SAW DEMO OVERVIEW

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A Look At The Saw Environment

What Is *SAW?*

SAW is a professional production tool for manipulating and crafting audio on your PC computer using the Windows Operating System.

The ***SAW*** System allows you to record and edit 16 Bit Resolution CD and DAT quality SoundFiles at Sampling Rates up to 48KHz on your computer's hard drive with ease. The elegance of the Workshop's design offers unmatched efficiency in taking a project from conception to completion.

SAW allows you to splice audio data Non-Destructively by building Play Sequences from marked Regions of data without modifying the original SoundFiles directly.

What's more, ***SAW*** gives you the capability to perform your splices with Down-To-The-Sample accuracy... that's 1/48000 of a sec at 48KHz Sampling rate.

SAW's MultiTrack Capability gives you 4 Stereo Tracks which can be overlaid and played back in RealTime, allowing you to Non-Destructively build productions and modify them at will.

SAW creates the 8 Tracks in Software and digitally combines them into a Stereo Output which plays through One (1) Stereo Sound Card.

A Software 4 Channel OnScreen Mixer gives you Non-Destructive programmable mixing control down to Sample Accuracy.

* Easily Overlay Vocals On Music Beds
* Easily Add Sound-Effects To Existing Productions
* Easily Draw In Custom Crossfades From One Track To Another
* Easily Assemble & Master Complete Album Projects

And Do It All Non-Destructively!

And since ***SAW*** allows you to edit across 40 SoundFiles 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.

SAW makes excellent use of the Windows Graphics Operating System and, in fact, boosts Window's normal performance tremendously due to the extensive use of 386

32Bit-Register Assembly Language Programming.

The editing environment offers simultaneous Full and Zoomed views of your audio waveforms making it fast and simple to move around within a SoundFile.

OnScreen Control Buttons eliminate the need for learning complex keystroke combinations to perform the basic editing operations.

Simultaneous Regions 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 Time View Window shows time references from different points of interest in one display.

The MultiTrack View graphically displays your Play Sequence Edit-Points and your Mix movements for each of the 4 Stereo Tracks simultaneously and allows you to place and drag Regions of audio to any position within the production, relative to the other tracks. This means you can control musical phrasing long after the original recording has been made. This also means you can easily create delay and flanging effects by placing the same Regions on two different tracks and sliding one slightly behind the other... all Non-Destructively.

SAW performs Vari-Pitching, to tenths of a semitone accuracy, without removing or duplicating any waveform samples. This translates into extremely clean sounding results with no audio glitches, or noticeable distortion.

With the addition of an inexpensive SMPTE/MIDI card to your system, ***SAW*** can handle MIDI and SMPTE synchronization problems with ease.

SAW can chase & Trigger to SMPTE Time Code or MIDI Time Code.

SAW can also generate SMPTE or MIDI Time Code as the master.

SAW can also respond to MIDI Note assignments that can be played directly from a Sequencer Program or Triggered Live to augment Live Show Performances.

What's more... ***SAW*** can respond to Note-Off information allowing Note-On information to be used for preloading data to solve critical timing problems.

SAW is designed to offer solutions to the most common problems associated with Hard Disk Editing Systems.

No More waiting for Screen Redraws!
SAW relies heavily on 386 32Bit-Register Assembly Language to virtually eliminate the endless waiting for screen updates. Also included in the interface design is Zoom Level Memory which remembers your current working Zoom Level whenever you zoom in close to critically adjust your marker points, so that you may return to your previous Zoom Level with only one screen redraw.

RealTime Archiving Of Complete Editing Sessions To Audio DAT!

SAW uses a unique process to archive complete editing session information to one small floppy disk file and a standard audio DAT machine... In RealTime!!! That means.... 20 minutes of audio in 20 minutes. You can archive a session on one ***SAW*** System and restore it on a completely different ***SAW*** system by simply carrying one DAT tape and one floppy disk between the two.

RealTime Preview Feature Virtually Eliminates The Repeated Do / Undo Process!
The Software Audio Workshop offers a Preview feature for most processing functions that allows you to preview the selected operation in RealTime before actually processing the data to the SoundFile. A tremendous time savings results from being able to hear the effect without the usual repeated do / undo process.

Precise Volume Processing Helps Eliminate Background Noises & P-Pops!
Separate control of Left & Right Volume within marked areas makes it a snap to remove background noises and even process P-Pops & sibilant S's without removing data from the SoundFile.

Catalog Sound-Effects Libraries!
Because the Regions List is sorted, ***SAW*** makes it easy to create and catalog Sound-Effects Libraries and because ***SAW*** allows you to edit across multiple SoundFiles, you can easily include them in your current editing session.

With the Software Audio Workshop you can put away your razor blade forever and begin crafting sound in ways not possible before.

About This Demo Version
This Demo Version of ***SAW*** is designed to give you a hands-on look and feel of the ***SAW*** environment. In order to reach many people easily, this version uses the *MultiMedia Windows Driver* mechanisms to communicate with your SoundCard. The Commercial version of ***SAW*** can also communicate directly with certain SoundCards on a hardware level, effectivly bypassing the slowdown that the *Windows MultiMedia* mechanism imposes on the system. Therefore, ***SAW*** can react even faster than this Demo, if you are using one of the Soundcards we directly support.

This *MultiMedia Version's* performance will vary, depending on how well the SoundCard's drivers have been written. Following is a list of common SoundCards and their performance ratings when using ***SAW***:

Digital Audio Labs CardD & CardD+: These cards perform extremely well with either the hardware or *MultiMedia Drivers* version, and offer simultaneous Record and Play with the ***SAW*** System.

