
SAW32_{LITE} **SAW32** **SAWPLUS32**

USER'S GUIDE

INNOVATIVE QUALITY SOFTWARE

*For PC Compatible Systems
Running Windows NT/95/98*

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*SAW represents the ideas,
contributions and work of
many people.*

*Etienne Muson was one of
them. His hard work helped
establish SAW as a product
and Innovative Quality
Software as a company.*

*This work is dedicated to his
incredible energy.*

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About This Manual

This manual was designed as a reference for understanding and using the features and functions of *SAW32Lite*, *SAW32*, and *SAWPlus32*. These products are continually being updated with new features which will not be included in this printing of the manual. Once you receive an updated version, look for details on any new features and maintenance fixes in *Latest Release Notes* located in the *Info* dropdown menu within the program.

This manual includes the following chapters:

Chapter 1 - Introduction:

Gives an overview of the *SAW* features, installation instructions, system requirements, helpful suggestions for system optimization, and trouble-shooting tips.

Chapter 2 - Understanding the Interface:

Explains the various window views, navigation within the *SAW* environment, descriptions of the various controls and instructions on how to use them.

Chapter 3 - Controlling the Mix:

An in depth look at working with volumes and pans in the *MultiTrack* environment, and some powerful techniques for creating the perfect mix.

Chapter 4 - MultiTrack Recording:

Explains the various options available for recording direct to the *MultiTrack*. Explores techniques including over-dubbing, punching, and multiple takes.

Chapter 5 - Using the Menus:

A comprehensive look at each of the dropdown menus and the options contained within them.

Chapter 6 - Using the Effect Modules:

Explains the various audio processing effects that are included with the *SAW* environment.

Chapter 7 - Working with SMPTE:

A hard look at SMPTE time code, its many complexities, and how you can make the most of it in the *SAW* environment.



Chapter 8 - Operation Quick Reference Guide:




Provides a quick reference to the keyboard, mouse, and menu commands in **SAW**.



Chapter 9 - Troubleshooting:

Provides helpful information for troubleshooting in the Windows 95/98 environment.

Manual Conventions and Terminology

	The hand symbol will be used to indicate important notices and warnings.
	The pointing finger symbol will be used to indicate a point of mention about a particular feature or concept.
	The clock symbol will be used to indicate a time saving suggestion.
<i>Italics</i>	Menu items, keyboard commands, screen objects and reference to terms relating to audio will be written in italics. (Example: Click the <i>Cancel</i> button.)
Click	When instructions indicate to ‘ <i>click</i> ’ an object, press and release the left mouse button.
Double-click	When instructions indicate to ‘ <i>double-click</i> ’ an object, press and release the left mouse button twice quickly.
Right-click	When instructed to ‘ <i>right-click</i> ’ an object, press and release the right mouse button.
Drag	When instructed to ‘ <i>drag</i> ’ the mouse, point to the object then press and hold the left mouse button as you drag the object.

Chapter 1

INTRODUCTION

Welcome to the exciting world of non-linear digital audio *MultiTrack* editing with **SAW**. At Innovative Quality Software, we take great pride in providing superior craftsmanship and exceptional functionality in each of our products, and we feel that **SAW** represents one of the best values in PC audio today. So have fun and make some noise!

Overview

SAW is the acronym for *Software Audio Workshop*. This program runs in Microsoft Windows and turns your Windows PC into a powerful digital audio workstation.

SAW32Lite, **SAW32** and **SAWPlus32** represent the third generation of digital hard disk editing software from Innovative Quality Software. **SAW** is written in native NT/95/98 32 bit code. It truly makes use of and takes advantage of the multithreaded technology of the Windows 32 bit API.

Now you can easily record and edit up to 32 mono or stereo tracks with **SAWPlus32** (16 tracks in **SAW32**, 8 tracks in **SAW32Lite**) of 16 bit resolution, CD and DAT-quality soundfiles directly on your computer's hard drive. **SAWPlus32** supports up to 12 stereo sound cards (6 for **SAW32**, 3 for **SAW32Lite**), for a maximum of up to 24 physical inputs and outputs, and automatically converts 8 bit, 16 bit, mono or stereo files of any samplerate, playing them all seamlessly in sync - LIVE...in REAL-TIME!! The elegance and speed of the **SAW** design offers unmatched efficiency in taking a project from conception to completion.

Each track contains software controls for mute, solo, pan and fader with user definable fader slope values. These controls give you non-destructive, real-time PROGRAMMABLE mixing control with down-to-the-sample accuracy. Easily set volume and pan offsets that work in addition to complex fades and pans, allowing you to adjust overall track levels without disturbing the details of your mix. Volume and pan information is displayed on the track so you can *see*, as well as hear, the mix changes!

Easily overlay vocals on music beds. Easily add sound affects to existing productions. Easily create custom cross fades from one track to another. Easily assemble and master complete album projects...perform fades and panning live during playback, recording every move for perfect reproduction. And do it all non-destructively!

And since **SAW** allows you to edit across 200 sound files at once in the same editing session, you can mix and blend sounds from pre-categorized libraries or easily assemble that perfect solo from many different musical takes.

The *MultiTrack View* allows you to copy, drag and drop regions of audio to any position within the production instantly! This means you

INTRODUCTION

Overview

can change musical phrasing long after the original recording has been made and hear the changes immediately.

While other systems rely heavily on complex and expensive hardware to manipulate digital audio, **SAW** relies extensively on hand-coded, 32 bit Assembly Language programming to efficiently manipulate the digital audio within the software using the computer's CPU. This rare digital craftsmanship translates directly into incredible savings for you. Also, since the **SAW** system is not directly dependent on one proprietary hardware design, it offers much more flexibility and user choice in selecting the exact configuration to fit specific needs.

SAW can continue to grow and expand rapidly with software updates alone, allowing you to benefit from the post-release product enhancements that Innovative Quality Software has become famous for.

SAW makes excellent use of the Windows graphics operating system without getting bogged down by the typical overhead of resource-intensive dialog boxes. In fact, **SAW** boosts Window's normal performance tremendously due to its assembly language code, and you will enjoy screen updates and fast waveform drawing unmatched by even some of the most expensive audio workstations.

The editing environment offers simultaneous full and zoomed views of your audio waveforms, making it fast and simple to move around within a soundfile. Audio waveforms are true oscilloscope style, allowing you to visually locate exact positions easily.

On-screen control buttons eliminate the need for learning complex keystroke combinations to perform basic editing operations, however a comprehensive list of keystroke commands are available for those who prefer to use the keyboard. (See *Keyboard Command Quick Reference* chapter.) **SAW** takes you far beyond the functionality of standard tape recording equipment and delivers the effectiveness of true, non-linear, random hard disk editing power, matching the capabilities of systems costing thousands more.

Simultaneous *Marker*, *Region* and play *Sequence Views* make it easy to select and audition various sections of your soundfile and update editlists with the click of the mouse.

The *MultiTrack View* graphically displays your entire session from a zoomed out overview to the most critical detail of a track's waveform, volume, pan and time information. Fully implemented drag and drop editing simplifies complex manipulation of large sessions beyond

anything you ever thought possible or expected from a digital audio workstation.

The capability to instantly copy, move, delete, replace or otherwise reorder and compare data on multiple tracks can save you hours of production time. In many cases, you can build productions that would not even be possible with standard audio equipment!

All windows can be rearranged and assigned to as many as twelve different function key views. This allows easy customization of the interface so you can optimize it for the way you want to work. Change from a full view of 32 tracks, to a view of all windows perfectly tiled, to a zoomed view of one section of your waveform - all in an instant!

SAW offers real-time, non-destructive effects processing for many of the most common functions including EQ, compression, limiting, gating, echo/delay, reversing, vari-pitch and more. These functions represent another breakthrough in high-quality, Assembly Language craftsmanship. All of the functions are designed using special high-resolution integer routines that actually out-perform the floating-point math co-processor and deliver the equivalent of 64 bit resolution, eight decimal point math. These features manipulate digital audio data without the need for expensive DSP (Digital Signal Processor) hardware, bringing the power of this technology to virtually any Windows-compatible sound card!

In short, the **SAW** environment can and most likely will change the way you work with audio forever.

SAW Features

- Simultaneous playback of up to 32 mono or stereo tracks in **SAWPlus32** (16 for **SAW32**, 8 for **SAW32Lite**)
- Supports up to 12 stereo sound cards (6 for **SAW32**, 3 for **SAW32Lite**), translating into a maximum of 16 input/output channels
- Record direct to *MultiTrack* or to *SoundFile View*
- Record, edit and play stereo or mono soundfiles in the same session at the same time
- Fast, accurate segmented bar graph meters in the *Record Panel* with peak hold
- *MultiChannel* record mode for instant emulation of a typical *MultiTrack* tape recording system
- Simultaneous Sync Record/Play (sound card dependent)
- *Remote Transport* panel allows control of **SAW** from any other application
- Complete Drag and Drop, non-destructive editing
- Get the same high performance with any size project - from seconds to hours in length
- *MultiTrack* display includes waveforms and adjustable track height
- Nine session versions can be instantly saved and recalled within each project
- *MultiTrack* select mode marking allows fast grouping of multiple regions for simultaneous editing operations
- *MultiTrack* edit tools provide quick segment splicing or removal functions
- Virtual scrolling of *SoundFile* and *MultiTrack* displays
- Software-emulated DSP functions provide parametric EQ, noise gate, peak limiter, normalizer, compressor, echo/delay effects, vari-pitch/speed, reverse audio, reverse phase, and center channel eliminate
- Emulated DSP functions are patchable to each track or sound card output for real-time processing during playback

- Separate master volume controls for each sound card output
- Live format conversion during playback (mix any combination of regions that are 8 bit or 16 bit, mono or stereo, and any samplerate)
- Adjust volume, pans, mutes, solos and effects during playback (without additional expensive hardware) and define fader slope values for each mix change
- Mix changes automatically recorded for exact duplication during playback
- Programmable function key views provide fast access to multiple workspaces
- Supports industry standard WAV file format
- Incredibly fast Assembly Language waveform displays and screen redraws
- SMPTE sync and generate capability with sub-frame accuracy
- MIDI trigger capability for regions or *MultiTrack* playback
- Loop scrubbing to find hard to see editpoints
- Special transcribe mode allowing soundfile control over top of your favorite word processor

And much, much more...

INTRODUCTION

Features

SAW provides enhanced performance to the previous generations of **SAW** products due to its new flat 32 bit Native NT/95/98 code and multithreaded handling routines which take advantage of the Priority Threading architecture of the Windows 32 bit API. **SAW** also supports long file names.

Fader resolution has been enhanced to 1/4 dB steps and each mix step is now ramped according to a Slope Setting, resulting in resolutions below 1/1000 of a dB for smoother, noiseless fades. *Marked Area* fade in/out also utilize Fade Curve parameters for more precise control and complex fades can now be stretched offset instantly. Vari-pitch resolution is enhanced to 1/100 of a percent in Time Mode.

The new *Sample Edit* mode allows you to edit the value of the actual samples of your soundfile in order to reconstruct a waveform that has been damaged from clipping, for example.

The new *KEEP TAKE* feature enhances recording by allowing you to keep multiple takes during the recording process.

MultiChannel Record mode simplifies live session recording and closely resembles a typical *MultiTrack* tape system.

GamePort switches are now supported through the joystick services, allowing remote control of playback commands.

The list of features far exceeds what is listed here. The true power of the **SAW** environment can only be appreciated by jumping in and getting your feet wet! Have fun and enjoy!

Setting Up SAW

System Requirements

SAW is designed to run under Microsoft Windows NT or 95/98 on a PC-compatible system. While **SAW** may be used with slow CPUs, the ability to play multiple tracks and process DSP functions diminishes accordingly with CPU speed.

You must have a minimum of 96 Megabytes of RAM (Random Access Memory) for **SAWPlus32**, a minimum of 64 Megabytes for **SAW32**, and a minimum of 32 Mb for **SAW32Lite**. You need a mouse or similar pointing device and a minimum VGA video resolution of 800x600 at 256 colors. Fast hard drives (7200 RPM SCSI and higher) are recommended for optimum performance. **SAW** requires at least one Windows-compatible, 16 bit sound card and supports up to 12 sound cards (16 simultaneous inputs/outputs) while **SAW32** supports up to six sound cards, and **SAW32Lite** supports up to three.

Setting Your Windows Display

SAW is able to display a substantial amount of information on the screen at any given time. We strongly recommend that you use the program at a video resolution of 1024x768 with 65,000 colors. SVGA 800x600 will work, but the amount of information displayed on the screen is very limited. The 256 color setting will work, but the 16 bit or higher color options help to eliminate palette switching problems inherent in the PC/Windows design.

Even though your video card and monitor might be capable of these higher resolutions, the Windows system installs at a default resolution of VGA (640x480). You must specifically select one of the higher resolutions. Refer to your video card documentation, the manufacturer, or your computer supplier for information on adjusting your video resolution.

Installing SAW On Your Computer

To install the **SAW** program files on your computer, simply run the **SETUP.EXE** program from inside Windows as follows:

➔ Installing SAW:

1. Insert *Disk 1* into your computer's floppy drive.
2. From the *Start* menu, point to *Settings*, select *Control Panel*, then choose *Add/Remove Programs*.
3. Click on the **Install** button and follow the installation instructions.



1. Insert *Disk 1* into your computer's floppy drive.
2. From the *Start* menu, choose *Run*.
3. In the *Run Command* text box, type *A:SETUP*.
4. Press *Enter* and follow the installation instructions.

SAW will install into its own folder (you can specify a different one if you like). The installation of **SAW** will in no way affect any of your system files. All files are installed to one location, without adding files to system folders or changing existing configuration files.

The program will also create a subfolder under the application folder name **AUDIO**. The program will default to this folder when saving. You may save your work to any folder you choose, and we recommend creating separate folders for each project, saving all associated project files to their applicable locations. We also suggest you *never* save your work directly to the application folder.



Important Information Regarding Product Updates: Please read the *Latest Release Notes* file (in the program's *Info* dropdown menu) for recent information about your current program version. This file will always contain information and operation guidelines for new features added since the printing of this manual. Windows 95/98 users should also read the section on *Optimizing Windows 95/98*. This can be found in the *Info* dropdown menu, by choosing *Help Contents*.

Installing Your Sound Card

First, complete the installation of your audio card(s) according to the instructions that accompany the card(s). Follow the manufacturer's recommendations and complete any necessary testing to insure that the card is functioning prior to running **SAW**.

SAW is fully compatible with the Windows MultiMedia specification. This allows **SAW** to work with virtually any sound card that is supplied with a well written Windows driver. You must install the sound card driver in order to work with **SAW**.

Installing Your MIDI/SMPTE Card

SAW has the ability to sync to or generate SMPTE and MTC time code. **SAW** can read MTC with any MIDI device, but only certain devices have the ability to generate SMPTE. Complete the hardware installation of your MIDI/SMPTE card according to the manufacturers instructions that accompany the card. Refer to the Options menu and MIDI/SMPTE hardware setup for further information on setting up **SAW** to use the installed MIDI card.


INTRODUCTION

Starting SAW32/SAWPlus32

Starting SAW

Once you have successfully completed the setup program installation, you are ready to run the **SAW** program:

➔ Starting SAW from the Start Menu:

1. From the *Start* menu on the taskbar, choose *Programs*.
2. Point to **SAW** and select the **SAW** program icon.
 You may also create a program shortcut on the desktop and double-click the icon to start the program. (*Refer to your Windows Help files for information on creating shortcuts.*)

➔ Starting SAW from the Run Command:

You may also use the *Run* command to start **SAW** in a special debug mode if you need to troubleshoot the program:

1. From the *Start* menu, choose *Run*.
2. Click *Browse* and navigate to the **SAW** folder.
3. Select the applicable .exe file (for example SAWPlus32.exe).
4. Click *OK*.
5. At the end of the pathname in the command line text box, add a space and **/D**. This will bypass your preference file and force the program to load its pre-programmed defaults. This can be helpful in detecting problems that can arise from a corrupted .prf file.

SAW will also accept a WAV, SND or EDL filename on the command line when starting up. WAV and SND files will automatically open into the *SoundFile View*. EDL files will automatically open into the *MultiTrack View*. With EDL filenames, you may also include a **/P** command option to immediately begin playback of the EDL. Make sure to include the entire path and filename and leave a space after an EDL name before adding the **/P**.

For example, to have **SAW** load a begin playback of an EDL upon startup from a shortcut icon on the desktop:

1. From the Windows desktop, right-click the **SAW** shortcut icon.

2. Select *Properties* from the shortcut menu.
3. Click the *Shortcut* tab.
4. In the Target textbox, click at the end of the command line.
5. Add a space, then type the pathname for the EDL followed by another space then /P.

Example: C:\SAWPLUS32\SAWPLUS32.EXE C:\AUDIO\TEST.EDL/P

6. Click *OK*.
7. Double-click the icon to start the program.

Adjusting Hardware Parameters

When you first run *SAW*, you must configure the program to work with your sound card(s). From the *Options* menu, choose *Audio Hardware Setup*. There are several options to adjust.

Wave Devices

The *Audio Card Setup* window first displays the wave *output* device selections. Start with *Wave Device 1* and select the audio card driver that matches the card that you have installed. If you have more than one card installed, repeat this for each card. You may assign devices in any order, and leave unassigned devices in any location.

Next, click the *Out/In Device Toggle* button to display the wave *input* device selections. Start with *Wave Device 1* and select the audio card driver that matches the card that you have installed. If you have more than one card installed, repeat this for each card. If your sound card has an unmatched number of inputs and outputs, you should set the matching input and output pairs to the same device number, leaving unmatched devices set to *none*. You may, however, assign devices in any order, and leave unassigned devices in any location.

☞ For example, if your sound card has four stereo analog outputs and one stereo digital output, but only one stereo analog input and one stereo digital input (thereby creating an unmatched set of inputs and outputs), set *out* device 1 to driver-out 1-2, out device 2 to driver-out 3-4, out device 3 to driver-out 5-6, and out device 4 to driver-out 7-8, and out device 5 to driver-out digital 1-2. Then set *in* device 1 to driver-in 1-2, and in device 5 to driver-in digital 1-2, leaving in device 2, 3, and 4 set to *none*.

PreLoad Buffer Queue

This setting controls how many buffers of data are preloaded to the card before playback or recording begins. This affects the response time of live controls such as mutes, solos, faders and pans. If this setting is too low for your system, audio stuttering or glitching during playback may occur, especially when minimizing or sizing windows, etc.

Pressing the PreLoad Queue button to the right of the display window will cycle through the available settings from 1 to 15. Lower values will give you faster response times.

If you are using a fast Windows NT system, a setting of 1 or 2 may work well. If you have a slower machine running Windows 95/98, try using higher settings like 4 to 6.

When you are finished with all adjustments, click *OK*, then save your default settings by clicking on the *File* menu and selecting *Save Preferences*.

Product Support

At Innovative Quality Software, we are dedicated to maintaining the highest standards of quality and integrity in all we do. We believe the best service we can offer our customers in one of education and guidance, giving you the power and the freedom to work independently and confidently while using our products.

In addition to our reference guides and online help, we also provide knowledgeable, friendly technical support and up-to-date information and updates on our World Wide Web site at <http://www.iqsoft.com>.

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To aid us in assisting you with your questions, please be in front of your computer. Our technicians may ask that you experiment with different settings on your equipment and/or software. It would be very helpful if you have a good working knowledge of the Windows environment (Windows Explorer and Control Panel) when you call for support or have someone with you that knows it well.

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Registered user program updates are now obtainable from our site. We suggest checking our website frequently to find out what the latest

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Product Support

available version of your software is and to download the latest update. When obtaining a program update from our website, you will be asked for your keycode access number, which can be found stamped inside the front cover of this manual.

In our endeavor to educate, inform, and inspire you, we encourage you to stop by and stay informed with the latest and most honest look at what's happening in digital audio and related industries.

Chapter 2

UNDERSTANDING THE INTERFACE

UNDERSTANDING THE INTERFACE

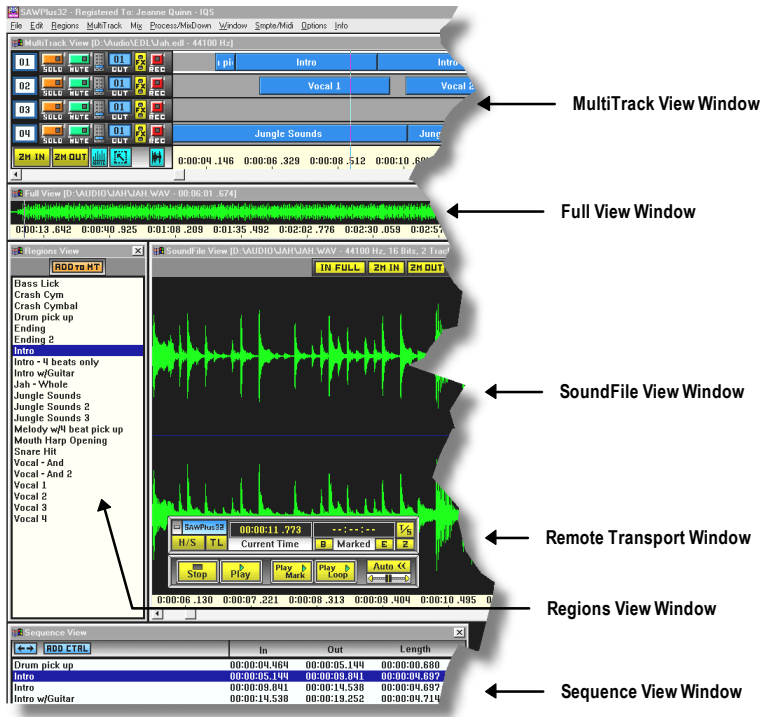
The **SAW** interface is superbly and strategically designed to give the user complete digital editing capabilities by enhancing (and in some cases overriding) the normal Windows behavior with procedures essential to performing *serious* digital editing with the highest degree of quality and proficiency. By reading about and understanding the logic behind this program and letting go of old standards and beliefs, **SAW** will reward you with a powerful new way of working with digital audio.

Even though **SAW** is considered to be one of the most sophisticated digital audio editing programs available, the intuitive visual design can take the “scare” out of digital editing, making the process fun and exciting.

The SAW Main Screen

The **SAW** interface is designed to be easy to use for the beginner as well as extremely powerful for the experienced user. Let's start the learning process by taking a look at the program's startup screen.

Below is a partial diagram of the main screen in **SAW** labeling the different windows within, followed by a table providing an overview on how each of the windows is used in audio production.



SAWPlus32 Main Screen with EditListFile Open

UNDERSTANDING THE INTERFACE

The Main Screen

Window	Function
MultiTrack View	The <i>MultiTrack View</i> window is where the majority of your work is accomplished. It is here that your production is assembled and referenced to time, fine tuned and ultimately finished.
Full View	The <i>Full View</i> window shows the current soundfile in its entirety, and is used to audition any part of the soundfile quickly.
SoundFile View	The <i>SoundFile View</i> window is used to audition editpoints and to create precise region definitions.
Remote Transport View	The <i>Remote Transport View</i> window controls playback of your sound and displays time or sample information about your production.
Regions View	The <i>Regions View</i> window displays the regions you create in an alphabetized list.
Sequence View	The <i>Sequence View</i> window displays detailed information about the <i>MultiTrack</i> entries in list form.

Saving Different Workspace Views

As you work with *SAW* and become more comfortable with the interface, you may wish to change the view of the main screen by moving and sizing the different windows to more easily facilitate your work. You may save up to 12 different views, assigning each view to a different function key on the keyboard. These views can then be easily recalled by simply pressing the applicable function key, making it extremely quick and easy to navigate to different views within the same editing session.

➔ To Assign a Workspace View to a Function Key:

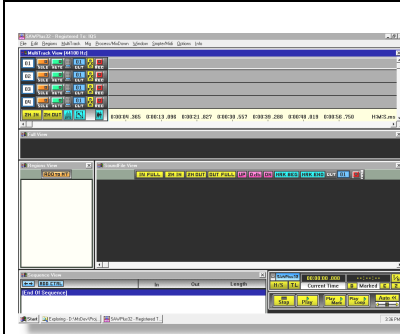
1. Arrange the *SAW* display to your specifications.
2. Press *Shift* and the function key you wish to use to recall that view.
3. To recall the view, press the assigned function key.
4. To permanently save your function key assignments, from the *File* menu, choose *Save Preferences*.

UNDERSTANDING THE INTERFACE

The Main Screen

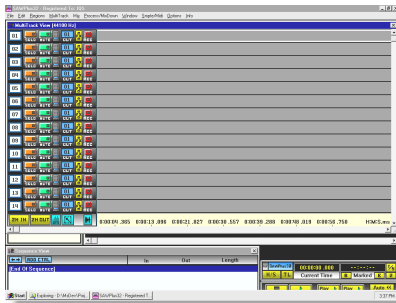
✎ Whenever preferences are saved, the current workspace view becomes the default startup view.

🕒 As a recommendation for a useful set of workspaces, try these suggestions:



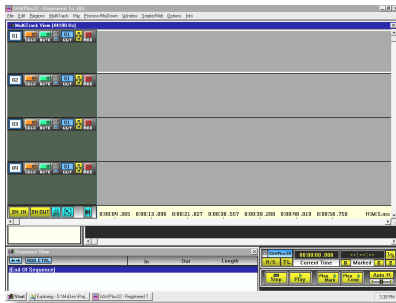
F1 Key

Leave as is (original screen view)



F2 Key

Extend the *MultiTrack View* window downwards by dragging the bottom of the window, to display 12-16 normal size tracks.

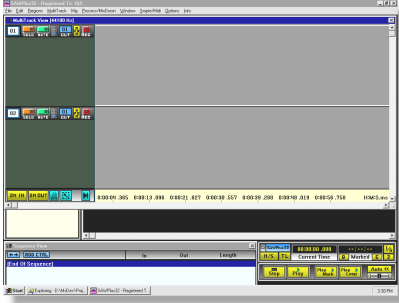
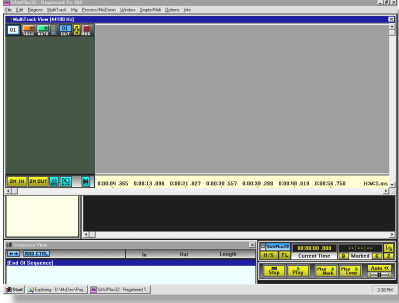
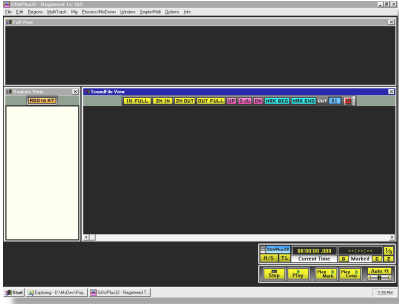


F3 Key

Press F1, then press *PageUp* three or four times to expand the track size of the original four track display.

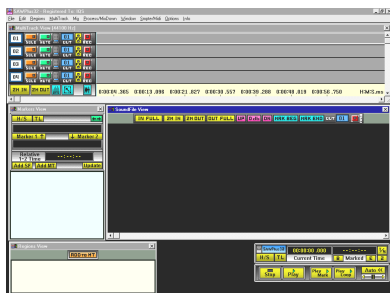
UNDERSTANDING THE INTERFACE

The Main Screen

	<p><u>F4 Key</u></p> <p>Shrink the <i>MultiTrack View</i> window, by dragging the bottom of the window upwards to display only two tracks, then press <i>PageUp</i> three or four times to expand the track size.</p>
	<p><u>F5 Key</u></p> <p>Shrink the <i>MultiTrack View</i> window, by dragging the bottom of the window upwards, to display only one track, then press <i>PageUp</i> three or four times to expand the track size.</p>
	<p><u>F6 Key</u></p> <p>Press F1 to get back to the original default. Close the <i>MultiTrack</i> and <i>Sequence View</i> windows. Expand the <i>Full View</i> window, by dragging the top of the window upwards to the top of the screen.</p>

UNDERSTANDING THE INTERFACE

The Main Screen



F7 Key

Press F1 to get back to the original default. Close the *Full* and *Sequence View* windows. Resize and reposition the *Regions View* window in the lower left corner. From the *Windows* menu, select *Markers* to open the *Markers View* window. Click the green button in the *Markers View* to contract the window.

F8-F12 Keys

Use as temporary workspace views for the current session.

The Fundamentals of Digital Audio

Now that you've been introduced to the basic windows of the **SAW** interface, let's explore some of the fundamentals of digital audio and how the power of non-linear editing can unleash unlimited possibilities when it comes to designing and building audio productions.

What is Digital Audio?

Prior to the computer age and the introduction of digital audio concepts, analog technology ruled the audio recording industry. Analog audio can be considered a continuous stream of fluctuating electronic pulses, a perfectly smooth facsimile of the original acoustic audio signal.

Digital audio, however, is actually a series of individual snapshots of the original acoustic audio signal, taken at defined time intervals, which when sequentially reassembled, creates a facsimile of the original signal.

Because the components of a digital audio signal are discreet in nature, they can easily be stored and manipulated as files in a standard PC computer environment. We will refer to these files as *soundfiles*.

The time intervals between snapshots we refer to as the *samplerate*. The smaller these intervals are, the more snapshots there are within a specified time. For example, if the time interval is a tenth of a second, then ten snapshots will be taken per second, making the *samplerate* ten. If the time interval is a hundredth of a second, then 100 snapshots will be taken per second, making the *samplerate* 100. The higher the *samplerate*, the more snapshots per second there are, making the facsimile closer to the original. We will refer to each snapshot as a *sample*.

Each *sample* in a digital audio signal represents the instantaneous volume level of the original audio at the moment the *sample* was taken. PC computers represent number values as binary data. The basic building block of binary data is called a *bit*. The higher the number of bits, the higher the value they can represent. For instance, one bit can represent two values, 0 and 1. Two bits combined can represent four values, 0, 1, 2, and 3. Eight bits can represent 256 values, 0 thru 255. Sixteen bits can represent 65,536 values.

When representing an audio signal with eight bits, the facsimile of the original is very limited in detail (only 256 values available). When representing the same signal with 16 bits (65,536 values available), the

amount of detail captured more closely duplicates the original signal. The amount of detail is referred to as *resolution*. The higher the *resolution* and the *samplerate*, the higher the quality of the digital audio captured.

The tradeoff to using the higher *resolution* and *samplerate* values is the need for more computer memory and speed to store and manipulate the data. For example, an 8 bit *resolution*, 44100 Hz *samplerate* stereo soundfile requires approximately 5.25 megabytes of hard disk storage per minute, whereas a 16 bit *resolution*, 44100 Hz *samplerate* stereo soundfile requires approximately 10.5 megabytes of hard disk storage per minute.

What is Non-Linear Editing?

There are two general methods commonly used to manipulate digital audio once it has been brought into the computer environment - *Linear* and *Non-Linear*.

The *Linear* method is generally a simpler concept to implement when designing a digital audio environment. Original soundfile data is typically marked, cut, copied, pasted, processed, and otherwise assembled from beginning to end, in a sequential fashion, most likely into a new soundfile representing the finished production. The process of linear editing is much like stacking bricks one on top of the other, one at a time. As the bricks are stacked, removing one brick near the bottom topples the entire structure. Each editing operation is usually performed on the actual soundfile data, requiring mass amounts of data manipulation, slowing processing time drastically. Also, many of the editing operations can actually be considered *destructive* as they permanently alter the original audio data. In order to provide *Undo* capabilities, copies of large amount of original data are required to be stored prior to each destructive operation. For instance, to cut six seconds from the front of a one minute soundfile might require saving one megabyte worth of data to an Undo file, and then copying the remaining nine megabytes forward. Undoing the cut would then require recopying the first megabyte from the Undo file and appending the remaining nine megabytes to the end. Expand this concept to editing a 20 minute soundfile and realize you might move and copy up to 200 megabytes of data each time you remove a few seconds from the file. This translates into large amounts of extra storage space and lots of precious time needed to perform simple editing operations in a typical production.

UNDERSTANDING THE INTERFACE

The Fundamentals of Digital Audio

The *Non-Linear* method is a more complex concept to implement, but offers phenomenal benefits, incredible power, and time-saving capabilities that a linear system can't begin to compare to. In this environment, small objects, typically called *clips* or *regions*, that represent and link to the original soundfile data are manipulated instead of the original data. Two immediate advantages of this concept are 1) there is no longer a need to move and copy large amounts of original soundfile data to perform simple editing operations, and 2) most editing operations can be considered *non-destructive* as they do NOT alter original soundfile data. Most non-linear environments are built around the concept of a virtual MultiTrack workspace. Regions can be randomly placed on any combination of tracks and assembled to create a finished production. A powerful non-linear editing environment like **SAW** allows the regions to be copied, moved, overlaid, processed and otherwise manipulated non-destructively in real-time, allowing instant auditioning of the production as it's being built, and eliminating the need for the Undo function for most operations. For example, the procedure of cutting a small amount of material from the front of a large soundfile requires absolutely no copying or moving of the data, and can be undone or altered at any time without the need for an Undo file. A small *Region* is created to represent the part of the soundfile in front of the desired cut point. Another *Region* is created to represent the part of the soundfile after cut. The two regions are simply placed side by side on a track, and the cut is complete. Playback can occur instantly and original soundfile remains intact! To alter the cut, one or both of the Region boundaries can be simply redefined and once again, the original soundfile remains intact!

The advantages of non-linear editing are numerous, and will continue to astound you the more you work with this concept. So hold on to your hat and fasten your seatbelt as we begin our journey into the powerful world of the **SAW** non-linear MultiTrack editing environment.

Basic Concepts You Should Know

Windows and SAW Conventions

The **SAW** interface displays many windows at the same time. The *Active Window* generally has the mouse and keyboard focus and is usually indicated by a different colored title bar. Clicking inside of any window typically makes that the active window. Commands that have functionality in multiple windows may, in some cases, function differently depending on which window is active.

Sizing and Moving Windows

If a window can be sized, you may do so by pointing the mouse arrow to the edge of the window until a double-headed arrow is displayed. When you see the double-headed arrow, click and hold the left mouse button and drag the window to the desired size.

Move any window by clicking and dragging its title bar and moving the window to a desired location. (Title bars are labeled in each diagram where applicable).

Using a List Box

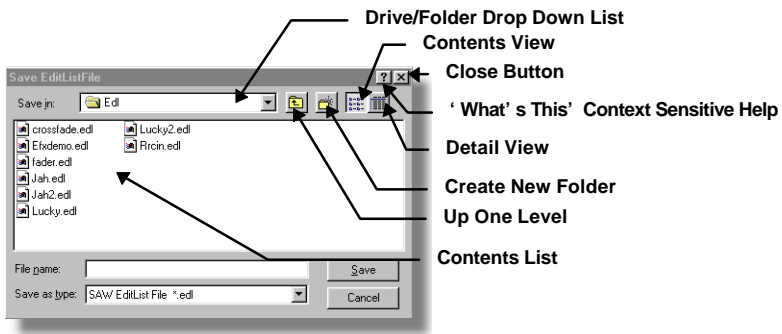
To navigate inside of a list box in **SAW** (such as the *Regions View* window), use one of the following methods:

1. Use the *Up* and *Down* arrow keys to move up and down the list one item at a time.
2. Use *Page Up*/*Page Down* keys to page up or down through the list, one screen at a time.
3. Click the scroll bar arrows to move up or down one item at a time.
4. Drag the scroll box inside of the scroll bar to move to a relative position.
5. Click inside of the scroll bar on either side of the scroll box to move up or down a page at a time.
6. Use the *Home*/*End* keys to go instantly to the top or bottom of the list.
7. To navigate to a specific item in a list, type the first letter of the item. Continue to type subsequent letters until the name of the desired item is selected.

UNDERSTANDING THE INTERFACE

Basic Concepts You Should Know

*Using the File Dialog Boxes (Open/Save)



Regarding File Management: It is recommended that you learn the basics of file management in the Windows platform (Windows Explorer or My Computer) from one of the many books available on the subject, or by studying the online help files built into the Windows operating system.

Basic concepts:

- The *Drive/Folder Drop Down List* indicates the folder you are currently accessing. Click the arrow to the right of the list box to display the hierarchy and drive information or select a new drive/folder location.
- To navigate to a folder residing within the current folder, double-click the desired folder name displayed within the *Contents List*. The newly selected folder name will be displayed in the *Drive/Folder Drop Down List*, and it's contents will be displayed in the *Contents List*.
- Use the *Up One Level* button to go backwards in the file structure.
- Use the *Create New Folder* button to create a new folder inside of the currently displayed folder.
- Use the *Contents View* button to display just the names of the files and folders in the *Contents List*.

- Use the *Detail View* button to display the names of the files and folders along with the size, type, and last modified date of each file.
- To open a file, navigate to the desired folder location, click the desired file name and click *Open*.
- To save a file, navigate to the desired folder location, type the name of the new file in the *File Name* text box and click *Save*.
- To use context sensitive help, click the 'What's This' button then click on the dialog box item you want more information on. An applicable help screen will be displayed.
- Click the *Close* button to close the *Save As* dialog box.

Recording Soundfiles

The first step in beginning a new project is to record soundfiles or otherwise bring soundfile data into the **SAW** environment. Soundfiles can be recorded directly to the *SoundFile View* window or, for more complex or synchronized recording operations, directly to the *MultiTrack View* window.

Let's explore *SoundFile View* recording. To begin, press the red *REC* (record) button located at the right edge of the *SoundFile View* control button bar. This will display an input device selection menu, allowing you to choose an input device for the recording. Selecting a device will then display the *Record Panel* and *Record Remote Transport* windows.

The screenshot shows the Audacity 2.0.6 software interface. The top menu bar includes File, Edit, View, Effects, and Help. The main window features a track area with two tracks: 'Mono L/R Left Channel' and 'Stereo or Mono L+R'. The 'Stereo or Mono L+R' track is selected and contains a single audio waveform. The bottom status bar displays '44100 Stereo 16 Bits' and '00:00:00'. The interface is annotated with numerous labels and arrows pointing to specific UI elements:

- File Name Labels:** 'Mono L/R Left Channel FileName' points to the top-left track header, and 'Stereo or Mono L+R FileName' points to the top-right track header.
- Track Indicator:** Points to the 'SF' (Stereo File) indicator in the top-right corner.
- Peak Clip Indicator:** Points to the 'TRK' (Track) indicator in the top-right corner.
- Input Meter Display:** Points to the vertical meter on the right side of the interface.
- Bit Resolution Selector:** Points to the '16 Bits' display in the bottom status bar.
- Margin Reading:** Points to the '0%' margin display in the bottom status bar.
- Meter Reset:** Points to the 'Reset' button in the bottom status bar.
- Time Readouts:** Points to the '00:00:00' time display in the bottom status bar.
- File Type Selector:** Points to the 'Stereo' display in the bottom status bar.
- Samplerate Selector:** Points to the '44100' display in the bottom status bar.
- Keep Take Retake:** Points to the 'Keep Take' button in the bottom status bar.
- Retake All:** Points to the 'Retake All' button in the bottom status bar.
- Incremental Fader Zones:** Points to the fader knobs on the left side of the interface.
- Fader Knobs:** Points to the fader knobs on the left side of the interface.
- Close/Save Soundfile dB:** Points to the 'Close / Save' button in the top-left corner.
- Title Bar:** Points to the top window title bar.

Diagram of the VHS control panel with labels:

- Top Latch**: Points to the top latch mechanism.
- Time Remaining**: Points to the digital display showing 05:35:26.
- Title Bar Hide/Show**: Points to the button with the 'H/S' icon.
- Stop Recording**: Points to the button with the 'Stop' icon.
- Simultaneous Record Playback**: Points to the button with the 'S+R+P' icon.
- Record**: Points to the button with the 'Rec' icon.
- Drive Selector**: Points to the button with the 'D' icon.
- Record Ready**: Points to the button with the 'RecRdy' icon.

The *Record Panel* is used to set up the parameters for the current recording session. The *Record Remote Transport* window is used to initiate and control the recording process.

The top of the *Record Panel* displays the currently selected wave device (sound card).

☞ If more than one wave device is installed, you may choose which device you wish to record to by clicking in the blue *OUT* display box (next to the *REC* button) prior to opening the *Record Panel*.

Before recording a soundfile, you must first set the basic file parameters and name the file.

➔ To Set Recording Parameters:

1. Select a *samplerate*. Click the *Samplerate Selector* button. A popup list of available samplerates is displayed. Either choose one of the preset rates or enter a custom samplerate by choosing the *Custom* option. The higher the rate, the better the quality. 44100 Hz is the same rate as an audio CD and is one of the most commonly used rates in digital audio.
2. Select a file *type*: *Stereo* creates a stereo soundfile, keeping the left and right audio information intact; *Mono L+R* creates a mono soundfile summing together the right and left audio information; *Mono L/R* creates one or two individual mono soundfiles keeping the left and right information separate.
3. Select a bit *resolution*. (The higher the resolution, the better the quality). Sixteen bit is the same resolution as an audio CD and is one of the most commonly used resolutions in digital audio.
4. If the file *type* is *Stereo* or *Mono L+R*, click the *FileName* button to display the file dialog box and name the file.

If the file *type* is *Mono L/R*, click the *Left* button to display the file dialog box and name the file that will contain the left input audio data. Click the *Right* button to name the file that will contain the right input audio data. You may use one or the other, or both, in which case **SAW** will automatically split the audio data into two separate files at the same time.

☞ If you select a pre-existing filename, the original data will not be overwritten, instead the new recording will be appended to the end of the existing data.

UNDERSTANDING THE INTERFACE

Recording Soundfiles

5. Click *Save*.

Next you should set the recording volume levels.

→ To Set Volume Levels:

1. In the *Record Remote Transport* window, click the *RecRdy* button (Or press the * key). This activates the meters and places **SAW** in *Record Ready* mode.
2. Start the audio source playback and observe the meter levels.
3. For the best signal to noise ratio (sound quality), if possible, adjust source levels outside of the **SAW** environment by using external volume controls or your sound card's mixer applet. *Meter* levels should average mostly in the yellow area with some peaks reaching slightly into the red area. *Margin* readings should be between 60-80%.
4. If necessary to fine-tune volume levels, adjust the red *record faders* by clicking and dragging a fader knob.

☞ By default both *Faders* are latched together. Adjusting either one moves both. Holding the *Shift* key breaks the latch, allowing you to adjust either one individually. Clicking the right mouse button while adjusting either *Fader* resets both to zero. You may also click in the *incremental Fader zone* to the right of either *Fader* to step up or down in ¼ dB increments. Clicking above the red zero dB lines will increase the level. Clicking below the lines will decrease the level.



Regarding Fader Processing: When the **SAW Faders** are set to zero dB (default), incoming audio data is not processed in any way. The saved soundfile data is an exact replica of the data delivered from the sound card. When the *Faders* are not set to zero, **SAW** alters each sample by scaling the data according to the *Fader* settings.

→ To Start and Stop Recording:

1. To start recording, click the *Rec* button (or press the *Enter* key) in the *Record Remote Transport* window.
2. To stop recording, click the *Stop* button (or press the *Enter* key) in the *Record Remote Transport* window.
 - ☞ If the *Enter* key is pressed, the operation will toggle back to *Record Ready* mode. To turn off *Record Ready* mode, click the *Stop* button (or press the * key).

➔ To Save the Soundfile and Close the Record Panel:

1. In the *Record Panel*, click the *Close/Save* button. This saves the soundfile and instantly opens it in the *Full View* and *SoundFile View* windows, ready for editing.

More About the Record Windows

There are many other features in the *Record Panel* and *Record Remote Transport* windows. These features add powerful versatility and functionality to the basic recording operation. As you read on, you'll discover many variations in the way soundfiles can be recorded in the *SAW* environment.

Title Bars

The *Record Panel* and the *Record Remote Transport* windows can be moved by dragging their respective title bars.

Time Readouts (Record Panel)

The left and right *Elapsed Time* readouts display the current time position in both the left and right soundfiles being recorded. Only the left readout will be used when the file type is *Stereo* or *Mono L+R*. Each time recording is stopped and restarted, the *Elapsed Time* continues to increase, reflecting the size of the growing soundfiles.

