

# ***STEREOSAVAGE***



## **USER GUIDE**

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# STEREOSAVAGE

## ABOUT

StereoSavage provides an integrated set of tools for generating and manipulating the stereo.

It allows professional producers to:

- Separate instruments.
- Add width.
- Add motion or excitement with stereo modulation.
- Create stereo from mono sources for a richer soundscape.
- Improve the headphone experience with mono instruments.
- Reduce the number of vocal takes required for rich, tight, backing vocals.

And it allows fine-tune the stereo field for the best possible mix.

It includes:

## STEREO WIDTH GENERATION EFFECTS

- **Vocal Detune** - VOX - uses very small amounts of detune on each channel to introduce both pitch and fractional timing variations for a natural multi-voice effect.
- **Delay** - introduces a straightforward delay to one channel or the other.
- **Expand** - introduces aggressive early reflections.

## STEREO FIELD ADJUSTMENT TOOLS

- **Width.**
- **Pan.**
- **Rotation** (a very natural form of panning)

## UTILITIES

- Stereo metering and a goniometer.
- **Bass-bypass** for a solid low end.
- **LFO** modulation of key effect parameters.
- Input **routing** control.

## GETTING STARTED

### TOUR AND DEMO MODE

When you first install and open StereoSavage it will:

- Operate in demo mode.
- Run a short tour showing you the key features.

The tour will run the first couple of times you open the plugin. If you would like to repeat it after that you can select it from the MENU.

Demo mode will run for 14 days. During which every five minutes or so some quiet white noise will be introduced into the audio output.

Once you have purchased and installed a license this limitation will be removed.

## INSTALLING A LICENSE

Once you have purchased your license:

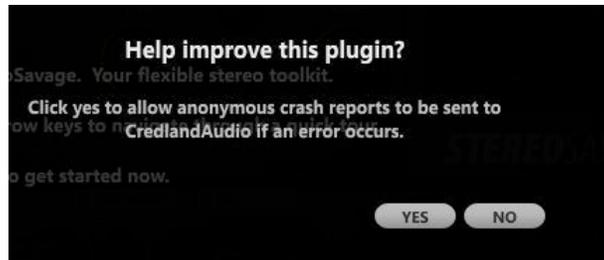
Copy the serial and ensure that the license includes the ---START--- and ---END--- lines.

Example serial...

```
---START---  
32472140400000  
"garry@plugginguru.com"  
"Garry PluginGuru"  
tctycbcu76d5hs8hxbxxe5a27fadcbc95d4b26ec01e631bcd756f81a69a  
be88ffcd6902cf884c35b50c064e6adcc4ec46fd45112d32e84b6ce2c05  
jxucycycycycycyc8f1bd020c00ffe96542bfa37db1a1934a21a7ee7e6326  
0f98de0f98de0f98de77777199b7398cc3f2760f98deaf453724098183  
04f860926df40c1dc659  
---END---
```

Load the plugin in your DAW.

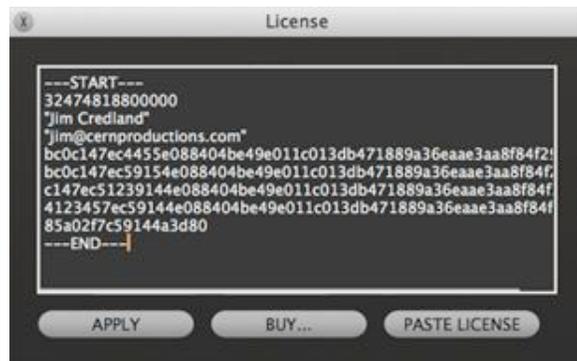
Select yes if you're happy for information on any error messages to be sent back to us so we can improve the plugin.



Click 'Menu' in the top right. Select 'License' from the dropdown menu.



Click 'Paste License' - Click 'Apply'



## RESIZABLE UI

You can change the size of the plugin window. It will remember the last size you used and future windows will open in that same size. The resizing handle is in the bottom right corner of the window. Click and drag there to make it as big or as small as you fancy.

## **ABOUT STEREO PROCESSING**

When mixing in stereo it's important that you both:

- Ensure that your studio monitoring isn't giving you a confusing picture.
- Consider the varied environments of your listeners.