Turtle Beach MultiSound, Tahiti and Monterey: These cards perform very well with either the hardware or *MultiMedia Drivers* version, and offer simultaneous Record and Play with the ***SAW*** System. Be sure to use the Calibrate option in Turtle Beache's Record Setup applet to eliminate any DC offset voltage within your system. This will help eliminate pops at the begin and end of playback.

SoundBlaster 16 & 16Asp: These cards perform very well with either the hardware or the *MultiMedia Drivers* version. We have seen a problem with the newer drivers that

seem to have a built-in fade mechanism when a start or stop command is issued. These will not perform well at all with the ***SAW*** System. Try to locate older drivers.

MediaVision Pro Audio Spectrum 16 & Studio 16: These cards perform very well with either the hardware or the *MultiMedia Drivers* version. ***SAW*** can take these cards up to 48K sampling rate.

Roland Rap10: This card performs adequately, although the drivers seem to bog the system down more than most. The hardware design of the card contributes to making the drivers more complex than other cards.

Ensonic SoundScape: We have had considerable trouble with this card and feel that it is not a workable choice with the ***SAW*** System. It is very confusing to setup, and generates Record Buffer Overflow errors on most systems, due to extremely slow drivers.

Certain *Menu Items* have been disabled in this Demo version, but you do have complete access to the MultiTrack environment and all of the ***SAW Utilities*** Preview functions.

Remember, the idea of this Demo Version is to give you a chance to experience the ***SAW*** environment first-hand. We hope that you will become a registered ***SAW & Utilities*** user by purchasing a commercial version of the products from your local dealer.

You are encouraged to copy and pass this Demo Version around freely to all who are interested.

CompuServe

We provide much of our Technical Support through our Forum on CompuServe. If you are already a CompuServe member, you may get to our support Forum by typing GO SAWSUPPORT at any ! prompt. (This is also known as the MIDICVEN area).

If you are not yet a CompuServe member, we highly recommend that you become one. You will need a standard modem and a CompuServe account. (CompuServe membership kits are available at many computer stores.)

CompuServe may be accessed with standard terminal programs, and with many graphical programs including their own CompuServe Information Manager, available for Windows, which we recommend if you do not already have a personal favorite.

The Editing Environment

There are six main windows that make up the Editing Environment. The *FullView Window*, the *SoundFile View Window*, the *EditList View Window*, the *Time View Window*, the *MultiTrack View Window*, and the *Mixer View Window*.

The *Play* and *Stop* buttons will function for all views although the play operation is slightly different depending on which view is active. You may also use the SpaceBar

or the Right Mouse button to toggle between Play and Stop Mode.

Learning to use each view in combination with the others can greatly enhance your speed and efficiency during an editing session.

FullView Window

The *FullView Window* normally resides at the top of the screen and is moveable and sizable. Initially it will adjust to fit the full window width according to your screen resolution.

This view will always show the entire SoundFile waveform compressed to fit in the window. Both the left and right channels are summed together and displayed in mono.

Along the bottom edge of the window is a yellow time marker that shows reference times which can help you position your editing cursor within the SoundFile.

The editing cursor is displayed as a line that reaches from the top to the bottom of the window. You may position the cursor anywhere within the window by pointing and clicking with the Left Mouse button, even while Play Mode is engaged.

You may move freely around the *FullView Window* without directly affecting your position in the *SoundFile View Window*. You may use the *Transfer* button to transfer your current FullView position into the *SoundFile View Window* or click within the yellow time marker to automatically cause your current FullView position to track in the *SoundFile View Window*.

When this view is selected and hi-lighted, activating Play Mode will begin playing from the FullView cursor position. Stopping and starting will act as a pause control, resuming play from where you last stopped. The FullView cursor will follow the playback and you may use this view as a visual reference to your current SoundFile position.

Cue Strt Button
Moves the FullView cursor position to the start of the SoundFile.

Cue Cur Button
Moves the FullView cursor position to the current SoundFile View cursor position.

Cue MrkB Button
Moves the FullView cursor position to the beginning of the currently marked area.

Cue MrkE Button
Moves the FullView cursor position to the end of the currently marked area.

Transfer Button
Transfers the current FullView cursor position into the *SoundFile View Window*. The SoundFile View display is updated and its cursor is centered, if possible, at the current zoom setting.

Stop Button

Stops any active Play Mode. You may also use the SpaceBar or Right Mouse button to toggle between Play and Stop Mode.

Play Button
Begins playback of the SoundFile. The actual playback operation depends on which window view is active at the time playback is activated. You may also use the SpaceBar or Right Mouse button to toggle between Play and Stop Mode.

Play / Loop Mrk Button
Plays only the currently marked area. This area is hi-lighted in the FullView display and also in the SoundFile View display, if visible at the current zoom setting. If The *Loop On Play Mrk* option is selected on the *Options Menu*, the button label reads Loop Mrk, and the playback area is continually looped until stopped by the operator. During Loop Mrk play you may use the Left Mouse button to adjust the Begin and End points by clicking near one or the other. The point closest to the mouse pointer will be adjusted to the new position.

If the SoundFile View cursor is at the beginning, end or outside the marked area, the entire area is played from beginning to end. This is useful for precisely adjusting edit points when creating Regions or setting up areas for special processing.

If the SoundFile View cursor is positioned anywhere inside the marked area, playback begins from that point and continues to the end of the area. This is useful when adjusting the end edit point of a large area. Positioning the cursor close to the end of the area will eliminate the need for repeated listening from the beginning.

The Shift-Right Mouse will start playback of a marked Region, and Ctrl-Right Mouse will start Loop-Playback.

SoundFile View Window
The *SoundFile View Window* may be moved and sized according to your needs. Pointing and dragging the titlebar of the window will allow you to position it anywhere on the screen. Pointing and dragging any of the window borders will allow you to change the window's size. You may also hide this window by double-clicking on the System Menu Bar in the upper left-hand corner of the title bar.

