

**Review: PSP StereoPack 1.8**  
by Rick Paul - 22nd March 2007 -



Most of the time we at CakewalkNet focus our product reviews on exciting new products. The idea is partly to get you, our readers, some in-depth information on those products before user feedback is widely available. If you already know about the product, why would you need to read our reviews? (If no one reads a product review, does it really exist?) Of course, it's also partly because we, too, are curious about the latest products, and want to get past any marketing hype to know what it will do for us in real life.

So why am I just now reviewing PSP StereoPack, a product I've been using since late 2001, and whose latest major revision, version 1.8, came out in late 2005? It actually started out with some curiosity about some of PSP Audioware's more recent product introductions, such as their PSP Neon linear phase precision equalizer and some recent updates to PSP VintageWarmer and PSP MasterQ. Just thinking about that idea somehow made it seem natural to just cover all the plug-ins in PSP's MasterPack bundle. Then I also got curious about some of the other PSP plug-ins I hadn't been using, some newer, some older, in their delay line. Okay, maybe an EffectsPack review, too? Then I got thinking, seeing as how I'd already covered PSP MixPack, MasterQ, and EasyVerb back in my ["PSP Audioware Plug-ins" review](#) of February 2004, why not get comprehensive and add a review of StereoPack to the pile? Also, just because PSP StereoPack has been around for a long time doesn't mean it is any less useful for its intended purpose, and not all our readers may have even been reading plug-in reviews back in 2000 and 2001 when StereoPack was reasonably widely covered. To put it another way, why not?

The net is that this review is going to be the first of a series of three reviews intended, when coupled with the above-mentioned review of PSP MixPack and EasyVerb, to comprehensively cover the PSP Audioware plug-in line. Since I've been using the StereoPack plug-ins for a number of years now, I decided to lead with this review to give me more time to get up to speed on some of the newer plug-ins (as well as older ones I hadn't been using previously). The MasterPack and EffectsPack reviews will follow spaced roughly a month apart, give or take a week or two.

## Background

PSP StereoPack is a suite of four plug-ins aimed at creating, manipulating, and analyzing the stereo field of recordings. PseudoStereo allows creating a stereo field from a mono signal. StereoEnhancer is for enhancing the stereo field, for example to widen or narrow it's apparent image. StereoController is for manipulating the stereo field, for example to correct issues in a mix while mastering that mix. StereoAnalyzer doesn't affect the signal itself, but rather allows observing it via multiple visual indicators. Taken together, these plug-ins provide a comprehensive set of tools for dealing with stereo field considerations.

Windows plug-in formats supported include VST, DirectX and RTAS. AudioUnit, VST and RTAS are supported on the Macintosh under OS X, and VST and MAS are supported on the Mac under OS 9. For purposes of this review, I checked out both DirectX and VST versions of the plug-ins under SONAR Producer Edition 6.2.1.

In addition to the four plug-ins, the \$49 list price of this plug-in pack (\$19 to upgrade to V1.8 from V1.6 or earlier) gets you a nicely bookmarked PDF format manual. At 16 pages, the manual is brief, but includes sufficient reference and explanatory information to get you up and going with what might otherwise be fairly hard to fathom functionality. I found the screen shots of StereoAnalyser's goniometer (a special form of oscilloscope for stereo image information), displaying several basic, particularly useful for turning a cool graphic display into information I can use.

Installation is straightforward and relatively automatic once the setup program is invoked. You can change default file locations, as well as which plug-ins are installed. For example, on Windows, I could pick DirectX, VST, and/or RTAS plug-in formats. Software protection is via a user name and software key, which you only need to enter once to authorize all four plug-ins the first time you load one of the plug-ins.

Let's dive into the details of the individual plug-ins.

## PseudoStereo



PSP PseudoStereo, as its name implies, is used to create a stereo signal from a mono source signal. For example, you might have an old mono mix that you'd like to sound like stereo. Or perhaps you have an individual mono track you'd like to give the impression of having a bit more depth. Does that sound like magic? Well, maybe just a little...

Actually, PseudoStereo uses an algorithm based on comb filtering to separate a mono input into left and right components. The idea, more or less, is to simulate replacing a mono microphone with a stereo pair of microphones. Used in moderation, the effect can add a very nice touch. Go overboard and, well, it sounds like comb filtering.

