD over a period of time. Once all desired tracks are added, you must close the CD before it can be played in a consumer CD player. However, once you have closed a CD, you can no longer add tracks to it.

### Correcting the sample rate for CD burning

Sample rates deviating from 44,100 Hz cause CD track lengths to be miscalculated. When attempting to write a file to CD that deviates from the 44,100 Hz sample rate, you are prompted to change the sample rate. Selecting **Yes** automatically resamples audio to 44,100 Hz.

In addition, you can use the **Resample** tool to change the sample rate of a file prior to burning the CD. *For more information, see [Resample](#) on page 154.*

### Writing mono tracks to a CD

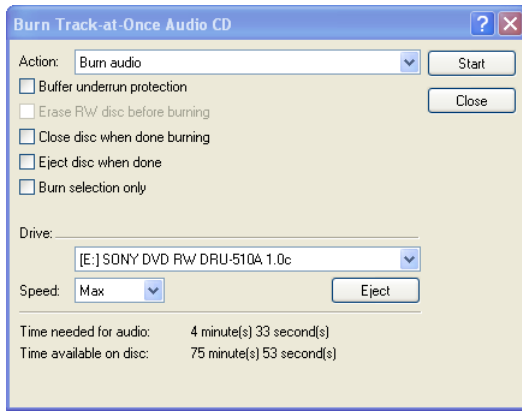
If you attempt to write mono audio tracks to a CD, you are prompted to create a stereo file by copying the mono data to both channels.

### Adding tracks to a CD

You should always save your audio files prior to writing them to CD.

1. From the **Tools** menu, choose **Burn Track-at-Once Audio CD**. The Burn Track-at-Once Audio CD dialog is displayed. The bottom of the dialog displays the length of the current audio file and the amount of time remaining on the CD currently in the CD-R/RW.

**Note:** *If there is no CD in the current drive, only the **Drive** and **Speed** drop-down menus and the **Close** button are available in this dialog. If you insert a disc or select a different drive after this dialog is displayed, it takes a moment to recognize the disc and make all options available.*



2. Choose a setting from the **Action** drop-down list:

Setting	Description
Burn audio	Begins recording audio to your CD when you click the <b>Start</b> button. You will need to close the disc before it can be played in an audio CD player.
Test, then burn audio	Performs a test to determine whether your files can be written to the CD recorder without encountering buffer underruns. Recording begins after the test if it is successful.
Test only	Performs a test to determine whether your files can be written to the CD without encountering buffer underruns. No audio is recorded to the CD.
Close disc	Closes your disc without adding any audio when you click the <b>Start</b> button. Closing a disc allows your files to be played on an audio CD player.
Erase RW disc	Erases your rewritable CD when you click the <b>Start</b> button. You should use this option if your rewritable CD already has data on it.

3. Select your burning options:

Option	Description
Buffer underrun protection	Select this check box if your CD recorder supports buffer underrun protection. Buffer underrun protection allows a CD recorder to stop and resume burning.
Erase RW disc before burning	If you're using a rewritable CD, select this check box to erase the CD before you begin burning if your rewritable CD already has data on it.
Close disc when done burning	Select this check box to close the CD after burning. Closing a disc allows your files to be played on an audio CD player. <b>Note:</b> You can close the disc using a separate step later. For more information, see <a href="#">Closing a CD</a> on page 125.
Eject disc when done	Select this check box to eject the CD automatically when burning has completed.
Burn selection only	Select this check box to burn only the audio within the loop region.

4. From the **Drive** drop-down list, choose the CD-R/RW drive that you want to use to burn your CD.

5. From the **Speed** drop-down list, choose the speed at which you want to burn. **Max** will use your drive's fastest possible speed; decrease the setting if you have difficulty burning.

6. Click the **Start** button.

**Important:** *Clicking **Cancel** after the CD writing process begins renders the CD unusable.*

After the audio is written to CD, the CD Operation dialog indicates whether the writing was successful.

7. Click **OK** to clear the message.



## Closing a CD

Closing the CD allows you to listen to it in an audio CD player. However, you cannot add tracks to a CD once it is closed.

1. From the **Tools** menu, choose **Burn Track-at-Once Audio CD**. The Burn Track-at-Once Audio CD dialog is displayed.
2. From the **Action** drop-down list, choose **Close Disc**.
3. If desired, select the **Eject disc when done** check box to eject the CD automatically when the disc has been closed.
4. Click the **Start** button. The Sound Forge application begins closing the CD and displays a progress meter in the dialog.  
After the CD is closed, the CD Operation dialog indicates whether the closing was successful.
5. Click **OK** to clear the message.

## Proper use of software

Sound Forge software is not intended for, and should not be used for, illegal or infringing purposes, such as the illegal copying or sharing of copyrighted materials. Using Sound Forge software for such purposes is, among other things, against United States and international copyright laws and contrary to the terms and conditions of the End User License Agreement. Such activity may be punishable by law and may also subject you to the breach remedies set forth in the End User License Agreement.



# Chapter 9: Editing, Repairing, and Synthesizing Audio

This chapter introduces some of the Sound Forge® advanced editing, repair, and synthesis features.

## Overwriting and replicating

Earlier in this manual, paste and mix were described as ways of adding clipboard contents to the current data window. As your audio editing projects become more elaborate, you may discover the need for three more sophisticated paste operations: overwrite and replicate.

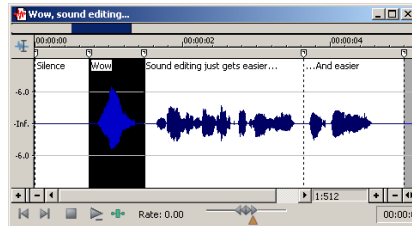
### Overwriting

Overwriting allows you to replace the current selection with the contents of the clipboard and has two basic guidelines:

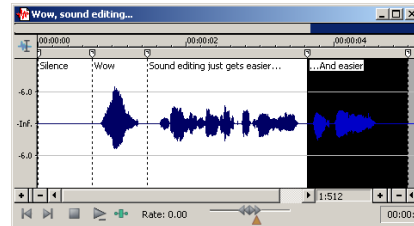
If	Then
The selection is longer than the clipboard contents	Data is overwritten from the beginning of the selection for the length of the clipboard contents only.
The clipboard contents are equal to or longer than the selection	Data is overwritten for the length of the selection only.

### Overwriting a selection

1. Open the Voiceover.pca file.
2. Create a selection containing "Wow."
3. Copy the selection. The data is placed on the clipboard.

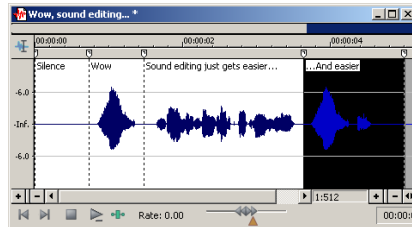


Copy the selection



Create a second selection

4. Create a selection of approximately the same length containing the final "...and easier."
5. From the **Edit** menu, choose **Paste Special**, and choose **Overwrite** from the submenu or right-click the data window and choose **Overwrite** from the shortcut menu. The selection is overwritten with the clipboard contents.



Overwrite the selection

**Note:** If any of the selection data remains, it is because the length of the clipboard contents was less than the length of the selection.

## Replicating

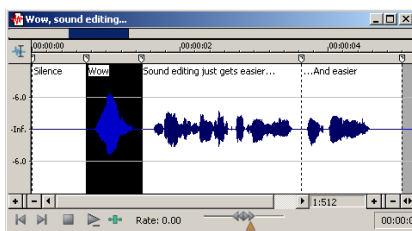
Replicating allows you to overwrite your current data window selection with several copies of the clipboard contents. When replicating, you must specify whether you want to use partial copies of the clipboard contents or only complete copies.

- Using partial copies of the clipboard content completely overwrites the selected data window area.
- Using complete copies of the clipboard content prevents a portion of the data window selection from being overwritten unless the selection length is an exact multiple of the length of the clipboard contents.

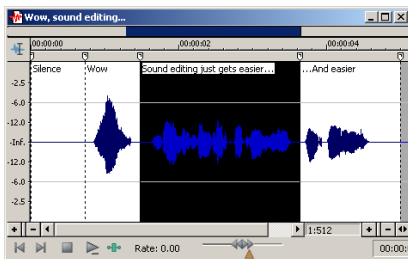
**Note:** The **Replicate** command will paste as many copies of the clipboard as will fit in the current selection. If no selection exists in the data window, the command is not available.

### Replicating a selection

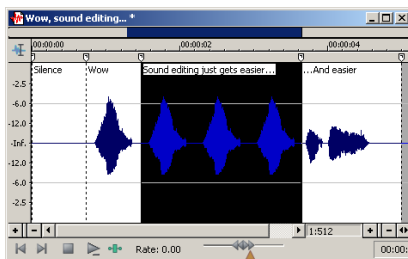
1. Open the Voiceover.pca file.
2. Create a selection containing "Wow."
3. Copy the selection. The data is placed on the clipboard.



4. Create a selection containing "Sound editing just gets easier."



5. From the **Edit** menu, choose **Paste Special** and choose **Replicate** from the submenu. The Replicate dialog is displayed.
6. Select the **Copy partials** radio button and click **OK**. The selection is overwritten with multiple copies of the clipboard contents. A partial copy of the clipboard contents is used where appropriate.




## Repeating an operation

Once you perform an operation on an audio file, you can quickly repeat it with the same parameters by choosing **Repeat** from the **Edit** menu. This allows you to reapply the same effect, process, or function to a different section of audio using the same parameters.

**Note:** In the **Edit** menu, the **Repeat** command displays in conjunction with the name of the previous function.

You can also repeat an operation by doing any of the following actions:

- Hold Shift while choosing the command from its menu.
- Press Ctrl+Y.
- Click the **Repeat** button  on the Standard toolbar.

## Using drag-and-drop

You can take advantage of using drag-and-drop to perform many common tasks. Drag-and-drop operations make controlling the Sound Forge software faster and more intuitive and allow for increased editing power. The major drag-and-drop editing operations are paste and mix.

### Dragging mono selections into multichannel destinations

When pasting or mixing a mono selection into a multichannel file, you can mix the selection to both channels by dropping it on the destination data window's center line. Otherwise, the selection is mixed into the left or right channel exclusively.

### Snapping to events in drag-and-drop operations

A major advantage of drag-and-drop editing is the ability to snap to markers, regions, time increments, or other events in the destination window. All drag-and-drop operations can be configured to snap (or align) to points in the destination file based on the events established within that file.

The following table describes all events that drag-and-drop selections snap to in the destination file.

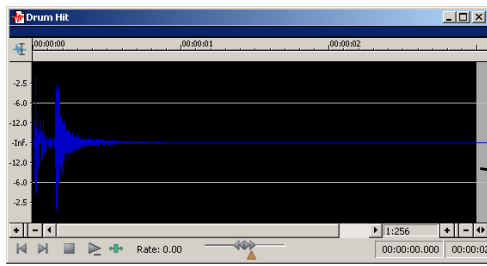
Events	Description
Cursor	Start of block snaps to cursor position.
Selection	Start of block snaps to start or end points of a selection.
Start	Start of block snaps to start of file.
End	Start of block snaps to end of file.
Markers	Start of block snaps to marker.
Regions Start and End Markers	Start of block snaps to region start or end.
Time, Measures, etc.	Start of block snaps to labeled divisions on time ruler.
Video Frames	Start of block snaps to the start of video frames appearing in the video strip.

### Pasting and mixing with drag-and-drop

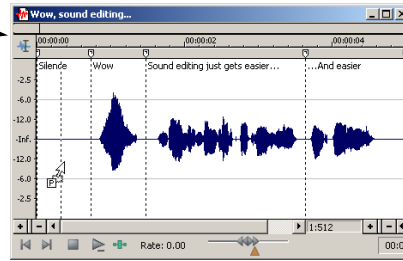
You can drag an audio selection and paste or mix it into another data window.

#### Pasting

1. Open the Voiceover.pca and Drumhit.pca files.
2. Select all audio data in Drumhit.pca.



Create a selection in the source window

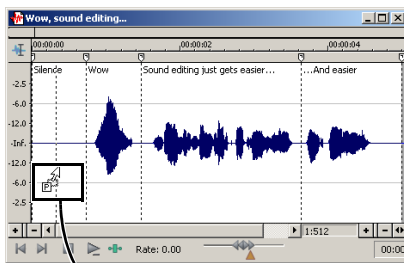


Hold the Alt key and drag the selection into the destination window

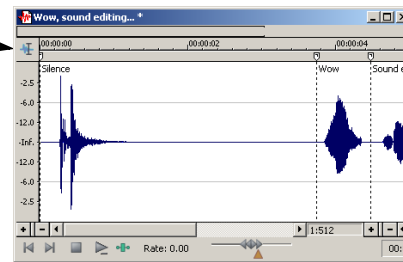
3. Hold the Alt key and drag the selection to the Voiceover data window.
  - A vertical dotted line representing the leading edge of the source selection appears in the destination window.
  - The letter "P" appears in the box adjacent to the pointer.

**Tip:** When dragging a selection to paste sound data, drag up or down before moving the mouse left or right. Dragging left or right before moving the mouse vertically adjusts the selection length.

4. Use the mouse to position the dotted line in the destination window where the source data will be pasted.

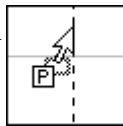


Drag the selection to the destination window



Selection is pasted into the destination window

Drag-and-drop paste indicator

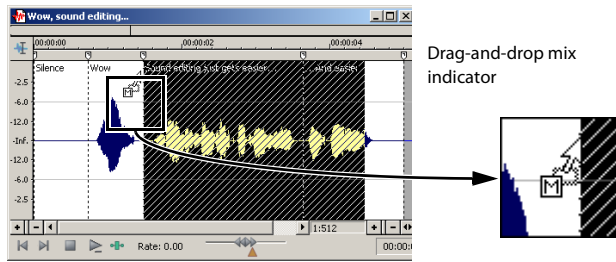


5. Release the mouse button. The selection is pasted into the destination window.

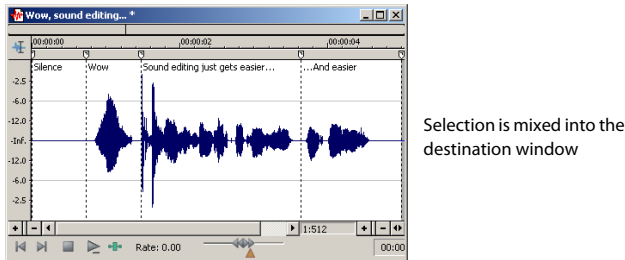
## Mixing

1. Open the Voiceover.pca and Drumhit.pca audio files.
2. Select all audio data in the Drumhit data window.
3. Drag the selection to the Voiceover data window.
  - A shaded region representing the source selection appears in the destination window.
  - An "M" appears in the box adjacent to the pointer.

**Tip:** When dragging a selection to paste sound data, drag up or down before moving the mouse left or right. Dragging left or right before moving the mouse vertically adjusts the selection length.



4. Position the leading edge of the shaded region in the Voiceover data window where the mixing of the selection will begin.
5. Release the mouse button. The Mix dialog is displayed.
6. Verify that both **Volume** levels are set to 0 dB and click **OK**.



### Toggle the Mix/Paste functions

An alternate way of specifying a mix or paste is the mouse toggle method.

1. Open the Voiceover.pca and Drumhit.pca files.
2. Select all audio data in the Drumhit data window.
3. Drag the selection to the Voiceover data window. A shaded region representing the source selection appears in the destination window and a letter appears in the box adjacent to the pointer.

**Tip:** When dragging a selection to paste sound data, drag up or down before moving the mouse left or right. Dragging left or right before moving the mouse vertically adjusts the selection length.

4. Continue holding the left mouse button while clicking the right mouse button. The letter in the box and the appearance of the selection region change to indicate the current drag-and-drop mode.
5. Release the left mouse button. The source audio data is pasted or mixed into the destination data.

### Creating new windows with drag-and-drop

Drag-and-drop also allows you to create a new data window from a selection.

1. Open the Voiceover.pca file.
2. Create a selection containing "Wow."
3. Drag the selection to an empty area of the Sound Forge workspace and drop it. A new data window is created containing the selection data with the attributes of the original file.

**Tip:** When dragging a selection to paste sound data, drag up or down before moving the mouse left or right. Dragging left or right before moving the mouse vertically adjusts the selection length.

## Finding and repairing audio glitches

Glitches are commonly the result of analog audio editing, analog to digital transfer, or electronic noise. Sound Forge software provides you with a tool for locating audio glitches and three distinct tools for repairing them: channel, interpolate, and replace. In addition, you can repair audio glitches manually using the Pencil tool.


### Locating glitches

The Find tool allows you to quickly locate glitches, specific volume levels, or silence in a file. The Find tool's glitch algorithm locates glitches by examining the file for instances where the waveform matches the specified threshold slope and sensitivity criteria. The cursor then moves to the location of the glitch to allow you to repair it. This tool only locates one glitch at a time. Therefore, it may be necessary to execute this command several times on a file to locate all glitches.

1. Open any audio file containing glitches.
2. From the **Tools** menu, choose **Find**. The Find dialog is displayed.
3. From the **Find** drop-down list, choose **Glitch**.
4. Adjust the **Threshold slope** fader to configure the minimum slope that constitutes a glitch.
  - A high value detects only glitches with steep slopes.
  - A lower value detects glitches with both steep and more gradual slopes.
5. Adjust the **Sensitivity** fader to determine the sensitivity of the detection algorithm.
  - A high value results in any part of the waveform with a slope greater than the **Threshold slope** being detected as a glitch.
  - A lower value forces the algorithm to verify that the slope is indeed a glitch, and not simply a portion of the smooth waveform.
6. Click **OK**. The first glitch in the file is found and its location is marked with the cursor.

**Tip:** If you can hear glitches that the **Find** tool does not locate, decrease the **Threshold slope** and increase the **Sensitivity**.

### Locating additional glitches using the same settings

Once you have configured the settings in the Find dialog, you can find the next glitch in the file without viewing the Find dialog. To find the next glitch using the current settings, hold Shift while choosing **Find** from the **Tools** menu or hold Shift while clicking the **Find** button  on the Tools toolbar.

Using the Shift key in this way is not limited to finding glitches. You can hold Shift and choose any command from a menu to repeat the command with the same settings. For more information, see [Repeating an operation](#) on page 129.

## Repairing audio

There are several ways to repair audio glitches.

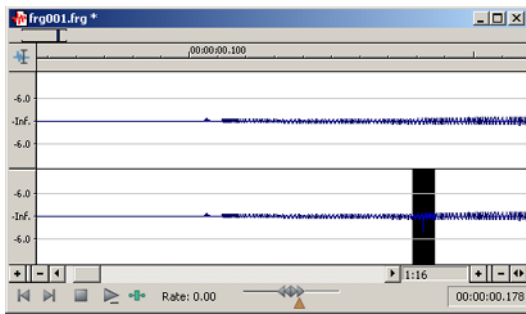
### Copying the other channel

For glitches in a single channel of a multichannel file, you can replace the glitched section of damaged channel with the corresponding data from a "good" channel.

**Note:** This method only works if the channels contain similar audio.

1. Open the file containing the glitch.
2. Create a selection in the channel containing the glitch, three or four times longer (maximum 50 ms) than the glitch itself.





- From the **Tools** menu, choose **Repair**, and choose **Copy Other Channel** from the submenu. The selected data is replaced with the corresponding data from the “good” channel. In addition, rapid crossfades are created at the beginning and end of the replacement selection to prevent a new glitch from being created.

**Tip:** If this method fails to repair the glitch, undo it and apply **Copy Other Channel** again, this time using a longer selection.

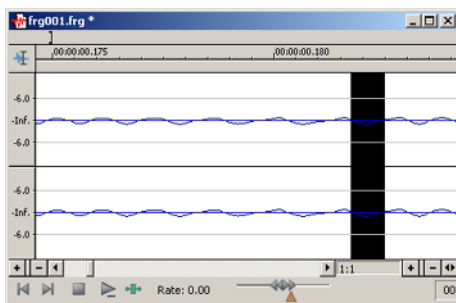
### Interpolating new audio

This is the most basic method of repairing glitches. New audio data is simply interpolated based on the data at the beginning and end of the selection. This method results in a straight line connecting the beginning and end of the selection. Interpolation should only be used to repair small (less than 2 ms) glitches.

- Open the file containing the glitch.
- Right-click the data window and choose **Zoom** from the shortcut menu, and choose **In Full** from the submenu. The file displays at a 24:1 zoom ratio.
- Create a selection containing the glitch.

**Tip:** To improve the accuracy of this feature, the selection should be as small as possible while still containing the glitch.

- From the **Tools** menu, choose **Repair**, and choose **Interpolate** from the submenu. The glitch data is replaced with interpolated data.



Data is interpolated within the selection

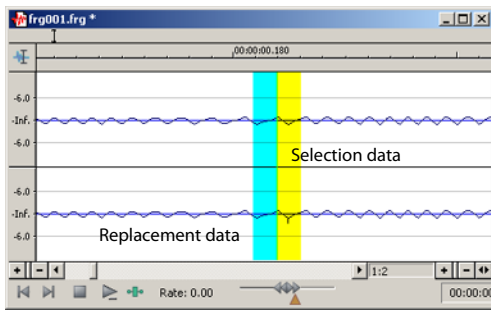
### Replacing audio with preceding data

The Replace tool allows you to repair audio files by replacing the damaged data with the data immediately preceding it. This repair method is useful for repairing longer glitches such as needle drops and scratches.

- Open the file containing the glitch.
- Create a 5 to 50 ms selection containing the damaged audio.


**Note:** The maximum allowed replace time is 0.5 seconds.

- From the **Tools** menu, choose **Repair**, and choose **Replace** from the submenu. The selection is replaced with the selection of identical length immediately preceding the damaged data. In addition, rapid crossfades are created at the beginning and end of the replacement selection to prevent a new glitch from being created.



### Repairing audio glitches manually with the Pencil tool

The Pencil tool is for users who prefer to repair their audio glitches manually. This tool allows you to repair waveform glitches by redrawing the damaged waveform section. However, the Pencil tool can only be used when a file's waveform displays at a zoom ratio of 1:32 or lower.

- Open the file containing the glitch.
- Zoom in tightly on the glitch.
- Select the Pencil tool using any of the following methods:
  - From the **Edit** menu, choose **Tool**, and choose **Pencil** from the submenu.
  - Click the **Pencil Tool** button  in the Standard toolbar.
  - Click the Edit Tool Selector in the top-left corner of the data window until the **Pencil** tool is displayed.
- Drag to draw a new waveform section. The new section is integrated into the original waveform, replacing the section containing the glitch.

### Repairing audio using Audio Restoration plug-in

Sound Forge software includes an ExpressFX™ plug-in called Audio Restoration that you can use to remove surface noise from old recordings. For more information on this plug-in, please see the Sound Forge online help file (accessible from the **Help** menu by choosing **Contents and Index**).

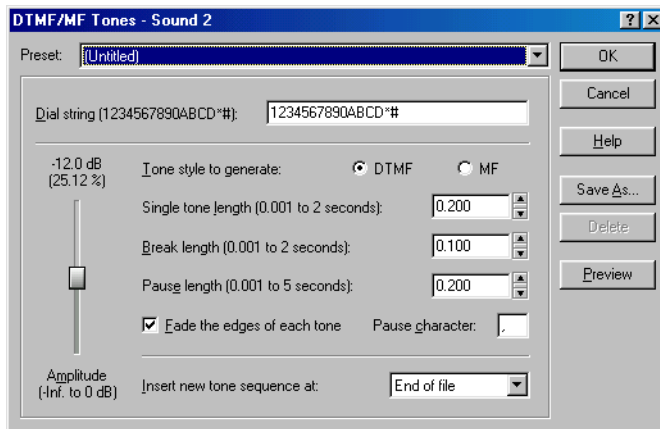
## Synthesizing audio

You can generate custom tones and waveforms for use in your audio projects.

### Generating DTMF/MF tones

You can generate standard dial tones used by telephone companies.

1. From the **Tools** menu, choose **Synthesis**, and choose **DTMF/MF Tones** from the submenu. The DTMF/MF Tones dialog is displayed.



2. Enter the phone number to be generated in the **Dial string** edit box, including pause characters.

**Note:** *Unknown characters are ignored.*

3. Use the **Amplitude** fader to set the peak level of the waveform.
4. Select the **Tone style to generate** radio button corresponding to the tone to be generated.
  - DTMF (Dual Tone Multi-Frequency) signals are used by standard push-button telephones and are generated using combinations of 679, 770, 852, 941, 1209, 1336, 1477, and 1633 Hz sine waves.
  - MF signals are used internally by the telephone networks and are generated with a combination of 700, 900, 1100, 1300, 1500, and 1700 Hz sine waves.
5. Specify the output length (in seconds) of each tone in the **Single tone length** box.
6. Specify the length (in seconds) of silence between tones in the **Break length** box.
7. Specify the pause length (in seconds) to be inserted for a pause character in the **Pause length** box.
8. Select the **Fade the edges of each tone** check box to help prevent glitching.
9. Specify the pause character in the **Pause character** box.
10. Use the **Insert new tone sequence at** drop-down list to specify where the generated tone is placed in the audio file.
11. Click **OK**.

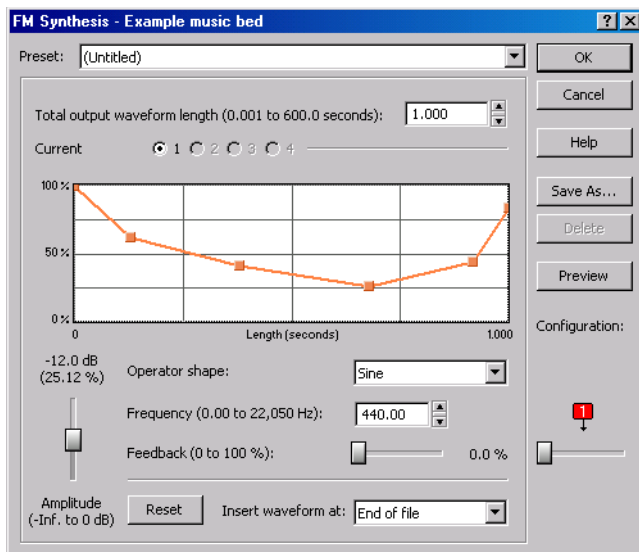
### Generating audio with frequency modulation

The Sound Forge FM Synthesis feature can be used to create complex sounds from simple waveforms using frequency modulation (FM). In frequency modulation, the frequency of a waveform (carrier) is modulated by the output of another waveform (modulator) to create a new waveform. If the frequency of the modulator is low, the carrier is detuned slowly over time. If the frequency of the modulator is high, the carrier is modulated so quickly that numerous additional frequencies (or sidebands) will be created.

Using the **FM Synthesis** tool, up to four waveforms (operators) can be used in a variety of configurations. Depending on the configuration, a waveform can be a carrier, a modulator, or a simple, unmodulated waveform.

## Generating a waveform

1. From the **Tools** menu, choose **Synthesis**, and choose **FM** from the submenu. The FM Synthesis dialog is displayed.



2. Specify the length (in seconds) of the generated waveform in the **Total output waveform length** box.
3. Use the **Configuration** slider to configure the arrangement and number of operators used to generate the waveform. *For more information, see [Specifying the number and arrangement of operators](#) on page 136.*
4. Modify individual operators as needed. *For more information, see [Modifying an operator](#) on page 136.*
5. From the **Insert waveform at** drop-down list, choose a position to determine where the generated waveform is placed in the file.
6. Click **OK**.

## Specifying the number and arrangement of operators

Dragging the **Configuration** slider changes the graphical representation of the arrangement and number of operators used to generate the waveform. When configuring your waveform, keep the following guidelines in mind:

- The outputs of horizontally joined operators are simply mixed. The outputs of the bottom operators are mixed to form the final output. Mixing unique simple waveforms is referred to as additive synthesis.
- Operators joined vertically are FM carrier-modulator pairs. The bottom operator is the carrier and the top operator is the modulator.
- Operators without other operators directly above are simple waveform generators.
- When three or more operators are stacked, the top operator modulates the operator below it, which modulates the following operator, and so on.

## Modifying an operator

1. Select the **Current** radio button corresponding to the operator to be modified.
2. Use the envelope graph to modify the amplitude of the operator over time. *For more information, see [Envelope graphs](#) on page 38.*
3. From the **Operator shape** drop-down list, choose a waveform shape.
4. Specify the frequency of the operator in the **Frequency** box.

### Notes:

- If **Frequency** is set to 0.00, a DC (zero-frequency) waveform is produced regardless of the waveform specified.
- When you choose **Filtered Noise** from the **Operator shape** drop-down list, **Frequency** determines the high-frequency content of the noise.

5. Use the **Feedback** slider to determine the amount of the operator's output that is used to modulate itself. If the operator is also being modulated by another waveform, the feedback path and the modulator output are mixed together to modulate the carrier.

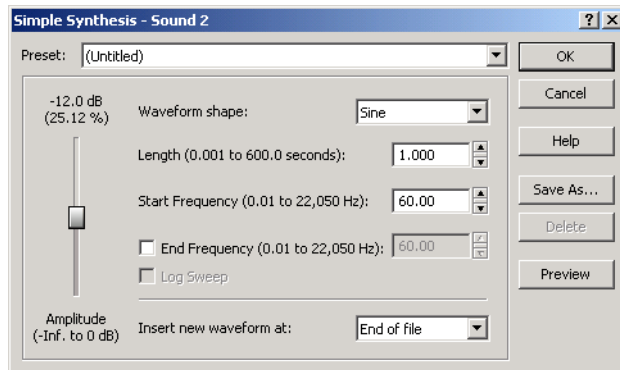
6. Use the **Amplitude** fader to determine the output gain that is applied to the current operator after the amplitude envelope.

**Note:** If the operator is a modulator, this control (along with the envelope) determines the amount of frequency modulation applied to the carrier. If the amplitude of a modulator is high, harsh audio may result.

## Generating simple waveforms

The **Simple Synthesis** tool is used to generate simple waveforms of a given shape, pitch, and length.

1. From the **Tools** menu, choose **Synthesis**, and choose **Simple** from the submenu. The Simple Synthesis dialog is displayed.



2. From the **Waveform shape** drop-down list, choose a shape to specify the shape of a single period of the current operator's waveform.
3. In the **Length** box, specify the length (in seconds) of the generated waveform.
4. In the **Start Frequency** box, specify the frequency of the waveform.
5. If you want to sweep a range of frequencies, select the **End Frequency** check box and specify an ending frequency in the box. Select the **Log Sweep** check box if you want to sweep the range logarithmically; when the check box is cleared, the sweep is linear.
6. Use the **Amplitude** fader to set the peak level of the waveform.

**Note:** When you choose **Noise** in the **Waveform shape** drop-down list, the amplitude is affected by the specified cutoff frequency.

7. From the **Insert new waveform at** drop-down list, choose a position to determine where the waveform is placed in the data window.
8. Click **OK**.



# Chapter 10 Processing Audio

This chapter provides descriptions of processing presets and previews as well as an overview of all functions in the Sound Forge® Process menu.

## Applying presets

Many Sound Forge dialogs contain drop-down lists of presets used to quickly apply processes and effects. Presets are especially useful when you are learning the application, as they allow you to hear the results of processing as well as view the control settings used to produce these results.

**Note:** All information regarding presets in this chapter is applicable to DirectX® Plug-Ins (effects) from Sony Media Software.

## Using presets

1. Open the Voiceover.pca file.
2. From the **Process** menu, choose **Fade**, and choose **Graphic** from the submenu. The Graphic Fade dialog is displayed.
3. From the **Preset** drop-down list, choose the **-20 dB exponential fade out** preset. Notice that the dialog's controls change to reflect the -20 dB exponential fade out.
4. Click the **Preview** button. The following actions occur:
  - The **Preview** button changes to a **Stop** button.
  - The effect previews on a brief selection of audio.

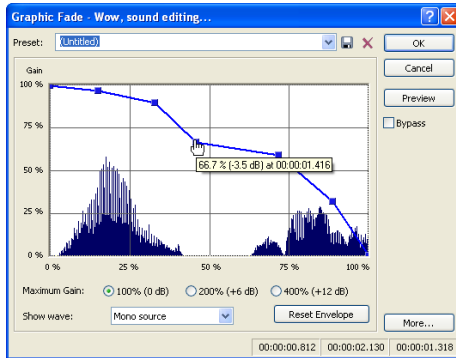
*For more information, see [Previewing processed audio](#) on page 141.*
5. From the **Preset** drop-down list, choose the **-3 dB exponential fade out** preset. Notice that the dialog's controls update to reflect the new preset and the effect automatically previews.
6. Select the **Bypass** check box. The original audio previews with no effects. *For more information, see [Bypassing a process while previewing](#) on page 141.*
7. Clear the **Bypass** check box and click **OK**. The **-3 dB exponential fade out** preset is applied to the audio file.

**Note:** An effect or process is not applied to the audio data until you click **OK**.


## Creating presets

You can also create custom effects and save them as presets.


1. Open the Voiceover.pca file.
2. From the **Process** menu, choose **Fade**, and choose **Graphic** from the submenu. The Graphic Fade dialog is displayed.
3. From the **Preset** drop-down list, choose the **-3 dB exponential fade out** preset. The dialog's controls change to reflect the preset.
4. Drag any of the graphic fade points to a new position.



Edit the graphic fade and click the **Save Preset** button.

5. Click the **Save Preset** button . The Save Preset dialog is displayed.
6. Enter a name for the preset and click **OK**. The new preset is saved and added to the dialog's drop-down list.

## Deleting presets

To delete a preset, choose it from the **Preset** drop-down list and click the **Delete Preset** button .

**Note:** *Built-in presets cannot be deleted.*

## Resetting parameters

To reset all dialog controls to their default settings, right-click the dialog and choose **Reset All** from the shortcut menu.

## Managing presets

Once you have created custom presets, you can use the Sound Forge Preset Manager to back up, transfer, or delete custom presets from any of the installed effects, processes, tools and plug-ins. You can also use the Preset Manager to manage your ACID® and Vegas® presets. *For more information, see [Using the Preset Manager on page 167](#).*



## Previewing processed audio

You can preview the effect that a process has on a file by using the **Preview** button found in most audio processing dialogs. You can use previews to fine-tune effect parameters without leaving the dialog. More importantly, using previews reduces wasted processing time.

## Setting custom preview parameters

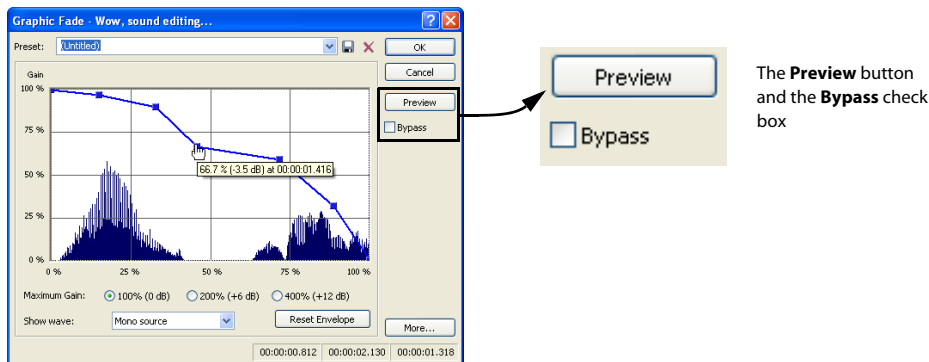
You can customize the preview parameters to satisfy your editing preferences. You can save custom previewing settings for the current process alone or for all processes.

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Previews** tab.
3. Edit the preview parameters as desired. *For more information, see [Previews tab on page 246](#).*
4. Click **OK**. The new preview parameters are updated and saved for all effects.

## Bypassing a process while previewing


You are also able to A/B test an effect by using the **Bypass** check box to switch between previewing the processed and unprocessed audio file.

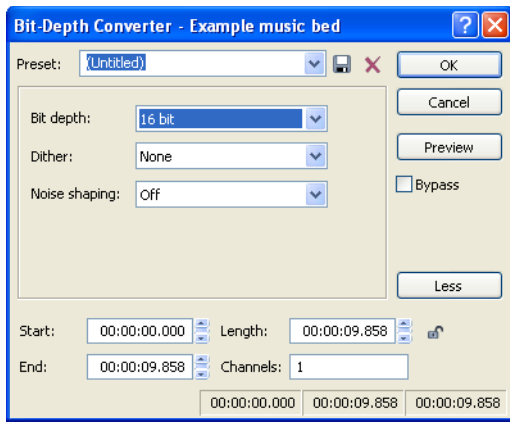
- If you select the **Bypass** check box, the unprocessed audio file is played when you click the **Preview** button.
- If you clear the **Bypass** check box, the processed audio file is played when you click the **Preview** button.



## Adjusting the data window selection

You can easily adjust your data window selection from within most processing dialogs by clicking the **More** button on the right side of the dialog and specifying the selection parameters explained below.

Control	Description
Start	Determines the starting point for your selection in the data window. The <b>Length</b> field adjusts automatically according to your input in this box.
End	Determines the ending point for your selection in the data window. The <b>Length</b> field adjusts automatically according to your input in this box.
Length	Determines the length of your selection in the data window. Click the <b>Lock Length</b> button  to lock or unlock the current selection length. When the selection length is locked, Sound Forge will adjust the values in the <b>Start</b> or <b>End</b> boxes to retain the specified selection length.
Channels	Determines the channel(s) included in the data window selection. Type a number in the box to change the channel selection while retaining the start, end, and length selections.



Clicking the **More** button displays additional information you can use to adjust your data window selection. To hide this information, click the **Less** button.

## Sound Forge processes

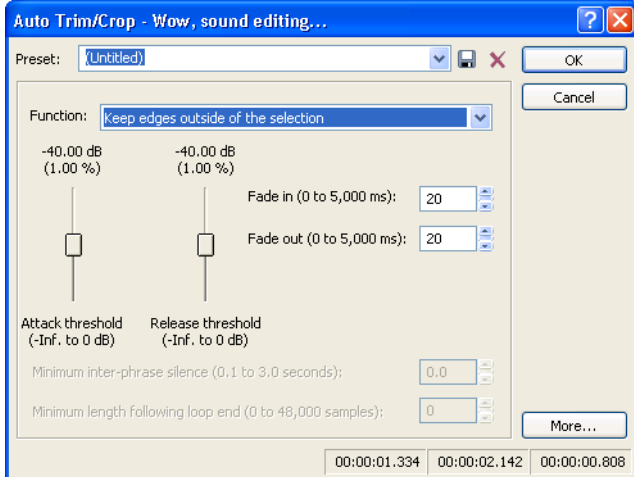
The remainder of this chapter describes the functions located in the **Process** menu.

### Auto Trim/Crop

Auto Trim/Crop removes silence from an audio file. In addition, this function automatically fades the endpoints of a phrase.

#### Using Auto Trim/Crop

1. Open the Voiceover.pca file.
2. From the **Process** menu, choose **Auto Trim/Crop**. The Auto Trim/Crop dialog is displayed.



3. From the **Preset** drop-down list, choose **Phrase Concatenator 1** and click **OK**. The **Auto Trim/Crop** function deletes silence in the file and creates new regions based on the preset's parameters. *For more information, see [Auto Trim/Crop controls](#) on page 143.*

## Auto Trim/Crop controls

The following controls are located in the Auto Trim/Crop dialog.

Control	Description
Function	This drop-down list contains five modes: <ul style="list-style-type: none"><li>• <b>Keep edges outside of the selection</b> - Removes silence within the selection, but retains all data outside of the selection.</li><li>• <b>Remove edges outside of the selection</b> - Removes silence within the selection and deletes all data beyond the selection.</li><li>• <b>Remove silence between phrases (creates regions)</b> - Removes silence within the selection and creates regions from individual phrases. For more information, see <a href="#">Minimum inter-phrase silence</a> on page 143.</li><li>• <b>Remove data beyond loop points</b> - Removes all data beyond the selected loop. For more information, see <a href="#">Minimum length following loop end</a> on page 143.</li><li>• <b>Remove data from start and limit file length</b> - Allows you to specify an amount of sound to be deleted from the beginning of each file and specify a maximum length for converted files. If a file is longer than this length, it is trimmed. This preset is useful for creating sample clips.</li></ul>
Attack threshold	Determines the threshold level for detection of the trim/crop start point: -Inf. indicates complete silence, and 0 dB indicates maximum amplitude level.
Release threshold	Determines the threshold level for detection of the trim/crop end point: -Inf. indicates complete silence, and 0 dB indicates maximum amplitude level.
Fade in	Determines the length (in milliseconds) of the fade applied to a section of audio prior to the detected trim/crop start point.
Fade out	Determines the length (in milliseconds) of the fade applied to a section of audio following the detected trim/crop end point.
Minimum inter-phrase silence	When you choose the <b>Remove silence between phrases</b> mode, the <b>Minimum inter-phrase silence</b> value determines the minimum amount of silence needed between phrases for a new region to be created.
Minimum length following loop end	When you choose the <b>Remove data beyond loop points</b> mode, the <b>Minimum length following loop end</b> value determines the number of samples that must follow a loop.
More	Click this button to view additional options that you can use to adjust your data window selection. For more information, see <a href="#">Adjusting the data window selection</a> on page 141.