This view shows both the left (top) and right (bottom) channels of the SoundFile in detail. You may zoom in or out to display the audio wave data in varying resolutions. You may also adjust the audio amplitude of the display to magnify low volume waveform data.

Along the bottom edge of the window is a yellow time marker that shows reference times which can help you position your editing cursor within the SoundFile. The time resolution will adjust to the current zoom level.

The editing cursor is displayed as a line that reaches from the top to the bottom of the window. You may position the cursor anywhere within the window by pointing and clicking or by pointing and dragging with the Left Mouse button.

The ScrollBar along the bottom of the window allows you to position the display

anywhere within the 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 thumb position with the mouse to any location within the SoundFile. Note that if you click in the ScrollBar to the left of the thumb position, you will jump to the beginning of the file and if you click in the ScrollBar to the right of the thumb position, you will jump to the end of the file.

You may move freely around the *SoundFile View Window* without directly affecting your position in the *FullView Window*. You may use the *Cue Cur* button to transfer your current SoundFile View position into the *FullView Window*.

When this view is selected and hi-lighted, activating Play Mode will begin playing from the SoundFile View cursor position. Stopping and starting will automatically rewind and begin playing again from the same cursor position. This can be very helpful when adjusting and fine tuning an edit point. A separate tracking cursor will follow the playback while the current playback position is within visual range of this view.

In Full Button (End Key Also)
Displays the audio wave at a resolution of one sample per pixel, which is the closest zoom possible. Use this zoom level to precisely align an edit point directly to a transient or other specific part of the waveform. ***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 Button (+ Key Also)
Steps the display resolution in one level and expands the time reference of the waveform display. Use this button to help find a comfortable resolution for the particular waveform you are working with.

Zm Out Button (- Key Also)
Steps the display resolution out one level and compresses the time reference of the waveform display. Use this button to help find a comfortable resolution for the particular waveform you are working with.

Out Full Button (Home Key Also)
Displays the audio wave at a resolution that attempts to compress all the SoundFile data into the window at once. This view will be very similar to the *FullView 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 Button (Page-Up Key Also)
Increases the amplitude of the waveform display. By using this button, you can magnify low level sections of audio data to help locate and remove background noises.

0 db Button (0 Key Also)
Sets the amplitude of the waveform display so that full digital clipping level is

reached at the top and bottom of the respective channel displays. The waveform display is shown at the exact recorded level. When toggling between this button and 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 Button (Page-Down Key Also)
Decreases the amplitude 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 Button (B Key Also)
Marks the current SoundFile View cursor position as the beginning boundary of an area of marked data. If the end boundary is beyond this point, the marked area between boundaries will be hi-lighted in both the *SoundFile View Window* and the *FullView Window*. You may clear the marked area at any time by setting the begin point beyond the end point or setting both points to the same location. The marked area is used to create Regions and to define boundaries for many of the Workshop's processing functions.

Mrk End Button (E Key Also)
Marks the current SoundFile View cursor position as the end boundary of an area of marked data. If the beginning boundary is before this point, the marked area between boundaries will be hi-lighted in both the *SoundFile View Window* and the *FullView Window*. You may clear the marked area at any time by setting the end point before the beginning point or setting both points to the same location. The marked area is used to create Regions and to define boundaries for many of the Workshop's processing functions.

EditList View Window
The *EditList View Window* may be moved and sized according to your needs. Pointing and dragging the titlebar of the window will allow you to position it anywhere on the screen. Pointing and dragging any of the window borders will allow you to change the window's size. You may also hide this window by double-clicking on the System Menu Bar in the upper left-hand corner of the title bar.

This view is split into two halves. The left side of this window displays the Regions List. The right side displays the Play Sequence List.

Regions are sections of SoundFiles that you mark and name. Play Sequences are lists of Regions that can be played back in a specified order. Regions can be created from many different SoundFiles and combined into one or more Play Sequences. By using the power of the *EditList View Window*, you can perform very complex non-destructive splicing and create many variations of a production simply by re-arranging your Play Sequence List.

You may save your Regions and Play Sequence data in EditList Files (Not Active In The Demo Version) which contain only pointer information, not actual audio data, and are therefore very small in size.

You may select and hi-light the Regions side of the EditList View Window by clicking anywhere within its boundaries with the Left Mouse button. When this view is selected and hi-lighted, and a Region name is also selected and hi-lighted, activating Play Mode will display and play the selected Region.

You may select and hi-light the Play Sequence side of the EditList View Window by clicking anywhere within its boundaries with the Left Mouse button. When this view is selected and hi-lighted, and a Play Sequence entry is also selected and hi-lighted, activating Play Mode will begin playing the Sequence from the selected entry. As the sequence plays, the Current Time will follow the playback and the Play Sequence List will hi-light each Region as it is currently playing.

Regions
To create a Region, you first mark an area of your SoundFile using the *Mrk Beg* and *Mrk End* buttons. Then click on the Regions Menu and select the Create New Region option. Give your Region a unique name and press OK. The Regions you create will be listed, alphabetically sorted, in the Regions section of the *EditList View Window*.

You may re-display a Region by simply double-clicking on the name in the Regions List with the Left Mouse button.

You may freely open other SoundFiles without disturbing the current EditList and create Regions from many different SoundFile sources. ***SAW*** will keep track of which SoundFile each Region belongs to and will automatically open and display the proper file as you select and work with your Regions.

Add Button
The *Add* button allows you to add a Region to the Play Sequence List. First select and hi-light the Region by clicking on the Region name with the Left Mouse button. Then press the *Add* button. The Region will be added to the Play Sequence List.

If no entry is selected and hi-lighted in the Play Sequence List, the Region will be added to the end of the list. If an entry is selected and hi-lighted in the Play Sequence List, the Region will be added at the selected location and the original and all following entries will be pushed back one notch.