## **STUDIO MONITORING**

To make sensible stereo decisions your monitoring environment doesn't have to be amazing. But it will be difficult if:

- It is so reflective that sounds are hard to localise
- It isn't symmetrical

In a good environment, a mono vocal, panned centrally, should sound like it's coming from somewhere fairly specific, in the middle, between your speakers. Close your eyes and listen to a mono vocal.

If not check:

Your speakers aren't too far apart. Too close together is probably better than too far apart.

The speakers are both:

- Roughly the same distance from your head.
- Roughly the same distance from the walls of your room.
- Set to the same volume.

## **CONSIDERING THE LISTENER**

Your audio may be reproduced on headphones, hi-fis, laptop speakers, PA systems and more. Some systems may reproduce the audio in mono.

More complex setups also exist. Club systems are interesting, mixes need to sound big for listeners at home, but the same mix needs to work in a club where it's likely that people are not in an ideal listening location for stereo panning.

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One PA hire company I spoke to frequently runs festivals and clubs with everything below 125Hz in mono, and the remainder of the mix in stereo.

Check your mix on different systems.

## **HEADPHONES**

Headphones are very dry. Sounds that are exciting on speakers may sound bland on headphones. Try a tiny bit of the EXPANDER to add just the slightest hint of room sound to another wise dry bass sound (see the Headphone Space preset) and listen in headphones.

## **PLAYING IT SAFE**

If in doubt, play it safe with key sounds. For music, that might be the drums, vocals, other lead instruments and/or bass.

Check the stereo processing on these. Does your mix sound good enough when:

- Summed to mono.
- If you are just listening, or very close to, one speaker.

Consider reserving the most dramatic stereo processing for effect sounds, background effects, supporting percussion and so on.

The StereoSavage BASS BYPASS control can be useful in adding stereo interest without making a mess of the important low end. See later in this manual for more information.

## **GETTING MORE INFORMATION**

There is a lot of good advice on how to setup your monitoring.

Good speaker companies have short reference guides much of which will be applicable to any brand of speaker. Check online.

If you have an appetite for detail, you could look at:

- Sound Reproduction – Loudspeakers and Rooms by Floyd E. Tool.
- Various papers in the AES Library.

## STEREO WIDTH GENERATION EFFECTS

These effects are enabled by clicking on the EFFECT button in the top left of the plugin. When they are disabled, as with the other plugin sections, the controls are dimmed:



Figure 1 - Controls are dimmed when disabled

Click EFFECT to enable the controls.

FX Mix controls the amount of the Detune, Delay and Expander section that will be mixed in with the original signal. This is often best when set to 100% but reducing the FX Mix will achieve a more subtle effect.

## VOX



VOX is a special pitch-shift and delay algorithm, popularised by the early pitch-shifting hardware devices from the 1980s and 1990s. It both detunes the left and right channels and adds a tiny bit of variation to the timing.

In moderate settings, up to say 20 cents, it is very effective on mono vocals.

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The more extreme settings sound good on un-pitched sounds. On rap or spoken voice the more extreme de-tune can sound fantastic.

## TIMING

The timing knob controls how relaxed the timing of the detuned audio is allowed to be. The control varies timing between two extremes:

**100% or LOOSE** – settings at this end of the scale will be great on many vocal track. And the quality of the detuned signal will be close to that of the original.

**0% or TIGHT** – at this setting the timing of the audio is tightly controlled. It will be great with percussion, drum loops and other noisy signals. However for a very pure signal such as like a vocal or flute the detuning artefacts may be audible.

## LR SWAP

One channel is detuned down, one up. You can swap the up and down channels using the LR SWAP control. This may be important when working with a number of backing vocal tracks or other stacked instruments.

## HINT

It's great on percussion.

For example we've used it here on a house hi-hat and clap loop and it sounded fantastic:

Duplicate a track in your sequencer.

Apply the maximum detune effect, with about 50% on the timing control, to one of the channels and then bring that channel forward in time by about 10ms to for a very human feel.

## DELAY

Delay introduces a short delay into the left or right speaker. It's most useful for adding a very wide stereo



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effect to percussion and cymbal sounds. Try it on a shaker, or perhaps a strummed guitar part.