## Bit-Depth Converter

The Bit-Depth Converter is used to increase/decrease the bit depth of a file while concealing the resulting quantization noise.

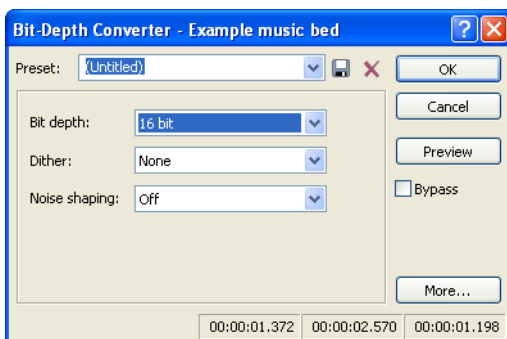
- Decreasing a file's bit depth decreases the overall size of the file, but results in added quantization noise, which can be masked using dither and noise shaping.
- Increasing a file's bit depth—while not improving the quality of the audio—allows subsequent audio processing to be performed with greater accuracy and resolution.

Prior to decreasing a file's bit depth, you should optimize the audio for conversion. *For more information, see [Minimizing quantization error](#) on page 85.*

**Note:** *There are no rules regarding maintaining audio quality when decreasing bit-depth. For this reason, you should always experiment with the **Dither** and **Noise shaping** controls to determine the optimum settings for each file.*

### Converting a file's bit depth

1. Open the Musicbed.pca file.
2. From the **Process** menu, choose **Bit-Depth Converter**.




3. From the **Bit depth** drop-down list, choose the desired bit depth.

4. If necessary, use the **Dither** drop-down list to specify the type of dither used to mask the quantization noise results from lowering a file's bit depth. *For more information, see [Dither on page 144](#).*
5. If desired, use the **Noise shaping** drop-down list to specify any noise shaping to be applied to the file. *For more information, see [Noise shaping on page 144](#).*

**Note:** When increasing a file's bit depth, set the **Dither** and **Noise shaping** controls to **None** and **Off** respectively.

## Bit-Depth Converter controls

The following controls are located in the Bit-Depth Converter dialog.

Control	Description
Bit depth	Choose a setting to specify the number of bits that should be used to store each sample.
Dither	<p>This control allows you to specify the randomness of the dither (generated noise) used to mask quantization distortion resulting from conversion to a lower bit depth. You can select from several shapes, each roughly describing the pattern that would be produced if you plotted a graph with the dither amplitude on the X-axis and the probability of the dither values on the Y-axis.</p> <p>As is frequently the case when working with audio, experimentation with dither values yields the best results; however, keep the following information in mind:</p> <p><b>Half Rectangular</b> - Eliminates distortion resulting from conversion to a lower bit depth, but the noise level is more likely to be dependent on the signal. This setting uses a maximum dither noise amplitude of 0.5 LSB (least significant bit).</p> <p><b>Rectangular</b> - Identical to <b>Half Rectangular</b>, but with a maximum dither noise amplitude of 1 LSB (least significant bit).</p> <p><b>Triangular</b> - Eliminates distortion products as well as any noise floor modulation, but results in a slightly higher noise level. The option typically works well in conjunction with noise shaping.</p> <p><b>Highpass Triangular</b> - Behaves like triangular dither, but shifts its noise into higher frequencies. This is typically the best option when used in conjunction with noise shaping.</p> <p><b>Gaussian</b> - Does not perform as well as <b>Rectangular</b> and <b>Triangular</b> dither, but may be suitable for certain audio.</p>
Noise shaping	<p>Determines the aural positioning of quantization noise. Using this control, you can shift the noise into audio registers that are less perceptible to human hearing. This lowers the perceived noise floor and creates the illusion of cleaner audio.</p> <p>High-pass contour noise shaping attempts to push all quantization noise and error into high frequencies.</p> <p>Equal loudness contour noise shaping attempts to push the noise under an equal loudness-type of curve.</p>
More	Click this button to view additional options that you can use to adjust your data window selection. These options are explained below.
Start	Determines the starting point for your selection in the data window. The <b>Length</b> field adjusts automatically according to your input in this box.
End	Determines the ending point for your selection in the data window. The <b>Length</b> field adjusts automatically according to your input in this box.
Length	Determines the length of your selection in the data window. Click the <b>Lock Length</b> button  to lock or unlock the current selection length. When the selection length is locked, Sound Forge will adjust the values in the <b>Start</b> or <b>End</b> boxes to retain the specified selection length.
Channels	Determines the channel(s) included in the data window selection. Type a number in the box to change the channel selection while retaining the start, end, and length selections.

## Noise shaping dangers

Noise shaping places quantization noise near the audio's Nyquist frequency, a value equal to one-half of the file's sample rate. Consider the following information:

- A file with a sample rate of 44.1 kHz has a Nyquist frequency of 22.05 kHz (at the high end of human hearing). Applying noise shaping to this file results in audio perceived to be cleaner than it actually is.
- A file with a sample rate of 22 kHz has a Nyquist frequency of 11 kHz (well within the sensitive range of human hearing). Applying noise shaping to this file results in audio that is perceived to be noisier than it actually is. Ironically, this defeats the entire purpose of the **Noise shape** control.

For this reason, we do not recommend using noise shaping on files with sample rates less than 44.1 kHz.

## Channel Converter

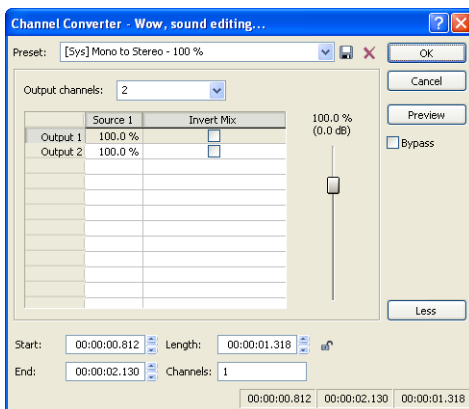
The Channel Converter is used to convert audio files between mono and multichannel formats. The Channel Converter dialog can also be used to reverse the channels of a stereo file or intermix the channels of a multichannel file to create interesting panning effects.

### Notes:

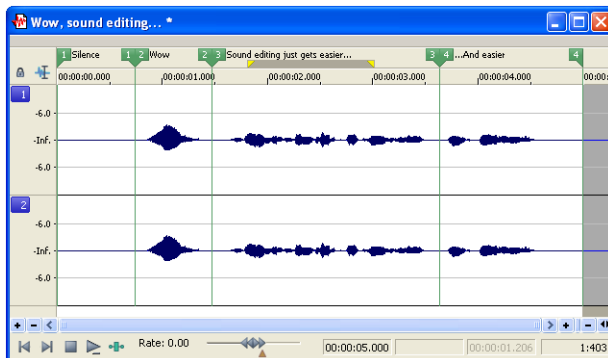
- To perform quick channel conversion without specifying the mix, use the **Format** tab on the Properties dialog (accessible from the File menu by choosing **Properties**).
- If you want to apply a panning envelope to a mono file, use the Channel Converter to convert the file to stereo first.
- You can use mono files in the Pan/Expand dialog (accessible from the Process menu by choosing **Pan/Expand**) if you choose **Pan (preserve stereo separation)** or **Pan (mix channels before panning)** from the Process mode drop-down list. When you click OK to apply your changes, the file will be converted to stereo and your panning settings will be applied.

### Converting a mono file to stereo (or multichannel)

1. Open the Voiceover.pca file. Notice that this is a mono file.
2. From the **Process** menu, choose **Channel Converter**. The Channel Converter dialog is displayed.



3. Choose a setting from the **Preset** drop-down list, or adjust the controls as needed:
  - a. Choose a setting from the **Output channels** drop-down list to indicate the number of channels in the converted file.
  - b. Click in the **Output** box for each output channel and type a gain value (or drag the fader) to adjust the amount of the original mono file that will be mixed to the new channel.
  - c. Select the **Invert Mix** check box if you want to reverse the phase of the new channel's content.
4. Click the **OK** button.



The file is converted to stereo.

## Converting a stereo file to mono

1. Open the saxriff.wav file. Notice that this is a stereo file.
2. From the **Process** menu, choose **Channel Converter**.
3. Choose a setting from the **Preset** drop-down list, or adjust the controls as needed:
  - a. Choose 1 from the **Output channels** drop-down list to create a mono file.
  - b. Click in the **Source 1** box and type a gain value (or drag the fader) to adjust the amount of the original left channel that will be mixed to the new mono file.
  - c. Click in the **Source 2** box and type a gain value (or drag the fader) to adjust the amount of the original right channel that will be mixed to the new mono file.
  - d. Select the **Invert Mix** check box if you want to reverse the phase of the new left-channel mix.
4. Click the **OK** button.

## Intermixing channels in a file


1. From the **Process** menu, choose **Channel Converter**.
2. Adjust the controls as needed:
  - a. Choose a setting from the **Output channels** drop-down list to indicate the number of channels in the converted file.
  - b. Click in the **Source** box for each output channel and type a gain value (or drag the fader) to adjust the amount of the original channel that will be mixed to the new channel.
  - c. Select the **Invert Mix** check box if you want to reverse the phase of the new channel's content.
3. Click the **OK** button.

## Swapping stereo channels

1. From the **Process** menu, choose **Channel Converter**.
2. From the **Preset** drop-down list, choose the **Stereo to Stereo - Swap Channels** preset.
3. Click the **OK** button.

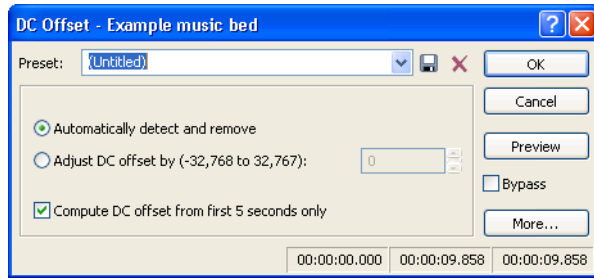
## Channel Converter controls

The following controls are located in the Channel Converter dialog.

Control	Description
Output channels	This drop-down determines the number of channels in the output file.
Source	Determines the amount of the original channel data that will be mixed to the new file.
Invert Mix	Select this check box to reverse the polarity of the new channel.
More	Click this button to view additional options that you can use to adjust your data window selection. These options are explained below.
Start	Determines the starting point for your selection in the data window. The <b>Length</b> field adjusts automatically according to your input in this box.
End	Determines the ending point for your selection in the data window. The <b>Length</b> field adjusts automatically according to your input in this box.
Length	Determines the length of your selection in the data window. Click the <b>Lock Length</b> button  to lock or unlock the current selection length. When the selection length is locked, Sound Forge will adjust the values in the <b>Start</b> or <b>End</b> boxes to retain the specified selection length.
Channels	Determines the channel(s) included in the data window selection. Type a number in the box to change the channel selection while retaining the start, end, and length selections.

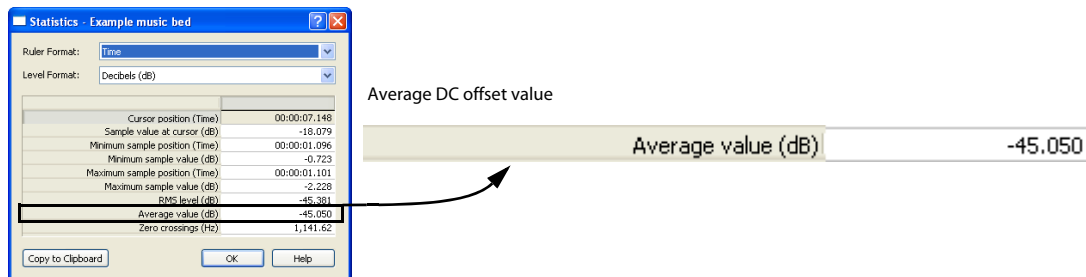
## DC Offset

Audio that is not centered around the zero baseline in the waveform display is said to have a DC offset. DC offsets are typically caused by electrical conflicts between the sound card and input device. The **DC Offset** function (located on the **Process** menu) is used to change the baseline of an audio file by adding a constant value to each sample to compensate for offsets.



## Estimating DC Offset

You can estimate the DC offset of an audio file by choosing **Statistics** from the **Tools** menu.




## DC Offset controls

Choose **DC Offset** from the **Process** menu to display the DC Offset dialog. The following controls are located in the DC Offset dialog.

Control	Description
Automatically detect and remove	Calculates and corrects the DC offset for each channel individually.
Adjust DC offset by	Allows you to specify a DC offset value manually. <ul style="list-style-type: none"> <li>-2,147,483,648 to 2,147,483,647 for 32-bit data</li> <li>-8,388,608 to 8,388,607 for 24-bit data</li> <li>-32,768 to 32,767 for 16-bit data</li> <li>-128 to 127 for 8-bit data</li> </ul>
Compute DC offset from first 5 seconds only	Selecting this check box specifies that only the first five seconds of a file are analyzed when measuring the DC offset. Be aware that five seconds is not sufficient if the beginning of a file has a long fade-in or mute.

## EQ

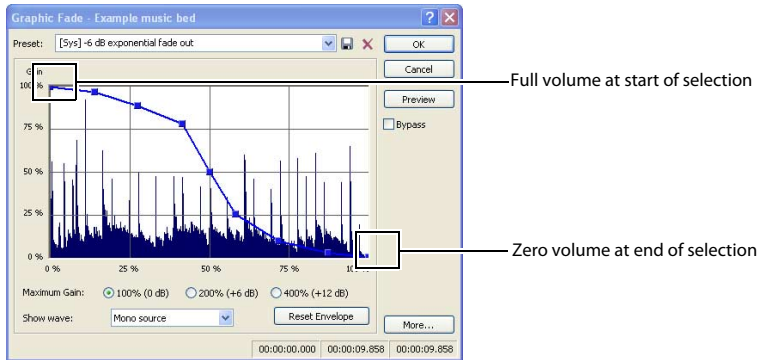
Three **EQ** options are available in the **Process** menu: **Graphic**, **Parametric**, and **Parametric**. Each of these options launch the appropriate XFX effect. For more information on using the XFX EQ effects, click the  button in the effect dialog.

## Fade - Graphic fade

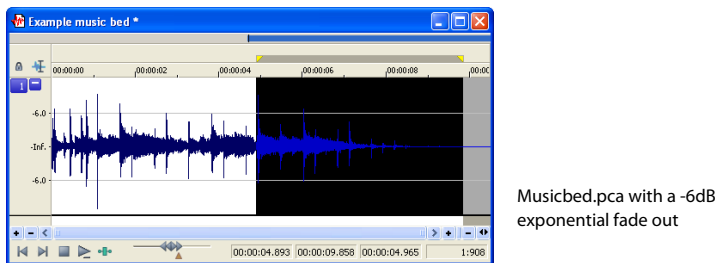
Graphic fade allows you to create custom fade envelopes to apply to audio data. You can use up to sixteen envelope points to create complex graphic fades.

## Creating a graphic fade

1. Open the Musicbed.pca file.
2. Select the last half of the audio (approximately 5 seconds).
3. From the **Process** menu, choose **Fade**, and choose **Graphic** from the submenu. The Graphic Fade dialog is displayed.
4. From the **Show wave** drop-down list, choose **Mono source**. The Musicbed.pca waveform displays in the graph. *For more information on the dialog controls, see [Graphic Fade controls](#) on page 149.*
5. From the **Preset** drop-down list, choose **-6 dB exponential fade out**. The fade's envelope displays in relation to the waveform in the graph.



6. Click **OK**. The specified fade is applied to the selection.



## Creating a custom graphic fade

1. Open the Musicbed.pca file.
2. Select the first half of the audio (approximately 5 seconds).
3. From the **Process** menu, choose **Fade**, and choose **Graphic** from the submenu. The Graphic Fade dialog is displayed.
4. From the **Show wave** drop-down list, choose **Mono source**. The Musicbed.pca waveform displays in the graph. *For more information on the dialog controls, see [Graphic Fade controls](#) on page 149.*
5. Edit the fade envelope using the following controls:
  - Click the envelope to create a new point.
  - Drag a point to move it to a new position.
  - Double-click or right-click a point to delete it.
  - Right-click an envelope segment and choose a new fade type from the shortcut menu.

*For more information, see [Envelope graphs](#) on page 38.*

6. Click **OK**. The custom graphic fade is applied to the selected audio.



## Graphic Fade controls

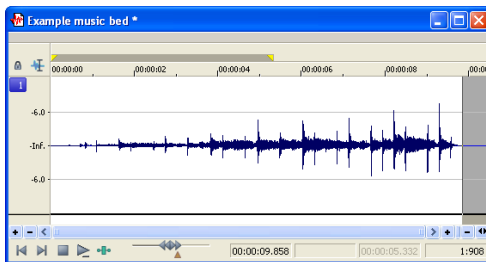
The following controls are located in the Graphic Fade dialog.

Control	Description
Maximum Gain	Select a radio button to adjust the range of the envelope graph.
Show wave	The <b>Show wave</b> drop-down list provides several settings for drawing the current selection's waveform on the envelope graph. This function is available only for small selections.
Reset Envelope	Clicking the <b>Reset Envelope</b> button clears the envelope of all points except the original two.

## Fade - Fade In

The Fade In command is used to linearly fade a selection from a volume of  $-\infty$  to a volume of 0 dB. The size of the selection determines the length of the fade.

1. Open the Musicbed.pca file.
2. From the **Process** menu, choose **Fade**, and choose **In** from the submenu. The fade is applied, and volume increases over the length of the entire file.

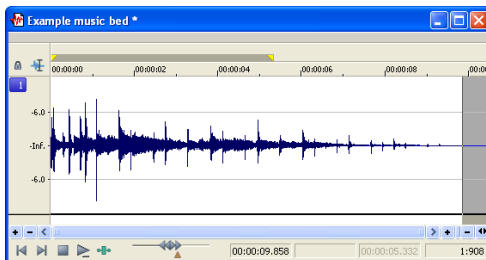


Audio file fades in from  $-\infty$  to 0 dB

## Fade - Fade Out

The Fade Out command is used to linearly fade a selection from a volume of 0 dB to a volume of  $-\infty$ . The size of the selection determines the length of the fade.

1. Open the Musicbed.pca file and select all audio data.
2. From the **Process** menu, choose **Fade**, and choose **Out** from the submenu. The fade is applied, and the volume decreases over the length of the entire file.



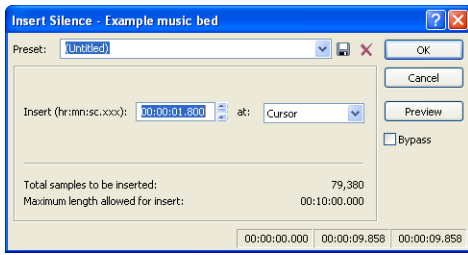
Audio file fades out from 0 dB to  $-\infty$ .

## Insert Silence

The **Insert Silence** command allows you to place sections of silence in audio files.

### Inserting silence into a file

1. Open the Musicbed.pca file.
2. From the **Process** menu, choose **Insert Silence**. The Insert Silence dialog is displayed.



**3.** Perform one of the following actions:

- From the **Preset** drop-down list, choose a preset that has been stored for the plug-in.
- Specify the length of silence that you want to add in the **Insert** box and choose a setting from the **at** drop-down list to specify where the silence should be inserted.

Setting	Description
Cursor	Inserts silence at the current cursor position.
Start of file	Inserts silence at the beginning of the file.
End of file	Inserts silence at the end of the file.

**4.** Click the **OK** button.

## Invert/Flip

The Invert/Flip command inverts the audio selection at its baseline, in effect reversing its polarity. Inverting a file, while creating no audible difference, is occasionally useful for matching sample transitions when executing certain pastes, mixes, or loops.

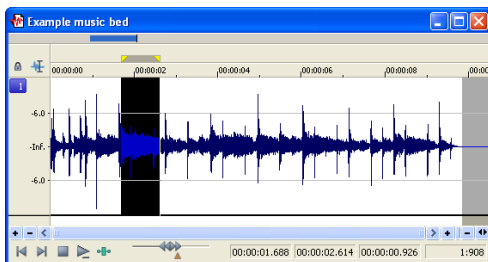
1. Create a selection in the data window.
2. From the **Process** menu, choose **Invert/Flip**. The selection is inverted.

## Mute

The Mute command forces the selection to a volume of -Inf. dB (silence).

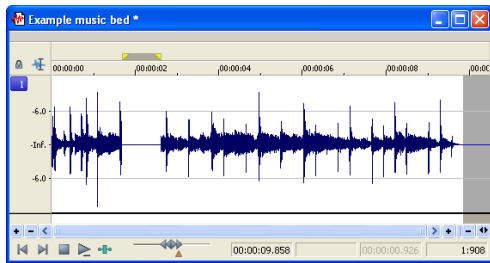
### Muting an audio selection

1. Create a selection in the data window.



Create a selection in the data window

2. From the **Process** menu, choose **Mute**. The selection is muted.



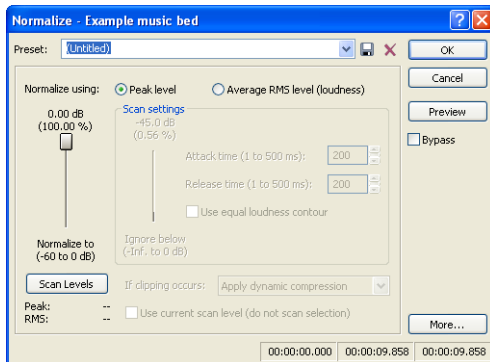
Selected audio is muted

## Normalize

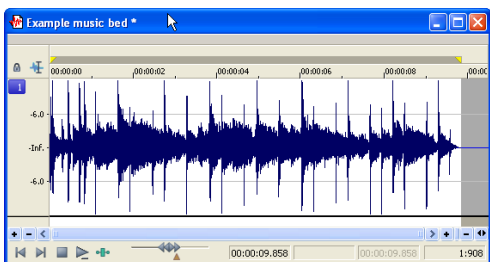
The Normalize command maximizes the overall volume of a file without introducing clipping. When you normalize a file, the entire file is scanned and a constant gain is applied to raise the file's level to a specified value.

### Normalizing audio

1. Open the Musicbed.pca file.
2. From the **Process** menu, choose **Normalize**. The Normalize dialog is displayed.



3. From the **Preset** drop-down list, choose **Normalize RMS to -16 dB (music)** and click **OK**. The file is normalized and its overall "loudness" is increased.



Normalized file

## Normalize controls

The following controls are located in the Normalize dialog.

Control	Description
Normalize using Peak level	This radio button normalizes the audio file using the maximum (instantaneous) sample values detected. A constant gain is then applied to the audio.
Normalize using Average RMS level (loudness)	This radio button normalizes the audio file using the detected average RMS value of the audio file. This is helpful for matching the apparent loudness of a number of individual recordings.
Normalize to	<p>This fader specifies the level to which the highest peak should be set.</p> <p>With <b>Peak level</b>, if the peak level is -10 dB and the <b>Normalize to</b> value is -3 dB, a constant boost of 7 dB is applied to the entire file.</p> <p>With <b>Average RMS level</b>, normalizing to 0 dB means boosting the signal until it has the same apparent loudness as a 0 dB square wave. This results in all the dynamic range of the signal being flattened and all peaks being either clipped or seriously compressed.</p> <p><b>Note:</b> As a rule, normalizing using <b>Peak levels</b> to 0 dB is acceptable, but normalizing using <b>Average RMS level</b> to anything above -6 dB is not recommended.</p>
Ignore below	Determines the level of audio data included in the RMS calculation. Data below the threshold is ignored, effectively eliminating silent sections from RMS calculation. The <b>Ignore below</b> fader should be set a few dB above perceived silence. If <b>Ignore below</b> is set to -Inf, all audio data is used. However, if the value is set too high (above -10 dB) the RMS value may never rise above the threshold. In this case, normalization cannot occur. For this reason, you should evaluate the threshold by clicking the <b>Scan Levels</b> button.
Attack time	Determines how quickly the scan responds to transient peaks.
Release time	Determines how quickly the scan should stop using transient peak material after it begins to drop in level. Slower release times result in more data being included in RMS calculation.
Use equal loudness contour	Allows the scan to compensate for the Fletcher-Munson Equal Loudness Contours. The Fletcher-Munson Equal Loudness Contours illustrate that very low- and high-frequency audio is less perceptible to the human ear than mid-range audio. Therefore, selecting this option forces the scan to factor this into RMS calculation.
Scan Levels	Clicking <b>Scan Levels</b> initiates Peak and RMS scans on the audio and displays the RMS level and the highest peak level detected. When previewing a normalize effect, the entire file must be scanned to preview even a small selection. Clicking <b>Scan Levels</b> saves the current Peak and RMS values and allows you to preview different <b>Normalize to</b> settings without re-scanning the entire file.
	<div> </div> <p>Current Peak and RMS levels</p> <p>An asterisk adjacent to a level value indicates that the value is not current. This occurs when the selection is updated or the dialog is initially opened. To update values, click <b>Scan Levels</b>.</p> <div> </div> <p>Noncurrent Peak and RMS levels</p> <p>If values have never been calculated, two dashes display. Click Scan Levels to calculate values.</p> <div> </div> <p>Nonexistent Peak and RMS levels</p> <p><b>Note:</b> If the RMS level never reaches the Ignore below threshold, a value of -96 dB displays. If this occurs, decrease the Ignore below threshold level and rescan.</p>
If clipping occurs	<p>The <b>If clipping occurs</b> drop-down list is used to specify how the normalize function handles clipping that may occur when an audio file is processed using the RMS option. This list provides four options:</p> <ul style="list-style-type: none"> <li>Apply dynamic compression - Audio peaks that will result in clipping are limited below 0 dB using non-zero attack and release times to minimize distortion. This mode is useful for getting loud and clear audio during mastering.</li> <li>Normalize peak value to 0 dB - The selection's peak amplitude level is normalized to 0 dB, thereby allowing the maximum possible constant gain without clipping the selection. However, less gain is applied than would be necessary to achieve the Normalize to RMS level.</li> <li>Ignore (saturate) - Audio is permitted to clip and distort.</li> <li>Stop processing - Audio peaks that will result in clipping force the normalize function to cease processing and alert you that clipping will occur at the current level.</li> </ul> <p><b>Note:</b> When normalizing multichannel audio, normalization is computed on the loudest sample value found in a channel and identical gain is applied to all channels. If a single channel is selected in a multichannel file, normalization processes only that channel.</p>
Use current scan level (do not scan selection)	When you select the <b>Use current scan level</b> check box, the current scan levels are used without initiating a new scan. This is useful when applying scan levels from a different selection or file to the current selection, thereby allowing identical gains to be applied to multiple files. This option can also be used to scan a selection of an audio file containing the loudest or most constant levels and then apply that scan to normalize the entire file.

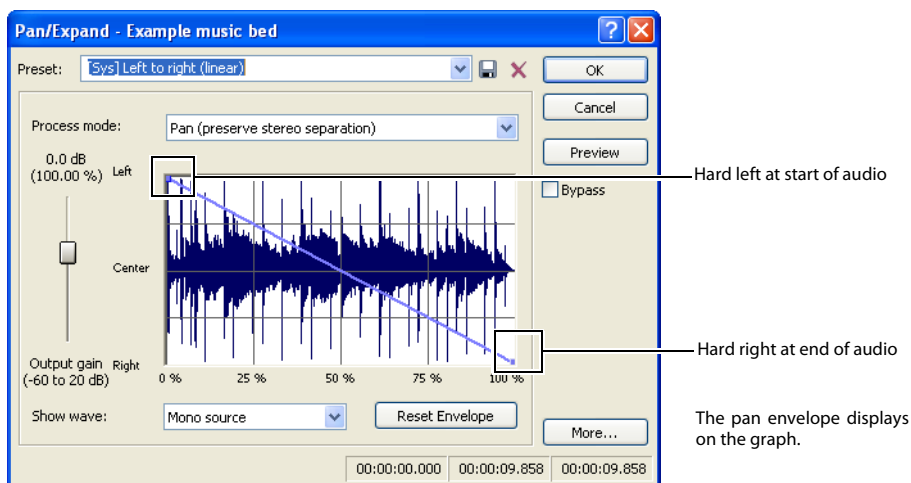
## Pan/Expand

Pan/Expand allows you to create panning effects and stereo compression/expansion in selections.

### Creating a pan

A pan is used to control the apparent position of a sound between the left and right channels of a stereo file.

1. Open the Musicbed.pca file.
2. From the **Process** menu, choose **Pan/Expand**. The Pan/Expand dialog is displayed.
3. From the **Preset** drop-down list, choose **Left to right (linear)**. The pan envelope displays on the graph.



4. Click **OK**. The file is converted to stereo and a left-to-right pan is added.
5. Play the file. The audio source seems to move from the left channel to the right channel during playback.

**Note:** A pan, by nature, cannot be created in a mono file.

### Creating a custom pan

You can create complex custom panning effects using up to sixteen envelope points.

1. Open the Musicbed.pca file.
2. In Sound Forge Pro software, choose **Pan/Expand** from the **Process** menu. The Process dialog is displayed.
3. Configure the pan envelope using the following controls:
  - Click the envelope to create a new point.
  - Drag a point to move it to a new position.
  - Double-click or right-click a point to delete it.
  - Right-click an envelope segment and choose a new fade type from the shortcut menu.

For more information, see [Envelope graphs](#) on page 38.

4. Click **OK**. The custom pan is applied to the file.

## Pan/Expand controls

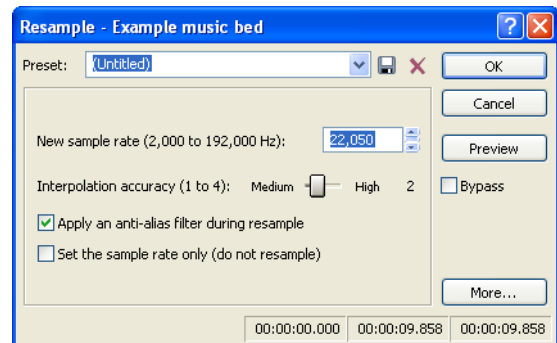
The following controls are located in the Pan/Expand dialog.

Control	Description
Process mode	The <b>Process mode</b> drop-down list contains the following options: <ul style="list-style-type: none"><li>• <b>Pan (preserve stereo separation)</b> - Applies the pan effect without mixing the channels, thereby simulating the spectral positioning of stereo recordings.</li><li>• <b>Pan (mix channels before panning)</b> - Mixes the left and right channels prior to applying panning effects.</li><li>• <b>Stereo expand</b> - Allows you to contract or expand the image of stereo audio from dead center (mono) to completely panned wide (no center channel).</li><li>• <b>Mix mid-side (MS) recording to left and right channels</b> - Simulates a recording technique in which one microphone is pointed directly at the source and used to record the center (mid) channel, and a second microphone is pointed 90 degrees away from the source (side) and used to record the stereo image. For proper playback on most systems, MS recordings must be converted to standard left/right orientation. To convert an MS-recorded track to a left/right track, first ensure that the center channel is in the left track and the side channel on the right. The MS mix function is then used to set the width of the stereo image for the converted track.</li></ul>
Output gain	Determines the amount of gain applied to the signal following pan/expand processing.
Show wave	The <b>Show wave</b> drop-down list provides several settings for drawing the current selection's waveform on the envelope graph. This function is available only for small selections.
Reset Envelope	Clicking the <b>Reset Envelope</b> button clears all but the two original envelope points. <ul style="list-style-type: none"><li>• For the <b>Pan</b> modes, these two points prevent unintended panning.</li><li>• For the <b>Stereo expand</b> and <b>Mix Mid-Side</b> modes, these two points prevent unintended expansion.</li></ul>

## Resample

The **Resample** command allows you to change the sampling rate of a file without altering its pitch or duration.

- Resampling to a lower sample rate results in less frequent samples and a decreased file size, but adds aliasing noise to the audio. *For more information, see [Apply an anti-alias filter during resample on page 155](#).*
- Resampling to a higher sample rate results in extra samples being created through interpolation and an increased file size. Like increasing bit depth, up-sampling does not improve the quality of an audio file, but permits subsequent audio processing to be performed with greater precision.



### Downsampling audio

1. Open the Musicbed.pca file.
2. Right-click the data window and choose **Properties** from the shortcut menu. The Properties dialog is displayed. Notice that this file has 44,100 Hz sample rate and a file size of 0.48 MB.
3. Click **OK**.
4. From the **Process** menu, choose **Resample**. The Resample dialog is displayed.
5. From the **Preset** drop-down list, choose **Resample to 8,000 Hz with anti-alias filter** and click **OK**. The audio is resampled at 8,000 Hz.
6. From the **File** menu, choose **Save As**. Save the resampled file with a new name and close it.
7. Open the resampled file and view its Properties dialog. The sample rate is lower (8,000 Hz) and the file size is smaller.
8. Play the file. Notice the obvious decrease in audio quality.

**Note:** Use this new file to perform the following up-sampling procedure.

### Upsampling audio

1. Verify that the file created in the previous procedure is the active data window.
2. From the **Process** menu, choose **Resample**. The Resample dialog is displayed.
3. From the **Preset** drop-down list, choose **Resample to 48,000 Hz with anti-alias filter** and click **OK**. The audio is resampled at 48,000 Hz.

4. From the **File** menu, choose **Save As**. Save the resampled file with a new name and close it.
5. Open the new file and view its Properties dialog. Notice that the sample rate is higher (48,000 Hz) and the file size is larger.
6. Play the file. Notice that resampling to a higher sample rate produces an audio quality at 48,000 Hz that is indistinguishable from the quality at 8,000 Hz.

## Resample controls

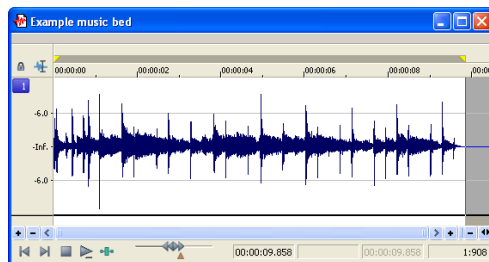
The following controls are located in the Resample dialog.

Control	Description
New sample rate	Determines the sample rate (in Hz) at which the file is resampled. <b>Tip:</b> Processing is quicker when downsampling by an even multiple (such as when going from 44 kHz to 22 kHz).
Interpolation accuracy	The <b>Interpolation accuracy</b> value determines the complexity of the interpolation method used during resampling. Interpolation accuracy is most apparent in high frequencies, but the audible difference between the values is subtle and often undetectable without the use of test tones. A value of 1 is suitable for general-purpose audio. A value of 2 or 3 is good for high-end audio applications. A value of 4 results in professional-quality audio, but requires substantial processing.
Apply an anti-alias filter during resample	Selecting this check box applies an anti-aliasing filter during the resampling process. Remember that the maximum frequency that can be represented by a sample rate is one-half of the sampling rate (the Nyquist frequency). Therefore, high frequencies cannot be accurately represented when downsampling. The anti-aliasing filter prevents high frequencies from becoming low-frequency distortion. <b>Tip:</b> It is also advisable to apply an anti-aliasing low-pass filter to an audio file prior to resampling to a lower sample rate.
Set the sample rate only (do not resample)	If this check box is selected, the playback rate is changed without resampling the data. This means that the pitch of the original file is not preserved. For this reason, this option is only useful for quickly converting between two similar sample rates.

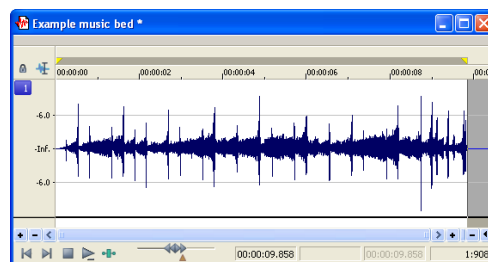
## Reverse

The Reverse command reverses the audio selection.

1. Open the Musicbed.pca file.
2. From the **Process** menu, choose **Reverse**. The reversed audio data displays in the data window.




Original audio data




Reversed audio

## Smooth/Enhance

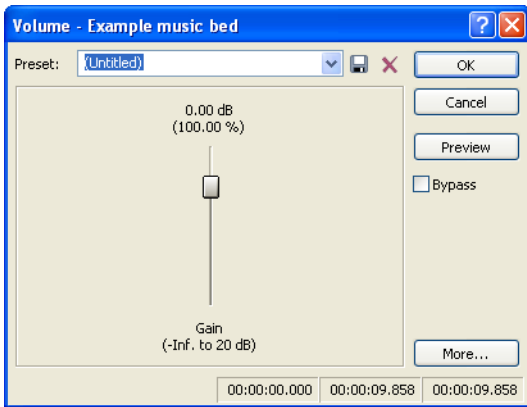
To start Sony Media Software's XFX Smooth/Enhance plug-in, choose **Smooth/Enhance** from the **Process** menu. For more information on using the XFX Smooth/Enhance plug-in, click the  button in the Smooth/Enhance dialog or refer to Sound Forge online help (from the **Help** menu, choose **Contents and Index**).

## Time Stretch

To start Sony Media Software's XFX Time Stretch plug-in, choose **Time Stretch** from the **Process** menu. For more information on using the XFX Time Stretch plug-in, click the  button in the Time Stretch dialog or refer to Sound Forge online help (from the **Help** menu, choose **Contents and Index**).

# Volume

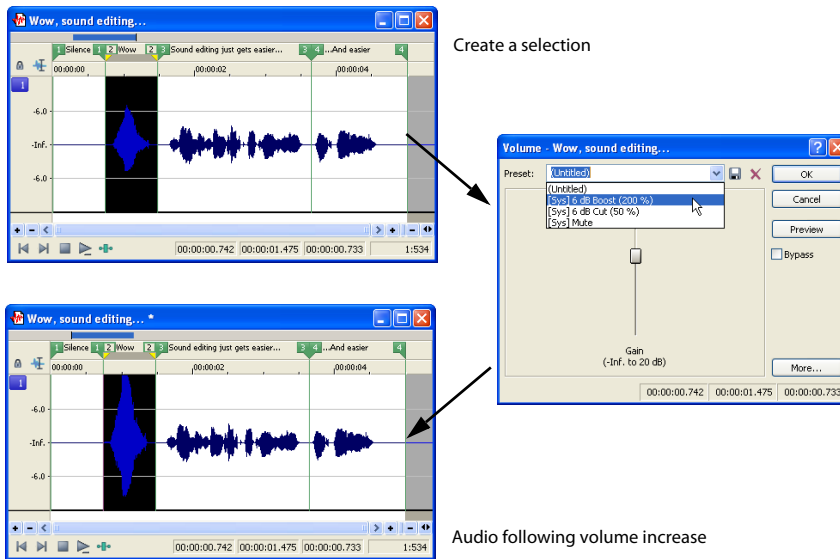
The Volume command alters the volume of an audio selection.



## Increasing the volume of a selection

1. Open the Voiceover.pca file.
2. Create a selection containing the word "Wow."
3. From the **Process** menu, choose **Volume**. The Volume dialog is displayed.
4. From the **Preset** drop-down list, choose **6 dB boost (200%)** and click **OK**. The specified boost is applied to the selection.
5. Play the file. The "Wow" data clips and distorts upon playback.

Exercise caution when using the **Volume** command. Unlike **Normalize**, **Volume** performs no pre-processing scans and offers no options for clipping audio data.



**Note:** Once audio data is clipped, it cannot be restored by performing a second Volume operation. The initial Volume operation must be undone.



## Volume control

The Volume dialog contains only one control: **Gain**. The Gain fader determines the new volume of a selection. Negative decibel values decrease the selection's volume, while positive decibel values increase the selection's volume.

**Note:** A value of *-Inf.* corresponds to mute (0%).



# Chapter 11 Working with Effects

Effects, or plug-ins, can be used to improve the quality of the audio or to create special artistic effects. Additional DirectX® and VST plug-in effects, both from Sony and other third-party vendors, can also be used.