The *Current Rec Time* readout displays the time elapsed since last engaging record mode. Each time recording is stopped and restarted, the reading resets to zero.

Time Remaining/Drive Selector (Record Remote Transport)

The *Time Remaining* readout shows the recording time remaining on the selected drive at the current recording parameters. To change the drive, click the left or right drive selector arrows.

Track Indicators (Record Panel)

The *Track Indicators* display the current tracks assigned to the left and right channels of the current recording. When recording directly in the *SoundFile View* window, they will indicate *SF* for *soundfile*. When recording directly in the *MultiTrack View* window, they will indicate the respective track assignments.

Extra Control Buttons

All (Record Panel)

The Retake *All* button allows you to clear the entire soundfile starting over again from the zero position.

(Record Remote Transport)

The *H/S* (Hide/Show) button is used to toggle between hiding and showing the *SAW* program workspace. When first clicking the *H/S* button in a window, the program workspace will be hidden, leaving that window on top. Clicking the *H/S* button again re-displays the workspace. This allows *SAW* to be controlled remotely while inside of another application.

Keep Take (Record Panel)

The *Keep Take* button is not used in the *SoundFile View* and will be discussed in the *MultiTrack Recording* chapter.

Reset (Record Panel)

The *Reset* button clears the meter display and resets the *Margin* readout to 0%. It may be clicked at any time prior to or during recording.

Retake (Record Panel)

The *Retake* button allows you to throw away the last recorded segment and record over again from the same soundfile start position. This keeps soundfiles from continually increasing in size if you make mistakes during recording.

(Record Remote Transport)

The *S-R-P* button is not used in the *SoundFile View* and will be discussed in the *MultiTrack Recording* chapter.

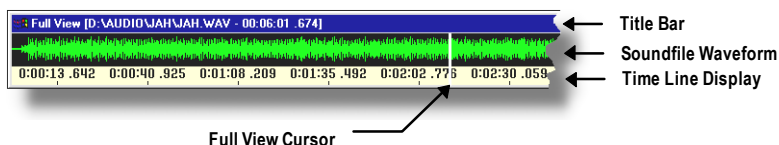
TL (Record Remote Transport)

The *TL* (Top Latch) button is used to latch a window to other windows containing *H/S* buttons. When any *H/S* button is clicked in any window, all windows with the *TL* button clicked will also remain on top.

UNDERSTANDING THE INTERFACE

Full View Window

Full View Window



The *Full View* window shows the entire current soundfile waveform, compressed to fit in the window, regardless of its size. On stereo files, both the left and right channels are summed together and displayed as mono. Its main purpose is to provide instant access to any part of a soundfile. Once a place of interest has been located, the position can be transferred to the *SoundFile View* for detailed work by clicking in the *Time Line* at the desired transfer point.

The *Full View cursor* is displayed as a line that reaches from the top to the bottom of the *Full View* window, representing the current playback position.

Title Bar

If no soundfile is currently active, the title bar displays the words Full View. When a soundfile is loaded, the pathname and length of the soundfile is also displayed. The window may be moved by dragging the title bar. The window may also be sized by dragging any of the window borders.

Time Line Display

Along the bottom edge of the window is the *Time Line* display, a light yellow horizontal bar that shows reference times and also links the *Full View* position to the *SoundFile* position. In the *Time Line* display area you will see reference numbers indicating either STANDARD time, SMPTE time, SAMPLE position or TEMPO depending on what mode is currently active. The mode is displayed in the right corner of the *Time Line* as H:M:S.ms for STANDARD time, SMPTE for SMPTE time, SAMPLES for SAMPLE position, and TEMPO for *Tempo* mode.

Full View Operation

Cursor Positioning

Clicking with the left mouse button controls the placement of the *Full View cursor* within the soundfile, determining the current playback position.

You may position the cursor anywhere within the window, even while the file is playing, and playback will immediately continue from the new position.

Playback

When the *Full View* window is the active window, you may start and stop playback by clicking the right mouse button, or pressing the *spacebar*, or pressing the *Play* button in the *Remote Transport* window.

Stopping in the *Full View* window acts as a pause control, and playback will resume from where you last stopped. The *Full View cursor* will follow the playback and you may use this view as an overall visual reference to your current soundfile.

Link To SoundFile View

Clicking the *Time Line* area of the *Full View* window (or pressing the *T* key) will transfer the cursor positions to exactly the same point in the *SoundFile View* window.

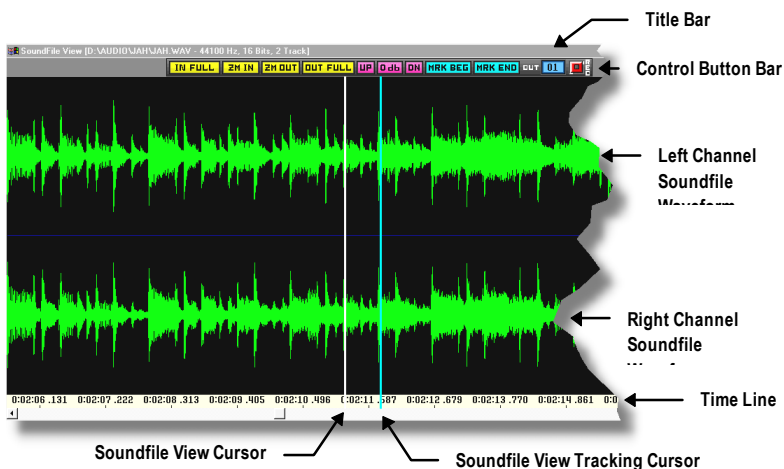
Link to Remote Transport Window

When the *Full View* window is active, the *Remote Transport* window displays the current *Full View cursor* position.

UNDERSTANDING THE INTERFACE

Soundfile View Window

SoundFile View Window



The SoundFile View waveform display can be zoomed and magnified to facilitate defining *Editpoints* and *Regions*.

This view shows both the left and right channels of a stereo file in detail. The left channel is displayed on top, the right on the bottom. Mono files show only one channel. You may zoom in or out to display the audio waveform data in more or less detail. You may also magnify the amplitude (height) of the display to see low volume waveform data in more detail.

The *SoundFile View cursor* is displayed as a line that reaches from the top to the bottom of the *SoundFile View* window. The cursor position is set by the user, and determines playback start position as well as *Region* boundary positions, and defines a point of action for various editing functions.

The *SoundFile View Tracking cursor* is displayed as an alternate colored line that moves during playback, tracking the current position. This cursor is not user adjustable.

Title Bar

If no soundfile is currently active, the title bar displays the words SoundFile View. When a soundfile is loaded, the pathname, samplerate,

bit resolution and the number of tracks (channels) is also displayed. The window may be moved by dragging the title bar. The windows may also be sized by dragging any of the window borders.

Time Line Display

Along the bottom edge of the window is the *Time Line* display, a light yellow horizontal bar that shows reference times and is also used to create a *Marked Area* of the soundfile for special editing functions. In the *Time Line* display area you will see reference numbers indicating either STANDARD time, SMPTE time, SAMPLE position or TEMPO, depending on what mode is currently active. The mode is displayed in the right corner of the *Time Line* as H:M:S.ms for STANDARD time, SMPTE for SMPTE time, SAMPLES for SAMPLE position, and TEMPO for *Tempo* mode.

Control Buttons



*Button descriptions are followed by keyboard equivalents if applicable.


In Full (Ctrl and +)

The *In Full* button takes the waveform display to the maximum zoomed-in view of one sample per pixel.

SAW will remember your previous zoom level and you may return to it by simply pressing the *Zm Out* button. If you press the *In Full* button twice in a row, you will clear the previous zoom level memories.

Zm In (+)

The *Zm In* button zooms the waveform display *in* to the next level and decreases the time reference increments in the *Time Line* display. The zoom-in amount is based on the increment factor specified using the *Zoom In/Out Factor* under the *Options* menu. Use this button to help find a comfortable display of visual detail for the particular waveform you are working with.

 **SAW** uses special peak data files to display waveforms quickly at decreased zoom levels. As the zoom level increases beyond a certain point (soundfile length dependent), **SAW** displays true, sample-accurate, vector graphic waveform displays for precise representation of the actual waveform.

Zm Out (-)

The *Zm Out* button zooms the waveform display out to the next level and increases the time reference increments in the *Time Line* display. The zoom-out amount is based on the increment factor specified using the *Zoom In/Out Factor* under the *Options* menu. Use this button to help find a comfortable display of visual detail for the particular waveform you are working with.

Out Full (Ctrl and -)

The *Out Full* button takes the waveform display to the maximum zoomed-out view that attempts to display the complete soundfile at once. This view will be very similar to the *Full View* window display.

SAW will remember your previous zoom level and you may return to it by simply pressing the *Zm In* Button. If you press the *Out Full* button twice in a row, you will clear the previous zoom level memories.

Up (PageUp)

The *Up* button increases the amplitude (height) of the waveform display. By using this button, you can magnify low level sections of the audio data to help locate and remove background noises.

dB (0)

The *0 dB* button sets the amplitude of the waveform display so that full digital clipping is reached at the top and bottom of the respective channel displays, showing the waveform at the exact recorded level.

When toggling between this button the *Up* button, the magnified level will be memorized, allowing you to easily switch between both levels. If you press this button twice in a row, the magnified level will be reset to zero.

Dn (PageDown)

The *Dn* button decreases the amplitude (height) of the waveform display. By using this button, you can reduce magnification of loud sections of audio data that might be extending beyond the visible limits of the respective channel displays.

Mrk Beg (B)

The *Mrk Beg* button marks the current *SoundFile View cursor* position as the beginning boundary of a *Marked Area* of data. If the end boundary is beyond this point, the *Marked Area* between boundaries will be highlighted in both the *SoundFile View* window and the *Full View* window.

Mrk End (E)

The *Mrk End* button marks the current *SoundFile View cursor* position as the ending boundary of a *Marked Area* of data. If the beginning boundary is before this point, the *Marked Area* between boundaries will be highlighted in both the *SoundFile View* window and the *Full View* window.

☞ You may clear the *Marked Area* at any time by pressing the *C* key, or by setting the end point before the beginning point. The *Marked Area* is used to create *Regions* and to define boundaries for many of the *SAW* processing functions.

Out

The *Out* display box is used to select a sound card for recording or playback from the *SoundFile View* window. Clicking in the blue display box will display a popup menu allowing you to select the desired sound card. All wave devices that have been specified in the *Audio Hardware Setup* section under the *Options* menu will be listed.

Rec

The red *Rec* button opens the *Record Panel* to initiate recording a soundfile directly to the *SoundFile View* window.


☞ Once recording is finished, the waveform will be instantly displayed in both the *SoundFile View* and *Full View* windows. Recording in the *SoundFile View* records raw audio data that is not inherently

part of the current EDL session or has no basis in time for that session until placed in the *MultiTrack View*.

SoundFile View Operations

Cursor Positioning

Clicking with the left mouse button controls the placement of the SoundFile View cursor within the soundfile, determining the current starting playback position. This start position will remain fixed when playback begins, allowing an instant re-cue when playback is stopped and restarted.

 This is a very powerful tool for setting a precise editpoint. Zoom-in, place your cursor, and repeatedly toggle playback on and off to quickly audition the accuracy of your editpoint selection. This technique literally makes the complex process of *scrubbing* obsolete!

Double-clicking on a specific point within the waveform display causes that point of the waveform to be centered in the display and makes that the new *SoundFile View cursor* position.

You can also center the current *SoundFile View cursor* position by pressing the = key.

You can transfer the *SoundFile View cursor* position to the *Tracking cursor* position by pressing the *T* key, even during playback.

You can drag the cursor from one point to another within the waveform display and see a relative distance readout within the *Remote Transport* window that updates as you drag, providing there is no currently *Marked Area*.

Navigation

There are many ways to move around within the *SoundFile View* window.

The scroll bar along the bottom of the window allows you to quickly position the display anywhere within the current SoundFile at any zoom level. You may click the left or right scroll arrow to move one screen at

a time or drag the scroll box with the mouse to jump to a relative position in the soundfile.

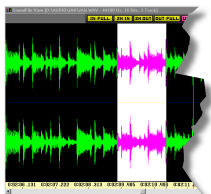
Clicking in the scroll bar to the left or right of the scroll box jumps the cursor position to the beginning or end of the file. This modification to the standard Windows interface allows much faster navigation and is more appropriate for this type of application.

☞ If you jump your position accidentally by clicking to the left or right of the scroll box, you may instantly return to your last position by pressing the *Shift* key and clicking in the scroll box.

SAW also features dynamic scrolling in the *SoundFile View*. Both edges of the waveform display are active zones. Clicking near the left or right edge of the waveform display causes the display to page left or right, respectively.

If you drag the cursor to the left or right edge of the waveform display, the screen will scroll automatically as long as there is movement of the mouse in that direction. You can adjust the scrolling speed by setting the *Wave Display Scroll Factor* located in the *Options* menu.

Marking Areas



Dragging the *SoundFile View* cursor while the mouse is positioned in the Time Line display defines a *Marked Area*. The beginning boundary is defined by where you start the drag, while the end boundary is defined by where you end the drag.

☞ Once an area is defined, you can alter either boundary by clicking inside the Time Line display near the boundary and dragging it to a new position.

Pressing the *B* and *E* keys (or *MRK BEG* and *MRK END* buttons) also define the beginning and end of a *Marked Area*.

☞ Pressing the *Ctrl* key and any one of the *B*, *E*, *MRK BEG*, or *MRK END* buttons defines the entire soundfile as a *Marked Area*.

A *Marked Area* is inverse highlighted, clearly showing the area between the boundaries, and the length of the *Marked Area* is displayed in the *Remote Transport* display window.

Clearing a Marked Area

To clear a *Marked Area* in the *SoundFile View*, click with the right mouse button anywhere in the *Time Line* display or press the *C* key.

Playback

Several options are available to control audio playback in the *SoundFile View*. When the *SoundFile View* is the active window, pressing the *Spacebar* or clicking the right mouse button toggles between play and stop. The *Play* and *Stop* buttons on the *Remote Transport* window can also be used.

If a *Marked Area* is defined, the *Play Mark* button on the *Remote Transport* window can be used to play back just that area. Pressing the *Shift* key and clicking the right mouse button will perform the same function.

☞ If the *SoundFile View cursor* is outside of the *Marked Area*, playback begins from the beginning of the *Marked Area* and plays back the entire area. If the cursor is within the boundaries of the *Marked Area* however, playback begins at the cursor position and plays to the end of the area.

If a *Marked Area* is defined, the *Play Loop* button on the *Remote Transport* window can be used to play back and loop just that area. Pressing the *Ctrl* key and clicking the right mouse button will perform the same function.

☞ If the *SoundFile View cursor* is outside of the *Marked Area*, playback begins from the beginning of the *Marked Area* and plays back and loops the entire area. If the cursor is within the boundaries of the *Marked Area* however, playback begins at the cursor position and plays to the end of the area and loops back to the beginning. While the loop is playing, the begin and end points can be redefined on-the-fly by clicking anywhere in the display area.

It's important to understand that the playback function in the *SoundFile View* is optimized for previewing editpoints. At times two cursors will be displayed, the normal *SoundFile View cursor* and a separate *SoundFile View Tracking cursor*.

Normal playback begins at the *SoundFile View cursor*. The *SoundFile View Tracking cursor* displays the current playback position as playback proceeds. Stopping and starting again automatically places the

SoundFile View Tracking cursor back to the *SoundFile View cursor* position and playback begins again from that original position.

Loop Scrub Mode

Loop Scrubbing is an alternative method of searching for an editpoint, when the visual display data contains no easily recognizable transient information. (For example, finding the exact beginning of an ‘s’ sound in the middle of a vocal dialog).

To enter *Loop Scrub* mode, press the *Ctrl* key and click the left mouse button. You have now grabbed the *SoundFile View cursor* while playback of a tight loop is activated. You may release the *Ctrl* key but keep pressing the left mouse button. You may now slowly slide the cursor position back and forth, listening for an audible change that defines your hard-to-see editpoint. The cursor position defines the end of the loop that is playing.

While still in this mode, you may change the length of the *scrub loop* by using the *Up* and *Down* arrow keys. Pressing the *Left* arrow key takes you back to the default loop size. Pressing the *Right* arrow key takes you to your adjusted loop size. Pressing the *Left* arrow key twice resets the adjusted size back to the default. You may also use the keyboard keys to adjust zoom and magnification level while *Loop Scrub* is active. Releasing the left mouse button exits *Loop Scrub* mode.

Sample Edit Mode

Sample Edit mode allows you to see and manipulate the individual samples that are part of a soundfile. *Sample Edit* mode is engaged when you zoom in past the IN FULL position. When *Sample Edit* mode is active, the mouse pointer changes to an X-shape.

Sample Edit mode displays the individual samples spread further and further apart as you continue to zoom in. Each sample is represented as a small square within the waveform display. Pressing the *Shift* key and clicking near a sample square snaps the mouse pointer directly on top of the sample. You may now drag the sample up or down in the display, instantly changing the actual sample value directly in the SoundFile.



Regarding Sample Edit Mode: This is a **destructive** process with no automatic Undo. To restore settings, you must manually drag the individual samples back into position.

UNDERSTANDING THE INTERFACE

SoundFile View Window

Zooming out past the IN FULL position disengages *Sample Edit* mode. Any process that opens a different soundfile will also disengage *Sample Edit* mode.

☞ *Sample Edit* mode is an incredibly powerful feature for removing clicks, pops, or any other unwanted random noises that appear as out of place samples when compared to neighboring samples. Even clipped soundfiles can sometimes be fixed in *Sample Edit* mode by adjusting the samples surrounding the clipped portion of the waveform attempting to reshape the wave to remove the distortion.

Link to Remote Transport Window

When the *SoundFile View* window is active, the *Remote Transport* window displays the current *SoundFile View* cursor position.

Special Keyboard Functions

These are extra *SoundFile View* keyboard functions that, in many cases, have no menu option or control button equivalent.

Home/End Keys

The *Home/End* keys moves the *SoundFile View* cursor to the beginning or end of the soundfile.

Left/Right Arrow Keys

Pressing the *Left/Right* arrow keys move the *SoundFile View* cursor one pixel left or right. The amount of actual samples this represents depends on the current zoom level.

Shift and Left/Right Arrow Keys

Pressing *Shift* and clicking the *Left/Right* arrow keys moves the *SoundFile View* cursor one pixel left or right, and also extends or contracts the closest *Marked Area* boundary to the current cursor position.

Ctrl and Left/Right Arrow Keys


Pressing *Ctrl* and clicking the *Left/Right arrow* keys moves the *SoundFile View cursor* to the beginning or ending boundary of the *Marked Area*.

M Key

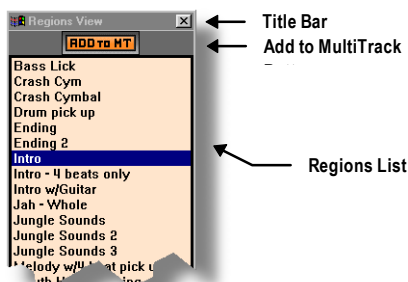
The *M* key drops and *SF* (soundfile) *Marker* at the current *SoundFile View cursor* position, even during playback. See the *Markers View Window* section for more detail.

Z Key

The *Z* key moves the *SoundFile View cursor* position to the nearest zero crossing point. The program looks for the lowest left/right average waveform value within a small range before and after the current cursor position.

 Use this tool to help find the best editpoint for creating quiet splices.

Regions View Window



Regions are the building blocks of your production. They are the core elements that give non-linear editing its power. The *Regions View* window alphabetically lists all *Regions* in the current editing session.

☞ A *Region* is simply a link to a *Marked Area* that has been named and saved, and contains various elements about that area such as the begin and end points, the pathname of the soundfile that contains the area, and the zoom levels at the time the region was created. It does NOT contain the actual audio data.

🕒 Because *Regions* are merely links to the audio data and not the actual audio data itself, manipulating and building a production using *Regions* can literally be done instantaneously due to the fact that you are not moving and processing massive amounts of data during the creation of your project. For example, in a typical cut and paste linear editing environment, copying an area of audio data any number of times requires moving and duplicating potentially hundreds of thousands of bytes of data, whereas *Regions* move and duplicate no data whatsoever.

Title Bar

The title bar displays the words *Regions View* and also displays the region count and file count for the current EDL as #Regions/#Files. The window may be moved by dragging the title bar. The window may also be sized by dragging any of the window borders.

ADD TO MT Control Button



Add to MultiTrack

The *Add to MT* button (or the *Insert* key on the keyboard) adds the currently selected *Region* to the active (hot) track in the *MultiTrack* at the current *MultiTrack View cursor* position.

☞ *Regions* that were recorded direct to the *MultiTrack* contain a position stamp of the original recorded position. Pressing the *Ctrl* key while clicking the *Add to MT* button overrides the current cursor position and places the *Region* at the original recorded position on the current *Hot Track*.

This can be very helpful when keeping multiple takes of an overdub. You may easily place those takes on other tracks at a later time, perfectly in sync, using this feature.

Regions View Operation

Creating Regions

Creating *Regions* in *SAW* is easy. There are many ways this can be accomplished - some directly, and some indirectly. Here are two of the most common methods to create a *Region*.

➔ To Create a Region Using the Regions Menu:

1. Define a *Marked Area* in the *SoundFile View* window.
2. From the *Regions* menu, select *Create New Region*.
3. In the *Input Text* box, specify a new *Region* name, or accept the default unique numbered name.
4. Click *OK*. The new *Region* will appear in the *Regions View* window in alphabetical order.

🕒 Group *Regions* in the *Regions View* window, by utilizing alphabetical naming conventions.

Example:

UNDERSTANDING THE INTERFACE

Regions View Window

Vocal - Beginning Phrase

Vocal - Center Phrase

Vocal - Ending Phrase

➔ To Create a Region Using Drag and Drop:

1. Define a *Marked Area* in the *SoundFile View* window.
2. With the *SoundFile View* as the active window, hold the *Shift* key and click and release the left mouse button. The cursor will change in appearance.

☞ A new *Region* will automatically be created and named with the soundfile name and a unique number identifier. The new *Region* will appear in the *Regions View* window in alphabetical order.

3. Position the new cursor onto an empty area of a track in the *MultiTrack View* and click the left mouse button to drop the newly created *Region* in place.

☞ You may cancel the drop operation by clicking anywhere outside the *MultiTrack View* window.

You may freely open other soundfiles at any time, without disturbing the current session, including already existing *Regions* and *MultiTrack Entries*. In this way, you can create new *Regions*, one at a time, from many different soundfile sources, blending them all into one session.

Inserting Regions onto the MultiTrack

➔ To Insert a Region Using the Addro MT Button:

1. In the *MultiTrack View* window, select the track and position where you would like to insert the *Region* by clicking the left mouse in the desired location.
2. In the *Regions View* window, click the left mouse button the desired *Region* name.
3. Click the *Add to MT* button or press the *Insert* key on the keyboard.

➔ To Insert a Region Using Drag and Drop:

1. Hold the *Shift* key and click and release the left mouse button on the desired *Region* name. The cursor will change in appearance.
2. Position the new cursor onto an empty area of a track in the *MultiTrack View* and click the left mouse button to drop the selected *Region* in place.

☞ You may cancel the drop operation by clicking anywhere outside the *MultiTrack View* window.

- ⌚ Add more copies of the same *Region* by making the *MultiTrack View* window active and pressing the *A* key.

Viewing Existing Regions

➔ To View an Existing Region:

1. In the *Regions View* window, double-click the desired *Region*. The soundfile linked to this *Region* will be instantaneously loaded and displayed in the *SoundFile* and *Full View* windows at the *Region's* original zoom levels.

Modifying Existing Regions

➔ To Modify an Existing Region:

1. In the *Regions View* window, double-click the desired *Region* to view.
2. Modify any *Region* setting you desire (such as boundaries, zoom levels, etc.)
3. From the *Regions* menu, select *Update Region*.
4. In the *Input Text* dialog box, accept the existing name or rename the *Region*.
5. Click *OK*.

Playing Back an Existing Region

➔ To Playback an Existing Region Using the Mouse:

1. In the *Regions View* window, click the left mouse button on the desired *Region* name.
2. Click the right mouse button anywhere inside the *Regions View* window. The linked soundfile will be loaded (if needed), and the *Marked Area* (the selected *Region*) will be played.

➔ To Playback an Existing Region Using the Keyboard:

1. With the *Regions View* as the active window, use the *Up* and *Down* arrow keys to select a *Region*.
2. Press the *Enter* key to load and play the *Region*.

☞ While a *Region* is playing, you may use the arrow keys to select another *Region* without affecting current playback. Pressing the *Enter* key will cancel the current playback, and load and play the newly selected *Region*.

Deleting an Existing Region

➔ To Delete an Existing Region Using the Regions Menu:

1. In the *Regions View* window, click the left mouse button on the desired *Region* name.
2. From the *Regions* menu, select *Remove Region*. The *Region* will be deleted from the *Regions View* window and from the *MultiTrack View* window if currently being used on one or more tracks. All following *MultiTrack Entries* on the same track(s) will be left undisturbed in their current positions.

OR

3. From the *Regions* menu, select *Delete Region*. The *Region* will be deleted from the *Regions View* window and from the *MultiTrack View* window if currently being used on one or more tracks. All following *MultiTrack Entries* on the same track(s) will be shifted to the left replacing any resulting gaps.

→ To Delete an Existing Region Using the Keyboard:

1. In the *Regions View* window, select the desired *Region*.
2. Press the *Delete* key. The *Region* will be deleted from the *Regions View* window and from the *MultiTrack View* window if currently being used on one or more tracks. All following *MultiTrack Entries* on the same track(s) will be left undisturbed in their current positions.



3. Hold the *Shift* key and press the *Delete* key. The *Region* will be deleted from the *Regions View* window and from the *MultiTrack View* window if currently being used on one or more tracks. All following *MultiTrack Entries* on the same track(s) will be shifted to the left replacing any resulting gaps.

Link to SoundFile and Full View

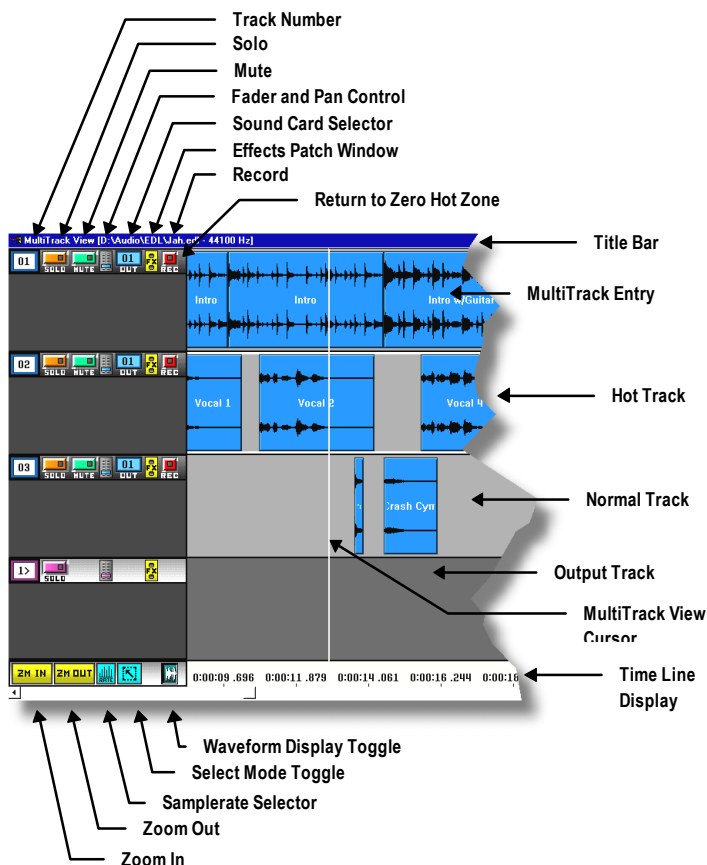
Double-clicking on a *Region* in the list causes the linked soundfile to be loaded and displayed in the *SoundFile View*, with the region shown at the zoom level it was saved at. The soundfile is also displayed in the *Full View*.

- ☞ Pressing the *Ctrl* key while double-clicking overrides the saved zoom levels and displays the *Region* at the current *SoundFile View* zoom levels.

UNDERSTANDING THE INTERFACE

MultiTrack View Window

MultiTrack View Window



The *MultiTrack View* window is the heart of the *SAW* non-linear environment, where, like a jigsaw puzzle, all the components come together to create the final production - the final masterpiece. And like a puzzle, different pieces (*MultiTrack Entries*) can be taken out, moved, and tried in other places until you find the perfect "fit". *MultiTrack View* combines its incredible power and functionality with ease of use, making it unbelievably fast and easy to produce a high quality production that even the high dollar systems envy.

The *MultiTrack View* window displays and provides real-time playback of up to 32 tracks (16 for *SAW32*, 8 for *SAW32Lite*) of audio data, accommodating any combination of stereo or mono files, samplerates or bit resolutions at the same time.

The default workspace normally shows four tracks, but you may view all or any number of tracks by dragging the window border to a different size. Audio *Regions* can be placed in the *MultiTrack*, where they are displayed as colored blocks (blue by default), and referred to as *MultiTrack Entries* (*MT Entries*).

The window has multiple zoom levels and can display audio waveforms when desired. It is also possible to record directly to the *MultiTrack*.

The *MultiTrack* also handles all of your mixing needs with virtual faders and pan controls. Audio effects processing on each track, such as equalization, delay, compression, etc. further adds to the comprehensive capabilities available for the creation of your projects.

This workspace can be used for something as simple as combining a music bed with a voice-over, or for creating complex audio productions utilizing thousands of *entries* with full mix automation and effects processing.

In general, the *MultiTrack* should be considered the most powerful and significant part of the *SAW* environment. Essentially, this is where it all comes together.



Regarding MultiTrack Entries: For many of the *MT Entry* manipulation functions, entries that are butt-spliced will be considered as one unit. Operating on one entry will affect all following butt-spliced entries, moving them accordingly.

Entries that are separated by a blank space will be considered as separate. In most cases, operating on one entry will leave following entries unaltered. If an operation conflict occurs (requiring following entries to be moved), the operation will either be cancelled or you will be prompted for confirmation to move the following entries.

Title Bar

If no editlist is currently active, the title bar displays the words *MultiTrack View*, followed by the current *MultiTrack* samplerate. Once an editlist is loaded or created, the pathname of the editlist file is displayed as well. The window may be moved by dragging the title bar. The window may also be sized by dragging any of the window borders.

Time Line Display

Along the bottom edge of the window is the *Time Line* display, a light yellow horizontal bar that shows reference times and is also used to create a *Marked Area* for special editing functions. In the *Time Line* display area you will see reference numbers indicating either *STANDARD* time, *SMPTE* time, *SAMPLE* position, or *TEMPO*, depending on what mode is currently active. The *Time/Position* readout of the *Remote Transport* window will display the current mode.

☞ The *MultiTrack Time Line* appearance attempts to provide an evenly distributed delineation at each zoom level. Realize that this gives an approximation of current cursor position with the exact position being displayed in the *Remote Transport* window. Depending on the zoom level, a wide range of position values will fall within the same pixel reference line in the *Time Line* display, accounting for any apparent readout discrepancies.

Normal Tracks and Output Tracks

In addition to the 32 normal tracks (16 for *SAW32*, 8 for *SAW32Lite*), there are 12 Output tracks (6 for *SAW32*, 3 for *SAW32Lite*), one for each available sound card. These special tracks are the last tracks at the bottom of the *MultiTrack* and are distinguished by different colors for both the controls and tracks. They provide master volume controls and effects processing capabilities for each sound card output.

☞ Use an output track to control the volume of the overall mix being sent to a specific sound card, or perform a master fade across multiple tracks assigned to that sound card output. Patching effects on an output track applies those effects to all tracks assigned to that sound card output.

Hot Tracks

One track is bordered by two white horizontal lines and is referred to as the *Hot Track*. The *Hot Track* is the target track for many *MultiTrack* operations. Clicking on any track selects it as the *Hot Track*.

Control Buttons

*Button descriptions are followed by applicable keyboard commands.



Regarding the PreLoad Queue Buffer Setting: Many controls can be operated in real-time during playback. The time it takes for a control to respond during playback is directly related to the *PreLoad Queue Buffer* setting. This setting can be adjusted in the *Audio Hardware Setup* option located in the *Options* menu. Smaller numbers result in faster response times.

Making changes during playback can seriously tax the CPU for a moment as the MultiTrack re-cues and changes are applied. Depending on the speed of your computer and the complexity of the session, playback may be interrupted. Increasing the PreLoad Queue Buffer setting may resolve the situation, but will result in slower response times.

Track Number display

By default, the *Track Number Display* boxes start track numbering sequentially from 1 to 32 (1 to 16 for *SAW32*, 1 to 8 for *SAW32Lite*).

You can drag any track to a new location in the *MultiTrack* by dragging the track's number display box up or down to a new position.



This is useful when you wish to place two non-sequential tracks side by side for editing purposes, for example, to align a musical downbeat on track three with a cymbal crash on track eight.

Pressing the *Ctrl* key and clicking on any *Track Number Display* box reorders the tracks sequentially.

Solo

Clicking the *Solo* button mutes all other tracks so that the current track is the only one you hear during playback. Placing multiple tracks in *Solo* mode allows you to hear a mix of only those selected tracks.

Pressing the *Shift* key and clicking on any *Solo* button leaves any plug-in *Return* track active, so *FX Returns* will still be heard. For example, use this option when a soloing a vocal track which uses an Aux Send to add reverb to hear the reverb with the vocal at the same time.

Pressing the *Ctrl* key and clicking on any *Solo* button clears all solos at once.

Mute

Clicking the *Mute* button on any track will mute or turn that track off to exclude it from playback. Placing multiple tracks in *Mute* mode allows you to hear a mix excluding those tracks.

Pressing the *Ctrl* key and clicking on any *Mute* button clears all mutes at once.

Fader Icon

Clicking on the *Fader* icon displays the *Fader and Pan Control* window for that particular track. We refer to this as *Open Fader View*.

☞ *Fader* windows have special “on top” status that prevents them from being hidden as you work with other windows.

The track's entry color changes and two horizontal lines representing pan and volume levels are displayed. The top line indicates pan information (red when in the center default position) and the bottom line indicates volume information (yellow when in the 0 dB default position).

Press the *Ctrl* key and clicking on any *Fader* icon opens *Faders* for all tracks at once.

☞ All *Fader* windows will be stacked on top of each other. Clicking on any track in the *MultiTrack* will cause its particular *Fader* window to come to the top, ready for use.

To close a *Fader* window, click its *close* button or the corresponding *Fader* icon. When multiple *Faders* are open, pressing the *Ctrl* key and clicking any *Fader close* button closes all *Faders* at once.

Details on *Fader* operation are discussed in the *Controlling the Mix* chapter.

Out

The *Out* display box is used to select a sound card for recording or playback for that particular track. Clicking in the blue display box will display a popup menu allowing you to select the desired sound card. All wave devices that have been specified in the *Audio Hardware Setup* section under the *Options* menu will be listed.

Pressing the *Ctrl* key while selecting a sound card default all tracks to the same card.

FX Icon

Clicking the *FX* icon displays the *Effect Patch Builder* window. This window displays a list of all built-in and installed *PlugIn* effects. It allows you to patch in various combinations of processing effects for that particular track.

Pressing the *Ctrl* key and clicking on any *FX* icon clears all *FX* patches from all tracks at once.

Details on effects operation are discussed in the *Using the Effects Modules* chapter.

Rec

Clicking the *Rec* button opens the *Record Panel* to initiate recording directly to the *MultiTrack*.

Details on recording to the *MultiTrack* are discussed in the *MultiTrack Recording* chapter.

Return to Zero Hot Zone

The gray section just to the right of the *Rec* button is a “hot zone” that snaps the playback cursor immediately to the beginning of the *MultiTrack* production.

Zm In (+)


The *Zm In* button zooms the *MultiTrack* display in to the next level and decreases the time reference increments in the *Time Line* display. Use this button to help find a comfortable display of visual detail for the particular session you are working with.

Zm Out (-)


The *Zm Out* button zooms the *MultiTrack* display out to the next level and increases the time reference increments in the *Time Line* display. Use this button to help find a comfortable display of visual detail for the particular session you are working with.

Rate

Clicking the *Rate* button displays the *Set MTRate* window. This window selects the default output samplerate for the entire session.

 All *MT Entries* of a different samplerate will be converted live during playback to this default rate. Since samplerate conversion is a CPU intensive process, try selecting a default samplerate that matches the majority of the soundfiles involved in the production.

In the *Set MTRate* window, clicking the *Out Rate* button displays a popup list of available samplerates. Either choose one of the preset rates or enter a custom samplerate by choosing the *Custom* option. Click *OK* to save your choice as the default rate. The new default rate will be displayed in the *MultiTrack View* title bar.

 **Regarding Repeated Samplerate Changing:** Changing the samplerate of an existing editlist file recalculates all entry positions and lengths. It's possible to accumulate slight position and length errors if the setting is changed over and over again. All butt-spliced entries are adjusted to remain butt-spliced, but slight discrepancies in start positions and length can occur.

Select Mode (S)

Clicking the *Select* mode button toggles *Select* mode on and off. When engaged, the mouse pointer takes on the button icon shape whenever it is positioned within the *MultiTrack View* window indicating that *Select* mode is active.

Select mode allows you to select and highlight *MT Entries*. Entries that are selected may be moved, copied, deleted, and manipulated in various ways.

- ☞ *Select* mode is normally engaged with no entries selected. Pressing the *Shift* key while activating *Select* mode highlights the *MT Entries* from the previous *Select* mode operation.

Waveform Display (W)

Clicking on the *Waveform Display* button toggles *MultiTrack* waveform display on and off. When active, audio waveforms will be displayed inside all *MT Entries*.

- ☞ Zooming, scrolling, or otherwise moving around the *MultiTrack* window with waveforms displayed can slow screen redraws considerably. For faster movement during these operations, toggle waveform display off.

MultiTrack Operation

Cursor Positioning

Clicking with the left mouse button within the current *Hot Track* controls the placement of the *MultiTrack View cursor*. The cursor is used as a focal point for many *MultiTrack* operations and functions as well as to determine playback and record start position.

- ☞ Clicking on another track selects a new *Hot Track* without changing cursor position. Clicking again in the new *Hot Track* will allow cursor positioning.

Double-clicking within the *Time Line* display at a specific point causes that point to be centered in the display and makes that the new *MultiTrack View cursor* position.

You can also center the current *MultiTrack View cursor* position by pressing the = key.

Pressing the *Tab* key snaps the cursor forward to the next *MT Entry* boundary on the current *Hot Track*. Pressing *Shift* and *Tab* snaps the cursor backward to the previous *MT Entry* boundary on the current *Hot Track*.

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MultiTrack View Window

You can drag the cursor from one point to another within the *MultiTrack* and see a relative distance readout within the *Remote Transport* window that updates as you drag, providing there is no currently *Marked Area*.

Navigation

There are many ways to move around within the *MultiTrack View* window. The scroll bar along the bottom of the window allows you to quickly position the display anywhere within the current session at any zoom level. You may click the left or right scroll arrow to move one screen at a time or drag the scroll box with the mouse to jump to a relative position in the session.

Clicking in the scroll bar to the left or right of the scroll box jumps the cursor position to the beginning or end of the session. This modification to the standard Windows interface allows for much faster navigation and is more appropriate for this type of application.

☞ If you jump your position accidentally by clicking to the left or right of the scroll box, you may instantly return to your last position by pressing the *Shift* key and clicking in the scroll box.

The vertical scroll bar along the right edge of the window allows you to quickly scroll through the tracks. You may click the up or down scroll arrow to move one track at a time. Clicking in the scroll bar above or below the scroll box jumps the display one screen at a time. Dragging the scroll box with the mouse, jumps the display to a relative track location.

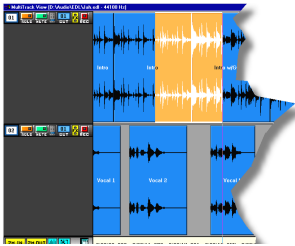
SAW also features dynamic horizontal and vertical scrolling the *MultiTrack View*. Both edges of the *MultiTrack* display are active zones. Clicking near the left or right edge of the display causes it to page left or right, respectively.

If you drag the cursor to the left or right edge of the display, the screen will scroll automatically as long as there is movement of the mouse in that direction.

If you drag the cursor to the top or bottom edge of the display, the screen will scroll up or down through the tracks as long as there is movement of the mouse in that direction.

You can adjust the scrolling speed by setting the *Wave Display Scroll Factor* located in the *Options* menu.

Marking Areas



Dragging the *MultiTrack View* cursor while the mouse is positioned in the *Time Line* display defines a *Marked Area*. The beginning boundary is defined by where you start the drag, while the end boundary is defined by where you end the drag.

- ☞ Once an area is defined, you can alter either boundary by clicking inside the *Time Line* display near the boundary and dragging it to a new position.

Pressing the *B* and *E* keys also define the beginning and end of a *Marked Area*.

- ☞ Pressing the *Ctrl* key and either the *B* or *E* key defines the entire *MT Entry* under the cursor as the *Marked Area*.

A *Marked Area* is inverse highlighted on the *Hot Track*, clearly showing the area between the boundaries, and the length of the *Marked Area* is displayed in the *Remote Transport* display window. Changing *Hot Tracks* transfers the *Marked Area* to the newly selected track.

- ☞ Even though the highlighting is displayed only on the *Hot Track*, certain functions use the *Marked Area* boundaries and apply them to all tracks at the same time.

Clearing a Marked Area

To clear a *Marked Area* in *MultiTrack View*, click with the right mouse button anywhere in the *Time Line* display or press the *C* key.

Playback

Several options are available to control audio playback in the *MultiTrack View*. When the *MultiTrack View* is the active window, clicking the right mouse button toggles between play and stop. The *Play* and *Stop* buttons on the *Remote Transport* window can also be used.

If a *Marked Area* is defined, the *Play Mark* button on the *Remote Transport* window can be used to play back just that area. Pressing the *Shift* key and clicking the right mouse button will perform the same function.

UNDERSTANDING THE INTERFACE

MultiTrack View Window

☞ If the *MultiTrack View cursor* is outside of the *Marked Area*, playback begins from the beginning of the *Marked Area* and plays back the entire area. If the cursor is within the boundaries of the *Marked Area* however, playback begins at the cursor position and plays to the end of the area.

If a *Marked Area* is defined, the *Play Loop* button on the *Remote Transport* window can be used to play back and loop just that area. Pressing the *Ctrl* key and clicking the right mouse button will perform the same function.

☞ If the *MultiTrack View cursor* is outside of the *Marked Area*, playback begins from the beginning of the *Marked Area* and plays back and loops the entire area. If the cursor is within the boundaries of the *Marked Area* however, playback begins at the cursor position and plays to the end of the area and loops back to the beginning.

MultiTrack playback gathers *MT Entry* audio data for each track, applies mix changes and effects processing, performs any necessary format and samplerate conversion, and combines all tracks together, dispersing them to their assigned sound card outputs in real-time.

☞ Depending on the complexity of the session, there may be a slight delay before playback begins while the *MultiTrack PreLoad* buffers are assembled. The amount of buffers preloaded before playback can be adjusted in the *MultiTrack PreLoad* option under the *Window* menu.

Pressing the *spacebar* performs a *MultiTrack PreLoad* only. Playback can then be initiated instantly on cue, with no delay, by pressing the *spacebar* (or any key) again.

Normal playback begins at the *MultiTrack View cursor*. The cursor displays the current playback position as playback proceeds. Stopping and restarting causes playback to resume from where you last stopped.

☞ Using the *AutoRewind* button in the *Remote Transport* window automatically returns the playback cursor to the original starting point when playback is stopped. See *Remote Transport Window* later in this chapter for more detail.