Play Sequence
Once you have created some Regions from one or more of your SoundFiles, you can list those Regions in a specific order in a Play Sequence List. The Play Sequence List can then be played back from any point and ***SAW*** will perform the splicing, non-destructively, as it plays.

Preview Button
The Preview button is used to audition a splice point in a Play Sequence. You can begin playback at any point in a Sequence by clicking the Sequence entry with the Left Mouse button. If you press the Preview button, rather than activating Play Mode by one of the normal methods, play will begin at a specified PreRoll time before the next splice point at the end of the currently selected Region. You may adjust the amount of PreRoll time using the *PreRoll Window* option found in the *Window Menu*.

Time View Window

The *Time View Window* may be moved anywhere on the screen by dragging the window titlebar. You may also hide this window by double-clicking on the System Menu Bar in the upper left-hand corner of the title bar. You cannot change the size of this window.

This view shows time references from different points of interest. These references can be very useful during the process of building a production.

Current

Always shows the time of the current playback position. It will track the position of whichever window is active. During playback it will act as a running clock. This time reference interacts with the Offset time described below.

Marked

Shows the time length of the currently marked area.

Sequence

Shows the time up to the beginning of the currently selected entry in the Play Sequence List.

If SMPTE Generate mode or MultiTrack SMPTE Trigger mode is active, clicking here with the Left Mouse button allows you to set the SMPTE position of the currently selected Sequence entry.

Offset

Can be used to move the zero reference point within a SoundFile. This is very useful when many different songs or music sections are in one SoundFile and you need to reference the Current time to one of the sections other than the first. The Current time references zero at the Offset time setting and begins incrementing from there. For example, if the Offset time is set to 1 min. then any time reference before 1 min. in the SoundFile will display a Current time of zero. Only time references after 1 min. will begin incrementing.

Note: In the SoundFile view, pressing the Shift key then click-drag the mouse will temporarily cause the current time to display the time related to the mouse drag distance.

Set Offset Button

To set the Offset time, position either the FullView cursor or the SoundFile View cursor to the offset position and press the *Set Offset* button.

MultiTrack View Window

The *MultiTrack View Window* may be moved and sized according to your needs. Pointing and dragging the titlebar of the window will allow you to position it anywhere on the screen. Pointing and dragging any of the window borders will allow you to change the window's size. You may also hide this window by double-clicking on the System Menu Bar in the upper left-hand corner of the title bar.

This view shows a graphical representation of the Play Sequence Entries for all four

stereo tracks. Each Region used within the Play Sequence for each track is displayed as a rectangular colored block with the Region name listed in the center. You may zoom in or out to see more or less of the entire Sequence at one time, which also adjusts the resolution of your cursor positioning movements.

Underneath the colored Region displays, a colored line is drawn which represents the active Mix volume at each point in time for the entire Play Sequence. A yellow line indicates 0 db (no change from the original recorded level), a dark green line indicates a minus db change, and a bright green line indicates a plus db change.

The editing cursor is displayed as a line that reaches from the top to the bottom of the window. You may position the cursor anywhere within the window by pointing and clicking or by pointing and dragging with the Left Mouse button.

The ScrollBar along the bottom of the window allows you to position the display anywhere within the Sequence at any zoom level. You may click the left or right scroll arrow to move one screen at a time or drag the scroll thumb position with the mouse to any location within the Sequence. Note that if you click in the ScrollBar to the left of the thumb position, you will jump to the beginning of the Sequence and if you click in the ScrollBar to the right of the thumb position, you will jump to the end of the Sequence.

When this view is selected and hi-lighted, activating Play Mode will begin playing the Sequence from the MultiTrack View cursor position. The cursor will follow the playback and the screen will automatically advance as the Sequence plays.

The Regions on all four tracks will be digitally summed together and played simultaneously through the stereo output of the SoundCard, in RealTime.

If you activate Play Mode using the Right Mouse button, playback is preceded by a PreLoad of the number of data buffers specified in the *PreLoad Window*. You may adjust the PreLoad time to the shortest time required for your system to keep up with the density of the MultiTrack data.

If you activate Play Mode using the SpaceBar, playback is preceded by a PreLoad of the maximum number of data buffers possible. This assures the maximum density playback possible on your system. After PreLoad is complete, ***SAW*** waits for you to press the SpaceBar again to begin instant playback, or press the Right Mouse button to cancel.

If MultiTrack SMPTE Trigger Mode is active, ***SAW*** will wait for SMPTE trigger at the cursor position after PreLoad is complete.

If you press a Mute button for a specific track, that track's Sequence will not be played.

The *Track* buttons are used to select the Active Track Play Sequence List for editing purposes. The Active Track will be displayed in red and its Play Sequence List will be displayed in the Play Sequence Window. The other tracks will be displayed in blue. All Sequence Menu functions will be performed on the Active Track only, for

example, selecting the *Clear All Sequence Entries* on the *Sequence Menu* will clear all entries on the Active Track and not disturb the other tracks in any way.

If you double click a Sequence Entry in the Play Sequence List, the *MultiTrack View Window* will scroll and position the selected entry at the center of the screen. In this manner you can quickly position the visual display to any section of a long Sequence.

If you place the mouse pointer within a red block and click with the Left Mouse button, the entry will be selected and hi-lighted in the Play Sequence List.

You may also grab Active Track Region blocks by positioning the mouse pointer within the block and pressing and holding the *Shift* key and Left Mouse button and dragging the block to a new position within the track. If you overlap the position of the preceding or following block, the new block position will be spliced directly to the adjacent block. You cannot push a block in this manner.

If you press the *Ctrl* key while grabbing a block, all following blocks within the track will reposition maintaining their relative positions to each other.