## Adding effects

You can choose an effect from the **Effects** menu to apply to a file or just a portion of a file. If you've added an effect to the **FX Favorites** menu, you can select it from that location as well. *For more information, see [Organizing effects in the FX Favorites menu](#) on page 166.*

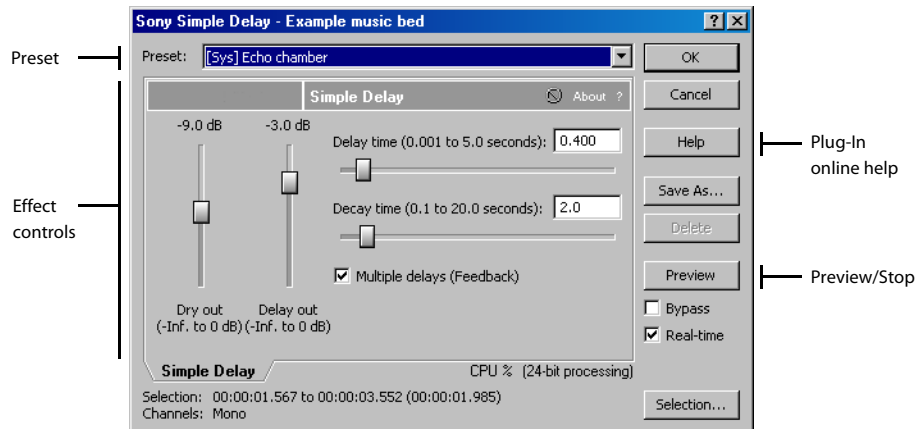
## Applying an effect

1. Select the data you want to process. If no data is selected, the effect is applied to the entire file.

**Note:** When you're working with multichannel files, only the selected region in the selected channel is processed. Most functions can be applied to the individual or all channels. However, since the channels in a multichannel file must be equal in length, functions that affect the length of the data cannot be performed on individual channels. These functions include *Insert Silence, Resample, Time Stretch, Gapper/Snipper, Pitch Bend, and Pitch Shift (without preserving duration)*.

*If you want to apply one of these processes in a single channel, convert the file into separate mono files (you can select a channel and drag it to the Sound Forge workspace to create a new file quickly), apply the process, and merge the files into a new multichannel file.*

2. Choose a command from the **Process, Effects, or FX Favorites** menu. The dialog for the selected effect is displayed.



3. Choose a preset from the **Preset** drop-down list and adjust the parameters in the dialog to achieve the effect you want. For help on the different controls in the effect dialog, click the **Help** button (?).
4. Click the **Preview** button to test out the effect. Adjust the settings as needed and click **Stop** to end the preview.

**Tip:** If the selection you made in the data window needs to be adjusted, click the **Selection** button to adjust the selection.

5. Click **OK**. During processing, a progress meter is displayed at the bottom of the data window. You can cancel the operation at any time by clicking the **Cancel** button to the left of the progress meter, or you can press the Escape key.

## Saving effect settings as a custom preset

Once you have adjusted the parameters in the effect dialog, you may want to save your settings as a custom preset for later use. You can select the preset from the **Preset** drop-down list to apply the same settings at a later time.

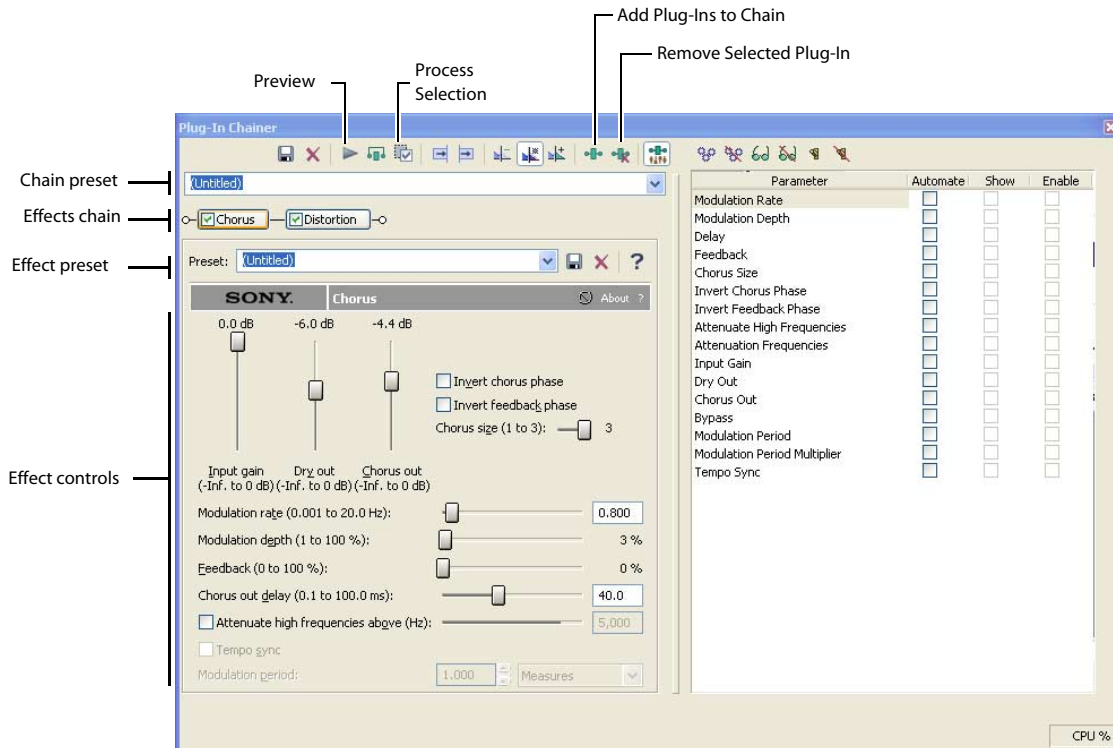
1. Adjust the parameters in the effect dialog to achieve the effect you want.
2. Click **Save As**. The Save Preset dialog is displayed.
3. Enter a new preset name and click **OK**. The new preset is added to the **Preset** drop-down list.

## Using the Plug-In Chainer



The Plug-In Chainer allows you to create a chain of 32 DirectX® and VST plug-ins. You can preview each plug-in in the chain simultaneously in real time as long as your computer has adequate processing power.



You can switch between the Plug-In Chainer window and data windows without leaving the Plug-In Chainer. This means you can change your selection in the data window or even switch to another data window—all without closing the Plug-In Chainer window.



Because the Plug-In Chainer offers these advanced features, you may want to use the chainer to create a single-effect chain instead of applying an effect from the **Effects** or **FX Favorites** menu. *For more information, see [Adding effects on page 159](#).*



## Creating a plug-in chain


1. Select the data you want to process. If no data is selected, the effect chain is applied to the entire file.
2. From the **View** menu, choose **Plug-In Chainer** or click the **Open Plug-In Chainer** button  on the data window. The Plug-In Chainer window is displayed.
3. To use an existing chain preset, choose the chain from the **Chain Preset** drop-down list. *For more information, see [Saving plug-in chains on page 163](#).* Otherwise, add the desired plug-ins to a new custom chain. *For more information, see [Adding a plug-in to a chain on page 161](#).*
4. Configure the parameters of each plug-in. For help on the different plug-in controls, click the **Help for Plug-In** button  or click a control and press Shift+F1.

- Click the **Preview** button  to test the effect chain. If needed, you can select different parts of the audio in the data window to preview different sections before applying the effect chain. You can also click the **Bypass** button  to temporarily bypass the effect. *For more information, see [Bypassing effects](#) on page 162.*

**Tip:** You can also click the **Play Plug-in Chainer** button  on the data window to preview the effects chain. Use the **Play Normal** button  to bypass the effects.


- If the effect changes the duration of a sound (for example, Reverb or Simple Delay), choose how the audio tail created by the effect should be processed. *For more information, see [Selecting the processing mode for audio tail data](#) on page 163.*

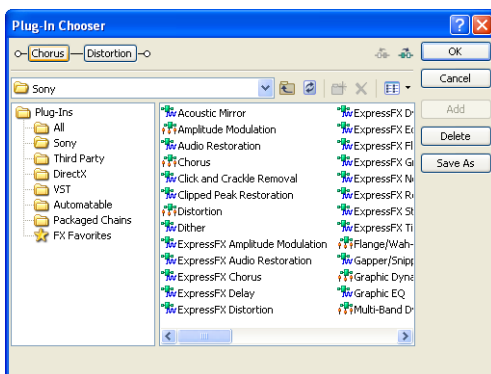
**Note:** The **Insert Tail Data** and **Mix Tail Data** commands may not function when using third-party reverb plug-ins. You can use the **Insert Silence** command to make room for the tails or apply the reverb in a new data window that has room for the tails and then mix the processed audio back into your source file.

- Click the **Process Selection** button  (or press Ctrl+Shift+P) to apply the effect chain.

## Adding a plug-in to a chain

You can add plug-ins to a chain in the Plug-In Chainer in several ways.


- Click the **Add Plug-Ins to chain** button  on the Plug-In Chainer window (or press Ctrl+E). The Plug-In Chooser dialog is displayed, listing all available DirectX plug-ins installed on your system.



- Select the desired plug-in(s).
- Click **Add**. The selected plug-ins are added to the chain and can be configured and arranged as needed.

**Tip:** You can also double-click a plug-in to add it to the chain.

## Removing a plug-in from a chain

To remove a specific plug-in from a chain, select it and click the **Remove Selected Plug-In** button . The plug-in is removed and the remaining plug-ins are adjusted.

**Tip:** You can also remove plug-ins by performing one of the following actions:

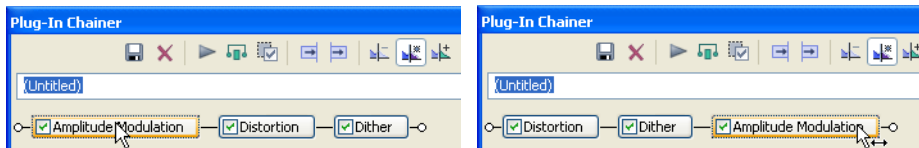
- Press **Ctrl+Tab** to select the next plug-in or **Ctrl+Shift+Tab** to select the previous plug-in, and then press **Ctrl+Delete** to remove the selected plug-in from the chain.
- Right-click a plug-in in the chain and choosing **Remove** from the shortcut menu.

You can arrange the order of plug-ins in the chain in either the Plug-In Chainer or the Plug-In Explorer.

**Note:** The order of plug-ins in a chain can have a dramatic effect on the final product of audio signal processing.

## Arranging plug-in order in the Plug-In Chainer




In the Plug-In Chainer window, drag an effect to a new location in the chain.




Drag a plug-in in the Plug-In Chainer to a new location in the chain.

**Tip:** You can also change the plug-in order by right-clicking a plug-in in the chain and choosing either **Move Left** or **Move Right** from the shortcut menu.

## Arranging plug-in order in the Plug-In Explorer

You can drag an effect to a new location in the chain in the Plug-In Explorer in the same way you can in the Plug-In Chainer. In addition, you can rearrange the chain by selecting a plug-in and clicking the **Shift Plug-In Left** button  or the **Shift Plug-In Right** button  to move it forward or backward in the chain. To access the Plug-In Explorer, click the **Add Plug-Ins to chain** button  in the Plug-In Chainer window.

## Configuring chained plug-ins

To configure the parameters of specific plug-in, select it from the chain. The plug-in's parameters display, allowing you to adjust all controls as needed. For help on the different plug-in controls, click the **Help for Plug-In** button  or click a control and press **Shift+F1**.

## Bypassing effects

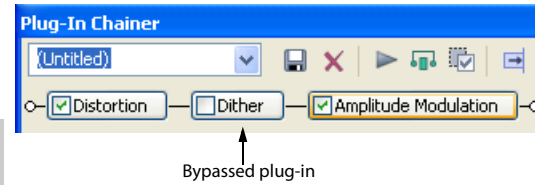
You can bypass single effects or all effects in a chain while previewing the file.

## Bypassing a plug-in on a chain


To bypass a plug-in, clear its check box in the Plug-In Chainer window. A bypassed plug-in does not process the audio signal, allowing you to preview the effect of the remaining plug-ins.

### Notes:

- You can bypass multiple plug-ins.
- You can also bypass the plug-in by right-clicking a plug-in in the chain and choosing **Bypass** from the shortcut menu.






## Bypassing the plug-in chain

To bypass the entire chain, click the **Bypass** button  (or press Ctrl+B) in the Plug-In Chainer window. Click the **Bypass** button again to restore the chain's processing of the audio.

## Selecting the processing mode for audio tail data

Some effects, such as Reverb or Simple Delay, create a "tail" at the end of the selected audio. This tail consists of the echo or reverb created by the effect that lasts beyond the end of the selection. When you select a portion of a file and apply the effect using the Plug-In Chainer, you can select one of three buttons to determine how the audio tail is processed:


If	Then
You want to ignore the tail	Select the <b>Ignore Tail Data</b> button  . The effect ends abruptly at the end of the selection.
You want to mix the tail into the adjacent material	Select the <b>Mix Tail Data</b> button  . This is the most natural-sounding option.
You want to insert the audio tail	Select the <b>Insert Tail Data</b> button  . All audio to the right of the tail moves over to accommodate the extra audio.

### Notes:

- Press Ctrl+T to toggle through the three audio tail data processing modes.
- The **Insert Tail Data** and **Mix Tail Data** commands may not function when using third-party reverb plug-ins. You can use the **Insert Silence** command to make room for the tails or apply the reverb in a new data window that has room for the tails and then mix the processed audio back into your source file.

## Saving plug-in chains

Once you've set up an effect chain, you may want to save it for later use. When you save a plug-in chain, you not only save the order of the effects in the chain but also the parameters of each individual effect.

1. Create an effects chain in the Plug-In Chainer window.
2. Enter a name for the new chain in the **Chain Preset** box.
3. Click the **Save Chain Preset** button . The new chain is saved in the **Chain Preset** drop-down list.



**Tip:** You can also save a chain preset by pressing Ctrl+S, entering a name for the preset, and pressing Enter.


## Saving individual plug-in settings as a custom preset

Once you have adjusted effect parameters in the Plug-In Chainer window, you can save your settings as a custom preset for later use. You can select a custom saved preset from the **Preset** drop-down list to apply the same effect settings at a later time.


You also have the option of saving the entire chain as a chain preset. *For more information, see [Saving plug-in chains](#) on page 163.*

**Note:** *Effect automation envelope points are not saved with presets. If you are using effect automation envelopes and save a preset during playback, the effect's settings at the playback cursor position are saved.*


### Saving a preset for an individual Direct X plug-in

1. Adjust the effect parameters in the Plug-In Chainer window to achieve the effect you want.
2. Enter a name for the new preset in the **Preset** box.
3. Click the **Save Preset** button . The new preset is saved in the **Preset** drop-down list.

### Saving a preset for an individual VST plug-in

1. Adjust the effect parameters in the Plug-In Chainer window to achieve the effect you want.
2. Enter a name for the new preset in the **Preset** box.
3. Click the **Save VST Preset As** button . The VST Preset dialog is displayed.
4. Browse to the folder where you want to save the .fxp file and type a name in the File name box.
5. Click the **Save** button. The current plug-in settings are saved in the .fxp file.

### Saving a bank of VST plug-in presets

1. Adjust the effect parameters in the Plug-In Chainer window to achieve the effect you want.
2. Click the **Save VST Bank As** button . The Save VST Preset Bank dialog is displayed.
3. Browse to the folder where you want to save the .fxb file and type a name in the File name box.
4. Click the **Save** button. All presets for the current plug-in are stored in the bank.

## Loading plug-in chains or plug-in presets

Once you have saved a plug-in chain, you can easily load it into the Plug-In Chainer.


### Loading a plug-in chain preset

Choose a setting from the **Chain** drop-down list. The preset chain loads into the window using the saved settings for each DirectX and VST plug-in in the chain.

### Loading an individual DirectX plug-in preset


Choose a setting from the Preset drop-down list. The plug-in settings stored in the preset are loaded.

### Loading an individual VST plug-in preset

1. Click the **Open VST Preset** button . The Open VST Preset dialog is displayed.
2. Browse to the .fxp file that you want to use.
3. Click the **Open** button. The current VST preset is replaced with the settings stored in the .fxp file.

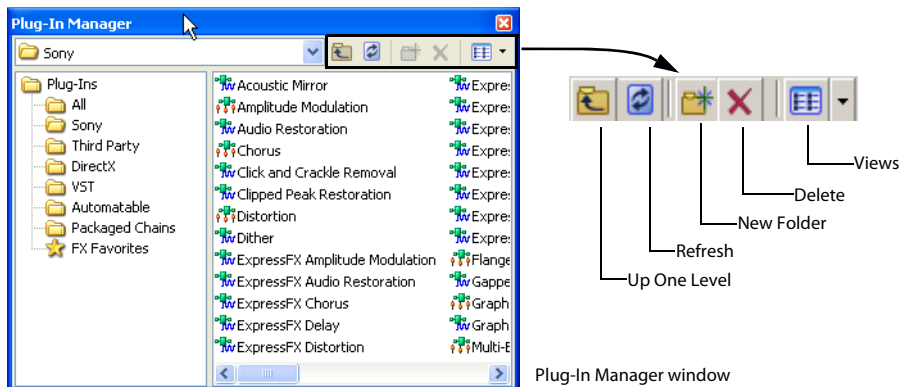


## Loading a bank of VST plug-in presets

1. Click the **Open VST Bank** button . The Open VST Bank dialog is displayed.
2. Browse to the .fxb file that you want to use.
3. Click the **Open** button. All presets for the current VST plug-in are replaced with the settings stored in the .fxb file and the first preset in the bank is loaded by default.

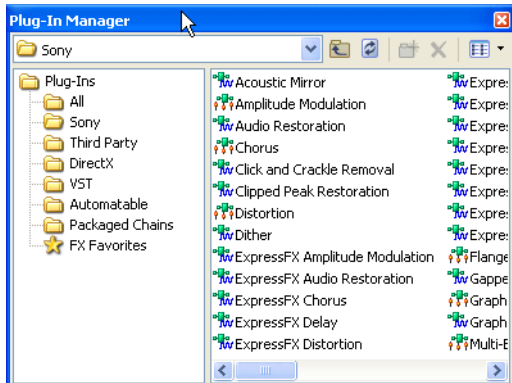
## Using the Plug-In Manager

You have several tools to help you manage your plug-ins, including the Plug-In Manager, **FX Favorites** menu, and the Preset Manager. The Plug-In Manager window not only allows you to add plug-ins and saved plug-in chains (pg. 165), but it provides a way to manage your plug-in files—to rename plug-ins, hide plug-ins, create folders, add plug-ins to a FX Favorites folder, and perform other standard file management tasks.



## Applying a plug-in or chain to a media file

You can add a plug-in to a chain in the Plug-In Chainer by dragging an effect from the Plug-In Manager window.



1. From the **View** menu, choose **Plug-In Manager**. The Plug-In Manager window is displayed.
2. Select the data you want to process. If no data is selected, processing will be applied to the entire file.

**Note:** When you're working with multichannel files, only the selected region in the selected channel is processed. Most functions can be applied to individual or all channels. However, since all channels in a multichannel file must be equal in length, functions that affect the length of the data cannot be performed on individual channels. These functions include Insert Silence, Resample, Time Stretch, Gapper/Snipper, Pitch Bend, and Pitch Shift (without preserving duration).



If you want to apply one of these processes in a single channel, convert the file into separate mono files (you can select a channel and drag it to the Sound Forge workspace to create a new file quickly), apply the process, and merge the files into a new multichannel file.

3. Select the desired plug-in(s).

**Note:** *Effects chains—including packages created in Sony Vegas or ACID—are displayed in the DirectX Chains folder in the Plug-In Manager.*

4. Drag the plug-in(s) from the Plug-In Manager window to the Plug-In Chainer window. The selected plug-in(s) are added to the chain.

**Tip:** *You can also drag plug-ins or a plug-in chain from the Plug-In Manager window to a data window. The Plug-In Chainer window is opened with the selected effects in a new chain.*

5. Use the Audio Plug-In Chainer to preview your effects and adjust settings as needed. You can select the **Bypass** button  to hear the original, unprocessed audio.
6. When you are satisfied with the chain, click the **Process Selection** button  in the Plug-In Chainer to apply the effect.

### Renaming a plug-in

You can customize the names of plug-ins within the software.

1. Right-click a plug-in in the Plug-In Manager and choose **Rename** from the shortcut menu.
2. Type a new name and press Enter.

### Hiding a plug-in

All DirectX plug-ins on your system are automatically available to you. You may want to hide a plug-in within the software without removing the plug-in from your system.



1. Right-click a plug-in in the Plug-In Manager and choose **Hide** from the shortcut menu. You are prompted to confirm that you want to permanently hide the plug-in.
2. Click **Yes**. The plug-in no longer appears in Sound Forge software.

**Tip:** *To restore hidden plug-ins, you can force Sound Forge to rescan your system for plug-ins by deleting the HKEY\_LOCAL\_MACHINE\SOFTWARE\Sony Media Software\Sound Forge\9.0\FXCache key in the Windows Registry.*

### Organizing effects in the FX Favorites menu

The **FX Favorites** menu provides easy access to the plug-ins you use most frequently. You can add and remove plug-ins and folders to organize the menu however you like. You can also automatically add all plug-ins on your system to the menu. *For more information, see [Automatically adding and organizing plug-ins](#) on page 167.*

Once you add a plug-in to the **FX Favorites** menu, you can apply the plug-in to a file by selecting it from the menu. *For more information, see [Adding effects](#) on page 159.*

1. From the **FX Favorites** menu, choose **Organize**. The Organize Favorites dialog is displayed.
2. Organize your plug-ins:
  - Drag plug-ins to the FX Favorites folder to add them to the **FX Favorites** menu.
  - Create submenus in the **FX Favorites** menu by clicking the FX Favorites folder and clicking the **Create New Folder** button . Once you have created a new folder, drag plug-ins to the folder to add them to the submenu in the **FX Favorites** menu.
  - Remove plug-ins or folders from the **FX Favorites** menu by selecting the plug-in or folder and clicking the **Delete** button . Deleting a plug-in from the FX Favorites folder removes it from the **FX Favorites** menu but does not delete the plug-in from your system.
3. Close the Organize Favorites dialog. The new plug-ins and/or submenus appear in the **FX Favorites** menu.

**Tip:** *You can also add plug-ins to the FX Favorites menu using the Plug-In Manager.*

## Automatically adding and organizing plug-ins

You can automatically add all the plug-ins on your computer to your FX Favorites folder and organize them by the first word in the plug-in name (usually the company name). This replaces any menu structure you may have created with a rebuilt **FX Favorites** menu.

1. From the **FX Favorites** menu, choose **Recreate by Plug-In Name**. You are prompted to confirm the reorganization of the FX Favorites folder.
2. Click **Yes** to continue.  
Folders are created and the plug-ins are organized based on the first word in the names of the plug-ins.

## Using the Preset Manager

Once you have created custom presets for effects or effect chains, you can use the Sound Forge Preset Manager to back up, transfer, or delete custom presets from any of the effects, processes, tools and plug-ins installed in the software. The Preset Manager also functions as a standalone application, meaning that you can use the Preset Manager outside of Sound Forge software to manage ACID and Vegas presets as well.

To display the **Preset Manager**, choose **Preset Manager** from the **Tools** menu. In the Preset Manager, choose **Contents and Index** from the **Help** menu for instructions on how to manage your presets.


## Automating Effect Parameters


When you add an effect that supports automation to the Plug-In Chainer, a list of the effect's automatable parameters is displayed on the right side of the window. You can use these controls to add, show/hide, and enable/bypass automation envelopes.

Plug-in parameters can be edited using the automation envelope in the data window.

**Note:** Choosing a new effect chain preset will clear the current effect automation settings.

## Adding an effect automation envelope

1. In the Plug-In Chainer, select the button  for an effect that includes automatable parameters. The plug-in's controls are displayed, and a list of the effect's automatable parameters is displayed on the right side of the Plug-In Chainer.

**Tip:** The Parameter Chooser is displayed on the right side of the Plug-In Chainer window when you add a plug-in that supports automation. Click the **Show Parameter Chooser** button  or press **Ctrl+H** to show or hide the chooser.

2. Select the **Automate** check box for each parameter you want to control with an envelope. An envelope is added to the data window for each selected check box.

## Adding a volume or panning envelope

Panning envelopes will have no effect on mono source data. Convert mono sound data to stereo before adding a panning envelope.

1. Click within a data window to give it focus.
2. Press **V** to add a volume envelope, or press **P** to add a panning envelope.

An envelope is added to the data window and the Sound Forge Volume or Sound Forge Pan plug-in is added to the Audio Plug-In Chainer. If the Plug-In Chainer is not visible, it will be opened.

**Note:** If a data window already has a volume envelope, pressing **P** or **V** will hide the envelope.

3. Adjust volume or panning with the envelope in the data window.


## Adjusting effect parameters with envelopes


An envelope is displayed in the data window for each effect parameter that you've chosen to automate. Envelope points represent plug-in parameter settings at a specific point in time.



You can add points, adjust their positions, and change the fade curves between points to modify effect parameters and the transitions between them.

**Note:** When you automate an effect's frequency parameter — such as the modulation frequency parameter in the amplitude modulation effect — you may notice that the frequency changes are more apparent when moving through the lower frequencies. This is because frequency scales plug-ins use a logarithmic scale, but effect automation uses linear interpolation. To make the automated frequency changes sound more natural, change the fade curve types to change the interpolation rates between envelope points. For high-to-low frequency sweeps, use a fast fade curve; for low-to-high frequency sweeps, use a slow curve.

## Previewing effect automation

To hear the results of your effect automation without applying it to the sound file, click the **Preview** button  in the Plug-In Chainer window.

You can select the **Bypass** button  in the Plug-In Chainer to bypass all effects in the chain, or clear an effects check box  **Chorus** to bypass individual effects.

You can also click the **Play Plug-In Chainer** button  in a data window's playbar to hear the effects of a chain on the data window. Click the **Play Normal** button  in the playbar to hear the unprocessed sound.

## Applying effects automation

To apply effect automation to a data window, click the **Process Selection** button  in the Plug-In Chainer window.


## Showing or hiding effect automation envelopes

1. In the Plug-In Chainer, select the button  **Chorus** for an effect that includes automatable parameters. The plug-in's controls are displayed, and a list of the effect's automatable parameters is displayed on the right side of the Plug-In Chainer.
2. Select the **Show** check box to display a parameter's envelope, or clear the check box to hide it. Hiding an envelope simply removes the line from the data window while it retains the playback properties.

## Enabling or bypassing effect automation envelopes


1. In the Plug-In Chainer, select the button  **Chorus** for an effect that includes automatable parameters. The plug-in's controls are displayed, and a list of the effect's automatable parameters is displayed on the right side of the Plug-In Chainer.
2. Select the **Enable** check box to apply an automation envelope to your audio signal, or clear the check box to ignore it.  
When the check box is cleared, an effect automation envelope is ignored and the effect's initial state is used for the duration of the data window.  
Bypassed envelopes are drawn with a dashed line in the data window.


## Removing effect automation envelopes

Click the **Automate None** button  in the Plug-In Chainer to remove all automation envelopes for the selected plug-in.

Choose **(Empty Chain)** or another preset from the **Chain Preset** drop-down list at the top-left corner of the Plug-In Chainer to clear the plug-in chain and remove all effect automation envelopes.

## Adjusting envelopes

When the Envelope tool  on the main workspace is selected, you can add, remove, select or adjust envelope points on effect automation envelopes.

The Edit tool  allows you to add, remove, or adjust envelope points, but you cannot select envelope points with the Edit tool.

By default, a new envelope will contain a single envelope point. If you want to adjust the overall level of an envelope, drag the envelope up or down. A floating ToolTip will show you the envelope's current setting.

If an envelope has multiple points, you can drag each point, or you can drag envelope segments up or down.

### Tips:

- Hold **Ctrl** while dragging an envelope point or segment to adjust the value in fine increments without changing the envelope points' horizontal positions.
- Hold **Ctrl+Alt** while dragging an envelope point or segment to adjust the value in normal increments without changing the envelope points' horizontal positions.
- Hold **Alt** while dragging an envelope point to move the point's horizontal position without changing its value.  
With the Envelope tool, you can drag horizontally to select multiple envelope points in the selected data window.

## Adding envelope points

To create more complex envelopes, you will need to add points. To add an envelope point, double-click the envelope. You can then drag and position the point as necessary.

To delete a point, right-click it and choose **Delete** from the shortcut menu.


## Flipping an envelope

You can flip an envelope to invert the envelope around its center. Volume, panning, and effect automation envelopes can be flipped.

### Flipping all points

1. Right-click an envelope or a point. A shortcut menu is displayed.
2. Choose **Flip All Points** from the shortcut menu.


### Flipping selected points

1. Create a time selection with the **Envelope** tool  to select the points you want to flip.
2. Right-click an envelope in the time selection. A shortcut menu is displayed.
3. Choose **Flip Selected Points** from the shortcut menu.

## Setting fade properties

You can adjust the fade curve for each envelope segment individually. To change the fade curve, right-click an envelope segment and choose a fade command (such as **Linear Fade** or **Fast Fade**, for example) from the shortcut menu.

## Cutting, copying, and pasting envelope points


1. Select the **Envelope** tool .
2. Click within a data window to select it.
3. Drag horizontally in a data window to select envelope points.
4. From the **Edit** menu, choose **Cut** or **Copy**.

5. Click to position the cursor where you want to paste envelope points.


**Tip:** Click within a different data window if you want to paste envelope points across data windows.

6. From the **Edit** menu, choose **Paste**.

### Copying an envelope to another data window

1. Select the **Envelope** tool .
2. Click within a data window to select it.
3. From the **Edit** menu, choose **Select All**.
4. From the **Edit** menu, choose **Copy**.
5. Click within a data window to select it.

**Tip:** You can paste envelope points to a different envelope type by selecting the envelope where you want to paste.

6. Click **Go to Start**  if you want the envelope to appear exactly as it was in the original data window, or click to position the cursor where you want the envelope to start.
7. From the **Edit** menu, choose **Paste**.

## Chapter 12 Using Acoustic Mirror and Wave Hammer

This chapter is designed to familiarize you with the Sound Forge® Acoustic Mirror™ and Wave Hammer™ effects. The Acoustic Mirror effect is a powerful digital signal processing tool that allows you to add environmental coloration to your existing recordings. The Wave Hammer effect is an audio mastering tool that features a classic compressor and volume maximizer.

### What are the Acoustic Mirror effects?

The Acoustic Mirror effects represents an advance in reverb technology in that it incorporates the acoustical responses of a given environment or venue into your audio files. You may never play Carnegie Hall, but that does not mean that your recordings can't sound like it. Taking this concept even further, this effect allows you to simulate the signal response of vintage musical equipment. Imagine the money you'll save not having to buy those paired U-47s.

### The acoustic signature

Acoustic Mirror effects use the environment's acoustic signature, or impulse response. These acoustic signatures are saved as impulse files and given the extension .wav or .sfi. An extensive library of high-quality impulse files are included. In addition, you can collect your own acoustic signatures and create custom impulse files.

### Adding an acoustic signature to an audio file

1. Open and play the Saxriff.pca file.

**Note:** This file is located in the same folder as the application.

2. From the **Effects** menu, choose **Acoustic Mirror**. The Acoustic Mirror dialog is displayed.

**Note:** You must have an active file in the Sound Forge workspace to start the Acoustic Mirror tool.

3. Click the **Browse** button located next to the **Impulse** field and locate the **Acoustic Mirror Impulse Files** folder on the Sound Forge CD.
4. Double-click the folder. Several impulse subfolders display.
5. Double-click the **Large venues** folder. Several impulse files display.
6. Double-click **Stadium, Camp Randall 50 yrd line.sfi**. This impulse file's acoustic signature is added to the Saxriff.pca file and you are returned to the Acoustic Mirror dialog.
7. Click **Preview**. The processed file plays and the sax riff is virtually placed in a football stadium-sized venue.
8. Select or clear the **Bypass** check box to toggle between the processed and unprocessed audio.

### Adjusting the acoustic signature

Once you add an acoustic signature to a file, you can use the controls of the Acoustic Mirror dialog to precisely configure the reverb effect. More importantly, you can preview configuration changes as quickly as you make them.

1. Open a file and display the Acoustic Mirror dialog.
2. Verify that the **Real-time** check box is selected.
3. From the **Impulse** drop-down list, choose the desired impulse file and click **Preview**. The processed audio file plays. Notice that all dialog controls are set to their default values.

4. Drag the **Dry Out** fader up. Notice the audible change in output as the balance between the **Wet Out** and **Dry Out** values changes.

**Tip:** *If you are experiencing difficulty previewing processing in real-time, decrease the **Quality/speed** value.*

5. Drag the **Response delay** slider to the right. Notice the audible change in the reverb's delay.

The Acoustic Mirror dialog contains four tabs: **General**, **Envelope**, **Summary**, and **Recover**. Each tab contains controls that allow you to precisely configure the effect as well as recover custom impulses. Notice that the Acoustic Mirror dialog contains the preset and preview controls found in all of the Sound Forge process and effect dialogs. *For more information, see [Applying presets on page 139](#) and [Previewing processed audio on page 141](#).*

## General tab controls

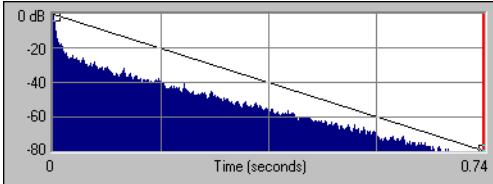
The following sections describe all controls located in the **General** tab.

Control	Description
Impulse	The <b>Impulse</b> drop-down list allows you to specify an impulse file from a list of those previously used. Clicking <b>Browse</b> displays the Open Impulse File dialog and allows you to locate an impulse file from your local system or network.
Response width	You can use the <b>Response width</b> slider to create some simple stereo expansion and stereo collapsing effects. This control's default setting of <b>50</b> represents normal stereo operation and is recommended to maintain the stereo field of the impulse response. A higher setting expands the stereo field, but may result in an unnatural sounding effect. Lowering this setting narrows the stereo field. A setting of <b>0</b> is essentially mono.
Response delay	The <b>Response delay</b> slider controls the time, in milliseconds, that elapses between the dry signal and the processed output. This control can be used to create interesting effects and add new dimensions to an acoustic signature. Configuring this control with a positive value results in the processed output following the dry output. A negative value results in the processed output preceding the dry signal, or a pre-delay.
Pan (left to right)	The <b>Pan</b> slider controls the balance between the left and right channels in stereo files. The default value is <b>0</b> and indicates a typical center position.
Dry Out	The <b>Dry Out</b> fader controls the amount of unprocessed signal mixed into the output.
Wet Out	The <b>Wet Out</b> fader controls the amount of processed signal mixed into the output.
Apply envelope and limit decay to (seconds)	When you select this check box, the length of the impulse is limited to the time specified in the adjacent box. Limiting the length of an impulse file shortens the decay of the reverberation and decreases the amount of processing required.  In addition, selecting this check box results in the impulse fading according to the <b>Envelope Graph</b> configured on the dialog's <b>Envelope</b> tab. <i>For more information, see <a href="#">Envelope Graph on page 173</a>.</i>
Low-shelf start frequency/High-shelf start frequency	Acoustic Mirror high- and low-shelving filters to allow you to tailor the frequency response of the impulse. Notice that you can adjust the cutoff frequency and boost/attenuation of each filter independently.
Convert mono to stereo	Selecting the <b>Convert mono to stereo</b> check box converts a mono signal to stereo output. If the impulse file is in stereo, selecting this check box imparts a pseudo-stereo effect on the mono input.
Quality/speed	The <b>Quality/Speed</b> slider allows you to strike a balance between the quality and speed of the audio processing. Lowering this value immediately affects the frequency response of the impulse. The processed signal sounds dull and high frequencies sound unnatural. At very low values, the length of the impulse is shortened. When this control is set to a high value, the audio quality is excellent, but the processing takes longer.  If you are experiencing difficulty previewing processing in real-time, decrease the <b>Quality/speed</b> value. However, you must return this value to <b>5</b> prior to actually processing the file to output the highest possible quality.



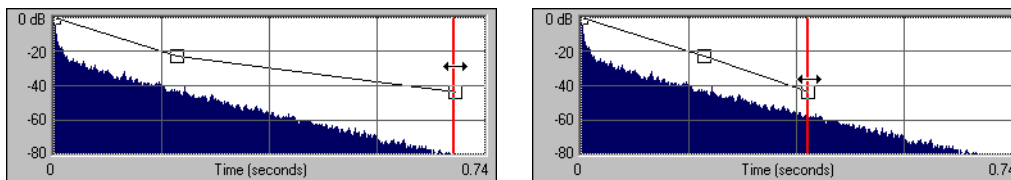
## Envelope tab controls

The following sections describe all controls located on the **Envelope** tab.

Control	Description
Impulse	This control is identical to the <b>Impulse</b> drop-down list on the <b>General</b> tab. This allows you to view the envelope graphs for the specified impulse file. <i>For more information, see <a href="#">Impulse</a> on page 172.</i>
Dry Out	This control is identical to the <b>Dry Out</b> fader on the <b>General</b> tab. <i>For more information, see <a href="#">Dry Out</a> on page 172.</i>
Wet Out	This control is identical to the <b>Wet Out</b> fader on the <b>General</b> tab. <i>For more information, see <a href="#">Wet Out</a> on page 172.</i>
Apply envelope and limit decay	This control is identical to the <b>Apply envelope and limit decay</b> check box on the <b>General</b> tab. <i>For more information, see <a href="#">Apply envelope and limit decay to (seconds)</a> on page 172.</i>
Envelope Graph	Selecting the <b>Apply envelope and limit decay</b> check box turns on the <b>Envelope Graph</b> . You can use the envelope graph to decrease the length of the specified impulse file, which consequently decreases the reverberation decay time and processing time. You can also use the envelope graph to apply fades to the specified impulse file.
	 <p>The horizontal axis of the graph represents the time of the impulse file and the vertical axis represents peak amplitude in dB. Specifying an impulse file from the <b>Impulse</b> drop-down list automatically displays its envelope in the graph.</p> <p><b>Note:</b> If the impulse file is greater than 6 seconds in length, it does not display in the envelope graph.</p>
Envelope points	Envelope points are used in the envelope graph to specify a fade curve. The fade amount can vary from 0% to 100%. You can create, delete, and arrange envelope points just as you can in all of the Sound Forge envelope graphs. <i>For more information, see <a href="#">Envelope graphs</a> on page 38.</i>
	<b>Note:</b> The fade value at any point in a curve does not use the same vertical logarithmic (dB) scale used for displaying the impulse file.
Reset	Clicking this button resets the envelope points to 100%, indicating no fade.
Package Impulse into Preset	Clicking this button creates a link between the current preset and the selected impulse file, along with encoding the impulse information. You can use the Preset Manager to share presets and the accompanying impulse files between computers without losing information. <i>For more information, see <a href="#">Using the Preset Manager</a> on page 167.</i>

## Adjusting the impulse length

Drag the vertical **Envelope Endpoint** line to the desired location. The **Envelope Endpoint** repositions and the length of the impulse adjusts.



Repositioning the envelope endpoint line

## Summary tab controls

The **Summary** tab provides information about the impulse file. The following section describes all controls located on the **Summary** tab.

Control	Description
Impulse	This control is identical to the <b>Impulse</b> drop-down list on the <b>General</b> tab. <i>For more information, see <a href="#">Impulse</a> on page 172.</i>
Dry Out	This control is identical to the <b>Dry Out</b> fader on the <b>General</b> tab. <i>For more information, see <a href="#">Dry Out</a> on page 172.</i>
Wet Out	This control is identical to the <b>Wet Out</b> fader on the <b>General</b> tab. <i>For more information, see <a href="#">Wet Out</a> on page 172.</i>
Quality/speed	This control is identical to the <b>Quality/speed</b> check box on the <b>General</b> tab. <i>For more information, see <a href="#">Quality/speed</a> on page 172.</i>

## Recover tab controls

The **Recover** tab is used in creating your own impulse files. *For more information, see [Creating impulse files](#) on page 175.* The following section describes all controls located on the **Recover** tab.

Control	Description
Recorded file	The <b>Recorded file</b> box allows you to select the file containing the test tone recorded in the field. You can enter the path directly into the box or click <b>Browse</b> to locate and select a file.
Test file used	The <b>Test file used</b> box allows you to select the file that was used as a test tone. You can enter the path directly into the box or click <b>Browse</b> to locate and select a file. <b>Note:</b> You should use one of the test files included in the <b>Acoustic Mirror Impulse Files\Test Tones</b> folder on the Sound Forge application disc.
Impulse output	The <b>Impulse output</b> box allows you to specify where the recovered impulse response file is saved. You can enter the path directly into the box or click <b>Browse</b> to locate and select a folder.
Remove very low frequencies	When you select this check box, very low frequencies (which are typically comprised of noise) are removed from the impulse response. This increases the impulse response's signal-to-noise ratio.
Recover Impulse	Clicking the <b>Recover Impulse</b> button starts the impulse recovery process. After the process is complete, an impulse file is created and saved in the folder specified in the <b>Impulse output file</b> box.
Impulse recovery mode	You can choose from three <b>Impulse recovery mode</b> options to determine the method used to recover the impulse: <b>Use the start and end of the recorded file as timing spikes</b> , <b>Auto-detect timing spikes</b> , or <b>Do not use timing spikes</b> . Each of these modes is described below. <ul style="list-style-type: none"><li>• <b>Use the start and end of the recorded file as timing spikes</b> - This option specifies that the beginning and end of the recorded file are used as timing spikes. This option is recommended for the best results during impulse recovery.<p>You must trim the file as close to the timing spikes as possible for this method of recovery to work most effectively. The first sample of the file should contain the start of the first spike and the last sample of the file should contain the start of the second spike. Therefore, most of the second spike is deleted.</p></li><li>• <b>Auto-detect timing spikes</b> - This option specifies that the timing spikes exist near the start and end of the recorded file and that they should be auto-detected. Timing spikes are used to correct for clock or tape speed mismatches. If you have not trimmed the recorded file so that the timing spikes are at the very beginning and end, select this option for the best results.<p>With this option, you need only ensure that the first spike occurs within one second of the start of the file and that the second spike exists in the file. To improve detection accuracy, you can also boost the level of the start and end spikes in the recorded file.</p><b>Tip:</b> If the spike's level is close to the noise floor, select the <b>Use the beginning and end of the recorded file as timing spikes</b> option.</li><li>• <b>Do not use timing spikes</b> - This option specifies that no timing spikes are used. This is the least desirable option as no timing information is used. To use this option, you must trim the recorded file so that the test tone starts and ends at the start and end of the file, with no blank audio before or after. This option should only be used if the timing spikes are lost in the recording or if you are certain that the play and record clocks are synchronized (such as when using an ADAT).</li></ul>

## Creating impulse files

You can obtain impulse responses from anything that accepts test tone input and supports recording the output. This includes physical spaces as well as electronic audio equipment. Creating custom impulse files requires planning, work, and additional audio equipment.