On pure and tuned sounds this effect may introduce comb filtering. This can be undesirable and especially noticeable if the mix is summed into mono.

## HAAS EFFECT AND AUTOPANNING

Technical note: with some sounds this delay introduces the Haas effect, a type of panning. Helmut Haas described the effect in the 1940s: *'when one sound follows another after a short time delay the listener perceives a single sound. The location of the sound is largely determined by the first of the two sounds to arrive at the listener's ears.'*



This has the advantage of ensuring sounds don't disappear in environments (like nightclubs) where the listener might be standing much closer to one channel than the other.

As an example, try the *Haas Autopan* on some percussion. The sound has movement from left to right, but if you mute one or the other speaker the volume doesn't change. So someone standing (or hopefully dancing?) by the left or right speaker won't hear a difference in level, unlike normal panning where the sound would come and go awkwardly.

## EXPAND

Expand provides a tight and extremely wide set of early reflections.

The goal of this type of algorithm is to provide enhanced width in a sound but without making the sound excessively 'roomy' or adding excessive comb filtering. The amount of the effect that's acceptable will be a matter of taste and very dependant on both the original sound source and the expectations of the listener.

In general synthetic noises and percussion sounds can have much more of the effect than a vocal.

Try it on a shaker, and a synth bass.

## SPLIT

Split, new in version 1.2, takes a different approach entirely. It splits the sound up into multiple frequency bands and pans those bands left and right. Compared with the previous three modes it is exceptionally natural sounding.

Adjust the FOCUS control to adjust the spacing of the bands.

The effect is good on almost everything, and the only time it will sound unnatural is if the listener is only listening to one of the two channels.

In particular this may be the best choice for adding some width to acoustic instruments and vocals with natural acoustic backings.

## STEREO ADJUST



## ROTATION

**Rotation** allows you to move the central sound within the stereo field without affecting the placement of the sounds at the extreme left or right. Try it on a sample recorded with some reverb and you'll hear the reverb staying put but sounds in the centre panning. It sounds very natural. Note that rotation will have no effect with sounds that are very wide to start with.

## WIDTH

**Width** this applies MS style processing to increase the width of the sound. At more extreme settings this introduces an out-of-phase component into the opposite speakers, which whilst this reduces some mono-compatibility, for

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effects sounds, or where mono-compatibility is not an issue can sound very exciting (and very wide!).

## LEVEL

**Level** adjusts the level of the effected sound. Applying stereo adjustments can affect the level of the signal. The change in the level is dependent on the stereo that's present in the input signal. This makes it impossible to transparently compensate for the level change in the plugin so you may need to tweak the level control as you adjust the stereo processing.

## PAN



PAN moves the sound left or right, just like your mixer. However the PAN can be automated for auto-panner effects. It can also be placed before or after the stereo width control for a more aggressive auto pan effect. Press the PRE button, and try using an LFO modulation on the PAN position, with the WIDTH set to between 1.5 and 2.0.

Technical Note: The StereoSavage PAN control uses the square root law.

## INPUT ROUTING MATRIX



The input routing matrix controls the sound before any processing takes place.

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The L and R buttons select which input channels to enable. If neither L nor R are selected the sound will be muted.

The  $\emptyset$  buttons swap the phase of the L or R channel.

The MODE button selects from:

- Normal stereo input mode.
- Summing both input channels to mono.
- Swapping the left and right channels over.

## LFO



A low-frequency-oscillator (LFO) can be set to control key stereo savage parameters.

## SYNC

It can be synchronised to your DAW so that the modulation happens in time with your music, or left unsynchronised.

When SYNC is disabled the RATE knob changes to a SPEED knob and the LFO speed can be set in Hz. When synchronised the rate can be set to divisions of a bar.



When sync is enabled the speed knob is replaced by RATE:



## METERING

The metering includes

- A stereo input and output peak meter. Some stereo processes will change the level slightly, and these meters useful for correcting for that change.
- A phase correlation meter.
- A goniometer with two different view modes.

In the latest version we have updated the goniometer to be easier to read.