Link to SoundFile, Full and Regions View

Double-clicking on an *MT Entry* (or pressing the *T* key) loads and displays the associated *Region*, at its saved zoom levels, in the *SoundFile View* and transfers the cursor position to the same relative position with the *Marked Area* representing the *Region*. This creates a bi-directional link between the two windows. The *Region* can be auditioned, zoomed, or magnified without breaking the link, however, adjusting either boundary, altering the *Region*, will break the link. Adjusting the cursor position to a new point within the *SoundFile's Marked Area* and then clicking inside the *MultiTrack*, to make it the active window, snaps the *MultiTrack cursor* to the exact relative sample position as selected in the *SoundFile View*.

The soundfile is also loaded and displayed in the *Full View*, and selected and highlighted in the *Regions View*.

☞ To override the *Region's* saved zoom levels and hold the current *SoundFile View* zoom and magnification levels when transferring *MT Entries*, press the *Ctrl* key while double-clicking.

Link to Sequence View

As you change *Hot Tracks* in the *MultiTrack View*, the *Sequence View* automatically changes and displays a list of the *MT Entries* for the newly selected track. When you click on a specific *MT Entry* in the *MultiTrack*, the *Sequence View* automatically jumps to that entry.

Link to Remote Transport Window

When the *MultiTrack View* window is active, the *Remote Transport* window displays the current *MultiTrack View cursor* position.

Working with MultiTrack Entries

Part of the excitement of working in a non-linear environment such as **SAW**, is the creative freedom it offers while assembling and experimenting with many variations of a project until the perfect blend of elements comes together.

One of the most powerful design benefits built into the **SAW** environment is the ability to place *Regions* as *MT Entries* on the *MultiTrack*. Because *MT Entries* are simply *representations* of the data and are not the *actual* audio data, the editing operations you perform, and any changes you make to them, are virtually instantaneous and will

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MultiTrack View Window

not effect the original audio data. The *MultiTrack View* works like a safety net, allowing you to practice, experiment, and redo anything, any number of times, in any order, at unbelievable speeds - all while leaving your original soundfile data untouched! This feature alone is an audio editor's dream come true.

➔ To Change an MT Entry Boundary Using the Mouse:

1. Confirm that the *MT Entry* track is the current *Hot Track*. If not, click once on the track to make it the new *Hot Track*.
2. While pressing the *Shift* key, click near the desired boundary of the *MT Entry* you wish to change. The mouse cursor changes to the *Extend Entry* cursor shape and the cursor snaps to the boundary edge.
3. Drag the cursor left or right to the new desired position.
4. Release the mouse to resize the *MT Entry* to the new boundary.

☞ If the *MT Entry* boundary you are adjusting is butt-spliced to an adjacent entry, then both entries are adjusted simultaneously, effectively shifting the splice point but not altering the time or meter. Pressing the *Ctrl* key along with the *Shift* key will break the butt-splice and adjust only the boundary of the *MT Entry* which is under the cursor when the grab is initiated.

☞ If you overlap the *MT Entry* boundary you are adjusting with the boundary of the next or previous entry, the *MT Entry* you are adjusting is sized to fit the gap and is directly butt-spliced to the overlapped entry.

☞ If the *Auto Zero Cross* option is active, the *MT Entry* boundary you are adjusting will snap to the closest *Zero Cross*. When two entries are butt-spliced, the *Zero Cross* is keyed from the first entry. This could leave the second entry boundary with energy that could create a "tick" sound. To correctly adjust butt-spliced entries in this instance, you could break the butt-splice first (by using the *Ctrl Shift* key combination as noted above), and adjust each entry separately, sliding the two entries back together afterwards.

➔ To Change an MT Entry Boundary Using the Keyboard:

1. Confirm that the *MT Entry* track is the current *Hot Track*. If not, click once on the track to make it the new *Hot Track*.

2. Place the cursor near the desired boundary of the *MT Entry* you wish to change.
3. Adjust the cursor to the new desired position.
4. Press the *U* key to update the *MT Entry* boundary.



Regarding Adjusting MT Entry Boundaries: The boundary that is updated is the boundary closest to the new cursor position. Adjusting the begin boundary in this manner is only possible within the front half of the *MT Entry*, likewise, adjusting the end boundary is only possible within the back half.



If the *MT Entry* boundary you are adjusting is butt-spliced to an adjacent entry, then both entries are adjusted simultaneously, effectively shifting the splice point but not altering the time or meter.



If you overlap the *MT Entry* boundary you are adjusting with the boundary of the next or previous entry, the *MT Entry* you are adjusting is sized to fit the gap and is directly butt-spliced to the overlapped entry.



If the *Auto Zero Cross* option is active, the *MT Entry* boundary you are adjusting will snap to the closest *Zero Cross*. When two entries are butt-spliced, the *Zero Cross* is keyed from the first entry. This could leave the second entry boundary with energy that could create a "tick" sound. To correctly adjust butt-spliced entries in this instance, you could break the butt-splice first (by using the *Ctrl Shift* key combination), and adjust each entry separately, sliding the two entries back together afterwards.

➔ To Remove an MT Entry Without Disturbing Following Entries:

1. Confirm that the *MT Entry* track is the current *Hot Track*. If not, click once on the track to make it the new *Hot Track*.
2. Click to place the cursor within the *MT Entry* boundaries you wish to delete.
3. Press the *Delete* key.
4. Click *OK* or press *Enter*.

➔ To Delete an MT Entry Pulling Following Entries Forward:

1. Confirm that the *MT Entry* track is the current *Hot Track*. If not, click once on the track to make it the new *Hot Track*.
2. Click to place the cursor within the *MT Entry* boundaries you wish to delete.
3. Press the *Shift* and *Delete* keys.
4. Click *OK* or press *Enter*.

➔ To Split an MT Entry into Two Regions Using the Keyboard:

1. Confirm that the *MT Entry* track is the current *Hot Track*. If not, click once on the track to make it the new *Hot Track*.
2. Click to place the cursor at the desired split point.
3. Press *Ctrl* and *K* to split and keep both entries.

☞ An *MT Entry* is based on a single *Region*. Splitting an entry automatically move the original *Region's* end boundary forward to the split point and creates and butt-splices a new *Region* from the split point to the end. The name of the new *Region* is the same as the original with an appended unique identifier number.

➔ To Split and MT Entry Using the Split Region Toolbar:

1. Confirm that the *MT Entry* track is the current *Hot Track*. If not, click once on the track to make it the new *Hot Track*.
2. Click to place the cursor at the desired split point.
3. From the *Window* menu, select *Split Region Toolbar*.
4. Click the *Split/Keep* button to split and keep both entries.

Select Mode

Select mode allows you to select and highlight *MT Entries*. Entries that are selected may be moved, copied, deleted, and manipulated in various ways.

When *Select* mode is engaged, normal cursor positioning functions are not available with the mouse, and cursor remains stationary in its current position. The right mouse button no longer toggles playback, but instead is used as part of the selection process.

☞ Using the mouse within the *Time Line* display replaces these functions. *Marked Areas* are unused and automatically cleared when *Select* mode is made active.

➔ To Select MT Entries:

1. Click the *Select* mode button in the *MultiTrack* (or press the *S* key)
2. Click an *MT Entry* with the left mouse button to select and highlight it. You may select multiple entries to create a group.
3. To clear all entries and start again, click the right mouse button (or press the *C* key).
4. To deselect a single entry, press the *Ctrl* key while clicking the right mouse button on an entry.

☞ To select a group of entries, click the left mouse button and drag the mouse over the desired entries. Dragging an imaginary rectangle from the top left corner to the bottom right corner selects all entries within those boundaries. (Note: Dragging too fast can cause tiny entries within the group to be missed.)

You may also select a range of entries without dragging (and inadvertently missing small entries) by selecting the first entry as usual, and pressing the *Alt* key while selecting the last entry in the range. All entries inclusive will be selected. This will work across multiple tracks also, as long as the last entry is on the same or higher track number.

➔ To Extend MT Entry Selections

- Pressing the *End* key after selecting an entry selects all following entries on that track to the end of the session.
- Pressing *Ctrl* and *End* after selecting an entry selects all following entries on the current *Hot Track* and all tracks below to the end of the session.

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MultiTrack View Window

- Pressing the *Home* key after selecting an entry selects all previous entries on that track to the beginning of the session.
- Pressing *Ctrl* and *Home* after selecting an entry selects all previous entries on the current *Hot Track* and all tracks below to the beginning of the session.
- Press the *A* key selects all entries in the entire session.



Regarding Key Entries: The last entry selected is referred to as the *Key Entry*, which is used by certain positioning operations as the reference point for position calculations. Prior to using one of these positioning operations, click again on the desired *Key Entry* to ensure that that entry is used as the reference point.

➔ To Move Selected MT Entries with the Mouse:

- Pressing the *Shift* key and dragging any one of the selected entries allows you to move them forward or backward in time on the same tracks. Releasing the mouse moves and places the entries at the new location.
 - Pressing the *Ctrl* key and dragging any one of the selected entries allows you to move them up or down to different tracks without altering their position in time. Releasing the mouse moves and places the entries at the new location.
-  Releasing the *Shift* or *Ctrl* key during the move removes the horizontal and vertical constraint and allows you to move freely in any direction.

➔ To Copy Selected MT Entries with the Mouse:

- Pressing the *Shift* key and dragging any one of the selected entries allows you to move them forward or backward in time on the same tracks. Clicking and releasing the right mouse button at any time during the move engages *Copy* mode. Releasing the mouse copies and places the entries at the new location leaving the originals intact. The copies will retain the highlighting in case you want to repeat the action.

- Pressing the *Ctrl* key and dragging any one of the selected entries allows you to move them up or down to different tracks without altering their position in time. Clicking and releasing the right mouse button at any time during the move engages *Copy* mode. Releasing the mouse copies and places the entries on the new tracks leaving the originals intact. The copies will retain the highlighting in case you want to repeat the action.
- ☞ Releasing the *Shift* or *Ctrl* key during the copy removes the horizontal and vertical constraint and allows you to move freely in any direction.
- ☞ During all move or copy operations, the begin and end boundaries of the entry you are dragging are extended vertically across all tracks as reference lines. These can be very helpful for aligning entries on different tracks. Another vertical reference line will be displayed at the mouse position within the entry you are dragging. This can be very helpful for aligning two specific sample points on different tracks.

When performing a *Shift* key horizontal move or copy operation, the *Current Time* display in the *Remote Transport* window will show the time where the entry starts and will update as you move the entry. Pressing the *Alt* and *Shift* keys displays the time at the mouse position within the entry, rather than the entry start time.



Regarding Moving and Copying: The entire range of selected entries from left to right and top to bottom forms an imaginary solid block which is not allowed to overlap another entry. If a conflict occurs, the move will be cancelled. Overlapping an entry while moving the block left or right restricts the move, butt-splicing the overlapped edges.

➔ To Snap Selected MT Entries to the Current Cursor Position

- ☞ This operation uses a *Key Entry* as the reference point for calculating the distance to be moved.
1. After selecting *MT Entries*, click the entry to be assigned as the *Key Entry*.
 2. Press the *Backspace* key to snap the selected entries to the current cursor position.

UNDERSTANDING THE INTERFACE

MultiTrack View Window

-
- ☞ The left side of the *Key Entry* aligns itself to the current cursor position and all other entries retain their relative positions. If a conflict occurs during the move, the move will be restricted possibly leaving the *Key Entry* short of its intended mark.
-

➔ To Copy and Duplicate Selected MT Entries at the Current Cursor Position:

- ☞ This operation uses a *Key Entry* as the reference point for calculating the distance to be moved.
3. After selecting *MT Entries*, click the entry to be assigned as the *Key Entry*.
 4. Press the *Ctrl* and *Backspace* key to duplicate the selected entries at the current cursor position, with the *Key Entry* starting on the current *Hot Track*.
 5. The left side of the *Key Entry* aligns itself to the current cursor position on the current *Hot Track* and all other entries retain their relative positions. If a conflict occurs during the move, the move will be restricted possibly leaving the *Key Entry* short of its intended mark.
-

➔ To Remove Selected MT Entries Without Disturbing Following Entries:

1. Press the *Delete* key.
 2. Click *OK* or press *Enter*.
-

➔ To Delete Selected MT Entries Pulling Following Entries Forward:

1. Press the *Shift* and *Delete* key.
 2. Click *OK* or press *Enter*.
-

Processing Data Back to the Original Soundfiles

Mix changes and effects processing assigned to a track in the *MultiTrack* can be processed permanently back to the original

soundfiles if desired. See *Process Marked Area Back to Original Soundfile* in the *Using the Menus* chapter for more detail.

Building MixDowns

The entire *MultiTrack* session, or selected tracks and portions of the session, may be mixed down and written to a new soundfile if desired. You may also alter the format, resolution and samplerate during this operation if you choose. See *Build/Mix Options* in the *Using the Menus* chapter for more detail.

Special Keyboard Functions

These are extra *MultiTrack View* keyboard functions that, in many cases, have no menu option or control button equivalent.

A Key

The A key adds the currently selected *Region* from the *Regions View* to the *Hot Track* at the *MultiTrack View* cursor position.

☞ *Regions* that were recorded direct to the *MultiTrack* contain a position stamp of the original recorded position. Pressing the *Ctrl* key at the same time overrides the current cursor position and places the *Region* at the original recorded position on the current *Hot Track*.

This can be very helpful when keeping multiple takes of an overdub. You may easily place those takes on other tracks at a later time, perfectly in sync, using this feature.

Home/End Keys

The *Home/End* keys move the *MultiTrack View* cursor to the beginning or end of the production.

Left/Right Arrow Keys

The *Left/Right arrow* keys move the *MultiTrack View* cursor one pixel left or right. The amount of actual samples this represents depends on the current zoom level.

UNDERSTANDING THE INTERFACE

MultiTrack View Window

Ctrl and Left/Right Arrow Keys

The *Ctrl* and *Left/Right* arrow keys move the *MultiTrack* cursor to the beginning or ending boundary of the *Marked Area*.

M Key

The *M* key drops an *MT* (MultiTrack) marker at the current *MultiTrack View cursor* position, even during playback. See the *Markers View Window* section for more detail.

Page Up/Down Keys

The *Page Up/Down* keys increase or decrease the track width in the *MultiTrack View*. As the tracks expand or contract, the window size automatically adjusts.

Shift and Page Up/Down Keys

The *Shift* and *Page Up/Down* keys amplify or reduce the waveform display. Press the *0* (zero) key to return to Zero dB (the original waveform size).

Ctrl and Page Up/Down Keys

The *Ctrl* and *Page Up/Down* keys expand or contract the track width to its maximum or minimum limits.

Up/Down Arrow Keys

The *Up/Down* arrow keys increment and decrement the current *Hot Track*, scrolling the view as necessary to keep the *Hot Track* visible.

Shift and Up/Down Arrow Keys

The *Shift* and *Up/Down Arrow* keys scroll the view up or down one track at a time. This does not alter the *Hot Track* selection.

Ctrl and Up/Down Arrow Keys

The *Ctrl* and *Up/Down Arrow* keys scroll the view up or down one screen at a time. This does not alter the *Hot Track* selection.

Z Key

The **Z** key moves the *MultiTrack View cursor* position to the nearest zero crossing point. The program looks for the lowest left/right average waveform value within a small range before and after the current cursor position.

- ☞ Use this tool to help find the best editpoint for creating quiet splices.

Ctrl and **Shift 1-9 / Ctrl 1-9**

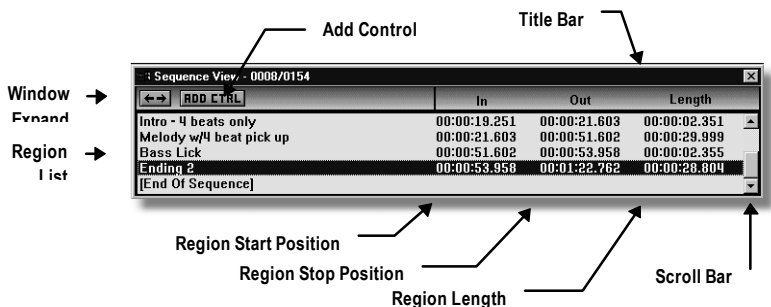
SAW has the ability to save multiple versions of a session under one common EDL file. This feature was designed to enhance the power of the typical *Undo* list, which usually can only step backward in a serial fashion. Multiple EDL versions can be recalled completely independently of each other, in any sequence, and up to nine of them can be created. At any time (especially before attempting a major change in your session), press the *Ctrl* and *Shift* keys and a number key (*1-9* on the main keyboard). A version of the current EDL will be saved to that number key, retaining all of the present session information. You may restore that version by pressing the *Ctrl* key and the corresponding number key. The versions will stay available with the original EDL *even after exiting the program*.

- ☞ Versions of an EDL are saved using the current EDL name, with the extension modified to reflect the version number. (For example, TEST.EDL will change to TEST.ED1 for version one, and TEST.ED2 for version two, etc.)

UNDERSTANDING THE INTERFACE

Sequence View Window

Sequence View Window



The *Sequence View* window displays information about all *MT Entries* on the current *Hot Track* in the *MultiTrack*. *MT Entries* are listed in the same order as they are positioned on the track, displaying the entry name, *In*-time, *Out*-time, and *Length*, according to the currently selected format: STANDARD time, SMPTE time or SAMPLES.

The *Sequence View* window may be used as a quick reference to entry position information, and as a quick navigational tool. It also is used to add special sequence entries that can control the flow of playback in the *MultiTrack*.

Title Bar

The title bar displays the words *Sequence View*, and also displays the *MT Entry* count and *Mix Change* count for the current *Hot Track* of the *MultiTrack* as #MT Entries/#Mix Changes. The window may be moved by dragging the title bar. The window may also be sized by dragging any one of the window borders.

Control Buttons

Window Expand

The *Window Expand* button toggles the *Sequence View* display between a narrow and wide view. The narrow view displays the *MT Entry* names only. The wide view displays all available information. This allows you to keep the window small, allowing room for other windows, but expand it quickly when you need additional information.

Add Ctrl

Pressing the *Add Ctrl* button displays the *Sequence Control View* window which allows special sequence entries to be added to control the flow of *MultiTrack* playback.

☞ These entries can be moved, copied, deleted, or otherwise manipulated like any other *MT Entry*.

- The *<BREAK>* entry causes the *MultiTrack* playback to stop at the entry position. This stops all tracks regardless of which track it is placed on. The *MultiTrack* is automatically cued forward to the end of the break entry, ready to play back the next entry if one follows immediately.

☞ This can be useful for using *SAW* as a live performance playback device. Production show segments can be automatically stopped and cued for the next segment.

☞ By activating the *Auto MT PreLoad After Break* option from the *Options* menu, an automatic preload of the *MultiTrack* after cueing can also take place.

- The *<LOOP TO BEG>* entry can be placed anywhere on any track, and when encountered, activates *MultiTrack Loop* mode. This resets the *MultiTrack* playback to the beginning and automatically restarts playback of all tracks after the entire production has been played to the end.

☞ This can be useful for using *SAW* as a background music playback device. For instance, place two hours of your favorite music on the *MultiTrack* and use this special entry to allow unattended repeated playback for as long as you like.

- The *<MIDI CUSTOM CMD>* entry can be used to send MIDI commands out through the MIDI Out Device, in sync with the *MultiTrack* playback. This command allows you to enter a series of HEX values which can be used to control any external device that accepts MIDI control data.

☞ This can be useful for using *SAW* as a live performance playback device. Lighting cues, fog machine devices, and other stage devices can be controlled with knowledge of the proper control strings. This information is usually supplied within the documentation included with the devices.

UNDERSTANDING THE INTERFACE

Sequence View Window

- The *<MIDI PRGM CHNG>* entry can be used to send MIDI commands out through the MIDI Out Device, in sync with the MultiTrack playback. This command allows you to enter a MIDI channel and program number which can be used to control external devices that accept program change data to change device settings.
 - ☞ This can be useful for changing external FX device program settings during mixdown, or be used during live performance playback to send lighting cues, or control other stage devices.
- The *<WAIT FOR TIME>* entry causes the *MultiTrack* playback to stop at the entry position and wait for a designated time in hh:mm:ss AM or PM. When the time is reached, *MultiTrack* playback will automatically start again. The *MultiTrack* is automatically cued forward to the end of this entry, ready to play back the next entry if one follows immediately.
 - ☞ This can be useful in environments where unattended announcements need to be played at specific times throughout the day, such as in hotel lobbies, or convention centers.
 - ☞ This entry can also be used during *SRP Record* mode to start and stop recording at specific times. For example, to create a recording template to automatically record five minutes beginning at each hour, place one of these entries set to the starting hour on a track of the *MultiTrack*. Five minutes down the track, place another of these entries set to the start of the next hour, and so forth. Engage *SRP Record* mode on another track and SRP recording will be started and stopped at each of these control entries.

In-Position Control Zone

When any SMPTE mode is active, you may double-click on the *In-time* position of a particular entry in the *Sequence List* to display the *SMPTE Position* window. Entering a SMPTE time in the window and clicking *OK* snaps that entry to the specified SMPTE time. See *the Working with SMPTE* chapter for more details on using the *SMPTE Position* window.

Sequence View Operation

Link to MultiTrack View

Selecting an entry in the *Sequence List* by clicking with the left mouse button or using the *Up/Down* arrow keys snaps the *MultiTrack cursor* directly to the beginning position of that *MT Entry*.

Link to SoundFile, Full and Regions View

Double-clicking on an entry in the *Sequence List* causes the associated *Region's* linked soundfile to be loaded and displayed in the *SoundFile View* at the saved zoom levels. The soundfile is also loaded and displayed in the *Full View*, and selected and highlighted in the *Regions View*.

☞ Pressing the *Ctrl* key while double-clicking overrides the saved zoom levels and displays at the current *SoundFile View* zoom levels.

Playing Back an Entry

➔ To Play Back an Entry Using the Mouse:

1. In the *Sequence View* window, click the left mouse button on the desired entry name.
2. Click the right mouse button anywhere inside the *Sequence View* window. This will initiate normal *MultiTrack* playback starting at that entry's position.

➔ To Play Back an Entry Using the Keyboard:

1. With the *Sequence View* as the active window, use the *Up* and *Down* arrow keys to select an entry.
2. Press the *Enter* key to initiate *MultiTrack* playback starting at that entry's position or press the *Spacebar* to initiate a *MultiTrack PreLoad*.

☞ While playback is active, pressing the *Up/Down* arrow keys to select another entry will immediately cue and begin playback at that entry.

UNDERSTANDING THE INTERFACE

Sequence View Window

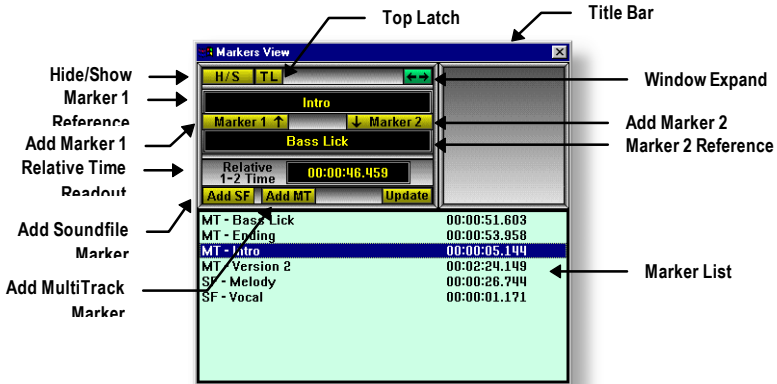
➔ To Delete an Entry:

1. In the *Sequence View* window, select the desired entry.
2. Press the *Delete* key. The entry will be removed from the *Sequence View* window and from the *MultiTrack View* window. All following *MT Entries* on the same track(s) will be left undisturbed in their current positions.

OR

3. Hold the *Shift* key and press the *Delete* key. The entry will be deleted from the *Sequence View* window and from the *MultiTrack View* window. All following *MT Entries* on the same track(s) will be shifted to the left replacing any resulting gaps.

Markers View Window



The *Markers View* provides powerful navigational features within the *SAW* environment. *Markers* are reference positions in either the *SoundFile View* (SF) or the *MultiTrack View* (MT) that can be named and easily recalled. *Markers* can be dropped live during playback in either view and also during recording in the *MultiTrack View*. The *Markers View* can also be used to display the relative distance between any two *Markers* and can even be used as a quick method for creating *Marked Areas*.

Title Bar

The title bar displays the words *Markers View*. The window may be moved by dragging the title bar. The window may also be sized vertically, and horizontally to a limit, by dragging the window borders.

Control Buttons

H/S

The *H/S* (Hide/Show) button is used to toggle between hiding and showing the *SAW* program workspace. When first clicking this button in a window, the program workspace will be hidden, leaving the *Markers View* window on top. Clicking the *H/S* button again redisplay the workspace. This allows *SAW* to be controlled remotely while inside of another application.

TL

The *TL* (Top Latch) button is used to latch this window to other windows containing *H/S* buttons. When any *H/S* button is clicked in any window, the *Markers View* window will also remain on top.

Window Expand

The *Window Expand* button toggles the *Markers View* display between a narrow and wide view. The narrow view displays *Marker* names only. The wide view also displays *Marker* information. This allows you to keep the window small, allowing room for other windows, but expand it quickly when you need additional information.

Marker 1

Clicking the *Marker 1* button places the currently selected *Marker* name in the *Marker 1* readout display.

Marker 2

Clicking the *Marker 2* button places the currently selected *Marker* name in the *Marker 2* readout display.

Relative 1-2 Time Readout Display

When *Marker* names of similar types (SF or MT) are displayed in the *Marker 1/Marker 2* readouts, the relative time between the two positions is displayed in the *Relative 1-2 Time* readout.

Add SF

The *Add SF* button adds a *Marker* referencing the current *SoundFile cursor* position. If playback is not active, you'll be prompted to enter a *Marker* name. Otherwise, a unique default name will be created which can be changed later.

☞ *Soundfile Marker* names will be listed with an *SF* prefix.

Add MT

The *Add MT* button adds a *Marker* referencing the current *MultiTrack cursor* position. If playback is not active, you'll be prompted to enter a

Marker name. Otherwise, a unique default name will be created which can be changed later.

☞ *MultiTrack Marker* names will be listed with an *MT* prefix.

Update

The *Update* button allows you to change the name and/or the position of the currently selected *Marker*.

Markers View Operation

Adding a Soundfile Marker

➔ To Add a Soundfile Marker:

1. From the *Window* menu, select *Markers* to display the *Markers View* window.

☞ You may want to create a function key workspace view that includes the *Markers View* window. See our suggested workspaces at the beginning of this chapter.
2. With a soundfile displayed in the *SoundFile View* window, place the cursor at the desired *Marker* position.
3. Click the *Add SF* button in the *Markers View* window.
4. In the *Input Text* box, specify a new *Marker* name, or accept the default unique numbered name.
5. Click *OK* or press the *Enter* key. This will add the new *Marker* in the *Markers View* window in alphabetical order.

Jumping to an Existing Soundfile Marker

➔ To Jump to an Existing Soundfile Marker:

1. From the *Markers View* window, click the desired *SF Marker* name. The associated soundfile will be loaded and the *SoundFile cursor* will be set to the *Marker* reference position.

Adding a MultiTrack Marker

➔ To Add a MultiTrack Marker:

1. From the *Window* menu, select *Markers* to display the *Markers View* window.
 - ☞ You may want to create a function key workspace view that includes the *Markers View* window. See our suggested workspaces at the beginning of this chapter.
2. In the *MultiTrack*, place the cursor at the desired *Marker* position.
3. Click the *Add MT* button in the *Markers View* window.
4. In the *Input Text* box, specify a new *Marker* name, or accept the default unique numbered name.
5. Click *OK* or press *Enter*. This will add the new *Marker* in the *Markers View* window in alphabetical order.

Jumping to an Existing MultiTrack Marker

➔ To Jump to an Existing MultiTrack Marker:

1. From the *Markers View* window, click the desired *MT Marker* name. The *MultiTrack cursor* will be set to the *Marker* reference position.
 - ☞ When double-clicking an *MT Marker*, the *MultiTrack cursor* will be set to the *Marker* reference position, and the *MT Entry* at the cursor position on the current *Hot Track* will be displayed in the *SoundFile* and *Full View* windows. If there is no *MT Entry* at the *Hot Track* cursor position, no change will be made in the *SoundFile* or *Full View* windows.



Regarding Markers View During Playback: These functions are immediate and occur, even during playback. While this is a powerful feature for fast navigation and editing, it is recommended that the *Markers View* be left closed during critical playback periods (as in a final mix) to minimize the chance of error.

→ To Create a Marked Area Between Two Markers:

1. Select the *SF* or *MT Marker* with the earliest time reference from the *Markers View* window. This will jump to that *Marker* location.
2. While holding the *Shift* key, select a second *Marker* (of the same type) at a later time reference. This will jump to that *Marker* location, and mark and highlight the area between them.

☞ The *Markers* must be of the same type (*SF* or *MT*) and *SF Markers* must be part of the same soundfile.

☞ Pressing the *Shift* key when selecting any *Marker* will automatically mark from the current associated cursor position (*SF* or *MT*) to the selected *Marker* position. The relative movement must be from left to right and, if using *SF Markers*, must be part of the same soundfile.

Playback

Pressing the *Enter* key or clicking the right mouse button initiates playback of any *Marker* position immediately.

Pressing the *Spacebar* toggles playback on and off. On *MT Markers*, it performs a *MultiTrack PreLoad* on the first press and pauses. The next press starts playback instantly.

Special Keyboard Functions

These are extra *Markers View* keyboard functions that, in many cases, have no menu option or control button equivalent.

Ctrl and Delete

Pressing *Ctrl* and *Delete* deletes all *Marker* entries.

UNDERSTANDING THE INTERFACE

Markers View Window

Delete

Pressing the *Delete* key deletes the currently selected *Marker* from the *Markers View*.

Up/Down Arrow

Pressing the *Up/Down arrow* keys selects the previous/next *Marker* and instantly jumps to its location.

☞ If the newly selected *Marker* is an *SF Marker*, playback, if active, will be stopped. If the newly selected *Marker* is an *MT Marker*, playback, if active, will continue at the new location.

K Key

Pressing the *K* key performs a *Split/Keep* function at the selected *MT Marker* position without the need to switch active windows to the *MultiTrack* view. This key has no affect on *SF Markers*.

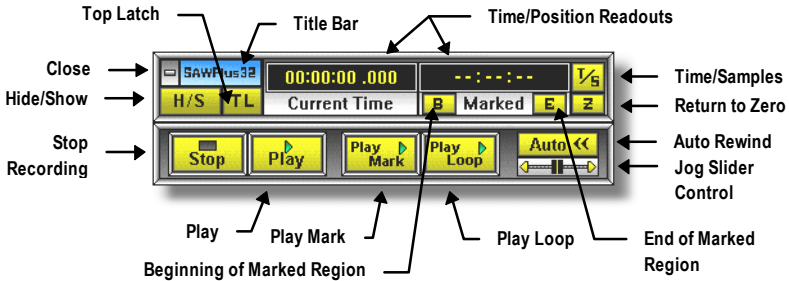
R Key

Pressing the *R* key performs a *Split/Remove* function at the selected *MT Marker* position without the need to switch active windows to the *MultiTrack* view. This key has no affect on *SF Markers*.

D Key

Pressing the *D* key performs a *Split/Delete* function at the selected *MT Marker* position without the need to switch active windows to the *MultiTrack* view. This key has no affect on *SF Markers*.

Remote Transport Window



The *Remote Transport* window serves as a central playback and position control, and information display tool. The window can remain active on top of other applications, allowing you to remotely control many of the SAW playback and positioning functions.

Title Bar

The *Remote Transport* window can be moved by dragging the title bar.

Time/Position Readouts

The *Current Time* readout displays the current cursor position in the active window. Depending on the active display mode, the readout will show STANDARD time (to the nearest millisecond), SMPTE time (to the nearest subframe), SAMPLE count, or TEMPO.

☞ This readout display can also act as a special *GoTo Position* feature.

If any SMPTE mode is active, clicking in the display with the left mouse button will display the *SMPTE Position* window, allowing you to enter the SMPTE position which the *MultiTrack* cursor will immediately jump to.

If the *Sample Display* mode is active, the same mouse click will prompt you for a ten-digit sample position instead.

UNDERSTANDING THE INTERFACE

Remote Transport Window

If the *Tempo* mode is active, the same mouse click will prompt you for a destination measure number.

The *Marked/Relative Time* readout displays the length of the current *Marked Area*, if one exists, or the relative difference between two points on the waveform as the mouse is dragged.

During *MultiTrack* playback and *SRP Recording*, the *Marked/Relative Time* readout displays a Power Reserve value that indicates how much processing power is available during the *MultiTrack* processing loop. The value is displayed from 99% to 0%, indicating the level at which the *MultiTrack* buffer processing is progressing. Higher numbers indicate that the *MultiTrack* loop is completing its track processing with time left over before the soundcard demands the next buffer. Lower numbers indicate that the processing load is struggling to keep up with the soundcard demands. As this value approaches 0%, the 'Machine Too Slow Message' is very close at hand.

Control Buttons

Close

This button closes the window with a single click.

H/S

The *H/S* (Hide/Show) button is used to toggle between hiding and showing the *SAW* program workspace. When first clicking this button in a window, the program workspace will be hidden, leaving the *Remote Transport* window on top. Clicking the *H/S* button again redisplay the workspace. This allows *SAW* to be controlled remotely while inside of another application.

TL

The *TL* (Top Latch) button is used to latch this window to other windows containing *H/S* buttons. When any *H/S* button is clicked in any window, the *Remote Transport* window will also remain on top.

B and E

The *B* and *E* buttons are included as a convenient way to navigate to the beginning or end of a marked region in the *SoundFile* or *MultiTrack*

View. *Ctrl* and *Left arrow* or *Ctrl* and *Right arrow* perform the same function.

T/S

The *T/S* (Time/Samples) button toggles between time and sample display modes and causes all position and time references in *SAW* to change accordingly.

Z

The *Z* (Return to Zero) button returns the cursor to the *Zero Position* of the *SoundFile View* or *MultiTrack View* windows, depending on which one is active.

Pressing the *Shift* key at the same time sets a new relative *Zero Position* for the *Current Time* display. The *Time Line* of the active window is updated to reflect the change. Any position prior to the new *Zero Position* will display as zero. When the cursor moves past the *Zero Position*, time will increment normally.

Pressing the *Ctrl* key at the same time clears the relative *Zero Position* back to the actual beginning position (real zero).

The *Full View* and *SoundFile View* retain a separate relative *Zero Position* from the *MultiTrack View*. The *Sample Display* mode or any *SMPTE* mode overrides the relative zero display.

Stop and Play

When the *MultiTrack View* is the active window, *Play* begins playback of all tracks that are not muted. *Stop* ends playback and leaves the cursor at a new current position ready to resume playback from that point.

When the *SoundFile View* is the active window, *Play* begins playback of the current soundfile from the *SoundFile View* cursor position. *Stop* ends playback leaving the *Tracking cursor* at a new current position. Clicking *Play* again replays from the original start point. This allows you to easily and quickly preview an editpoint as many times as you like.

When the *Regions View* is the active window, *Play* automatically loads and displays the selected *Region* in the *SoundFile View*, and begins playback at the start of the *Region*, automatically stopping at the end of the *Region*.

UNDERSTANDING THE INTERFACE

Remote Transport Window

When the *Sequence View* is the active window, *Play* begins playback in *MultiTrack View* from the start of the currently selected sequence entry.

Play Mark

If the *MultiTrack View* is the currently active window, then clicking the *Play Mark* button initiates playback of the *MultiTrack Marked Area*. Otherwise, clicking the *Play Mark* button immediately shifts the focus to the *SoundFile View* and initiates playback of the *SoundFile Marked Area*.

☞ If the playback cursor is outside of the *Marked Area*, playback begins from the beginning of the *Marked Area* and plays back the entire area. If the cursor is within the boundaries of the *Marked Area* however, playback begins at the cursor position and plays to the end of the area.

Play Loop

If the *MultiTrack View* is the currently active window, then clicking the *Play Loop* button initiates and loops playback of the *MultiTrack Marked Area*. Otherwise, clicking the *Play Loop* button immediately shifts the focus to the *SoundFile View* and initiates and loops playback of the *SoundFile Marked Area*.

☞ If the playback cursor is outside of the *Marked Area*, playback begins from the beginning of the *Marked Area* and plays back and loops the entire area. If the cursor is within the boundaries of the *Marked Area* however, playback begins at the cursor position and plays to the end of the area and loops back to the beginning.

☞ During *SoundFile View* looping, the begin and end points can be seamlessly redefined on-the-fly by clicking anywhere in the display area, while the loop is playing. The *MultiTrack View* looping is not seamless, however, as playback stops and immediately re-cues at the beginning, and the begin and end points can not be altered while the loop is playing.

Auto<<

This button toggles the *MultiTrack View AutoRewind* mode on and off. When this mode is active, the *MultiTrack playback cursor* automatically returns to the original starting point when a playback or

record operation is stopped. This button has no effect in the *SoundFile View*.

Jog Slider Control

Dragging the *Jog Slider* control to the left or right will rewind or fast forward the cursor position in *MultiTrack View*. The farther you drag from the center, the faster the position changes. When you release the control, the *MultiTrack View* window redraws the screen, centering the new cursor position.

Chapter 3

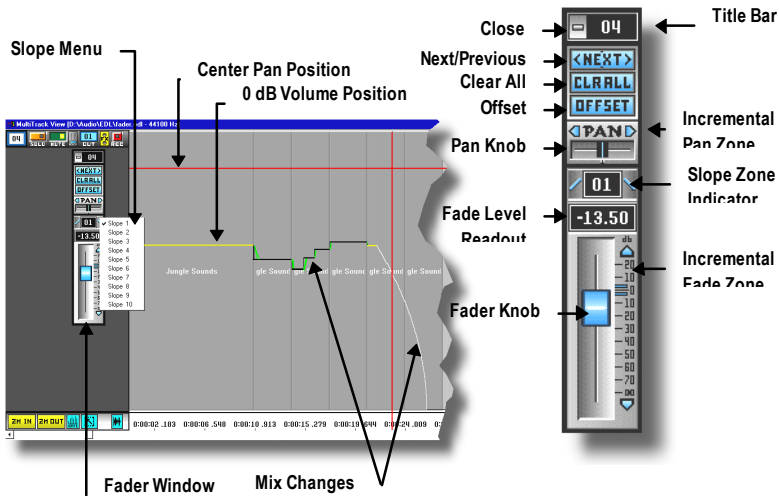
CONTROLLING THE MIX

The **SAW** environment offers an incredible array of tools and functions to control Volume Levels and Pan Positions. Popup *Faders* for each track are the central element used to adjust the mix. Mix changes can be programmed non-destructively, one at a time, and played back simultaneously, live in real-time, without ever modifying the original soundfile data! Programmed mix changes can be moved, copied, expanded and compressed, at any time, because they are never written directly to the soundfiles themselves. Level and pan changes can also be programmed live during playback, if desired.

SAW is designed do the work of a full featured audio mixing console complete with a sophisticated fader automation system capable of down-to-the-sample-accuracy.

The mixing concepts and techniques presented here are probably quite different from what you are accustomed to, using physical hands-on faders and controls, but the incredible power and flexibility gained by this design is worth the small learning curve. So let's jump in and get control of the mix.

Using The Faders



Clicking a *Fader* icon on any track of the *MultiTrack* opens and displays a popup *Fader* window for that track. You may open as many *Fader* windows as you wish, and arrange them on the screen in any fashion. When multiple *Faders* overlap, the current *HotTrack Fader* will always be displayed on the top. Changing the *Hot Track* will also change the topmost *Fader*. Clicking on any *Fader* to bring it to the top will also change the current *Hot Track*. This bi-directional link can be very helpful when trying to manipulate many *Faders* at the same time.

☞ Relying on this design feature, you might find that the default overlapping *Faders* work most efficiently and save screen space, rather than spreading the *Fader* windows out like a standard mixing console display.

When any *Fader* is open, its corresponding track display will change color and two horizontal mix display lines will appear. The top line represents pan information and the bottom line represents volume information. The default *Center Pan Position* is displayed as red. The default *zero dB Volume Level* is displayed as yellow. Whenever a mix change is programmed, these lines change color, giving visual indication of the new value and position. Whenever the mix displays are at the default positions, **SAW** performs no mix calculations on the data at all. Any deviation from the default, causes **SAW** to mathematically scale the audio data on the fly to accomplish the desired mix changes, thereby adding CPU processing time to the playback operation.

CONTROLLING THE MIX

Using The Faders

The *Faders* dynamically display the current mix values at the *MultiTrack* cursor position. If you drag the cursor across the *MultiTrack* mix changes, you will see the associated *Fader* knobs move to reflect the levels. This display mode is also active during playback.

- ☞ The *Fader* tracking during playback can be disabled to save CPU processing time if desired by toggling off the *MultiTrack View Playback Mixer Tracking* option in the *Options* menu.

When a *Fader* is open (and the *Offset* button is not pressed), it is automatically ready for programming. Placing the *MultiTrack* cursor at the desired mix change position and adjusting the *Fader* or *Pan Knob*, writes the mix change onto the track, altering the display lines to show the change. The *Fader* is also active for programming live during playback. When playback is active, adjusting either knob writes the changes into the track as you perform them. Whenever you release the mouse button the display is updated. A slight delay in hearing a change will be experienced based on the *Preload Queue Buffers* setting in the *Audio Hardware Setup* window, located under the *Options* menu. The smaller the setting, the less the delay. The changes are actually written onto the track without the delay and during following playbacks will exactly duplicate your moves and timing.

- ☞ This feature is useful for performing a live fade that does not fit the preset *Fade Curve* selections, however we recommend programming precision mix adjustments in non real-time to take advantage of the power and accuracy available to you in that mode of operation.

SAW guides you to write mix changes only within the confines of *MT Entry* boundaries, although the flexibility of the interface makes it possible to place mix changes anywhere on a track (possibly as a result of certain editing operations).

- ☞ **Regarding Mix Changes:** We strongly recommend keeping all mix changes inside *MT Entry* boundaries so that you can freely move, copy and otherwise adjust your production at any time, maintaining perfect sample accurate sync between *MT Entries* and mix events. Any mix event outside an *MT Entry* boundary will not retain its relative position to the rest of the production during many of the positioning operations.

Title Bar

The title bar displays the *Fader* window's associated *Track Number*. The *Fader* window may be moved by dragging the title bar.

Control Buttons

Close

The *Close* button closes the *Fader* window. Pressing the *Ctrl* key while clicking any *Fader Close* button, closes all *Fader* windows at once.

Next

The *Next* button snaps the *MultiTrack cursor* position to the next or previous mix change. Clicking on the right half of the button moves the cursor forward to the next mix change. Clicking on the left half of the button moves the cursor backward to the previous mix change. If there are no more mix changes in the chosen direction, the cursor does not move.

Clr All

The *Clr All* button clears all mix changes on the associated track. Pressing the *Ctl* key at the same time will clear all mix changes on all tracks.

Offset

The *Offset* button adjusts the volume and pan levels of the entire track at once. All mix changes are left intact relative to each other, and are offset as a group by the offset value. When the *Offset* button is pressed in, dynamic *Fader* tracking is disabled and the only value displayed is the offset value. Offset adjustments are not connected to cursor positions and do not write programmed changes into the track. With *Faders* set to *Offset* mode, you can adjust them dynamically during playback to set a relative mix between multiple tracks, much the same as you would adjust a physical mixing console.

Pan Incremental Zones

Clicking in the *Pan Incremental Zones* adjusts the pan position left or right in repeatable, incremental steps.

CONTROLLING THE MIX

Using The Faders

- ☞ If playback is active, the display will not be updated at each click to show the pan changes until the pan knob is clicked once. This reduces CPU overhead considerably.

Pan Knob

Adjusting the *Pan Knob* changes the left/right position of the track in the mix. Clicking the right mouse button while adjusting the pan knob snaps the pan to the default center position.

Slope Zone

The *Slope Zone* displays the current slope value for the mix change. Each mix change (volume and pan) in **SAW** is actually a series of ramped steps at a resolution of about 1/1000 dB. These tiny steps allow the mix changes to be applied without creating digital noise (crackles and pops) during sustained tones or music information. The *Slope Value* determines how fast or slow these step transitions take place. Lower values produce slower transitions. Clicking in the *Slope Zone* pops up a *Slope* menu. The checked value is the current default value. You may select a new default value from 1 to 10. The lower values sound like quick fades and the higher values sound like instantaneous jumps. This default value is used for every new mix change programmed. You may select different values for individual mix changes and you may change an individual slope value at any time. The *Fader Slope* value display is dynamic and reflects the current *Slope* value at the cursor position, not necessarily the default value.