**Note:** *Impulses derived from electronic devices that produce nonlinear effects such as overdrives, distortion pedals, pitch shifters, harmonic enhancers, chorus pedals, or flange pedals cannot be modeled using the Acoustic Mirror tool. While they produce interesting effects, the acoustic signature cannot be correctly replicated.*

### What you need to create custom impulses

The equipment required to create custom impulses depends upon whether you want to create the impulse from a physical acoustic space or from a piece of equipment. Regardless of the method, you need a playback device that reproduces test tones and a recording device that has microphone or line-level inputs. Be aware that the quality of the impulse is directly affected by the quality of your playback and recording devices. The flatter your system's response, the more accurate the impulse response.

### Recovering an impulse from an acoustic space

To recover an impulse from an acoustic space, you need the following equipment:

- A playback device and speakers
- A stereo pair of microphones to record the test tone
- A recording device for recording the signal captured by the microphones

### Recovering an impulse from an electronic device

To recover an impulse from an electronic device, you need the following equipment:

- A playback device that connects to the device's inputs
- A recording device that connects to the device's outputs

### Recording the impulse in an acoustic space

Once you have assembled the required equipment, you are ready to begin recording the impulse. The following sections describe the typical impulse recording procedure.

#### Transferring the test tone

The first step in recording the impulse is to transfer the desired test tone to your playback device. The Sound Forge application disc contains two test tones: a 24-second test tone and a 48-second test tone. We typically recommend that you use the 24-second tone because longer tones result in greater signal-to-noise ratios. The 48-second tone should be used in particularly noisy environments or when the decay time of the acoustic space is greater than six seconds.

**Tip:** *There are spikes at the beginning and end of each test tone. You should include the spikes in the recording to simplify the recovery of the impulse in the later stages of the process.*

#### Placing equipment

When recording the test tone in an acoustic space, you must determine where to place your playback system, speakers, microphones, and recording system to produce optimal results. Microphone placement is crucial to the quality of the impulse. The distance between the speakers and the microphone is the perceived distance of audio processed with the impulse you create. For example, if you record the test tone with the speakers positioned 100 feet from the microphones, all sounds processed with the resulting impulse sound as if they are originating 100 feet from the listener.

## Setting levels

After the devices are positioned, you should begin playback of the test tone. The test tone should be played as loudly as possible (or practical) to produce the best signal-to-noise ratio. With the test tone playing at optimum volume, set the levels on the recording device. Recording devices levels should also be set as high as possible, but not permitted to clip or distort. Safe levels are determined by whether you are recording to an analog or digital medium.

## Recording the test tone

Begin recording on the recording device and begin playback of the test tone. Remember to include the spikes at the beginning and end of the test tone. Record the test tone several times using the initial setup, then move the microphones and record the test tones several more times. Continue moving the microphones and recording until you have exhausted the space's acoustic possibilities. Recording impulses in this manner provides you with several distinct impulses for each space.

## Recording the impulse through an electronic device

The recording process is similar if you are recording the output of an electronic device, but there are no speakers or microphones to be placed.

Using the appropriate cables, connect the playback system's outputs to the electronic device's inputs and the electronic device's outputs to the recording system's inputs. Once the devices are connected, play the test tone through the electronic device and record its output on the recording system.

## Other impulses

Any number of methods can be used to create an impulse, including starter pistols, clap boards, or even a sharp hand clap. The drawback of these "impulse generators" is that they add their own coloration to the sound. For best results, we recommend using the test tones included on the Sound Forge application disc.

## Recovering the impulse

Once you have recorded your test tones, they must be processed and converted into impulse responses. The following sections describe the typical impulse recovery procedure.

### Trimming the test tone

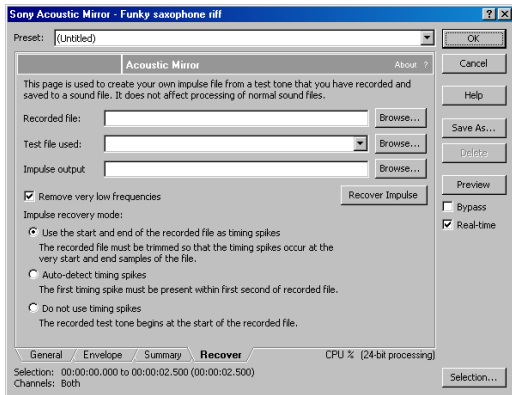
1. Open your test tone file (the "room processed" output test tone) in the software.
2. Locate the first timing spike and delete all audio before it. Cut as close to the beginning of the timing spike as possible, but do not delete the spike itself.
3. Locate the second timing spike and delete all data from the start of the second spike to the end of the file. Again, cut as close to the start of the timing spike as possible.

You should now have an audio file with a spike at the beginning, a test tone, and silence.

4. Save the test tone file.

### Naming, configuring, and recovering the impulse

1. From the **Effects** menu, choose **Acoustic Mirror**. The Acoustic Mirror dialog is displayed.
2. Click the **Recover** tab.



3. Enter the name and path of your impulse file in the **Recorded File** box or click **Browse** and locate the file.
4. Enter the name of the original test tone file in the **Test file used** box.
5. Enter the desired name for the impulse response file to be created in the **Impulse output** box. If necessary, click **Browse** and specify the folder in which the impulse file will be saved.
6. Select the **Remove very low frequencies** check box.
7. If the recorded file was trimmed exactly to the start and end spikes using the procedure described previously, choose **Use start and end of the recorded file as timing spikes** from the **Impulse recovery mode** drop-down list. *For more information, see [Trimming the test tone](#) on page 176.*
8. Click the **Recover Impulse** button to begin recovering the impulse.

After processing is complete, you can open the impulse file in the Sound Forge software and perform any necessary trimming or editing. *For more information, see [Trimming the impulse file](#) on page 177.*

### Trimming the impulse file

After the impulse file is recovered, it may still require minor trimming. In general, you should try to make the impulse response as short as possible to increase processing speed when using the Acoustic Mirror tool. Impulse files greater than 131,071 samples (about 3 seconds) in length require substantial processing time. When possible, trim the impulse response to less than 65,535 samples (about 1.5 seconds). In addition, we recommend fading the tail of the impulse. Of course, this is not always an option when dealing with spaces that produce extended reverberations.

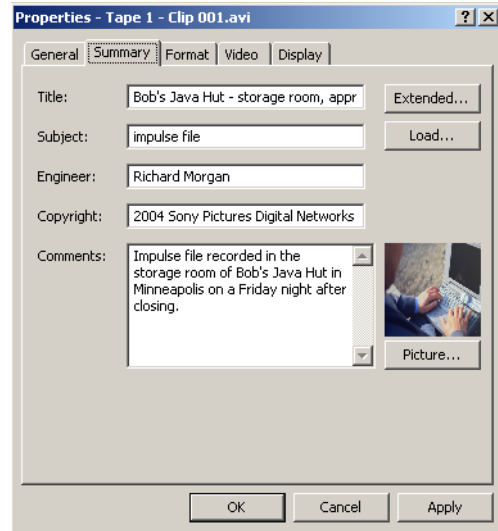
1. Open the recovered impulse file in the Sound Forge software and play it.
2. Delete any silence or low-level noise that occurs before or after the actual audio data. Typically there are between 900 and 1100 samples of data at the beginning of the impulse that should be removed.
3. Save the trimmed impulse response file using the standard WAV format.

**Tip:** *To prevent phase problems when mixing the dry and wet signals, you may also want to verify the phase of the impulse file. The file should begin by going positive (above the centerline). If the impulse file has a negative (below the centerline) phase, choose **Invert/Flip** from the **Process** menu.*

## Adding summary information to your impulse file

If you plan on sharing impulses with other Sound Forge users, we recommend adding summary information and BMP images to your files.

1. Open the impulse file in the software.
2. From the **File** menu, choose **Properties**. The Properties dialog is displayed.
3. Click the **Summary** tab.
4. Enter the appropriate information in each box.
5. Click the **Picture** button. The Open Picture dialog is displayed.
6. Locate the desired image and click **Open**. The image is linked to the impulse file.
7. Click **OK**.



Properties dialog with an attached image

**Note:** If you are using a palletized display setting (256 colors or less) and attach a bitmap to an impulse file, the bitmap colors are distorted when viewed in the Acoustic Mirror tool. This is because the bitmap is converted using the default palette at the time of attachment, which is not optimal. For this reason, you should set the display settings to at least a 16-bit palette prior to attaching bitmaps to impulse files.

## Using the new impulse file

To use your new impulse file, open the Acoustic Mirror dialog and choose it from the **Impulse** drop-down list as you would any other impulse file. If you performed the previous procedures properly, the custom impulse file should realistically recreate the reverberation characteristics of the electronic device or acoustic space.

## Using impulse files in creative ways

Now that you understand the use and creation of impulse files, you may want to begin using the Acoustic Mirror tool in more interesting ways than simply applying an impulse to an audio file. The following sections describe some creative and advanced uses for Acoustic Mirror technology that can contribute to the professionalism of your work.

### Processing individual audio elements

Instead of applying an impulse file to an entire song, try applying an impulse to individual elements of the song. Applying an impulse to specific notes, chords, riffs, or phrases can quickly change the dynamics of a song. This technique is possible because the tail of processed audio is automatically mixed with the adjacent unprocessed audio.

### Adding realistic stereo to mono recordings

You can give mono recordings realistic stereo characteristics by selecting the **Convert mono to stereo** check box in the **General** tab of the Acoustic Mirror dialog when applying the specified impulse file. The stereo image produced using this method is virtually indistinguishable from an actual stereo recording.

If you choose to use the Acoustic Mirror effect for stereo simulation, you may find the output too reverberant. If this is the case, decrease the **Apply envelope and limit decay** value. Frequently, setting this value to as little as 0.1 seconds provides stereo realism without adding a distracting amount of reverb.

## Creating special effects

Processing an audio file using a non-impulse WAV file can produce any number of unexpected and interesting special effects. To demonstrate this concept, create several short (less than 12 seconds) audio files using the **FM Synthesis** tool and save them as individual WAV files. Now choose any of these files from the **Impulse** drop-down list and preview the results.

We have included several short files on the Sound Forge application disc to allow you to experiment with this technique. After some experimentation, you should begin to notice a few general rules regarding this use of the tool:

- Impulse files that cover the entire frequency spectrum prevent the output from sounding too filtered.
- Using a frequency sweep as an impulse creates a frequency-dependent delay effect.
- Panning within the impulse causes the stereo image of the output to flutter between channels.
- Using staccato sounds (such as drum hits) creates a variety of echo effects.

## Recreating spaces for foley effects and dialog replacement

Frequently, dialogue recorded in the field is rendered unusable by ambient noise. If you are shooting in the field and realize that overdubbing will be necessary, you should create an impulse in each filming location. This allows you to overdub dialog during post-production that is indistinguishable from dialog recorded on location.

If you intend to use the Acoustic Mirror effect as a film/video post-production tool, there are some factors to keep in mind:

- Distance information is determined by the distance between the source and the microphone when creating the impulse. Record multiple impulses at various distances for each location to create realistic dialog effects when matching audio processing to approximate camera positioning.
- The frequency response of the human ear changes as the volume of a sound increases. As a result, impulses created from a significant distance may sound unusual at high volumes.
- Placing a microphone off center allows you to create directional information in the recovered impulse. For example, placing a microphone to the left of the speaker produces an impulse that approximates a source located on the left side of the screen.

## Panning with head-related transfer functions

A head-related transfer function (HRTF) contains the frequency and phase response information required to make a sound seem to originate from a specific direction in a three-dimensional space. The **Acoustic Mirror Impulse Files\HRTF Impulses** folder on the Sound Forge application disc contains a collection of impulse files that contain directional cues.

To achieve optimal results using these impulse files, the original file should be mono and playback should be monitored using headphones. To begin, convert the mono file to stereo by replicating the mono signal in each channel. After the audio is converted to stereo, choose an impulse file from the **HRTF Impulses** folder. You will notice that the **HRTF Impulses** folder is further divided into **Left** and **Right** directories. Opening the desired folder displays the available impulse files, all of which are named based on their elevation (up or down) and azimuth (left or right) angles in degrees. The following table provides some examples:

File Name	Impulse positioning
0E000L	Straight ahead
0E090L	Far left
0E090R	Far right
90E000L	Directly above your head
0E180L	Directly behind you
-20E120L	Below, behind, and to your left

**Note:** Refer to *Readme.doc* in the **HRTF Impulses** folder for more information.

## Troubleshooting the Acoustic Mirror effect

The following sections describe problems that may be encountered when working with the Acoustic Mirror tool.

### Stuttering during real-time previewing

It is not uncommon to experience problems when previewing processing in real-time. The following sections contain several suggestions to remedy the situation.

#### Lower the Quality/speed setting

Lower the value of the **Quality/speed** control on the **General** page. When previewing lengthy impulse responses, a setting of **1** or **2** may be necessary; however, the quality suffers. This setting should always be returned to **5** prior to processing to maintain effect quality.

#### Increase the DirectX buffering size

1. Open the Acoustic Mirror dialog.
2. Right-click an empty area of the dialog outside of the four tabs and choose **Configuration** from the shortcut menu. The Real-Time Preview Configuration dialog is displayed.
3. Reconfigure the **Buffers to process per second** and **Total playback buffers** controls. Typically, lowering the **Buffers to process per second** value and increasing the **Total playback buffers** value reduces gapping during real-time previewing.

#### Close all memory-intensive applications

Real-time previewing may be limited by any additional applications operating on the desktop. To avoid this situation, close all memory-intensive applications prior to using this effect.

#### Add additional RAM to the system

We recommend at least 64 MB of RAM to operate Sound Forge software and its related tools.

#### Add a faster floating point arithmetic processor

Many high-speed processors are still lacking in speed when processing floating point arithmetic. We recommend using high-speed processors that provide exceptional floating point arithmetic for reliable real-time previewing.

### Impulses do not recover properly

If you experience problems recovering custom impulse recordings, verify each of the following:

- a. Verify that you have trimmed the recorded test tone based on the mode chosen from the **Impulse recovery mode** drop-down list. *For more information, see [Trimming the test tone](#) on page 176.*
- b. Verify that the second spike is present in the recorded test tone if the **Auto-detect timing spikes** options is specified.
- c. Verify that the file specified in the **Test file used** box is the exact test tone used to make to field recording and that neither its length or data has been changed.
- d. If the impulse still does not recover properly in **Auto-detect timing spikes** mode, normalize the spikes in the recorded test tone file. This should aid the auto-detect algorithm in detecting the timing spikes and recovering the impulse.

### Recovered impulse is too noisy

To maximize the impulse's signal-to-noise ratio, you should verify that the field recording's noise floor is not too high. When recording in noisy environments, increase the test tone's amplitude until the test tone is at least 25 dB louder than the noise floor. At least 40 dB of signal-to-noise is recommended for optimal impulses. If you cannot avoid noise when recording in the field, Sony Media Software's Noise Reduction tool can salvage a session.



Speaker nonlinear distortion can also cause noisy impulses. The most common source of nonlinear distortion is loudspeaker harmonics. Most speakers display substantial harmonic distortion at low frequencies. For example, when you play a 60 Hz tone, the speaker vibrates at 60 Hz, but also outputs lower-level audio at multiples of 60 Hz (120, 180, etc.). The impulse recovery method greatly minimizes these low-frequency distortions; however, inexpensive tweeters often display substantial high-frequency distortion that can disrupt the recovery process. When possible, use high-quality components and do not overdrive the speakers.

## Error message explanations

The following sections briefly describe Acoustic Mirror error messages that you may encounter.

### The selected file is not a valid test file

The file specified in the **Test file used** box is not a test tone file included on the Sound Forge application disc.

### The level of the first spike is low. Do you wish to use it as a timing spike?

This typically means that no actual timing spike was detected. Verify that the first spike is within one second of the start of the recorded file. If the recording is noisy and the spike is not very pronounced, you can aid detection by muting the audio immediately before and after the spike.

### An error occurred reading the test tone file

Either the test tone file was not found or is not a valid test tone file. Always use a test tone file provided on the Sound Forge application disc.

### The selected Recorded file is much smaller than the test tone size

This may indicate that the test tone or the recorded file specified in the **Recover** tab is not correct. Verify that the length of the recorded file roughly the same size as the test tone file.

### The end spike was not found

Verify that the spike following the test tone is present in the recorded file when recovering impulses in **Auto-detect timing spikes** mode.

## What is the Wave Hammer plug-in?

Sony Media Software's Wave Hammer DirectX plug-in is an audio mastering tool consisting of a classic compressor and a volume maximizer.

The Wave Hammer tool can be used in any Microsoft DirectX-compatible host application (for example, Sound Forge and ACID® Pro software), and the quality and functionality of the Wave Hammer plug-in is the same in each host application; however, the method of previewing effects is different. Consult your host application's documentation to determine the available previewing methods.

### Displaying the Wave Hammer plug-in

To display the Wave Hammer tool, choose **Wave Hammer** from the **Effects** menu.

## The Wave Hammer dialog

The Wave Hammer controls are divided into two tabs: **Compressor** and **Volume Maximizer**.

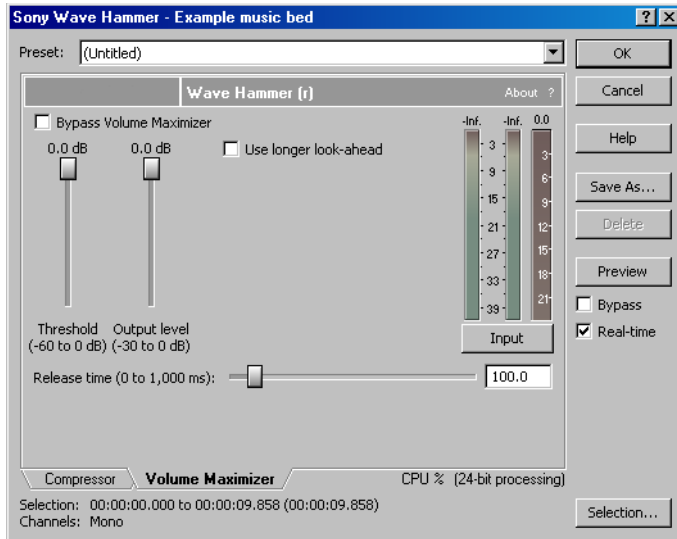
## Compressor tab

The controls on the **Compressor** tab are used to compress the audio signal. When applied properly, compression reduces the dynamic range of audio and allows you increase overall loudness. Compression has various uses. For example, applying heavy compression at a low threshold to electric guitar produces distortion. The controls are explained below.

Control	Description
Threshold	The <b>Threshold</b> fader is used to adjust the audio level at which compression is applied. Audio with levels higher than the <b>Threshold</b> value are compressed, while audio at levels lower than this value pass through the compressor uninterrupted.
Ratio	The <b>Ratio</b> slider determines the amount of compression applied to audio signals surpassing the threshold. A ratio of 1:1 applies no compression to audio surpassing the threshold, while a ratio of 2:1 requires a 2 dB increase in actual volume to raise the processed volume 1 dB. A ratio of <b>Inf:1</b> is considered a limiter.
Output gain	The <b>Output gain</b> fader allows you to determine how much the audio signal is boosted following its compression.
Attack time	The <b>Attack time</b> slider allows you to determine how soon after rising above the threshold the audio signal is attenuated.
Release time	The <b>Release time</b> slider allows you to determine how soon after falling below the threshold the audio signal attenuation is interrupted.
Smart release	<p>The <b>Smart Release</b> slider allows you to configure the compressor to automatically increase the release time for sustained notes and decrease the release time for sharp transients. Setting this value higher increases the internal variability of the specified <b>Release</b> value.</p> <p>Generally, louder overall audio levels can be achieved with lower <b>Release</b> values. However, low <b>Release</b> values can also lead to an increase in “pumping” artifacts. Configuring a <b>Smart Release</b> value increases the release time during sustained sounds, thereby preventing release changes from occurring too rapidly.</p>
Scan mode	<p>The <b>Scan</b> mode radio buttons allow you to specify whether Peak or RMS mode is used to determine the loudness of an audio file, which in turn determines the amount of compression that is applied. When compressing in Peak mode, the compressor applies compression where it detects audio signal peaks that surpass the threshold.</p> <p>However, when compressing using RMS mode, the compressor processes the audio using the detected average RMS value of the entire file. The Root Mean Square (RMS) of audio is a measure of its intensity over a period of time. Therefore, the RMS level of audio corresponds to the loudness perceived by a listener when measured over small intervals of time. As a result, rapid transient peaks may not be processed when compressing in RMS mode.</p>
Auto gain compensate	<p>When you select the <b>Auto gain compensate</b> check box, the compressor output is boosted by a constant amount derived from the <b>Threshold</b> and <b>Ratio</b> settings. This option prevents a loss in overall level when compressing audio.</p> <p><b>Tip:</b> When using the <b>Auto gain compensate</b> option, the <b>Output gain</b> fader should be used to fine tune the signal output level.</p>
Use longer look-ahead	When you select the <b>Use longer look-ahead</b> check box, the compressor scans farther ahead in the incoming audio to determine how much compression is needed. This results in compression being applied before the threshold-surpassing audio actually occurs, thereby allowing for a slower <b>Attack time</b> value. However, the pre-compression effect (fades that occur prior to attacks) of this option may be distracting.
Smooth saturation	Selecting the <b>Smooth saturation</b> check box lowers the amount of distortion caused when applying heavy compression. When this option is turned on, the compressed audio sounds warmer and not overly bright.
Input/Output meter	This meter allows you to monitor the level of the incoming and outgoing signals. When the <b>Input</b> button is displayed, the meters display the incoming signal level. Clicking <b>Input</b> toggles the button to an <b>Output</b> button and displays the outgoing signal level. Clicking <b>Output</b> returns you to the incoming signal display.
Attenuation meter	This meter allows you to monitor the audio signal attenuation derived from the current settings.

## Volume Maximizer tab

The controls on the **Volume Maximizer** tab are used to limit the peak amplitude of an audio file or to boost the overall level without clipping the waveform and distorting the audio. These controls are explained below.



Control	Description
Threshold	The <b>Threshold</b> fader is used to adjust the audio level at which the volume maximizer activates. Audio with levels higher than the <b>Threshold</b> value are affected, while audio at levels lower than this value pass through the volume maximizer uninterrupted.
Output level	The <b>Output level</b> fader allows you to determine the level to which peaks above the <b>Threshold</b> setting are boosted or cut.
Release time	The <b>Release time</b> slider allows you to determine how soon after falling below the threshold the audio signal attenuation is interrupted.
Use longer look-ahead	When you select the <b>Use longer look-ahead</b> check box, the volume maximizer scans farther ahead in the incoming audio to determine the amount of limiting that is needed. This results in limiting being applied before the threshold-surpassing audio actually occurs. However, the pre-limiting effect (fades that occur prior to attacks) of this option may be distracting.
Input/Output meter	This meter allows you to monitor the level of the incoming and outgoing signals. When an <b>Input</b> button is displayed, the meters are displaying the incoming signal level. Clicking <b>Input</b> toggles the button to an <b>Output</b> button and displays the outgoing signal level. Clicking <b>Output</b> returns you to the incoming signal display.
Attenuation meter	This meter allows you to monitor the audio signal attenuation derived from the current settings.



## Chapter 13 Utilizing the Scripting Feature

- You can use scripting to streamline repetitive tasks and implement customized features. When the Script Editor window displays, you can use it to create, edit, or run scripts.
- Sound Forge® software can use scripts written using JScript, VBScript, or C# as well as scripts that have been compiled as DLLs.

### Scripting references

#### Sample scripts

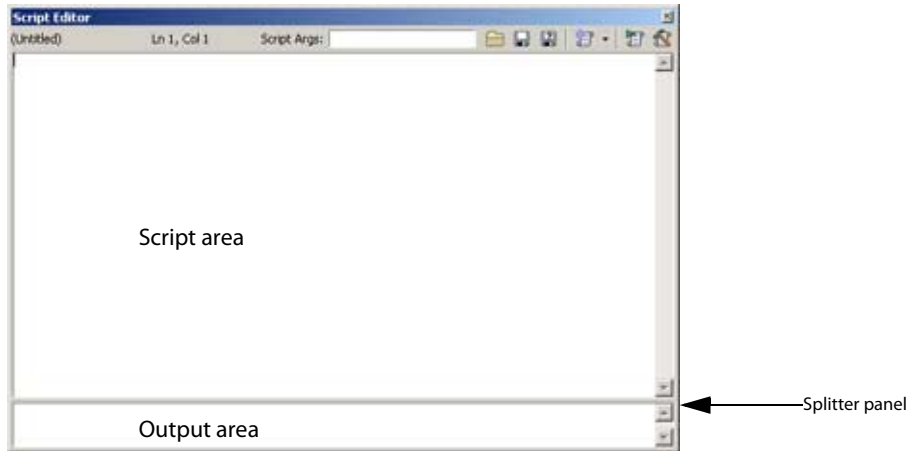
You can find the most recent scripting API (application programming interface) and sample scripts on our Web site <http://www.mediasoftware.sonypictures.com/download/step1.asp?catid=15> in the **Plugin Development Kits** section.

#### Additional scripting information

For additional information about scripting, we encourage you to check out the Sound Forge scripting forum on our Web site: <http://www.mediasoftware.sonypictures.com/forums/ShowTopics.asp?ForumID=27>






## Opening the Script Editor window

From the **View** menu, choose **Script Editor** to display the Script Editor window. You can use the Script Editor window to open, run, create, or edit scripts.



- **Script area** - Displays the current scripts written code.
- **Output area** - Displays text results for the current script.
- **Splitter panel** - Allows you to adjust the size of the output area window by dragging it up or down.

The Script Editor toolbar displays by default when you open the Script Editor window.



	Open: opens the Open Script dialog.		New Script Template: opens a basic C# or JScript template needed to write a script.
	Save: saves the current script.		Run Script: runs the current script.
	Save As: saves the current files with a new name or format.		Compile Script: compiles and tests your script.

## Opening and running a script

You can open and run a script that has already been developed.

**Warning:** *Scripts can pose a security risk to your computer. A script has the power to delete files, read files, write files, execute programs, access the Internet, access files on your network, and so on. Always examine the contents of a script before running it. If you don't understand the script, do not run it unless it comes from a trusted source. In general, take the same precautions you would take for any program you download from the Internet or receive in an e-mail attachment.*

### Running a script from the Script Editor window

1. Click in the data window where you want to apply the script to establish focus.
2. From the **View** menu, choose **Script Editor** to display the Script Editor window if it isn't already displayed.
3. Click the **Open** button  in the Script Editor toolbar. The Open Script window is displayed.
4. Select the script file (.vb, .js, .cs, or .dll) that you want to run. The script data is displayed in the top portion of the Script Editor window.
5. Click the **Run Script** button .

### Running a script from the Scripting menu

1. Click in the data window where you want to apply the script to establish focus.
2. From the **Tools** menu, choose **Scripting**.
3. Choose a script from the submenu or choose **Run Script** from the submenu to browse to the script file (.vb, .js, .cs, or .dll) that you want to run.

### Adding scripts to the Scripting menu

When you start the program, Sound Forge software looks at the Script Menu folder in the Sound Forge program folder to determine which scripts appear in the Scripting submenu. This folder is C:\Program Files\Sony\Sound Forge 9.0\Script Menu by default.




1. To change the contents of the submenu, add or delete scripts in the Script Menu folder.

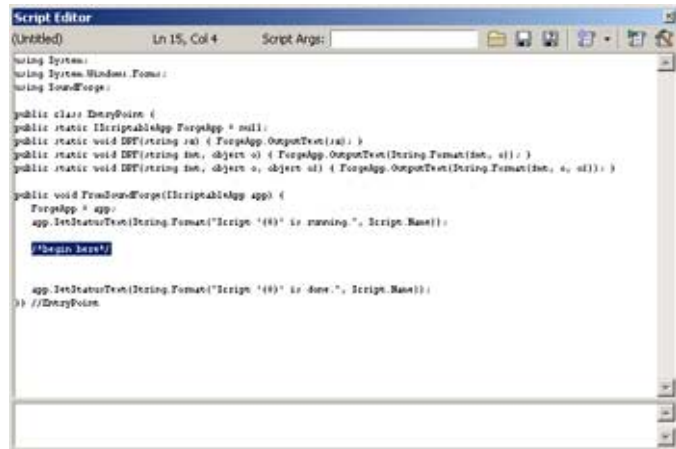
**Tip:** *To prevent duplication of script files, you can use shortcuts in the Script Menu folder.*

2. From the **Tools** menu, choose **Scripting** and then choose **Rescan Script Menu Folder** to update the menu.

## Creating a script


Sound Forge scripting uses the Microsoft .NET framework for scripting. You can write scripts in JScript, Visual Basic .NET, or C#.

1. From the **View** menu, choose **Script Editor** to display the Script Editor window if it isn't already displayed.
2. Click the **New Script Template** button  and choose **C#** or **JScript**. A new script is displayed in the Script Editor window, with what is needed to write a script.
3. Replace the `/*begin here*/` text with your script.
4. Click the **Compile Script** button  to compile and test your script. If there are any errors, they will be displayed at the bottom of the window.
5. Click the **Save** button  to choose the file name and location that you want to use to save your script.



## Editing an existing script




Editing a script in the Script Editor window should not be very difficult as the scripts that are included with Sound Forge software are fully commented to help you find and edit the parameters you need.

1. From the **View** menu, choose **Script Editor** to display the Script Editor window if it isn't already displayed.
2. Click the **Open** button  in the Script Editor window, choose the script you want to edit and then click **Open**. The script data is displayed in the top portion of the Script Editor window.

**Note:** You cannot edit scripts that have been compiled as DLLs.

3. Edit the script as necessary. The comments in the script will help you find the parameters you need to edit.

**Note:** Comments are indicated with double forward slashes: `//`.

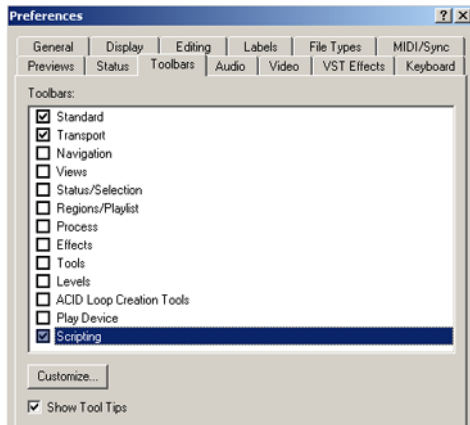
4. Click the **Compile Script** button  to compile and test your edited script. If there are any errors, they will be displayed at the bottom of the window.
5. Click the **Save** button  to replace the script you edited or click the **Save As** button  to save the edited script with a different name or in a different location.



## Using the Scripting toolbar

### Adding or removing toolbar buttons

1. From the **View** menu, choose **Toolbars**. The Preferences dialog appears with a list of available toolbars.
2. Select the **Scripting** check box.



3. Click **Customize**. The Customize Toolbar dialog is displayed.
4. Use the controls in the Customize Toolbar dialog to add, remove, or rearrange the buttons on the selected toolbar. All scripts from the Script Menu folder are listed in the **Available tools** column.

If you want to	Then
Add a script to the toolbar	Select a script in the <b>Available tools</b> column and click the <b>Add</b> button. <b>Note:</b> The script will appear before the currently selected button.
Remove a script from the toolbar	Select a script in the <b>Current tools</b> column and click the <b>Remove</b> button.
Rearrange the buttons	Select a script in the <b>Current tools</b> column and click the <b>Move Up</b> or <b>Move Down</b> button.
Restore the toolbar to its default setting	Click the <b>Reset</b> button.

5. Click the **OK** button.

## Creating custom button images

You can display custom button images for the scripts that you have added to the toolbar by adding .png files to your Script Menu folder.

As an alternative to creating your own custom button images, you can use the default Script\*.cs.png files, which were installed by default in your Script Menu folder.

1. Create a PNG file with the icon that you want to use.

**Note:** *Icons should be 16x16 pixels and transparency is supported.*

2. Save the PNG file in your Script Menu folder using the same name as the name of the script that you want it to represent (i.e. to assign a custom icon to the HelloWorld.js script, the icon should be saved as HelloWorld.js.png)..

**Note:** *The Script Menu folder can typically be found in the following location: C:\Program Files\Sony\Sound Forge 9.0\Script Menu.*

3. Customize the toolbar as needed. The custom icons will display on the Scripting toolbar the next time you start the application.

## Running a script

You can run scripts using a single click if you have customized the Scripting toolbar to include buttons for scripts that you have created.

1. Click in the data window where you want to apply the script to establish focus.
2. Click the button of the script that you would like to run on the Scripting toolbar.

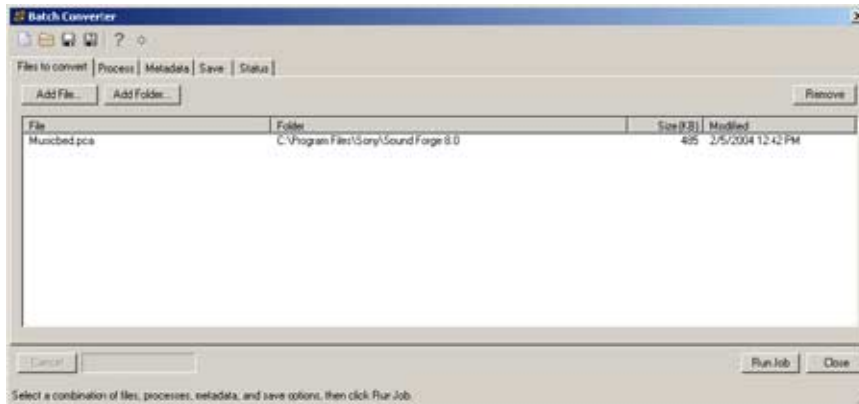
**Tip:** *You may need to hover a button to display a ToolTip, which displays the name of the script associated with the button.*


## Using the Batch Converter script

You can use the Batch Converter script to modify and manipulate audio files without having to process each file individually.

### Converting using an existing batch job

1. From the **Tools** menu, choose **Batch Converter**. The Batch Converter window is displayed.



2. Open the batch job that you want to run.
  - a. Click the **Open Job** button . The Open dialog is displayed.
  - b. Browse to the folder where your batch job (.bj) file is saved.
  - c. Select a batch job and click the **Open** button.
3. Select the **Files to convert** tab and add the files that you want to process. When you start Batch Converter, any open data windows will be included in the list.

If	Then
You want to add individual files	Click the <b>Add File</b> button, browse to a file, and click the <b>Open</b> button.
You want to add all files within a folder	Click the <b>Add Folder</b> button, select a folder, and click the <b>OK</b> button.
<b>Note:</b> Subfolders are not included when selecting a folder.	
You want to add files by dragging	Drag files from the Windows Explorer to the <b>Files to convert</b> tab.

4. Select the **Process** tab and verify the processing settings. *For more information, see [Creating or editing a batch job](#) on page 192.*

**Tip:** When you convert files to a compressed format such as MP3, peaks that are at or near 0 dB may be clipped by the compression process. You may want to consider normalizing first to reduce the possibility of clipped peaks (normalizing to a peak level of -0.9 dB is a good starting point).

5. Select the **Metadata** tab and type values for any metadata (file information) that you want to save in the output files.

If	Then
The <b>Overwrite</b> check box is not selected and the destination file already includes information for a metadata item	The existing information is preserved (keywords; however, will be appended).
The <b>Overwrite</b> check box is selected and the destination file already includes information for a metadata item	The existing information is overwritten with the information from the Metadata tab (existing information will be erased if the box is blank).

**Note:** If a metadata type is not supported by the output format, it will be ignored.

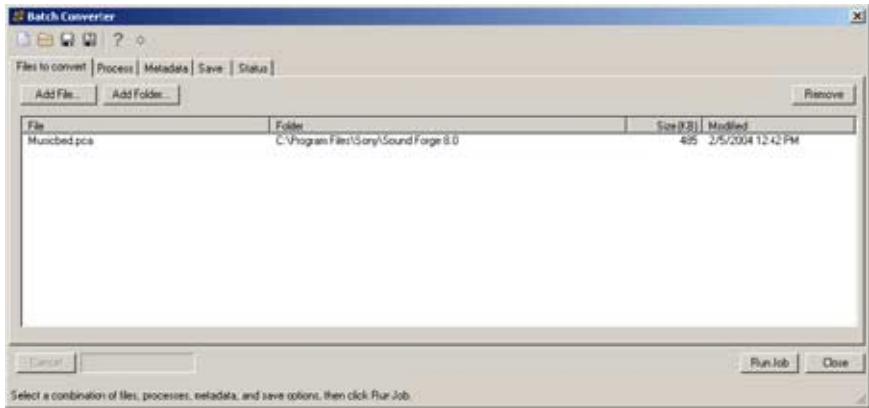
- Select the **Save** tab and verify the file output settings. For more information, see [Creating or editing a batch job](#) on page 192.

**Note:** If you want to convert to multiple formats at once, click the **Add Save Options** button to create a setting for each file type that you want to convert.



- Click the **Run Job** button to start processing. The Batch Converter will then display the **Status** tab to allow you to monitor the progress of your batch job.

### Creating or editing a batch job

- From the **Tools** menu, choose **Batch Converter**. The Batch Converter window is displayed.




- Create a new batch job or open the batch job that you want to edit.

If	Then
You want to create a new batch job	Click the <b>New Batch Job</b> button  .
You want to edit an existing job	Click the <b>Open Job</b> button  , select a batch job and click the <b>Open</b> button.

- Select the **Process** tab to choose the processing settings that you want to apply.

**Tip:** When you convert files to a compressed format such as MP3, peaks that are at or near 0 dB may be clipped by the compression process. You may want to consider normalizing first to reduce the possibility of clipped peaks (normalizing to a peak level of -0.9 dB is a good starting point).

- Choose a plug-in from the **Select** drop-down list and click the **Add Effect** button to add it to the end of the list. The plug-in dialog is displayed.
- Adjust the effect's settings and click the **OK** button. For more information about an individual effect's settings, click the **Help** button  in the plug-in window.
- Repeat steps 3a and 3b as necessary to create your effects list.
- Perform the following actions as needed:

If	Then
You need to change an effect's preset	Select the effect in the list and click the <b>Change Preset</b> button.
You need to change an effect's position in the chain	Select the effect in the list and click the <b>Move up</b> or <b>Move down</b> button.

- Select the **Metadata** tab and type values for any metadata (file information) that you want to save in the output files.

If	Then
The <b>Overwrite</b> check box is not selected and the destination file already includes information for a metadata item	The existing information is preserved (keywords; however, will be appended).
The <b>Overwrite</b> check box is selected and the destination file already includes information for a metadata item	The existing information is overwritten with the information from the Metadata tab (existing information will be erased if the box is blank).

**Note:** If a metadata type is not supported by the output format, it will be ignored.

5. Select the **Save** tab to choose file output settings for rendered files.

a. Click the **Add Save Option** button to create a new setting or select an existing setting and click the **Change Save Options** button. The Output Options dialog is displayed.

If you want to convert to multiple formats at once, click the **Add Save Options** button to create a setting for each file type that you want to convert.

b. In the File Format section, select a radio button to indicate the format that you want to use for processed files:

Button	Description
Same as source	Select this radio button if you want to save converted files using the same format as the original file.
Convert to	Select this radio button and choose a file type from the <b>Type</b> drop-down list if you want to convert your files to a new format. The parameters that will be used for rendering your file are displayed in the <b>Template</b> box. You can click <b>Change</b> to choose a new template.  For any output format, choose <b>Default Template</b> to preserve the source file's format (sample rate, bit-depth, and number of channels) in the output file.



c. In the File Names section, select a radio button to indicate the format that you want to use for processed files:

Button	Description
Same as source	Select this radio button if you want to save converted files using the same name as the original file.
Append to name	Select this radio button and type text in the <b>Append to name</b> box if you want to add a descriptor to the file names of converted files.  The text you enter will be added to the original file name during conversion. For example, if your source file is C:\Audio\DoorSlam.wav, the file could be saved as C:\Audio\DoorSlam-BatchConverted.wav during conversion.

d. In the File Folder section, select a radio button to indicate where you want to save processed files:

Button	Description
Same as source	Select this radio button if you want to save converted files in the same folders as the original files.
Save files to	Select this radio button and type a path in the edit box (or click <b>Browse</b> ) in the <b>Append to name</b> box if you want to save all converted files in a specific folder.  You can select the <b>Preserve source subfolders</b> check box if you want to use the same folder structure in your source and converted files. For example, if your source file is C:\Audio\DoorSlam.wav, you could specify D:\ as your output folder, and the file will be saved as D:\Audio\DoorSlam.wav during conversion.

e. Click the **OK** button.