Up at the top of PseudoStereo's user interface is a stereo/mono correlation meter. On one end of the meter is the letter "S" (for "Stereo"), and there is an "M" (for "Mono") on the other end. Technically, the meter shows the relationship between the mean and differential components of the output signal. In plain English, the idea is that, the more toward "M" the meter reads, the greater the prominence of the mono component of the signal (i.e. the parts of the signal that are the same in each channel). The more toward "S" the meter reads, the greater the prominence of the pseudo stereo component (i.e. the parts of the signal that are different from each other). PSP suggests that the most natural results will occur when keeping the meter reading slightly to the right (i.e. more toward the "M") of the center position.

To control the effects, there are three sliders plus a button to reverse the phase of the output signal. Those three sliders are depth, "freq" or frequency, and "emph" or emphasis. The depth slider controls the blend of the input signal with the processed signal. The frequency slider sets the base frequency of the comb filter. The comb filter resonates at all frequencies that are multiples of the base frequency. Using a lower filter results in more frequencies resonating, and the perception of a wider stereo image. The emphasis slider determines to what degree treble frequencies are emphasized within the processed signal. There is also a Process switch, which is like a bypass button in reverse -- i.e. when it is lit, processing is turned on -- except that metering is still functional when Process is turned off.

Let's take a listen to a few examples of PseudoStereo in action. For my first test case, I used a mono acoustic guitar pattern. Processing it with depth set at 62%, base frequency at 71 Hz, and 0% treble emphasis gave it a nicely three-dimensional sound. Have a listen to the before and after samples:

[Raw Guitar Track](#)  
[Guitar Track Processed with PseudoStereo](#)

For a second test I selected an old work demo with a piano, lead vocal, and several background vocals. Here I processed the mix with depth set at 75%, the base frequency at 75 Hz, and treble emphasis at 50%. Have a listen to before and after clips from the first chorus:

[Mono Chorus from "Her Little Man"](#)  
[Chorus from "Her Little Man" Processed with PseudoStereo](#)

Working with the mix was a bit trickier. The first few settings I tried got a fairly unnatural, "comby" result. But watching the stereo/mono correlation meter while tweaking the depth slider helped me get things in the ballpark, then playing around with the other two sliders while listening both on speakers and with headphones made further improvements. In the end, I think the result is an improvement over the mono mix, though I might be tempted to play around with it a bit longer if this were a recording intended for release.

## StereoEnhancer

PSP StereoEnhancer is very similar in concept to PseudoStereo. However, where PseudoStereo creates a stereo image where there was none, StereoEnhancer combines the techniques used by PseudoStereo with taking the existing stereo image into account. Thus, rather than creating a stereo image where none existed, you might be creating the perception of a wider image, for example.



Looking at the controls provided in StereoEnhancer's user interface, if you look quickly, you might think you're looking at PseudoStereo. There are the same stereo/mono correlation meter, depth and frequency sliders, and Process and Phase buttons, and those have the same functions as in PseudoStereo. If you look more closely, though, you'll find one extra button, a Mode switch. Also, the third slider, which was an emphasis slider in PseudoStereo, is either an emphasis slider or a width slider, depending on which mode of operation is active. To avoid redundancy, I will simply refer you to the PseudoStereo discussion above for information on the common controls. Let's take a look at the two areas of difference, though.

StereoEnhancer's Mode switch toggles operation between three modes. MODE 1 is intended for processing good stereo signals that only need slight spatialization and expansion of the stereo field. MODE 2 and MODE 3 are for taking corrective action on poorer quality stereo signals. The difference between MODE 2 and MODE 3 is that MODE 2 operates based on the mono signal (i.e. the portion of the signal that is common between the two stereo channels), while MODE 3 operates based on the differential signal (i.e. the portion of the signal that is different between the two channels). PSP recommends using MODE 2 if there is insufficient spatial information in the stereo signal.