Fader Incremental Zones

Clicking in the *Fader Incremental Zones* adjusts the volume level up or down in ¼ dB steps. Pressing the *Shift* key while clicking in the zones increases the steps to 1 dB each.

- ☞ If playback is active, the display will not be updated at each click to show the level changes until the *Fader* knob is clicked once. This reduces CPU overhead considerably.

Fader Knob

Adjusting the *Fader* knob changes the volume level of the track in the mix. Clicking the right mouse button while adjusting the *Fader* knob snaps the *Fader* to the default 0 dB position. The adjustment increments are in 1 dB steps. Use the incremental zones for ¼ dB resolution.

Operation

The following operations assume that the *Fader* window is open for the track(s) you are working with.

Working with Individual Volume and Pan Changes

When working with individual volume and pan changes, the default slope value is used to determine the speed of the actual change from one value to the next. A different slope value may be chosen before making new changes, and that value will remain in effect for all following changes until a new value is selected.

➔ To Add a Volume or Pan Change:

1. Place the *MultiTrack* cursor at the desired position.
2. Adjust the *Fader* or *Pan* knob to the new value.

➔ To Adjust an Existing Mix Change Value:

1. Place the cursor near the mix change you wish to adjust.
2. Click the *Next* button to snap the cursor in the appropriate direction until it is at the exact mix change position you wish to adjust.
3. Adjust the *Fader* or *Pan* knob to the new value.

➔ To Adjust a Range of Mix Change Values:

1. Create a *Marked Area* encompassing the whole range of mix changes to be adjusted.
2. Place the cursor within the *Marked Area*.
3. Adjust the *Fader* knob to shift relative volume of the original mix changes up or down.

🕒 To adjust the volume within a portion of an *MT Entry*, this feature can be used as a shortcut rather than setting two individual volume changes. Mark the portion of interest, currently containing no mix changes, and adjust the fader to the desired volume. This will automatically place a volume change at the beginning boundary and the ending boundary creating the effective shift within the *Marked Area*.

➔ To Move Mix Changes on the Same Track:

1. Create a *Marked Area* encompassing the mix changes you wish to move.
2. While pressing the *Shift* key, click and hold the left mouse button inside the *Marked Area* and drag the selection left or right on the same track to the new position.

➔ To Move Mix Changes to a Different Track:

1. Create a *Marked Area* encompassing the mix changes you wish to move.
2. While pressing the *Ctrl* key, click and hold the left mouse button inside the *Marked Area* and drag the selection up or down to the new track.

➔ To Copy Mix Changes on the Same Track:

1. Create a *Marked Area* encompassing the mix changes to be moved.
2. While pressing the *Shift* key, click and hold the left mouse button inside the *Marked Area* and drag the selection left or right on the same track to the new position. At any time during the move, click and release the right mouse button to engage *Copy* mode.
3. Release the mouse to copy and place the mix changes in the new position leaving the originals intact.

➔ To Copy Mix Changes to a Different Track:

1. Create a *Marked Area* encompassing the mix changes to be moved.
2. While pressing the *Ctrl* key, click and hold the left mouse button inside the *Marked Area* and drag the selection up or down to the new track. At any time during the move, click and release the right mouse button to engage *Copy* mode.
3. Release the mouse to copy and place the mix changes in the new position leaving the originals intact.

→ To Sweep Between Pan Positions :

1. Place the *MultiTrack cursor* at the desired end position and set the destination pan position.
2. Move the cursor back to the desired start position.
3. From the *Mix* menu, select *Sweep to Next Pan Change* (or press *P*).

☞ Using the keyboard bypasses the confirmation prompts, to allow for quicker operation.

→ To Reverse Mix Changes:

1. Create a *Marked Area* encompassing the mix changes to be reversed.
2. From the *Mix* menu, select *Reverse Marked Vol and Pan Changes* (or press *Shift-R*).

→ To Clear Volume and Pan Changes at the Same Time:

1. Create a *Marked Area* encompassing the mix changes to be cleared.
2. From the *Mix* menu, select *Clear Marked Vol and Pan Changes* (or press *Shift* and *C*).
3. Click *OK* or press *Enter*.

→ To Clear Volume Changes Only:

1. Create a *Marked Area* encompassing the mix changes to be cleared.
2. From the *Mix* menu, select *Clear Marked Vol Changes* (or press *Shift* and *V*).
3. Click *OK* or press *Enter*.

→ To Clear Pan Changes Only:

1. Create a *Marked Area* encompassing the mix changes to be cleared.

CONTROLLING THE MIX

Using The Faders

2. From the *Mix* menu, select *Clear Marked Pan Changes* (or press *Shift* and *P*).
3. Click *OK* or press *Enter*.

Working with Fades

A fade in *SAW* is actually a series of individual mix changes maintained as a group (displayed in white) and pre-programmed to follow a specific curve shape. The curve shape is pre-selected using the *Fade Curve Setup* option under the *Mix* menu. For more information about selecting *Fade Curves*, see *Using the Menus*.

- ☞ The default slope value is still used for each step in the fade group. Fades created with the same curve shape but different slope values will produce subtle differences in the overall sound of the fade.

➔ To Fade In or Out Within a Marked Area

1. Create a *Marked Area* defining the begin and end points of the fade.
2. Confirm that the desired *Fade Curve* parameters and the *Slope Value* are set as desired.
3. From the *Mix* menu, select *Fade Out Marked* (or press *O*), or select *Fade In Marked* (or press *I*).

- ☞ Using the keyboard bypasses the confirmation prompts, to allow for quicker operation.
- ☞ Using this fade process, a fade-in always starts from a mute volume level and ends at the volume level of the *Marked Area* end boundary. A fade-out always starts at the volume level of the *Marked Area* begin boundary and ends at a mute volume level.

➔ To Fade from a Higher to a Lower Volume Level:

1. Place the *MultiTrack cursor* at the desired end position and set the destination volume to a lower level.
2. Move the cursor back to the desired start position.
3. From the *Mix* menu, select *Fade to Next Volume Change* (or press *F*).

- ☞ Using the keyboard bypasses the confirmation prompts, to allow for quicker operation.

CONTROLLING THE MIX

Using The Faders

→ To Fade from a Lower to a Higher Volume Level:

1. Place the *MultiTrack* cursor at the desired end position and set the destination volume to a higher level.
2. Move the cursor back to the desired start position.
3. From the *Mix* menu, select *Fade to Next Volume Change* (or press F).

☞ Using the keyboard bypasses the confirmation prompts, to allow for quicker operation.

☞ In some cases, you may need to set a starting volume first before performing this operation. For example: Suppose you have an entry in the middle of a track. The current volume at that entry position is 0 dB. You would like to fade this entry in from -40 to 0 dB. In order to accomplish this, *Tab* (or *Shift-Tab*) to the beginning boundary of the entry. Adjust the *Fader* knob to -40 dB to create the start volume level. Position the cursor in the entry where you would like the fade-in to end. Adjust the *Fader* knob to 0 dB. This creates a dip in the volume display line. Place the cursor slightly inside of the begin boundary (confirming the fader readout is -40) and press the *F* key to create the fade.

Working with CrossFades

Fading one audio segment out while an overlapping audio segment fades in, is referred to as a CrossFade. Creating automatic CrossFades in *SAW* is extremely simple, and yet incredible flexibility is provided for precisely selecting the crossover point, so critical in achieving the desired effect.

The crossover point is the position where the incoming and outgoing volume levels of both audio segments are the same. If the crossover point occurs at a -6 dB level, there is no apparent decrease in volume during the transition.

The *SAW* environment does not allow *MT Entries* to overlap on the same track, therefore, CrossFades between audio segments must occur across different tracks. To use the automatic CrossFade functions, overlapped segments must be on adjacent tracks.

→ To Create a CrossFade Between Two Overlapped MT Entries:

1. If the entries are not on adjacent tracks, reposition the tracks to be next to each other by dragging the *Track Number* display of either track.
2. Select the top track as the *Hot Track*.
3. Place the cursor within the overlapped area at the desired crossover position.
4. From the *Mix* menu, select *CrossFade Marked or Overlapped to the Next* (or press *X*).



From the *Mix* menu, select *CrossFade (-6dB) Marked or Overlapped to the Next* (or press *Shift-X*) to maintain a -6 dB crossover point.

☞ Using the keyboard bypasses the confirmation prompts, to allow for quicker operation.

☞ By creating a *Marked Area* you can shorten or extend the boundaries of the actual overlap. The CrossFade function will use the *Marked Area* as its boundaries.

Modifying Existing Fades

A major advantage of working in the non-destructive, non-linear *SAW* environment is that programmed fades are not etched in stone. In other words, they can still be modified at any time after they've been created.

→ To Stretch or Shrink an Existing Fade

1. Place the cursor within the fade near the boundary to be adjusted.
2. While pressing the *Ctrl* key, click and hold the left mouse button to snap the cursor to the fade boundary.
3. Drag the boundary left or right to stretch or shrink the fade. Releasing the mouse will resize the fade while retaining its original shape.

→ To Offset the Relative Volume of an Existing Fade:

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Using The Faders

1. Create a *Marked Area* encompassing the whole fade or portion of the fade to be offset.
 2. Place the cursor within the fade area.
 3. Adjust the *Fader* knob to shift relative volume of the fade up or down.
- ☞ Placing the cursor outside the fade area but still within the *Marked Area* boundaries, still applies the offset, but causes the *Fader* knob to snap back to its default position upon release. If the default position is 0 dB, you can obtain a direct readout of the relative offset you are applying.

Creating Master Mix Changes Using the Output Tracks

The popup *Faders* on the output tracks at the bottom of the *MultiTrack* can be used to create master mix changes that apply to all tracks assigned to that output card.

- 🕒 Use this feature to create a master fadeout, rather than creating individual fades on each track.
- ☞ **Regarding Mix Changes on Output Tracks:** Output track mix changes are not linked to any particular *MT Entry*. Therefore, shifting elements of a production will not shift corresponding mix changes on the output track. It is recommended that you adjust all entry positions first, and create master mix changes as a finishing touch to the production process.

Chapter 4

MULTiTRACK RECORDING

MULTITRACK RECORDING

Recording soundfiles in the *SoundFile View* window records audio data that has no reference to time as far as the *MultiTrack* session is concerned. In other words, this audio data will be placed at a later time in the front, middle or end of the actual non-linear session we are building. This method of recording is very useful for bringing unconnected pieces of an entire project into the editing environment, which we will then assemble in a certain order as the session progresses. *SAW* also provides very flexible and powerful ways to record audio files directly in sync with other audio data already placed in a *MultiTrack* session, or even synchronized to a specific time reference (SMPTE Timecode). This method involves recording audio directly into the *MultiTrack View* window.

Two distinctly different modes of *MultiTrack* recording exist. *Normal* mode uses the same *Record Panel* as in *SoundFile View* recording. This mode is useful when recording one or two tracks at a time in sync with existing audio on other tracks, or when dropping individual audio segments on a track at a specific SMPTE time reference. *Multi-Channel Record* mode uses a completely different control interface and is designed for live session overdubbing and emulation of a typical *Multi-Channel* tape recording system. This mode makes it easy to assign and record multiple tracks at the same time.

Both modes automatically create and drop *MT Entries* in place to designated tracks at the time of recording. You may also perform manual or automatic *Punch In/Out* to drop small sections of a recording in between already existing sections, live and on the fly.

☞ The *Regions* that are created as MT Entries when recording direct to the *MultiTrack* contain a position stamp of the original recorded position. Pressing the *Ctrl* key when adding one of these stamped *Regions* to the *MultiTrack* at a later time, places the *Region* at the original recorded position on the current *Hot Track*.

This can be very helpful when keeping multiple takes of an overdub. You may easily place those takes on other tracks at a later time, perfectly in sync, using this feature.

The *MultiTrack Record* modes also allow for keeping multiple takes of a performance, and for retaking a performance and automatically reclaiming hard drive space.

All SMPTE *Trigger* and *Generate* modes can be used during *MultiTrack Recording*. These are explained in detail in the *Working with SMPTE* chapter.

Normal Mode

Normal mode is in effect for recording, unless the *Multi-Channel Record Mode* option in the *MultiTrack* menu is checked. To begin, click the *MultiTrack View* red *REC* button for the specific track you wish to record to. This will display an input device selection menu, allowing you to choose an input device for the recording. Selecting a device will then display the *Record Panel* and *Record Remote Transport* windows. (For more details see *Recording Soundfiles in Understanding the Interface*.) Setting recording parameters in the *MultiTrack* is the same as using the *Record Panel* in the *SoundFile View* window, except for special conditions when using the *Mono L/R* file type.

The *Record Panel* will open with the default *MultiTrack* samplerate selected. You may override the default and record at a different samplerate if desired, but realize that samplerate conversion will take place during *MultiTrack* playback, which adds to CPU processing time. We recommend using the default rate. The *Record Panel* will also default to the soundcard currently assigned as the output card on the selected track.

☞ If more than one wave device is installed, you may choose which device you wish to record to by clicking in the blue *OUT* display box prior to opening the *Record Panel*.

You may record *Stereo* or *Mono L+R* file types to a single track in the *MultiTrack*, but the *Mono L/R* file type requires the use of two tracks at the same time.

→ To Setup *Mono L/R* Recording:

1. Click the *REC* button on the first track you wish to use. After selecting an input device, the *Record Panel* and *Record Remote Transport* windows are displayed. Both track indicators will be assigned to the selected track.
2. Select the *Mono L/R* type.
3. Click either the *Left* or *Right* filename button to assign a filename for this track. The track indicators display and the associated filename display will be updated. The opposite track indicator is now available for a different track assignment.

☞ The button you choose determines which sound card input data records to this track.

MULTITRACK RECORDING

Normal Mode

4. Click the *REC* button on the second track you wish to use. Select the same input device. The other track indicator will now be assigned to this track.
5. Click the opposite filename button (*Left* or *Right*) to assign a filename for this track. The associated filename display will be updated. You are now ready to record!

When recording in the *MultiTrack*, the cursor location designates the starting record position. Clicking the *Rec* button in the *Record Remote Transport* window begins recording at that point. The cursor moves forward and the time readouts display the recording progress.

Clicking the *Stop* button in the *Record Remote Transport* window stops the recording process and automatically creates a *Region* and places an *MT Entry* at the original record start position, for each assigned recording track.

☞ The *Regions* are automatically named using the assigned filename(s) enclosed in brackets, followed by a unique number identifier. *Region* names may be changed after closing the *Record Panel*, by double-clicking the associated *MT Entry*, selecting *Update Region* from the *Regions* menu, and entering a new name in the *Input Text* box.

Without closing the *Record Panel*, you may now play back the *MultiTrack* to decide if you want to keep the recording. If you decide to discard the recording and reclaim the hard drive space, click the *Retake* button on the *Record Panel*. This button allows you to throw away the last recorded segment and record over again from the same start position. This keeps soundfiles from continually increasing in size if you make mistakes during recording.

☞ The automatically created *Regions* and *MT Entries* associated with the last recorded segment will be deleted, and the file pointer and *MultiTrack* start position will be reset, ready to record again.

Pressing the *Shift* key and the *Retake* button will retake only a portion of the last recorded segment, allowing you to save the recording up to a certain point designated by the *MultiTrack* cursor position. Placing the *MultiTrack* cursor at a position within the last recorded *MT Entry* and pressing *Shift* and the *Retake* button, will reset the file pointers and update the *MT Entry* to match the cursor position.

Clicking the *All* button (next to *Retake*) will reset the file pointer to the beginning of the soundfile, deleting all associated *Regions* and *MT Entries*, and reclaiming all associated hard drive space.

If you decide to keep the recording but would like to try another take, click the *Keep Take* button on the *Record Panel*. This will append a Take number and an *MT Entry* position value to the *Region* name. The *MT Entry* will then be removed and the record start position will be reset. The file pointer will be left alone causing the next take to be appended to the end of the soundfile.

- 🕒 These *Regions* are timestamped to their original recorded position and can easily be placed in perfect sync on any track at a later time by pressing the *Ctrl* key when adding the *Region* to the *MultiTrack*.

S-R-P Recording

S-R-P (Simultaneous Record and Play) recording allows you to hear other tracks in the *MultiTrack* at the same time you record new tracks.

This feature can be used to overdub vocals to music, apply instrument solos to existing rhythm tracks, etc. S-R-P recording is soundcard dependent and requires an S-R-P capable driver and hardware.

Clicking the *S-R-P* button begins *MultiTrack* playback of all non-muted tracks and arms the soundcard for record. Clicking the *Rec* button punches in on the fly beginning the actual record process at the point where you clicked.

- ☞ Pressing the *Shift* key when clicking the *S-R-P* button links and activates the *Rec* button at the same time, causing the recording to begin simultaneously. This link can be set as a default condition by choosing *Auto SRP/Rec Link* in the *Options* menu. In this mode, pressing the *Shift* key breaks the link temporarily.

Punch in/out points may be automated for precision recording operations, such as capturing a single phrase in the middle of a vocal section. If a *Marked Area* exists in the *MultiTrack*, once the *S-R-P* button has been activated, the *Rec* button will be automatically activated at the *Marked Area* begin boundary and deactivated at the end boundary.

Overdubbing on the Same Track

As with standard tape recording equipment, **SAW** allows you to punch in and overdub a new recording over an existing track. Unlike standard

tape recording equipment, the underlying data in **SAW** is still available even after the newly recorded data has been inserted on top.

Whenever the *Record Panel* is activated on a track with existing data, and your recording position overlaps an *MT Entry*, **SAW** automatically splits the existing entry, and inserts and butt-splices the new entry in place when recording stops.

☞ This process is completely non-destructive to the underlying data, which can easily be restored by adjusting the boundaries of the newly recorded entry. Adjusting either boundary of the newly inserted entry inward, will extend the underlying entry boundaries, restoring the original data up to the splice point.

This extremely powerful enhancement to the overdub process eliminates any chance of destroying surrounding data to the overdub area. To take full advantage of this power, we recommend relaxing, punching in early, punching out late, and adjusting the inserted entry after the recording.

SAW can be set to automatically mute the underlying entry playback at the punch in position, similar to standard tape recording equipment. Activate this mode by choosing *Auto Mute During SRP Punch-In* in the *Options* menu.

☞ A slight delay will occur before the mute is heard based on the *PreLoad Buffer Queue* setting located in the *Audio Hardware Setup* under the *Options* menu. The smaller the setting, the shorter the delay. The delay does not affect the actual recording, which is inserted correctly at the punch in point.

Using Multiple Soundcards and Record Panels

If you have more than one soundcard or a multichannel soundcard installed (providing more than two physical inputs), you may open more than one *Record Panel* at the same time. Each *Record Panel* will be associated with two input channels. Parameters must be set for each *Record Panel* separately, yet all panels are synchronized through the common *Record Remote Transport* window.

Multi-Channel Record Mode

Multi-Channel Record mode is activated by selecting the *Multi-Channel Record* mode option in the *MultiTrack* menu. When recording more than two inputs at a time, or for live session overdubbing and emulation of standard tape recording equipment, you may find *Multi-Channel Record* mode a powerful enhancement to the *SAW* environment. This mode greatly simplifies the recording process by eliminating the need to set parameters and file names for each recording operation. Multiple inputs can be instantly assigned and recording can begin immediately. Inputs may be reassigned to different tracks on the fly, making multi-take recording a simple and efficient process.

When *Multi-Channel Record* mode is active, you must first set a base file name for all soundfiles to be recorded by selecting the *Multi-Channel Record Setup* option in the *MultiTrack* menu. This file name will become a common base file name for each available input channel installed in your system. This base name will be saved with the EDL and be automatically available the next time this session is opened. Once set, you may initiate record operations as many times as you like without ever having to re-enter file names and other recording parameters. The base file name will display on the *MultiTrack* title bar each time a *Multi-Channel* record operation is engaged.

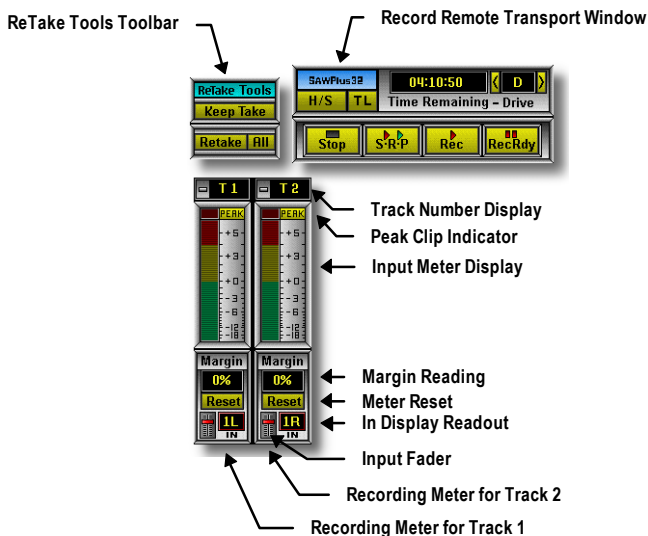
☞ *Multi-Channel Record* mode automatically creates a separate soundfile for each soundcard input that you utilize, and uses the base file name with appended soundcard and input channel information as the complete soundfile name. Each time you select a soundcard input as a recording source, the associated soundfile is either newly created or opened for appending. The new data is recorded in a non-linear fashion into these soundfiles and automatically assigned to the appropriate track and *MT Entry*.

Each of these soundfiles are created as mono 16 bit soundfiles at the *MultiTrack* samplerate setting, closely emulating a standard tape recorder with multiple inputs.

To begin recording, click the *MultiTrack View* red *REC* button for the specific track you wish to record to. Instead of the standard *Record Panel*, a single recording meter will be displayed along with the *Record Remote Transport* window and the *Retake Tools* window. Clicking the *REC* button on another track displays a new recording meter alongside the previous. You may open a meter for each soundcard input installed. These meters will attach themselves into a straight line in order of track assignment.

MULTITRACK RECORDING

Multi-Channel Record Mode



The default input connection will assign sequentially down the device list as each channel is placed into record. The sequence will follow from the highest device previously assigned. Clicking on the *In* display readout at the bottom of the meter will pop up a list of all available input selections. You may freely assign the input with no regard to the automatic assignment. All previously assigned selections will appear grayed out and the selection for the current meter will display a check mark next to it.

☞ For example, if you engage the first record channel, the input assigned will start from 1L (device 1 Left). If you change the assignment manually to 3L, the following record channels will sequentially continue from there as 3R, 4L, 4R, etc.

Clicking on the small fader icon will pop up an input fader, if needed, to adjust input level. Clicking on the track number display readout at the top of the meter pops up a list of all available track selections. All previously assigned selections will appear grayed out and the selection for the current meter will display a check mark next to it. You may freely reassign the current meter to any available track by clicking on a new selection. The meter will automatically reorder itself sequentially in the group of displayed meters.

Clicking the *Rec* or *S-R-P/Rec* button begins the recording process at the current cursor position. Clicking *Stop* or *S-R-P* (to punch out) stops

the recording process and automatically creates *Regions* and *MT Entries* for each meter's associated track.

You may instantly play back and audition the newly recorded material without altering your record setup. If you decide to retake the recording, clicking the *Retake* button will remove all the *Regions* and *MT Entries* created by the last recording, and reset the file positions to the last position before recording started. In this way, you will not waste disk space for recordings you did not like.

Pressing the *Shift* key and the *Retake* button will retake only a portion of the last recorded segment, allowing you to save the recording up to a certain point designated by the *MultiTrack* cursor position. Placing the *MultiTrack* cursor at a position within the last recorded *MT Entry* and pressing *Shift* and the *Retake* button, will reset the file pointers and update the *MT Entry* to match the cursor position.

If you decide to keep the recording but would like to try another take at the same spot, click the *KeepTake* button, and each *Region* name belonging to the last recording will be appended with a unique *Take Number* and the actual *Sample Position* insertion point. The *MultiTrack* will be cleared and the cursor returned to the starting point, but the file positions will not be altered. Therefore recording again will retain the last recorded information.

- ⌚ These *Regions* are timestamped to their original recorded position and can easily be placed in perfect sync on any track at a later time by pressing the *Ctrl* key when adding the *Region* to the *MultiTrack*.
- ⌚ You will find it easy to do multiple vocal takes or harmony guitar solos etc., by setting up a track to record, assigning the input (which will stay the same between overdubs), and doing your first track's recording. To change to another track and do a harmony part, click inside the *Track Number* display readout at the top of the meter and select a new track. All internal assignments and file handling will be done automatically, so you can begin recording immediately.
- ⌚ You can setup a template for typical emulation of a multitrack tape system. Start with a clean EDL. Arrange the first group of tracks on the *MultiTrack* to point to each installed soundcard a pair at a time. For instance, Track 1 to Card 1, Track 2 to Card 1, Track 3 to Card 2, Track 4 to Card 2, and so on for each installed pair of inputs. Bring up the fader on Track 1 and click the *Offset* button. Pan all the way left and close the fader. Bring up the fader on Track 2 and *Offset* pan all the way right. Follow this procedure all the way down

for each track assigned to a different soundcard. Activate *MultiChannel Record* mode and save your EDL, naming it 'MultiChannel Record Template', or whatever you prefer. To instantly setup a *MultiChannel Record Mode Session*, open this template EDL, enter a *Base Name* in the *MultiChannel Record Mode Setup* and immediately save and name your session. Now when you arm a track for record, it will automatically pick up the exact input matching channel, just as if you were using an ADAT or some other type of multitrack tape system. Each track will output through its specific card's output to your external mixer and you will be emulating the feel of your old-style multitrack tape system.

When recording is complete, click the close box to close each meter. Pressing the *Ctrl* key when closing the meter panels will close all meters at once.

Using Record Templates

After opening and assigning multiple recording channels to your desired settings, closing all channels using the *Ctrl* key (as mentioned above), creates an automatic record template of these last assignments. To begin recording again with this template, press the *Ctrl* key when engaging the first track's record button again. If you choose a different starting track, the track assignments are independent, and what will restore are the number of engaged channels with the same input assignments, now reordered to the next group of sequential tracks, beginning from this new starting track.

You may also create and save preset record templates by setting up your *Multi-Channel* recording assignments, and then closing them using the *Ctrl* key to create an automatic template for this setup. The *Save Template File* option in the *MultiTrack* menu may now be used to save this template to disk for restoring later us the *Open Template* option in the same menu. (See the *MultiTrack Menu* section in the *Using the Menus* chapter.)

Chapter 5

USING THE MENUS

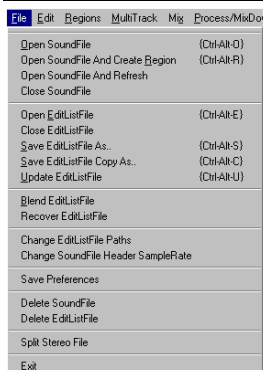
The menu bar at the top of the **SAW** screen provides access to the various pull down menus. These menus offer many powerful options and tools for manipulating data in the **SAW** environment. Applicable keyboard shortcuts are displayed next to the menu items in each menu.

Menu selections may be duplicated in a toolbar window or some other control. Selecting an option from a menu usually displays warning prompts. Many of the keyboard shortcuts or toolbar buttons will bypass the warning prompts increasing efficiency for the advanced user.

USING THE MENUS

File Menu

File Menu



The *File* menu contains options for opening, closing, and manipulating files, saving preferences, and exiting the **SAW** program.

Open SoundFile (*Ctrl* and *Alt* and *O*)

This option opens an existing soundfile to the *Full* and *SoundFile View* windows.

Use the *File* dialog box to select a file and click *OK*.

☞ The path set in the *File* dialog box using this option can be saved in the *Preferences* file as the default path. When first using **SAW**, navigate to the drive and folder you wish to use as the default, and save your preferences.

👉 **Regarding Soundfile Storage:** It is suggested that you use the Audio folder, created automatically during installation under the **SAW** application folder, or create a separate folder at a desired location to store all of your soundfiles and editlists. It is recommended that you always keep your audio files separate from the **SAW** program files by saving to a dedicated folder instead of the application folder.

Open SoundFile and Create Region (*Ctrl* and *Alt* and *R*)

This option opens an existing soundfile to the *Full* and *SoundFile View* windows and automatically marks the entire soundfile and creates a *Region* adding it to the *Regions View* ready for further use.

Use the *File* dialog box to select a file and click *OK*.

Open SoundFile and Refresh

This option opens an existing soundfile and refreshes the peak data file that is used to enhance screen display speed. This is used after modifying a file in another utility program. When the file is reopened in **SAW**, a new peak data file must be built in order for the changes to be properly displayed.

Use the *File* dialog box to select a file and click *OK*.

Close SoundFile

This option closes the current soundfile, clearing the *Full* and *SoundFile View* windows.

Open EditListFile (**Ctrl** and **Alt** and **E**)

This option opens an existing editlist file. EDL files contain all of the *Region*, *MT Entry*, mix automation, effects, and other information involved in the editing session.

Use the *File* dialog box to select a file and click *OK*.



EDL files are relatively small in size as they contain no actual audio data. You may keep different versions of a particular production by saving different editlist files during the course of an editing session.



Regarding EDL Files: Because EDL files are linked directly to soundfiles on the hard drive and refer to audio data contained within those soundfiles, deleting any soundfiles referenced in an EDL will adversely affect linked portions of the EDL in future use.

When opening an EDL file, you will be notified if any linked soundfile cannot be found. You may choose to ignore the warning and continue working with the remaining information that is not affected. Any *Region* or *MT Entry* referencing a soundfile that cannot be located will be skipped during playback.



The path set in the *File* dialog box using this option can be saved in the *Preferences* file as the default path. When first using **SAW**, navigate to the drive and folder you wish to use as the default, and save your preferences.

USING THE MENUS

File Menu

Close EditListFile

This option closes the current editlist file, clearing all windows except the *Full* and *SoundFile View*.

Save EditListFile As... (*Ctrl* and *Alt* and *S*)

This option saves your current project as an editlist file (EDL), including all *Region*, *MT Entry*, *Marker*, and mix automation information, effects patches and settings, and other information needed to recall the session. These are small files saving only reference information and not the actual soundfile data, and use the .EDL extension.

Use the *File* dialog box to create a file name and click *OK*. **SAW** will automatically add the .EDL extension to your file name and the editlist information will be saved.

☞ Use this option to save different versions of a production during the course of an editing session. By saving the EDL file under a new name, a copy of the session is created, which then becomes the active session, leaving the original file intact.

🕒 **SAW** has the ability to save multiple versions of a session under one common EDL file. This feature was designed to enhance the power of the typical *Undo* list, which usually can only step backward in a serial fashion. Multiple EDL versions can be recalled completely independently of each other, in any sequence, and up to nine of them can be created. At any time (especially before attempting a major change in your session), press the *Ctrl* and *Shift* keys and a number key (1-9 on the main keyboard). A version of the current EDL will be saved to that number key, retaining all of the present session information. You may restore that version by pressing the *Ctrl* key and the corresponding number key. The versions will stay available with the original EDL *even after exiting the program*.

☞ Versions of an EDL are saved using the current EDL name, with the extension modified to reflect the version number. (For example, TEST.EDL will change to TEST.ED1 for version one, and TEST.ED2 for version two, etc.)

Save EditListFile Copy As... (*Ctrl* and *Alt* and *C*)

This option saves a copy of the current EDL to a new file, but leaves you working in the original EDL, not the new one.

Use the *File* dialog box to create a file name and click *OK*. *SAW* will automatically add the .EDL extension to your file name and the editlist information will be saved.

Update EditListFile (*Ctrl* and *Alt* and *U*)

This option overwrites and updates the current EDL file without any further prompts.

- ☞ Use this option to continually update an EDL as you are working on and building a new production. It is recommended that you update and backup your EDLs often to avoid the possibility of losing data.

Blend EditListFile

This option allows you to blend the File, Region, Marker and Track Sequence data from an existing EDL into the current EDL at the *MultiTrack cursor* position. The position must be chosen after the end of the current EDL. Once the data is on the *MultiTrack*, it can be positioned anywhere using the *Select* mode positioning capabilities.

Position the *MultiTrack cursor* anywhere past the end of the current EDL. Use the *File* dialog box to select a file and click *OK*.

- ☞ Global track information such as solo, mute, effects, volume and pan offsets, etc. is not transferred by using this option. The current global track information overrides the blended EDL information. You may rearrange the blended sequence data to empty tracks and reassign effects and/or other global information without disturbing the current EDL.

Recover EditListFile

This option can be used to attempt a recover of the last EDL undo operation, even after a system crash.

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Use the *File* dialog box to see a list of all EDL undo files. Select the session you are trying to recover and most, if not all, of your session should be restored.

Change EditListFile Paths

This option allows you to change the path of any or all soundfiles associated with an EDL file.

If you decide to move a soundfile associated with an EDL, you must use this option to change the path in the EDL so that when it is opened, *SAW* knows where to find the linked soundfile(s).

This option displays a dialog box listing each soundfile linked to the EDL, one at a time. You are given the option to change the path and soundfile name. Type in a new path, if needed, and click *OK* to move on to the next name. You must complete every entry, by clicking *OK*, in order for the changes to take effect. A file reference can be removed from an editlist by clearing the name and then clicking *OK*. After the last entry is done, the EDL file is modified and ready to be opened for further editing.


Change SoundFile Header SampleRate

This option overwrites the *samplerate* information in a soundfile header with a new *samplerate*. This does not convert or otherwise alter the audio data in any way. It only changes the header itself which affects how the soundcard opens the file and the actual playback speed.

☞ This is a useful way to easily change a digitally recorded file whose *samplerate* was not correctly set in the *Record Panel*. If the *samplerate* in the soundfile header does not match the correct *samplerate* of the original source material, the soundfile will play back at the wrong speed.

Save Preferences

This option saves certain settings as defaults which take effect each time you start the *SAW* program. Your preferences are saved in a file called *SAW32LITE.PRF*, *SAW32.PRF* or *SAWPlus32.PRF*.

 The settings currently saved in the preferences file are:

- *Audio Hardware Setup* information
- *MIDI/SMPTE Hardware Setup* information
- Window size & placement settings
- Function key view settings
- Current *Open SoundFile* path
- Current *Open SoundFile* qualifier
- Current *Record Soundfile* path
- Current *Record Soundfile* qualifier
- Current *MultiChannel Record Mode* setting
- Current *MultiChannel Record Setup* information
- Current *Open EditlistFile* path
- Current default *Samplerate* (selected in the *MultiTrack View*)
- Current default *Record Type* and *Resolution* (selected in the *Record Panel*)
- Current *MultiTrack PreLoad Buffer* setting
- Current *Fade Curve Setup* information
- Current *Fade Slope* setting
- Current SMPTE active mode
- Current *SMPTE Chase-Advance* setting
- Current *SMPTE Conform 30 to 29.97* setting
- Current *SMPTE StartOffset* position
- Current *Auto SMPTE Stop Detection* setting
- Current *Auto SMPTE Format Detection* setting
- Current *Directory Path Setup* information
- Current *Color Setup* information
- *All Time Line, Tempo* and *Grid* settings
- Each individual option setting in the *Options* menu

Delete SoundFile

This option deletes a soundfile and its associated peak data file. Use the file dialog box to select a file. You will then be prompted for

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verification before the file is actually deleted. Click *OK* to delete the file or *Cancel* to stop the operation.

It is always best to delete soundfiles using this command rather than from outside of **SAW** (i.e. Explorer or My Computer). This ensures that both the soundfile and the peak data file are deleted as a group.



Regarding Deleting Soundfiles: Avoid deleting soundfiles that are part of your current work session. It is recommended that you first remove all *Regions* referencing the soundfile, close your editlist file, and then delete the soundfile.

Delete EditListFile

This option deletes an EDL file. Use the file dialog box to select a file. You will then be prompted for verification before the file is actually deleted. Click *OK* to delete the file or *Cancel* to cancel the operation. This option does not delete the soundfiles referenced by the editlist, only the session information.

Split Stereo File

This option splits a stereo file into two separate mono files. You will be asked for the source filename and then the new left and right filenames. The source file is not destroyed by this operation.

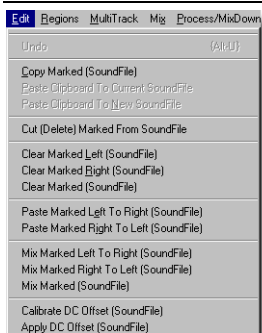
Exit

This option exits the program. **SAW** will prompt you to save your EDL file if you have made any changes since the last time saved, or to confirm that you want to exit.



Regarding Saving Editlists: It's a good idea to get in the habit of saving your editlist frequently and always prior to exiting **SAW**. This minimizes the chance of accidentally exiting without saving your current work session. All soundfile data, however, is securely saved on the hard disk as soon as it is recorded.

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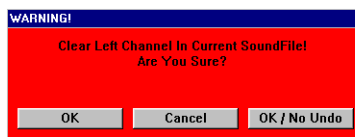


The *Edit* menu contains several options which allow you to directly manipulate audio data within your soundfiles. Some of these options actually overwrite the originally recorded soundfile data, and are therefore called *destructive* processes.

SAW can keep information in an *Undo* file that allows you to *Undo* the last destructive operation performed. Writing the *Undo* information takes extra processing time and hard disk storage space. Consequently, you

are given the choice of skipping this process if you feel you do not need the *Undo* information for a particular operation.

When you select one of these options, a warning dialog box is displayed giving you three choices:



1. Select *OK* to proceed with the operation and save the current audio data to an *Undo* file, giving you the chance to *Undo* the process later.
2. Select *Cancel* to abort the operation.
3. Select *OK / No Undo* to proceed with the operation without saving the *Undo* information. This will be a faster operation, but you will no longer have the option to *Undo* the process later.

⌚ Some of these operations write the results to a new soundfile. An *Undo* file is not needed, since the original data is not destroyed. Therefore, using the *OK / No Undo* option is the preferred choice as it saves time and hard drive space.

When processing large data areas, creating *Undo* files can be very time consuming and require large amounts of extra disk space. Consider testing the operation on a small area first, using the *OK* option to create an *Undo* file. Repeat the *Undo* process on the small area until the desired results are achieved. Use the *Undo*

process one more time to restore the soundfile to its original state, then process the large area using the *OK / No Undo* option.

Undo (*Alt* and *U*)

This option allows you to *Undo* the last destructive operation or EDL manipulation that was saved to the *Undo* file. When no *Undo* file exists, this option will be grayed and unavailable. Many *MultiTrack* manipulations as well as destructive operations will create an *Undo* file.

When you select *Undo*, if the *Undo* is associated with a destructive file operation, the file will be opened and displayed in the *SoundFile View*, the affected data will be displayed as a *Marked Area*, and you will be notified of the type of operation you are about to *Undo*. Click *OK* to replace the original data back into the soundfile or *Cancel* to leave things as they are.

If the *Undo* is associated with an EDL manipulation (i.e. functions affecting *MT Entries*, *Regions*, mix changes, etc.), you will be notified that you are about to *Undo* the last EDL change. Click *OK* to restore the EDL or *Cancel* to leave things as they are.

☞ The *Auto EDL Undo* option under the *Options* menu must be checked for the *Undo* function to operate with EDL manipulations.

🕒 **SAW** has the ability to save multiple versions of a session under one common EDL file. This feature was designed to enhance the power of the typical *Undo* list, which usually can only step backward in a serial fashion. Multiple EDL versions can be recalled completely independently of each other, in any sequence, and up to nine of them can be created. At any time (especially before attempting a major change in your session), press the *Ctrl* and *Shift* keys and a number key (1-9 on the main keyboard). A version of the current EDL will be saved to that number key, retaining all of the present session information. You may restore that version by pressing the *Ctrl* key and the corresponding number key. The versions will stay available with the original EDL *even after exiting the program*.

☞ Versions of an EDL are saved using the current EDL name, with the extension modified to reflect the version number. (For example, TEST.EDL will change to TEST.ED1 for version one, and TEST.ED2 for version two, etc.)

-
- ☞ If the *Auto EDL Undo* option is active, most EDL manipulations will save an *Undo* file as the current EDL file name with the extension modified to .ED0. If for any reason an important .EDL is rendered unusable, many times changing the extension of the associated .ED0 file (if one exists) to .EDL will allow you to retrieve the EDL in the condition it was prior to your last major EDL manipulation.

Save Marked (SoundFile) To Undo

This option saves the currently marked soundfile area to the undo file.

- ☞ Since there is normally no undo capability for *Sample Edit* mode, this option can be used to manually force an undo save of the soundfile area you wish to manipulate prior to making changes. This then allows you to make repeated *Sample Edit* mode adjustments to the soundfile marked area with the ability to revert to the original if desired.

Copy Marked (SoundFile)

This option copies the currently marked soundfile area to the **SAW** internal clipboard (not the Windows clipboard). It only copies pointer information, not audio data, and therefore does not require massive amounts of storage space.

To use this option, first mark the area of interest in the *SoundFile View* and then select the *Copy Marked* option. You will hear two beeps signaling the completion of a successful copy operation.

Paste Clipboard to Current SoundFile

This option pastes the audio data referenced in the **SAW** clipboard (not the Windows clipboard) to the current *SoundFile View cursor* position.

Position the *SoundFile View cursor* at the location where you would like to paste the data then select this function. You will be warned that this is a destructive process. Choose an option and the clipboard data will be pasted at the cursor position.

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This function overwrites the existing data in the destination soundfile, adding to the file length if necessary. The destination soundfile does not have to be the same soundfile from which the clipboard data was taken, but it does have to be the same format (i.e. samplerate, resolution, file type). This allows audio data to be easily moved from one soundfile to another.

☞ After this operation, the newly pasted data will be automatically displayed as a *Marked Area*. This can save time when updating or creating new *Regions* associated with this data in its new location.

Paste Clipboard to New SoundFile

This option pastes the audio data referenced in the *SAW* clipboard (not the Windows clipboard) to a new *SoundFile*, or appends the data to the end of an existing file.

Using this option will display the *File* dialog box. Create a new name or select an existing name and click *OK*. You will be warned that this is a destructive process. Choose an option and the clipboard data will be written to the new file or appended to the end of the existing file.

☞ After this operation, the new file will be opened in the *SoundFile View* and the newly pasted data will be automatically displayed as a *Marked Area*. This can save time when updating or creating new *Regions* associated with this data in its new location.

Cut (Delete) Marked from SoundFile

This option allows you to physically cut audio data from the soundfile. This permanently alters the size of the file and cannot be reversed.

When selecting this option the *Edit Cut SoundFile dialog* box is displayed. The *Preview* button plays back the soundfile in the *SoundFile View* and skips over the marked area, allowing you to hear the effect of the cut before actually cutting the file. Place your cursor a small distance before the *Marked Area* begin boundary to define a *PreRoll* distance. Playback begins at this point and continues for the same approximate distance after the cut. Adjust the *Marked Area* boundary positions to your satisfaction, and click the *Cut Snd File* button.



Regarding Cutting Soundfiles: This operation must move all data past the cut end-point forward to the cut begin-point and can be an extremely time consuming procedure when working with large files. All *Regions* past the cut begin-point will become invalid and can cause random session errors if referenced data has been moved forward or no longer exists. If you find it necessary to trim soundfiles in this manner, do so prior to creating *Regions*.

Physically cutting a soundfile is not the most efficient way to work in the *SAW* environment. We suggest using the power of non-linear editing instead, where it is unnecessary to worry about extraneous audio data in your soundfiles. Using *Regions* and the power of the *MultiTrack* allows you to skip over soundfile data you don't want to use in the final production, easily, instantly, and non-destructively.

Hard drives with gigabytes of storage space are now very affordable. If concerned about saving hard drive space by trimming files using this function, consider that the cost of a new hard drive can easily be offset by the tremendous savings of your valuable time by using *SAW's* non-linear power, rather than waiting for this function to do its job.

Clear Marked Left (SoundFile)

This option clears the left channel of the currently marked soundfile area to zero. This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

To use this function, create a *Marked Area* in the *SoundFile View* and select this option.