6. Click the **Save Job** button  to save the updated batch job or click the **Save As**  button to save the edited batch job with a different name.



# Chapter 14 Working with MIDI/SMPTE

This chapter describes using Sound Forge® software in conjunction with internal and external MIDI devices.

## What is MIDI?

The musical instrument digital interface (MIDI) is a set of commands or a language that music software and hardware use to communicate. The most common way to utilize MIDI is to have a device, such as a MIDI sequencer, generating and sending MIDI commands to another device, such as a synthesizer.

## MIDI triggers

You can use numerous internal and external devices to generate MIDI commands and trigger audio playback in the software.

### Playback versus triggered playback

Procedures in this section use the Sound Forge MIDI Keyboard as the MIDI device for triggering audio playback.

For more information, see [Using the MIDI Keyboard](#) on page 209.

### Simple playback

When you click the **Play** button in the transport bar or playbar, the audio file in the active data window plays and you hear the audio. MIDI is not involved.

### Triggered playback

When the MIDI keyboard triggers playback of the same file, the following items occur:

- The MIDI Keyboard transmits MIDI commands to the MIDI router.
- The MIDI router transmits the MIDI commands to the Sound Forge MIDI input port.
- The audio file plays.

**Note:** In the case of triggered playback, MIDI commands may come from any software or hardware device that generates MIDI.

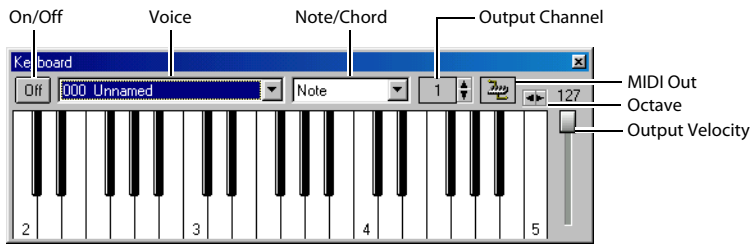
### Triggering file playback


Using the MIDI Keyboard or any other MIDI device to trigger audio playback involves three separate procedures:

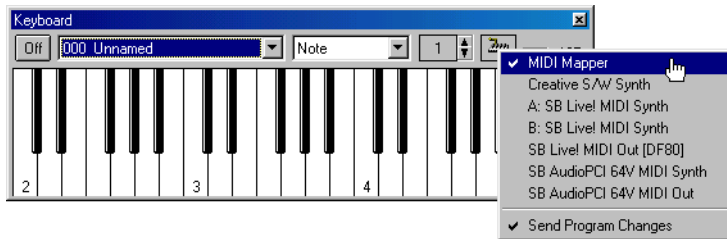
- Configuring the MIDI device (in this case, the MIDI Keyboard).
- Enabling MIDI input synchronization.
- Configuring the MIDI trigger.

## Configuring the MIDI device

1. From the **View** menu, choose **Keyboard**. The MIDI Keyboard is displayed.



2. Open the Voiceover.pca file.
3. Click the **MIDI Out** button  and choose the appropriate MIDI router from the menu.



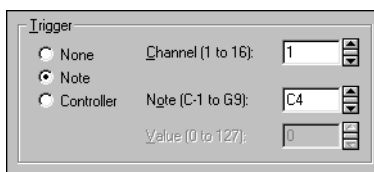
4. Set the keyboard's **Output channel** value to 1. The MIDI device is configured.

## Turning on MIDI input synchronization

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **MIDI/Sync** tab.
3. From the **Input** drop-down list, choose the appropriate MIDI router and click **OK**.

## Configuring the MIDI trigger

1. From the **Options** menu, choose **MIDI Triggers**. The MIDI Triggers dialog is displayed.
2. Select **Play All** from the **Event** list box.
3. In the **Trigger** section, select the **Note** radio button. The **Channel** and **Note** boxes activate.



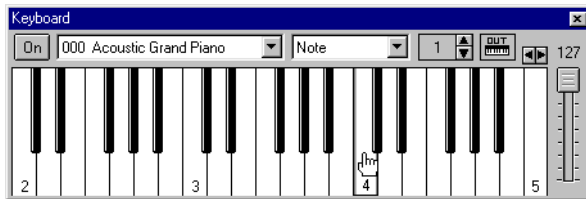
4. Enter **1** in the **Channel** box.
5. Enter **C4** in the **Note** box and click **OK**.

The Sound Forge software is now configured to play the Voiceover.pca file when it receives a C4 Note-On command on MIDI Channel 1.



## Starting playback

1. From the **Options** menu, choose **MIDI In/Out**, and choose **Trigger from MIDI Timecode** from the submenu. A check mark appears adjacent to the command, indicating that it is active and the software is ready to receive MIDI commands.
2. Click the **C4** key on the MIDI Keyboard.



Click the C4 key to begin playback

The Voiceover.pca file plays in its entirety.

## Resetting MIDI triggers

Once set, MIDI triggers are not permanent. They can be edited or deleted as needed.

1. From the **Options** menu, choose **MIDI Triggers**. The MIDI Triggers dialog is displayed.
2. From the **Preset** drop-down list, choose **Reset all triggers to (none)** and click **OK**.

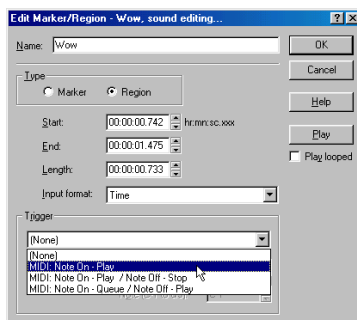
## Triggering region playback

Frequently, it is preferable to use a MIDI device to control the triggering of the individual regions within a file. As in the previous example, the MIDI Keyboard will be used to demonstrate this function.

**Note:** Before performing this procedure, reset all triggers. For more information, see [Resetting MIDI triggers on page 197](#).

## Configuring region playback triggers

1. Display and configure the MIDI Keyboard. For more information, see [Configuring the MIDI device on page 196](#).
2. Set up the MIDI input synchronization. For more information, see [Turning on MIDI input synchronization on page 196](#).
3. Open the Voiceover.pca file and display its Regions List.
4. Select the “Wow” region and press Enter. The Edit Marker/Region dialog is displayed.
5. From the **Trigger** drop-down list, choose **MIDI: Note On - Play**.



6. Enter **1** in the **Channel** box and **C-4** in the **Note** box.
7. Click **OK**. A small musical note appears adjacent to the “Wow” region in the **Regions List** to indicate that a trigger has been configured.

	Name	Start	End	Length
	ence	00:00:00.000	00:00:00.742	00:00:00.742
	Wow	00:00:00.742	00:00:01.475	00:00:00.733
	ound editing just gets easier...	00:00:01.475	00:00:03.639	00:00:02.163
	And easier	00:00:03.639	00:00:05.000	00:00:01.360

A small musical note indicates a region trigger

- Repeat steps 4 through 7, providing each region with a unique MIDI trigger.

### Using region playback triggers

- From the **Options** menu, choose **MIDI In/Out**, and choose **Trigger from MIDI Timecode** from the submenu. A check mark appears adjacent to the command, indicating it is active and the software is ready to receive MIDI commands.
- Click **C4** on the MIDI Keyboard. The “Wow” region plays.
- Click other trigger keys on the MIDI Keyboard and observe how this feature can be used to play regions on cue or quickly rearrange an audio file.

**Note:** Only one region can be played at any given time. Overlapping causes the active region’s playback to be interrupted and the new region’s playback to begin.

### Triggering playback from additional internal/external MIDI devices

The basic concepts of MIDI routing and triggering from the Sound Forge MIDI Keyboard described in previous sections apply to any hardware or software device capable of generating MIDI commands. Follow the same basic steps to trigger playback:

- Install and configure the MIDI controller (refer to the product-specific documentation for installation procedures).
- Set up MIDI input synchronization. *For more information, see [Turning on MIDI input synchronization on page 196](#).*
- Configure the MIDI triggers to respond to the corresponding controls on the controller. *For more information, see [Configuring the MIDI trigger on page 196](#).*

### Advantages of external MIDI controllers

In addition to simple playback, MIDI commands can be used to control a wide array of the Sound Forge navigation and editing functions. In fact, a quick look at the **Event** drop-down list in the MIDI Triggers dialog can provide you with an idea of the power of MIDI commands used in conjunction with Sound Forge software.

### Using external MIDI controller presets

Sound Forge system presets support the sequencer, cursor, dial, and function buttons on the following external MIDI controllers:

- Roland MCR-8 Multi-Controller
- JLCooper Media Control Station 2

The system presets for these controllers allow you to perform the following actions:

- Move the cursor using the controller’s dial.
- Drop markers by clicking the dial.
- Zoom in and out of the waveform using the cursor keys (vertically and horizontally).
- Start and stop audio playback using the sequencer controls.

**Note:** Users of the aforementioned external MIDI controllers need not limit themselves to Sony Media Software’s default configurations.

## Sound Forge software and MIDI timecode synchronization

MIDI timecode (MTC) is a method of using SMPTE timing signals to synchronize multiple devices. Although MIDI timecode is typically used to synchronize audio and video, it can also be used to synchronize playback devices. You can synchronize to external MTC or generate MTC for other devices to follow. *For more information, see [SMPTE Timecode](#) on page 265.*

You can also specify start times of regions in the Regions List to synchronize digital audio with additional timed events. For example, if a MIDI sequencer generates SMPTE timecode, you can synchronize to it with its own SMPTE timecode and initiate region playback at specified times.

### MTC synchronization versus Note-On MIDI triggering

Synchronizing to MTC is similar to synchronizing to other MIDI events and can be used in many of the same situations. The major advantage of MTC synchronization is that it allows for you to specify accurate SMPTE start times. However, MTC synchronization requires more of your system's processing power.

When triggering a limited number of sounds in the software from a sequencer, it is preferable to use Note-On MIDI Triggering. *For more information, see [Triggering file playback](#) on page 195.*

### Playing regions using MTC from a sequencer

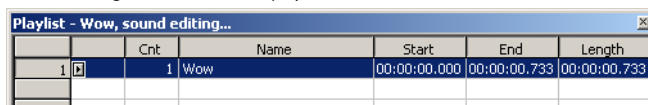
Triggering region playback in Sound Forge software from a sequencer using MTC involves three procedures:

- Configuring the regions.
- Enabling MIDI input synchronization.
- Configuring the sequencer.

#### Configuring the regions

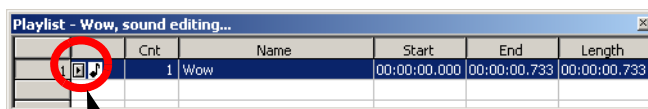
1. Open the Voiceover.pca file and view the Regions List and Playlist windows.
2. Select the "Wow" region in the Regions List and drag it to the playlist. The "Wow" region is added to the playlist.

The "Wow" region is added to the playlist.



	Cnt	Name	Start	End	Length
1	1	Wow	00:00:00.000	00:00:00.733	00:00:00.733

3. Select the "Wow" region in the playlist and press Enter. The Edit Playlist dialog is displayed.
4. From the **Trigger** drop-down list, choose **SMPTE: Play at Time**. The **SMPTE time** box is activated.
5. Enter an appropriate SMPTE start time using the hours:minutes:seconds:frames format and click **OK**. A small musical note appears adjacent to region in the playlist to indicate that a start time for this region's playback is configured.



	Cnt	Name	Start	End	Length
1	1	Wow	00:00:00.000	00:00:00.733	00:00:00.733

A small musical note indicates a start time

#### Turning on MIDI input synchronization

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **MIDI/Sync** tab.
3. Specify the MIDI input that corresponds to the output port of the sequencer and click **OK**.
4. From the **Options** menu, choose **MIDI Triggers**. The MIDI Triggers dialog is displayed.

5. From the **Preset** drop-down list, choose **Reset all triggers to (none)**. This prevents other MIDI commands from creating additional triggers.
6. Click **OK**.
7. From the **Options** menu, choose **MIDI In/Out**, and choose **Trigger from MIDI Timecode** from the submenu. A check mark appears adjacent to the command to indicate that synchronization to MTC is ready.

### Configuring the sequencer

1. Set the sequencer's MIDI output port to correspond with the Sound Forge MIDI input port.
2. Turn on the sequencer's MTC output. If the sequencer supports generating MTC, it is now ready to sync.
3. Press the sequencer's **Play** button. The Sound Forge **MIDI In** status box displays the same SMPTE time as the sequencer's SMPTE time. At the specified SMPTE time, playback of the region is started without interrupting the sequencer's output to other devices.

### Playing regions using MTC from an external device

When using a hardware device that generates MTC, the configuration procedure is basically the same as outlined above. Simply specify the device's MTC output driver as the Sound Forge MIDI input port in the Preferences dialog's **MIDI/Sync** tab.

### Using Sound Forge software to generate MTC for a MIDI sequencer

You can generate MTC for other devices to follow. However, it is important to understand that the software only generates MTC while playing a file or from a playlist. Generating MTC involves two procedures:

- Configuring the Sound Forge software.
- Configuring the sequencer.

### Configuring Sound Forge software

1. Open an audio file.
2. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
3. Click the **MIDI/Sync** tab.
4. Specify the Sound Forge MIDI output that corresponds to the input port of the sequencer and click **OK**.
5. From the **Options** menu, choose **MIDI Triggers**. The MIDI Triggers dialog is displayed.
6. From the **Preset** drop-down list, choose **Reset all triggers to (none)**. This prevents other MIDI commands from creating additional triggers.
7. Click **OK**.
8. From the **Options** menu, choose **MIDI In/Out**, and choose **Generate MIDI Timecode** from the submenu. A check mark appears adjacent to the command, indicating that the software is ready to generate MTC.

### Configuring the sequencer

1. Specify the sequencer's MIDI input port that corresponds to the Sound Forge MIDI output port.
2. Set the sequencer's SMPTE offset time value as needed.

**Note:** *Sound Forge software uses 00:00:00:00 as its output start point, but certain sequencers recommend a SMPTE offset time of at least four seconds to ensure synchronization.*

3. Turn on the sequencer's MTC input.
4. If required by the sequencer, press the **Play** button. The sequencer does not begin playback, but switches to "Waiting for MTC" mode.
5. Start playback of the file in the software. When the SMPTE offset time is satisfied, the sequencer locks to and follows the MTC generated by the Sound Forge application.

### Using Sound Forge software to generate MTC for an external device

To use the software to send MTC to an external device, follow the previous instructions, but configure the Sound Forge MIDI output port to send directly to the device's MIDI driver.



# Chapter 15: Optimizing for Sound Forge Software

This chapter contains information on configuring your system to optimize the performance of Sound Forge® software.

## Defragmenting your hard drive

The Sound Forge application is a disk-based digital audio editor that allows editing operations to be performed on the system's hard drive rather than in memory. Because of this, you are able to edit large files as well as retain extensive undo/redo information and clipboard data. This also means that the hard drive specified for temporary storage must have sufficient free space to store large quantities of data.

With time and usage, hard drives become fragmented, leading to discontinuous files and slow access. This is particularly true for older hard drives. Since the software is hard drive intensive, faster disk access equates better performance. Therefore, the initial step in improving system performance is hard drive defragmentation. The computer's operating system is typically equipped with a defragmenting program that should be run prior to using Sound Forge software.

## Increasing total buffer size

The total buffer size value determines the amount of RAM used for recording to/playing from the hard drive. A total buffer size of 512 KB is recommended, but increased buffering may be necessary if you detect gaps during playback.

Increasing the total buffer size requires additional memory. Combined with a large preload size, this may result in a delay when starting and stopping playback.

1. From the **Options** menu, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **Audio** tab.
3. Use the **Playback buffering** slider to configure an appropriate buffer size value and click **OK**.

## Turning off the playback cursor and record counter

The playback cursor and record counter options determine whether these displays are updated during recording and playback. If you detect dropouts and skipping at high sample rates (greater than 44,100 Hz), turn these displays off to minimize processing overhead.

1. From the **Options** menus, choose **Preferences**. The Preferences dialog is displayed.
2. Click the **General** tab.
3. Clear the **Show the position of the playback cursor** and **Show the record counter while recording** check boxes and click **OK**.

## Turning off the channel (output) meters

Sound Forge channel meters use a small amount of processing overhead during playback. However, if you detect dropouts during playback and previous fixes have failed, try turning off these meters.

From the **View** menu, choose **Channel Meters**. The check mark adjacent to the command is cleared, indicating that the channel meters are turned off.

## Turning on passive updating for time and video displays

Passive update options lower the priority of redrawing the time and video displays during playback. When these options are turned on, the displays update only if there is ample time. Frequently this goes unnoticed, and enabling these options minimizes playback overhead with little or no inconvenience.

## Time displays

From the **Options** menu, choose **Time Display**, and choose **Passive Update** from the submenu. A check mark appears next to the command to indicate that this option is turned on.

## Video displays

From the **Options** menu, choose **Video**, and choose **Passive Update** from the submenu. A check mark appears next to the command to indicate that this option is turned on.

## Synchronizing audio and video

If your video has been opened from a slow device, such as a CD-ROM, DVD-ROM, or network drive, Sound Forge software may have trouble accurately playing back the audio and video in sync. You should always copy your video files to a fast hard drive. Listed below are a few tips that can help when trying to synchronize the audio and video:

- After assembling or editing the audio you wish to use with your video, place markers during video playback to correspond to any major synchronization points. You can locate a particular frame by dragging the cursor along the audio if the Video Preview window is open (from the **View** menu, choose **Video Preview**) or the **Animate Video Strip** option is enabled (from the **Options** menu, choose **Video>Animate Video Strip**). After primary locations have been identified, drag your audio to these markers to mix and paste audio.
- Features such as Insert Silence, Delete/Clear, and Time Stretch are commonly used to correct synchronization. Another useful trick is to create a region representing the offset between a video frame and audio event. Then you can enable Lock Loop/Region Length and drag the offset region to a preceding silent section. Use the region as a template for adjusting the audio stream length—either copying and pasting to insert time or deleting to remove time.



## Chapter 16 Sampling

Used in conjunction with the Sampler Tool, the Sound Forge® software's powerful editing capabilities allow you to create, edit, and transfer samples between external and internal samplers. This chapter describes the procedures used to transfer (dump) samples between the computer and sampler with the Sampler Tool.

### Samplers

Samplers are devices that produce on-demand playback of audio samples at varying pitches. For the purposes of this manual, we will concentrate on two basic varieties: external samplers and internal samplers.

#### External samplers

External samplers are typically capable of recording samples or transferring prerecorded samples into their memory. You can choose between two methods to transfer samples to external samplers:

- MIDI Sample Dump Standard (SDS)
- SCSI MIDI Device Interface (SMDI)

#### MIDI Sample Dump Standard (SDS)

The MIDI SDS is used to send and receive digital samples using normal MIDI hardware and cable connections. Due to the limited bandwidth of the MIDI protocol and the large amount of data required by digital samples, a MIDI SDS transfer can be time consuming. Furthermore, SDS is limited to mono samples, though certain samplers allow two mono samples to be joined as a stereo sample.

#### SCSI MIDI Device Interface (SMDI)

The SCSI MIDI Device Interface (SMDI) allows music hardware and software to communicate using SCSI hardware and cables. Because SCSI hardware has a greater bandwidth than MIDI, SMDI transfers are considerably faster than SDS transfers. In addition, SMDI supports mono and stereo sample transfers.

#### Internal samplers

Internal samplers are cards installed in your system that, unlike typical sound cards, actually allow sounds to be downloaded into memory and played at varying pitches to simulate a musical instrument.

#### Using an unsupported internal sampler

If you have an internal sampler not directly supported by the Sampler Tool, you have two options:

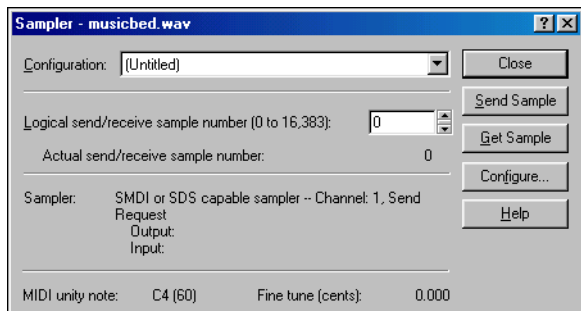
- Use the MIDI SDS transfer protocol.
- Use an open loop transfer.

**Note:** *If you have a Windows-compatible internal sampler, contact the manufacturer about supporting SDS in Windows drivers.*

### Configuring the Sampler Tool

Configuring the Sampler Tool is fairly straightforward, especially if the desired configuration exists in the list of presets.

1. From the **Tools** menu, choose **Sampler**. The Sampler dialog is displayed.

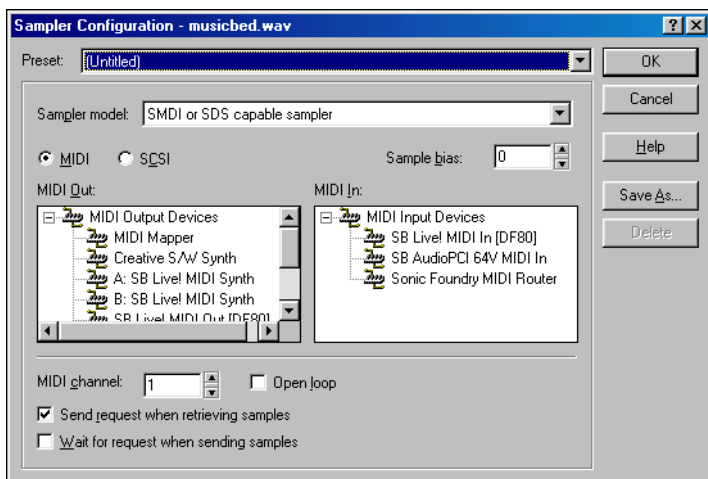


2. From the **Configuration** drop-down list, choose the desired configuration. If the desired configuration is not listed, you must create it in the Sampler Configuration dialog. *For more information, see [Creating a sampler configuration](#) on page 206.*
3. Enter a value in the **Logical send/receive sample number** box.  
This value determines the number that the sampler uses as its location reference when sending or receiving samples. This number can be biased for specific samplers with the **Sample bias** option in the Sampler Configuration dialog. *For more information, see [Creating a sampler configuration](#) on page 206.*
4. Begin the process of sending or receiving samples. *For more information, see [Sending and receiving samples](#) on page 208.*

## Creating a sampler configuration

The Sampler Configuration dialog allows you to create new sample configurations that can be saved as presets and accessed from the Sampler dialog. Creating new custom configurations requires you to specify the sampler and sample transfer mode. However, the process of creating a custom sampler configuration differs based on which transfer mode is used.

1. From the **Tools** menu, choose **Sampler**. The Sampler dialog is displayed.
2. Click the **Configure** button. The Sampler Configuration dialog is displayed.



3. From the **Sampler model** drop-down list, choose the appropriate sampler. If the desired sampler is not included in the drop-down list, choose the generic **SMDI or SDS capable sampler** option. If the sampler supports the specified protocol, the Sampler Tool should interface with the sampler.
4. Specify input/output settings for the sampler:

If	Then
Your sampler uses MIDI/SDS transfer	Select the <b>MIDI</b> radio button and choose input and output ports in the <b>MIDI In</b> and <b>MIDI Out</b> boxes
Your sampler uses SCSI/SMDI transfer	Select the <b>SCSI</b> radio button and select your sampler in the <b>Sampler</b> box.

**Note:** The **Sampler** box lists all devices connected to the selected SCSI host, including devices that are not samplers.

5. If desired, enter a value in the **Sample bias** box. Sample bias is a user-specified value that is added to the logical sample number to determine the actual sample number used for sending or receiving.

Additionally, sample bias can be used to define unique biases for multiple projects. For example, when composing multiple pieces using different samples, it is possible to create unique sampler configurations for each project. Simply establish a unique sample bias to segregate the samples within the sampler.

6. Enter a value in the **MIDI channel** box to specify which MIDI channel (1-16) is used when transferring samples.
7. Select the **Open loop** check box if you want to send SDS sample data immediately upon clicking the **Send Sample** button. This is an unconditional transfer of sample data (no handshake).
8. Select the **Send request when retrieving samples** check box if you want the Sampler Tool to send a request for the sample to the sampler when you click **Get Sample**.

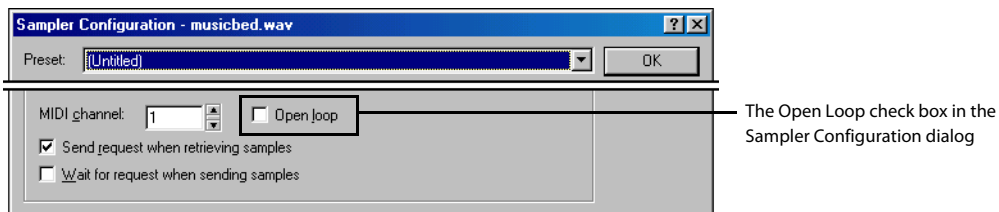
Clearing the **Send request** check box requires that the sample transfer be initiated from the sampler, even after you click **Get Sample**. Typically, pressing the appropriate button on the sampler satisfies this request.

9. Select the **Wait for request when sending samples** check box if you want the Sampler tool to wait for the sampler to request the sample transfer before sending the sample, even after you click **Send Sample**. Typically, pressing the appropriate button on the sampler satisfies this request.

Clearing the **Wait for request** check box configures the Sampler Tool to send the sample as soon as you click **Send Sample**.

### Open loop versus closed loop

Open loop describes a unidirectional communication protocol. When the **Open loop** check box is selected, the source transmits all data to the destination without listening for instruction from the destination. The destination has no control over how the data is sent and cannot ask for information to be repeated. This lack of feedback makes open-loop transfers prone to error.



If the **Open loop** check box is cleared, the communication protocol is referred to as closed loop. A closed loop allows information to flow in both directions. Using closed-loop transfers, the source sends data in small packets and the destination, upon receiving the packet, either retains the data or discards the packet and requests the data to be resent. Using closed-loop protocol, the source does not send the next packet of data until the destination requests it. This makes closed-loop transfers more reliable than open-loop transfers.

In addition to being less reliable, open-loop transfers are slower than closed-loop transfers, especially when sending samples using the Sampler Tool. This is due to intentional delays placed between data packets to compensate for varying sampler speeds. Closed-loop transfers typically guarantee the most efficient timing between packets.

If possible, avoid using an open loop to receive samples from a sampler. The Sampler Tool cannot control the flow of data packets and there is a high probability that data will be missed.

**Tip:** Open-loop transfers can be useful when you do not have enough cables to connect both the MIDI input and MIDI output ports.

## Saving sampler configurations

Once you complete a sampler configuration, you can save it as a preset and quickly access it in the future.

1. From the Sampler Configuration dialog, click **Save As**. The Save Preset dialog is displayed.



2. Enter a descriptive name in the **New preset name** box and click **OK**. The new configuration is saved and can now be chosen from the **Configuration** drop-down list in the Sampler dialog.

**Note:** To delete a preset, choose it from the **Preset** drop-down list and click **Delete**.

## Sending and receiving samples

Once you have accurately configured the sampler setup, you can send and receive samples using the **Send Sample** and **Get Sample** buttons in the Sampler dialog.

### Sending a sample

1. From the **Tools** menu, choose **Sampler**. The Sampler dialog is displayed.
2. From the **Configuration** drop-down list, choose the sampler configuration.
3. Enter the sample number to be sent in the **Logical send/receive sample number** box. The Sampler Tool takes into account the configuration's sample bias and displays values for the **Actual send sample number** and **Actual receive sample number**. *For more information, see [Creating a sampler configuration](#) on page 206.*
4. Click **Send Sample**. Sample transfer starts. A meter in the status bar indicates the progress of the transfer. You can cancel a transfer at any time by clicking **Cancel** or pressing Esc.

### Receiving a sample

1. From the **Tools** menu, choose **Sampler**. The Sampler dialog is displayed.
2. From the **Configuration** drop-down list, choose the sampler configuration.
3. Enter the sample number to be received in the **Logical send/receive sample number** box. The Sampler Tool takes into account the configuration's sample bias and displays values for the **Actual send sample number** and **Actual receive sample number**. *For more information, see [Creating a sampler configuration](#) on page 206.*
4. Click **Receive Sample**. Sample transfer starts. A meter in the status bar indicates the progress of the transfer. You can cancel a transfer at any time by clicking **Cancel** or pressing Esc.

## MIDI unity note and Fine tune

Once you specify a configuration in the Sampler dialog, the **Sampler** area near the bottom of the dialog displays all relevant sampler configuration information.

The bottom pane of the dialog contains two additional parameters: **MIDI unity note** and **Fine tune**.



Parameter	Description
<b>MIDI unity note</b>	The <b>MIDI unity note</b> value indicates the pitch to which the sample is tuned.
<b>Fine tune</b>	The <b>Fine tune</b> value indicates any minor tuning differences (measured in cents) in the sample.

### Editing MIDI unity note and Fine tune

Both values can be edited and used with samplers that support tuning information by choosing **Edit Sample** from the **Special** menu.

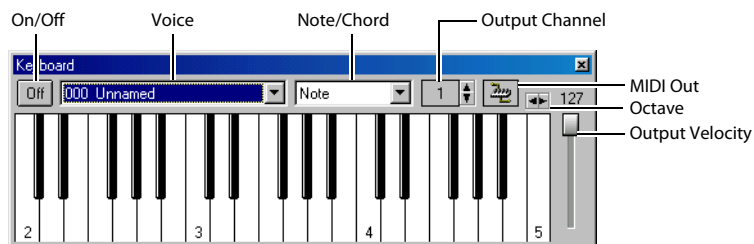
**Note:** *The software does not use this information.*

## Using the MIDI Keyboard

With the MIDI Keyboard, you can control internal/external synthesizers and samplers from the Sound Forge application. The MIDI Keyboard can also be used to listen to the sounds on a synthesizer or in the synthesis section of the sound card.

### Displaying the MIDI Keyboard


To display the MIDI Keyboard, choose **Keyboard** from the **View** menu. The keyboard can be resized, moved, or docked within the workspace.

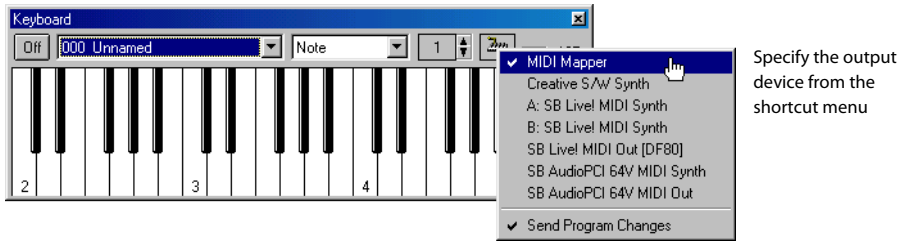


### Turning on the MIDI Keyboard

Clicking any key turns the keyboard on. If you do not hear any sound, verify that the output is connected to the MIDI Output device.

## Configuring the MIDI Keyboard output port and channel

1. Click the **MIDI Out** button  and choose an output device from the menu.



2. Choose **Send Program Changes** from the menu if the keyboard will be used to choose instrument voices. A check mark appears adjacent to the command to indicate that this option is turned on.
3. Configure the MIDI input channel of the selected device to correspond to the keyboard's output channel.


**Note:** Most MIDI devices are configurable to accept MIDI commands on any channel.

## Troubleshooting the MIDI Keyboard

If after configuration, the keyboard fails to produce sound, check the following items:

- Verify that the output velocity of the keyboard is set to a value greater than 100.
- Verify that the MIDI input channel in the sound module is set to the same channel as the keyboard.
- Verify that the device is configured to receive MIDI input.
- Verify the device output volume level.
- Verify external MIDI connections, if applicable.

## Specifying instruments

1. Choose **Send Program Changes** from the **MIDI Out** button  menu. A check mark appears adjacent to the command to indicate that this option is turned on. If this option is turned off, patches cannot be switched.
2. From the **Voice** drop-down list, choose the new voice and click any key.

**Note:** Patch names are arranged as specified in the General MIDI Standard. For synthesizers not using the General MIDI convention, use the patch number instead of the instrument name.

## Generating chords

You can also generate chords instead of single notes by choosing a chord structure from the keyboard's **Note/Chord** drop-down list. Chords are generated using the specified note as the root of the chord or interval.

## Setting up MIDI/SDS hardware

To use MIDI/SDS protocol with an external sampler that supports MIDI/SDS, you must install a MIDI card with MIDI input and output ports in the system.

1. Using a MIDI cable, connect the MIDI output port of the sampler to the MIDI input port of the MIDI card.
2. Connect the MIDI input port of the sampler to the MIDI output port of the card.

**Note:** *This is the same configuration used to connect a MIDI keyboard to a computer for sequencing.*

Internal samplers do not require a MIDI card and MIDI cables; however, an open-loop protocol may be required when sending samples to an internal sampler. The sampler's documentation should specify the requirements for performing SDS transfers if the sampler supports this action.

## Troubleshooting MIDI/SDS with open loop

Open-loop transfers, while not recommended for sending or receiving samples, can assist you in troubleshooting SDS hardware setup problems. If the Sampler Tool does not transfer data to (or from) the sampler, select the open-loop option and attempt single cable transfers. If open-loop transfers are successful, but closed-loop transfers are not, any of the following items may be the cause:

- The sampler does not support closed-loop transfers (handshaking).
- One or more of the MIDI cables or connections is faulty.
- The MIDI card is not receiving MIDI input (send) or sending MIDI output (receive). Interrupt conflicts are common for MIDI input.

## Setting up SCSI/SMDI hardware

To use the SCSI/SMDI protocol with an external sampler that supports the SCSI/SMDI protocol under Windows 98SE, Windows Me, Windows 2000, or Windows XP, only a compatible SCSI adapter is needed. The computer and sampler must be powered-down prior to connecting or disconnecting SCSI cables to prevent damage to the computer and/or hardware.

## Troubleshooting SCSI/SMDI

A brief description of some common problems encountered with SCSI and samplers follows.

### Conflicting SCSI IDs

When connecting devices on a SCSI chain, each device must have a unique device identifier (ID). SCSI allows for up to eight unique ID values, numbered 0 to 7. Typically, device ID 7 is used for the internal SCSI controller card, leaving ID 0 through 6 for other devices.

**Note:** *The ID of a bootable SCSI hard drive must be set to 0.*

The following table describes a typical SCSI configuration:

ID	Device(s)
0	Hard Drive
1	CD-ROM/DVD-ROM Drive
2-6	Samplers
7	SCSI Controller Card

## Periodic transfer failures

Messages such as “The SCSI Device is not responding” or “A problem was encountered while transferring the sample” may indicate a problem with a SCSI bus.

1. From the **Tools** menu, choose **Sampler**. The Sampler dialog is displayed.
2. Click **Configure**. The Sampler Configuration dialog is displayed.
3. Repeat the selection of the SCSI host. This causes a series of SCSI commands to be executed that may settle the bus.

If the problem persists, power-down and restart all equipment.

## Sampler is recognized but does not transfer reliably

The following items are possible causes of unreliable SCSI transfers.

### Synchronous transfer mode

Select samplers (the Kurzweil K2000 among them) do not operate properly if there is a SCSI device set to synchronous transfer mode on the same SCSI chain. SCSI hard drives and CD-ROMs or DVD-ROMs often have the option of using a synchronous transfer mode. If there is a host versus device synchronous transfer option, select the host option. Refer to the SCSI device’s documentation for more information.

### SCSI termination

If the SCSI chain is not properly terminated, unreliable SCSI transfers may be experienced. Refer to the SCSI card and SCSI device documentation for more information.

### Long or faulty SCSI cables

SCSI cables that are very long or not properly shielded may not operate reliably. In addition, do not use cables that are not certified SCSI cables.

### Adaptec 1540/1542CF does not recognize a sampler

If the Adaptec 1540/1542CF does not recognize the sampler, a change may be required in the configuration of the Adaptec controller. Some samplers do not operate when the **Reset SCSI Bus at Power-On** option of the Adaptec controller is turned on. This is the default operation for the 1540/1542CF and must be turned off to allow the system to work with the sampler.

**Note:** *Turning off the Reset SCSI Bus at Power-On option may keep other devices on the SCSI chain from resetting correctly when using the system’s soft boot feature. Other systems may freeze temporarily. To guarantee that devices are reset when rebooting with this option turned off, use the system’s reset button or power-down and up to reset the system.*

### SCSI/SMDI-compatible menu is not displayed under Windows 98SE and Windows Me

Verify proper SCSI termination and check for multiple devices on the SCSI chain using the same SCSI ID. If this fails to solve the problem, Adaptec SCSI card users may need to update the system’s mini-port drivers. Adaptec has a series of updated mini-port drivers available for Windows 98SE and Windows Me on the Web.

After you download the file, you must create a temporary directory or folder on the system and run the WIN95MPD.EXE program. Follow the directions in the readme.txt file to update the drivers for the Adaptec SCSI card.



# Chapter 17 Looping

- Sound Forge® software is an excellent tool for creating loops and provides the perfect compliment to Sony Media Software's revolutionary ACID® line of loop-based music creation tools.
- Creating loop regions in files is useful only when you intend to transfer the files to a hardware sampler that supports the loop regions.

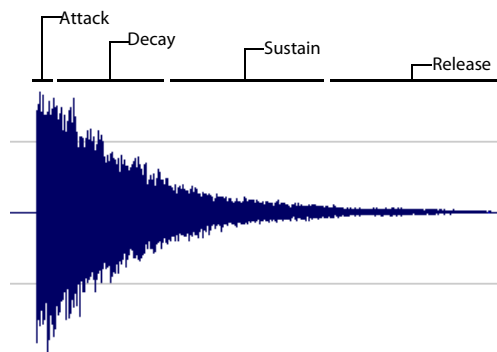
## Loops

A loop is a sample or region in an audio file that is repeated during playback. Samples are finite and frequently very short in length. Therefore, they must be repeated (or looped) to create longer or sustaining sounds.

**Note:** *Loops can also be used to repeat entire sections of music, although the playlist is better suited to this purpose.*

## Sustaining and release loops

A sound envelope contains four elements: attack, decay, sustain, and release.

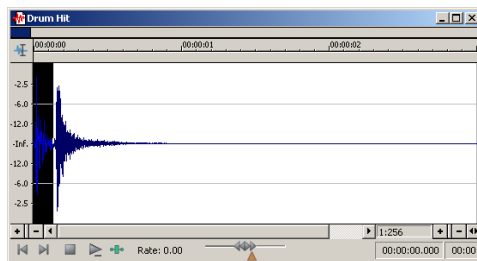


Typically, the sustain portion of the envelope is looped to lengthen the duration of a sound. This is referred to as the sustaining loop.



While sustaining loops are useful, it is frequently necessary to create a second loop, taken from later in the envelope. This allows you to reproduce longer, more complex sounds, such as a piano chord struck with the sustain pedal depressed. This second type of loop is referred to as the release loop.

## Creating a sustaining loop

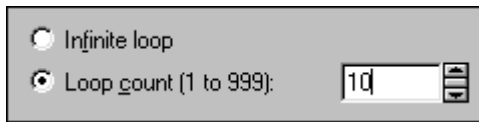
1. Open the Drumhit.pca file and create a selection containing the snare hit at the beginning of the waveform.




Create and preview the selection

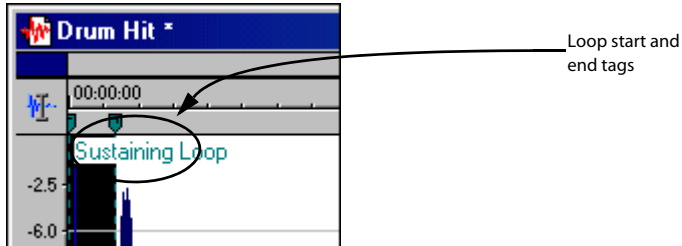
2. With the **Loop Playback** button  selected in the transport bar, click the **Play Normal** button  on the playbar to preview the loop.
3. From the **Special** menu, choose **Insert Sample Loop** (or press Alt+Shift+L). The Edit Sample dialog is displayed.
4. Choose the **Sample type** by selecting the **Sustaining** radio button if it is not already selected. The controls in the middle pane of the dialog activate.