According to the PSP StereoPack manual, when MODE 1 is active, the third slider should be a width slider, and is used for adjusting the content of the base differential (i.e. stereo portion) in the input signal. This allows widening the stereo base of the signal before the signal is processed by the space-generating algorithm. The manual also indicates that when either MODE 2 or MODE 3 are active, the third slider should be an emphasis control similar to in PseudoStereo. However, when looking at the actual user interface for StereoEnhancer the bottom slider is labeled "width" in both MODE 1 and MODE 2, and emphasis only in MODE 3. There is also some weirdness in the scale labeling for MODE 2. The scale for mode 2 initially seems to start at 0% on the far right, but then moves up to 400% on the far left -- i.e. the same left-hand scale as for a width control. If you then move it back to the far right, the minimum value is 100%, again like a width control. However, if you then toggle through modes, independent of where you left it, you get percentage values more in line with an emphasis control, though the control is still labeled "width". This leads me to believe the manual is correct in stating that the control is an emphasis slider in MODE 2,

but that there are bugs in the user interface which make the field name incorrect, and which also make the data values displayed incorrect in some cases.

To check this plug-in out, I brought up an old stereo mix. Turning processing off in StereoEnhancer just to view the stereo/mono correlation meter on the input signal showed that, although the mix was stereo, it was heavily weighted toward mono content. Have a listen to a clip from the original mix:

### ["Bubble Gum" - Original Mix](#)

I decided I would try using a combination of my eyes and my ears to see what StereoEnhancer could do. Starting out by setting a base frequency of 81 Hz to keep lower frequencies centered in the mix. With MODE 1 operational, I played with the depth and width controls until I got what appeared to be a reasonably optimal reading on the meter based on PSP's recommendations, then tweaked a bit further to taste. Here is the result:

### ["Bubble Gum" - StereoEnhancer: Mode 1, depth 66%, frequency 81 Hz, width 161%](#)

The result does sound like it has more depth and a wider image. I also noticed, though, that it is significantly louder than the original mix, which may somewhat mislead my perception given, all other things being equal, our ears tend to prefer louder mixes to softer ones. Next, I decided to see what would happen if I simply changed the position of the Mode switch, without changing any of the other settings. This may not be a fair test of the modes, in the "which mode is better?" sense, in that position settings for the width slider in MODE 1 may not correspond meaningfully to emphasis settings in MODE 2 and MODE 3. However, testing each mode simply by tweaking by ear wouldn't be any better in providing meaningful comparisons since it would be too subjective, and too subject to human error. Here are the results:

### ["Bubble Gum" - StereoEnhancer: Mode 2, depth 66%, frequency 81 Hz, width \(emphasis?\) 20%](#)

### ["Bubble Gum" - StereoEnhancer: Mode 3, depth 66%, frequency 81 Hz, emphasis 20%](#)

The volume level of these two versions is much more in line with the original mix, and with each other. Each is subtly different overall, but there are some larger differences in some areas. In particular, compare the relative balance of the organ solo in each of these mixes. It is much more prominent in MODE 2, and much further back in MODE 3. Which one do you prefer? Of course, the general idea is that you would tweak whichever setting comes closest until you achieved the results you were seeking, but it is interesting to note the differences in the results, and the potential for enhancing the spaciousness of the mix.

## StereoController



Whereas PseudoStereo and StereoController are about enhancing what you have, PSP StereoController is intended for making corrections. As such, its primary uses will be found in the post-mix stage (i.e. since any issues with the stereo balance can be adjusted in the mix itself prior to the mix). The idea here is to do what you can to fix stereo field issues when you don't have access to the raw components to fix things at the source. For example, StereoController might be used to adjust proportions of left and right signals in the mix without changing their perceived positioning in the stereo field.

Alternately, it could be used to change the apparent positioning of the center signal without changing the proportions of maximum left and right signal components. Of course, there are a number of other tricks it can do, too. You might think of StereoController as the Swiss Army Knife of stereo field tools.