## GONIOMETER

The goniometer helps you see how extreme the stereo is in your mix. The centre line is mono. Areas L and R are normal stereo panned sounds, and areas below the diagonal lines are out-of-phase signals. Too much out-of-phase information can be a problem when listening in mono.

This first picture is a mono signal:



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And this one is a signal with a mono component, but also a balance of stereo information and a smattering of out-of-phase information:



The next image shows a signal panned slightly to the left with some stereo components as well:



Here is a signal that has huge amounts of out of phase information and, unless it's a special effect of some kind, is likely to be far too quiet if it's played back in mono:



## PHASE CORRELATION METER

The phase meter sits below the goniometer.



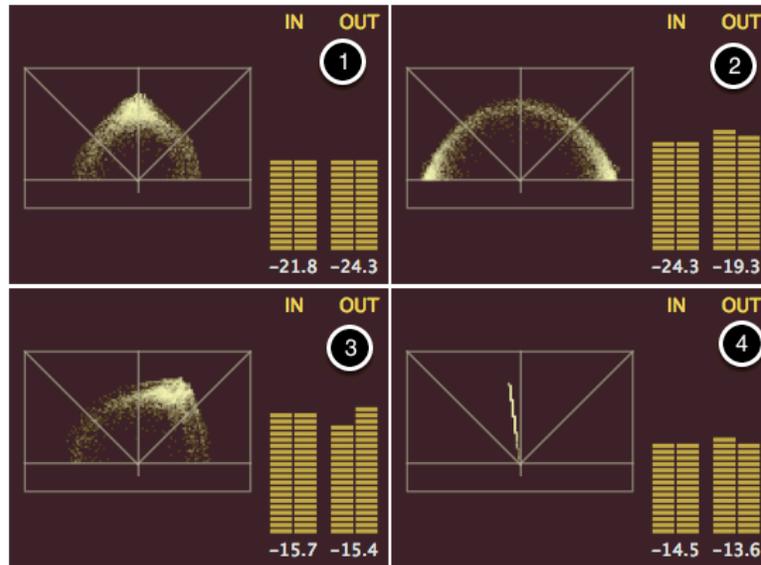
Very roughly, if the phase meter is mainly in the right hand (positive) side, things are good. If it spends lots of time on the left there might be a problem. The phase meter works best on individual sounds, and won't be very useful on the master bus.

See the section ALL ABOUT PHASE at the end of this manual for much more information on the PHASE CORRELATION METER.

## TRADITIONAL GONIOMETER VIEW

Clicking on the display will toggle to the traditional goniometer view. This allows the width and position of the stereo effect to be visualised. In the images below you are seeing:

1. A centre panned sound (the fat bit in the middle) with some stereo component (the less dense areas to the left and right).
2. A sound with lots of out-of-phase components. The majority of the sound is outside the diagonal lines. This sound will probably sound very different in mono.
3. A sound rotated to the right but with some stereo components.
4. A mono signal panned slightly left.



## BASS BYPASS

Bass bypass allows the bass to be passed through the plugin unprocessed. This can be useful for maintaining a solid low end.

The gain knob can be used to compensate for differences in level that may arise as a result of the stereo processing.



## OTHER FEATURES

### AB COMPARISON

The plugin will hold two sets of settings at once: settings A and settings B. Button (1) shows which of the two sets of settings you are currently listening to. Clicking it switches between the two alternatives. Button (2) copies the current settings to the alternative.

Note: Loading a preset replaces the only the current set. And only the current set of settings is saved when you save your session or a preset.

Use this feature to help choose between alternative settings and presets.

## LOAD

Load shows all your presets.

It also has an option called Manage. Clicking Manage will show you a preset manager. Here you can organise your presets by: renaming them, creating new folders, moving the presets into folders and deleting unwanted presets.

In Manage, right clicking on any preset file will bring up a menu of options. This can be seen in the image below.



## SAVE

This button allows you to save your preset. It will then appear as a User Preset on the LOAD menu.

## MENU

Menu provides quick access to:

- The about box
- The tour that runs the first time you open the plugin.
- This manual
- The licensing tools
- The support page

It also provides access to a 'Buy Now' link when you are running a demo version of the software.