You may jump directly to the waveform display of any portion of any Region on any track by double clicking within the Region block. The *SoundFile View Window* will come to the top and display the selected Region at the saved Zoom Level. The SoundFile View cursor will be placed within the Region at the exact relative position that you double clicked within the block.

You may now zoom, scroll, and reposition the cursor anywhere within the Region, or adjust the beginning and ending marks and update the Region. When you return to the *MultiTrack View Window*, by clicking on a visible portion of it or selecting it again from the *Window Menu*, the MultiTrack View cursor position will be updated to reflect the new position, and the Region size will be updated to reflect any size changes.

In this manner you may easily position the cursor to an exact beat in a music Region and then use the Sequence MultiTrack functions to snap a Region on another track to that exact cursor position.

You are free to update and replace Regions on any track without worry of disturbing the positions of Regions that follow, provided that there is enough blank wait time between the Regions. Any Regions that are directly spliced together with no blank time between them will be considered as one group when adjusting the relative time positions of the other Regions on a track. If your adjustment would cause any position to be shifted, you will be warned and allowed to cancel before the operation is performed.

The *Add* button in the *EditList View Window* has some useful features that pertain directly to placing entries into the MultiTrack Active Track Sequence List. If the selected Sequence entry is a blank entry, the new Region is inserted at the beginning of the blank area, splicing itself onto the end of the previous entry. This does not shift the positions of the following entries. If the MultiTrack window is the active window and the MultiTrack cursor position is within the selected blank area, the Region is

inserted at the cursor position directly.

Track Buttons
Used to select the Active Track. The Active Track is displayed in red and all other tracks are displayed in blue. The Active Track also displays its Sequence List in the *Play Sequence Window* and becomes the active list that *Sequence Menu* functions operate on. You must make a track the Active Track in order to use the *Add* button to build a Sequence List from the available Regions.

Mute Buttons
Used to mute a track during MultiTrack playback. Also, during a MultiTrack Paste Sequence operation, any tracks that are muted will not be included in the paste operation.

Zm In Button
Expands the resolution of the MultiTrack View display allowing finer cursor position capability.

Zm Out Button
Reduces the resolution of the MultiTrack View display showing more of the Sequence at one time.

Mixer View Window
The *Mixer View Window* may be moved anywhere on the screen by dragging the window titlebar. You may also hide this window by double-clicking on the System Menu Bar in the upper left-hand corner of the title bar. You cannot change the size of this window.

This view shows the mixer level positions of each of the four stereo tracks at the current MultiTrack View cursor position. If you drag the cursor position across the MultiTrack View, the mixer faders will move to display the actual db levels at each cursor position.

If you drag the MultiTrack View cursor while the mouse is positioned in the dark gray Time Zone section at the bottom of the *MultiTrack View Window*, you will create a rectangular box around the Active Track's mix display area. These mix changes are now considered to be marked and can be repositioned by simply grabbing and dragging the rectangular box to a new position. You may also clear the marked area mix changes by using the *MultiTrack Clear Marked Mix Entries* in the *Sequence Menu*.

Fader Knobs
The Fader Knobs can be grabbed and moved with the Left Mouse button. The mix volume at the current MultiTrack View cursor position will be changed to the new knob value. Each of the four tracks can be individually adjusted for the current cursor position. You may readjust the value as many times as you wish and the old value will be overwritten.

Fader Arrows
The Fader Arrows at the top and bottom of the level markings to the right of each

fader can be used to increase or decrease the fader value by one db at a time.

Next Buttons
Used to position the MultiTrack View cursor to the next mix change position for the associated track. By positioning the cursor in front of a specific mix change position and pressing the Next button for that particular track, you can jump the cursor to the exact mix change position, allowing you to adjust its value.

Clr All Buttons
The *Clr All* buttons will clear all mix changes for the associated track. To clear only certain mix changes refer to the *MultiTrack Clear Marked Mix Entries* option in the *Sequence Menu*.

Tips & Suggestions

Sizing SoundFiles For Efficiency
The SoundFiles you record may be as big as the amount of free space you have available on your hard disk at the time of recording.

There are a few reasons why you might consider controlling the size of your SoundFiles.

Better Visual Display - If you keep your SoundFiles around 3 to 4 minutes long, the FullView Window display will show much more useful detailed information. When the SoundFile is very long, the FullView Window has to compress the data so much to fit on the screen that most of the waveform transient details will get lost and the display will tend to approach a solid black mass.

Easier Position Seeking - It can actually take more time to seek from one end of a long file to the other than to seek to a different file. This can affect splice efficiency when making a jump from a point near the beginning to a point near the end of a long file and sometimes result in an audio dropout. You can usually have better results by splitting the long SoundFile into one or more shorter SoundFiles and perform the splices across SoundFiles.

Standardizing Your Sample Rate
Choosing a Sampling Rate will depend on your individual needs and the type of audio production work you will do with the Workshop.

Naturally, the best audio quality is obtained with the higher Sampling Rates. However, the higher Sampling Rates require more hard disk storage space and also a higher performance level from your computer system.

Whichever Sampling Rate you decide will serve your needs, it is recommended that you stay with that Rate for all your SoundFile recordings.

SAW will currently not allow you to edit and mix between SoundFiles that are at different Sampling Rates. Therefore, creating Sound Libraries that are useful for all your projects could become quite complicated if your projects are constantly shifting Sampling Rates.

Pick a Sampling Rate, stick with it, and when your hard disk storage space limits are reached, dump finished projects to DAT or other means of permanent storage.

If you do need to use SoundFiles that are recorded at different Sample Rates, you must use the Paste And Convert functions to create Regions that are all at the same rate.

Using Work Files To Enhance Your Productivity

Many times during the creative process of building a production, you will need to record extra music sections or sound effects that you did not include in the original production SoundFiles that you created at the beginning of the session.