Starting from the top of the StereoController user interface, you will find the familiar stereo/mono correlation meter right up on top. Below that is a width control, which affects the balance of the differential (stereo) signal. At the center position, or 100%, the input signal is passed through unaffected. At full right, or 0%, the signal becomes

mono, and at full left, or 400%, the differential signal is amplified by 12 dB. Below the width control is a gain slider or volume control, which allows raising or lowering the signal by up to 12 dB. Next comes a channel balance meter, which shows the balance between the two channels of the processed signal when the Process button is engaged, or the input signal when the Process button is not engaged. Underneath the channel balance meter is the channel balance slider. As its name implies, it affects the balance between the two channels, raising one channel while lowering the other. For example, in its extreme left position, the left channel is amplified by 6 dB, which is perceived as doubling its loudness, while the right channel is removed altogether. Next up is the "stability", or differential signal balance, slider. This is used to change the proportions of the left and right channels without changing their perceived positions within the central stereo field. Below that is the "center", or central stereo panorama, slider. Its affect is more or less the opposite of that of the stability slider, in that it is used to affect the position of the mean, or center, signal without changing the proportions of maximum left and maximum right signal components. Finally, down on the bottom are four buttons: Process, "L", "R", and Swap. The Process button has its familiar function as in the other two plug-ins. The "L" and "R" buttons are phase reversal switches for the left and right channels, respectively, at the processor's input. The Swap button does just what its name implies -- i.e. swaps the left and right channels in the stereo field.

Because I primarily work on my own material, and can generally remix as needed to correct stereo field problems, StereoController was the least familiar to me of the StereoPack plug-ins. To give it a workout, I thought I'd try taking a master from one of my song demos to see if I could improve its stereo imaging without going back to the mix stage. Here is a clip from the original master:

### ["Help Us Understand" - Original Master](#)

This mix is a relatively sparse one, with the main stereo instrumental elements being the piano and string quartet sounds, as well as the stereo elements of the drum set. My main observations from listening closely to the mix for stereo information, while also paying attention to StereoController's stereo/mono correlation meter and watching StereoAnalyser's display, were that the mix felt fairly mono, perhaps due to the relatively high balance of centrally-placed parts (i.e. vocal, bass, snare, and kick), and that the right side of the piano felt a bit more dominant than might be optimal. The overall result felt a bit more heavy-handed than I might have liked.

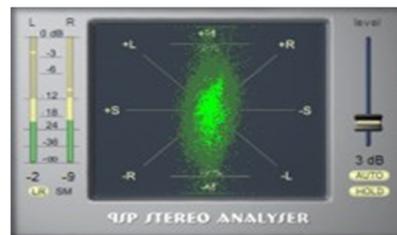
Playing around with StereoController, I used a combination of my ears and eyes to pick a width setting, then offset the gain to compensate for the difference in loudness. Next, I used the stability control to play with the proportion of the differential signal in the result, increasing the left side, which was weighted toward the violins from the string quartet. With the proportion of the left differential signal increased, I used the balance control to shift things right a small amount to compensate (at least to my ears). Finally, I played around with the Swap button to see whether I preferred the audience perspective I'd set up initially, or the players' perspective the Swap button would provide. I guess I just prefer being on stage to being in the audience, because the variation with the swapped channels felt slightly preferable to me. Here is the result with notes on settings:

### ["Help Us Understand" - StereoController Mix \(width: 159%, gain: -2 dB, balan: R2, stabil: L11, center: C, swap: on\)](#)

Granted, this is a fairly artificial example, because my inclination would be to go back to the multitrack version and make any needed changes there. However, even just digging up the multitrack archives and getting them reloaded on my hard disk would have taken me longer than tweaking things at the mix level with StereoController did. Of course, if this were an outside post-mix job, the multi-track project probably wouldn't have been available anyway.

## StereoAnalyser

Last, but decidedly not least, is PSP StereoAnalyser. While it doesn't do anything to affect the sound passing through it, it is, at least arguably, the most useful, and certainly the "sexiest", plug-in in StereoPack thanks to the



goniometer that occupies the largest, most central portion of the StereoAnalyser user interface. Let's take a look at the various controls and meters StereoAnalyser provides.

The most prominent element of the StereoAnalyser interface is the goniometer that occupies approximately one half of StereoAnalyser's total user interface real estate. With its "hold" function turned on, the display resembles a pulsating galaxy, and it may seem similarly mysterious until you understand how to read it. Keeping in mind that this is a meter for reading stereo signals, each channel is plotted along a diagonal axis. The left channel runs from top left (positive amplitude) to bottom right (negative amplitude), and the right channel runs from top left (positive amplitude) to bottom right (negative amplitude). A pure mono signal would form a straight vertical line, while a pure, out of phase, stereo signal, would form a straight horizontal line. Greater amplitude means a lengthier vertical signal, while greater stereo differential means a wider horizontal signal. The general goal is to shoot for a shape that looks a bit like a spiral galaxy viewed from the side and stood on end -- or maybe like a skinny (American-style) football waiting for kickoff.