Clear Marked Right (SoundFile)

This option clears the right channel of the currently marked soundfile area to zero. This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

To use this function, create a *Marked Area* in the *SoundFile View* and select this option.

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Clear Marked (SoundFile)

This option clears both channels of the currently marked soundfile area to zero. This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

To use this function, create a *Marked Area* in the *SoundFile View* and select this option.

Paste Marked Left to Right (SoundFile)

This option pastes the left channel data to the right channel (at the same location) of the currently marked soundfile area. This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

To use this function, create a *Marked Area* in the *SoundFile View* and select this option.

Paste Marked Right to Left (SoundFile)

This option pastes the right channel data to the left channel (at the same location) of the currently marked soundfile area. This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

To use this function, create a *Marked Area* in the *SoundFile View* and select this option.

Mix Marked Left to Right (SoundFile)

This option mixes the left channel data to the right channel (at the same location) of the currently marked soundfile area. This results in the left channel remaining intact and the right channel becoming a mono mix of left and right data. This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

To use this function, create a *Marked Area* in the *SoundFile View* and select this option.

Mix Marked Right to Left (SoundFile)

This option mixes the right channel data to the left channel (at the same location) of the currently marked soundfile area. This results in the right channel remaining intact and the left channel becoming a mono mix of left and right data. This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

To use this function, create a *Marked Area* in the *SoundFile View* and select this option.

Mix Marked (SoundFile)

This option mixes both left and right channel data to both channels (at the same location) of the currently marked soundfile area. This results in a mono mix of left and right data on both channels. This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

To use this function, create a *Marked Area* in the *SoundFile View* and select this option.

Calibrate DC Offset (SoundFile)

SAW can be calibrated to compensate for audio cards or external equipment that create some level of constant DC offset voltage in your recorded soundfiles. A soundfile without DC offset will display its audio waveform peaks and valleys evenly balanced above and below the display center line (zero reference). A soundfile with some level of DC offset will display a shift in either the positive or negative direction, and can potentially cause pops at the beginning and ending of *Region* playback.

To use the *Calibrate DC Offset* function on existing soundfiles, zoom in on a blank section of the soundfile and click the *Up* button on the *SoundFile View* window, (or press the *Page Up* key) to magnify the waveform. You should see a flat line for both the left and right channels. As you continue to increase the magnification, the flat lines will start to show noise waveforms, but should still be balanced around each center line. If there is DC Offset present then the lines will tend to shift above or below their respective center lines.

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Create a small *Marked Area* and select this function. **SAW** calculates the average DC Offset in the section and reports and saves the values.

Apply DC Offset (SoundFile)

This function uses the *Calibrate DC Offset* values and applies them to the soundfile *Marked Area*.

After using *Calibrate DC Offset* function, mark the entire soundfile or area of interest and select this function.

SAW applies the calibration values and centers the waveform properly around the center lines, thereby eliminating the potential pops that might occur on *Region* boundaries.

This is a destructive operation and undoing it is subject to your choice of saving the *Undo* file information or not.

Regions Menu



The *Regions Menu* contains options which allow you to create and manipulate *Regions*, which are the basic building blocks of your production in the *SAW* environment. *Regions* can be manipulated in various ways and are the basis for performing non-destructive splices, mixes, etc.

See *Regions View Window* in the *Understanding the Interface* chapter for detailed information on working with *Regions*.

Create New Region (**Ctrl** and **N**)

This option allows you to create and name a new *Region*.

First mark the area of interest in the *SoundFile View* window, select the desired zoom and magnification level, and select this option.

In the *Input Text* dialog box, accept the default name or enter a new name for the *Region*. Click *OK* to create the new region.

Uppdate Region (**Ctrl** and **U**)

This option allows you to rename, adjust and update the parameters of an existing *Region*.

First select and display the existing *Region* into the *SoundFile View* by one of the various methods explained in the *Understanding the Interface* chapter.

Make any desired parameter adjustments and select this option. The original name is displayed in the *Input Text* dialog box, which can be changed if desired. Click *OK* to update the *Region* and all associated *MT Entries* that reference it.

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Get EDL Region

This option allows you to easily import a *Region* from another EDL file into the current editing session, making it simple to retrieve existing *Regions* from other editing sessions you have created.

When this option is selected, the *File* dialog box is displayed, allowing you to select another EDL file. A second *Regions View* window is then displayed, containing the *Regions* from the selected EDL file. You can now select and preview *Regions* from this window in the same manner as the current editing session.

By clicking the *Add to EDL* button in the new *Regions View* window, the newly selected *Region* is copied into the current EDL session. You may continue auditioning and adding as many *Regions* as desired. When you are finished, close the second *Regions View* window.

The newly added *Regions* are now available in the current editing session for further use.

Merge EDL Regions


This option allows you to easily import all *Regions* from another EDL file into the current editing session.

When this option is selected, the *File* dialog box is displayed, allowing you to select another EDL file. All *Regions* from that EDL will be instantly added to the current editing session.

Split/Keep Region (K)

This option splits an existing *Region*, and *MT Entries* referencing this *Region*, into two parts.

Using the shortcut keys to access this function bypasses the confirmation prompt, allowing for immediate operation.

 When in *MultiTrack View*, pressing *Ctrl* and *K* extends the operation across all tracks below the current *Hot Track*.

This function works in either the *MultiTrack* or *SoundFile View* and is also available in the *Split Region Tools* toolbar window.

SoundFile View

To use this function in *SoundFile View*, first display the *Region* in the *SoundFile View* window, using one of the various methods explained in the *Understanding the Interface* chapter. Position the *SoundFile View cursor* at the point where you want to divide the *Region* and select this option. The *Region* and all associated *MT Entries* are split at that point. The *Region* and the associated entries to the left of the split retain the original name. The *Region* and the associated entries to the right of the split will have a unique number appended to the original name.

MultiTrack View

When using this function in *MultiTrack View*, an *MT Entry* becomes the focal point for the split and is the only entry affected by the split. Position the *MultiTrack View cursor* at the point where you want to split the *MT Entry* and select this option. The *MT Entry* and associated *Region* is split at that point. The entry and the associated *Region* to the left of the split retain the original name. The entry and the associated *Region* to the right of the split will have a unique number appended to the original name.

Split/Mark Region (*Shift* and *M*)

This option splits an existing *Region*, and *MT Entries* referencing this *Region*, into two parts, and automatically marks any associated entry to the left of the split point as a *Select* mode selected entry.

Using the shortcut keys to access this function bypasses the confirmation prompt, allowing for immediate operation.

☞ When in *MultiTrack View*, pressing *Ctrl* and *Shift* and *M* extends the operation across all tracks below the current *Hot Track*.

This function works in either the *MultiTrack* or *SoundFile View* and is also available in the *Split Region Tools* toolbar window.

SoundFile View

To use this function in *SoundFile View*, first display the *Region* in the *SoundFile View* window, using one of the various methods explained in the *Understanding the Interface* chapter. Position the *SoundFile View cursor* at the point where you want to divide the *Region* and select this option. The *Region* and all associated *MT Entries* are split at that point.

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The *Region* and the associated entries to the left of the split retain the original name and leave the entries marked as *Select* mode selected entries. The *Region* and the associated entries to the right of the split will have a unique number appended to the original name.

MultiTrack View

When using this function in *MultiTrack View*, an *MT Entry* becomes the focal point for the split and is the only entry affected by the split. Position the *MultiTrack View cursor* at the point where you want to split the *MT Entry* and select this option. The *MT Entry* and associated *Region* is split at that point. The entry and the associated *Region* to the left of the split retain the original name and the entry is marked as a *Select* mode selected entry. The entry and the associated *Region* to the right of the split will have a unique number appended to the original name.

When *Select* mode is active, this function can be used to perform several *Split/Mark* operations in succession and then copy, move or delete the pre-selected entries all at once. Clear all selected *Regions* (by right-clicking while in *Select* mode) prior to using the *Split/Mark* function.

☞ If *Select* mode is not active at the time of using this option, ensure that you enter *Select* mode while pressing the *Shift* key to retain the marks set by this function.

Split/Remove Region (R)

This option splits an existing *Region*, and *MT Entries* referencing this *Region*, into two parts and automatically removes the *Region* and associated entries to the left of the split point.

Using the shortcut keys to access this function bypasses the confirmation prompt, allowing for immediate operation.

☞ When in *MultiTrack View*, pressing *Ctrl* and *R* extends the operation across all tracks below the current *Hot Track*.

This function works in either the *MultiTrack* or *SoundFile View* and is also available in the *Split Region Tools* toolbar window.

SoundFile View

To use this function in *SoundFile View*, first display the *Region* in the *SoundFile View* window, using one of the various methods explained in the *Understanding the Interface* chapter. Position the *SoundFile View cursor* at the point where you want to divide the *Region* and select this option. The *Region* and all associated *MT Entries* are split at that point. The *Region* and associated entries to the left of the split retain the original name. This *Region* is removed from the *Regions View*, and all associated entries are removed from the *MultiTrack*. All following *MT Entries* will be left in their original positions. The *Region* and associated entries to the right of the split will have a unique number appended to the original name.

MultiTrack View


When using this function in *MultiTrack View*, an *MT Entry* becomes the focal point for the split and is the only entry affected by the split. Position the *MultiTrack View cursor* at the point where you want to split the *MT Entry*. If this is the only entry referencing the *Region*, this entry and the associated *Region* are split at that point. The entry and associated *Region* to the left of the split retain the original name. This entry is removed from the *MultiTrack*, and the associated *Region* is removed from the *Regions View*. All following *MT Entries* are left in their original positions.

If there are multiple entries referencing the same *Region*, the associated *Region* is duplicated and a unique number appended to the original name, and the *MT Entry* is updated to reference this duplicate *Region*. The entry and the duplicate *Region* are then split at that point. The entry and the associated *Region* to the left of the split retain the original name. This entry is removed from the *MultiTrack*, and the associated *Region* is removed from the *Regions View*. All following *MT Entries* are left in their original positions. The entry and associated *Region* to the right of the split will have a unique number appended to the original name.

Split/Delete Region (D)

This option splits an existing *Region*, and *MT Entries* referencing this *Region*, into two parts and automatically deletes the *Region* and associated entries to the left of the split point.

Using the shortcut keys to access this function bypasses the confirmation prompt, allowing for immediate operation.

 When in *MultiTrack View*, pressing *Ctrl* and *D* extends the operation across all tracks below the current *Hot Track*.

This function works in either the *MultiTrack* or *SoundFile View* and is also available in the *Split Region Tools* toolbar window.

SoundFile View

To use this function in *SoundFile View*, first display the *Region* in the *SoundFile View* window, using one of the various methods explained in the *Understanding the Interface* chapter. Position the *SoundFile View* cursor at the point where you want to divide the *Region* and select this option. The *Region* and all associated *MT Entries* are split at that point. The *Region* and associated entries to the left of the split retain the original name. This *Region* is deleted from the *Regions View*, and all associated entries are deleted from the *MultiTrack*. All following *MT Entries* will shift forward from their original positions replacing any resulting gaps. The *Region* and associated entries to the right of the split will have a unique number appended to the original name.

MultiTrack View

When using this function in *MultiTrack View*, an *MT Entry* becomes the focal point for the split and is the only entry affected by the split. Position the *MultiTrack View* cursor at the point where you want to split the *MT Entry*. If this is the only entry referencing the *Region*, this entry and the associated *Region* are split at that point. The entry and associated *Region* to the left of the split retain the original name. This entry is deleted from the *MultiTrack*, and the associated *Region* is deleted from the *Regions View*. All following *MT Entries* will shift forward from their original positions replacing any resulting gaps.

If there are multiple entries referencing the same *Region*, the associated *Region* is duplicated and a unique number appended to the original name, and the *MT Entry* is updated to reference this duplicate *Region*. The entry and the duplicate *Region* are then split at that point. The entry and the associated *Region* to the left of the split retain the original name. This entry is deleted from the *MultiTrack*, and the associated *Region* is deleted from the *Regions View*. All following *MT Entries* will shift forward from their original positions replacing any resulting gaps. The entry and associated *Region* to the right of the split will have a unique number appended to the original name.

Remove Region (Don't Affect Other MT Entries) (Del)

This option removes the currently selected region (in the *Regions View*), and all associated *MT Entries* from the session. Any following entries in the *MultiTrack* are not affected and remain in their original position.

Delete Region (Move Other MT Entries Frwd) (Shift and Del)

This option removes the currently selected region (in the *Regions View*), and all associated *MT Entries* from the session. All following entries in the *MultiTrack* are shifted forward replacing any resulting gaps.

Clear All Regions

This option clears all *Regions* from the *Regions View* list and all *MT Entries* from the *MultiTrack*. This operation does not destroy any soundfile data but it does clear your entire session.

Clear All Unused Regions

This option scans through all tracks of your production and removes all *Regions* from the EDL that are not being referenced by *MT Entries*.

Paste Region to Current SoundFile

This option pastes the currently selected *Region* (in the *Regions View*) to the current *SoundFile View cursor* position.

Position the *SoundFile View cursor* at the location where you would like to paste the data then select this function. You will be warned that this is a destructive process. Choose an option and the clipboard data will be pasted at the cursor position.

This function overwrites the existing data in the destination soundfile, adding to the file length if necessary. The destination soundfile does not have to be the same soundfile which contains the *Region*, but it does have to be the same format (i.e. samplerate, resolution, file type). This allows audio data to be easily moved from one soundfile to another.

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- ☞ After this operation, the newly pasted data will be automatically displayed as a *Marked Area*. This can save time when updating or creating new *Regions* associated with this data in its new location.

Paste Region to New SoundFile

This option pastes the currently selected *Region* (in the *Regions View*) to a new *SoundFile*, or appends the data to the end of an existing file.

Using this option will display the *File* dialog box. Create a new name or select an existing name and click *OK*. You will be warned that this is a destructive process. Choose an option and the clipboard data will be written to the new file or appended to the end of the existing file.

- ☞ After this operation, the new file will be opened in the *SoundFile View* and the newly pasted data will be automatically displayed as a *Marked Area*. This can save time when updating or creating new *Regions* associated with this data in its new location.

Paste Region and Convert SampleRate to Current SoundFile

This option pastes the currently selected *Region* (in the *Regions View*) to the current *SoundFile View cursor* position, and performs a samplerate conversion at the same time.

Position the *SoundFile View cursor* at the location where you would like to paste the data then select this function. The *Set Conversion Parameters* dialog box is displayed, allowing you to select a new samplerate. The destination file samplerate must match the newly selected rate. You will be warned that this is a destructive process. Choose an option and the *Region* will be pasted at the cursor position and converted at the same time.

- ☞ **SAW** performs the samplerate conversion without removing or duplicating any samples, thereby producing extremely clean, glitch-free results.

This function overwrites the existing data in the destination soundfile, adding to the file length if necessary.

-
-
- ☞ After this operation, the newly pasted data will be automatically displayed as a *Marked Area*. This can save time when updating or creating new *Regions* associated with this data in its new location.

Paste Region and Convert SampleRate to New SoundFile

This option pastes the currently selected *Region* (in the *Regions View*) to a new *SoundFile*, or appends the data to the end of an existing file, and performs a samplerate conversion at the same time.

Using this option will display the *Set Conversion Parameters* dialog box, allowing you to select a new samplerate. Next, the *File* dialog box is displayed. Create a new name or select an existing name and click *OK*. If selecting an existing file, the destination samplerate must match the newly selected rate. You will be warned that this is a destructive process. Choose an option and the *Region* will be written to the new file or appended to the end of the existing file and converted at the same time.

- ☞ After this operation, the new file will be opened in the *SoundFile View* and the newly pasted data will be automatically displayed as a *Marked Area*. This can save time when updating or creating new *Regions* associated with this data in its new location.

USING THE MENUS

MultiTrack Menu

MultiTrack Menu



The *MultiTrack Menu* provides several options for manipulating *MT Entries* in the *MultiTrack*. Some of the functions operate on the *Hot Track MT Entry* at the current *MultiTrack cursor* position. Some functions operate on a *Marked Area*, while other functions require *Select* mode to be activated, and operate on only selected entries.

Replace Entry (R)

This option replaces the *Hot Track MT Entry* at the *MultiTrack cursor* position with the selected *Region* from the *Regions View* list. This action affects other entries as follows:

- The replacement entry shifts all following butt-spliced entries forward or backward to accommodate any size difference between the original and replacement entries.
- Any following entries that are separated by blank space will not be moved, if there is enough space to accommodate the change. If there is not enough space to accommodate the increased region size, a conflict exists and the operation will be cancelled.

To use this option, click on the entry you wish to replace in the *MultiTrack*, then click on the replacement *Region* in the *Regions View*. Select this option, and click *OK* to confirm the replacement.

☞ If there is a conflict (causing the operation to be cancelled), try moving the conflicting entry to another track, then perform the replacement operation again.

Update Entry (U)

This option selects the *Hot Track MT Entry* boundary closest to the *MultiTrack cursor* position, and moves the boundary to the cursor position, extending or shrinking the entry size.

To use this option, place the *MultiTrack cursor* at a position near the *MT Entry* boundary you wish to adjust, and select this function to move the boundary to the cursor position. If two entries are butt-spliced, both will be adjusted at the same time so that the splice point is then at the cursor position.

Remove Entry (Don't Affect Others) (Del)

This option removes an individual *MT Entry* or multiple *Select* mode selected entries from the *MultiTrack*. All following entries to the right are not affected and remain in their original positions.

Select an entry by clicking and placing the *MultiTrack View cursor* on it, or use *Select* mode, and select and highlight multiple entries prior to using this function.

This function removes only the selected *MT Entries*, and does not affect the referenced regions in the *Regions View* list.

Delete Entry (Move Others Frwd) (Shift and Del)

This option deletes an individual *MT Entry* or multiple *Select* mode selected entries from the *MultiTrack*. All following entries to the right are shifted forward filling in any remaining gaps.

Select an entry by clicking and placing the *MultiTrack View cursor* on it, or use *Select* mode, and select and highlight multiple entries prior to using this function.

This function deletes only the selected *MT Entries*, and does not affect the referenced regions in the *Regions View* list.

Clear Entries On Current Track

This option clears the current *Hot Track* of all *MT Entries* at once. The *Regions* and *Markers View* windows are not affected.

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MultiTrack Menu

Clear Entries On All Tracks

This option clears the entire *MultiTrack* of all *MT Entries* at once. The *Regions* and *Markers View* windows are not affected.

Cut/Remove Entry

This option cuts and removes the *Marked Area* from an existing *MT Entry*.

This function is also available in the *Cut MT Entry Tools* toolbar window.

To use this option, create a *Marked Area* within the boundaries of an existing *MT Entry* that you wish to remove, then select this function.

☞ The *Marked Area* cannot include or span across an entry boundary.

This function operates only on the selected entry and does not affect duplicate entries referencing the same *Region*.

Cut/Splice Entry

This option cuts the *Marked Area* from an existing *MT Entry* and splices the ends together, very much emulating tape splicing with a razor blade.

This function is also available in the *Cut MT Entry Tools* toolbar window.

To use this option, create a *Marked Area* within the boundaries of an existing *MT Entry* that you wish to cut, then select this function.

☞ The *Marked Area* cannot include or span across an entry boundary.

This function operates only on the selected entry and does not affect duplicate entries referencing the same *Region*.

Snap Selected to Cursor (*BackSpace*)

This option snaps all *Select* mode selected entries to the current *MultiTrack* cursor position, using the beginning boundary of the *Key Entry* as the reference point. All *MultiTrack* mix changes within *MT Entry* boundaries are included in the move.

To use this option, activate *Select* mode and select the entries you wish to move. Click last on the entry you wish to use as the snap-to reference point (*Key Entry*), even if it has already been selected. The left side of the *Key Entry* will be the point that snaps to the cursor position.

Place the *MultiTrack View cursor* at the desired position and select this function.

Snap Selected to SMPTE

This option snaps all *Select* mode selected entries to a specified SMPTE position, using the beginning boundary of the *Key Entry* as the reference point. All *MultiTrack* mix changes within *MT Entry* boundaries are included in the move.

☞ These options are not available until one of the SMPTE modes are activated.

To use this option, activate *Select* mode and select the entries you wish to move. Click last on the entry you wish to use as the snap-to reference point (*Key Entry*), even if it has already been selected. The left side of the *Key Entry* will be the point that snaps to the specified SMPTE position.

Select this function, and the SMPTE position window will be displayed. Set the desired SMPTE position and click *OK*. (See the *Working with SMPTE* chapter for details on using the SMPTE position window.)

Set Offset

This option allows you to set any point within an *MT Entry* as an offset from the beginning of the entry. This offset can then be used as the snap-to point instead of the beginning of the *Key Entry*.

USING THE MENUS

MultiTrack Menu

To set the offset, select the desired point within the entry, and select this function. The offset is now established, and can be used with one of the *Snap Selected Offset* options.

Snap Selected Offset To Cursor

This option snaps all *Select* mode selected entries to the current *MultiTrack cursor* position, using an established offset position of the *Key Entry* as the reference point. All *MultiTrack* mix changes within *MT Entry* boundaries are included in the move.

To use this option, first use the *Set Offset* function to establish an offset position within your desired *Key Entry*.

Activate *Select* mode and select the entries you wish to move. Click last on the desired *Key Entry*, even if it has already been selected. The established offset within the *Key Entry* will be the point that snaps to the cursor position.

Place the *MultiTrack View cursor* at the desired position and select this function.

Snap Selected Offset To SMPTE

This option snaps all *Select* mode selected entries to a specified SMPTE position, using an established offset position of the *Key Entry* as the reference point. All *MultiTrack* mix changes within *MT Entry* boundaries are included in the move.

☞ These options are not available until one of the SMPTE modes are activated.

To use this option, first use the *Set Offset* function to establish an offset position within your desired *Key Entry*.

Activate *Select* mode and select the entries you wish to move. Click last on the desired *Key Entry*, even if it has already been selected. The established offset within the *Key Entry* will be the point that snaps to the specified SMPTE position.

Select this function, and the SMPTE position window will be displayed. Set the desired SMPTE position and click *OK*. (See the *Working with SMPTE* chapter for details on using the SMPTE position window.)

Multi-Channel Record Mode

This option activates *Multi-Channel Record* mode. (See the *MultiTrack Recording* chapter for more details on *Multi-Channel Record* mode.)

Multi-Channel Record Base FileName Setup

This option allows you to select a base file name for *Multi-Channel Record* mode operation. The base file name must be set before recording will be allowed in *Multi-Channel Record* mode. (See the *MultiTrack Recording* chapter for more details on *Multi-Channel Record* mode.)

Clear Multi-Channel Record Base FileName

This option allows you to clear a previously entered base file name.

MC Meter Display Wrapping

When this option is selected, any time the multi-channel record meters are extended beyond the right edge of the screen, a second row will be created beneath the first, forcing all meters to be visible.

When this option is off, the meters will disappear off the screen to the right.

☞ This can be useful on dual monitor configurations, allowing the meters to be dragged off to the second monitor.

This option can be saved with the preferences.

Save Multi-Channel Record Template File

This option allows you to save a previously record template. You may create a record template by setting up your *Multi-Channel* recording

USING THE MENUS

MultiTrack Menu

assignments, and then close them using the *Ctrl* key to create an automatic template for this setup. Then use this option to save the template as a file.

Use the *File* dialog box to create a filename and click *OK*. **SAW** will automatically add the .mcr file extension to your file name and the record template information will be saved.

Open Multi-Channel Record Template File

This option allows you to open a previously saved record template. (See *Save Multi-Channel Record Template File* above.)

Use the *File* dialog box to select a filename and click *OK*.

Mix Menu

Mix	Process/MixDown	Window	Sample/Midi	Options	Info
Fade To Next Volume Change				(F)	
Fade Curve Setup				(Shift+F)	
Sweep To Next Pan Change				(P)	
Fade Out Marked				(O)	
Fade In Marked				(I)	
CrossFade Marked Or Overlapped To Next Track				(C)	
CrossFade (6 db) Marked Or Overlapped To Next Track				(Shift+C)	
Clear Marked Vol And Pan Changes				(Shift+C)	
Clear Marked Vol Changes				(Shift+V)	
Clear Marked Pan Changes				(Shift+P)	
Reverse Marked Vol And Pan Changes				(Shift+R)	
Snap Marked Mix Changes To Cursor				(BackSpace)	

The *Mix Menu* provides several options for manipulating volume and pan automation. Many of these functions work within a *Marked Area*.

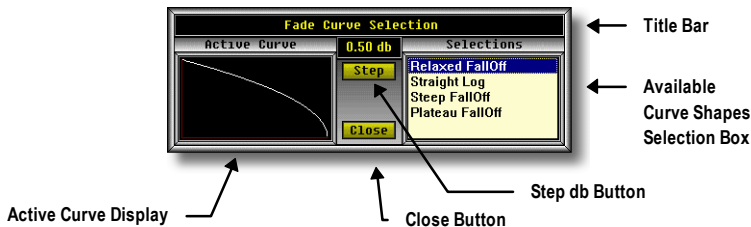
☞ Using the keyboard equivalents in many cases, bypasses the confirmation prompts, allowing for quicker operation.

Fade To Next Volume Change (F)

This option creates a fade from the current *MultiTrack View* cursor position to the next volume mix change position on the currently selected track. The fade will be a fade in or fade out depending on whether the next volume change is higher or lower in level than the level at the current cursor position.

The fade curve created is defined in the *Fade Curve Setup* option in the *Mix* menu. (For more details on working with fades, see the *Controlling the Mix* chapter.)

Fade Curve Setup (Shift and F)



This option allows you to select the fade curve shape used in the various fade functions. Selecting this option displays the *Fade Curve Selection* dialog box.

The *Active Curve* display on the left shows the relative shape of the currently selected curve. The *Selections* list box on the right displays a list of available curve shapes.

USING THE MENUS

Mix Menu

To select a new curve shape, click on a name in the *Selections* list. The new curve shape will be shown in the *Active Curve* display. This curve will be the default setting for all subsequent fades performed until you select a new fade curve.

Sweep To Next Pan Change(P)

This option creates a smooth pan sweep from the current *MultiTrack View cursor* position to the next pan mix change position on the currently selected track. The direction of the sweep will depend on whether the next pan change is further left or right from the pan setting at the current cursor position. (For more details on working with pans, see the *Controlling the Mix* chapter.)

Fade Ot Marked (O)

This option creates a fade out within a *Marked Area*. The fade starts from the current volume level at the beginning of the *Marked Area* and ends at a zero level.

The fade curve created is defined in the *Fade Curve Setup* option in the *Mix* menu. (For more details on working with fades, see the *Controlling the Mix* chapter.)

Fade In Marked (I)

This option creates a fade in within a *Marked Area*. The fade starts from a zero level at the beginning of the *Marked Area* and ends at the *Marked Area* end boundary volume level.

The fade curve created is defined in the *Fade Curve Setup* option in the *Mix* menu. (For more details on working with fades, see the *Controlling the Mix* chapter.)

CrossFade Marked Or Overlapped to Next Track (X)

This option creates a crossfade between two overlapping entries on two adjacent tracks. The length of the crossfade is defined by a *Marked Area*, or the entire overlap if no *Marked Area* exists. The crossover equal

energy point is defined by the current cursor position placed within the overlapped or *Marked Area*.

The curve used for the crossfade is defined in the *Fade Curve Setup* option in the *Mix* menu. (For more details on working with crossfades, see the *Controlling the Mix* chapter.)

CrossFade (-6db) Marked Or Overlapped to Next Track (*Shift* and *X*)

This option creates a crossfade between two overlapping entries on two adjacent tracks. The length of the crossfade is defined by a *Marked Area*, or the entire overlap if no *Marked Area* exists. The crossover equal energy point is defined by the current cursor position placed within the overlapped or *Marked Area* and occurs at a -6db level. This creates a crossfade with no apparent decrease in volume during the transition.

The curve used for the crossfade is defined in the *Fade Curve Setup* option in the *Mix* menu. (For more details on working with crossfades, see the *Controlling the Mix* chapter.)

Clear Marked Vol And Pan Changes (*Shift* and *C*)

This option resets all volume changes to 0db, and pan changes to center within a *Marked Area*.

Clear Marked Vol Changes (*Shift* and *V*)

This option resets all volume changes to 0db within a *Marked Area*, leaving the pan changes undisturbed.

Clear Marked Pan Changes (*Shift* and *P*)

This option resets pan changes to center within a *Marked Area*, leaving the volume changes undisturbed.

USING THE MENUS

Mix Menu

Reverse Marked Vol And Pan Changes (*Shift* and *R*)

This option reverses all volume and pan changes within a *Marked Area*. For example, fade outs will now fade in, and pan sweeps will reverse direction.

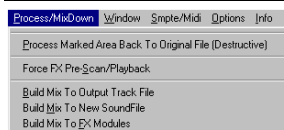
Snap Marked Mix Changes to Cursor (*Backspace*)

This option is used to precisely position marked mix changes to the *MultiTrack Cursor* location, for example, relocating a fade to the exact position of a slightly extending *MT Entry* boundary. This option can only be used when the track fader is open and a marked mix area exists.



For a quick way to snap a fade to the beginning boundary of an *MT Entry*, try this: Place the *MultiTrack cursor* in front of the fade and use the fader *Next* button to snap the cursor to the beginning of the fade. Press the *B* key to mark the beginning. Place the cursor past the end of the fade and press the *E* key to mark the end. Use the *tab* key to position the cursor at the *MultiTrack* boundary and select this option from the menu, or press the *backspace* key. The *fade begin* will snap to the cursor position at the entry boundary.

Process/MixDown Menu



This menu contains options for processing modified data back to original soundfiles (destructive), or building mixdowns of all *MultiTrack* elements to various destinations.

Process Marked Area Back To Original File (Destructive)

This option allows effects and mix changes to be processed and written back to the original soundfile. This eliminates the need for live processing during *MultiTrack* playback and can free up CPU time for other processing operations.



This is a destructive process. Changes are written directly back to the original soundfile, permanently modifying the data.

This option works on a single *MT Entry* on the current *Hot Track* of the *MultiTrack*. Any effects or mix changes applied to that track will be permanently written back to the entry's referenced soundfile.

To use this option, first mark the entire entry or a section of it (*you cannot mark across different entries*). Make sure the track is selected as the *Hot Track* and then select this function.

You will be warned that this is a destructive process. Choose an option to continue with or without creating an *Undo* file, or cancel the operation.

When the process is finished, double-click the *MT Entry* to transfer it to the *SoundFile View*. Here you can play it back and hear the results of the processing. Playing it back in the *MultiTrack* without first clearing the effects and mix changes would result in applying the effects again to the already processed data. If the results you hear in the *SoundFile View* are satisfactory, clear the processed effects and mix changes from the *Hot Track* to gain back the CPU processing time that was required to perform the effects live.



Vari-Pitch and Reverse Audio effects cannot be processed back to the original file using this option. You must use one of the

USING THE MENUS

Process Mix/Down Menu

BuildMix options to process those effects to a destination different from the original soundfile.

Force FX Pre-Scan/Playback

This option can be used to force an FX Pre-Scan and wait for user input to begin immediate playback so that, for example, you may hear PeakLimit and Normalize functions live. This is also useful if you want to mix directly to DAT with PeakLimit and Normalize functions, and do not wish to process the data destructively, or build a mix to a separate soundfile.

After selecting this function, an FX Pre-Scan will be performed and a message prompt will be displayed at the end of the Pre-Scan. Click *OK* or press any key to begin playback.

Build Mix To Output Track File

This option builds a mixdown of all active (unmuted) tracks in the *MultiTrack* to a new soundfile for each assigned output card, and places the file(s) on the respective output track(s). This process can also perform samplerate, file type, and bit resolution conversion if desired.

All tracks assigned to the same output card destination will be grouped and mixed together. All effects and mix changes assigned to the entries on those tracks will be included. The resulting soundfile will be placed as an *MT Entry* on the respective output track.

If a *MultiTrack Marked Area* exists, the mix will begin and end at the *Marked Area* boundaries across all tracks.

If there is no active *Marked Area*, the mix includes the entire length of the active tracks from beginning to end.

☞ Each output track acts as a master for all tracks assigned to it. All effects, volume and pan settings on the output tracks are included in the mix. Use this feature to adjust overall volume levels of a mix, or apply a specific effect to all tracks simultaneously.

When choosing this option, the *Set Conversion Parameters* dialog box is displayed allowing you to change samplerate, file type, or bit resolution for the destination files. The *In* parameters will display the

current settings. Change any *Out* parameter, if desired, and click *OK*, or click *Cancel* to abort the operation.

Next, the *File* dialog box is displayed prompting you to enter a file name for each active output track mix file. Once all file names are entered, the mixdown will proceed.

A progress bar is displayed showing the current status of the operation. You may press *Escape* (Esc) at any time to cancel the operation, or press *Enter* to continue the operation in the background, allowing you to work in other applications while the mix is being processed.

When the process is complete, *MT Entries* for each mix file created are placed on their respective output tracks, and are displayed upon completion of the mix.

The *Solo* buttons on the output tracks can be used to play the mixed output files. All output track effects and mix changes will be temporarily bypassed, allowing you to hear the actual mix as created. If a slight adjustment is desired, deactivating the output solos leaves all parameters intact, ready for modification and a new mixdown.

☞ The output track solos are independent from those on the normal tracks and you cannot solo both sections at the same time. Output track solos override normal track solos.

You may also audition the mixdown files by double-clicking the output *MT Entries* into the *SoundFile View* and playing back from there.

If the mix is satisfactory, this new entry can be easily moved to a normal track and the original track(s) that created the mix can be muted or erased. This process is similar to “bouncing” tracks on a typical multitrack tape recording system, but since the bounce remains in the digital domain, there is no signal degradation as occurs when using analog tape.

☞ This technique allows slower machines to utilize the full power of *SAW* even though the machine may not be capable of playing a complex and densely packed session live. For example, a session with 20 tracks, multiple EQ and reverb patches which will not play live in real-time, can be mixed in this manner, creating a single stereo output file which will play back successfully on virtually any machine.

USING THE MENUS

Process Mix/Down Menu

Build Mix To New SoundFile

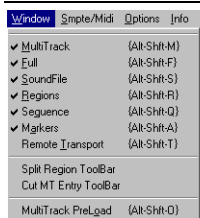
This option is similar to the *Build Mix To Output File* option with the following exceptions:

- New entries will not be created on the active *Output Tracks*.
- The newly created soundfiles can overwrite or append to existing files by your choice.

Build Mix to FX Modules

This option is similar to the *Build Mix To New SoundFile* option, however actual mix files are not created. This is designed to send your mix to special effects modules which will create their own type of output, for example, a CD burner module which will send it's output directly to a CD.

Window Menu



The *Window* menu contains options allowing you to open any **SAW** window that has been closed. A window which is already open displays a checkmark next to its name. Selecting a checkmarked option brings the applicable window to the top.

MultiTrack (*Alt* and *Shift* and *M*)

This option opens or brings the *MultiTrack View* window to the top.

Full (*Alt* and *Shift* and *F*)

This option opens or brings the *Full View* window to the top.

SoundFile (*Alt* and *Shift* and *S*)

This option opens or brings the *SoundFile View* window to the top.

Regions (*Alt* and *Shift* and *R*)

This option opens or brings the *Regions View* window to the top.

Sequence (*Alt* and *Shift* and *Q*)

This option opens or brings the *Sequence View* window to the top.

Markers (*Alt* and *Shift* and *A*)

This option opens or brings the *Markers View* window to the top.

USING THE MENUS

Window Menu

Remote Transport (*Alt* and *Shift* and *T*)

This option opens the *Remote Transport* window. When open, it is always on top.

Split Region ToolBar

This option opens the *Split Region ToolBar* window. When open, it is always on top.

This toolbar duplicates the four corresponding functions found in the *Regions* menu. However, using this toolbar bypasses all confirmation prompts, allowing quicker operation for the more advanced user.

☞ Pressing *Ctrl* while clicking any of the buttons on the toolbar extends the operation across all tracks below the current *Hot Track*.

Cut MT Entry ToolBar

This option opens the *Cut MT Entry ToolBar* window. When open, it is always on top.

This toolbar duplicates the two corresponding functions found in the *MultiTrack* menu. However, using this toolbar bypasses all confirmation prompts, allowing quicker operation for the more advanced user.

MultiTrack PreLoad (*Alt* and *Shift* and *O*)

This window allows you to adjust the amount of audio buffers that *SAW* pre-loads into RAM before *MultiTrack* playback begins.

When *MultiTrack* playback is initiated, the smaller the setting, the shorter the delay before playback actually begins.

A larger setting causes more buffers to be pre-loaded before playback begins. This increases the playback delay, but can help slower computers process dense sessions in the *MultiTrack*, especially ones that contain extensive mix and effects processing.

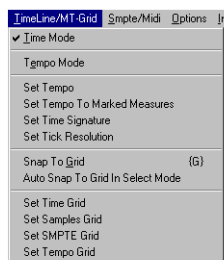
Once playback is in process, **SAW** has stringent timing constraints that must be met in order to prevent audio playback gaps. If a dense or complex section of the *MultiTrack* requires more time to assemble than the time allotted, an audio glitch can result. By having more data already processed, ready to go, and loaded into RAM, **SAW** has more time available to assemble new complex sections in the background while feeding the soundcard with the already processed data from RAM.

Use this option to extend preview time of a session that your machine is not capable of playing back in real-time. By setting the pre-load buffers extremely high, you may incur a long delay before playback begins, but be able to preview 10-15 seconds of actual live real-time playback. This extended preview can allow you to make needed adjustments in critical areas of your session that otherwise would not be possible prior to building a mixdown.

USING THE MENUS

TimeLine/MT-Grid Menu

TimeLine/MT-Grid Menu



The *TimeLine/MT-Grid* menu contains options which control the appearance of the *Time Line* displays, and control the settings for an adjustable snap-to MT-grid which can be used to force cursor and *MT Entry* positioning to exact grid point boundaries.

Time Mode

This option sets the *Time Line* displays to reference **time**. If a *SMPTE* mode is active then the readout will be SMPTE time. If the *Time/Samples* button is set to *Sample* mode, Sample display will override.

Tempo Mode

This option sets the *Time Line* displays to reference **tempo** displayed as *Measure>Beats>Ticks*. If the *Time/Samples* button is set to *Sample* mode, Sample display will override.

Set Tempo

This option allows you to set the tempo reference for *Tempo* mode. Enter a value within the specified range in the dialog box.

☞ The range limits are 20.000 to 350.000 beats per minute (bpm).

Set Tempo to Marked Measures

This option allows you to automatically determine the tempo of a piece of music by referencing marked measures in a *MultiTrack Entry*. Enter the number of measures marked in the dialog box and the tempo will be automatically calculated.

Set Time Signature

This option allows you to set the Time Signature for the tempo reference. Enter a value within the specified range in the dialog box.

☞ The range limits are 1 to 16 for the numerator and 2, 4, 8, 16 for the denominator, for example 4/4, 3/4, 7/8.

Set Tick Resolution

This option allows you to set the *Ticks per Quarter Note* resolution. Enter a value within the specified range in the dialog box.

☞ The range limits are 48 to 999 ticks per quarter note.

Snap to Grid (G)

This option toggles the *MultiTrack Snap To Grid* option On/Off. The *G* key does the same thing. When this mode is active, cursor and *MT Entry* positioning will snap to current grid boundary settings.

No attempt is made at displaying grid reference lines on the *MultiTrack* when the grid is active, as this would clutter the *MultiTrack* display beyond usefulness. However, the *Remote Transport View* Time/Position readout title will be bound by two vertical lines, signaling that the grid is active.

Auto Snap to Grid in Select Mode

This option toggles the *Auto Snap to Grid in Select Mode* option On/Off. When this option is on, the grid will automatically activate when entering *Select* mode and automatically deactivate when leaving *Select* mode. This allows you to position the cursor normally without grid snaps, but automatically causes all *MT Entry* moves to snap to grid.

Set Time Grid

This option allows you to set the grid distance for *Time* mode in milliseconds. Enter a value within the specified range in the dialog box.

USING THE MENUS

TimeLine/MT-Grid Menu

☞ The range limits are 1 to 10,000 milliseconds.

Set Samples Grid

This option allows you to set the grid distance for *Sample* mode in samples. Enter a value within the specified range in the dialog box.

☞ The range limits are 1 to 1,000,000 samples.

Set SMPTE Grid

This option allows you to set the grid distance for *SMPTE* mode in frames. Enter a value within the specified range in the dialog box.

☞ The range limits are 1 to 1,000 frames.

Set Tempo Grid

This option allows you to set the grid distance for *Tempo* mode in note-time references. Enter a value within the specified range in the dialog box.

☞ The range limits are 32 (32nd note), 16 (16th note), 8 (8th note), 4 (quarter note), 2 (half note), and 1 (whole note).

To set the grid to a tuplet value, add a 'T' after the value. For example, quarter note tuplets are entered as 4T.

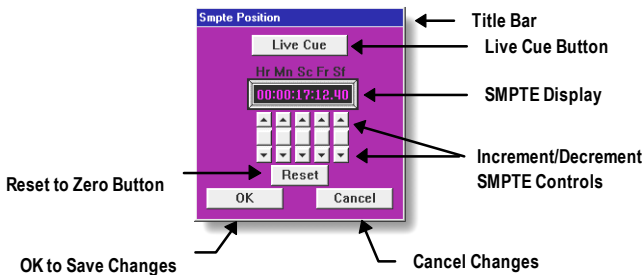
To set the grid to a dotted value, add a 'D' after the value. For example, dotted quarter notes are entered as 4D.

Smpte/Midi Menu



The *Smpte/Midi* menu contains options which control *SAW*'s response to MIDI and SMPTE information.

Many functions dealing with SMPTE require you to enter SMPTE position information. In these instances, *SAW* will display the *Enter Smpte* dialog box. (The title bar text will be relative to the chosen function.)



Live Cue

The *Live Cue* button transfers the current incoming SMPTE time into the *Enter Smpte* display. Use this button while *SMPTE Time Code* is being received to pick up a live cue point and transfer the *Time Code* to the display.

This method is very useful for getting close to the actual cue time you might need for a specific cue point. You may then use the *Up/Down* arrow controls to make minor adjustments.

Up/Down Arrow Controls

These controls allow you to increment or decrement the Hours, Minutes, Seconds, Frames or Sub-Frames in the SMPTE display.

USING THE MENUS

Smppte/Midi Menu

The controls will wrap in accordance with the current SMPTE format and clicking any one of the scroll box controls resets the associated value to zero.

☞ If sub-frames do not apply to the current function, the sub-frame controls will be grayed and disabled.

Reset

The *Reset* button resets all values in the SMPTE time display to zero.

OK and Cancel

After setting the SMPTE display value click *OK* to exit and accept the value, or *Cancel* to cancel the operation.

For more information on using SMPTE, see the *Working with SMPTE* chapter.

Receive Midi Trigger

This option allows *SAW* to trigger *Region* or *SF/MT Marker* playback in response to incoming MIDI note information, arriving at a MIDI In-port. Selecting this option toggles the MIDI trigger on and off. This menu item will be grayed and unavailable if no MIDI In-device has been selected in the *Midi/Smppte Hardware Setup* under the *Options* menu. This option is saved with the EDL.

Using MIDI Trigger, you may play only one *Region* or *Marker* location at a time. Receiving another trigger while one is still playing, cuts off playback of the first to start playback of the second.

You must first assign MIDI notes to *Regions* or *Marker* locations using the *Assign MIDI Notes To Regions/Markers* option under the *Midi/Smppte* menu before MIDI Trigger will function.