There also might be sections of musical transitions that might require overlays and effects processing along the way and you do not want to process the original SoundFile data.

Such instances can be easily handled by creating Work Files which can be used for intermediate data processing. You create a Work File by simply recording a New SoundFile, which you name Work1, Work2 and so on. Record however many seconds of blank time that you need by recording with the Monitor Mode OFF.

Then paste Regions or marked data into the Work Files and modify the data to your heart's content. Build overlays, change volumes, create effects, do crossfades, etc. all with the realization that the original SoundFile data is left untouched.

Create new Regions from the processed data in the Work Files and use those Regions in your production Play Sequence List.

Remember, ***SAW*** allows you to edit across multiple SoundFiles as easily as editing within one SoundFile.

Creating Song SetLists

SAW can be very effective when used as source of music in a live show application.

The Break Regions are an extremely effective tool in building and maintaining a show SetList.

Inserting Break Regions at the end of each song and naming them with the title of the next song in the SetList is a very effective way of cueing and controlling the music being played during a live performance application.

This is a much more versatile way of controlling live show music than a DAT or Tapedeck because you can easily skip a song or rearrange the SetList within moments without having to re-record master show tapes.

By saving various EditList Files you can easily keep many variations of the show music on file to be instantly recalled with the click of the mouse.

Deleting Small Areas Of SoundFiles

SAW does offer a Process-Cut feature to handle deleting portions of SoundFiles. While you may preview the cut as many times as you wish, the process is not reversible.

SAW does not create temporary files in the background, thereby eliminating much of the disk fragmenting associated with creating small files.

Although deleting a section of a file may be useful, we suggest that you consider the following suggestion:

Instead of marking the sections of audio you wish to delete, with SAW, you reverse your thinking and mark the sections of audio you wish to keep and name them as Regions. Then you simply chain the Regions together in a Play Sequence and the sections that you were not interested in are simply not played.

This eliminates the need for relying on Process operations every time you wish to alter any edits. You simply recall any Region to the screen and alter its marks and Update the Region to alter your Play Sequence. This translates into more versatility and much more efficiency.

Common Splices

1. Load or Record a SoundFile.

2. Create separate Regions by marking all individual areas of audio you wish to include in your production. Use the Zoom-in capabilities of SAW to find low-energy (zero-crossing) begin/end points. You may include other SoundFiles in your production by loading or recording them at any time.

3. Add the Regions to the Sequence list in the order you wish them to play. You may repeat sections by adding the same Region more than once.

4. Play the edited production by highlighting the first Sequence entry and clicking the Right Mouse button.

5. Remember to save your work as an EditList File by using the File Menu Save EditListFile option.

Voice-Over And Sound-Effects Overlays

1. Create a Sequence as described in Common Splices.

2. Open the MultiTrack View Window and select Track 2.

3. Create a new Sequence of Voice-Over Regions in the new Sequence list for Track 2.

4. You may now grab and position the Voice-Over Regions with the mouse relative to the Sequence on Track 1.

5. Select Track 3 and add Sound-Effects in the same manner.

6. Play the MultiTrack production by selecting the MultiTrack window and pressing the Right Mouse button.

7. Remember to save your work as an EditList File by using the File Menu Save EditListFile option.

Crossfading Between Songs

1. Record a song into a SoundFile and mark the entire song as a Region.

2. Record the second song into a different SoundFile and mark it as another Region.

3. Place the Song 1 Region onto Track 1.

4. Place the Song 2 Region onto Track 2 and position it near the end of Song 1 with a slight overlap.

5. Select Track 1 as active (red). Open the Mixer View Window and try to position it beside the MultiTrack View Window, adjusting the window sizes to your screen resolution, so that you can see both at the same time.

6. Place the cursor at the end of the Song 1 Region.

7. Pull the Fader 1 down to minus 70 db. A dark green line will appear on Track 1 starting from the cursor position.

8. Place the cursor where you would like to begin the fade-out.

9. Select the Sequence Menu Fade To Next Mix Change option to create the fade-out.

10. Select Track 2 as active (red).

11. Place the cursor slightly before the start of the Song 2 Region.

12. Pull the Fader 2 down to minus 70 db. A dark green line will appear on Track 2 starting from the cursor position.

13. Place the cursor where you would like the fade-in to end.

14. Pull the Fader 2 back up to 0db. A yellow line will appear on Track 2 starting from the cursor position.

15. Place the cursor to the beginning of the Song 2 Region (after the start of the dark green line) and select the Sequence Menu Fade to Next Mix Change option to create the fade-in.

16. Listen to your crossfade and decide if it is ok.

17. You may change the position of either the fade-out or fade-in by marking the mix entries and sliding the fade positions to a new location.

To move the fadeout position:
A. Select Track 1 as active (red).

B. Place the cursor just in front of the fade-out start position and with the mouse pointer down in the dark gray Time Zone area at the bottom of the MultiTrack View Window, hold down the Left Mouse button and drag the mouse to the right, past the end of the fade-out. You will draw a rectangular box around the fade-out mix entries.

C. Place the mouse pointer inside the box and grab and drag the box forward or backward to a new position and you will see the fade-out entries change location.

18. Remember to save your work as an EditList File by using the File Menu Save EditListFile option.

Gaining Maximum Speed In The MultiTrack Mode
1. If possible, keep SoundFiles at an average size of 3 to 5 minutes.

2. Try to record items that are being processed on different tracks in different SoundFiles. Placing some SoundFiles on another Harddisk will also increase speed.

3. Keep mix volume processing to a minimum. Any constant mix volume, different from 0 db, takes a tremendous amount of processing time per track. Where possible use the Process Menu to process the volume change directly into the Soundfile and keep the MultiTrack volume at 0 db (yellow).