On the right-hand side of the StereoAnalyser interface, are several controls that affect the appearance of the goniometer. At the top there is a signal level slider, which can be used to optimize the size of the waveform displayed on the goniometer, for example, if dealing with low-level signals. Just below that is an "Auto" button, which, if engaged, will automatically optimize the size of the waveform for you while the signal is active. Below that is a "Hold" button, which allows freezing the traces of the waveforms, albeit in a dimmed view compared to the active waveform, to get a picture of the waveform's movement over time.

On the left-hand side of StereoAnalyser is a pair of signal level meters, as well as a meter function switch to govern what those meters actually measure. The options are either left and right channel signals or mono and stereo (or "mid-side") signals. Each meter provides peak, peak-hold, and average signal level readings.

StereoAnalyser is a very useful tool for keeping track of what is going on with the stereo signal. In addition to providing helpful readings that can be use while manipulating the stereo field via the other StereoPack plug-ins, StereoAnalyser is also a great tool to use across the mix bus while working with individual track pan settings. While the SONAR 6 AN-879 Analyst plug-in is very useful for monitoring the frequency spectrum of a recording, SONAR doesn't provide anything for monitoring the stereo spread beyond typical stereo audio meters and a phase meter in the Sonitus:fx Phase plug-in. StereoAnalyser steps up nicely to fill the void.

## Playing Around

In most cases, the "Playing Around" section of my product reviews involves coming up with some hands-on test cases, preferably in real life projects, to see how the product being reviewed works in practice. In the case of PSP StereoPack, though, I've been using these plug-ins, albeit earlier versions of them, for years, so there was no need to either find a new project to which they could be applied or to manufacture an artificial test case to gain experience with the plug-ins.

In fact, PSP StereoAnalyser is something I tend to use on most all projects, at one stage or another, for checking what is going on stereo field-wise, whether or not I used any of the other StereoPack plug-ins on that project. For those of you using the 64-bit audio engine available in SONAR 5 and 6, there is one caveat, though. Make sure and bypass StereoAnalyser before rendering any results if you want to preserve any resolution beyond 32-bits in your signal. While StereoAnalyser nominally does not affect the sound of the signal that passes through it, because it only has a 32-bit host-to-DAW and DAW-to-host interface, it does lop off any bits beyond 32. This truncation is easy to see by placing the SONAR 6 BitMeter plug-in both before and after StereoAnalyser in a case where there has already been resolution beyond 32-bits generated prior to StereoAnalyser's position in the effects chain. Bypassing StereoAnalyser lets the full 64-bits of resolution pass through its position in the chain. (While the other plug-ins in StereoPack are also limited to 32-bit interfaces, as are the majority of audio plug-ins at this point in time, we often don't think of a metering plug-in as affecting the audio signal in any way, which is not the case in this specific situation.)

Over the years, I have also made fairly frequent use of other StereoPack components, especially StereoEnhancer, and occasionally PseudoStereo. I have used StereoController much less since I can generally address stereo field issues in the mix. Perhaps my favorite application for StereoEnhancer has been applying it to a background vocal submix, to play around with how wide the background vocal image is within the mix. The idea is to let me submix background vocals early, in order to treat them as a single unit, and then experiment with how they sit in the mix and the stereo field while experimenting in parallel with placement of other elements in the mix. I have also used both StereoEnhancer and PseudoStereo to impart more of a sense of spaciousness to individual instruments.

## Closing Notes

PSP StereoPack has been around for awhile, but it is as worthwhile now as it ever has been. While Cakewalk's Sonitus:fx Phase plug-in does have some overlap with PSP StereoPack functionality, by and large, PSP StereoPack is completely complementary to functionality provided in SONAR. While there are other plug-ins out there that also address portions of PSP StereoPack's functionality, I'm not aware of any that are as comprehensive as PSP StereoPack is for monitoring and dealing with stereo image issues. At \$49, it is one of the best values out there, too.

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