5. Select the **Loop count** radio button.



Select the **Loop Count** radio button and enter a loop count value

6. Enter a value of 10 in the **Loop count** box and click **OK**. The data window displays the appropriate tags in the ruler to specify the loop's start and end points. The **Play as Sample** button  appears on the playbar.



7. Click the **Play as Sample** button  on the playbar. The looped snare selection repeats ten times before the cymbal crash.

### Creating a sustaining loop with a release loop

To add a release loop to the sustaining loop created in the previous procedure, you must reconfigure the dialog and rearrange the loop tags in the data window.

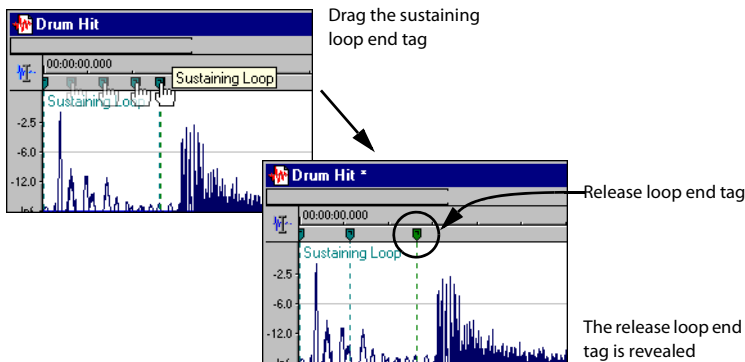
#### Configuring the dialog

1. Right-click either of the loop tags and chose **Edit** from the shortcut menu. The Edit Sample dialog is displayed.
2. In the Edit Sample dialog, select the **Sustaining with Release** radio button.
3. Verify that the **Release** radio button is selected in the **Loop to edit** area of the dialog.
4. Select the **Loop count** radio button. The edit box is activated.
5. Enter a value of 5 in the **Loop count** box and click **OK**. Both loops (sustaining and release) are configured.

#### Arranging the loop tags

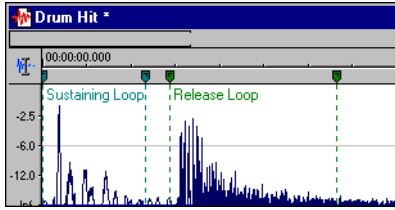
Once the dialog is properly configured to support a release loop, release loop tags are created in the data window beneath the sustaining loop tags. The sustaining and release loops temporarily contain identical data.

1. Drag the sustaining loop end tag toward the left side of the data window to reveal the release loop end tag.




2. Drag the sustaining loop start tag toward the right side of the data window. This reveals the release loop start tag.

3. Arrange the loop tags so that the snare hit is contained within the sustaining loop and the cymbal crash is contained within the release loop.



Arrange the sustaining and release loops in the data window

4. Click the **Play as Sample** button  in the playbar. The entire file plays with the snare hit repeated ten times followed by the cymbal crash five times.

## Looping techniques

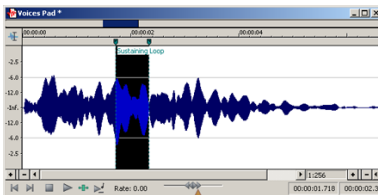
Depending upon the source material, creating a natural-sounding loop can be a difficult task. Many factors beyond your control may produce distracting pops and glitches, thereby calling unwanted attention to the loop. Although looping skill is largely the product of practice and experimentation, there are some guidelines to consider.

### Match endpoint amplitudes

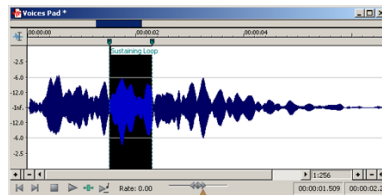
One of the easiest ways to minimize the occurrence of glitches when creating loops is to select loop endpoints that have an amplitude of zero. These points are known as zero-crossings. *For more information, see [Finding zero-crossings on page 236](#).*

### Match endpoint waveform slope

Another technique for reducing loop glitches is to avoid matching loop endpoints where the waveform slope does not match. If the waveform slope changes drastically, a pop plays when the sample is looped.



Non-matching slope



Matching slope

### Match endpoint sound levels

The overall amplitude (or loudness) approaching the loop's endpoints should be as similar as possible to prevent distracting glitches. Unfortunately, it is frequently difficult to avoid this problem, particularly with rapidly decaying source material. *For more information, see [Viewing loop amplitude on page 236](#).*

### Avoid very short loops

If the loop is shorter than ~50 ms (1/20 Hz), the pitch of the loop may not equal the sample pitch. Pitch-tuning a loop is accomplished by creating short loops with a length equal to 1/frequency. For example, a sample of pitch 440 Hz corresponds to A5 on the keyboard, meaning the loop can be pitch-tuned 2.27 ms. However, pitched loops do not sound like the original sample.

## Editing loops

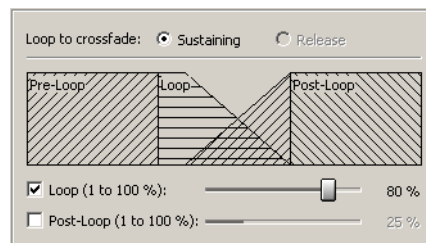
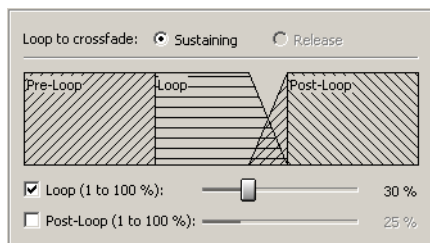
The loop you initially create in any situation is rarely perfect. Frequently, loops require some degree of editing before they are usable. Once you create a loop, you can quickly edit its beginning and end (and subsequently its length) by dragging the markers to a new location.

## Crossfading loops

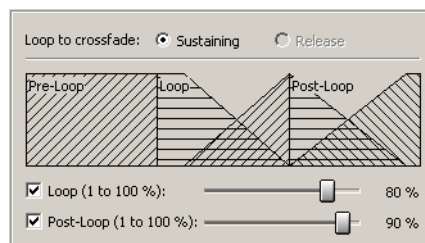
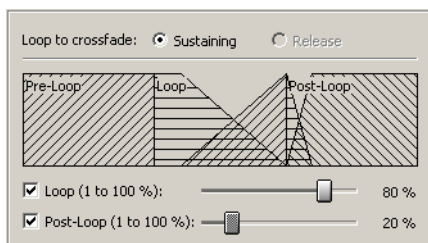
You can use the Crossfade Loop tool to loop audio from difficult source material. It allows you to crossfade the end of a loop with the beginning of the loop in order to create a smoother, more natural-sounding transition. In addition, you can configure the Crossfade Loop tool to crossfade the beginning of the audio loop with the beginning of the post-loop audio on the loop's final pass. This smooths the occasionally awkward transition from looped to non-looped audio.

### Using the Crossfade Loop tool

1. Open the Loop.pca file. A sustaining loop appears in the data window.
2. From the **Tools** menu, choose **Crossfade Loop**. The Crossfade Loop dialog is displayed.
3. Drag the **Loop** slider to configure the percentage of the loop to be crossfaded.



4. If desired, select the **Post-Loop** check box and drag the slider to configure the percentage of the loop to be crossfaded into the post-loop audio.



5. From the **Preview mode** drop-down list, specify how the **Preview** button operates: **Loop the Loop**, **Play Loop through Post-Loop**, or **Play as One Shot**.
6. Preview and tune the crossfade until you cannot detect the loop transitions.
7. Click **OK**.

## Creating loops for ACID software

The Sound Forge application is an excellent tool for creating and editing loops to be imported into any of the ACID family of products. You can create four different types of files for ACID use:

- One-shot file
- Loop file
- ACID 2.0 disk-based file
- ACID 3.0 or later beatmapped file

### Creating an ACID one-shot file

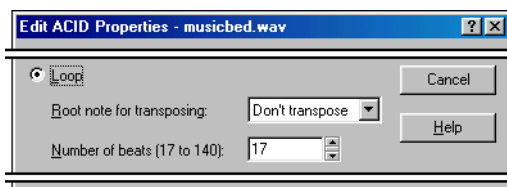
One-shots are files that do not stretch with tempo or change pitch to match the key of the ACID project. This behavior makes one-shots particularly suited for audio such as cymbal crashes, sound effects, and short vocal lines.

1. Open the Voiceover.pca file.
2. Create a selection containing the “Wow” and drag it to the workspace. A new data window is created containing the “Wow” audio data.
3. From the **Special** menu, choose **Edit ACID Properties**. The Edit ACID Properties dialog is displayed.
4. Select the **One-Shot** radio button and click **OK**.
5. From the **File** menu, choose **Save As** and save the file with a descriptive name.

### Creating an ACID loop file

Loops are musical building blocks and are by far the most common type of file used in the ACID application. Loops stretch with an ACID project’s tempo and can be configured to change pitch. When creating Sound Forge files for use in ACID software, the Edit ACID Properties dialog defaults to the loop setting.

1. Open the Voiceover.pca file.
2. Create a selection containing the “And easier” and drag it to the workspace. A new data window is created containing the “And easier” audio data.
3. From the **Special** menu, choose **Edit ACID Properties**. The Edit ACID Properties dialog is displayed.
4. Select the **Loop** radio button. The **Root note for transposing** and **Number of beats** boxes activate.



Select the Loop radio button

5. Choose one of the following options:

If	Then
The loop should be transposed when inserted in an ACID project	Choose it’s root note from the <b>Root note for transposing</b> drop-down list.
The loop should not be transposed in an ACID project	Choose <b>Don’t transpose</b> from the drop-down list.

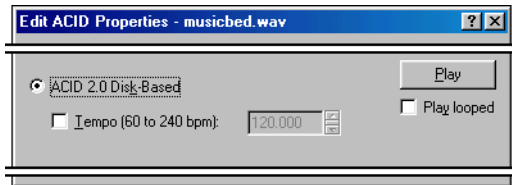
6. In the **Number of beats** box, specify the length of the loop in beats. The default value is four beats.
7. Click **OK**.
8. From the **File** menu, choose **Save As** and save the file with a descriptive name.

## Creating an ACID 2.0 disk-based file

ACID 2.0 disk-based files can stretch to comply with an ACID project's tempo, but require that you specify the file's original tempo upon configuration. If the original tempo is not specified in the Edit ACID Properties dialog, no stretching occurs.

While ACID 2.0 disk-based files can change tempo, they cannot change pitch. Disk-based files are typically used in ACID 2.0 software for extended vocal tracks or other long audio files that do not loop.

1. Open the Voiceover.pca file and select the entire waveform.
2. From the **Special** menu, choose **Edit ACID Properties**. The Edit ACID Properties dialog is displayed.
3. Select the **ACID 2.0 Disk-Based** radio button. The **Tempo** check box activates.

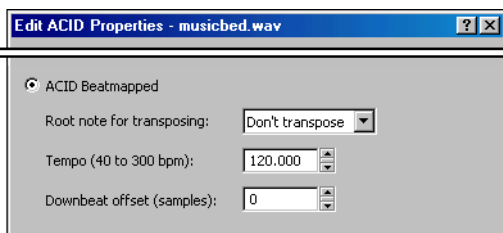


4. If the file should stretch to match the ACID 2.0 project's tempo, select the **Tempo** check box. The **Tempo** box activates.
5. Specify the file's original tempo (60-240 bpm) in the **Tempo** box and click **OK**. For more information, see [Setting loop tempo on page 221](#).
6. From the **File** menu, choose **Save As** and save the file with a descriptive name.

## Creating an ACID beatmapped file

ACID beatmapped files can change tempo and pitch to match an ACID project. You must specify the file's original tempo and root note for transposing upon configuration. If you do not specify these values, no tempo or key changes occur. Beatmapped files are typically used in ACID software version 3.0 or later for extended vocal tracks or other long audio files that do not loop.

1. Open the Voiceover.pca file and select the entire waveform.
2. From the **Special** menu, choose **Edit ACID Properties**. The Edit ACID Properties dialog is displayed.
3. Select the **ACID Beatmapped** radio button. Complete the information for an ACID beatmapped file:
  - Select a value from the **Root note for transposing** drop-down list so that the ACID application can transpose the file to match the project key. Select **Don't transpose** from this list to keep the key from being changed.
  - Specify the file's original tempo (40-300 bpm) in the **Tempo** box so that the ACID application can stretch the file to match the project tempo. For more information, see [Setting loop tempo on page 221](#).
  - Enter a value in the **Downbeat offset (samples)** box to indicate the location of the first downbeat.












4. Click **OK**.
5. From the **File** menu, choose **Save As** and save the file with a descriptive name.

## Using the ACID Loop Creation Tools toolbar

The ACID Loop Creation Tools toolbar provides quick access to the commands used to create and edit files for the ACID software.

1. From the **View** menu, choose **Toolbars**. The Preferences dialog appears with a list of available toolbars.
2. Select the **ACID Loop Creation Tools** check box and click **OK**.

	Edit ACID Properties: displays the Edit ACID Properties dialog.		Shift Selection Right: shifts the current selection to the right so the current end point becomes the start point.
	Edit Tempo: calculates the musical tempo (beats per minute) based upon the current selection.		Rotate Audio: moves the current selection to the opposite end of the file.
	Double Selection: doubles the size of the current selection.		Selection Grid Lines: toggles the selection grid line display on/off.
	Halve Selection: divides the current selection in half.		Tempo: displays the current loop tempo.
	Shift Selection Left: shifts the current selection to the left so the current start point becomes the end point.		

## Editing loops for ACID software

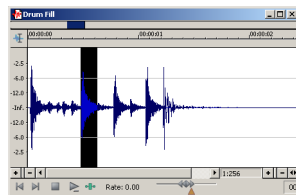
You can use a number of tools to prepare audio for use in ACID software.

### Halving or doubling a loop

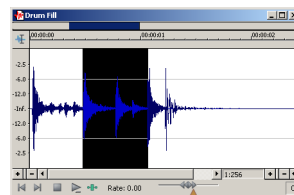
These commands allow you to quickly change the size of a selection.



Loop



Half loop



Double loop


### Halving a loop

From the **Special** menu, choose **ACID Looping Tools**, and choose **Halve Selection** from the submenu.

**Tip:** You can also click the **Halve Selection** button  on the ACID Loop Creation Tools toolbar or press ; (semicolon key).

### Doubling a loop

From the **Special** menu, choose **ACID Looping Tools**, and choose **Double Selection** from the submenu.

**Tip:** You can also click the **Double Selection** button  on the ACID Loop Creation Tools toolbar or press ' (apostrophe key).

## Shifting a selection left or right

The shift selection commands allow you to quickly create a new selection adjacent to the current selection while maintaining the size of the original.

### Creating a new selection to the left of the current selection

From the **Special** menu, choose **ACID Looping Tools**, and choose **Shift Selection Left** from the submenu.

**Tip:** You can also click the **Shift Selection Left** button  on the **ACID Loop Creation Tools** toolbar or press **<**.

### Creating a new selection to the right of the current selection


From the **Special** menu, choose **ACID Looping Tools**, and choose **Shift Selection Right** from the submenu.

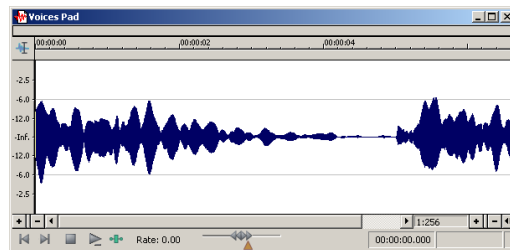
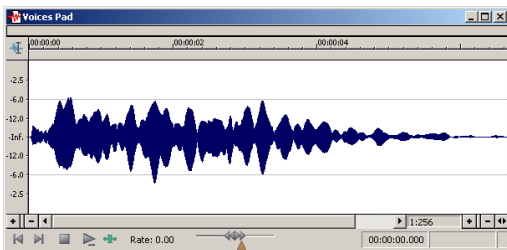
**Tip:** You can also click the **Shift Selection Right** button  on the **ACID Loop Creation Tools** toolbar or press **>**.

## Rotating audio

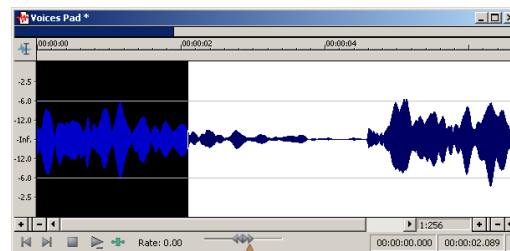
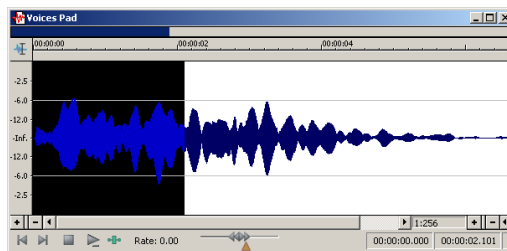
You can move the beginning of a loop to the end, or the end of a loop to the beginning by rotating the audio. From the **Special** menu, choose **ACID Looping Tools**, and choose **Rotate Audio** from the submenu.

### Notes:

- You can also click the **Rotate Audio** button  on the **ACID Loop Creation Tools** toolbar or press **: (colon)**.
  - If the selected audio does not originate from the start or end of a loop, **Rotate Audio** has no effect.
  - Rotating the audio has different effects, depending on what is selected.
- If no audio is selected, **Rotate Audio** transfers the first 25% of the loop to the end of the loop.

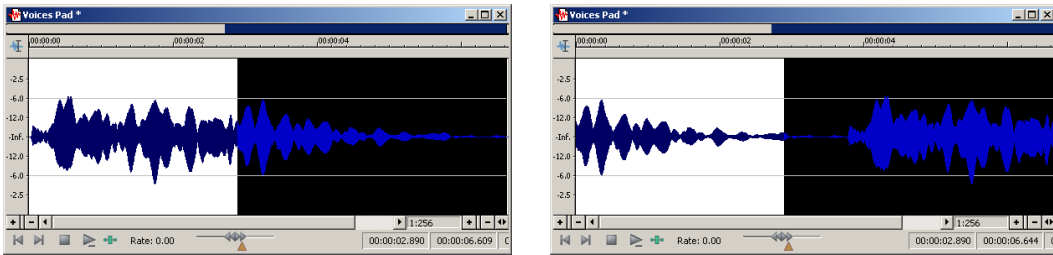


- If audio is selected from the start of a loop, **Rotate Audio** transfers the selection to the end of the loop.



- If audio is selected from the end of a loop, **Rotate Audio** transfers the selection to the start of the loop.





## Setting loop tempo

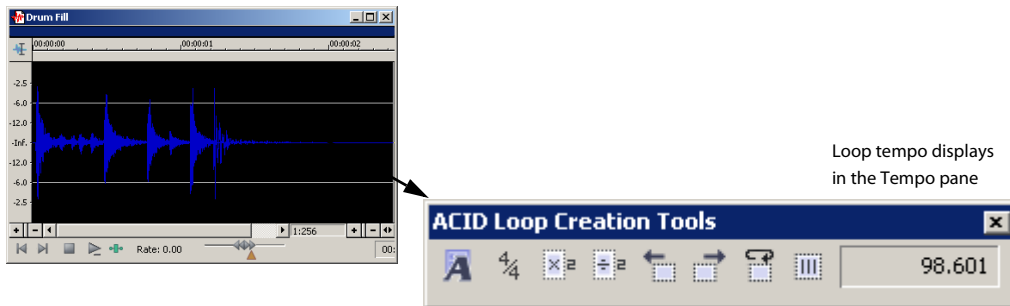
You can calculate, and if necessary edit, the tempo of your loops. Loop tempo is especially important if the loop will be used for building a project in any ACID product. *For more information, see [Creating loops for ACID software on page 217](#).*

### Calculating loop tempo

1. Select the loop.
2. From the **Special** menu, choose **Edit Tempo**. The Edit Tempo dialog is displayed.
3. Specify the number of beats the loop represents in the **Selection length in beats** box.
4. Click the mouse pointer in the **Tempo in beats per minute** box. The loop tempo calculates and displays.

### Calculating loop tempo using the ACID Loop Creation Tools toolbar

To calculate loop tempo using the **ACID Loop Creation Tools** toolbar, select the looped audio in the data window. The tempo pane indicates the loop tempo based on the current **Beat Length** value.



## Saving loop points

To save loop information with the file, select the **Save metadata with file** check box in the Save As dialog. *For more information, see [Using the Save As/Render As dialog on page 52](#).*



# Chapter 18 Working with Video

Sound Forge® software supports opening and saving Microsoft® Audio and Video Interleave (AVI), Windows Media® Video (WMV), QuickTime® (MOV), and MPEG video files. You can edit a video file's audio track with single-frame accuracy.

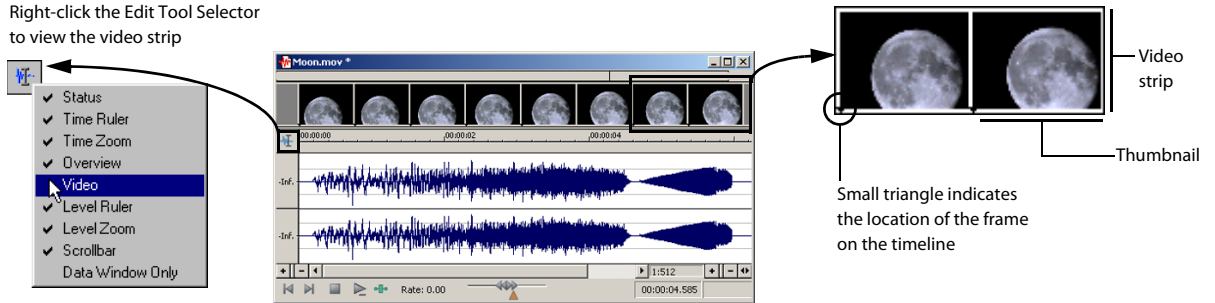
## Viewing video

You can view the video portion of a file in the data window's video strip and in the Video Preview window. You can also view video on an external monitor.

## Using the video strip

Though Sound Forge software does not perform video editing, the video strip display allows you to navigate video files.

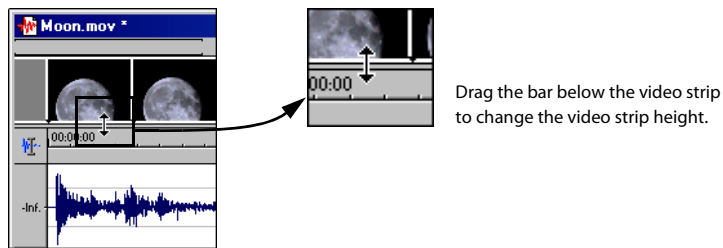
Right-click the Edit Tool Selector to view the video strip



By default, the video strip displays when you open a file containing video. If the video strip is not displayed, right-click the data window's Edit Tool Selector and choose **Video** from the shortcut menu. A check mark appears adjacent to the command and the video strip is displayed. To hide the video strip, choose **Video** from the shortcut menu again.

## Changing video strip height

You can change the video strip height by dragging the thin bar at the bottom of the video strip. To change the default height for all video files you open, choose **Preferences** from the **Options** menu and set a **Default video strip height** on the **Display** tab.



## Enabling frame animation

When playing a video file, you can specify whether frames are animated or displayed as still frames. To turn on frame animation, right-click the video strip and choose **Animate** from the shortcut menu. A check mark appears adjacent to the command to indicate this feature is turned on.

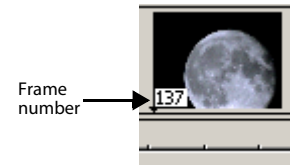
## Using the cursor to select a frame

When frame animation is turned on, clicking anywhere within the audio portion of the data window displays the corresponding video frame in the video strip. To move the cursor by single frames, press **Alt+→** or **Alt+←**.

## Viewing frame numbers

You can display frame numbers on each frame in your video strip, which can assist you in positioning your audio. As you zoom in more tightly, each frame in the strip represents one frame in the video.

1. Open a video file and display the video strip.
2. From the **Options** menu, choose **Video**, and then choose **Number Frames**. A check mark appears next to this option on the menu when the feature is enabled, and a small box with a number appears at the bottom of each frame. The small black arrow marks the exact position of the frame.



**Tip:** You can also right-click the video strip and choose **Number Frames** from the shortcut menu.

3. Using the data window's zoom ratio controls, zoom in/out on the waveform several times and observe the numbering of the video frames.

**Tip:** Select a frame number format by choosing **Preferences** from the **Options** menu and selecting an option from the **Frame numbering on thumbnails** drop-down list on the **Video** tab.

## Animating the video strip

During playback of a video file, the video strip can display animated or still frames. This can visually aid in editing and positioning your audio to match the video. From the **Options** menu, choose **Video**, and then choose **Animate Video Strip** (or right-click the video strip and choose **Animate** from the shortcut menu). A check mark appears next to this option on the menu when the feature is enabled. When the video strip is animated, the video strip always displays the frame that corresponds to the cursor position. Press **Alt+→** or **Alt+←** to move the cursor one frame.


When frame animation is turned off, the video strip always shows the frame that corresponds to the left edge of each image in the video strip.

**Tip:** If you experience slow or stuttering video preview, turn off animated video to reduce the load on your CPU.

## Copying the current video frame to the clipboard

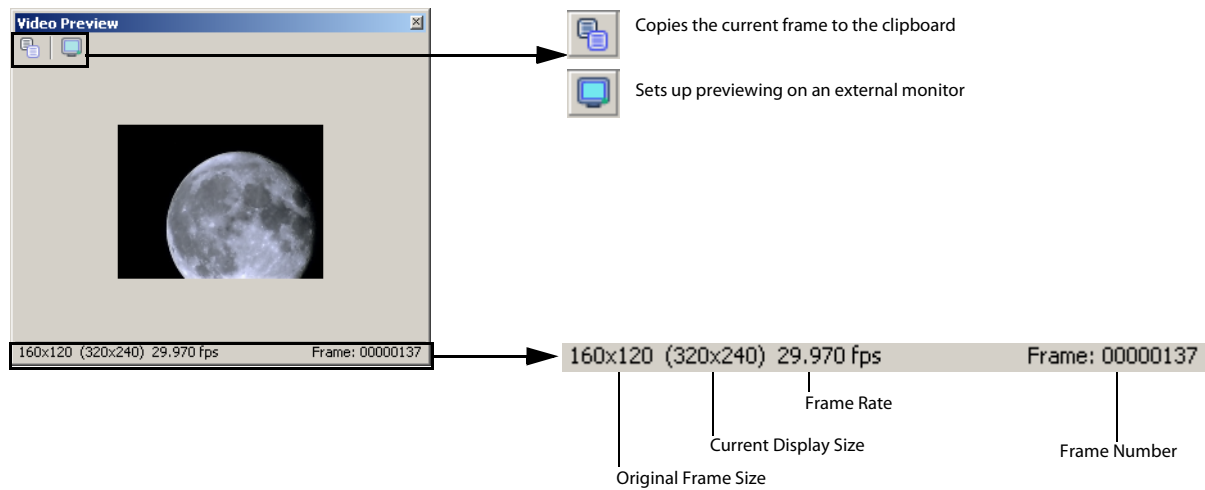
You can use the clipboard to copy the video frame at the current cursor position. From the **Options** menu, choose **Video**, and then choose **Copy Frame** (or right-click the video strip and choose **Copy Frame** from the shortcut menu). The current frame is copied to the clipboard.

## Previewing files with video

If you are working with a media file that contains video, you can use the Video Preview window for previewing. You must have the Video Preview window displayed to preview the audio stream. You can hide or display the Video Preview window by choosing **Video Preview** from the **View** menu. To begin previewing the current data window, click the **Play All** button  on the transport bar.

**Tip:** To display the Video Preview window, press **Alt+4**.

## Video Preview window



## Changing the Video Preview settings

The Video Preview window can be configured in a number of ways to make it more useful. The Video Preview window can be used on a separate monitor (if your video hardware supports this feature), docked at the bottom of the workspace, or floated freely on the screen.

You can quickly access settings for the Video Preview window using the shortcut menu. Right-click the Video Preview window to adjust the following options:

Option	Description
Copy Frame	Copies the contents of the frame to Windows Clipboard.
Default Background	Sets the Video Preview window background color to the system default color.
Black Background	Sets the Video Preview window background color to black.
White Background	Sets the Video Preview window background color to white.
Integral Stretch	When selected, the Video Preview frame will only be stretched by integral amounts. Turning this setting on usually provides faster drawing.
Simulate Device Aspect Ration	Compensates for any spatial distortion due to non-square pixel aspect ratios when viewed on a computer monitor.
External Monitor	Sends the preview out to an external monitor. This only functions if your hardware supports this feature. If you have not configured your external monitor settings, clicking this button displays the Video tab of the Preferences dialog, allowing you to choose your external monitor device. For more information, see <a href="#">Configuring your video settings</a> on page 228.
<b>Important:</b> Pulldown is automatically added when you preview 24p video on an external monitor.	
Passive Update	Reduces the overhead needed to update the Video Display window. The Video Display is updated when the processor is idle.
Show Toolbar	Toggles the display of the toolbar at the top of the window.
Show Status Bar	Toggles the information display at the bottom of the window.


## Resizing the Video Preview

Double-click the title bar of the Video Preview window to automatically resize the window to fit the current video file. Double-click the title bar again to resize the window to half its previous size. This smaller size window allows for faster video frame previewing.

## Using an external monitor

You have the option of viewing video on an external monitor. To use this feature, you must have an OHCI-compliant IEEE-1394 DV interface and a device to convert the DV signal to video, such as a DV camcorder, deck, or media converter.

**Note:** *Pull-down is automatically added when you preview 24p video on an external monitor.*

1. From the **Options** menu, choose **Preferences** and click the **Video** tab (or click the **External Monitor** button  on the Video Preview window).
2. From the **External monitor device** drop-down list, select the appropriate device.
3. Click **Properties** and adjust the following settings as needed:

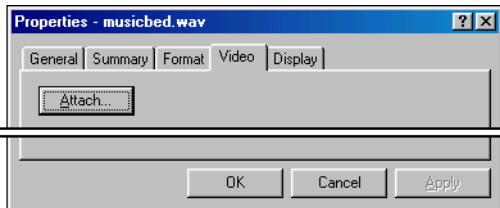
If	Then
Your source media does not conform to DV standards	Choose a setting from the <b>If project format is invalid for DV output, conform to the following</b> drop-down list. The video is automatically adjusted to display properly on your external monitor
Your audio is not synchronized with your external monitor	You can configure an offset for your hardware. Drag the <b>Sync offset (frames)</b> slider to synchronize audio and video. This setting affects synchronization for previewing on an external monitor only; audio and video synchronization in the file is unaffected.

4. Click **Close** to close the External Monitor dialog.
5. Click **OK** to close the Preferences dialog.

## Attaching video to an audio file

Once you have edited an audio file to your satisfaction, you can attach it to a video file and save it as a video file.

1. Open the audio file you want to use. *For more information, see [Getting media files on page 44](#).*
2. From the **File** menu, choose **Properties**. The Properties dialog is displayed.
3. Click the **Video** tab.



4. On the **Video** page, click the **Attach** button. The Open dialog is displayed.
5. Locate and select a video file you want to attach, and click the **Open** button. The Open dialog closes and you return to the **Video** page.
6. Click **Apply** to attach the video file.
7. To change the field order setting for the video file, choose an option from the **Field order** drop-down list. The options are explained below:

Option	Use
None (Progressive)	For video to be viewed on a computer monitor.
Lower Field First	For DV output
Upper Field First	For output that is jittery or shaky, or if specified by your hardware manual.

8. To change the video's pixel aspect ratio, choose an option from the **Pixel aspect ratio** drop-down list. The pixel aspect ratio should be based on the destination and use of the final media file.

9. Click **OK** to close the Properties dialog.

**Note:** *The file must be saved in a video file format to permanently attach the video. For more information, see [Saving a video file](#) on page 228.*

## Detaching video from an audio file

You can detach the video stream from a media file.

1. Open the media file you want to use. *For more information, see [Getting media files](#) on page 44.*
2. From the **File** menu, choose **Properties**. The Properties dialog is displayed.
3. Click the **Video** tab.
4. On the **Video** page, click the **Detach** button.
5. Click **OK**. The video stream is removed, and the video strip is hidden.

## Setting video options

### Video file properties

The video properties for a file affect how video is displayed and rendered when you save the file. In most situations, you can leave these settings at their default values. However, you can adjust the video properties of a file as needed.

1. From the **File** menu, choose **Properties**.
2. Click the **Video** tab.
3. Choose a setting from the **Field order** drop-down list. This setting affects how the video is displayed and rendered when you save the file.
  - **None (progressive scan)** treats video as non-interlaced.
  - **Upper field first** treats video as interlaced and reads the interlaced video as upper field first.
  - **Lower field first** treats video as interlaced and reads the interlaced video as lower field first.

**Note:** *The **Field order** setting remains in effect only as long as the file is open; the setting is not retained when you save or close the file.*

4. Choose a setting from the **Pixel aspect ratio** drop-down list to determine the ratio used to display and render the video. In most cases, this value is auto-detected for you.
5. Click **OK**.

## Configuring your video settings

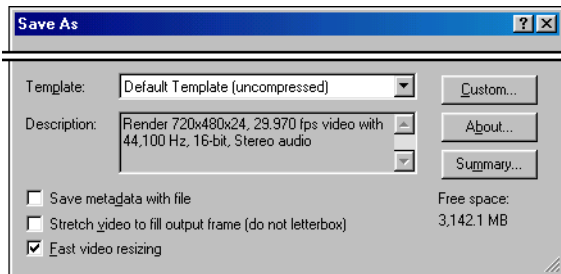
You can use the **Video** tab on the Preferences dialog to choose your video settings. From the **Options** menu, choose **Preferences**, and then click the **Video** tab.

The items on this tab are explained below.


Items	Description
Resample source video when rendering to a higher frame rate	Select this check box if you want to interpolate video frames when you render to a frame rate that is greater than the source file's frame rate.
Deinterlace method	Choose a setting from the drop-down list to determine how the two fields that make up a video frame are separated when you render to a progressive format: <ul style="list-style-type: none"><li>• <b>Blend Fields:</b> Maintains the data in the two fields by blending them together. This method can produce a smooth, motion-blurred image.</li><li>• <b>Interpolate:</b> Deletes one field and uses the remaining field to interpolate the deleted lines. This produces sharper images than <b>Blend Fields</b> but can introduce jagged motion or stair-stepping artifacts.</li></ul>
Allow pulldown removal when opening 24p DV	If you want to automatically remove pulldown fields when opening 24 fps progressive-scan DV video files, select this check box. To open your 24p DV video files as 29.97 fps interlaced video (60i), clear this check box.
Frame numbering on thumbnails	This drop-down list determines how the frame information is displayed on the video strip when you have frame number display enabled. To display frame numbers, choose the Frame number option. To display timecode, choose the Media timecode option.
External monitor device	Allows you to identify an external video device with which Sound Forge software can communicate. This video device is used to display previews on an external monitor. <b>Important:</b> Pulldown is automatically added when you preview 24p video on an external monitor.


## Saving a video file

1. From the **File** menu, choose **Save As**. The Save As dialog is displayed.
2. From the **Save as type** drop-down list, choose a video file format.
3. Name the file in the **File name** box.



4. Select or clear the following check boxes as needed:
  - **Stretch video to fill output frame (do not letterbox):** Selecting this check box stretches the source video frame if the destination frame size differs. When this check box is cleared, letterboxing or pillarboxing is used to keep the frame aspect correct.
  - **Fast video resizing:** Selecting this check box speeds the process of saving video. When this check box is cleared, the time required to save the file can increase dramatically. Clear this check box only when you have critical material where nothing but the highest quality video rendering will do.
5. From the **Template** drop-down list, select a template for rendering and compressing the file.

You can click **Custom** to customize the settings in the Custom Settings dialog. For help on the different settings, click the **Help** button  or press Shift+F1. Click **OK** to close the Custom Settings dialog and return to the Save As dialog.

**Tip:** You can save the custom settings to use again by entering a template name in the **Template** box and clicking the **Save Template** button .

6. Click **Save**.



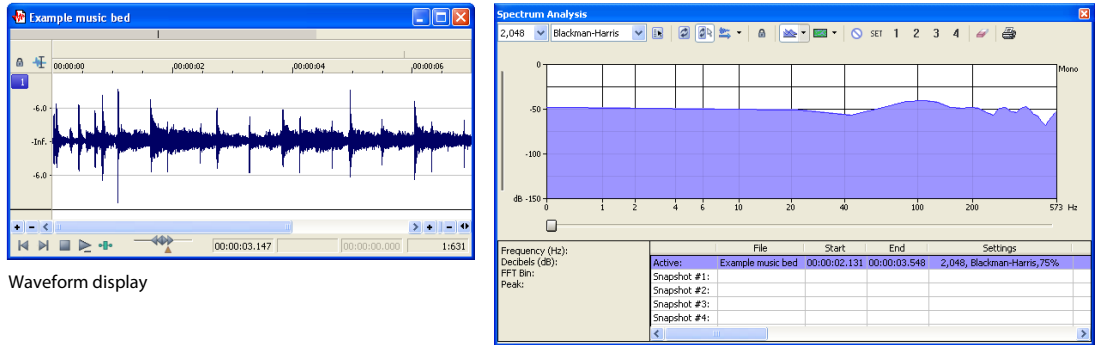
# Chapter 19: Using Spectrum Analysis

This chapter introduces you to the concept of frequency and describes the Sound Forge® Spectrum Analysis. Spectrum Analysis allows you to examine audio frequencies and overtones using either spectrum graphs or sonograms.

## Working in the frequency domain

Unlike the waveform display, which represents audio in the time domain (amplitude vs. time), Spectrum Analysis allows you to examine sound by representing the sound in the frequency domain (amplitude vs. frequency).

Consider the following graphic, which depicts the same audio event as a waveform and as a spectrum graph.



Waveform display

Spectrum graph

Data displayed in the frequency domain (whether in the form of a spectrum graph or sonogram) shows the amplitudes and frequencies of sine waves that, if mixed together, would sound much like the original sound. Since it's relatively easy to remember how a sine wave sounds at different frequencies, it's possible to visualize how simple waveforms sound by looking at the spectrum of the sound.

Learning to “read” the frequency components of a sound in conjunction with their corresponding amplitudes makes it possible to determine the fundamental frequency of a sound, as well as its overtones. Similarly, you can identify unwanted noise, thereby allowing filtering to be applied where needed.

## Fast Fourier Transform

A Fourier transform is computationally intensive, and for this reason it is common to use a technique called a Fast Fourier Transform (FFT) to perform spectral analysis. The FFT utilizes mathematical shortcuts to reduce the processing time at the expense of putting limitations on the analysis size.

The analysis size, also referred to as the FFT size, indicates the number of samples from the audio signal used in analysis and also determines the number of discrete frequency bands. When a large number of frequency bands are used, the bands have a smaller bandwidth and this provides for more accurate frequency readings.

However, since complex sounds have a rapidly changing spectrum, a large analysis size can blur the time-changing frequencies of a sound. For example, when performing FFT analysis of an audio file sampled at 44,100 Hz using an analysis size of 4096, almost 100 milliseconds (44,100/4096) of sound are analyzed. If the sound is not constant for those 100 milliseconds, it is impossible to focus on the instantaneous spectrum at smaller time intervals. This is the trade-off between time resolution and frequency resolution encountered when analyzing audio signals.

Spectrum Analysis allows you to perform precise FFT analysis and displays the resulting data in a spectrum graph or a sonogram display. The spectrum graph allows real-time monitoring of playback or input, while the sonogram displays a playback cursor for real-time preview. Both formats make it easy to navigate data and read audio frequency and position.

## Using a spectrum graph

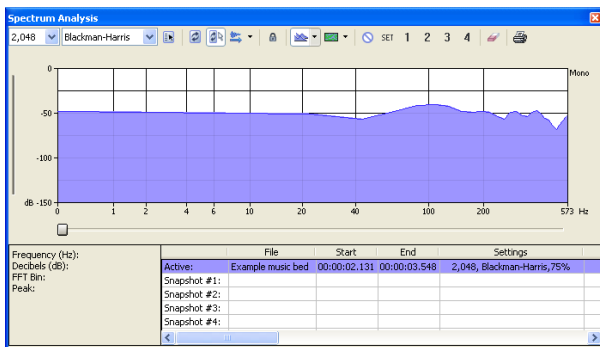
In the spectrum graph, the horizontal axis represents frequency in Hertz (Hz), while the vertical axis represents amplitude in decibels (dB).

### Displaying a spectrum graph


1. Open an audio file.
2. Select the portion of the waveform you want to analyze. The sound or note you want to analyze should be in the center of the highlighted area.

**Note:** Analyzing long sections of audio can take a long time and decreases the time resolution, so your selection should be relatively short. Also, if the audio has a low amplitude level, you can boost it by using the Volume or Normalize functions. For more information, see [Volume](#) on page 156 and [Normalize](#) on page 151.


3. From the **View** menu, choose **Spectrum Analysis**. The Spectrum Analysis window is displayed.




4. Use the toolbar at the top of the window to set your display options.

**Tip:** You can also click the **Settings** button (  ) in the Spectrum Analysis window to set additional options.

The spectrum graph displays the amplitude (in dB) of each frequency component from 0 Hz (DC) to the Nyquist frequency. Frequency is displayed along the X (horizontal) axis, and the amplitude is displayed along the Y (vertical) axis.

**Tip:** You can continue to make selections in the sound file with the Spectrum Analysis window open (just move the cursor or make selections as you normally would). Click the **Refresh** button (  ) in the Spectrum Analysis toolbar to update the display. If no selection is made, analysis is performed on the samples immediately following the cursor position.

## Monitoring an input and output source

Click the **Real Time Monitoring** button  to turn real-time spectrum analysis on or off. Click the down arrow next to the button and choose a command from the menu to specify whether you want to monitor your sound card's input or output:

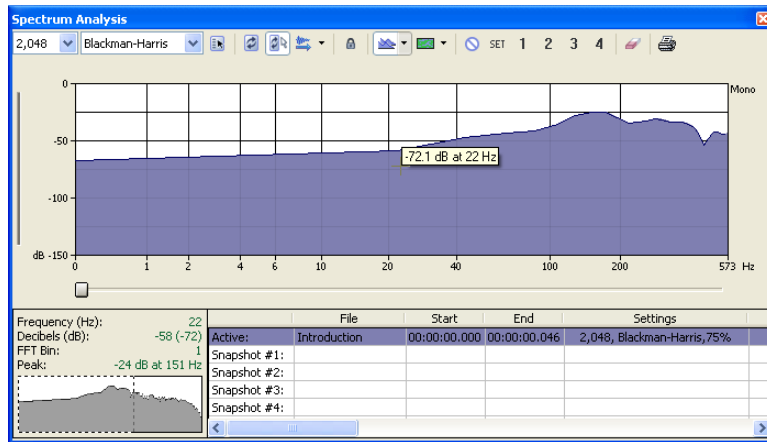
- When you choose **Monitor Input**, Sound Forge will monitor the recording devices selected on the **Record** page of the **Audio** tab in the Preferences dialog. *For more information, see [Audio tab](#) on page 248.*
- When you choose **Monitor Output**, Sound Forge will monitor the playback devices selected on the **Playback** page of **Audio** tab in the Preferences dialog. *For more information, see [Audio tab](#) on page 248.*

### Notes:

- When **Monitor: Output** is selected, the post-processing signal is monitored when you start playback from the **Plug-In Chainer**.
- Real-time spectrum analysis can require significant processing power. If the spectrum graph's refresh rate seems sluggish, set the display mode to **Line Graph**, decrease the FFT size, or turn off snapshots.

## Viewing frequency and amplitude values, notes and statistics

As you move the cursor through the spectrum graph, the amplitude and frequency values at the current position are displayed in a ToolTip next to the cursor and in the Statistics area at the bottom of the window:

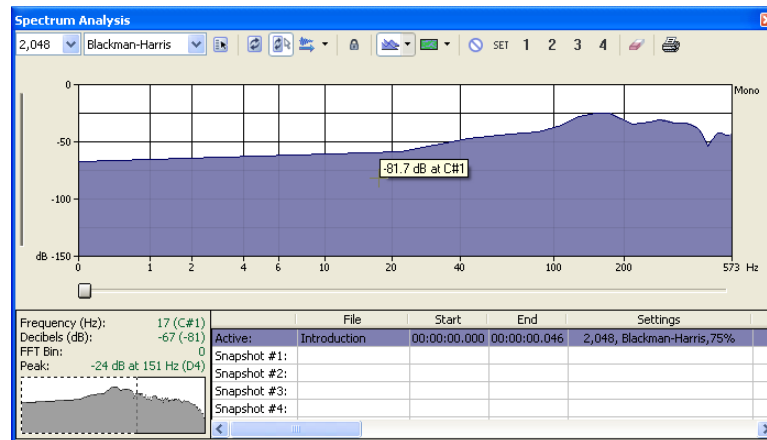


Use the cursor to display amplitude and frequency values

Statistics area

Right-click the graph and choose **Show Position** from the shortcut menu to toggle the display of ToolTips. The setting for each graph in a multichannel file is independent.


If you want to display the nearest musical note equivalent of the cursor position in a ToolTip, right-click the graph and choose **Show Notes** from the shortcut menu:



Use the cursor to display musical note equivalent

Right-click the Spectrum Analysis window and choose **Show Statistics** from the shortcut menu to toggle the display of the Statistics area at the bottom of the Spectrum Analysis window.


## Navigating a spectrum graph

After a spectrum graph displays, Grab/Pan mode allows you to scroll vertically and horizontally. To enable Grab/Pan mode, right-click the Spectrum Analysis dialog and choose **Grab/Pan** from the shortcut menu. A check mark appears next to this option when Grab/Pan mode is enabled. The cursor displays as a hand , and you can drag horizontally or vertically to scroll through the graph.

When you are zoomed into a selection of the spectrum graph, you can drag the horizontal and vertical sliders to scroll through the graph. The thumbnail image in the lower-left corner of the Spectrum Analysis window will show you which part of the graph is being displayed.

To turn off Grab/Pan mode, choose **Grab/Pan** from the shortcut menu again.

## Changing the graph type

Click the down arrow next to the **Normal Display** button  and choose **Line Graph**, **Filled Graph**, or **Bar Graph** from the menu to change the type of graph displayed in the Spectrum Analysis window. A check mark is displayed next to the selected graph type.

**Note:** Some video drivers have problems displaying **Filled Graph** and **Bar Graph** modes. If you encounter problems such as incorrect shading or very slow drawing, use the **Line Graph** option or change video drivers.

If you're analyzing a multichannel file, you can click the down arrow next to the **Normal Display** button and choose **Single Graph** to see all channels in a single graph.


Right-click the graph and choose **Logarithmic** from the shortcut menu to toggle the x-axis between logarithmic and linear mode. In logarithmic mode, more of the graph is devoted to lower frequencies.

## Changing the zoom level of the graph


Zooming can be accomplished in several ways:


1. Drag on the graph to draw a box around the area you want to magnify. You can toggle through mouse selection mode by right-clicking while holding the left mouse button:
  - The first type is a vertical zoom window. This will allow you to zoom to a frequency range.
  - The second type is horizontal zoom window. This will allow you to zoom to an amplitude range.
  - The third type is a combination of vertical and horizontal zoom. This will allow you to zoom to a frequency and amplitude range.
2. Right-click the graph and choose **Zoom Out Full** to view the entire amplitude and frequency range.
3. Right-click the graph and choose **Normalize dB** to set the Spectrum Graph amplitude range equal to the maximum and minimum values in the graph.


## Synchronizing graphs in a multichannel file

When viewing a spectrum graph for a multichannel file, an individual graph displays for each channel. Click the **Sync** button  to synchronize the displays so you can view the same region of the FFT in all channels.

## Updating a spectrum graph


Select the **Auto Refresh** button  if you want the Spectrum Analysis display to refresh automatically updated when you change your selection in the data window.

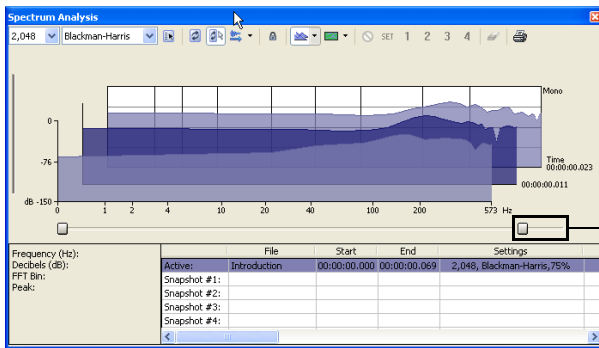
When the button is not selected, the display is not updated until you click the **Refresh** button .

If you want the graph to refresh automatically during playback or input monitoring, select the **Real Time Monitoring** button .

## Viewing multiple spectrum graphs

Once you create a selection in the data window, you can display up to 64 individual spectrum graphs (each representing a specific point in time).

1. Open an audio file.
2. From the **View** menu, choose **Spectrum Analysis**. The Spectrum Analysis window is displayed.
3. Click the Settings button . The Spectrum Settings dialog is displayed. *For more information, see [Adjusting Spectrum Analysis settings](#) on page 237.*
4. Type a number in the **Slices displayed** box. The **Forward** and **Backward** radio buttons activate.
5. Select either the **Forward** or **Backward** radio button.
  - Selecting the **Forward** radio button displays the first slice of the selection in the foreground of the spectrum graph.
  - Selecting the **Backward** radio button displays the last slice of the selection in the foreground of the spectrum graph.
6. Click **OK**.
7. Use the **Slice** slider to add/remove slice graphs in the Spectrum Analysis dialog.




Use the **Slice** slider to add or remove slice graphs

## Creating and comparing snapshots of the Spectrum Analysis window

You can store up to four snapshots to compare multiple spectrum graphs. You can take snapshots from a single data window or from different data windows.


**Note:** Snapshots are not available in sonogram display or when the **Slices displayed** setting in the Spectrum Settings dialog is greater than 1.

### Taking a snapshot



1. Navigate to the portion of the graph you want to capture.
2. Click the **Set** button, and then click a snapshot button  in the Spectrum Analysis toolbar.

Available snapshots buttons are displayed in black, and buttons that are in use are displayed in blue and underlined.

### Showing and hiding snapshots

1. Select a numbered button in the Spectrum Analysis toolbar to display a stored snapshot. All selected snapshots will be displayed in the Spectrum Analysis window at the same time.
2. Click a selected snapshot button to exclude it from the display.
3. Select the **Hide active plot** button  to hide the current spectrum so you can concentrate on your snapshots.

## Erasing snapshots

You don't need to erase individual snapshots to update or replace them. Simply click the **Set** button , and then click a snapshot button  in the Spectrum Analysis toolbar to update its image.


If you want to erase all snapshots, click the **Clear all snapshots** button .

## Viewing snapshot statistics

Information about each snapshot is displayed at the bottom of the Spectrum Analysis window:

	File	Start	End	Settings
Active:	Wow, sound editi...	00:00:01.575	00:00:01.622	2,048, Blackman-Harris, 75%
Snapshot #1:	Introduction	00:00:03.035	00:00:05.413	2,048, Blackman-Harris, 75%
Snapshot #2:	AVI_6Ch_44-16_V...	00:00:00.000	00:00:00.046	2,048, Blackman-Harris, 75%
Snapshot #3:	Example music bed	00:00:00.000	00:00:00.046	2,048, Blackman-Harris, 75%
Snapshot #4:				

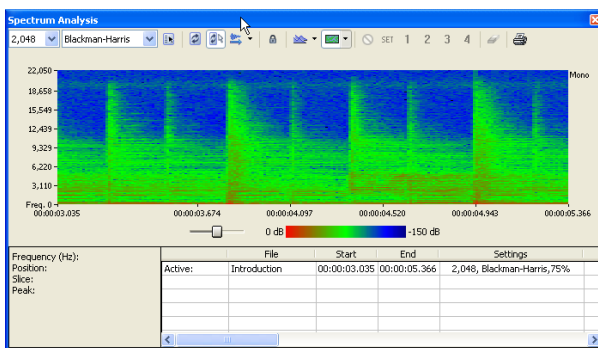
## Printing the graph

Click the **Print** button  to print the contents of the Spectrum Analysis window, including the graph and statistics data.

## Using a sonogram

The sonogram is another way of displaying spectral data variations over time. In a sonogram, the X (horizontal) axis represents time, and the Y (vertical) axis represents frequency.

Sonogram




The amplitude of each frequency component in the sonogram is represented by the color intensity of each point in the graph. This method of displaying spectral information is useful for identifying distinctive spectral patterns created from sounds such as speech, musical instruments, and ambient noise.


## Displaying a sonogram

1. Open an audio file and select the portion of the waveform you want to analyze. The sound or note you want to analyze should be in the center of the highlighted area.

**Note:** Analyzing long sections of audio can take a long time and decreases the time resolution, so your selection should be relatively short. Also, if the audio has a low amplitude level, you can boost it by using the **Volume** or **Normalize** functions. For more information, see [Volume](#) on page 156 and [Normalize](#) on page 151.

2. From the **View** menu, choose **Spectrum Analysis**. The Spectrum Analysis dialog is displayed.
3. Click the **Sonogram** button  to display your data as a sonogram.

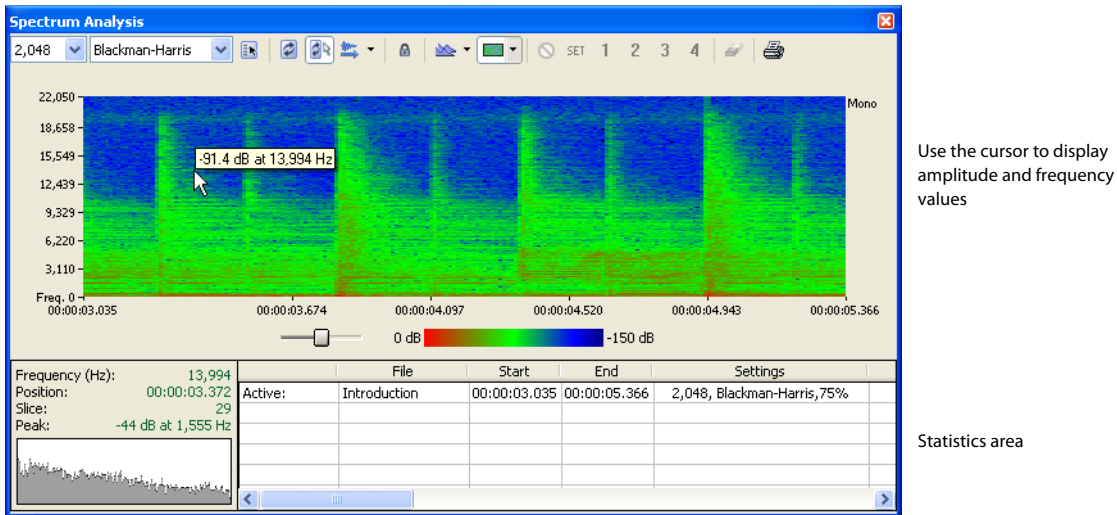
- Use the toolbar at the top of the window to set your other display options.

**Tip:** You can also click the **Settings** button  in the Spectrum Analysis window to set additional options.

If there is no selection in the waveform display window, the sonogram analyzes the sound data from the current cursor position to the end of the file.

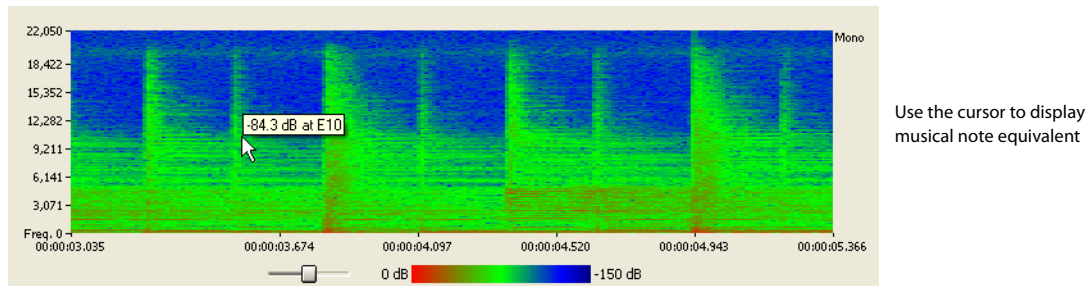
### Displaying frequency and amplitude values, notes and statistics

As you move the cursor through the sonogram, the amplitude and frequency values at the current position are displayed in a ToolTip next to the cursor and in the Statistics area at the bottom of the window:



Right-click the sonogram and choose **Show Position** from the shortcut menu to toggle the display of ToolTips. The setting for each sonogram in a multichannel file is independent.

If you want to display the nearest musical note equivalent of the cursor position in a ToolTip, right-click the sonogram and choose **Show Notes** from the shortcut menu:




Right-click the Spectrum Analysis window and choose **Show Statistics** from the shortcut menu to toggle the display of the Statistics area at the bottom of the Spectrum Analysis window.

### Updating a sonogram

A sonogram updates in the same method as a spectrum graph. *For more information, see [Updating a spectrum graph](#) on page 232.*

## Monitoring an input and output source

Click the **Real Time Monitoring** button  to turn real-time spectrum analysis on or off. Click the down arrow next to the button and choose a command from the menu to specify whether you want to monitor your sound card's input:

- When you choose **Monitor Input**, Sound Forge will monitor the recording devices selected on the **Record** page of the **Audio** tab in the Preferences dialog.
- When you choose **Monitor Output**, a cursor is displayed in the sonogram to indicate the play position (real-time output monitoring is not available in sonogram display mode).

## Tuning a sonogram

It is frequently necessary to experiment with the control parameters in the Spectrum Settings dialog to produce the best possible sonogram. *For more information, see [Adjusting Spectrum Analysis settings](#) on page 237.*

## Improving the graph's contrast

To improve the contrast of the sonogram, decrease the frequency and amplitude ranges as much as possible.

## Smoothing the graph's display

If the graph appears too pixelated, raise the **Set sonogram resolution** value to 200.

## Improving the frequency resolution

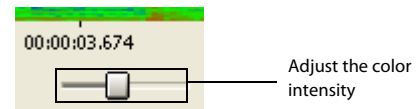
For greater frequency resolution, choose a higher value from the **FFT size** drop-down list.

## Reducing the processing time

To reduce processing time, decrease the **Set sonogram resolution** value and/or choose a lower value from the **FFT size** drop-down list.


## Adjusting color intensity

Adjust the sonogram's color intensity using the **Color** slider located directly beneath the sonogram. Notice that the bottom pane of the dialog depicts the color scale in dB.



**Tip:** *This function may be fairly slow if you do not have a palletized driver or if Video for Windows is not installed.*


## Synchronizing sonograms in a multichannel file

When viewing a sonogram for a multichannel file, an individual graph displays for each channel. Click the **Sync** button  to synchronize the displays so you can view the same region of the FFT in all channels.

## Returning to a spectrum graph


To return to the spectrum graph, click the **Normal Display** button  in the toolbar.

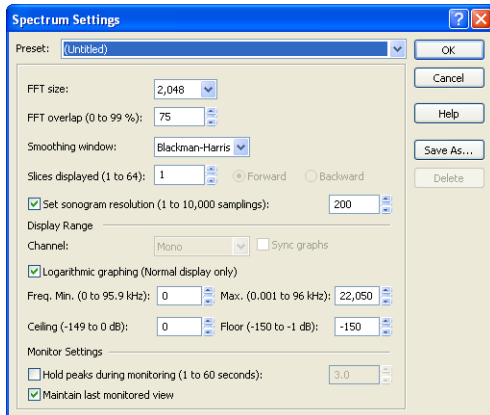
## Printing the sonogram

Click the **Print** button  to print the contents of the Spectrum Analysis window, including the sonogram and statistics data.



## Adjusting Spectrum Analysis settings

From the Spectrum Analysis toolbar, click the **Settings** button  to display the Spectrum Settings dialog. The following table explains the role of each control in audio spectrum analysis.



Item	Description
FFT size	Choose a value from the <b>FFT size</b> drop-down list to set the size in samples of the analysis window and number of discrete frequencies analyzed. Higher numbers produce increased frequency resolution at the expense of lower time resolution and longer computational time.
FFT overlap	The value in the <b>FFT overlap</b> box specifies the percentage of overlap between FFT analysis windows. Overlapping allows for more accurate analysis. Lower settings decrease the number of distinct analysis functions performed, which decreases processing time. High settings allow for more analysis, but can result in slow processing.
Smoothing window	Choose a setting from the <b>Smoothing window</b> drop-down list to determine the window function applied to the input data before analysis. The window function affects the sharpness of peaks in an FFT graph and the leakage into neighboring frequencies. <ul style="list-style-type: none"> <li>Choose <b>Rectangle</b> to apply no window. This results in a very sharp peak, but high leakage.</li> <li>Choose <b>Triangular</b> (also called a Bartlett or Parzen window) to apply a window that results in less leakage than the rectangle window.</li> <li><b>Hamming</b>, <b>Hanning</b>, and <b>Blackman</b> windows are commonly used in audio applications.</li> <li>Choose <b>Blackman-Harris</b> to obtain the least sideband leakage of the six options. The major drawback of Blackman-Harris is rounded graph peaks.</li> </ul>
Slices displayed	The <b>Slices displayed</b> value determines the number of FFT slices displayed. When displaying multiple slices in the spectrum graph, slices are displayed chronologically forward or backward based on whether you have the <b>Forward</b> or <b>Backward</b> radio button selected.
Set sonogram resolution	The <b>Set sonogram resolution</b> value determines the number of FFT samplings used in a sonogram. This keeps the processing time and graph resolution constant. Increasing this value increases the horizontal graph resolution, but requires more processing time.  When this check box is cleared, the number of samplings is determined by the length of the selection and the <b>FFT overlap</b> setting.  <b>Note:</b> Increasing the samplings increases the horizontal graph resolution but requires more processing time.
Channel	Choose a setting from the drop-down list to specify which graph you want to edit.
Sync graphs	If you are analyzing a multichannel file, select the <b>Sync graphs</b> check box to synchronize the displays so you can view the same region of the FFT in all channels.
Logarithmic graphing	Select the <b>Logarithmic graphing</b> check box to display the X-axis in logarithmic mode rather than linear mode. In logarithmic mode, more of the graph is devoted to lower frequencies.  <b>Note:</b> Logarithmic graphing affects the display only when <b>Normal Display</b> is selected.
Freq. Min. (Frequency minimum)	Determines the lowest frequency displayed in the graphs.
Max. (Frequency maximum)	Determines the highest frequency displayed in the graphs.
Ceiling	Determines the highest amplitude displayed in the graphs.
Floor	Determines the lowest amplitude displayed in the graphs.
Hold peaks during monitoring	Select this check box to indicate the highest value of each frequency on the spectrum graph with a small horizontal line. The length of time (in seconds) that the peak is held is determined by the value entered in the edit box.
Maintain last monitored view	Select this check box if you want to maintain the state of the Spectrum Graph when you stop playback. Clearing this check box results in the graph resetting to the cursor position when playback stops.

## Saving spectrum graph settings

After you configure the controls in the Spectrum Settings dialog, you can save the settings as a custom preset by clicking **Save As** and entering a name for the new preset. Click **OK** to save the new preset.

## Chapter 20 Customizing Sound Forge

You can customize Sound Forge® software to suit your project needs and working references. Many of the settings depend on your equipment or studio set-up. Sound Forge software can be set to work with the components that you use in your studio.

### Setting preferences

Preferences affect how Sound Forge software functions. Any changes that you make to the preferences remain set until you change them again or reset Sound Forge software to use the default presets.

You can access the Preferences dialog by choosing **Preferences** from the **Options** menu. This dialog contains tabbed pages. The following sections explain the settings on each tab.

## General tab

The **General** tab allows you to set miscellaneous Sound Forge options.

Option	Description
Show logo splash-screen on startup	When this check box is selected, the Sound Forge splash screen will be displayed briefly upon startup.
Open default Workspace on startup	If this check box is selected, files that were open when you last exited the program will be opened automatically.
Default to slow scroll when drag selecting	In some very fast computers, automatic scrolling while selecting is too fast to use accurately. When this option is turned on, drag-selecting will cause a slow scroll.  <b>Tip:</b> Click the right mouse button while selecting to toggle slow scrolling.
Warn when Paste or Mix formats do not match	Select this check box if you want to be warned before mixing data that has different sample rates.  Mixing data of different sample rates may produce unintended results.
Confirm on close	Select this check box if you want the application to present a confirmation message box before exiting.
Compatible draw mode (for broken video drivers)	Because the application's drawing routines are highly optimized, they increase the chance of causing little-known video card problems to arise. Some video cards have bugs in their drivers that can make your system lock up when the application tries to draw a waveform.  Compatible draw mode uses a different method of drawing the waveform that, although not as smooth, puts less stress on the video card. With some video cards, this mode actually increases the draw speed. However, more flashing can occur.
Compatible scroll mode (for other broken video drivers)	When this check box is selected, a less optimized method of scrolling the data window will be used. In some instances, this can reduce interference problems between your audio and video card when Smooth Scrolling playback is selected.
Show a textured background on the Workspace	When this check box is selected, a stucco texture will be used for the application background.
Ignore fact chunk when opening compressed WAV files	When this check box is selected, the software will ignore fact chunks in compressed WAV files.  Compressed WAV files use fact chunks to specify how many actual samples are represented in the file. If a compressed file is improperly authored, this may cause some of the compressed data to not be loaded. If you suspect that not all sound data is being loaded from a compressed file, try checking this option and reopening the file.  <b>Tip:</b> If you change the setting of this check box, please delete any proxy (.sfap0) files associated with compressed WAV files.
Show free storage space on Status Bar	When this check box is selected, the total amount of free disk space available on your specified temporary drive is displayed on the status bar.  Use the <b>Temporary files and record folder</b> box at the bottom of the General tab to set the folder that will be used for temporary files and recorded data.
Show shuttle controls on Data Window transport	When this check box is selected, <b>Rewind</b> and <b>Forward</b> buttons will appear on each data window's transport controls.
Auto-power MIDI keyboard window	Select this check box if you want to open the MIDI device assigned to the MIDI keyboard (if it is not already open) when you click a key on the MIDI keyboard. You may want to turn off this option if you are using the same MIDI output device for MIDI synchronization or for your sequencer.  If this option is turned off, you need to click the <b>On</b> button on the keyboard prior to using it to send notes.
Use Net Notify to stay informed about Sony products	When this check box is selected, information from Sony will be displayed periodically at startup. Clear the check box to bypass the Net Notify dialog.
Allow floating windows to dock	When this check box is selected, windows will automatically be docked when you drag them to the edges of the Sound Forge workspace. You can hold the Ctrl key while dragging a window to prevent it from docking.  When this check box is cleared, windows will not dock unless you hold the Ctrl key.
Spacebar and F12 Play/Pause instead of Play/Stop	Select this check box if you want the F12 and spacebar keyboard shortcuts to toggle between Play and Pause mode. In this mode, the cursor will maintain its position.
Warn when metadata cannot be saved in the file	Select this check box if you want to be prompted to save metadata to a separate file if it cannot be saved within the media file.  When the check box is cleared, metadata will automatically be saved to a separate file if necessary.
Show the position of the playback cursor	When this check box is selected, the <b>Position</b> field in the status bar will show the cursor position during playback. Turn off this option if you have a very slow computer or video card.
Show the record counter while recording	Select this check box if you want the record time displayed in the Record dialog. Clear the check box if you have a very slow computer or video card.
Automatically reopen file after Save As	Select this check box if you want to automatically reopen files when you save to a different format. Changes in bit depth, channels, or compression format will result in reopening and will allow you to listen to any changes in sound quality.  Clear the check box and select the <b>Prompt to open new file after Save As</b> check box if you want to be prompted to open the saved file in a new data window.  When both check boxes are cleared, Sound Forge software does nothing after saving to a different format. If you're saving a file to several compressed formats, clearing these check boxes prevents you from having to reopen the file after saving each format.
Prompt to open new file after Save As	When the Automatically reopen files after Save As check box is cleared, select this check box if you want the application to prompt you to open the destination file to a new data window after saving a sound file to a different format.  Opening the file in a new data window will allow you to hear any changes in quality between the original file and the result of the Save As operation.

Option	Description
Keep media files locked	Select this check box if you want to lock media files after you've opened them.  Clear the check box if you want to unlock media files when you switch to another application.
Delete temporary files on close	Select this check box if you want to delete the peak (.sfk) and proxy (.sfap0) files associated with a media file when you close a data window.
Hide new temporary files	Select this check box if you want to turn on the <b>Hidden</b> file attribute when creating new peak (.sfk) and proxy (.sfap0) files.  In the Windows Control Panel, double-click <b>Folder Options</b> and select the <b>View</b> tab. Select the Show hidden files and folders radio button if you want to be able to see hidden files.
Always proxy compressed formats	Select this check box if you want to create an uncompressed proxy (.sfap0) file when you open a compressed file format.  Selecting this check box can improve performance on slower computers or for formats that cannot be decompressed quickly for real-time playback.
Remember last-used sample rate for .vox and .ivc files	Select this check box if you want the software to remember the last-used sample rate when you open a .vox file. When the check box is cleared, you will be prompted to choose a sample rate each time you open a .vox file.
Remember last-used settings for .raw files	Select this check box if you want the software to remember the last-used settings when you open .raw files. When the check box is cleared, you will be prompted to choose a settings each time you open a .raw file.
Allow Undo past Save	When this check box is selected, your undo history is maintained until you close the data window (or exit the application) so you can undo edit operations even if you've saved your file.  When this check box is selected, quick file saving may not be available.  <b>Tip:</b> If you want to be able to undo edit operations even after closing and reopening your file, save a Sound Forge project.
Use floating point temporary files	Select this check box if you want to use higher precision IEEE floating-point temporary files for audio files. This setting results in more accurate processing but requires more disk space and yields slower processing.  When the check box is cleared, the bit depth of the temporary file will match the source file.
Use SPTI for CD burning	Select this check box if you want to use SPTI (SCSI Pass-Through Interface) to communicate with your CD burning drive.
Enable Windows XP Theme support	When this check box is selected, the Sound Forge window will inherit the appearance of the current theme when using Windows XP. When the check box is cleared, user interface elements will maintain the classic Windows operating system appearance.
Automatically detect plug-and-play CD/DVD drives	Select this check box if you want the software to check the capacity of the media when you insert a CD. Selecting the check box can prevent a hang that can occur with some external drives.  When the check box is cleared, the software will not scan the media each time you insert a disc.
Allow Ctrl+drag style cursor scrub in data windows	When this check box is selected, you can hold Ctrl while dragging the cursor to scrub in data windows.
Automatically name regions and markers if not playing	When regions and markers are added, this option automatically prompts you for a name. This does not happen when adding markers on-the-fly during playback.
Always open dropped files in new window	When this check box is selected, files that are dropped onto the Sound Forge workspace are automatically opened in a new data window.
Recently used file list	Select the check box if you want to display a list of recently used files on the File menu. Use the edit box to specify the number of files you want to display.
Temporary files and record folder	Specify a folder for storing temporary files and recorded audio, or click the <b>Browse</b> button to specify a new folder.  Using temporary file space allows you to edit very large files and keeps Sound Forge from using large portions of RAM on your computer. Your temporary directory must have enough space to accommodate the total size of all files you plan to edit along with space for any clipboard data and undo buffers.  If you change the temporary storage folder, you will have to restart Sound Forge for the change to take effect.

## Display tab

The **Display** tab allows you to specify options for adjusting the appearance of the Sound Forge window.

Description	Option
Default sound file window height	Drag the slider to specify the default data window height for a sound file. This magnification level is used when you load a sound file or create a new window.
Default video strip height	Drag the slider to specify the default height of the video strip when you open a video file.
Peak ratio default for new sound files	<p>Choose a ratio from the drop-down list to specify the zoom ratio above which the application will use a peak file instead of the original file to draw the waveform.</p> <p>If you notice problems with waveform scrolling, try decreasing this setting so it is less than your current zoom ratio.</p> <p>To calculate the size of the resulting peak files, divide the size of the file by the peak ratio. For example, a 100 MB sound file will need a 0.39 MB (100/256) peak file when using 1:256.</p>
Normal zoom ratio	<p>Choose a zoom ratio from the drop-down list to specify the default horizontal magnification. This magnification level is used when you load a sound file, create a new window, or use the <b>Zoom Normal</b> command.</p> <p>High values show more data, and small values show more detail.</p>
Custom zoom ratio 1	Choose a zoom ratio from the drop-down list to specify a custom level of horizontal magnification.
Custom zoom ratio 2	<p>This zoom ratio will be used when you perform any of the following actions:</p> <ul style="list-style-type: none"><li>• Click the <b>Custom Zoom 1</b> or <b>Custom Zoom 2</b> button on the Navigation toolbar.</li><li>• From the <b>View</b> menu, choose <b>Zoom Time</b>, and then choose a <b>Custom Zoom</b> command from the submenu.</li><li>• Right-click in a data window, choose <b>Zoom</b> from the shortcut menu, and then choose a <b>Custom Zoom</b> command from the submenu.</li></ul>
Color preference for	<p>The color preferences section allows you set a custom color for a variety of graphics within the Sound Forge interface.</p> <ol style="list-style-type: none"><li>1. Choose a screen element from the <b>Color preference for</b> drop-down list.</li><li>2. Set the color of the selected item:<ul style="list-style-type: none"><li>• Drag the <b>Hue</b> slider to change the color of the selected item.</li><li>• Drag the <b>Saturation</b> and <b>Brightness</b> sliders to adjust the intensity of the selected color.</li><li><b>Note:</b> When adjusting the display color for channel waveforms, the <b>Saturation</b> and <b>Brightness</b> sliders are not available. To adjust saturation and brightness for all channels, choose <b>Wave: All Channels</b> from the <b>Color preference for</b> drop-down list and then adjust the controls.</li><li>• Click the <b>Default</b> button to restore a custom color the default setting.</li></ul></li><li>3. Click the <b>OK</b> button.</li></ol>
Icon color saturation	Drag the slider to adjust the color intensity of icons in the Sound Forge window. Drag to the left to decrease the color saturation, or drag to the right to increase it.
Icon color tint	<p>Drag the slider to adjust the amount of tinting that is applied to the icons in the Sound Forge window. Drag the slider to the right to add an average of the title bar colors to the icons. Drag to the left to decrease the amount of tinting applied.</p> <p><b>Tip:</b> You can use the Display Properties control panel to change your active window title bar colors.</p> <ul style="list-style-type: none"><li>• In Windows 2000, open the Display Properties control panel and select the <b>Appearance</b> tab. Then choose <b>Active Title Bar</b> from the <b>Item</b> drop-down list.</li><li>• In Windows XP, open the Display Properties control panel and select the <b>Appearance</b> tab. Then click the <b>Advanced</b> button and choose <b>Active Title Bar</b> from the <b>Item</b> drop-down list.</li></ul>

## Editing tab

The **Editing** tab allows you to specify preferences for editing and undo operations.

Option	Description
Disable triple-clicking to select all sound file data	Select this check box if you don't want to select all data when you triple-click in a data window. You might want to select this option if triple-clicks are falsely detected when you make a selection and then try to perform a drag operation. Otherwise, decrease Windows' double-click threshold time.  When this check box is cleared, you can triple-click anywhere in a data window to select all data.
Disable auto-snapping below 1:4 zoom ratios	Select this check box if you do not want selections to snap to time or zero-crossings when the data window zoom ratio is less than 1:4.  This is useful if you commonly zoom in fully to adjust selection points manually yet still want to use automatic snapping when zoomed out.
Force loop bar to match selection	Select this check box if you want the loop region to always match the current time selection. Clicking to position the cursor in a data window will clear the loop region. When no loop region exists and looped playback is enabled, the entire data window will play looped. When the check box is selected, the behavior is similar to Sound Forge 8.0.  Clear the check box if you want to be able to position the cursor without clearing the loop region.
Drag & drop auto rise delay	Drag this slider to specify the time before a window underneath the cursor becomes active during drag-and-drop operations.
Snap to zero-crossing slope	Use this drop-down list to specify how zero-crossings are detected when you choose Snap to Zero: <ul style="list-style-type: none"><li>• <b>Negative Slope</b> - Zero-crossings are detected only on a negative slope.</li><li>• <b>Any Crossing</b> - Zero-crossings are detected on both positive and negative slopes.</li><li>• <b>Positive Slope</b> - Zero-crossings are detected only on a positive slope.</li></ul> <b>Tip:</b> It is usually best to use either <b>Positive Slope</b> or <b>Negative Slope</b> so that noticeable pops and clicks are not generated by cutting data.
Zero-cross scan time	Specify the maximum time (in samples) that will be used to search for the next zero-crossing.
Zero-cross level threshold	Specify the sample value below which data will be considered a zero-crossing. <b>Note:</b> Setting this value above zero can compensate for DC offset. However, if possible, you should remove DC offset first.
Pencil tool maximum zoom ratio	Choose a setting from the drop-down list to specify the maximum zoom ratio at which the Pencil tool will be available.
JKL / shuttle speed	Choose a setting from the drop-down list to set the speed that will be used for scrubbing the timeline with the JKL keys or with a multimedia controller.

## Labels tab

The **Labels** tab allows you to modify the default names that are assigned to data windows, regions, and markers.

### Edit default data window names

The Window labels section of the **Labels** tab allows you to modify the names that are assigned to new data windows when you create a new data window or choose **Create a new window for each take** from the **Mode** drop-down list in the Record dialog.

1. From the **Options** menu, choose **Preferences**, and click the **Labels** tab.
2. Select the **New window prefix** check box and type a prefix in the box if you want to display a name in the new window's title bar. Clear the check box if you do not want to include a prefix (if you want to number windows only, for example).
3. Select the **Use counter and start at** check box and type a number in the box if you want to number new data windows.
4. Select the **Insert leading zeros in field width of** check box and specify a field width if you want to use leading zeros in window names. For example, if you specify a field width of 3, windows numbered 1 to 99 would be numbered 001 to 099.
5. Click the **OK** button.

## Editing default region names

The Region Labels section of the **Labels** tab allows you to modify the names that are assigned to regions when you insert regions or choose **Multiple takes creating regions** from the **Mode** drop-down list in the Record dialog.

1. From the **Options** menu, choose **Preferences**, and click the **Labels** tab.
2. Select the **Label Regions** check box to display text labels for regions in the data window when you insert regions or choose **Multiple takes creating regions** from the **Mode** drop-down list in the Record dialog.
3. Adjust additional settings as necessary:

Item	Description
Prefix	Type a prefix in the box if you want to assign a name to new regions. Clear the check box if you do not want to include a prefix (if you want to number regions only, for example).
Use counter and start at	Select this check box and type a number in the box if you want to number new regions.
Insert leading zeros in field width of	Select this check box and specify a field width if you want to use leading zeros in region names. For example, if you specify a field width of 3, regions numbered 1 to 99 would be numbered 001 to 099.

4. Click the **OK** button.

## Editing default marker names

The Marker labels section of the **Labels** tab allows you to modify the names that are assigned to markers when you insert markers during playback or recording.

1. From the **Options** menu, choose **Preferences**, and click the **Labels** tab.
2. Select the **Label Markers** check box to to display text labels for markers in the data window when you insert markers.
3. Adjust additional settings as necessary:

Item	Description
New marker prefix	Type a prefix in the box if you want to assign a name to new markers. Clear the check box if you do not want to include a prefix (if you want to number markers only, for example).
Use counter and start at	Select this check box and type a number in the box if you want to number new markers.
Insert leading zeros in field width of	Select this check box and specify a field width if you want to use leading zeros in marker names. For example, if you specify a field width of 3, markers numbered 1 to 99 would be numbered 001 to 099.

4. Click the **OK** button.

## File Types tab

The **File Types** tab allows you to indicate which types of files you want to associate with Sound Forge software. When file is associated with Sound Forge software, you can double-click a sound file in the Windows Explorer and it will open for editing.

1. Select a file type from the list. The **File association details** box near the bottom of the tab displays information about the selected file type, as well as the current association.
2. Select the check box for each sound file format you want to associate with Sound Forge software, or clear the check box to remove a file association.
3. Click the **OK** button.




## MIDI/Sync tab

The **MIDI/Sync** tab allows you to specify preferences for MIDI and synchronization.

Item	Description
Output	Choose a MIDI device from the drop-down list to specify the MIDI output device for synchronization when Generate MIDI Timecode is enabled.
Input	Choose a MIDI device from the drop-down list to specify the MIDI input device for synchronization and triggering when Trigger from MIDI Timecode is enabled. This is the device through which Sound Forge will receive all MIDI triggering and synchronization input, including SMPTE/MTC, MIDI triggers, and Regions/Playlist triggers.
Bound record time on SMPTE record sync	When this check box is selected, Sound Forge software will not allow recording beyond the specified end time. This ensures that your record length is exact regardless of any inaccurate timecode.
Use internal timer for SMPTE generation	Select this check box if you want to use the internal timer for SMPTE generation rather than position values reported by the sound card driver. Since many sound cards do not report their position accurately, it is usually better to use the internal timer for SMPTE generation. Choose a value from the <b>Internal timer resolution</b> drop-down list to specify the internal timer accuracy used for generating SMPTE. Low values produce more accurate SMPTE generation, but may also decrease system performance.
Use free-wheel for SMPTE loss	Select this check box to stop playback if the incoming MIDI timecode signal stops. When this check box is not selected, Sound Forge playback will continue until the user stops playback manually.  In the <b>Free-wheel time</b> box, specify the amount of time that Sound Forge playback will continue after the incoming MIDI timecode signal stops. If timecode starts again during this time, playback will continue.  In the <b>Free-wheel slack</b> box, specify how fast the software should expect timecode updates before going into Free-wheel mode. If you have a fast computer, this value can be set to a lower value if you want to stop playback immediately when timecode is interrupted.
Enable SMPTE playback offset	Select this check box to specify an offset that will be added to the time displayed in the Sound Forge play counter. For example, if you want to generate MIDI timecode starting at 01:00:00:00, instead of inserting 1 hour of silence at the beginning of your sound file, you can specify that amount in this box. When using Record Sync, you'll often want to set this value to the Enable MTC/SMPTE Input Synchronization Start time. The Sound Forge ruler and play counter will not display this offset.