4. Where possible, break Regions into chunks and slide them apart during blank audio areas, rather than leaving them as one long Region with blank audio inside. Any blank time between Regions gives SAW a chance to catch up on its processing load.

5. If you're experiencing difficulty getting through a particularly dense MultiTrack section, remember to try increasing the Preload Buffers number to give SAW more of a head-start.

The SAW Utilities

The ***SAW Utilities Package*** adds some incredible processing power to the Software Audio Workshop's Editing Capabilities. It allows you to process various audio effects on a marked area of a SoundFile. You may *Preview* the effects live, before actually processing the data back to the original wavefile. The Preview-Preroll may be adjusted allowing you to effectively audition the before and after. You may also adjust the amount of Preview-Preload to help compensate for math intensive data manipulations and allow longer live playback of some of the more complex effects.

The Main Rack
The Main Rack functions like a drop down menu. Clicking on an individual piece of processing equipment opens up a larger detailed graphic of the item. If you click on the top title piece (the piece containing the OFF button), you can obtain version information, and will be able to save window placements and file path preferences.

You can close the Main Rack by pressing the OFF button.

All of the effects modules allow you to *Save* and *Load* an unlimited number of presets. All adjustable settings for each effect can be instantly recalled, so that complex setups can be used again at another time.

The WAV / SND / EDL File Converter

The Wav/Snd/Edl Converter can be used to alter the format of SoundFiles and EditList Files. You can easily convert between *Snd* and *Wav* formats and also perform high quality conversions between *Mono* and *Stereo* and *8* and *16 Bit* resolutions.

Source FileName
The Source FileName allows you to pick the Source SoundFile. Click in the blackened area with the Left Mouse button and select the directory, qualifier and filename to be used as the Source File. The other settings will be automatically detected from the file header, if possible. If they cannot be detected, you will have to set them manually.

Source Rate
The Rate displays the sample rate of the current Source File.

Source Resolution
The Resolution sets or displays either *8 Bit* or *16 Bit* resolution for the Source File. Pressing and holding the Left Mouse button in the black-readout and moving the mouse forward or backward will change the setting.

Source Type
The Type sets or displays either *Mono* or *Stereo* Source File Type. Pressing and holding the Left Mouse button in the black-readout and moving the mouse forward or backward will change the setting.

Destination FileName
The Destination Filename allows you to pick the Destination SoundFile. Click in the blackened area with the Left Mouse button and select the directory, qualifier and filename to be used as the Destination File. In most cases you will be creating a new filename. Make sure to manually set the other settings to their new values before processing the conversion.

Destination Rate
The Rate displays the sample rate of the current Source/Destination File.

Destination Resolution
The Resolution sets or displays either *8 Bit* or *16 Bit* resolution for the Destination File. Pressing and holding the Left Mouse button in the black-readout and moving the mouse forward or backward will change the setting.

Destination Type
The Type sets or displays either *Mono* or *Stereo* Destination File Type. Pressing and holding the Left Mouse button in the black-readout and moving the mouse forward or backward will change the setting.

EditList FileName
The EditList Filename is used to pick the EditList File for the EDL functions. Click in the blackened area with the Left Mouse button and select the directory, qualifier and EDL filename.

Next, select one of the functions currently supported and follow the prompts on the screen. The *ASCII Dump* will create a standard ASCII file report of your entire session. The *Pack Session* will build new SoundFiles containing only the Regions that are contained in the active Sequence Lists.

The Audio Compressor / Limiter

The Audio Compressor / Limiter offers many different ways to alter the dynamic content of your audio waveform. There are four main processing areas.

The Gate
The Gate is used to help eliminate unwanted background noise during low volume areas of your wavefile. The Gate starts with the volume off and opens the volume to full when the audio signal rises above the *Threshold* setting. The *Attack* setting adjusts how quickly the volume is ramped up and the *Release* setting adjusts how quickly the volume is ramped down when the audio signal drops below the *Threshold* again. The *Out/In* button turns the Gate off and on.

The Compressor
The Compressor is used to help squeeze high volume areas of your wavefile to a lower volume. The Compressor starts with the volume at full and closes the volume down when the audio signal rises above the *Threshold* setting. The *Attack* setting adjusts how quickly the volume ramps down and the *Release* setting adjusts how quickly the volume ramps back up when the audio signal drops below the *Threshold* again. The *Ratio* setting determines how much of a squeeze is placed on the large volume areas. The higher the *Ratio* the farther the volume is dropped. The *Out/In* button turns the Compressor off and on.

The interaction of the controls allows you to apply many different dynamic changes to your audio file. By adjusting the *Threshold* down into the bulk of the audio material and using a large *Ratio* setting you can effectively take the spiked transient edge off of drums and other sharp sounds effectively bringing more attention to the decay of the sounds. Using less *Ratio*, you can squash the transients without audibly changing the quality of the waveform. By using a higher *Threshold* setting and a higher *Ratio* you will only affect the extreme transients. Adding *Attack* and *Release* settings allows you to drastically alter the dynamic quality of your audio waveform. Experiment!

The Peak Limiter
The Peak Limiter is used to limit large transient spikes to a specified volume. The attack and release of the volume changes are absolutely instantaneous and operate on each half (plus and minus) of the waveform independently thereby doing an effective job of limiting individual transients without audibly affecting the overall sound of the waveform. Use this adjustment sparingly trying 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 will be severely altering the plus and minus audio waves at an ever

changing and different rate, creating various amounts of audible distortion depending on the actual shape of the audio wave.

The Output Volume and Normalizer
The *Output Volume* control can be used to manually adjust the overall volume of the audio waveform louder or softer. 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 area. Grabbing the Out Volume control with the Left Mouse button and pressing the Right Mouse button at the same time will reset the control back to zero db.

The *Normalizer* allows automatic volume processing, raising or lowering the volume the necessary amount to reach a certain margin percentage. There are two modes of *Normalizing*, Average Mode and Peak Mode. Pressing and holding the Left Mouse button in the *Normalize* black-readout and moving the mouse forward or backward will change the setting. Clicking with the Right Mouse button will turn *Normalize* On or Off. The same method is used for selecting the A (Average) or P (Peak) Mode. Note that the manual volume setting and the *Normalize* setting are connected together. Adjusting one will reset the other. Also, since *Normalizing* requires a complete scan of the data to be processed first and then a second processing pass, there is no Preview Function when *Normalize* is On.

Average Mode averages all the peaks on each channel, then 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. Note that this mode preserves relative volume differences between the left and right channels.

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.

The Equalizer

The Equalizer offers many different ways to alter the frequency content of your audio waveform. The EQ is designed to look and feel like a graphic equalizer, but also gives you the versatility of a parametric equalizer since each band is completely center-frequency and bandwidth adjustable. There are also adjustable Hi and Lo Cut Filters and an Output Volume Trim.

You may utilize the Boost and Cut controls to draw a graphic representation of the EQ curve being applied by grabbing the controls with the Left Mouse button and moving the control up or down. Grabbing the Boost and Cut controls with the Left Mouse button and pressing the Right Mouse button at the same time will reset the control back to zero db.

Pressing and holding the Left Mouse button in the Frequency black-readout and moving the mouse forward or backward will change the frequency setting. Clicking with the Right Mouse button will turn the individual Band On or Off. The Hi and Lo

Cut Filters work in the same manner.

The Individual Frequency Bands
Each frequency band is a bandpass filter that affects only audio frequencies that fall near the Center-Frequency setting and lie within the Bandwidth Octave spread.

The Hi and Lo Cut Filters
These filters will cut all frequencies above or below the respective filter frequency setting, rolling off at about 18db per octave.

The amount of mathematical calculations and data manipulation in a digital EQ processor is extremely intensive and usually requires the use of High-Speed DSP processor hardware. Much attention has been given to optimizing the speed of the routines in the SAW Utilities to allow live Preview of the EQ changes on most 386 or higher systems. In most cases, you should be able to Preview from 1 to 3 bands for the entire length of your marked area. More bands can be previewed for short periods. You may also adjust the Preview Preload Buffers to a higher setting to extend your Preview time. If you are adjusting many bands at once, try settling on one band setting at a time and temporarily turn that band off while previewing the setting of the other bands. Then turn all bands back on when processing back to the SoundFile. When a band is at its center 0db setting or off, it adds no processing time to the loop.

The Echo Effects Generator

The Echo Effects Generator creates single or repeating stereo or cross delay stereo effects. You are given individual left and right control of the Delay Time, Feedback and Strength of the delayed signals. You also have control of Output Volume Trim to keep very dense echo effects from clipping.

Pressing and holding the Left Mouse button in the Delay Time black-readout and moving the mouse forward or backward will change the delay time by 2 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.

The Feedback and Mode functions may be adjusted also using the Left Mouse Button and forward or backward mouse movement. The Shift and Ctrl Keys only affect the Delay Time adjustment.

The Delay Time
The Delay Time setting determines the amount of time between echo repeats. You may use the tracking marker that appears in the SoundFile view to help adjust delays to visual transients within the SoundFile.

The Feedback
The Feedback setting determines how much of the output signal is fed back to the input. This creates repeating delays spaced at the Delay Time interval. Using 0% feedback causes the generator to act as a single straight delay unit, creating only one echo of the original sound.

The 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.

The Mode
The Mode setting switches between Normal and Cross. Normal Mode keeps the Left and Right tracks separate. The Cross 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 pingponging effect of echoes bouncing back and forth between channels.

The Auto Panner

The Auto Panner creates Automatic Motion effects within the stereo Left/Right field. You may easily create sweeping effects from Left to Right or Right to Left. You can also oscillate the sound image back and forth. A special Custom pan can be created with up to 100 points of Pan positions.

Pressing and holding the Left Mouse button in the Cycle Time black-readout and moving the mouse forward or backward will change the cycle time by 1% increments. Holding the Shift-Key at the same time will change the cycle time by 5% increments.

The Feedback and Mode functions may be adjusted also using the Left Mouse Button and forward or backward mouse movement. The Shift Key only affects the Cycle Time adjustment.

Cycle Time
The Cycle Time setting sets the length of time it takes to complete the panning motion. This time is referenced as a percentage of the entire marked area. For example, 100% will spread the pan motion evenly across the entire marked area. 50% will complete the motion at the halfway point of the marked area.

Direction
The Direction setting sets the direction type of pan motion.

A *Sweep* direction causes the pan motion to sweep one time from either Left to Right or Right to Left based upon the starting Pan Position knob setting.

An *Oscillate* direction causes the pan motion to oscillate back and forth between Left and Right over and over for the length of the marked area. The starting direction is determined by the starting Pan Position knob setting, and the cycle time controls the length of each sweep.

The *Custom* direction allows you to create a different pan position for each of 100 cycle percentage points. A special screen display shows your position and draws a reference line on the audio waveform to show the pan motion. The pan positions are displayed with the Left positions on the top of the SoundFile display and the Right positions on the bottom. As you adjust the cycle time, the display will appear. Pick a cycle time and adjust the Pan Position knob for the stereo position you desire. Then pick another cycle time and place the pan position. You may select 100 points. The

panner will create the motion you design.

Type
The Type setting selects between different types of pan motion effects.

The *CrossPan* effect creates a smooth transition across the stereo field with the signal fading form one side and growing louder on the other side in one even motion.

The *FadePan* effect creates a more circular motion across the stereo field with the signal fading from one side completely before growing louder on the other side.