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## **ALL ABOUT PHASE**

Earlier we talked briefly about the phase correlation meter, and explained that positive readings are good, and negative readings are bad.

However, as with many things, it's actually a little more complicated than that.

To really understand it we need to talk about phase in some more detail.

This section is entirely optional reading, but covers:

- What is phase?
- What does the phase correlation meter show for various simple waveforms?
- Why the phase correlation meter might not tell the full story.
- Why out-of-phase signals might be a problem.
- What causes out of phase signals?
- How to correct out of phase signals if they are a problem for you.

## **WHAT IS PHASE**

The phase of a signal, in engineering, roughly means how far through the cycle of a waveform a signal is. Engineers measure phase in degrees and use it all the time.

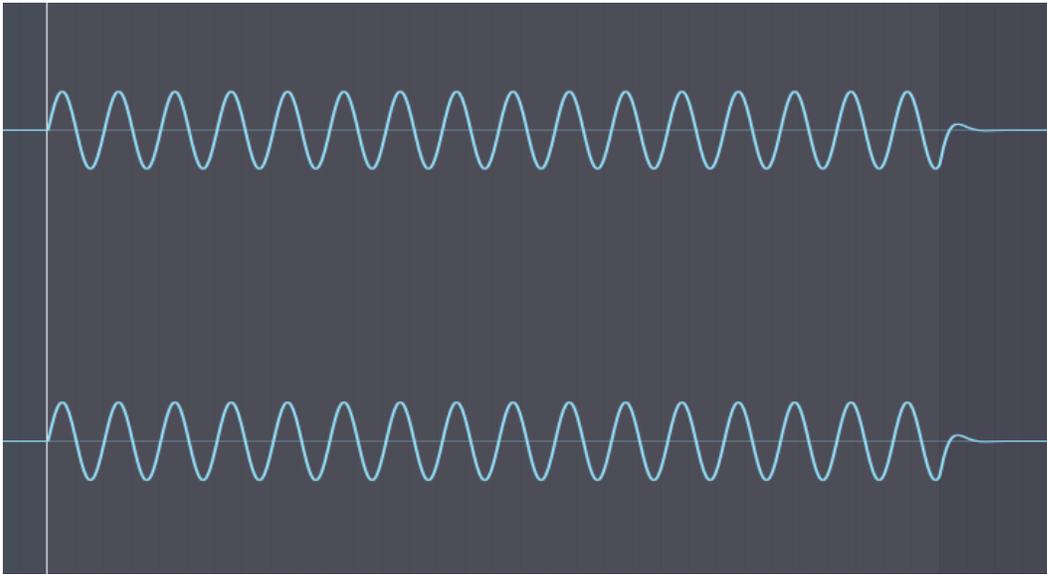
But for our purpose we just need to know that a stereo signal is 'in-phase' if the left and right channels are in the same position at the same time.

## **EXAMPLES**

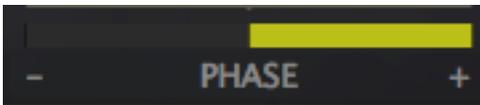
The next picture shows a perfectly in-phase sine wave.

Summed into a mono signal it will just be a slightly louder but otherwise identical sine wave.

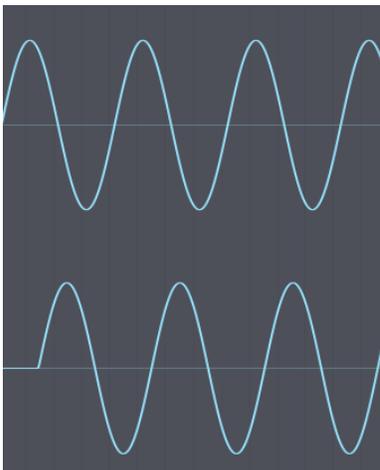
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For this signal, our phase correlation meter reads:



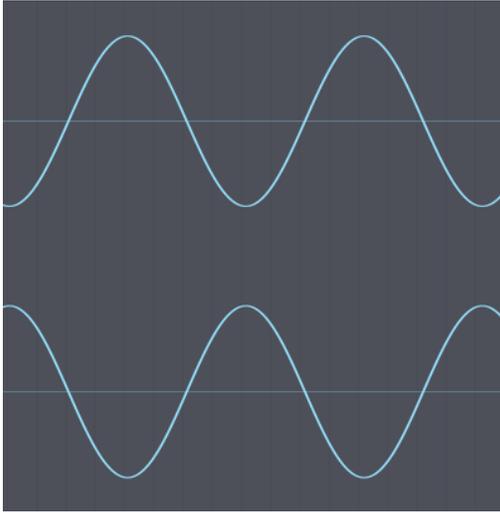
If we delay the bottom channel slightly, the signals will become slightly out-of-phase. This is shown in the next diagram.