Assign Midi Notes To Regions/Markers

This option allows you to assign MIDI Trigger notes to *Regions* or *Marker* locations. When the *Receive Midi Trigger* option is activated, and an assigned MIDI note is received at the MIDI in-port, the associated *Region* or *Marker* location is played. This menu item will be grayed and

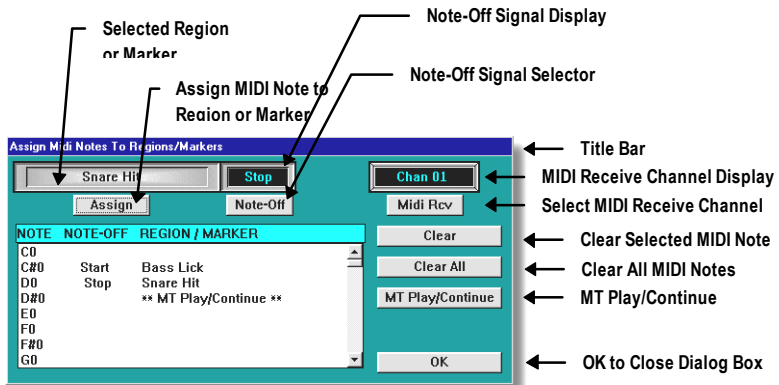
unavailable if no MIDI In-device has been selected in the *Midi/Smpte Hardware Setup* under the *Options* menu.

Assigning a MIDI Note to a *Region* causes the *Region* to begin playback upon triggering.

Assigning a MIDI Note to an *SF Marker* causes the associated soundfile to load and begin playback at the *Marker* location upon triggering.

Assigning a MIDI Note to an *MT Marker* causes the *MultiTrack* to cue and begin playback at the *Marker* location upon triggering.

When selecting this option, the *Assign Midi Notes* dialog box is displayed.



Assign Midi Notes Dialog Box Operation

The *Assign Midi Notes* dialog box displays a list of MIDI notes spanning ten octaves from **C0** through **G10**. Assigned *Regions* or *Markers* and *Note-Off* parameters are displayed next to associated MIDI Notes in the list. When this dialog box is open, it is actively connected to the MIDI in-port, and triggering MIDI Notes from a MIDI keyboard will instantly select that note in the list box. You may also select any note by clicking once with the left mouse button.

Assign

The *Assign* button and the associated title box above it are used to assign the selected *Region* or *Marker* to the currently selected MIDI Note, with the current *Note-Off* parameter.

Selecting a *Region* from the *Regions View* or selecting a *Marker* from the *Markers View* automatically updates the title box above this button.

To assign a MIDI Note, first select the *Region* or *Marker* so that it is displayed in the title box, then select a MIDI Note. Select the desired *Note-Off* option and click the *Assign* button.

Note Off

The *Note-Off* button offers three options for utilizing the MIDI *Note-Off* signal that occurs when you release a MIDI keyboard note.

- **Ignore it (--):** Playback trigger is applied when the *Note-On* signal is received and continues after the note is released until the end of the *Region* or *Marker* selection, or until playback is stopped by some other means.
- **Stop Playback:** Playback trigger is applied when the *Note-On* signal is received and stopped when the *Note-Off* signal is received (when the note is released).
- **Start Playback:** Playback is cued when the *Note-On* signal is received and triggered when the *Note-Off* signal is received, resulting in perfectly synced playback starting precisely when the note is released.

☞ Use this option when accurate start timing is needed, because normal triggering will actually have a variable delay prior to playback due to the time it takes to cue the *Region* data or *Marker* data into the playback buffers.

Midi Rcv

The *Midi Rcv* button selects the MIDI receive channel that **SAW** uses to look for MIDI trigger. All other MIDI channel data will be ignored.

Clear

The *Clear* button clears the currently selected MIDI Note of all previously assigned data.

Clear All

The *Clear All* button clears all MIDI Notes of previously assigned data.

MT Play/Continue

The *MT Play/Continue* button can be used instead of the *Assign* button to assign a MIDI Note to play back from the current *MultiTrack cursor* position (at the time the trigger is received), rather than playing back a *Region* or *Marker*.

To use this option, select a MIDI Note and click the *MT Play/Continue* button.

OK

Click *OK* to close the dialog box when MIDI Note assignments are complete.

☞ The MIDI Note assignments will be saved permanently with the EDL.

Generate Smppte As Master

This option allows *SAW* to generate *SMPTE Time Code*, using various MIDI/Audio devices, and act as the master component when synchronizing other equipment or software with the *SAW* environment. This menu item will be grayed and unavailable if no SMPTE Generate device has been selected in the *SMPTE Gen Protocol* option of the *Midi/Smppte Hardware Setup* under the *Options* menu.

Selecting this option toggles *SMPTE Generate* mode on and off. When active, the *Current Time* display in the *Remote Transport* window will show that *SMPTE Generate* is active by displaying *SMPTE Gen* and the *SMPTE Format* information.

All time references in the *Remote Transport* will switch to display *SMPTE Time Code* references (Hrs:Mins:Secs:Frmes:Sub-Frames). The

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Smp^te/Midi Menu

Time Lines in the *Full*, *SoundFile* and *MultiTrack Views* will also switch to indicate SMPTE times.

Whenever playback is initiated from the *MultiTrack*, *SAW* will generate SMPTE code starting from the *MultiTrack cursor* position.

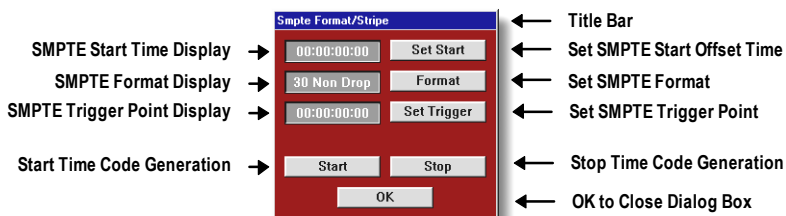
Generate SMPTE mode is also active during *MultiTrack* recording, and the program will generate SMPTE code starting at the current *MultiTrack cursor* position.

☞ The *SMPTE Start Offset* time is added into the *MultiTrack cursor* position when it is translated to a SMPTE position. Changing the *SMPTE Start Offset* time will instantly change the actual SMPTE values generated from the same *MultiTrack* position, and can be used to slip the sync forward or backward without moving the data.

Any sequencer or other device that is set to chase SMPTE, and is connected to the SMPTE Generate device output, will synchronize to *SAW*'s playback.

You may also generate MTC code (MIDI Time Code) by turning this option on in the *Midi/Smp^te Card Hardware Setup* under the *Options* menu. We recommend using SMPTE, if possible, to keep the time code data out of the MIDI data stream.

Smp^te Format/Stripe



This option allows you to set the SMPTE *Format* and stripe SMPTE *Time Code* to tape for later use in synchronizing sequencers and other equipment with *SAW*. Selecting this option displays the *Smp^te Format/Stripe* window.

Set Start

The *Set Start* button allows you to set the SMPTE *Start Offset Time* for the stripe operation. When clicking this button, the *Enter Smppte dialog* box is displayed. Set the desired time and click *OK*.

☞ This *Start Offset Time* affects only the stripe operation, and does not apply to the *MultiTrack* session.

Format

The *Format* button allows you to cycle through the various SMPTE time formats. The four choices are *30N* (30 Non Drop), *30D* (30 Drop), 25 or 24 frames per second.

☞ Using the *Smppte Conform 30 to 29.97* option under the *Smppte/Midi* menu, in conjunction with *30N* or *30D* alters those formats to 29.97.

Set Trigger

The *Set Trigger* button allows you to set an incoming SMPTE trigger point which will begin the striping process. If this value is zero, then the process will begin as soon as you click the *Start* button. If a value is entered here, *SAW* will read incoming SMPTE and wait for the trigger point to be reached before starting the stripe operation.

☞ This option can be used to generate new SMPTE code, offset by an exact amount from an older existing code.

Start

The *Start* button begins generating SMPTE code starting with the displayed *Start Offset* value. The display will be updated as the *Time Code* is generated provided that the SMPTE generate device is capable of feeding the *Time Code* back to *SAW*.

Stop

The *Stop* button stops *Time Code* generation.

OK

The *OK* button closes the dialog box.

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Smpte/Midi Menu

MultiTrack Smpte Emulate

This option can be used whenever SMPTE references need to be visible, and is always available even without any SMPTE/MIDI device installed in the system.

MultiTrack Smpte Trigger

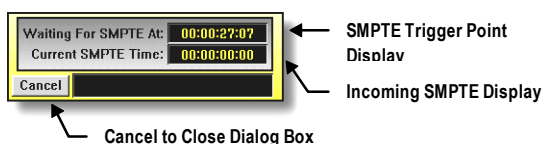
This option allows **SAW** to manually trigger to incoming SMPTE *Time Code* and act as a slave component when synchronizing other equipment or software with the **SAW** environment. The current *MultiTrack cursor* position defines the SMPTE trigger point.

This menu item will be grayed and unavailable if no Midi In-device has been selected in the *Midi/Smpte Hardware Setup* under the *Options* menu.

Selecting this option toggles *MultiTrack SMPTE Trigger* mode on and off. When active, *Receive Midi Trigger* will be deactivated (if active), and the *Current Time* display in the *Remote Transport* window will show that *SMPTE Trigger* is active by displaying *SMPTE Trig* and the SMPTE *Format* information.

All time references in the *Remote Transport* will switch to display SMPTE *Time Code* references (Hrs:Mins:Secs:Frmes:Sub-Frames). The *Time Lines* in the *Full*, *SoundFile* and *MultiTrack Views* will also switch to indicate SMPTE times.

When this option is active, and *MultiTrack* playback is initiated by pressing the spacebar, the *Waiting For SMPTE* window is displayed.



SAW will cue all *MultiTrack* data and wait for SMPTE *Trigger* at the current *MultiTrack cursor* position. The trigger point is displayed in the *Waiting For SMPTE At:* readout. Incoming SMPTE is displayed in the *Current SMPTE Time:* readout. **SAW** will begin playback when the incoming SMPTE time matches the trigger point time.

You may click the *Cancel* button to cancel the *SMPTE Trigger* playback.

Clicking the right mouse button to initiate *MultiTrack* playback, instead of pressing the spacebar, overrides the *Trigger* operation and activates normal playback.

MultiTrack SMPTE Trigger mode is also active during *MultiTrack* recording, and the program will wait for *SMPTE Trigger* at the current *MultiTrack* cursor position when the *Rec* button is clicked in the *Record Remote Transport* window.

MultiTrack SmpTe Chase Trigger

This option allows **SAW** to automatically chase and trigger to incoming *SMPTE Time Code* and act as a slave component when synchronizing other equipment or software with the **SAW** environment. The *Trigger* point is automatically calculated from incoming *Time Code*.

This menu item will be grayed and unavailable if no Midi In-device has been selected in the *Midi/SmpTe Hardware Setup* under the *Options* menu.

Selecting this option toggles *MultiTrack SMPTE Chase Trigger* mode on and off. When active, *Receive Midi Trigger* will be deactivated (if active), and the *Current Time* display in the *Remote Transport* window will show that *SMPTE Chase Trigger* is active by displaying *SMPTE Chse* and the *SMPTE Format* information.

All time references in the *Remote Transport* will switch to display *SMPTE Time Code* references (Hrs:Mins:Secs:Frms:Sub-Frames). The *Time Lines* in the *Full*, *SoundFile* and *MultiTrack Views* will also switch to indicate *SMPTE* times.

When this option is active, **SAW** is actively looking for incoming *SMPTE Time Code*. When code arrives, the program will automatically cue forward or backward to the arriving *SPMTE* position, then add the number of *SMPTE Chase Advance* seconds as a pre-roll. (Set in the *SMPTE Chase Advance* option under the *SmpTe/Midi* menu.) This pre-roll time is used for *MultiTrack PreLoad* and can be set smaller or larger based on the speed of your computer and the complexity of the session.

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SAW will wait for *SMPTE Trigger* at this new *MultiTrack cursor* position. The new *Trigger* point is displayed in the *Waiting For SMPTE At:* readout. Incoming SMPTE is displayed in the *Current SMPTE Time:* readout.

You may click the *Cancel* button to cancel the *SMPTE Chase Trigger* playback.

Clicking the right mouse button to initiate *MultiTrack* playback, overrides the *Chase Trigger* operation and activates normal playback.

MultiTrack SMPTE Chase Trigger mode is also active during *MultiTrack* recording, and if incoming SMPTE arrives, the program will chase, cue, and wait for *SMPTE Trigger* at the new *MultiTrack cursor* position. **SAW** will begin recording when the incoming SMPTE time matches the *Trigger* point time.

Chase Trigger Record = SRP

When this option is selected, *Chase Trigger* recording will actually activate SRP recording.

Smpte Conform 30 To 29.97

This option will adjust all SMPTE mode 30 fps position calculations for 29.97 broadcast color video. Use this option if you are working with any type of color video synchronization in the **SAW** environment.

Set Smpte Start Offset

This option allows you to set the *SMPTE Start Offset* time for the *MultiTrack* session. When selecting this option, the *Enter Smpte dialog* box is displayed. Set the desired time and click *OK*.

Smpte Chase-Advance

This option opens the *SMPTE Chase-Advance* window. The scroll bar allows you to adjust the number of seconds that the *SMPTE Chase Trigger* mode advances after first detecting incoming SMPTE *Time*

Code. The *MultiTrack* will cue to the advanced SMPTE point, then preload its data and wait to *Trigger*. Slower machines or complex sessions will require a larger value.

Auto Smpte Stop Detection

When this option is selected, and playback is initiated by one of the *Trigger* modes *SAW* will stop playback automatically when incoming SMPTE code stops.

Auto Smpte Format Detection

When this option is selected, the SMPTE *Format* will be automatically detected and changed with incoming SMPTE data. When this option is not active, the incoming *Format* data will be ignored, allowing you to override any automatic *Format* changes.

Use IQS DirectMidiTC Protocol

This option activates the extended IQS MIDI TC protocol. This protocol, developed by IQS, extends the communication interface between the standard MIDI driver and the application. The driver must be capable of this protocol for this option to work.

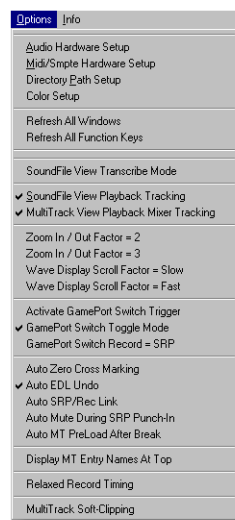
This protocol allows the application to communicate more directly with MIDI/SMPTE generator/reader hardware, effectively eliminating much of the standard Windows multimedia driver overhead associated with reading and generating SMPTE time code. This results in more accurate synchronization operations.

When this option is activated, *SAW* will query the driver to determine if it recognizes this protocol, and if so, use this means of communication for all SMPTE operations.

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Options Menu

Options Menu

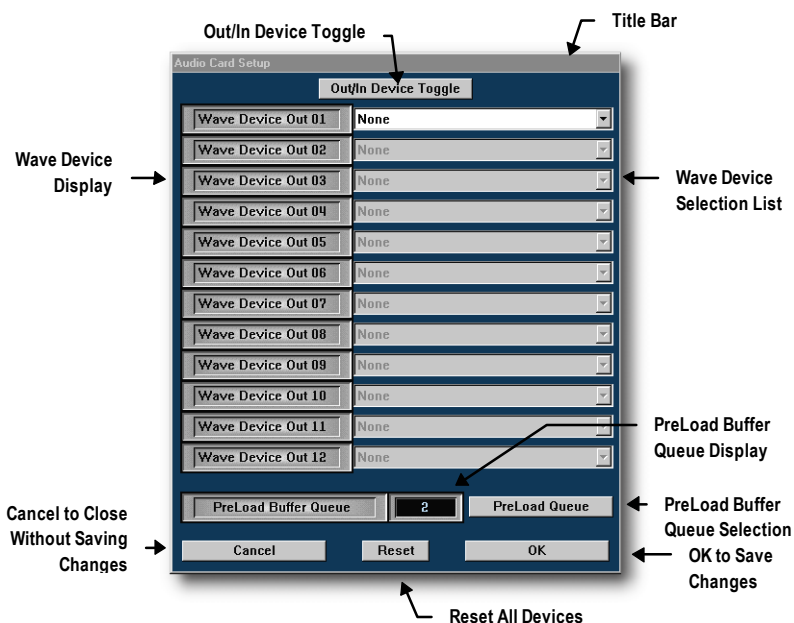


The *Options* menu allows you to setup hardware preferences and select various adjustable options within the **SAW** environment.

You may save these choices as program defaults by using the *Save Preferences* option under the *File* menu.

Audio Hardware Setup

This option displays the *Audio Card Setup* window which allows you to select the appropriate soundcard drivers for up to 12 separate soundcards (6 for **SAW32** and 3 for **SAW32Lite**.)



Wave Devices

The *Audio Card Setup* window first displays the wave *output* device selections. Start with *Wave Device 1* and select the audio card driver that matches the card that you have installed. If you have more than one card installed, repeat this for each card. You may assign devices in any order, and leave unassigned devices in any location.

Next, click the *Out/In Device Toggle* button to display the wave *input* device selections. Start with *Wave Device 1* and select the audio card driver that matches the card that you have installed. If you have more than one card installed, repeat this for each card. If your sound card has an unmatched number of inputs and outputs, you should set the matching input and output pairs to the same device number, leaving unmatched devices set to *none*. You may, however, assign devices in any order, and leave unassigned devices in any location.

☞ For example, if your sound card has four stereo analog outputs and one stereo digital output, but only one stereo analog input and one stereo digital input (thereby creating an unmatched set of inputs and outputs), set *out* device 1 to driver-out 1-2, out device 2 to driver-out 3-4, out device 3 to driver-out 5-6, and out device 4 to driver-out 7-8, and out device 5 to driver-out digital 1-2. Then set *in* device 1 to driver-in 1-2, and in device 5 to driver-in digital 1-2, leaving in device 2, 3, and 4 set to *none*.

PreLoad Buffer Queue

This setting controls how many buffers of data are preloaded to the card before playback or recording begins. This affects the response time of live controls such as mutes, solos, faders and pans. If this setting is too low for your system, audio stuttering or glitching during playback may occur, especially when minimizing or sizing windows, etc.

Pressing the PreLoad Queue button to the right of the display window will cycle through the available settings from 1 to 15. Lower values will give you faster response times.

If you are using a fast Windows NT system, a setting of 1 or 2 may work well. If you have a slower machine running Windows 95/98, try using higher settings like 4 to 6.

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Reset

The *Reset* button allows you to reset all devices at one time. If you have added or removed audio devices in your Windows setup, then you may use this option to clear then reselect the devices for **SAW** if necessary.

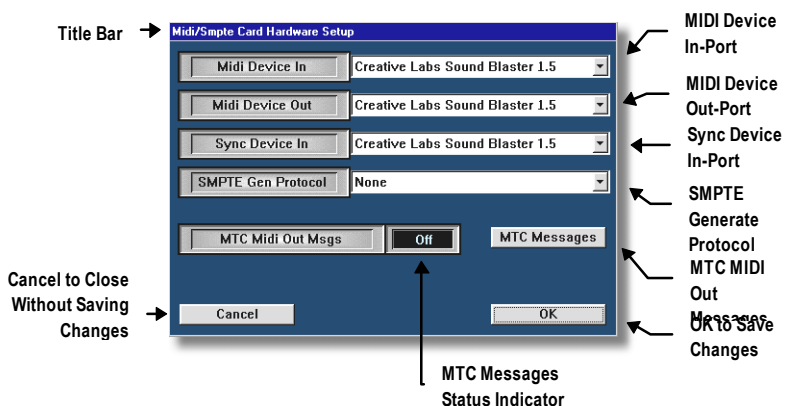
OK and Cancel

When you are finished with all adjustments, click *OK* to close the dialog box and save the new settings, or click *Cancel* to close the dialog box and leave settings as they were.

☞ Save your new settings permanently by clicking on the *File* menu and selecting *Save Preferences*.

Midi/Smppte Hardware Setup

This option displays the *Midi/Smppte Card Hardware Setup* window which allows you to select the appropriate MIDI drivers and SMPTE protocol for MIDI and SMPTE devices.



Midi Device In

This device is used as the in-port for the receive MIDI *Trigger* options, and for the SMPTE generate feedback signal with certain devices. This is not a required setting unless you plan to use those features. Select the desired MIDI device from the drop down list box.

Midi Device Out

This device is used as the communication link for generating SMPTE with certain devices. In some cases, if MTC messages are turned on, they will be sent out through this device.


Sync Device In

This device is used as the in-port for reading MTC or SMPTE *Time Code*. Select the desired MIDI device from the drop down list box.

SAW can read MTC with any MIDI device, but only certain devices have the capability to read actual SMPTE *Time Code* directly. Check the documentation that came with your MIDI device to confirm whether or not this capability is available.


SMPTE Gen Protocol

Since there is no Windows standard for generating SMPTE through the Multimedia driver mechanism, you must select a SMPTE generate protocol in this window if you plan to use the generate functions, to instruct **SAW** how to communicate with your SMPTE device. Select the protocol from the drop down list box that matches your SMPTE device.

 Because each protocol is proprietary to each device, you must use a device that supports one of the listed protocols. This list is constantly being updated as new devices become available.

MTC Midi Out Msgs

This option toggles the output of *MTC MIDI Time Code Messages* on and off. This feature is only available on certain MIDI devices that have the ability to generate SMPTE and output MTC at the same time.

 **Regarding MTC Messages:** MTC messages are transmitted in the MIDI data stream, and can place a heavy burden on MIDI data processing. Therefore, this is not the preferred method for achieving sync between equipment or software. If possible, use dedicated SMPTE devices.

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OK and Cancel

When you are finished with all adjustments, click *OK* to close the dialog box and save the new settings, or click *Cancel* to close the dialog box and leave settings as they were.

☞ Save your new settings permanently by clicking on the *File* menu and selecting *Save Preferences*.

Directory Path Setup

This option displays the *Directory Path Setup* window which allows you to select the default paths for special data files used within the **SAW** environment.

To use the *Directory Path Setup* window, click inside the desired path name text box, type a full path (for example C:\AUDIO), or click the Browse button and use the Browse dialog box to navigate to the desired folder. Click *OK* to accept the new paths and close the window, or click *Cancel* to close the window without changing the paths.

Aux Peak Data File

This option is used to set a default path for the creation of peak data files when utilizing soundfiles from a read only device such as a CD-ROM in a **SAW** session. **SAW** normally creates its peak data information (for faster screen redraws) in the same folder as the source soundfile. If for some reason it cannot place the files in that folder (i.e. on a CD-ROM), it will use this path. These files will remain there until you delete them manually.

Undo Data File

This option is used to set a default path for the creation of soundfile undo data files. These files store actual audio data when performing destructive editing operations, and can grow quite large. Use this option to point to a large drive for storing these files.

☞ If this option is left blank, the undo file will be stored in the same folder as the soundfile from which the data comes.

Open SoundFile Path

This option is used to set a default path for opening soundfiles.

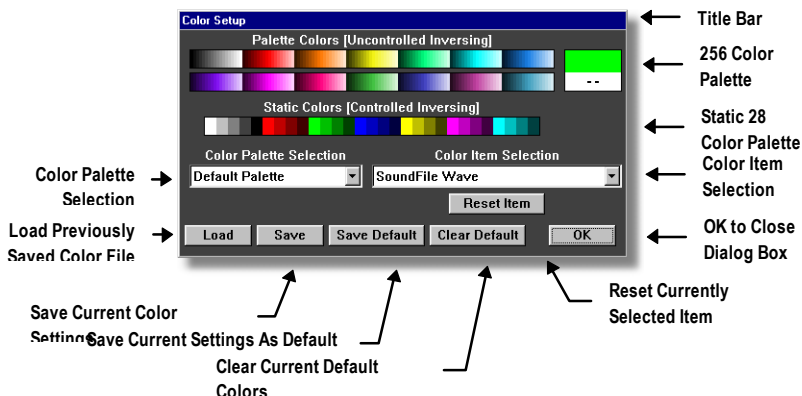
Record SoundFile Path

This option is used to set a default path for recording soundfiles.

Open/Save EDLFile Path

This option is used to set a default path for opening and saving EditList files.

Color Setup



This option opens the *Color Setup* dialog box which allows you to customize the color combinations of many areas of the program. The Color Setup window displays two palettes of color choices, the top one being the actual 256 color palette and the bottom being the static or system colors. Static colors have a more controlled and repeatable inverse algorithm and are therefore useful in the waveform and background areas of the program where colors are inverted for certain operations.

The 256 color palette offers more color choices and is more fun to utilize, but inverted colors (such as a *Marked Area* in the *SoundFile View*) cannot be easily controlled and may change randomly due to the fact that the palette is continually altered as programs are opened and closed in the Windows environment.

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Individual color-set files can be saved and loaded at any time, and a default set can also be saved which the program will use on startup.

➔ To Change Colors of Selected Items :

1. Select the item you wish to adjust from the *Color Item Selection* drop down list.
2. Choose a color from *Palette Colors* or *Static Colors* by clicking the left mouse button on the desired color. The item color will update upon release of the mouse.

If choosing from the *Palette Colors*, drag the mouse across a color box to adjust the color shade.

➔ To Change Overall Graphic Color Intensity

1. From the Color Palette Selection drop down list, choose the desired palette.

Color Setup Dialog Box Command Buttons

Reset Item

The *Reset Item* button will reset the currently selected item in the *Color Item Selection* drop down list to the previously saved color.

Load

The *Load* button displays the *Open Color Preset* dialog box allowing you to load previously saved color preset files.

Save

The *Save* button displays the *Save Color Preset* dialog box allowing you to save the current color settings to a color preset file.

Save Default

The *Save Default* button saves your current color settings as the default preset will be loaded each time you restart the program.

☞ If you create a color scheme as a default that you wish to keep, save it as a unique file name also, so that it can be reloaded at any time.

This allows use of the Clear Default option without permanently losing your color scheme.

Clear Default

The *Clear Default* button clears the current default color preset file, so the next time the program is restarted, it will load the original predefined *SAW* colors.

OK

The *OK* button closes the *Color Setup* window and retains the color settings until the program is closed. To use the current color scheme each time the program is started, click the *Save Default* button before closing this window.

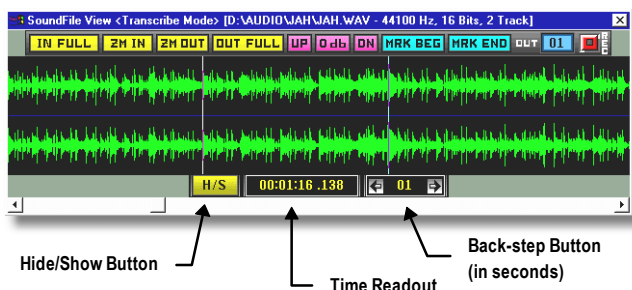
Refresh All Windows

This option allows you to refresh all windows to the *SAW* default window sizes and positions for the current video resolution. You can use this to instantly reset your windows after you have changed video resolution.

Refresh All Function Keys

This option resets all programmed function key views to the currently displayed view. You will be prompted to confirm this action. Your original function key settings are saved with your preferences. If you do not re-save your preferences after refreshing the function keys, all settings will be restored when you next run the program.

SoundFile View Transcribe Mode



Selecting this option toggles a special transcription mode on or off. When active, certain elements about the *SoundFile View* window change to facilitate the use of *SAW* as a transcription tool.

The *Time Line* display is replaced with a *H/S* (Hide/Show) button, a time readout display, and a back-step time display. The *SoundFile View* window is now capable of becoming a topmost window allowing operation on top of other applications, such as a word processor.

Playback operates slightly differently. Beginning playback is handled in any of the normal ways (including GamePort foot switch), but when playback stops, the finished playback position time is copied into the Windows clipboard (which can then be easily pasted into your word processor document), and the start cursor position will automatically jump forward to the finished playing position minus the number of seconds set in the back-step time display. This gives an automatic built-in pre-roll for the next playback.

☞ This mode allows for very efficient transcribing, because playback will begin just in front of where you left off each time you start and stop playback.

You may adjust the back-step time from zero to ten seconds by clicking on the left or right arrows in display. You may also jump the playback position forward or backward with the left mouse button during playback, just as in the *Full View* window, allowing you to scan and search for a specific spot in the material to be transcribed. You may also use the *Play Mark* and *Play Loop* features in the *SoundFile View* to help with difficult sections of material. These operations differ from normal *SoundFile View* mode in that the entire *Marked Area* will be played or looped regardless of where the starting cursor position is set.

SoundFile View Playback Tracking

Selecting this option toggles *SoundFile View Playback Tracking* on or off. When active, the *SoundFile View* window will update as the tracking cursor reaches the end of the display. If inactive, the original *SoundFile View cursor* position or wave form display will not be disturbed when the cursor scrolls off the screen during playback.

☞ This option will track playback only if the *Zoom* level is set to display data from the peak data file. If the display does not track when this option is active, try zooming out a level or two until the display refreshes.

This setting can be saved with your preferences.

MultiTrack View Playback Mixer Tracking

Selecting this option toggles *MultiTrack View Playback Mixer Tracking* on or off. When active, any open *faders* will track their associated mix settings with *MultiTrack* playback.

On slower machines, turning the option off can help performance by reducing the overhead required to update the screen as mix changes occur.

This setting can be saved with your preferences.

Zoom In/Out Factor = 2

This option adjusts the scaling factor used for the *Zoom In/Out* functions. Normally *SAW* automatically scales the factor based on the current zoom level and the size of the soundfile to keep screen redraws at an even speed as you move from one zoom level to the next, and to reduce the need to step through many zoom levels that are very similar in display.

This option allows you to force the scaling factor to a value of 2 which allows for many more intermediate levels of display than *SAW* would normally step through. This option provides the maximum number of zoom steps.

This setting can be saved with your preferences.

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Options Menu

Zoom In/Out Factor = 3

This option adjusts the scaling factor used for the *Zoom In/Out* functions. Normally **SAW** automatically scales the factor based on the current zoom level and the size of the soundfile to keep screen redraws at an even speed as you move from one zoom level to the next, and to reduce the need to step through many zoom levels that are very similar in display.

This option allows you to force the scaling factor to a value of 3 which allows for many more intermediate levels of display than **SAW** would normally step through.

This setting can be saved with your preferences.

Wave Display Scroll Factor = Slow/Fast

These options adjust the speed of the wave display scrolling when pushing or clicking the mouse at the edge of the *SoundFile* or *MultiTrack* views. With both unchecked, the default speed is medium.

These settings can be saved with your preferences.

Activate GamePort Switch Trigger


Selecting this option toggles *Activate GamePort Switch Trigger* on or off. When active, **SAW** can be remotely triggered through the game port by a mechanical switch or relay. The *Trigger* will toggle play or record on and off.

☞ Pressing and holding the *Shift* key when the footswitch is triggered will toggle a *Play Mark* operation. Pressing and holding the *Ctrl* key when the footswitch is triggered will toggle a *Play Loop* operation.

➔ To Build a Remote GamePort Switch Trigger:

1. Obtain a 15 pin din plug.
2. Solder a 150K resistor between pins 1 and 3.
3. Solder another 150K resistor between pins 1 and 6.

4. Solder switch or relay #1 between pins 2 and 5.
5. Solder switch or relay #2 between pins 7 and 5.
6. Go to the *Control Panel* in Windows and select *Joystick*. Choose *Custom* and test your buttons.

 A standard musician's keyboard sustain pedal is a good choice for a foot switch. These are readily available at most music stores.

This setting can be saved with your preferences.

GamePort Switch Toggle Mode

When this option is checked, the *GamePort Switch Trigger* functions as a toggle switch. Pushing and releasing turns it on, and pushing and releasing again turns it off.

When this option is unchecked, the *GamePort Switch Trigger* functions as a momentary switch. Pushing turns it on, and releasing turns it off.

This setting can be saved with your preferences.

GamePort Switch Record = SRP

When this option is checked, and recording is triggered by the *GamePort Switch*, SRP recording is automatically engaged.

This setting can be saved with your preferences.

Auto Zero Cross Marking

Selecting this option toggles *Auto Zero Cross Marking* on or off. When active, zero cross detection (same as pressing the Z key) is automatically performed every time you mark a beginning or end boundary with a command button or a keyboard equivalent.

Zero cross detection finds the nearest waveform zero crossing point. The program looks for the lowest left/right average waveform value within a small range before and after the current cursor position. This is helpful in the best editpoint for creating quiet splices.

USING THE MENUS

Options Menu

This setting can be saved with your preferences.

Auto EDL Undo

Selecting this option toggles *Auto EDL Undo* on or off. When active, *Undo* files will automatically be created prior to most functions that affect the *MultiTrack* and *Region* areas of the session. This is a one-level *Undo*. Selecting the *Undo* option under the *Edit* menu will return the session back to the previous EDL state.

This setting can be saved with your preferences.

Auto SRP/Rec Link

Selecting this option toggles *Auto SRP/Rec Link* on or off. When active, the *SRP* and *Rec* buttons on the *Record Remote Transport* are linked together. This allows recording to start simultaneously when the *SRP* button is clicked.

When inactive, clicking the *SRP* button begins *MultiTrack* playback only. Recording begins after clicking the *Rec* button. This mode of operation is used for punching in and out.

☞ In either mode, pressing the *Shift* key while clicking the *SRP* button overrides the existing mode with the opposite. For example, if the buttons are linked, pressing the *Shift* key temporarily unlinks them.

This setting can be saved with your preferences.

Auto Mute During SRP Punch-In

Selecting this option toggles *Auto Mute During SRP Punch-In* on or off. When active, *SRP* punch-in will cause automatic muting of any *MT Entry* that is being recorded over. For example, if you are recording a new vocal on the same track and over top of an existing vocal, the existing vocal will be heard up to the point of record punch-in, at which point it will be muted.

☞ A slight delay, dependent on the *PreLoad Buffer Queue* setting in the *Audio Hardware Setup* under the *Options* menu, will occur. Smaller settings result in shorter delays. On a fast computer running

Windows NT, with a *PreLoad Buffer Queue* setting of 1 or 2, the delay should be almost unnoticeable.

- ☞ This option requires a *MultiTrack* re-cue operation each time you punch in or out. Re-cue operations on dense *MultiTrack* sessions can be extremely CPU intensive, and on slower computers, can result in a '*Machine Not Fast Enough*' warning message, which will stop the *MultiTrack*.

This setting can be saved with your preferences.

Auto MT PreLoad After Break

When this option is active, a *Break* control entry will cause the *MultiTrack* to automatically preload after stopping and re-cueing.

Display MT Entry Names At Top

When this option is active, the *MT Entry* names are displayed at the top of each entry, rather than in the middle. This is helpful with mono waveform displays.

This setting can be saved with your preferences.

Relaxed Record Timing

When this option is active, the record buffer size is doubled, which relaxes the timing between interrupts during recording. This option can be helpful when using multiple card recording. If you are experiencing glitches or audio dropouts during recording, try activating this option.

- ☞ **Regarding Relaxed Record Timing:** The record meter responsiveness will be very sluggish compared to normal record timing. The Margin and Peak information, however, will still be accurate.

This setting can be saved with your preferences.

MultiTrack Soft-Clipping

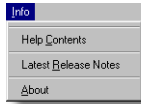
In the interest of speed and performance, the final output of the *MultiTrack* normally makes no attempt to adjust for clipping that may occur if the overall mix is too loud. This can cause large audible spikes in the final mix that wrap around from positive to negative polarity or vice versa. These spikes are a very noticeable indication that clipping has occurred, and simply adjusting the individual or output track mix levels can correct the problem.

When *MultiTrack Soft-Clipping* is active, the output summing routines will check each sample for clipping and adjust its value to correct for wrap-around error. This can effectively remove the otherwise loud spikes that would occur at the clipping positions. However, if the mix is consistently too loud, the waveform will take on a squashed or flattened characteristic at the clipped areas resulting in a more common form of harmonic distortion.

☞ The use of this option adds extra CPU overhead to the mixing process. Another consideration is that clipped areas could possibly slip by unnoticed during the final mixdown process, only to be discovered at a later time. In many cases, the wrap-around audio spikes can more easily warn you of a clipping problem so that it can be addressed immediately before the completion of the project.

This setting can be saved with your preferences.

Info Menu



Help Contents

This option displays the contents of the Help File.

Latest Release Notes

This option displays the Latest Release Notes which contain the most recent information on the newest features of your current version of **SAW**.

About

This option displays the current *Version* and *Registration Number* of your product.

Chapter 6

USING THE EFFECTS MODULES

Effects Overview

SAW provides several effects processing options for use in your sessions. These effects can be patched or “plugged-in” to a track in the *MultiTrack*. The interface has been designed with an open architecture that will allow easy integration of additional plug-in effects modules as they are made available.

Most all of the **SAW** effects may be applied in real-time, closely emulating the look and feel of the physical hardware they replace. Because you can change settings live during playback and hear the results instantly, production time can be reduced to a minimum. Without the need for the typical time-consuming Do/Undo process of auditioning effects, you can shave hours off your session construction time.

☞ Effects processing can be very CPU intensive, especially on slower computers. When building a complex session with many effects and mix operations, real-time playback may be adversely affected due to the tremendous processing demands on your computer’s CPU. **SAW** offers some nice options to help you avoid playback warnings, while building a successful production:

- Select either the *Build Mix To Output File* or *Build Mix To New SoundFile* option under the *Process/MixDown* menu to pre-process some of the effects.

(For more information on these options, see the *Process/MixDown Menu* section in the *Using the Menus* chapter.)

Plug-Ins

SAW comes with many built-in effects. Additional effects can be added by installing software *Plug-Ins*. Once these *Plug-Ins* are installed you will be able to select them and use them as though they were part of **SAW**.

Accessing the Effects

Clicking the *FX* icon displays the *Effect Patch Builder* window. This window displays a list of all built-in and installed *Plug-In* effects. It allows you to patch in various combinations of processing effects for that particular track.

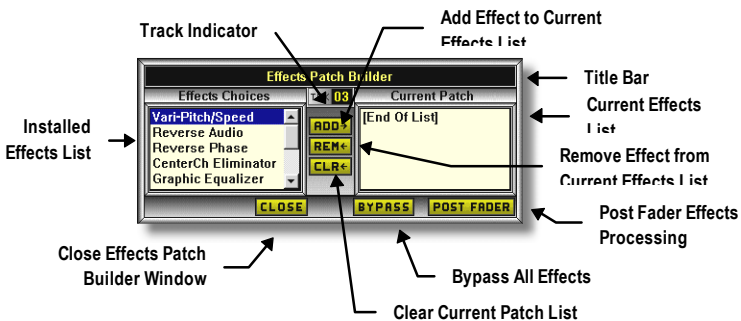
All effects are assigned to the entire track, not to individual entries on a track. To effect an *MT Entry* differently than the entries on the rest of the track, move that entry to a different track.

Most effects can be assigned to multiple tracks, each having different settings. All effects settings are saved with your EDL file.

When effects are patched to a track, that track's *FX* icon will display a connected bar through the center of the icon to indicate that effects are being used. If effects are patched, but the track is in *Bypass* mode, the connected bar will be broken in the middle to indicate that the effects are currently inactive.

Closing an EDL file clears all effects from the *MultiTrack*. Pressing the *Ctrl* key and clicking on any *FX* icon clears all *FX* patches from all tracks at once.

The Effects Patch Builder Window



Title Bar

The top of the *Effects Patch Builder* window is the title bar which can be used to reposition the window.

USING THE EFFECTS MODULES

Accessing The Effects

Effects Choices List

The *Effects Choices* list displays the installed effects that can be patched to the current track. Any additional installed *Plug-In* effects will display at the bottom of the list.

Current Patch List

The *Current Patch* list displays the currently patched effects in the order in which they will be processed.

☞ Double clicking on an effect listed in the *Current Patch* window will display that effect's control window, where you can adjust it's settings.

Trk Indicator Readout

The *Trk* indicator readout displays the current *Hot Track*. Once the *Effects Patch Builder* window is open, switching *Hot Tracks* will automatically display the effects patch for the new *Hot Track*.

Add

The *Add* button adds the selected effect from the *Effects Choices* list into the *Current Patch* list. Double-clicking on the effect in the *Effects Choices* list has the same result. The effect is inserted above the currently selected effect in the *Current Patch* list.

Rem

The *Rem* button removes the selected effect from the *Current Patch* list.

Clr

The *Clr* button removes all effects from the *Current Patch* list at once.

Close

The *Close* button closes the *Effects Patch Builder* window. If any effects control windows are open, they will also be closed at the same time.

Bypass

The *Bypass* button bypasses all effects processing for this track. Use this to quickly compare the processed sound to the original, unprocessed sound.

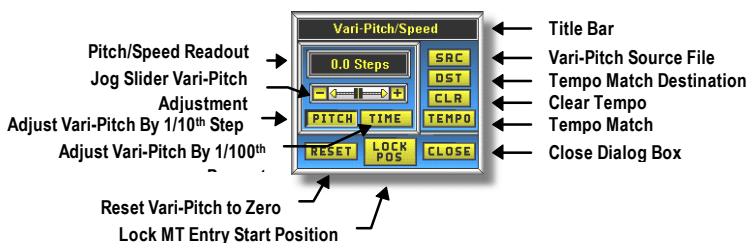
Post fader

The *Post Fader* button forces the effects processing to take place after the volume and pan processing. This can result in a subtle change of the overall processed sound for certain effects.

USING THE EFFECTS MODULES

Vari-Pitch/Speed

Vari-Pitch/Speed



This effect changes the pitch and speed of the audio. Vari-pitching is similar to a speed control on a tape recorder. If you pitch the audio up, you will also increase the playback speed. If you pitch the audio down, you will slow down the playback speed.

When adjusting the vari-pitch amount, the *MT Entries* in the *MultiTrack* will automatically resize to reflect the change. These adjustments can be made live during playback.

SAW performs the vari-pitch operation without removing or duplicating any samples, thereby producing extremely clean, glitch-free results.

☞ This is a great tool for creating special effects or fine tuning the length of a radio spot.

This effect is completely non-destructive and operates in real-time.

Title Bar

The top of the window is the title bar which can be used to reposition the window.

Pitch/Speed Readout

The *Pitch/Speed* readout displays the relative change (from zero) of the current setting.

Jog Slider Control

This control is used to adjust the amount of vari-pitch. The *plus* and *minus* buttons change the amount in single increments. The *jog slider* can be dragged left or right, and held, to change the amount. The farther the slider is dragged to either side, the faster the change occurs.

Pitch

The *Pitch* button allows you to adjust the vari-pitch amount in reference to 1/10th of a step.

☞ **SAW** defines a step as one musical note of the twelve note octave.

This button is interlocked to the *Time* and *Tempo* buttons, and only one may be selected at any one time.

Time

The *Time* button allows you to adjust the vari-pitch amount in reference to 1/100th of a percent.

This button is interlocked to the *Pitch* and *Tempo* buttons, and only one may be selected at any one time.

Tempo

The *Tempo* button allows you to adjust the vari-pitch amount of the current track by referencing and matching the tempo of another piece of music. The two pieces should already be relatively close in tempo for this feature to be useful.

This button is interlocked to the *Pitch* and *Time* buttons, and only one may be selected at any one time.

☞ **SAW** performs tempo matching by calculating the difference between two areas that reference the same amount of time in each piece of music, and setting the vari-pitch amount to compensate. The Marked Areas can be referenced from either the *MultiTrack* or the *SoundFile View*, whichever is the active window at the time.

Src

The *Src* button is used in conjunction with the *Tempo* button to lock-in a tempo reference (a *Marked Area*) from the source file (the file you wish to vari-pitch).

Dst

The *Dst* button is used in conjunction with the *Tempo* button to lock-in a tempo reference (a *Marked Area*) from the destination file (the file you wish to match).

Clr

The *Clr* button is used in conjunction with the *Tempo* button to clear the source and destination tempos allowing you to set new tempo references.

Reset

The *Reset* button simultaneously resets the current vari-pitch amount adjustment to zero for pitch, time and tempo modes, clearing all previous settings.

Lock Pos

The *Lock Pos* button locks the start position of each *MT Entry* on the track when *Vari-Pitch* is used, adjusting each entry separately. If the vari-pitch setting extends the length of an entry causing it to run into the next entry, the first will be truncated and the next entry will still start on time.

☞ Use this option when individual entries are synchronized to other tracks, for example, when sound effects are synchronized to music cues on another track. Suppose you want to lower the pitch of an explosion sound effect that has been synchronized to music on another track. Using *Vari-Pitch* without the *Lock Pos* will adjust the pitch *and* the position of the explosion entry, causing it to lose sync with the music track. Using *Vari-Pitch* with the *Lock Pos* will adjust only the pitch of the explosion track, locking the entry to the

exact same start position, therefore keeping perfect sync with the music track.

Close

The *Close* button closes the *Vari-Pitch/Speed* control window.

Methods for Using Vari-Pitch

→ To Adjust Vari-Pitch Using Pitch Mode in the MultiTrack:

1. Select the track to apply a pitch change to.
2. Patch in the *Vari-Pitch/Speed* effect and double-click the effect in the *Current Patch* list to open the *Vari-Pitch/Speed* control window.
3. From the control window, click the *Pitch* button.
4. Drag the *Jogger Slider* left or right, or click the plus or minus buttons to adjust the vari-pitch in $1/10^{\text{th}}$ of a step increments.
5. Initiate playback to hear changes.

→ To Adjust Vari-Pitch Using Time Mode in the MultiTrack:

1. Select the track to apply a time change to.
2. Patch in the *Vari-Pitch/Speed* effect and double-click the effect in the *Current Patch* list to open the *Vari-Pitch/Speed* control window.
3. From the control window, click the *Time* button.
4. Drag the *Jogger Slider* left or right, or click the plus or minus buttons to adjust the vari-pitch in $1/100^{\text{th}}$ of a percent time increments.
5. Initiate playback to hear changes.

→ To Adjust Vari-Pitch Using Tempo Matching in the MultiTrack:

USING THE EFFECTS MODULES

Vari-Pitch/Speed

- ☞ This operation assumes that you wish to match the tempo of two pieces of music, and have placed those pieces on two separate tracks of the *MultiTrack*. It is recommended, for ease of use, that the two tracks be adjacent. The piece of music you wish to vari-pitch will be referred to as the *source*. The piece of music you are matching will be referred to as the *destination*.
1. Expand the two tracks, turn on the waveform display, and adjust the zoom level to create a comfortable working view.
 2. Select the destination track and create a *Marked Area* of exactly eight complete beats anywhere within the music.

☞ It may be helpful to solo and play back the track to more easily find a clearly defined eight beat area. Use the zoom control to help trim the begin and end points to adjust the *Marked Area* to be as accurate as possible. The accuracy of the tempo match relies on the accuracy of the *Marked Area*.
 3. Select the source track and patch in the *Vari-Pitch/Speed* effect.
 4. Double-click the *Vari-Pitch/Speed* effect in the *Current Patch* list to open the control window.
 5. Click the *Tempo* button.
 6. Click the *Dst* button to lock-in the destination *Marked Area*.
 7. On the source track, create a *Marked Area* of exactly eight complete beats.
 8. Click the *Src* button to lock-in the source *Marked Area*. The percent difference between the source and destination areas is automatically calculated and applied as the vari-pitch amount. Both tracks should now be the same tempo.

Reverse Audio

This effect causes each *MT Entry* to be played in reverse. The entries keep their positions on the track but the audio in each is played backwards. If the waveforms are displayed on the track, they will be reversed also.

This effect is completely non-destructive and operates in real-time.

Reverse Phase

This effect reverses the phase of the audio 180 degrees. All positive and negative values of the waveform are swapped. Two signals that are mixed out of phase will cancel each other out rather than reinforce each other.

This effect is completely non-destructive and operates in real-time.

☞ Phase reversal can sometimes be used to control audio leakage between tracks. For example, suppose you have a guitar on one track and a piano on another that were recorded at the same time. Both tracks have unwanted drum leakage. Reversing phase on one of the tracks could possibly cancel the drum leakage, creating a cleaner overall mix.

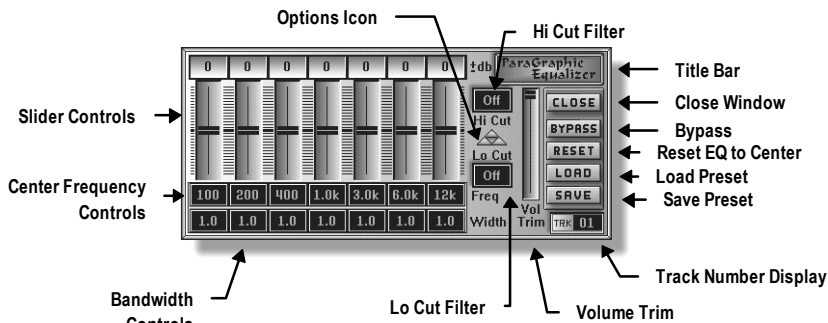
CenterCh Eliminator

This effect reverses the phase of the left side of a stereo signal and mixes it with the right side creating a mono result, effectively canceling all center channel (common to both left and right) information.

This effect is completely non-destructive and operates in real-time.

USING THE EFFECTS MODULES

Graphic Equalizer



This effect offers many different ways to alter the frequency content of your audio. The *Paragraphic Equalizer (EQ)* is designed to look and feel like a typical graphic equalizer, but also gives you the versatility of a parametric equalizer, hence the name “Paragraphic”.

Adjusting the slider controls creates a somewhat-graphic representation of the overall shape of the resulting EQ curve (like a typical graphic equalizer). Also, each of the seven bands has adjustments for center-frequency and bandwidth (like a typical parametric equalizer). There are also adjustable *Hi-Cut* and *Lo-Cut* filters and a control to trim the output volume.

This effect is completely non-destructive and operates in real-time. Because this effect requires a lot of calculations which places a heavy demand on the CPU, the number of bands that can process live depends completely upon the speed of your computer.

☞ Examples of machine performance: a typical 486/66 running Windows NT might average 2-4 bands live; a Pentium 166 might average 18-22 bands; a Pentium 200 might average 30-40 bands; a Pentium Pro200 might average 50-60 bands; a P2/266 might average 80-100 bands!

☞ Right-clicking in the *Graphic Equalizer* window in an area other than a control zone will start and stop *MultiTrack* playback.

Title Bar

The title bar area, labeled *Paragraphic Equalizer*, can be used to reposition the window.

Slider Controls

The *Slider Controls* adjust the amount of boost or cut at the associated center frequency. The dB representation is displayed above each control.

Drag a slider with the left mouse button to adjust the EQ. Clicking the right mouse button at the same time will reset any control back to zero dB.

Freq

The *Freq* controls adjust the center frequency for each of the seven frequency bands. The frequency range overlaps the adjacent bands to allow plenty of versatility in setting frequency combinations.

Each frequency band is a bandpass filter that affects only the audio frequencies that are near the center frequency setting and lie within the bandwidth range evenly balanced on either side.

Click and hold the left mouse button inside this window and move the mouse forward or backward to change the frequency setting. Clicking with the right mouse button will turn the individual band on or off.

Width

The *Width* controls adjust the bandwidth of the frequency range affected by the filter. A smaller bandwidth has a sharper sound and can be used to zero in tight on a specific frequency. A larger bandwidth has a smoother sound and can be used to affect a wider range of frequencies with one control.

Click and hold the left mouse button inside this window and move the mouse forward or backward to change the frequency setting. Clicking with the right mouse button will turn the individual band on or off.

Hi-Cut Filter

The *Hi-Cut* filter control is a shelving filter that will attenuate high frequencies above the cutoff frequency setting. The rate of attenuation is 18 dB per octave.

Click and hold the left mouse button inside this window and move the mouse forward or backward to change the frequency setting. Clicking with the right mouse button will turn the individual band on or off.

Lo-Cut Filter

The *Lo-Cut* filter control is a shelving filter that will attenuate low frequencies below the cutoff frequency setting. The rate of attenuation is 18 dB per octave.

Click and hold the left mouse button inside this window and move the mouse forward or backward to change the frequency setting. Clicking with the right mouse button will turn the individual band on or off.

Vol Trim

The *Vol Trim* control can be used to trim the overall volume to eliminate clipping that may occur when boosting or cutting frequency bands in a loud section of audio.

Drag the *Vol Trim* slider with the left mouse button to trim the volume. When this control is at the top, no volume processing occurs.

Track Number Display

The *Track Number Display* shows the reference track for the currently displayed settings. Opening a new EQ on another track will change settings and track reference numbers on the same open window.

The EQ window may remain open even after closing the *Effects Patch Builder* window, and the *Track Number Display* becomes the reference to which track settings are currently being viewed.

You may click in the *Track Number Display* to display a list of all tracks that have an EQ assigned, and select another track to view.

There is also an *Auto Tracking* option at the top of the list which allows the display to change automatically with the current *Hot Track* selection in the *MultiTrack* view. This option may be saved with the module preferences.

- ☞ Click anywhere in the EQ window to close the popup list box without changing selections.

Reset

The *Reset* button resets all EQ frequency bands to the center, flat position, and turns off the *Hi-Cut* and *Lo-Cut* filters. This button does not change the frequency or bandwidth settings.

Bypass

The *Bypass* button bypasses this effect without affecting other modules patched into this track.

Load

The *Load* button loads a previously saved preset file containing all adjustable settings for a specific EQ setup. Clicking this button opens the file dialog box. Select the folder and file name of the preset file you wish to load and all settings will be set accordingly. Equalizer preset files use the .EQ extension.

Save

The *Save* button saves a preset file containing all adjustable settings for the current EQ setup. Clicking this button opens the file dialog box. Select the folder and enter a file name for the preset file you wish to save and all settings will be saved to the preset file. Equalizer preset files use the .EQ extension.

Close

The *Close* button closes the EQ window. Any settings that were made remain in effect.

Options Icon

Clicking on the blue IQS Logo *Options* icon displays a small popup menu containing the following options:

Save Preferences

This option allows you to save preferences for the EQ module which includes the load and save file paths, the current EQ window position, and the *Continuous Adjustment Tracking* option.

Continuous Adjustment Tracking

This option allows continuous monitoring of all EQ parameter adjustments, LIVE, as the mouse is being moved, instead of waiting for the mouse to be released.

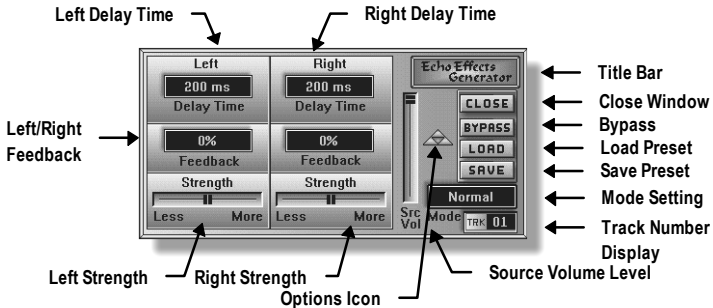


Regarding Continuous Adjustment Tracking: This option performs continuous MultiTrack re-cueing and is *extremely* CPU intensive. It is highly recommended that the track being adjusted be soloed while using this option, especially on machines using lower processor speeds, or when the EDL is extremely complex.

About

This option displays the *About* information window including current version information.

Echo/Delay



This effect creates a variety of digital delay and repeating echo effects. Individual left and right controls are available for the *Delay Time*, *Feedback* and *Strength* of the delayed signals. There is absolutely no noise and no degradation of the audio signal on repeating echoes.

This effect is completely non-destructive and operates in real-time.

☞ Right-clicking in the *Echo/Delay* window in an area other than a control zone will start and stop *MultiTrack* playback.

Title Bar

The title bar area, labeled *Echo Effects Generator*, can be used to reposition the window.

Left/Right Delay Time

The *Delay Time* setting determines the amount of time between echo repeats.

Clicking and holding the left mouse button in the Delay Time readout area and moving the mouse forward or backward will change the delay time by 1 millisecond (ms) increments. Holding the *Shift* key at the same time will change the *Delay Time* by 10 ms increments. Holding the *Ctrl* key at the same time will change the *Delay Time* by 100 ms increments.

☞ Right-clicking on the *Delay Time* setting will cause it to match the delay time value of the opposite channel.

USING THE EFFECTS MODULES

Echo/Delay

A special link to the *SoundFile View* provides a unique and powerful feature to assist in setting precise delay times. Double-clicking an *MT Entry* from the current track into the *SoundFile View* provides the opportunity for a visual display of the current *Delay Time* setting referenced against the audio waveform. When adjusting the *Delay Time* setting, a red vertical cursor will appear on top of the waveform indicating the exact *Delay Time* distance from the *SoundFile View cursor*.

- ☞ Use this feature to set echo repeats precisely in rhythm with a piece of music by placing the *SoundFile View cursor* on a downbeat or upbeat, and adjusting the delay time to align the red cursor to the next beat, or halfway to the next beat.

Left/Right Feedback

The *Feedback* setting determines how much of the echo signal is fed back to the input. This creates repeating echoes, spaced at the *Delay Time* interval, each one at a slightly lower volume than the previous, eventually fading away to nothing. Using 0% *Feedback* creates a single echo of the original sound, acting as a simple delay effect.

Clicking and holding the left mouse button in the *Feedback* readout area and moving the mouse forward or backward will change the *Feedback* amount by 1% increments. Holding the *Shift* key at the same time will change the *Feedback* amount by 5% increments. Holding the *Ctrl* key at the same time will change the *Feedback* amount by 10% increments.

- ☞ Right-clicking on the *Feedback* setting will cause it to match the feedback value of the opposite channel.

Left/Right Strength

The *Strength* setting controls the loudness of the main echo relative to the original audio volume. It will also affect how many repeats are heard at a particular *Feedback* setting.

- ☞ Right-clicking on the *Strength* setting will cause it to match the strength value of the opposite channel.

Src Vol

The *Src Vol* control can be used to adjust the level of the original source signal in the output mix. Dropping the level to zero will remove the original source signal completely, leaving only the echoes and delays.

Mode

The *Mode* setting switches between *Normal* and *Cross* delay. Clicking and holding the left mouse button in the *Mode* readout area and moving the mouse forward or backward will change the setting.

Normal delay mode keeps the *Left* and *Right* echoes in place on their respective channels.

Cross delay mode crosses the *Left* channel echo over to the *Right* channel and the *Right* channel echo over to the *Left* channel. With a high percentage of feedback, you can create a ping-ponging effect of echoes bouncing back and forth between channels. With 0% feedback and a delay time of 20 to 40 ms, you can create the effect known as *Cross Delay Stereo*, which can give the illusion of a wider overall stereo image from a mono signal source.

☞ Creating a *Cross Delay Stereo* effect requires the use of the *Post Fader* button in the *Patch Builder* window. The source track must be panned to one side or the other, and the *Delay Time* should be set between 20-40 ms. Set the *Strength* for that channel to the maximum setting and select *Cross* delay mode. This should result in the mono signal being spread across the left/right stereo image. The width of the spread can be controlled by the delay setting.

Track Number Display

The *Track Number Display* shows the reference track for the currently displayed settings. Opening a new *Echo/Delay* on another track will change settings and track reference numbers on the same open window.

The *Echo/Delay* window may remain open even after closing the *Effects Patch Builder* window, and the *Track Number Display* becomes the reference to which track settings are currently being viewed.

USING THE EFFECTS MODULES

Echo/Delay

You may click in the *Track Number Display* to display a list of all tracks that have an *Echo/Delay* assigned, and select another track to view.

There is also an *Auto Tracking* option at the top of the list which allows the display to change automatically with the current *Hot Track* selection in the *MultiTrack* view. This option may be saved with the module preferences.

☞ Click anywhere in the *Echo/Delay* window to close the popup list box without changing selections.

Bypass

The *Bypass* button bypasses this effect without affecting other modules patched into this track.

Load

The *Load* button loads a previously saved preset file containing all adjustable settings for a specific *Echo/Delay* setup. Clicking this button opens the file dialog box. Select the folder and file name of the preset file you wish to load and all settings will be set accordingly. *Echo/Delay* preset files use the .EKO extension.

Save

The *Save* button saves a preset file containing all adjustable settings for the current *Echo/Delay* setup. Clicking this button opens the file dialog box. Select the folder and enter a file name for the preset file you wish to save and all settings will be saved to the preset file. *Echo/Delay* preset files use the .EKO extension.

Close

The *Close* button closes the *Echo/Delay* window. Any settings that were made remain in effect.

Options Icon

Clicking on the blue IQS Logo *Options* icon displays a small popup menu containing the following options:

Save Preferences

This option allows you to save preferences for the *Echo/Delay* module which includes the load and save file paths and the current *Echo/Delay* window position.

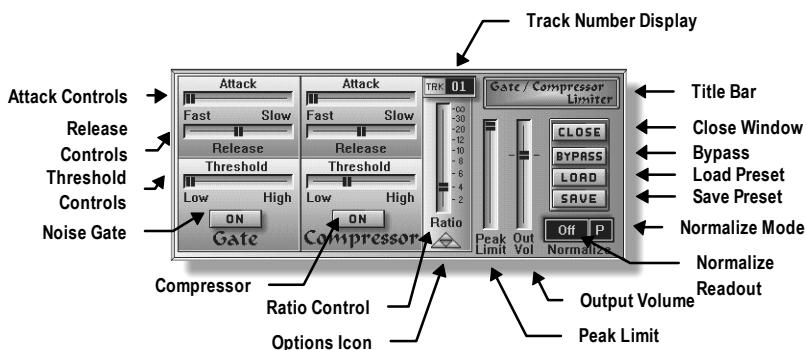
About

This option displays the *About* information window including current version information.

USING THE EFFECTS MODULES

Comp/Gate/Limiter

Comp/Gate/Limiter



This effect performs four volume dynamics processing functions. These functions are performed with much finer precision than most external analog compressor/limiters can provide.

A unique and powerful visual approach to threshold adjustments allows you to reference the various *Threshold* adjustments directly against the *SoundFile View* waveform display, providing accuracy never before achievable with currently existing audio equipment.

☞ Right-clicking in the *Comp/Gate/Limiter* window in an area other than a control zone will start and stop *MultiTrack* playback.

Title Bar

The title bar area, labeled *Gate/Compressor Limiter*, can be used to reposition the window.

Gate

The *Noise Gate* is used to help eliminate unwanted background noise during low volume areas of your soundfile. The *Gate* starts with the volume off and opens the volume to full when the audio signal rises above the *Threshold* setting. When the signal level falls below the *Threshold* setting again, the *Gate* turns the volume back down.

By experimenting with different combinations of control settings, you can effectively clean up otherwise noisy soundfiles.

Attack

The *Attack* setting adjusts how quickly the volume is ramped up once the signal level rises above the *Threshold* setting. Speeds range from instantaneous to a very slow fade up.

Release

The *Release* setting adjusts how quickly the volume is ramped down once the signal level falls below the *Threshold* setting again. Speeds range from instantaneous to a very slow fade down.

☞ By using a slower *Release* time, the *Gate* will operate smoother as the signal momentarily fluctuates above and below the *Threshold*.

Threshold

The *Threshold* setting determines the signal level which triggers the *Gate* into action.

A special link to the *SoundFile View* provides a unique and powerful feature to assist in adjusting the *Threshold* settings. Double-clicking an *MT Entry* from the current track into the *SoundFile View* provides the opportunity for a visual display of the current *Threshold* setting referenced against the audio waveform. When adjusting the *Threshold* setting, a pair of horizontal lines for each channel will appear superimposed on the audio waveform in the *SoundFile View* window.

☞ You may zoom and magnify the display to reference the *Threshold* setting directly against the unwanted noise in the waveform data.

On

The *On* button turns the *Gate* on and off. When the *Gate* is off, it adds no processing time to the *Compressor/Limiter* functions.

Compressor

The *Compressor* is used to help squeeze high volume areas of your soundfile to a lower volume. The *Compressor* starts with the volume at full and lowers the volume down when the audio signal rises above the *Threshold* setting.

Attack

The *Attack* setting adjusts how quickly the *Compressor* springs into action, and begins the volume squeeze once the signal level rises above the *Threshold* setting.

- ☞ Using a fast *Attack* setting can effectively compress the attack transient and the sustain of a musical instrument, whereas a slow *Attack* setting lets the attack transient through at full volume compressing only the sustain portion of the signal. Experimenting with the *Attack* setting allows you to drastically alter the dynamic quality of different types of audio signals.

Release

The *Release* setting adjusts how quickly the *Compressor* releases it's effect on the signal, and begins ramping the volume back up once the signal level falls below the *Threshold* setting again.

- ☞ Experimenting with the *Release* setting can help smooth out the overall *Compression* effect, but for most signals should probably be set in the center position.

Threshold

The *Threshold* setting determines the signal level which triggers the *Compressor* into action. The actual *Threshold* setting you choose will depend on whether you are attempting to create a noticeable change in the sound or keep the effect as transparent as possible. The lower the *Threshold*, and therefore the deeper into the bulk of the audio, the more audibly noticeable the compressing effect will be.

A special link to the *SoundFile View* provides a unique and powerful feature to assist in adjusting the *Threshold* setting. Double-clicking an *MT Entry* from the current track into the *SoundFile View* provides the opportunity for a visual display of the current *Threshold* setting referenced against the audio waveform. When adjusting the *Threshold* setting, a pair of horizontal lines for each channel will appear superimposed on the audio waveform in the *SoundFile View* window.

- ☞ You may zoom and magnify the display to reference the *Threshold* setting directly against the unwanted noise in the waveform data.

Ratio

The *Ratio* setting determines how much the *Compressor* squeezes (thereby lowering the volume) the audio once it kicks into action. The higher the *Ratio* the lower the volume is dropped.

☞ The interaction of the *Compressor* controls allow you to alter the dynamics of your audio file drastically. By adjusting the *Threshold* down into the bulk of the audio material and using a large *Ratio* setting, you can effectively squash sharp transient sounds and balance out the overall volume level of the entire signal, or create unnatural audio effects by adjusting the settings to extremes.

By using a small *Ratio* setting, the effects of the compression will be more subtle, effectively smoothing out only the rough edges of the signal.

On

The *On* button turns the *Compressor* on or off. When the *Compressor* is off, it adds no additional processing time to the *Compressor/Limiter* functions.

Peak Limiter

The *Peak Limiter* is used to limit large transient spikes to a specified volume. *SAW* can perform this process absolutely transparently, effectively removing large transient spikes without audibly affecting the overall sound of the waveform! Most hardware peak limiters can only chop the transient at the specified volume level, introducing many noticeable audible side effects. Using a unique design concept, *SAW* actually scales the volume level of each half cycle (positive and negative) of the waveform independently, from zero cross to zero cross, resulting in an instantaneous blending of the transient into the rest of the signal, with no noticeable thumping or pumping side effects.

Peak Limit

The *Peak Limit* setting adjusts the ceiling threshold, which triggers the *Peak Limiter* into action, thus creating the maximum audio level that any transient in the file can attain. If the setting is left at the extreme top of the control, the *Peak Limiter* is turned off and adds no processing time to the *Compressor/Limiter* functions.

USING THE EFFECTS MODULES

Comp/Gate/Limiter

A special link to the *SoundFile View* provides a unique and powerful feature to assist in adjusting the *Peak Limit* setting. Double-clicking an *MT Entry* from the current track into the *SoundFile View* provides the opportunity for a visual display of the current *Peak Limit* setting referenced against the audio waveform. When adjusting the *Peak Limit* setting, a pair of horizontal lines for each channel will appear superimposed on the audio waveform in the *SoundFile View* window.

☞ When adjusting this setting, attempt only to clip the peaks that stick out well above the bulk of the audio material. If you place the setting down into the bulk of the audio you can introduce varying amounts of audible distortion.

☞ *Peak Limiting* requires a complete pre-scan of the data first, and then a second pass to perform the process, therefore this effect cannot be processed live during *MultiTrack* playback. Use this function by processing the data back into the original soundfile, or by using one of the *Build Mix* options to process the effect to a new soundfile.

Normalizer

The *Normalizer* automatically calculates and determines the exact amount of volume adjustment (up or down) needed for the soundfile to attain a certain percentage of clipping.

Clicking and holding the left mouse button in the *Normalize* readout area and moving the mouse forward or backward will activate and adjust the *Normalize* percentage in 1% increments. Pressing the *Shift* key at the same time will change the percentage in 5% increments. Clicking the right mouse button in the *Normalize* readout area will turn the *Normalize* on or off, retaining the current setting.

☞ *Normalizing* requires a complete pre-scan of the data first, and then a second pass to perform the process, therefore this effect cannot be processed live during *MultiTrack* playback. Use this function by processing the data back into the original soundfile, or by using one of the *Build Mix* options to process the effect to a new soundfile.

Average/Peak

There are two *Normalizing* modes available, *Peak* and *Average*.

Clicking and holding the left mouse button in the mode readout area and moving the mouse forward or backward will switch between *Peak* and *Average* modes.

Peak mode applies a different scaling factor to each channel, placing the loudest peaks at the new margin setting. This mode will set both channels to approximately equal levels, thereby canceling large volume discrepancies between left and right.

Average mode averages all the peaks on each channel, combines the left and right results into another average, then applies the same scaling factor to both channels. If the scaling factor applied will cause clipping, the factor is adjusted so that the loudest peak is placed at 95%. This mode tries to place the bulk of the audio material into an average relative margin position. Some peaks will still rise above this margin. This mode preserves relative volume differences between the left and right channels.

☞ Combining the use of the *Peak Limiter* and the *Normalizer* is an incredibly effective way to maximize the overall volume level of your final mixdowns. For example, in order to master a CD at the maximum level, apply the *Peak Limiter* to limit transient peaks to a level just above the bulk of the audio material, and add the *Normalize* function in *Peak* mode at a setting of around 98%. This should maximize the final output level with no audible side effects.

Out Vol

The *Out Vol* control can be used to adjust the overall volume of the *Compressor/Limiter* output. You may use this to increase the overall average sound level of your waveform by compressing or limiting the peaks, and at the same time raising the overall gain of the entire output.

Dragging the *Out Vol* control with the left mouse button and pressing the right mouse button at the same time will reset the control back to zero dB.

This control and the *Normalize* setting are connected together. Only one can be active at a time, and adjusting either one resets the other.

Track Number Display

The *Track Number Display* shows the reference track for the currently displayed settings. Opening a new *Compressor/Limiter* on another track will change settings and track reference numbers on the same open window.

The *Compressor/Limiter* window may remain open even after closing the *Effects Patch Builder* window, and the *Track Number Display* becomes the reference to which track settings are currently being viewed.

You may click in the *Track Number Display* to display a list of all tracks that have an *Compressor/Limiter* assigned, and select another track to view.

There is also an *Auto Tracking* option at the top of the list which allows the display to change automatically with the current *Hot Track* selection in the *MultiTrack* view. This option may be saved with the module preferences.

☞ Click anywhere in the *Compressor/Limiter* window to close the popup list box without changing selections.

Bypass

The *Bypass* button bypasses this effect without affecting other modules patched into this track.

☞ If the *Peak/Limit* or *Normalize* functions are active, when *Bypass* is used, the popup warning message during normal playback will not be displayed.

Load

The *Load* button loads a previously saved preset file containing all adjustable settings for a specific *Compressor/Limiter* setup. Clicking this button opens the file dialog box. Select the folder and file name of the preset file you wish to load and all settings will be set accordingly. *Compressor/Limiter* preset files use the .CL extension.

Save

The *Save* button saves a preset file containing all adjustable settings for the current *Compressor/Limiter* setup. Clicking this button opens the file dialog box. Select the folder and enter a file name for the preset file you wish to save and all settings will be saved to the preset file. *Compressor/Limiter* preset files use the .CL extension.

Close

The *Close* button closes the *Compressor/Limiter* window. Any settings that were made remain in effect.

Options Icon

Clicking on the blue IQS Logo *Options* icon displays a small popup menu containing the following options:

Save Preferences

This option allows you to save preferences for the *Compressor/Limiter* module which includes the load and save file paths and the current *Compressor/Limiter* window position.

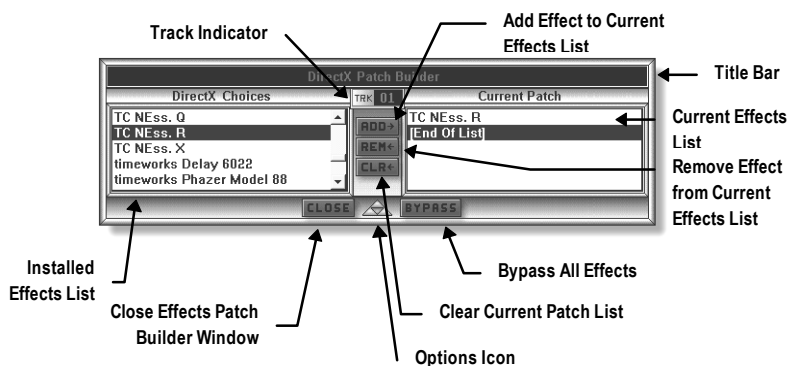
About

This option displays the *About* information window including current version information.

USING THE EFFECTS MODULES

DirectX Linker

DirectX Linker



The *DirectX Linker* opens access to all plug-ins conforming to the *Microsoft DirectX* standard. There are currently numerous *DirectX* plug-ins available from many manufacturers and the list is growing steadily. *Flangers*, *Pitch Benders*, *Chorus Units*, *Time Compressors*, and many more exotic effects as well as many different choices of *Eqs*, *Compressors*, *Reverbs*, *Delays*, etc., are presently available.

The *DirectX Linker* creates a bridge between the *SAW* programming interface and the *DirectX* protocol allowing *SAW* to act as a *DirectX* host program. You must have *DirectX 5.x* installed on Windows 95 and Windows NT to use these plug-ins. Windows NT also requires Service Pack 3. Windows 98 already has *DirectX* installed as part of the operating system.

MONO plug-ins will be automatically detected and loaded, shifting the Linker into MONO mode. A notice will appear in the Linker Title Bar area. The *SAW* left and right data will be mixed to MONO and passed thru the plug-ins and returned back to both the left and right channels of the MultiTrack. Stereo plug-ins may also be patched at the same time, but will be treated as MONO. Another Linker may be patched on the same track if separate stereo plug-ins are desired to be maintained in stereo mode.

☞ Since each *DirectX* plug-in uses varying methods to design and display their graphic screens, we strongly recommend that you set your video card color depth to 65,000 (16-bit hi) colors. This will prevent color palette problems with the *SAW* screens when opening different plug-ins.

Title Bar

The top of the *DirectX Linker* window is the title bar which can be used to reposition the window. Mono plug-ins will cause the word “MONO” to be displayed in the right-hand side of the title bar.

DirectX Choices List

The *DirectX Choices* list displays the installed *DirectX* filters that can be patched to the current track. The list is displayed alphabetically and will display up to 128 installed filters.

Current Patch List

The *Current Patch* list displays the currently patched filters in the order in which they will be processed. You may add up to 16 filters to the current patch for each *Linker* window.

☞ Double clicking on an filter listed in the *Current Patch* window will display the *PropertyPages* for the plug-in which allow you to adjust any of the plug-in’s settings.

Track Number Display

The *Track Number Display* shows the reference track for the currently displayed *Linker* window. Opening a new *Linker* on another track will change patches and track reference numbers on the same open window.

The *Linker* window may remain open even after closing the *Effects Patch Builder* window, and the *Track Number Display* becomes the reference to which track patches are currently being viewed.

You may click in the *Track Number Display* to display a list of all tracks that have a *Linker* assigned, and select another track to view.

There is also an *Auto Tracking* option at the top of the list which allows the display to change automatically with the current *Hot Track* selection in the *MultiTrack* view. This option may be saved with the module preferences.

USING THE EFFECTS MODULES

DirectX Linker

Click anywhere in the *Linker* window to close the popup list box without changing selections.

Add

The *Add* button adds the selected filter from the *DirectX Choices* list into the *Current Patch* list. Double-clicking on the effect in the *DirectX Choices* list has the same result. The effect is inserted above the currently selected filter in the *Current Patch* list.

Rem

The *Rem* button removes the selected filter from the *Current Patch* list.

Clr

The *Clr* button removes all filters from the *Current Patch* list at once.

Close

The *Close* button closes the *DirectX Linker* window.

Bypass

The *Bypass* button bypasses all filter processing for this *Linker*. Use this to quickly compare the processed sound to the original, unprocessed sound.

Options Icon

Clicking on the blue IQS Logo *Options* icon displays a small popup menu containing the following options:

Save Preferences

This option allows you to save preferences for the *Linker* module which includes the current *Linker* window position and the *Continuous Adjustment Tracking* option setting.

Continuous Adjustment Tracking

This option allows continuous monitoring of all filter parameter adjustments, *LIVE*, as the mouse is being moved, instead of waiting for the mouse to be released.



Regarding Continuous Adjustment Tracking: This option performs continuous *MultiTrack* re-cueing and is extremely CPU intensive. It is highly recommended that the track being adjusted be soloed while using this option, especially on machines using lower processor speeds, or when the EDL is extremely complex.

About

This option displays the *About* information window including current version information.

DirectX PropertyPages

DirectX filters can contain *PropertyPages* which allow the user to adjust settings specific to the operation of the filter. Most filters contain only one main *PropertyPage*, but some will contain more than one. The name of the filter is displayed at the top of the *PropertyPage* window. Just to the right of the name, the current *PropertyPage* number and the total number of pages is displayed as 1:2. This means page 1 of 2. Clicking in the page number display area displays a popup menu selection of all available pages for the filter. A different page may be selected if the filter has more than one.

Options Icon

Clicking on the blue IQS Logo *Options* icon displays a small popup menu containing the following options:

Load Presets

This option loads presets for the filter, that were previously saved with the *Save Presets* option.

Save Presets

This option saves presets for the filter. *SAW* creates a folder under the *SAW* main folder called *DirectX_Presets* and places preset files (.dxp) in separate folders for each filter using the filter's name as a folder name.

Help

This option opens up the filter's *HelpFile*, if provided.

X

Clicking on the red *X* button closes the *PropertyPage* window.

Adjusting Settings

Settings on the currently displayed *PropertyPage* may be adjusted in real-time and will be applied to the filter when the mouse button is released, or live during mouse movement if the *Continuous Adjustment Tracking* option is active.



Regarding Adjusting Settings: There will be a certain amount of delay before you hear the applied changes, depending on your *PreLoad Buffer Queue* setting and other factors within your system setup. Also note that reverb and echo tails might be glitched during the re-cue process as this introduces a break in the continuity of the filter data path.

You may look at only one *PropertyPage* of one filter at a time and selecting a new *PropertyPage* or a new filter will close the current filter display before opening the new one.

DirectX Filter Compatibility

DirectX filters represent a wide range of processing algorithms and programming styles. Most filters will be completely compatible within *SAW's* live *MultiTrack* environment. If the filter's code is well written and performs its processing algorithm efficiently, the overall system performance should feel very close to *SAW's* native plug-in performance. If the filter is slow and/or uses very complex algorithms to perform its processing, the overall system performance can be dragged

down. Some filters might be best used with the *BuildMix To New SoundFile* option, which takes the processing loop out of real-time and is therefore not dependent on filter processing performance.

Certain filter designs will actually cache buffers (attempt to hold on to more than one buffer at a time before returning the processed buffer) or change the size of a buffer during its processing. Both of these behavior patterns force **SAW** to bypass the filter chain during live *MultiTrack* playback, because the **SAW** engine currently does not allow for these possibilities. *Time Compression* and some *Noise Reduction* and *Pitch Shifting* filters fall into this category.

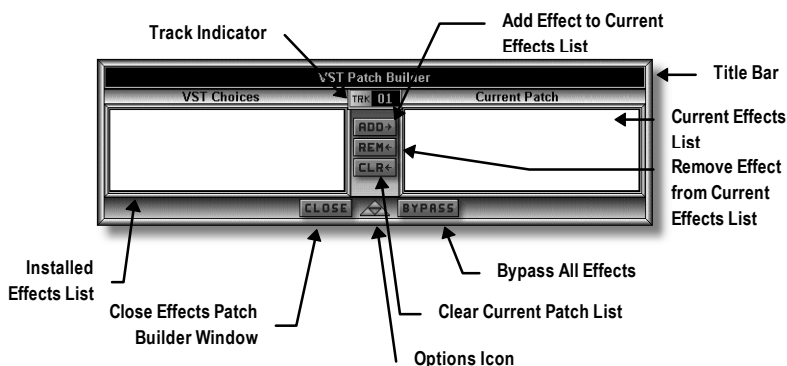
Many filters that behave in this manner can still be used effectively if patched to the output track and used with the *Build Mix To FX Modules* option. When the *Build Mix* is activated, **SAW** will detect the filter's behavior and prompt you with a *File Dialog* box, asking for an output *Spool FileName*. **SAW** will spool the processed data directly to this output file, even though it can not return it back into the processing loop directly. When completed, you can open this *Spool File* and **SAW** will build a *PeakData File* for it and display your final processed results in the *SoundFile* view.

A *DirectX* Filter compatibility list will be updated periodically on our website, as well as links to the various manufacturers of *DirectX* plugins. Check our website at www.iqsoft.com for more information.

USING THE EFFECTS MODULES

VST Linker

VST Linker



The *VST Linker* opens access to all plug-ins conforming to the *Steinberg* VST plug-in standard. There are currently numerous VST plug-ins available from many manufacturers and the list is growing steadily. *Flangers*, *Pitch Benders*, *Chorus Units*, *Resonance Filters*, and many more exotic effects as well as many different choices of *Eqs*, *Compressors*, *Reverbs*, *Delays*, etc., are presently available.

The *VST Linker* creates a bridge between the *SAW* programming interface and the VST protocol allowing *SAW* to act as a VST host program.

Title Bar

The top of the *VST Linker* window is the title bar which can be used to reposition the window.

VST Choices List

The *VST Choices* list displays the installed VST plug-ins that can be patched to the current track. The list is displayed alphabetically and will display up to 128 installed plug-ins. The plug-ins are .DLL files that must be placed in the *VST_Plugins* folder which is automatically created under the *SAW* main program folder when the program is run for the first time.

Current Patch List

The *Current Patch* list displays the currently patched plug-ins in the order in which they will be processed. You may add up to 16 plug-ins to the current patch for each Linker window.

☞ Double clicking on a plug-in listed in the *Current Patch* window will display the *Setup* window for the plug-in which allows you to adjust any of the plug-in's settings. VST plug-ins may display their own graphics and setup windows or display using the built-in SAW *VST Linker Setup* graphic, depending on the plug-in.

Track Number Display

The *Track Number Display* shows the reference track for the currently displayed *Linker* window. Opening a new *Linker* on another track will change patches and track reference numbers on the same open window.

The *Linker* window may remain open even after closing the *Effects Patch Builder* window, and the *Track Number Display* becomes the reference to which track patches are currently being viewed.

You may click in the *Track Number Display* to display a list of all tracks that have a *Linker* assigned, and select another track to view.

There is also an *Auto Tracking* option at the top of the list which allows the display to change automatically with the current *Hot Track* selection in the *MultiTrack* view. This option may be saved with the module preferences.

Click anywhere in the *Linker* window to close the popup list box without changing selections.

Add

The *Add* button adds the selected plug-in from the *VST Choices* list into the *Current Patch* list. Double-clicking on the plug-in in the *VST Choices* list has the same result. The plug-in is inserted above the currently selected plug-in in the *Current Patch* list.

Rem

The *Rem* button removes the selected plug-in from the *Current Patch* list.

Clr

The *Clr* button removes all plug-ins from the *Current Patch* list at once.

Close

The *Close* button closes the *VST Linker* window.

Bypass

The *Bypass* button bypasses all plug-in processing for this *Linker*. Use this to quickly compare the processed sound to the original, unprocessed sound.

Options Icon

Clicking on the blue IQS Logo *Options* icon displays a small popup menu containing the following options:

Save Preferences

This option allows you to save preferences for the *Linker* module which includes the current *Linker* window position and the *Continuous Adjustment Tracking* option setting.

Continuous Adjustment Tracking

This option allows continuous monitoring of all plug-in parameter adjustments, *LIVE*, as the mouse is being moved, instead of waiting for the mouse to be released.



Regarding Continuous Adjustment Tracking: This option performs continuous *MultiTrack* re-cueing and is extremely CPU intensive. It is highly recommended that the track being adjusted be

soloed while using this option, especially on machines using lower processor speeds, or when the EDL is extremely complex.

About

This option displays the *About* information window including current version information.

VST Plug-in Setup Displays

Many VST plug-ins do not contain their own setup displays, and these plug-ins will display within the IQS *VST Linker* common display window. This window is similar in layout to the *Steinberg* VST display window. The name of the plug-in is displayed at the top of the window, along with the i/o configuration. Three plug-in parameters are displayed in the rest of the window. To see other parameters for more complex plug-ins, click in the right or left arrow area at the top of the display. This will shift the parameter display right or left, showing new parameters. Pressing the *Ctrl* key at the same time will shift parameters one page at a time. Use the mini sliders under the parameters to make adjustments.

Many VST plug-ins can contain internal memory program settings. The current program name and number is displayed just above the parameters. You may click in the name display area to edit the name. Clicking in the program number area will popup the program selection menu. This allows you to select a different program number.

Options Icon

Clicking on the blue IQS Logo *Options* icon displays a small popup menu containing the following options:

Load Presets

This option loads presets for the plug-in, that were previously saved with the *Save Presets* option.

Save Presets

This option saves presets for the plug-in. **SAW** creates a folder under the **SAW** main folder called *VST_Presets* and places preset files (.vsp files)

USING THE EFFECTS MODULES

VST Linker

in separate folders for each plug-in using the plug-in's name as a folder name.

Programs...

This option displays a popup list of all internal programs (if the plug-in supports programs). The first program is always reserved for the current EDL, but all others are free for you to modify.

Load Program Bank

This option loads a previously saved bank of programs (.vsb files).

Save Program Bank

This option saves a complete bank of programs (.vsb files).

Save Default Program Bank

This option saves the current bank of programs as the default for this plug-in. Every time this plug-in is loaded, it will automatically load and start with this program bank.

Clear Default Program Bank

This option clears the default program bank file.

X

Clicking on the blue X button closes the Setup Display window.

Adjusting Settings

Settings on the currently displayed *Setup* window may be adjusted in real-time and will be applied to the plug-in when the mouse button is released, or live during mouse movement if the *Continuous Adjustment Tracking* option is active.



Regarding Adjusting Settings: There will be a certain amount of delay before you hear the applied changes, depending on your

PreLoad Buffer Queue setting and other factors within your system setup. Also note that reverb and echo tails might be glitched during the re-cue process as this introduces a break in the continuity of the plug-in data path.

You may look at only one *Setup* display of one plug-in at a time and selecting a new plug-in will close the current display before opening the new one.

VST Plug-in Compatibility

VST plug-ins represent a wide range of processing algorithms and programming styles. Most plug-ins will be completely compatible within *SAW's* live MultiTrack environment. If the plug-in's code is well written and performs its processing algorithm efficiently, the overall system performance should feel very close to *SAW's* native plug-in performance. If the plug-in is slow and/or uses very complex algorithms to perform its processing, the overall system performance can be dragged down. Some plug-ins might be best used with the *BuildMix To New SoundFile* option, which takes the processing loop out of real-time and is therefore not dependent on plug-in processing performance.

VST plug-ins can have different input/output configurations: 1 in / 1 out, 1 in / 2 out, and 2 in / 2 out. Mono input plug-ins will work in the *SAW MultiTrack*, but will only take the left channel input data. If your track is a mono signal, nothing is lost. Mono output plug-ins will output the same data to both the left and right channels. If your track is a stereo signal, you should use stereo plug-ins.

A VST plug-in compatibility list will be updated periodically on our website, as well as links to the various manufacturers of VST plug-ins. Check our website at **www.iqsoft.com** for more information.

Chapter 7

WORKING WITH SMPTE

This chapter is a light-hearted attempt at shedding some light on the overly complex and confusing world of SMPTE synchronization as it applies to **SAW**. It explains in depth, the different considerations that need to be addressed when attempting to link MIDI Sequencers and audio/video decks to the **SAW** environment through the use of SMPTE time code. This chapter uncovers the many complications surrounding successful SMPTE operation, and is mainly intended as an educational guide to the many variables involved, and the possible solutions to the problems. Realize that many thousands of registered users are happily and successfully synchronizing their **SAW** environments to a vast variety of other equipment.

What Is SMPTE?

For the purpose of this discussion, SMPTE will simply be defined as an electronic reference to time that can be recorded on audio/video decks and transmitted between different pieces of equipment allowing them to keep in sync with each other.

The SMPTE code is displayed as follows: 00:00:00:00 (Hours: Mins: Secs: Frames). There are many sources of detailed technical descriptions of the actual SMPTE standard, and this chapter will not attempt to reiterate them. One of the most important things to note about SMPTE, as it applies to the **SAW** environment, is the different formats that are commonly used by the different industries. There are generally four format types that we will concern ourselves with: 30 Non-Drop, 30 Drop, 25, and 24 frames per second.

- *30 Non-Drop* is often used by the music production industry, usually in conjunction with MIDI sequencers.
- *30 Drop* is often used by the video production industry in the United States.
- 25 is often used by the video production industry outside the United States.
- 24 is often used by the film production industry.

The concept starts out simple, but *hang on to your hat* because *Complicitis* (a human condition that presumes that the shortest distance between two points is around the world 10 times) sets in real fast from here. *Twenty four* and *Twenty Five* frames per second are fairly straightforward. Time is broken down into 24 or 25 fractions of a second. Each fraction is called a *Frame* and therefore defines the smallest segment of time that can be referenced. *Thirty Non-Drop* works similarly with a *Frame* being equal to 1/30 of a second. Now the confusion sets in.

Thirty Drop was created for use by the video industry in the United States because of a specific technical dilemma that resulted when color video was introduced. Each frame of color video required an extra signal for the color burst information that was encoded in between video frames. This caused a tiny amount of extra time to occur during playback between each frame of color video and as a result, the actual number of video frames no longer matched the actual running time of the full video production. In truth, the frame count actually lagged behind, loosing approximately 1.8 frames per minute. *Drop Frame* was created (although many would argue that it never should have been) and the Pandora's Box was opened. *Drop Frame* encoding is at best, a weak

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What Is SMPTE?

attempt at solving the color video timing problem. At every *Minute Boundary*, two frames are dropped from the SMPTE value, helping to keep the actual SMPTE time reference in line with the actual video frame count. Since we are dealing with a fractional timing loss however, more adjustment was necessary. To compensate for the remainder of the timing inaccuracy, at every *Ten Minute Boundary*, the SMPTE Time is not adjusted at all. Now let's look at what this means in terms of actual SMPTE code values. As we cross the first *Minute Boundary*, the SMPTE values actually look like this; 00:00:59:28... 00:00:59:29... 00:01:00:02... 00:01:00:03...etc. Notice the two frames that are skipped at the crossing. Each minute up to the *Ten Minute Boundaries* follows the same pattern. As we cross a *Ten Minute Boundary*, the SMPTE values actually look like this; 00:09:59:28... 00:09:59:29... 00:10:00:00... 00:10:00:01...etc. Notice that no frames are skipped.

As you may begin to see, hardware and software handling of SMPTE in this format has been complicated considerably. But realize, once *Complicitis* sets in, it can spread quickly. Sometime after that, the conclusion was drawn and (surprisingly) widely accepted that instead of doing all this complicated manipulating of numbers, a similarly accurate result could be created by simply slowing down the actual SMPTE stripe by a correction factor of .999%. Thus was born the 29.97 SMPTE format. The SMPTE running time now matched the video frame count.

Are you still with us? What exactly is this 29.97 SMPTE format? It is usually *30 Non-Drop* running slow. But believe it or not, it is also, in many cases, *30 Drop* running slow, which is actually a double application of the correction factor resulting in the same error in the opposite direction that *Drop Frame* attempted to correct originally.

Many of the MIDI devices on the PC platform cannot detect 29.97 timing at a hardware level, and will actually read it as *30*, therefore making it much more complex for software applications to handle it properly.

Let's feed the *Complicitis* a bit and spice up the situation with the addition of digital audio. Digital audio creates sound by sampling the continuous analog audio signal at precise timing increments called the *Sampling Rate*. Some of the most common rates used are 32000, 44100 and 48000. Recording audio signals with a digital connection (rather than analog connection) complicates matters because the soundcards will lock to the source digital clock and not use their internal clock during the recording process. The problems arise when the source deck is a video deck locked to a House Sync master generator running at 29.97. A *Sampling Rate* of 44100 will actually be internally

pulled down .999% by the deck to 44056. The soundcard will happily record at this rate, but during playback, will use its internal clock and playback at the 44100 rate. The result is a serious corruption of synchronization.

We have now been introduced to some of the SMPTE complexities at the ground floor. Many more variables come into the picture as we begin interfacing to different types of equipment. Since each situation has unique parameters, let's take a look at each one individually.

MIDI Sequencers and the SAW Environment

This is actually the easiest of combinations. In this configuration, the **SAW** environment is usually setup as the master, generating the SMPTE code for the sequencer to chase as the slave. The generate SMPTE capability is MIDI card dependent. **SAW** can currently generate SMPTE with a variety of MIDI devices, however there are other factors involved in this equation that can complicate matters somewhat.

The Windows MultiMedia specification has no real direct provision for generating SMPTE through the Windows driver mechanism. Many of the newer MIDI products provide a method of accessing the SMPTE generator using their own programming protocol, and many of these protocols have been added to the **SAW** environment. New products will continue to be added to the list as the required code for each device is written and tested.

Another option, instead of hardware SMPTE generation, is to output MTC (MIDI Time Code) code directly from software through the MIDI port. This method, however, is overwhelmed with timing problems in the Windows environment and it is very difficult, if not impossible, to generate evenly spaced Quarter Frame MTC messages that can be used to drive a MIDI sequencer smoothly without stuttering. **SAW** makes no attempt at this method, as after much research into the matter, the conclusion was made that this is currently not a good solution within the Windows Operating System.

So, the final outcome of all this confusion, boils down to using one of two recommended procedures for having **SAW** act as a SMPTE Master:

Generating SMPTE Within One of the Supported Devices

Using one of the supported MIDI/SMPTE devices, have **SAW** generate SMPTE within the device itself and have the sequencer program take its sync input from the same device. Most of the newer supported devices can internally feed the generated SMPTE back into a MIDI port as MTC code, which the sequencer can read and chase to. To do so, the device drivers must be capable of MultiClient operation, meaning that more than one program can access the device at the same time. Such devices allow both **SAW** and the MIDI sequencer program to open the driver at the same time, giving **SAW** the ability to control the SMPTE Generator while the sequencer program waits and looks for sync input.

One remaining concern with this method is the fact that the sequencer is actually chasing the SMPTE Generator signal from the MIDI device, not

the soundcard. If the soundcard oscillator circuitry and the MIDI device generator circuitry are not precisely accurate and are running at slightly different speeds, then the sequencer and the digital audio playback can drift apart. In most cases, any subtle differences in timing between the devices is irrelevant when dealing with project lengths of 4-5 minutes, and in general this method works well even on projects of substantial length, such as 30-60 minutes.

Many of the newer multi-channel output audio cards now also include MIDI and SMPTE capabilities and these offer the best solution. Generating SMPTE from such a card will usually guarantee perfect sync because both the generator and the audio output reference the same oscillator.

Striping SMPTE on a Track in the MultiTrack

Using one of the multi-channel output audio cards, (with or without SMPTE capabilities), record a SMPTE stripe from a separate SMPTE generator source to a *MultiTrack* track and assign that track to one of the card's last outputs (for example, output 4). Now as you play the audio tracks in the *MultiTrack*, the SMPTE stripe is also played and remains in perfect sync. Have your sequencer read the SMPTE through your MIDI device and you are in business.

Choice of SMPTE Format

When working with MIDI sequencers, it is recommended that the SMPTE Format be set to 30 NonDrop to maximize the resolution of the timing signal.

Operation

Operation when *SAW* is the master, is simple and straightforward. Select the *Generate Smppte As Master* option under the *Smppte/Midi* menu. Playing back from the *MultiTrack* will automatically begin SMPTE generation from your MIDI/SMPTE device at the current *MultiTrack cursor* position, or if you are using a SMPTE stripe on one of the tracks, SMPTE will be output from that track. SMPTE will not be generated, in either case, during *Soundfile View* playback.

Recording will also generate SMPTE, starting from the *MultiTrack cursor* position when the *SRP* or *REC* button is clicked on the *Record Remote Transport*. If you are using the striped method on one of the

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MIDI Sequencers And The SAW Environment

MultiTrack tracks, you must use the *SRP* option to output the SMPTE stripe while recording.

Audio Tape Decks and the SAW Environment

This combination has many parameters to consider and can get a bit complex. In this configuration, the **SAW** environment is usually setup as the slave, triggering to **SMPTE Time Code** which is striped on one track of the tape deck, which acts as the master. There are many factors involved here in order for accurate sync to happen. **SAW** can manually trigger, or chase and trigger to the incoming **SMPTE**, but once playback has accurately started, the computer and the tape deck are running wild. In order for sync to be maintained, the tape transport must be very accurate and not wow and flutter during the playback process. Most newer Digital decks, like ADATs and DA-88s, can maintain this level of accuracy, and with one of these decks, **SAW** can happily pass data back and forth between the tape system and the computer in perfect sync, or be used as an add-on to increase the number of live tracks in the system.

Analog tape decks, however, can pose a problem. Most analog tape decks have a high degree of wow and flutter and very rarely playback the exact same way twice. Therefore moving audio between the tape and computer in multiple passes will cause individual tracks to be randomly out of sync with each other. The best way to integrate analog tape decks with the **SAW** environment, is to have the analog tape deck act as the slave, if possible, and have it chase and lock to **SAW** acting as the master. Many analog decks are capable of motor drive control using a specialized synchronizer device which can chase **SMPTE** and constantly vary the motor speed of the transport. This is the only recommended method of integrating analog decks with the **SAW** environment. ADATs and DA-88s can also be used as the slave in this configuration with the proper sync devices.

Another option is to use one of the newer soundcards which are capable of external *Word Clock* sync. Many newer audio decks are capable of generating a *Word Clock* sync signal directly, or there are devices available that will generate *Word Clock* sync directly from a **SMPTE** stripe. If the soundcard is set to reference external *Word Clock* for its oscillator signal, after the initial **SMPTE** trigger, the soundcard output will actually chase and lock at a hardware level (no need to worry about drift) because the actual oscillator reference is coming from the generated *Word Clock* sync.

Choice of SMPTE Format

When working with Audio Tape Decks, it is recommended that the **SMPTE** Format be set to 30 Non-Drop to maximize the resolution of the timing signal.

Operation

Operation when **SAW** is the slave, can be handled in one of two ways, manual trigger or chase trigger.

Manual trigger allows you to select the trigger point manually by placing the *MultiTrack cursor* at the desired trigger location. Select the *MultiTrack Smpte Trigger* option under the *Smpte/Midi* menu. Press the spacebar to initiate SMPTE trigger playback. **SAW** will pre-load the *MultiTrack* and wait for SMPTE at the trigger location. Rewind your audio deck to a location in front of the trigger point and start the audio deck playback. **SAW** will read the incoming SMPTE and start playback in sync when the SMPTE matches the trigger location.

Chase trigger allows you to leave **SAW** unattended and control the operation completely from your audio deck. Select the *MultiTrack Smpte Chase Trigger* option under the *Smpte/Midi* menu. Rewind your audio deck to the desired location and start the audio deck playback. In this mode, **SAW** is actively looking for incoming SMPTE and when code arrives, the program will automatically cue forward or backward to the arriving SMPTE position, then add the number of *SMPTE Chase Advance* seconds as a pre-roll (set in the *SMPTE Chase Advance* option under the *Smpte/Midi* menu). This pre-roll time is used for *MultiTrack PreLoad* and can be set smaller or larger based on the speed of your computer and the complexity of the session. **SAW** will wait for SMPTE trigger at this new *MultiTrack cursor* position. The new trigger point is displayed in the *Waiting For SMPTE At:* readout. Incoming SMPTE is displayed in the *Current SMPTE Time:* readout.

Operation when **SAW** is the master, is simple and straightforward. Select the *Generate Smpte As Master* option under the *Smpte/Midi* menu. Playing back from the *MultiTrack* will automatically begin SMPTE generation from your MIDI/SMPTE device at the current *MultiTrack cursor* position, or if you are using a SMPTE stripe on one of the tracks, SMPTE will be output from that track. SMPTE will not be generated, in either case, during *Soundfile View* playback.

Recording will also generate SMPTE, starting from the *MultiTrack cursor* position when the *SRP* or *REC* button is clicked on the *Record Remote Transport*. If you are using the striped method on one of the *MultiTrack* tracks, you must use the *SRP* option to output the SMPTE stripe while recording.

Video Tape Decks and the SAW Environment

This combination can drive many people to drink. There are many parameters and variations of parameters that can truly test any man's ability to stay sane. In this configuration, the **SAW** environment is usually setup as the slave, triggering to SMPTE *Time Code* which is striped on one track of the video deck, which acts as the master. There are many factors involved here in order for accurate sync to happen. **SAW** can manually trigger, or chase and trigger to the incoming SMPTE, but once playback has accurately started, the computer and the video deck are running wild. In order for sync to be maintained, the tape transport must be very accurate and not wow and flutter during the playback process. Most video deck transports can maintain this level of accuracy, and **SAW** can happily pass data back and forth between the tape system and the computer in perfect sync, for long periods of production time.

For more precise synchronization, especially when working on long projects, use one of the newer soundcards which are capable of external *Word Clock* sync. Many video decks are capable of generating a *Word Clock* sync signal directly, or there are devices available that will generate *Word Clock* sync directly from a SMPTE stripe. If the soundcard is set to reference external *Word Clock* for its oscillator signal, after the initial SMPTE trigger, the soundcard output will actually chase and lock at a hardware level (no need to worry about drift) because the actual oscillator reference is coming from the generated *Word Clock* sync.

When working with the PAL video standard, things remain fairly straightforward from here. The NTSC video standard, however, can complicate matters very rapidly. The problems arise from the use of the 29.97 SMPTE timing used with all NTSC color video. Most video production houses run a master clock signal, called House Sync, to all video and audio equipment in the control room. This master clock generates a 29.97 SMPTE code signal, a *Word Clock* sync signal, and a video burst signal that all pieces of equipment reference in order to stay in perfect phase accurate sync. The SMPTE stripe placed on the video tape copy you will most likely work with, will have come from this master clock. The actual SMPTE Format encoded within the stripe, will be either 30 Non-Drop or 30 Drop (even though it is really at 29.97), depending on the production house you are involved with, and in some cases will even vary from project to project within the same house. It is imperative that you properly match the format and set the **SAW** environment to conform the 30 to 29.97 so all trigger and position calculations will be accurate.

Transferring all audio information using analog soundcard inputs and outputs can eliminate any further complications. Transferring audio using digital inputs and outputs throws a few more elements into the fire. When recording digitally, the soundcards will lock to the source digital clock and not use their internal clock. A *Sampling Rate* of 44100 will actually be internally pulled down .999% by the deck to 44056. The soundcard will happily record at this rate, but during playback, will use its internal clock and playback at the 44100 rate. This will obviously compromise the sync, and also make it impossible to work within the **SAW** environment. The solution here is to use one of the newer soundcards, capable of playback at the 44056 rate. In fact, the soundcard should be capable of all the video pulldown and pullup rates (44056, 44144, 47952 and 48048). These soundcards will usually also be capable of external *Word Clock* sync, making them the best choice for working with video projects.

Choice of SMPTE Format

When working with the PAL video standard, the SMPTE Format should be set to 25. When working with the NTSC video standard, the SMPTE Format should be set to 30 Non-Drop or 30 Drop to match the individual project. In all NTSC cases, the *Smppte Conform 30 to 29.97* option should be turned *On* under the *Smppte/Midi* menu.

Operation

Operation when **SAW** is the slave, can be handled in one of two ways, manual trigger or chase trigger.

Manual trigger allows you to select the trigger point manually by placing the *MultiTrack cursor* at the desired trigger location. Select the *MultiTrack Smppte Trigger* option under the *Smppte/Midi* menu. Press the spacebar to initiate SMPTE trigger playback. **SAW** will pre-load the *MultiTrack* and wait for SMPTE at the trigger location. Rewind your video deck to a location in front of the trigger point and start the video deck playback. **SAW** will read the incoming SMPTE and start playback in sync when the SMPTE matches the trigger location.

Chase trigger allows you to leave **SAW** unattended and control the operation completely from your video deck. Select the *MultiTrack Smppte Chase Trigger* option under the *Smppte/Midi* menu. Rewind your video deck to the desired location and start the video deck playback. In this mode, **SAW** is actively looking for incoming SMPTE and when code arrives, the program will automatically cue forward or backward to

the arriving SMPTE position, then add the number of *SMPTE Chase Advance* seconds as a pre-roll (set in the *SMPTE Chase Advance* option under the *SmpTe/Midi* menu). This pre-roll time is used for *MultiTrack PreLoad* and can be set smaller or larger based on the speed of your computer and the complexity of the session. **SAW** will wait for SMPTE trigger at this new *MultiTrack cursor* position. The new trigger point is displayed in the *Waiting For SMPTE At:* readout. Incoming SMPTE is displayed in the *Current SMPTE Time:* readout.

When using analog inputs and outputs, you may select any samplerate as the *MultiTrack* default rate and recording rate.

When using digital inputs and outputs, you must determine the samplerate of the source audio signal and match the *MultiTrack* default rate and recording rate to the pulldown version of it. For instance, if the source audio is at 44100, you must select 44056 as your recording and *MultiTrack* samplerate, and of course, your soundcard must be capable of this rate.

Summary

As can be seen from this information, working with SMPTE requires a little attention to the details at hand, but once configured to your specific setup, stable and consistent results can be achieved. It is highly recommended that you test and confirm the results of your specific setup on a test project, from beginning to end, prior to attempting any real projects that have a completion deadline. This information is not meant to scare you away, but to make you aware of the many variables involved and present you with some of the various options that can have you up and running and synching successfully to SMPTE in the shortest amount of time.

Chapter 8

OPERATION QUICK REFERENCE GUIDE

This Quick Reference Guide is designed to give you a composite listing of the commands for basic operations in the SAW environment. The first column displays the function description. The second column references the keyboard and/or mouse command and/or any applicable menu option.

<u>Global Functions</u>	
To:	Use:
OPEN THE FULL VIEW WINDOW (OR BRING TO TOP)	ALT AND SHIFT AND F M WINDOW FULL
OPEN THE SOUNDFILE VIEW WINDOW (OR BRING TO TOP)	ALT AND SHIFT AND S M WINDOW SOUNDFILE
OPEN THE REGIONS VIEW WINDOW (OR BRING TO TOP)	ALT AND SHIFT AND R M WINDOW REGIONS
OPEN THE MULTITRACK VIEW WINDOW (OR BRING TO TOP)	ALT AND SHIFT AND M M WINDOW MULTITRACK
OPEN THE SEQUENCE VIEW WINDOW (OR BRING TO TOP)	ALT AND SHIFT AND Q M WINDOW SEQUENCE
OPEN THE MARKERS VIEW WINDOW (OR BRING TO TOP)	ALT AND SHIFT AND A M WINDOW MARKERS
OPEN THE REMOTE TRANSPORT WINDOW (OR BRING TO TOP)	ALT AND SHIFT AND T M WINDOW REMOTE TRANSPORT
OPEN A SOUNDFILE	CTRL AND ALT AND O M FILE OPEN SOUNDFILE
OPEN AN EDITLIST FILE	CTRL AND ALT AND E M FILE OPEN EDITLISTFILE
SAVE A NEW EDITLIST FILE	CTRL AND ALT AND S M FILE SAVE EDITLISTFILE AS...
SAVE AN EDITLIST FILE COPY	CTRL AND ALT AND C M FILE SAVE EDITLISTFILE

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	COPY AS...
UPDATE THE CURRENT EDITLIST FILE	CTRL AND ALT AND U M FILE UPDATE EDITLISTFILE
SAVE AN EDL VERSION TO A NUMBER KEY	CTRL AND SHIFT AND 0 - 9
RECALL AN EDL VERSION FROM A NUMBER KEY	CTRL AND 0 - 9
SAVE THE CURRENT WORKSPACE VIEW TO A FUNCTION KEY	SHIFT AND F1 - F12
RECALL A WORKSPACE VIEW FROM A FUNCTION KEY	F1 - F12
UNDO THE LAST EDIT OR EDL CHANGE	ALT AND U M EDIT UNDO

FULL VIEW FUNCTIONS	
To:	Use:
START AND STOP PLAYBACK	SPACEBAR
TRANSFER THE FULL VIEW CURSOR POSITION TO THE SOUNDFILE VIEW.	T KEY DOUBLE-CLICK IN THE TIME LINE

SOUNDFILE VIEW FUNCTIONS	
To:	Use:
START/STOP PLAYBACK	SPACEBAR RIGHT CLICK
PLAY A MARKED AREA	SHIFT AND RIGHT CLICK
PLAY THE MARKED AREA AND LOOP	CTRL AND RIGHT CLICK
START LOOP SCRUB MODE	CTRL AND LEFT CLICK
CHANGE THE LENGTH OF THE LOOP SCRUB WHILE ACTIVE	UP/DOWN ARROW KEYS
SELECT THE DEFAULT SCRUB LENGTH WHILE ACTIVE	LEFT ARROW KEY
RESELECT THE ALTERED SCRUB LENGTH WHILE ACTIVE	RIGHT ARROW KEY
RESET TO THE DEFAULT SCRUB LENGTH WHILE ACTIVE	LEFT ARROW KEY (PRESS TWICE)
INCREASE/DECREASE THE AMPLITUDE OF	PAGE UP/DOWN

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THE WAVEFORM DISPLAY	
INCREASE/DECREASE THE AMPLITUDE OF THE WAVEFORM DISPLAY TO MAXIMUM LIMIT	CTRL AND PAGE UP/DOWN
RESTORE THE WAVEFORM DISPLAY TO THE ORIGINAL AMPLITUDE	ZERO KEY
ZOOM IN/OUT	+/- KEYS
ZOOM IN/OUT FULL	CTRL AND +/- KEYS
MOVE THE CURSOR ONE PIXEL LEFT/RIGHT	LEFT/RIGHT ARROW KEYS
MOVE THE CURSOR TO THE BEGINNING/END OF THE MARKED AREA	CTRL AND LEFT/RIGHT ARROW
MARK THE CURSOR POSITION AS THE BEGINNING OF THE MARKED AREA	B KEY
MARK CURSOR POSITION AS THE END OF THE MARKED AREA	E KEY
CLEAR THE MARKED AREA	C KEY RIGHT CLICK IN THE TIME LINE
MARK AN AREA WITH THE MOUSE	DRAG IN THE TIME LINE
ADJUST A MARKED AREA BOUNDARY WITH THE MOUSE	DRAG IN THE TIME LINE NEAR THE DESIRED BOUNDARY
MARK THE ENTIRE SOUNDFILE	CTRL AND B OR CTRL AND E
CREATE A NEW REGION	CTRL AND N
UPDATE THE CURRENT REGION	CTRL AND U
TRANSFER THE SOUNDFILE VIEW CURSOR TO THE TRACKING CURSOR POSITION	T KEY
PLACE A MARKER AT THE CURRENT CURSOR POSITION	M KEY
JUMP TO NEAREST ZERO CROSS ENERGY POINT	Z KEY

REGIONS VIEW FUNCTIONS	
TO:	USE:
SELECT A REGION	CLICK THE REGION NAME
LOAD THE SELECTED REGION AND START PLAYBACK	SPACEBAR OR ENTER
STOP PLAYBACK	SPACEBAR RIGHT MOUSE CLICK

DISPLAY THE SELECTED REGION IN SOUNDFILE VIEW	DOUBLE CLICK THE REGION NAME
SELECT A REGION AND ACTIVATE DRAG AND DROP	SHIFT AND CLICK THE REGION NAME
DELETE THE SELECTED REGION AND ALL THE ASSOCIATED MT ENTRIES IN THE SESSION WITHOUT AFFECTING FOLLOWING ENTRIES	DELETE M REGIONS REMOVE REGION (DON'T AFFECT OTHER MT ENTRIES)
DELETE THE SELECTED REGION AND ALL THE ASSOCIATED MT ENTRIES IN THE SESSION AND PULL FOLLOWING ENTRIES FORWARD	SHIFT AND DELETE M REGIONS DELETE REGION (MOVE OTHER MT ENTRIES FRWD)
SELECT THE FIRST REGION IN THE LIST	HOME
SELECT THE LAST REGION IN THE LIST	END
SELECT THE NEXT/PREVIOUS REGION IN THE LIST	DOWN/UP ARROW KEYS
UPDATE THE SELECTED REGION	CTRL AND U M REGIONS UPDATE REGION

MULTITRACK VIEW FUNCTIONS	
TO:	USE:
PRELOAD THE BUFFERS AND WAIT FOR 2ND PRESS TO PLAYBACK - 3RD PRESS STOPS PLAYBACK	SPACEBAR
DELETE THE ENTRY UNDER THE CURSOR AND DON'T AFFECT FOLLOWING ENTRIES	DELETE M MULTITRACK REMOVE ENTRY (DON'T AFFECT OTHERS)
DELETE THE ENTRY UNDER THE CURSOR AND MOVE THE FOLLOWING ENTRIES FORWARD	SHIFT AND DELETE M MULTITRACK DELETE ENTRY (MOVE OTHERS FRWD)
MOVE TO THE BEGINNING OF THE SESSION	HOME
MOVE TO THE END OF THE SESSION	END
INCREASE/DECREASE THE WIDTH OF THE TRACKS	PAGE UP/DOWN
INCREASE/DECREASE THE AMPLITUDE OF THE WAVEFORM DISPLAY	SHIFT AND PAGE UP/DOWN

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RESTORE THE WAVEFORM TO THE ORIGINAL AMPLITUDE	ZERO KEY
ZOOM IN/OUT	+/- KEYS
ZOOM IN/OUT FULL	CTRL AND +/- KEYS
MOVE THE CURSOR ONE PIXEL LEFT/RIGHT	LEFT/RIGHT ARROWS
MARK THE BEGINNING POINT OF AN AREA	B KEY
MARK THE END POINT OF AN AREA	E KEY
CLEAR THE MARKED AREA	C KEY RIGHT CLICK IN THE TIME LINE
MARK AN AREA WITH THE MOUSE	DRAG IN THE TIME LINE
ADJUST A MARKED AREA BOUNDARY WITH THE MOUSE	DRAG IN THE TIME LINE NEAR THE DESIRED BOUNDARY
MOVE THE CURSOR TO THE BEGINNING/END OF THE MARKED AREA	CTRL AND LEFT/RIGHT ARROW
MARK THE ENTIRE MT ENTRY AT THE CURSOR LOCATION ON THE HOT TRACK	CTRL AND B OR CTRL AND E
MOVE TO THE NEXT/PREVIOUS MT ENTRY BOUNDARY ON THE HOT TRACK	TAB/SHIFT AND TAB
PLACE A MARKER AT THE CURRENT CURSOR POSITION	M KEY
TOGGLE THE WAVEFORM DISPLAY ON/OFF	W KEY
JUMP TO NEAREST ZERO CROSS ENERGY POINT	Z KEY
CHANGE THE TRACK ORDER	DRAG THE DESIRED TRACK NUMBER READOUT
RETURN THE TRACKS TO THEIR ORIGINAL POSITION	CTRL AND CLICK ANY TRACK NUMBER READOUT
KEEP FX RETURN TRACKS ACTIVE WHEN SOLOING	SHIFT AND CLICK ANY SOLO BUTTON
RELEASE ALL SOLO BUTTONS	CTRL AND CLICK ANY SOLO BUTTON
RELEASE ALL MUTE BUTTONS	CTRL AND CLICK ANY MUTE BUTTON
OPEN ALL FADER WINDOWS	CTRL AND CLICK ANY FADER ICON
CLOSE ALL FADER WINDOWS	CTRL AND CLICK ANY FADER CLOSE BOX

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CLEAR ALL EFFECTS ON ALL TRACKS	CTRL AND CLICK ANY EFFECTS ICON
SPLIT AND KEEP THE ENTRY AT THE CURSOR LOCATION AND ALL ENTRIES ON ALL TRACKS BELOW THE CURRENT HOT TRACK	CTRL AND CLICK THE SPLIT/KEEP BUTTON ON THE SPLIT REGION TOOLBAR
DISPLAY AN MT ENTRY IN THE SOUNDFILE VIEW	T KEY DOUBLE CLICK THE ENTRY
DISPLAY AN MT ENTRY IN THE SOUNDFILE VIEW OVERRIDING THE SAVED ZOOM INFORMATION	CTRL AND T CTRL AND DOUBLE CLICK THE ENTRY
RESIZE THE BEGINNING/END OF AN ENTRY OR REPOSITION THE SPLICE POINT BETWEEN ENTRIES	SHIFT AND DRAG THE ENTRY BOUNDARY
RESIZE THE BEGINNING/END OF AN ENTRY AND BREAK A BUTT-SPLICE AT THE SAME TIME.	SHIFT/CTRL AND DRAG THE ENTRY BOUNDARY
CENTER THE DISPLAY AT THE CURSOR POSITION	DOUBLE CLICK IN THE TIME LINE
ENTER/EXIT SELECT MODE	S KEY

MULTITRACK SELECT MODE FUNCTIONS	
TO:	USE:
START/STOP PLAYBACK	RIGHT CLICK IN THE TIMELINE
SELECT AN ENTRY	LEFT CLICK ON THE ENTRY
DESELECT ALL SELECTED ENTRIES	RIGHT CLICK
DESELECT ONE SELECTED ENTRY ONLY	CTRL AND RIGHT CLICK ON THE ENTRY
MOVE SELECTED ENTRIES HORIZONTALLY	SHIFT AND DRAG ANY SELECTED ENTRY
MOVE SELECTED ENTRIES VERTICALLY	CTRL AND DRAG ANY SELECTED ENTRY
MOVE SELECTED ENTRIES IN ANY DIRECTION	CTRL AND SHIFT AND DRAG, OR BEGIN HORIZONTAL OR VERTICAL MOVE AND RELEASE THE SHIFT OR CTRL KEY WHILE DRAGGING
COPY SELECTED ENTRIES TO A NEW LOCATION	BEGIN ONE OF THE ABOVE MOVE OPERATIONS AND

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		RIGHT CLICK BEFORE RELEASING THE LEFT MOUSE BUTTON.
SNAP THE BEGINNING OF THE KEY ENTRY (LAST ENTRY SELECTED) TO THE CURSOR POSITION, AND RELATIVELY MOVE ALL OTHER SELECTED ENTRIES	M	BACKSPACE MULTITRACK SNAP SELECTED TO CURSOR
SNAP THE BEGINNING OF THE KEY ENTRY (LAST ENTRY SELECTED) TO A SMPTE POSITION, AND RELATIVELY MOVE ALL OTHER SELECTED ENTRIES	M	DOUBLE-CLICK THE /N POSITION ON THE ENTRY NAME IN THE SEQUENCE LIST WHEN IN ANY SMPTE MODE MULTITRACK SNAP SELECTED TO SMPTE
DELETE ALL SELECTED ENTRIES AND DON'T AFFECT OTHERS	M	DELETE MULTITRACK REMOVE ENTRY (DON'T AFFECT OTHERS)
DELETE ALL SELECTED ENTRIES AND PULL FOLLOWING ENTRIES FORWARD	M	SHIFT AND DELETE MULTITRACK DELETE ENTRY (MOVE OTHERS FRWD)

MIX FUNCTIONS		
To:	Use:	
OFFSET VOLUME AND PAN CHANGES OF AN ENTIRE TRACK		CLICK THE OFFSET BUTTON IN THE FADER WINDOW AND ADJUST AS DESIRED
OFFSET VOLUME AND PAN CHANGES WITHIN A MARKED MIX AREA		PLACE CURSOR WITHIN THE MARKED AREA AND ADJUST VOLUME/PAN TO DESIRED SETTINGS
MOVE A MARKED MIX AREA HORIZONTALLY		SHIFT AND DRAG IN THE MARKED AREA
MOVE A MARKED MIX AREA VERTICALLY		CTRL AND DRAG IN THE MARKED AREA
COPY A MARKED MIX AREA TO A NEW LOCATION		BEGIN ONE OF THE ABOVE MOVE OPERATIONS; RIGHT CLICK BEFORE RELEASING THE LEFT MOUSE BUTTON.
CLEAR VOLUME AND PAN CHANGES FROM A MARKED MIX AREA	M	SHIFT AND C MIX CLEAR MARKED VOL AND PAN CHANGES

OPERATION QUICK REFERENCE GUIDE

CLEAR VOLUME CHANGES FROM A MARKED MIX AREA	SHIFT AND V M Mix CLEAR MARKED VOL CHANGES
CLEAR PAN CHANGES FROM A MARKED MIX AREA	SHIFT AND P M Mix CLEAR MARKED PAN CHANGES
RESTORE THE FADER LEVEL TO 0 dB	LEFT CLICK AND HOLD THE FADER KNOB, THEN RIGHT CLICK
RESTORE THE PAN POSITION TO CENTER	LEFT CLICK AND HOLD THE PAN KNOB, THEN RIGHT CLICK

SEQUENCE VIEW FUNCTIONS

To:	USE:
PRELOAD THE MULTITRACK FROM THE BEGINNING OF THE SELECTED ENTRY AND WAIT FOR 2ND PRESS TO PLAYBACK - 3RD PRESS STOPS	SPACEBAR
START MULTITRACK PLAYBACK FROM THE BEGINNING OF THE SELECTED ENTRY (USE SPACEBAR TO STOP)	ENTER
DELETE THE SELECTED ENTRY AND DON'T AFFECT FOLLOWING ENTRIES	DELETE M MULTITRACK REMOVE ENTRY (DON'T AFFECT OTHERS)
DELETE THE SELECTED ENTRY AND MOVE FOLLOWING ENTRIES FORWARD	SHIFT AND DELETE M MULTITRACK DELETE ENTRY (MOVE OTHERS FRWD)
SELECT THE FIRST ENTRY IN THE LIST	HOME
SELECT THE LAST ENTRY IN THE LIST	END
SELECT THE NEXT/PREVIOUS ENTRY IN THE LIST	DOWN/UP ARROW KEYS

MARKERS VIEW FUNCTIONS

To:	USE:
MT - PRELOAD THE MULTITRACK AT THE MARKER POSITION AND WAIT FOR 2ND PRESS TO PLAYBACK - 3RD PRESS STOPS SF - START/STOP SOUNDFILE PLAYBACK	SPACEBAR

OPERATION QUICK REFERENCE GUIDE

AT THE MARKER POSITION	
START PLAYBACK AT THE MARKER POSITION (PRESS SPACEBAR TO STOP)	ENTER
DELETE A MARKER ENTRY	DELETE
SELECT THE FIRST MARKER IN THE LIST	HOME
SELECT THE LAST MARKER IN THE LIST	END
SELECT THE NEXT/PREVIOUS MARKER IN THE LIST	DOWN/UP ARROW KEYS

RECORDING CONTROL PANEL FUNCTIONS	
TO:	USE:
START/STOP SRP PLAYBACK IN THE MULTITRACK	SPACEBAR
PUNCH IN/OUT (TOGGLES BETWEEN REC AND REC READY)	ENTER
TOGGLE REC READY ON/OFF	* (ASTERISK KEY)
START SRP PLAYBACK AND RECORD SIMULTANEOUSLY (AUTO SRP/REC LINK IS OFF)	SHIFT AND CLICK THE SRP BUTTON
START SRP PLAYBACK AND RECORD SIMULTANEOUSLY (AUTO SRP/REC LINK IS ON)	CLICK THE SRP BUTTON
MOVE THE LEFT/RIGHT FADER INDEPENDENTLY	SHIFT AND CLICK THE DESIRED INPUT FADER KNOB
RESTORE THE FADER LEVEL TO 0 DB	LEFT CLICK AND HOLD THE FADER KNOB, THEN RIGHT CLICK

Chapter 9

TROUBLESHOOTING

Windows 95/98

The Windows 95/98 operating system may have difficulty with real time applications for many reasons, but the dynamic disk caching and the multitasking time slicing are the two that most concern the **SAW** environment.

These suggested optimizations are recommended to avoid clicks/pops and audio glitching within the Windows 95/98 platform.

Below are steps that can be taken to optimize Windows 95/98 for audio and video real-time applications, in the order of importance. We recommend starting at the top of the list and making the minimum amount of changes needed to hopefully solve your particular problem.

Windows 95/98 will normally ask you to restart after each one of these adjustments, so it is recommended that you close all applications before making these changes.

Optimization Suggestions

Virtual Memory Size

The virtual memory swap file seems to be one of the most troublesome areas of the Windows 95/98 platform for real-time applications such as **SAW**. By default, Windows 95/98 allows this swap file to be resized dynamically as the operating system runs. This resizing leads to system delays which may cause clicks/pops or audio glitching to happen during audio playback.

Setting the virtual memory size of Windows 95/98 to prevent resizing of the swap file can have a big impact on improving **SAW**'s performance.

➔ To Set Virtual Memory Size:

1. Click *Start* on the Windows 95/98 Taskbar. Click *Settings* and choose *Control Panel*.
2. Double-click the *System* icon.
3. Click the *Performance* tab.
4. Click the *Virtual Memory* button.

5. Click the option *Let me specify my own virtual memory settings*.
6. Set both the *Minimum* and *Maximum* values to 16 to prevent repeated resizing of the swap file.
 - ☞ We recommend a setting of 16 megabytes regardless of the amount of RAM installed on the system.
7. Click *OK* to accept your changes.

CD-ROM Auto Insert Notification

By default, Windows 95/98 is set to continuously check the CD-ROM for the insertion of a CD so that it may automatically run the CD setup program. This can result in audio glitches during playback and recordings because it forces Windows 95/98 to continually time-slice all other running applications. This will also interfere with the ability of a CD-R burner to write a CD by causing the SCSI controller to error out if it checks the CD-R at the same time a CD is being burned.

➔ To Disable CD Auto Insert Notification

1. Click *Start* on the Windows 95/98 Taskbar. Click *Settings* and choose *Control Panel*.
 2. Double-click the *System* icon.
 3. Click the *Device Manager* tab.
 4. Click the plus sign next to the *CD-ROM* listing to expand the list of CD-ROM devices.
 5. Select your CD-ROM and click the *Properties* button.
 6. Click the *Settings* tab.
 7. Uncheck the *Auto Insert Notification* checkbox.
 8. Click *OK* to save your changes.
- ☞ Follow this procedure for each CD-ROM installed on your system.

Write-Caching

By default, Windows 95/98 is set to enable disk write file caching. This function allows Windows 95/98 to write disk files in the background at some later time, rather than at the moment you initiate a disk write procedure. When recording soundfiles in **SAW**, the data is presented to the disk in one continual streaming operation, leaving no time for background writing operations. When write file caching is active, Windows 95/98 tries to put the data in RAM first, waiting for an

TROUBLESHOOTING

opportune time to write it to disk in the background. This opportune time never comes, and Windows 95/98 runs out of RAM space, interrupts *SAW* trying to quickly empty its cache to disk, and potentially loses incoming data, causing audio glitches in the recording.

➔ To Turn Off File Write-Caching:

1. Click *Start* on the Windows 95/98 Taskbar. Click *Settings* and choose *Control Panel*.
2. Double-click the *System* icon.
3. Click the *Performance* tab.
4. Click the *File System* button.
5. Click the *Troubleshooting* tab.
6. Check the *Disable Write-Behind Caching For All Drives* checkbox.
7. Click *OK* to save your changes.

Read-Caching

By default, Windows 95/98 caches all disk reads to RAM. Normally read caching can be an advantage for *SAW*. Problems can occur, however, when Windows 95/98 dynamically resizes the amount of space allocated for the read-cache buffers. This can cause audio glitching during playback.

➔ To Limit the Maximum File Read-Cache Size

☞ This procedure requires a good working knowledge of the Windows 95/98 environment. If you're not comfortable with the following steps, solicit the help of someone well-versed in the Windows 95/98 platform.

1. Using *Windows Explorer*, navigate to your *Windows* folder, and double-click the *System.ini* file to open it into the *Notepad* application.
2. Scroll through the file looking for a section labeled [vcache].
3. Create a blank line under the [vcache] heading and type **MaxFileCache = 4096**. If this entry already exists, just change the size value. Make sure the upper case and lowercase letters are maintained, otherwise this line will not work.

- ☞ This limits the maximum file cache size to 4096 Kilobytes (4 Megabytes). You can experiment with different sizes, but the size specified should be in increments of 1024 and it is recommended that the size not be made less than 2048.
4. Save the file and close *Notepad*. Restart Windows 95/98 for this change to take effect.

Double Buffer

In some cases, depending on your disk configuration, Windows 95/98 may create a double buffering scheme for handling disk transfers. This can cause serious audio glitching during record and playback.

➔ To Disable Double Buffering

- ☞ This procedure requires a good working knowledge of the Windows 95/98 environment. If you're not comfortable with the following steps, solicit the help of someone well-versed in the Windows 95/98 platform.
1. Using *Windows Explorer*, navigate to the root directory of your boot drive.
 2. Right-click on the MSDOS.SYS file and select *Properties* from the popup menu.
 3. Uncheck the *Read Only* checkbox.
 4. Click *OK*.
 5. Double-click on the MSDOS.SYS file and choose *Notepad* to open the file.
 6. Scroll through the file looking for a section labeled [Options].
 7. Create a blank line under the [Options] heading and type **DoubleBuffer=0**. If this entry already exists, make sure it is =0, not =1. Make sure the upper case and lowercase letters are maintained, otherwise this line will not work.
 8. Save the file and close *Notepad*.
 9. Right-click on the MSDOS.SYS file and select *Properties* from the popup menu.
 10. Check the *Read Only* checkbox.
 11. Click *OK*.
 12. Restart Windows 95/98 for changes to take effect.

Additional Suggestions

If the above suggestions do not work, here are some additional options you may try.

Video Cards

Some video cards can interfere with the PCI bus and/or DMA operations. Many of the newer hardware accelerated video cards will contain their own specialized applet or settings tab in the Windows 95/98 *Display Properties* control panel. If a checkbox exists referencing PCI bus retries or DMA bus mastering, or something similar, try disabling this option.

Graphics Hardware Acceleration

Some video cards hardware acceleration interactions can be controlled directly from the Control Panel in Windows 95/98.

→ To Reduce Graphics Hardware Acceleration:

1. Click *Start* on the Windows 95/98 Taskbar. Click *Settings* and choose *Control Panel*.
2. Double-click the *System* icon.
3. Click the *Performance* tab.
4. Click the *Graphics* button.
5. Adjust the *Hardware Acceleration* slider control one notch to the left to lower the setting.
6. Click *OK* to save your changes.

☞ After restarting Windows 95/98, if the problem persists, try adjusting this setting one notch lower, until the desired results are achieved. If the lowest setting does not work, it is recommended that you reset the control to the highest setting.

Media Control

By default, the Media Control Interface (MCI) will allocate a certain amount of memory to buffer from 2 to 9 seconds worth of audio for the default audio wave device. This can introduce a double buffering condition and may cause clicks/pops and/or audio glitches when using *SAW*.

→ To Disable the Wave Audio Device:

1. Click *Start* on the Windows 95/98 Taskbar. Click *Settings* and choose *Control Panel*.
2. Double-click the *MultiMedia* icon.
3. Click the *Advanced* tab.
4. Click the plus sign next to the *Media Control Devices* listing to expand the list.
5. Select the *Wave Audio Device (Media Control)* and click the *Properties* button.
6. Select the *Do not use this Media Control device* option button.



Click the *Settings* button, and adjust the slider control all the way to the left to the minimum setting.

7. Click *OK* to save changes.

Computer Role

Windows 95/98 allows you to select different role types for your computer system, and it appears that memory and disk handling may be treated differently depending on the type selected. Sometimes selecting a different role type may be the solution.

→ To Change the Computer Role Type:

1. Click *Start* on the Windows 95/98 Taskbar. Click *Settings* and choose *Control Panel*.
2. Double-click the *System* icon.
3. Click the *Performance* tab.
4. Click the *File System* button.
5. Change the typical role of this machine to *Mobile or Docking System*.
6. Click *OK* to save your changes.

Background Processing

- Ensure that all power management functions are disabled on the computer.
- Ensure that no memory resident virus software is installed. Software of this type intercepts all disk access and can cause audio glitches due to these delays.
- Ensure that no disk compression software is enabled on any drives regardless of whether these drives are used for audio data or not.

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