## Previews tab

The **Previews** tab allows you to specify options for previewing files.

Item	Description
Limit non-realtime previews to	Select this check box and specify the length of audio that will be used when generating a preview. Low values decrease the amount of time needed to generate a preview when tuning effects or processing values.
Pre-roll	Select this check box and specify how many seconds of unprocessed audio will be played before the processed selection. Use this to listen to the transition from unprocessed to processed data.  <b>Tip:</b> <b>Pre-roll</b> can be toggled on and off by right-clicking the dialog and choosing <b>Pre-roll</b> from the shortcut menu.
Post-roll	Select this check box and specify how many seconds of unprocessed audio will be played after the processed selection. Use this to listen to the transition from processed to unprocessed data.  <b>Tip:</b> <b>Post-roll</b> can be toggled on and off by right-clicking the dialog and choosing <b>Post-roll</b> from the shortcut menu.
Reactive previewing	Select this check box to automatically recalculate and play back the preview buffer if the parameters of an effect change. This allows for immediate feedback of the effects of a change.  This option is most useful when using a fast computer, limiting preview times, and not using processor-intensive effects.  <b>Note:</b> You can temporarily suspend <b>Reactive Previewing</b> by holding down the Shift key while making parameter changes.
Audio event locator:	Use the <b>Pre-roll</b> and <b>Loop time</b> settings to control how the audio event locator plays audio:
Pre-roll/Loop time	<ul style="list-style-type: none"><li>• In the <b>Pre-roll</b> box, specify the amount of data played prior to the cursor position.</li><li>• In the <b>Loop time</b> box, specify the amount of time that will loop when you stop the cursor while clicking and dragging in the overview bar.</li></ul> To use the audio event locator, click the overview bar and drag the mouse. Similar to a scrub control, playback follows mouse movement and loops around the cursor position when the mouse is still. Playback stops when the mouse button is released.
Cut preview configuration:	Use the <b>Pre-roll</b> and <b>Post-roll</b> settings to control the amount of data that is played back when you choose Preview Cut/Cursor from the Edit menu:
Pre-roll/Post-roll	<ul style="list-style-type: none"><li>• In the <b>Pre-roll</b> box, specify the amount of data played prior to the selection or cursor position.</li><li>• In the <b>Post-roll</b> box, specify the amount of data played after the selection or cursor position.</li></ul>
Play Looped adjust pre-roll	When <b>Loop Playback</b>  mode is turned on and you make a selection during playback, playback is pre-rolled from the end of the selection to help you tune long loops.  Specify the number of seconds before the end of the selection that you would like to pre-roll.
Playlist pre-roll	Enter a value in the edit box or use the up and down arrows to specify the amount of pre-roll that will be used when playing entries in the Playlist/Cutlist window. This allows you to easily hear the transition from one region to another without having to play all the way through the first region.

## Status tab

The **Status** tab allows you to specify preferences for displaying information in the status bar.

Item	Description
Default frames per second	The default frame rate used to calculate frame values. Frame values are useful when trying to synchronize sound with animation. Most animation players specify a playback frame rate at which video frames are shown to the user. If you are using an animation that has a frame rate of 15.0 frames per second, you would set the frame rate to 15.0. When status values are displayed, they will be shown in values of frames. This allows you to find the frame to which a given point in the sound file corresponds.
Default beats per measure	The number of beats in each measure for displaying in measures and beats. For example, 2/4 time would have two beats per measure. This setting will be also be used in the Edit Tempo dialog.
Default beats per minute	The number of beats per minute, i.e. the tempo of a song for displaying lengths. This setting will be also be used in the Edit Tempo dialog.
RMS level scan time	The amount of sound data surrounding the cursor used to calculate the RMS level in the Levels toolbar.
Peak level scan time	The amount of sound data surrounding the cursor used when searching for a peak level to display in the Levels toolbar.
0 VU (+4 dBu) level	Choose a setting from the drop-down list or type a value in the box to calibrate the VU/PPM meters to their associated levels on the peak meters. VU meters display sound in dB VU, where 0 VU is a reference level, and there is headroom above 0 VU. The Sound Forge peak meters display peaks in dB FS (decibels relative to full scale). In digital audio, there is no headroom above 0 dB FS. Choosing a setting from this drop-down list subtracts a nominal dB value from the VU meters so that a signal displayed on the VU meters remains slightly below 0 dB on the peak meters.
VU meter integration time	Type a value in the box to set the amount of data surrounding the cursor that will be used to calculate levels in the VU meters. This setting has no effect on the PPM scales, which use fixed integration times: <ul style="list-style-type: none"><li>• UK PPM: 10 ms</li><li>• EBU PPM: 10 ms</li><li>• DIN PPM: 5 ms</li><li>• Nordic PPM: 5 ms</li></ul>

## Toolbars tab

The **Toolbars** tab allows you to specify which toolbars you want to display.

### Display or hide toolbars

Select the check box to display a toolbar; clear a check box to hide a toolbar.

### Display or hide Tool Tips

Select the **Show Tool Tips** check box if you want to display pop-up descriptions when the mouse is held over certain items.

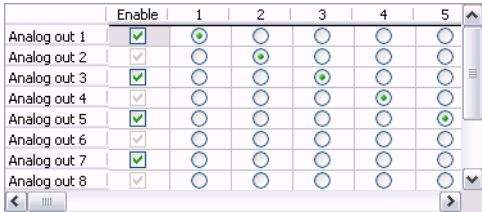
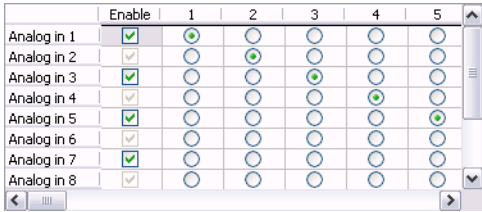
### Customizing a toolbar

1. From the **View** menu, choose **Toolbars**. The Preferences dialog appears with a list of available toolbars.
2. Select the check box for a toolbar and click **Customize**. The Customize Toolbar dialog is displayed.
3. Use the controls in the Customize Toolbar dialog to add, remove, or rearrange the buttons on the selected toolbar. Click **Reset** to restore the toolbar to its default setting.
4. Click the **OK** button.

## Audio tab

The **Audio** tab allows you to specify playback and recording options.

### Basic audio preferences

Item	Description
Audio device type	<p>Choose a driver type from the drop-down list.</p> <ul style="list-style-type: none"> <li>• <b>Microsoft Sound Mapper</b> - The default setting. Allows the Sound Mapper to choose appropriate playback and recording devices.</li> <li>• <b>Windows Classic Wave</b> - Allows you to choose a specific audio device using a classic Wave driver.</li> <li>• <b>ASIO</b> - Allows you to choose a specific audio device using a low-latency ASIO driver.</li> </ul>
Playback	<p>Click the <b>Playback</b> tab to adjust playback routing and buffering settings.</p>
- Playback device routing	<p>Use this control to assign channels from multichannel audio files to outputs on your sound card: the numbered columns represent audio channels, and the rows represent the selected playback device's outputs. Select the Enable check box to enable an output, and select a radio button to assign the channel to an output.</p> <p>In the following example, channel 1 is routed to the sound card's first output, channel 2 is routed to the second output, and so on.</p> 
- Playback buffering (seconds)	<p>Specifies the total amount of buffering that is used during playback.</p> <p>The larger the number, the more buffering is performed during playback. This value must be as low as possible without gapping. To set it, start at .25 and play back a typical song. Move some of the track faders. If the playback gaps, try increasing this slider in small increments until the gapping goes away.</p> <p>If you simply cannot get playback to be free of gapping, you need to install more RAM in your computer so you can increase buffering, buy a faster access hard drive, or minimize the number of audio plug-ins you are trying to use simultaneously.</p>
Record	<p>Click the <b>Record</b> tab to adjust record input routing and buffering settings.</p>
- Recording device routing	<p>Use this control to assign channels from multichannel audio files to outputs on your sound card: the numbered columns represent audio channels, and the rows represent the selected record device's inputs. Select the Enable check box to enable an input, and select a radio button to assign the input to a channel.</p> <p>In the following example, the signal from Analog in 1 is recorded to channel 1, Analog in 2 is recorded to channel 2, and so on.</p> 
- Record buffering (seconds)	<p>Specifies the total amount of buffering that is used during recording.</p> <p>If you use your computer for other tasks while recording, increasing this setting can reduce the likelihood of those tasks interrupting recording.</p>
Advanced	<p>Click this button to open the Advanced Audio Configuration dialog. For more information on these options, see below.</p>
Default All	<p>Click to restore the <b>Audio</b> tab to the default settings.</p>


## Advanced audio preferences

You can click the **Advanced** button on the **Audio** tab to access the advanced audio preferences.

Setting	Description
Audio devices	This list contains all of the audio devices that are installed in your computer. Select a device from the list to set the options below for that device.
Interpolate position	When this check box is selected, the software will attempt to compensate for inaccurate devices by interpolating the playback or recording position. If you notice that your playback cursor is offset from what you are hearing, enable this option for the playback device.
Position bias	If the position of playback or recording does not match what you hear after you enable <b>Interpolate position</b> , you can attempt to compensate using the <b>Position bias</b> slider.  Moving this slider will offset the position forward or backward to compensate for the inaccuracies of the device.
Do not pre-roll buffers before starting playback	When this check box is selected, the software will not create buffers prior to starting playback. Some devices do not behave properly if this check box is cleared.  If your audio stutters when you start playback try selecting this check box.
Audio buffers	Drag the slider to set the number of audio buffers that will be used. Adjusting this setting can decrease gapping or help you synchronize the input and output.
Buffer size	Choose a setting from the drop-down list to indicate the buffer size you want to use. Choose <b>MME</b> to use the <b>Playback buffering</b> setting on the <b>Audio</b> tab in the Preferences dialog.  For example, if you choose <b>MME</b> from the <b>Buffer size</b> drop-down, set the <b>Audio buffers</b> slider to 5, and set <b>Playback buffering</b> to 0.35 seconds, five 0.07-second buffers are created.  If you choose 1024 from the <b>Buffer size</b> drop-down and set the <b>Audio buffers</b> slider to 5, five 1024-byte buffers are created.
Priority	Choose a setting from the drop-down list to set the priority that is assigned to your audio buffers.  Increasing the buffers' priority can help you attain smoother playback, but it can also adversely affect other processes.

## Video tab

Use the **Video** tab to specify preferences for displaying video.

Item	Description
Frame numbering on thumbnails	Determines how individual frame information, located in a box at the lower left-hand corner of each frame, will be displayed in the video strip when frame numbering is turned on.  The frame information box can include <b>Frame Numbers</b> or <b>Media Timecode</b> .
Allow pulldown removal when opening 24p DV	Select this check box if you want to remove pulldown when you open 24 fps progressive-scan DV video files.  When the check box is cleared, Sound Forge software will read 24p video as 29.97 fps interlaced video (60i).
Deinterlace method	Choose a setting from the drop-down list to determine how Sound Forge software separates the two fields that make up a video frame when you render to a progressive format: <ul style="list-style-type: none"><li>• <b>Blend Fields:</b> Maintains the data in the two fields by blending them together. This method can produce a smooth, motion-blurred image.</li><li>• <b>Interpolate:</b> Deletes one field and uses the remaining field to interpolate the deleted lines. This produces sharper images than <b>Blend Fields</b> but can introduce jagged motion or stair-stepping artifacts.</li></ul>
Resample source video when rendering to a higher frame rate	Select this check box if you want to interpolate video frames when you render to a frame rate that is greater than the source file's frame rate.
External monitor device	Choose a device from the drop-down list to configure an IEEE-1394 device for use with an external monitor. Sound Forge will send your video output to this device when you click the Preview on External Monitor button  in the Video Preview window.  More information on this device are displayed in the <b>Details</b> pane.  You can make additional preview playback adjustments near the bottom of the Video tab once you've selected an external monitor device: <ul style="list-style-type: none"><li>• If necessary, you can adjust the video to display properly on your external monitor. Choose the desired format from the drop-down list.</li><li>• If audio and video do not play back in synchronization, drag the <b>Sync offset</b> slider to specify a frame offset to restore synchronization.</li></ul>
Details	Displays information about the device selected in the <b>External monitor</b> drop-down list.
If project format is invalid for DV output, conform to the following	If your source media does not conform to DV standards, choose a setting from the drop-down list. The video is adjusted to display properly on your external monitor.
Sync offset (frames)	If your audio is not synchronized with your external monitor, you can configure an offset for your hardware. Drag the slider to synchronize audio and video.  This setting affects synchronization for previewing on an external monitor. Audio and video synchronization in the Sound Forge workspace is not affected.

## VST Effects tab

The **VST Effects** tab allows you to specify where your VST plug-ins are installed.

Item	Description
Default VST search folder	This is the folder in which the application looks for VST effects during startup.
Alternate VST search folder 1	Enter a path in the edit box or click <b>Browse</b> to indicate where the application can find VST effects.
Alternate VST search folder 2	Enter a path in the edit box or click <b>Browse</b> to indicate where the application can find VST effects.
Select VST effects to be available as audio plug-ins	Lists the VST effects that are currently available. Select a VST effect's check box to make it available for use as a plug-in. <b>Note:</b> When you use a VST plug-in, the software will lock it for the remainder of your session. A lock is displayed next to the check box to indicate that the plug-in cannot be removed until you close and restart the application.

## Customizing keyboard shortcuts

From the **Options** menu, choose **Customize Keyboard** to customize the keyboard shortcuts available in the Sound Forge interface.

The **Shortcut keys** box displays the currently assigned shortcut keys for the selected command. Click a tab in the middle of the dialog to choose which shortcuts you want to see.

### Editing or creating new shortcuts

1. From the **Options** menu, choose **Customize Keyboard**. The Customize Keyboard dialog is displayed.
2. Click a tab in the middle of the dialog to indicate the type of command you want to assign to a keyboard shortcut.
3. Select a command in the list.

**Tip:** You can type a word in the **Show commands containing** box to filter the list of commands to display only commands that contain the word you typed.

4. Click the **Shortcut keys** box and press the key combination you want to assign to the selected command.

**Tip:** If you type a key combination that has already been assigned to another command, the **Shortcut currently assigned to box** displays the existing assignment. To find the existing command, click the **Locate** button.

5. Click the **Add** button to assign the key combination in the **Shortcut keys** box to the selected command.

### Saving a keyboard mapping

1. From the **Options** menu, choose **Customize Keyboard**. The Customize Keyboard dialog is displayed.
2. Click the **Save as** button and type a name to save your current keyboard shortcuts to an .ini file in the C:\Documents and Settings\[user name]\Application Data\Sony\Sound Forge\9.0 folder.

**Note:** The Application Data folder is not visible unless the **Show hidden files and folders** radio button is selected on the **View** tab of the Windows Folder Options control panel.

You can use this file as a backup or to share your keyboard shortcuts with other Sound Forge users.

### Deleting a keyboard mapping

1. From the **Options** menu, choose **Customize Keyboard**. The Customize Keyboard dialog is displayed.
2. Choose a mapping from the **Keyboard map** drop-down list and click the **Delete** button to remove the selected keyboard mapping.

**Note:** You cannot delete the default Sound Forge keyboard mapping.

## Importing or renaming a keyboard mapping

Copy a Sound Forge keyboard mapping .ini file to the C:\Documents and Settings\[user name]\Application Data\Sony\Sound Forge\9.0 folder.

**Note:** *The Application Data folder is not visible unless the **Show hidden files and folders** radio button is selected on the **View** tab of the Windows Folder Options control panel.*

The next time you start Sound Forge, the new keyboard mapping will be available from the **Keyboard map** drop-down list in the Customize Keyboard dialog.

**Tip:** *If you want to edit a the name used to identify a keyboard mapping in the Customize Keyboard dialog, open the .ini file in a text editor and change the <Display Name> portion of the **Name=<Display Name>** entry. Save the .ini file and restart Sound Forge to use the new name.*

## Resetting the default keyboard mapping

1. From the **Options** menu, choose **Customize Keyboard**. The Customize Keyboard dialog is displayed.
2. Choose [**Default**] from the **Keyboard map** drop-down list and click **OK** to restore the default configuration.





# Appendix A Shortcuts

## Keyboard shortcuts

The following shortcuts represent the default configuration. Your system may differ if you've used the Keyboard tab in the Preferences dialog to customize your keyboard shortcuts in Sound Forge software. Click the **Default All** button on the Keyboard tab to restore the default configuration, or you can click the **Export** button on the Keyboard tab to save the current shortcuts in a map file.

The available shortcut keys are arranged in tables according to function.

### Project file commands

Press	Result
Ctrl+N	Create a new data window.
Ctrl+Shift+N	Create a new data window without displaying the New Window dialog
Ctrl+O	Open a sound file or project.
Ctrl+S	Save modified sound data back to the file.
Alt+Enter	Display the Properties dialog for the active data window.
Ctrl+W	Close the active data window.
Alt+F4	Exit the application.

## Magnification and view commands

Press	Result
Alt+0	Set input focus to the waveform display in the active data window.
Alt+1	Show/set input focus to the Explorer window.
Alt+2	Show/set input focus to the Regions List.
Alt+3	Show/set input focus to the Playlist/Cutlist window.
Alt+4	Show/set input focus to the Video Preview window.
Alt+5	Show/set input focus to the Time Display window.
Alt+6	Show/set input focus to the Channel Meters window.
Alt+7	Show/set input focus to the Undo/Redo History window.
Alt+8	Show/set input focus to the Spectrum Analysis window.
Alt+9	Show/set input focus to the Plug-In Chainer window.
Ctrl+Alt+0	Show/set input focus to the Plug-In Manager window.
Ctrl+Alt+1	Show/set input focus to the MIDI Keyboard window.
Ctrl+Alt+2	Show/set input focus to the Script Editor window.
Ctrl+Alt+3	Show/set input focus to the Hardware Meters window.
Shift+F4	Tile the data windows vertically.
Alt+F5	Restore the Sound Forge application window.
Shift+F5	Cascade the data windows.
Ctrl+F5	Restore the active data window.
F6	Toggle playback scrolling on and off.
Shift+F6	Toggle smooth playback scrolling on and off.
Ctrl+F6	Go to the next data window.
Ctrl+Shift+F6	Go to the previous data window.
Ctrl+F10	Maximize the active data window.
Alt+F10	Maximize the Sound Forge application window.
F11	Show/hide windows docked at the bottom of the workspace.
Shift+F11	Show/hide windows docked at the sides of the workspace.
Ctrl+F11	Show/hide all docked windows.
Ctrl+Enter	Maximize the width of the active data window.
V	Insert/show/hide volume envelope.
Shift+V	Insert/remove volume envelope.
P	Insert/show/hide pan envelope.
Shift+P	Insert/remove pan envelope.

## Data window edit commands

Press	Result
D/Shift+D	Select the previous/next editing tool (Edit tool, Magnify tool, Pencil tool).
Ctrl+D	Select the Edit tool.
Ctrl+A	Select all data in the active window.
Ctrl+C	Copy the selected data onto the clipboard.
Ctrl+E	Paste the clipboard contents into a new data window.
Ctrl+M	Mix data from the clipboard with the active window.
Ctrl+T	Trim (crop) to the current selection.
Ctrl+V	Paste data from the clipboard into the active window.
Ctrl+X	Move (cut) the selected data onto the clipboard.
Ctrl+Y	Repeat last process, effect, or tool.
Ctrl+Z	Undo the last action.
Ctrl+Shift+Z	Redo the last undone action.
Delete	Clear (delete) the selected data; nothing is placed on the clipboard. <b>Note:</b> If the <b>Treat as Cutlist</b> command (available in the <b>Special</b> menu, <b>Playlist/Cutlist</b> submenu) is selected, deleting a selection creates a region in the Cutlist window, but does not remove the selection.
C	Insert a command marker at the current cursor position.
M	Insert a marker at the current cursor position.
Ctrl+B	Toggle Auto Snap to Zero on and off.
V	Insert/show/hide volume envelope.
Shift+V	Insert/remove volume envelope.
P	Insert/show/hide pan envelope.
Shift+P	Insert/remove pan envelope.
Alt+Shift+L	Create a loop from the current selection.
Alt+L	Create a loop from the current selection without displaying the Edit Sample dialog.
Esc	Stop or cancel the current action (including playback).
F8	Toggle drag-and-drop snapping on and off.

## Cursor movement

Press	Cursor moves to
→ (right arrow)/ ← (left arrow)	Move one pixel right/left.
Ctrl+Alt+ → (right arrow)/Ctrl+Alt+ ← (left arrow)	Move one audio sample right/left.
Alt+ ← (left arrow)/Alt+ → (right arrow)	Previous/next video frame (video files). <b>Note:</b> This is only available if the data window contains a video file.
Ctrl+G	Display the Go To dialog.
Home	Go to the first sample visible in the waveform display.
End	Go to the last sample visible in the waveform display.
Ctrl+Home	Go to the first sample in the data window.
Ctrl+End	Go to the last sample in the data window.
Page Up	Move 10% of the current view prior to the cursor position.
Page Down	Move 10% of the current view past the cursor position.
Ctrl+Page Up	Move 100% of the current view prior to the cursor position.
Ctrl+Page Down	Move 100% of the current view past the cursor position.
Ctrl+ → (right arrow)	Go to end of file. If regions, loops, or markers exist in the file, this keystroke moves to the next region, loop, or marker boundary.
Ctrl+ ← (left arrow)	Go to beginning of file. If regions, loops, or markers exist in the file, this keystroke moves to the previous region, loop, or marker boundary.
. (period) or \	Center the cursor in the waveform display.
+ (numeric keypad)	Go to the next sample.
- (numeric keypad)	Go to the previous sample.
Ctrl+numeric keypad +	Move 10 samples past the current cursor.
Ctrl+numeric keypad -	Move 10 samples prior to the current cursor.

## Selecting data

Press	To select from cursor to
Ctrl+Shift+D	Show the Set Selection dialog.
Shift+ → (right arrow)/Shift+ ← (left arrow)	Select from the cursor to the next/previous screen pixel.
Shift+Ctrl+Alt+ → / Shift+Ctrl+Alt+ ←	Select from the cursor to the next/previous sample.
Shift+Alt+ → / Shift+Alt+ ←	Select from the cursor to the next/previous video frame. <b>Note:</b> This is only available if the data window contains a video file.
Shift+Home	Select from the cursor to the first sample visible in the waveform display.
Shift+End	Select from the cursor to the last sample visible in the waveform display.
Ctrl+Shift+Home	Select from the cursor to the first sample in the data window.
Ctrl+Shift+End	Select from the cursor to the last sample in the data window.
Shift+Page Up	Select from the cursor to 10% of the current view prior to the cursor position.
Shift+Page Down	Select from the cursor to 10% of the current view past the cursor position.
Ctrl+Shift+Page Up	Select 100% of the current view prior to the cursor position.
Ctrl+Shift+Page Down	Select 100% of the current view past the cursor position.
Ctrl+Shift+ →	Select 10 pixels past the cursor position. If regions, loops, or markers exist in the file, this keystroke selects to the next region, loop, or marker boundary.
Ctrl+Shift+ ←	Select 10 pixels prior to the cursor position. If regions, loops, or markers exist in the file, this keystroke selects to the previous region, loop, or marker boundary.
Shift+numeric keypad +	Select from the cursor to the next sample.
Shift+numeric keypad -	Select from the cursor to the previous sample.
Ctrl+Shift+numeric keypad +	Select 10 samples past the current cursor.
Ctrl+Shift+numeric keypad -	Select 10 samples prior to the current cursor.
T	Snap to time.
Shift+T	Snap edge to time.
Z	Snap to next zero crossing.
Shift+Z	Snap edge to next zero crossing.
Tab/Shift+Tab	Switch the selection through the channels in a multichannel file.
<	Shift current selection to the left by the length of the selection.
>	Shift current selection to the right by the length of the selection.
;	Cut the current selection length in half.
'	Double the current selection length.
:	Rotate audio.
S or Backspace	Toggle current selection on and off.
Alt+Shift+L	Create a loop from the current selection.
Alt+L	Create a loop from the current selection without displaying the Edit Sample dialog.

## Navigation and playback

Press	Result
Ctrl+<Number>	Save a view in cell <Number> where <Number> ranges from 1 to 8.
<Number>	Restore a view using cell <Number> where <Number> ranges from 1 to 8.
↑ (up arrow) or mouse wheel up	Increase time magnification (zoom in).
↓ (down arrow) or mouse wheel down	Decrease time magnification (zoom out).
Shift+↑	Increase level magnification.
Shift+↓	Decrease level magnification.
Ctrl+↑	Zoom to selection if a selection exists; otherwise Zoom In Full.
Ctrl+↓	Zoom normal (zooms to default zoom ratio set in Preferences).
1 (on numeric keypad)	Display custom zoom ratio 1.
2 (on numeric keypad)	Display custom zoom ratio 2.
Ctrl+Shift+↑	Pan data window up if zoomed in vertically.
Ctrl+Shift+↓	Pan data window down if zoomed in vertically.
5 (on numeric keypad)	Switch cursor to opposite end of selection.
I	Set Mark In at the current cursor position.
O	Set Mark Out at the current cursor position.
Spacebar or F12	Play or stop the contents of the data window in default mode.
Shift+Spacebar or Shift+F12	Play all.
Enter or Ctrl+F12	Play/Pause.
X	Switch play mode between Normal, Plug-In Chainer, Play as Sample, and Play as Cutlist playback modes.
Enter	Pause playback and leave the cursor at the current position.
Esc	Stop or cancel the current action (including playback).
Q	Toggle looped playback.
Ctrl+K	Preview cut (skip selection on playback with pre-roll).
Ctrl+Shift+K	Play to cursor with pre-roll.
J, K, or L	Scrub playback
F6	Toggle playback scrolling on and off.
Shift+F6	Toggle smooth playback scrolling on and off.
F7	Generate MIDI timecode.
Ctrl+F7	Trigger from MIDI timecode.

## Record dialog keyboard shortcuts

Press	Result
Ctrl+R	Open Record dialog.
Alt+R	Start/stop recording.
Alt+P	Play.
Alt+T	Reset clip indicators.
Esc	Stop recording or playback.
Alt+Z	Go to the start of the file.
M	Insert a marker while recording.

## Plug-In Chainer

Press	Result
Ctrl+P	Preview audio through plug-in chain.
Ctrl+Shift+P	Process selection using the plug-in chain.
Ctrl+B	Bypass the plug-in chain while previewing audio.
Ctrl+S	Save chain preset.
Ctrl+T	Toggle through audio tail processing modes (Ignore Tail Data, Mix Tail Data, Insert Tail Data).
Ctrl+E	Open the Plug-In Chooser dialog to add plug-ins to chain.
Ctrl+Delete	Remove selected plug-in from chain.
Ctrl+Tab	Select the next plug-in in the chain.
Ctrl+Shift+Tab	Select the previous plug-in in the chain.
Ctrl+H	Shows/hides the effect automation parameter chooser.

## Regions List

Press	Result
Spacebar	Play or stop playback of the active marker or region.
Enter or Shift+E	Edit the active marker or region.
Delete	Delete the active marker or region.
R	Create region from the current selection.
Shift+R	Create region without displaying dialog.

## Playlist/Cutlist

Press	Result
Spacebar	Play or stop playback of the active playlist entry.
Enter	Edit the active playlist entry.
Delete	Delete the active playlist entry.
+ (plus sign)	Add one to the active playlist entry play count.
- (minus sign) (not numeric keypad)	Subtract one from the active playlist entry play count.
* (asterisk) (not numeric keypad)	Add or remove a stop point on the active playlist entry.
/ (forward slash) (not numeric keypad)	Toggle pre-roll on and off for the playlist.

## Script Editor

Press	Result
F3	Find next instance of last-searched text
Shift+F3	Find previous instance of last-searched text
Ctrl+F3	Find next instance of the selected text
Ctrl+Shift+F3	Find previous instance of the selected text
Ctrl+N	Create a new script
Ctrl+O	Open a script
Ctrl+R	Run the current script.
Ctrl+Shift+R	Compile the current script.
Ctrl+S	Save the current script.

## Mouse wheel shortcuts

Mouse wheel action	Result
Wheel Up	Zoom in horizontally.
Wheel Down	Zoom out horizontally.
Ctrl+Wheel Up	Zoom in vertically.
Ctrl+Wheel Down	Zoom out vertically.
Shift+Wheel Up	Scroll left (in 10ths of screen width).
Shift+Wheel Down	Scroll right (in 10ths of screen width).
Ctrl+Shift+Wheel Up	Cursor left or current selection point left (if there is a selection).
Ctrl+Shift+Wheel Down	Cursor right or current selection point right (if there is a selection).

## Additional mouse shortcuts

### Select all

Double-click the waveform display to select the entire sound file. Triple-click when regions, loops, or markers are present.

**Tip:** You can turn off the triple-click feature on the **Editing** tab of the *Preferences dialog*.

### Zoom time and level

Double-click the level ruler to zoom the current selection vertically and horizontally. If no selection exists, all waveform data is zoomed.

### Return control value to default

Double-click a slider, fader, or spinner to return the control to its default value.

### Fine-tune control value

To fine-tune a slider, fader, or spinner, hold the right and left mouse buttons (or hold Ctrl) while dragging.

### Preview

Hold Shift and click the **Preview** button to hear the original audio. This is equivalent to selecting the **Bypass** check box.

Hold Ctrl and click the **Preview** button to display the Preview Configuration dialog.

### Status bar

The status bar is displayed across the bottom of the Sound Forge window. Right-click the **Sample Rate**, **Bit Depth**, or **Channels** box and choose a setting from the shortcut menu, or double-click a box to edit the setting directly. Right-click the **Total Length** box and choose a format from the shortcut menu.



### Selection status bar

The selection status bar is displayed at the bottom of Sound Forge data windows. There are several shortcuts for the selection status bar:

- Double-click the **Selection Start**, **Selection End**, or the **Selection Length** boxes to type values in the boxes to specify or edit a selection.
- Right-click any of the boxes and choose **Go To** from the shortcut menu to display the Go To dialog and specify a start position for your selection.
- Right-click any of the boxes and choose **Set Selection** from the shortcut menu to display the Set Selection dialog and specify your selection position and length.
- Right-click any of the boxes and to choose a time format.

### Go to marker

Double-click a marker tag in the ruler to move the cursor to the position of the marker.

### Set selection to region/loop

Double-click a region or loop tag in the ruler to change the current selection to the region or loop end points.

### Edit region or marker

Double-click a region or marker in the Regions List to display the Edit Region/Marker dialog.

### Edit playlist

Double-click a playlist entry to display the Edit Playlist dialog. *For more information, see [Editing a playlist/cutlist region](#) on page 109.*

### Play Normal button

Hold Ctrl and click to preview a Cut operation. Hold Ctrl+Shift and click to play to the cursor with pre-roll.

### Slow and fast selection scroll toggle

To create a selection extending past the start or end of the waveform display, hold the left mouse button while clicking the right mouse button to toggle between fast and slow scrolling.



## Appendix B: Microsoft Audio Compression Manager

The Microsoft Audio Compression Manager (ACM) is a standard interface for audio compression in Windows. This interface allows applications such as Sound Forge® to use compression algorithms provided by other companies.

Sound Forge software fully supports audio compression through the ACM. This allows you to use any ACM-compatible compression. Compressed WAV files are transparently opened and all available compression formats for WAV files are provided in the Save As dialog.

There are two major components to the ACM:

- Audio data compression and decompression
- Transparent playback and recording of non-hardware supported audio files

### Audio data compression and decompression

The first component of the ACM allows audio data to be compressed and decompressed. Audio compression is used to decrease the amount of data required to represent a sound and results in smaller sound files. However, there are drawbacks to using audio compression on sound files:

- Most audio compression algorithms degrade sound quality. This is referred to as lossy compression because information contained in the sound is lost when it is compressed. The amount of sound degradation is dependent upon the algorithm.
- Compressed audio requires more processing time than uncompressed data. The amount of processing time is dependent on the algorithm as well as the system's hardware. Typically, opening and saving compressed files takes longer than uncompressed files.
- Compressed files are not as portable as uncompressed files. To distribute WAV files in a compressed format, you must verify that the audience can use them. Also, not all audio software can use compressed WAV files, which may make using other applications with the Sound Forge software difficult.

In Sound Forge software, any compressed WAV file can be opened if a compatible ACM driver is installed. If no compatible ACM driver is available for a compressed WAV file, you are alerted to the problem.

Saving compressed WAV files is as simple as specifying the compression algorithm in the **Format** drop-down list of the Custom Settings dialog. Once a compressed file is saved, updates to the file are automatically saved using the selected compression algorithm. The compression format can be changed later—or reverted to an uncompressed format—using the Save As dialog.

## Transparent playback and recording of non-hardware supported audio files

The second component of the ACM is called the Sound Mapper. It allows playback and recording of audio data formats that are not directly supported by the sound card. You can select the Sound Mapper as the Playback and Record devices on the **Audio** tab of the Preferences dialog. You can perform any additional configuration of the Sound Mapper from the Windows Control Panel.

The Sound Mapper functions as follows. When faced with a sound file recorded at an unusual sample rate such as 22,257 Hz and a sound card that supports 22,050 Hz, the sound file normally cannot be played. The sample rate of the file must be changed to 22,050 Hz before it can be played back, but changing the sample rate without resampling causes a pitch shift. However, the Sound Mapper plays this file without resampling by mapping the sound to the best format possible and performing the resampling in real time.

In addition, the Sound Mapper plays compressed sound files, even on sound cards that do not support compression directly. A file compressed with Microsoft ADPCM or The DSP Group's TrueSpeech plays on any sound card without first decompressing the file.

The Sound Mapper can, under the right circumstances, record compressed sound files. Compressing sound data can be computationally expensive, and the amount of time required is dependent upon the specific compression algorithm and how it is implemented. Decompressing sound data is typically faster than compressing the same sound data.

It should be noted, however, that the Sound Forge application does not play and record compressed sound files directly. Rather, all compression and decompression is performed while opening and saving the files. This limitation is fairly insignificant, and the compressed sound files are saved using the best possible quality—something that cannot always be done in real time. Compressed sound files saved with the software typically sound better than those recorded with audio compression.

After you save uncompressed audio data to a compressed format, you should audition the file. Compression and decompression are performed during opening and saving; therefore, the compressed file is not accurately represented until it has been reopened.

## Appendix C SMPTE Timecode

The Society of Motion Picture and Television Engineers (SMPTE) timecode may be one of the most misunderstood concepts among individuals within the music industry. The problem with SMPTE timecode formats is that they may mean different things to people in the audio and video fields. What follows is a brief description of each SMPTE timecode format.

**Important:** *When synchronizing audio to video, it is crucial that the SMPTE timecode format used in the sequencer or digital audio workstation is the same as the SMPTE timecode striped onto the video. This guarantees that the SMPTE times on the video screen and computer monitor synchronize during playback.*

### SMPTE 25 EBU (25 fps, Video)

SMPTE 25 EBU timecode runs at 25 fps (frames per second), and matches the frame rate used by European Broadcasting Union (EBU) television systems.

SMPTE 25 EBU format is used for PAL DV/D1 video projects.

### SMPTE Drop Frame (29.97 fps, Video)

SMPTE Drop Frame timecode runs at 29.97 fps, and matches the frame rate used by NTSC television systems (North America, Japan).

SMPTE Drop Frame format is used for NTSC DV/D1 video projects.

Both SMPTE Drop and SMPTE Non-Drop run at 29.97 fps. In both formats, the actual frames are not discarded, but they are numbered differently. SMPTE Drop removes certain frame numbers from the counting system to keep the SMPTE clock from drifting from real (“wall clock”) time. The time is adjusted forward by two frames on every minute boundary except 0, 10, 20, 30, 40, and 50. For example, when SMPTE Drop time increments from 00:00:59.29, the next value is 00:01:00.02.

### SMPTE Non-Drop Frame (29.97 fps, Video)

SMPTE Non-Drop Frame timecode runs at a rate of 29.97 fps. This leads to a discrepancy between real (“wall clock”) time and the SMPTE time, because there is no compensation in the counting system as there is in SMPTE Drop Frame.

SMPTE Non-Drop format is used for NTSC D1 video projects that are recorded on master tapes striped with Non-Drop timecode.

### SMPTE 30 (30 fps, Audio)

SMPTE 30 is an audio-only format and runs at exactly 30 fps. SMPTE 30 is commonly used when synchronizing audio applications such as multitrack recorders or MIDI sequencers. This format is not used when working with video.

### SMPTE Film Sync (24 fps)

The SMPTE Film Sync time format runs at 24 fps (frames per second). This frame rate matches the standard crystal-sync 16/33 mm film rate of 24 fps.



## Appendix D Using CSOUND, MTU, IRCAM, BICSF, and EBICSF Files

Although Sound Forge® software supports a large number of sound file formats directly, it does not support the CSOUND, MTU, IRCAM, BICSF or EBICSF file types. However, you can use the Sound Forge Raw File Type capabilities to extract sound data from these file types.

### About IRCAM files

The IRCAM or IRCAM-Gross format consists of a 1024-byte header prior to the audio data. This header contains standard information like the number of channels, sampling rate, and data format, but can also contain the name of the sample and comments. This format is used by the MTU system and these files are frequently referred to as MTU files. IRCAM files support two types of data formats: 16-bit linear PCM and floating point data.

### About BICSF and EBICSF files

BICSF and EBICSF files (Berkeley/IRCAM/CARL Sound File or Extended BICSF) are extensions of the IRCAM format. Instead of using the standard IRCAM header, these files replace the first 28 bytes of the header with a standard NeXT/Sun header. This allows the IRCAM format to store additional information in its 1024-byte header, while also allowing the files to be read by software that supports the NeXT/Sun file format, such as the Sound Forge application.

### Opening files

#### BICSF and EBICSF files

When reading BICSF and EBICSF files, the software identifies them as NeXT/Sun files. This is because the header of the BICSF file has been modified to allow it to be read as a NeXT/Sun file. These files are read as long as they are in one of the supported NeXT/Sun data formats.

#### IRCAM, CSOUND and MTU files

To read these formats, users must import them as Raw data files. This is best accomplished by configuring the parameters in the Raw File Type dialog and saving them as presets. The Raw File import function allows these files to be opened providing they are stored in 16-bit linear format. Sound Forge software does not open floating point format IRCAM files.

## Opening an IRCAM file

1. From the **File** menu, choose **Open**. The Open dialog appears.
2. Specify **Raw Audio** from the **Files of type** drop-down list.
3. Select an IRCAM file to open and click **Open**. The Raw File Type dialog appears.
4. Configure the following parameters:
  - Specify a sample rate from the **Sample rate** drop-down list.
  - In the **Sample type** area, select the **16-bit PCM** radio button.
  - In the **Format** area, select the **Signed** radio button.
  - Select the appropriate **Byte order** radio button.
  - Choose a setting from the **Channels** drop-down list to select the number of channels stored in the file.
  - Set the **Header** value to **1024 bytes**.
  - Set the **Trailer** value to **0 bytes**.
  - To automatically use these settings to open all Raw files, select the **Remember my preference and apply it in the future** check box.

**Tip:** If you select the **Remember my preference and apply it in the future** check box, Sound Forge will bypass the Raw File Type dialog. However, you can access and change these settings from the Open dialog by selecting a Raw file and then clicking the **Custom** button.

5. Click **OK**.

### Notes:

- The settings you choose for opening the file — with the exception of the sample rate — will be used when you click **Save** or save the file using the **Default Template** setting in the Save As dialog as long as the number of channels in the source file matches the number of channels in the file you're saving. The sample rate will be determined from the source file.
- If you do not always use the same settings for reading raw files, make sure the **Keep media files locked** check box is selected on the **General** tab of the Preferences dialog. Otherwise, the individual settings will be lost if you have multiple raw files open and switch away from the Sound Forge window.

6. Click **Save As**. The Save Preset dialog is displayed.
7. Enter a name for the preset in the **New preset name** box and click **OK**. The preset is saved and the Raw File Type dialog is displayed.
8. Click **OK**. The file opens.

Remember that the byte order of files generated by CSOUND is not constant. CSOUND executables for PC generate files that use Little Endian byte ordering, while CSOUND for other platforms tends to generate files with Big Endian ordering. In addition, MTU files use Big Endian byte ordering. Sony Media Software recommends initially trying a file in Big Endian.

**Note:** You may want to save presets for byte ordering, as well as mono or multichannel, when receiving CSOUND files from a number of source computers.

## Saving files

You cannot save these files in their original format. You must select a Sound Forge-supported file format.

To save files for use with software that supports the BICSF/EBICSF format, use the NeXT/Sun format. This format does not save the additional information found in BICSF/EBICSF files, but allows the data to be read as a NeXT/Sun file.



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