The phase correlation meter in this case shows this:



Finally, let's look at a completely out-of-phase signal:



In this case our phase correlation meter will read:



And we can see here the goniometer fully in the out-of-phase area as well. This signal will be trouble. In mono it will vanish entirely as the peaks in the top channel are cancelled out by the troughs in the lower channel.

## MORE COMPLICATED SIGNALS

The signals we looked at above are perfect sine waves at a single frequency. Here the phase differences are consistent all the way through the sound.

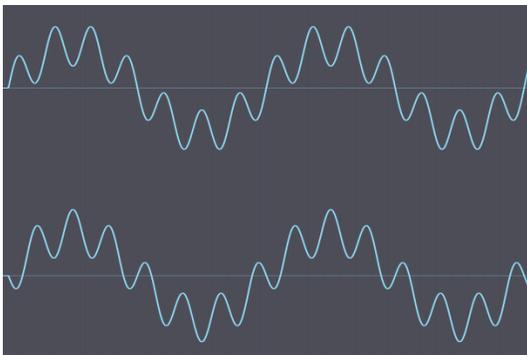
With real signals, say a stereo recording, lots of frequencies will be present. And usually the phase meter will jump around a bit. But if it's on the positive side most of the time things are probably okay!

Certain types of fault may cause a consistent phase error, such as a badly wired cable, and the phase meter may end up pinned to the left. This is likely to be a problem you want to fix.

## LIMITATIONS OF THE PHASE CORRELATION METER

It's also worth noting that this type of meter only really checks the phase of the loudest frequency in the mix.

The signal below has a loud in-phase bass, but with a completely out of phase higher pitched signal mixed in.



The phase correlation meter reports:



However, summed to mono the higher pitched signal will vanish entirely.

So it's most useful on individual mix channels, where problems will show up easily.

## IS OUT OF PHASE A PROBLEM?

If a sound or signal is largely out of phase the following problems are likely:

- The sound may get very quiet in the mix if the mix is summed into mono.
- The sound may not appear to have a fixed placement in the mix.

However using out-of-phase, or partially out of phase signals can:

- Produce the illusion of sounds outside of the speakers.

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- Be useful when you want to add atmospheric effects that do not need a fixed and clearly distinguishable position.

You may want to avoid substantial out-of-phase components on:

- Natural sounds, particularly lead vocals.
- Important sounds in your mix.
- The bass, for a variety of reasons (which is why StereoSavage includes a bass bypass feature so the more extreme effects don't make a mess of your low end)

## **SOURCES OF PHASE PROBLEMS**

The following processes can cause phase issues, which may be a problem on important sounds in your mix:

- Poor microphone placement with stereo microphones.
- Delays induced by using microphones in combination with Direct Injection.
- Delays added during processing.
- Cables wired the wrong way around (or polarity inversion)

Also - synthesisers can create almost any sound you like, including sounds with out-of-phase components that may be an issue.

And reverb can introduce all kinds of out-of-phase components, but these add to the spaciousness and are quiet enough that they shouldn't be a problem.

### **CORRECTION**

The first few of these problems are basically delay induced. These can be corrected if necessary with a little compensating delay on the other channel. You can use the delay feature in StereoSavage for this.

The polarity inversion problem can be corrected by inverting the phase of one of the channels. Use the input routing controls in the bottom left of the StereoSavage UI.

## **FINALLY**

If you have any problems, suggestions or questions we'd be delighted to hear from you.

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## SIGNAL FLOW DIAGRAM

This diagram shows how audio is routed through the various components within StereoSavage. It may help you develop an intuitive feel for how the settings will affect the audio:

