THE ESSENTIAL GUIDE TO...

Convolution reverb

Mac PC

Do you want to surround your audience with realistic ambience? It's all about impulse responses...

JARGON BUSTER

▸ IMPULSE RESPONSE
A short recording which captures the acoustic properties of a particular environment

▸ PDC (PLUG-IN DELAY COMPENSATION)
A feature designed to ensure that all audio paths stay in sync, even if delays are introduced by certain plug-in types

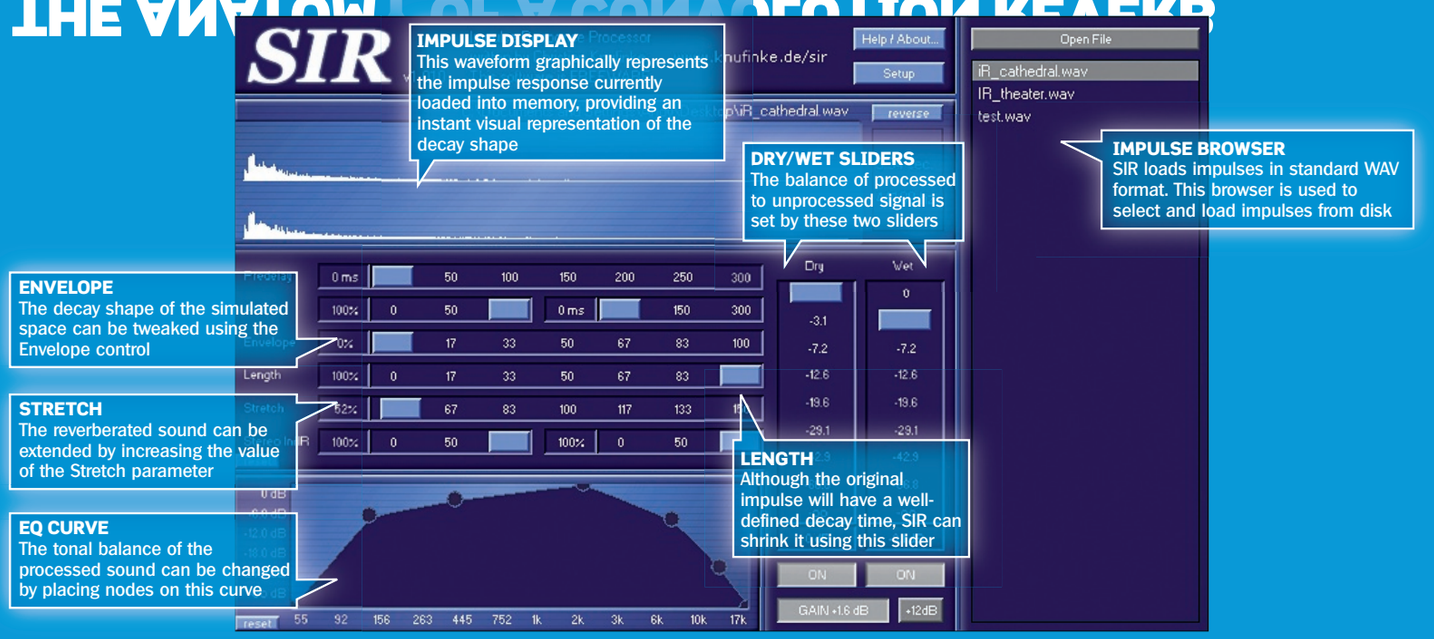
Way back at the start of this *Essential Guide* series, we looked at reverb – the king of audio effects. There's no denying that traditional software reverbs have come a long way over the past few years, and have even improved since we dealt with them in **cm**84. However, even the latest conventional software reverbs are synthetic approximations (albeit good ones) of the lush acoustic ambiences that can be found in concert halls, cathedrals and churches.

While even entry-level reverb plug-ins are good enough for many applications, there are times when a bit more realism is called for (perhaps when you're creating an orchestral arrangement or a chilled-out ambient soundscape). In situations such as these, convolution reverb is ideal, as it can provide an authentic simulation of a real acoustic environment.

In this, the final *Essential Guide*, we'll be asking our usual questions: what is it, what's it used for, and how do we use it? We'll also demonstrate that using convolution reverb doesn't have to be a convoluted affair… **cm**

"WE'LL DEMONSTRATE THAT USING CONVOLUTION REVERB DOESN'T HAVE TO BE A CONVOLUTED AFFAIR"

THE ANATOMY OF A CONVOLUTION REVERB



WHAT IS IT?

As we've already suggested, convolution reverb is all about reproducing the exact ambience of a real acoustic space. This is done by making a short recording of the way a space responds to different elements of sound – said recording is called an impulse.

The simplest way to create an impulse is to record a starting pistol being fired in the environment in question. The explosion will contain high levels of most audio frequencies, and so will serve as a quick and crude method of comprehensively testing how a space responds across the audio spectrum. More importantly, it will also demonstrate how the reverberating sound decays over time.

A more refined but complex technique involves playing back a series of swept test tones through loudspeakers and recording the resulting ambience using high quality mics and preamps. Impulses are normally recorded using 24-bit converters to ensure enough resolution right at the end of a long reverb tail.

Although an engaging art in its own right, you don't have to go about creating your own impulse responses. Plenty are freely available for download, and they deal with spaces as big as the grand canyon and as obscure as the inside of someone's mouth! Your convolution reverb plug-in can take the generated impulse and use it to apply exactly the same ambience to any material you like.

WHAT'S IT USED FOR?

Convolution reverb plug-ins can be used to carry out almost all of the same tasks as their conventional counterparts. They can add a subtle hint of 'air' to an otherwise dead and dry track, or they can smother an entire mix (you're likely to find a sensible setting somewhere in between these two extremes).

Where possible, you should try and use a conventional reverb plug-in in preference to a convolution-based model, as the latter type of effect will use a lot of system resources. It definitely pays to be aware of the situations where a conventional plug-in is adequate and where a convolution plug-in can really shine. As ever, experimentation is the key, but as a general rule, convolution reverbs are best used on relatively exposed and isolated parts, or on entire mixes if you're working in a genre where a realistic 'setting' is important.

It should be noted that convolution plug-ins are not limited to producing high quality reverb. They can also be used to successfully reproduce the sonic characteristics of certain pieces of vintage equipment, for example. While doing this raises a whole load of legal and ethical questions, it does demonstrate the flexibility of a good quality convolution plug-in. Although it's fair to say that the most practical application of the convolution process is definitely for producing high quality reverbs, there are plenty of other creative uses to be discovered as well.

HOW DO I USE IT?

A convolution reverb plug-in is used in exactly the same way as any other reverb plug-in – either as an insert effect or in a send/return configuration. Due to the CPU-intensive nature of the convolution process, most people tend to place convolution plug-ins in send channels so that they can easily be shared between several input channels at a time.

Convolution reverbs share many controls with their conventional counterparts (wet/dry mix, decay, colour or EQ, etc). Basic convolution plug-ins can actually be less flexible than their standard counterparts, but then again, you always have the option of picking a different impulse response to work with if the correct sound cannot be obtained.

Many convolution reverbs introduce a significant delay into the audio chain in which they're placed. This is a necessary evil of certain implementations (some high-end products can minimise this at the expense of additional CPU load). If your favourite host does not have PDC, you can work around this problem by using a plug-in that's capable of delaying the signal by a specified number of samples.

Because of the inherent delay that they introduce, convolution plug-ins are less suited to being used for live effects monitoring – for example, you wouldn't use one if you wanted to give a vocalist some wet feedback during a recording take.

FIVE TO TRY...

Space Designer
www.apple.com

Voxengo Pristine Space
www.voxengo.com

Prosoniq Rayverb
www.prosoniq.com

Waves IR-1
www.waves.com

Elevayta Convo Boy
www.elevayta.com

STEP BY STEP Using SIR to add ambience to a sound

1 Program a simple loop with a percussive sound to give some feedback while you set up the plug-in. Load the SIR convolution reverb plug-in (**www.knufinke.de/sir**) into the first effect slot of the master channel. »

2 Download the example impulses from **www.knufinke.de/sir/download.html** and extract them to your desktop. Click the **Open** button at the top right of the SIR user interface and select the **Cathedral** impulse. »

3 Press play to hear the plug-in in action. Reduce the **Wet** slider to -12dB and shape the decay by setting the **Envelope** slider to 80% (note the visual feedback on the display). Use the EQ curve at the bottom left to roll off the high and low ends of the reverb (as shown).