

CHAPTER 1

WELCOME!

Thank you for joining Acustica Audio and purchasing this product.

Nebula3 is shipped with an extensive library of programs, which we hope you will enjoy.

To find out more about Nebula 3 beyond the contents of this guide, please visit our website, which is located at www.acusticaudio.net.

If interested, or if you have questions on our products, join our forum or send an e-mail to info@acusticaudio.com

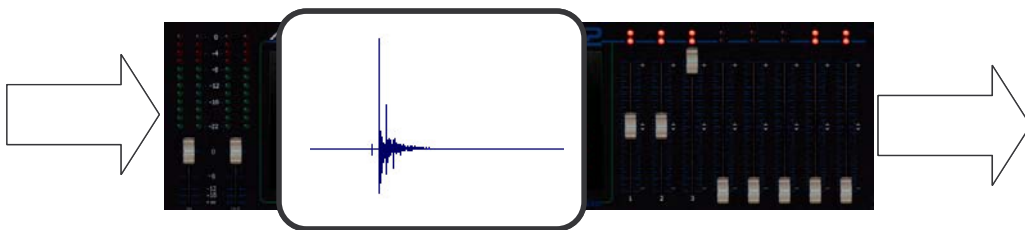
A LITTLE OVERVIEW

Nebula is essentially a sophisticated fx processor.

We have tried to keep things simple, because we felt it was not useful for the musician or the mixer engineer if things are too complicated. It is possible to operate Nebula3 with a minimum amount of knowledge, however there are some more advanced options and parameters that enable a variety of changes to be made to the way in which the Nebula engine operate.

Please follow the addendum-note contained within this guide, as it demonstrates how to use the shipped programs in the best way possible.

A simple fx processor is the basic convolver:



A target system (for example a reverb processor) is excited by a test tone and its outputs are sampled. Through a process called “deconvolution” the final impulse response is calculated. The impulse can now be loaded within the convolver. After loading the impulse into the convolver (the fx processor) it is able to behave ‘like’ the target system.

In this case the results are pretty good, as long as the system is linear in nature. The method is not suitable for modelling distortion though. Why? Because there is an inherent limitation within impulse responses that prevents this.

From a conceptual view convolution can be viewed as being a static process, which is somewhat analogous to the concept of taking photographs. A static photograph can be considered to be a clean “snapshot” of reality, an abstraction of sorts. Similarly speaking a basic impulse capture is similar in nature that it is a static snapshot. Overall it can be said that convolution as implemented by a basic convolver is as much a static representation of a real world system as a photograph is a depiction and perfect model of the real world.

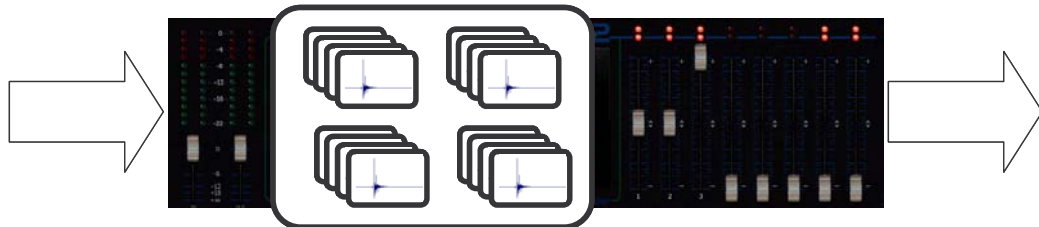
A general theory on distortion was formulated by a mathematician, Volterra, in 1870. According to Volterra, for each harmonic order it is possible to model a "whole system" via the utilisation of a finite number of "kernels". The standard impulse response is simply one of them.

This tells us how to get a "dirty" photo.

Nebula is able to process an high number of kernels at once, through the built-in **Kernel Engine**:

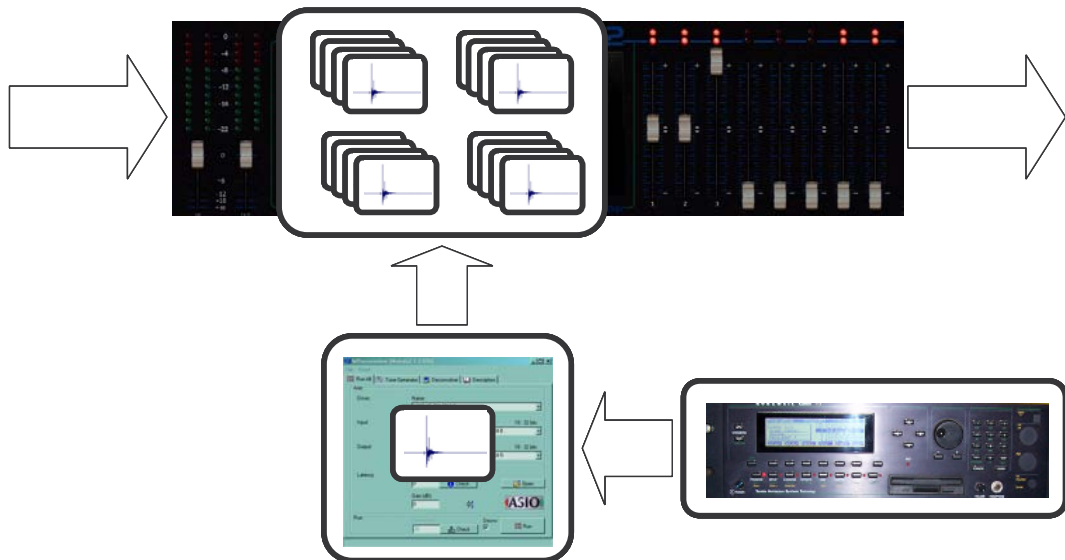


Kernel
engine



It is able to store not only a static copy, but also a dynamic one. For example a time-variant system could be modelled by a large number of kernels, exactly as if you were using a camera for making a movie. An equaliser could be modelled by a photo for each setting (combinations of frequency, gain, q) and so on. A cyclic time-variant fx like a flanger could be modelled sampling it and looping its kernels. Further, Nebula is particularly good for "guessing" the missing photographic "frames", resulting in perfect fluid animation.

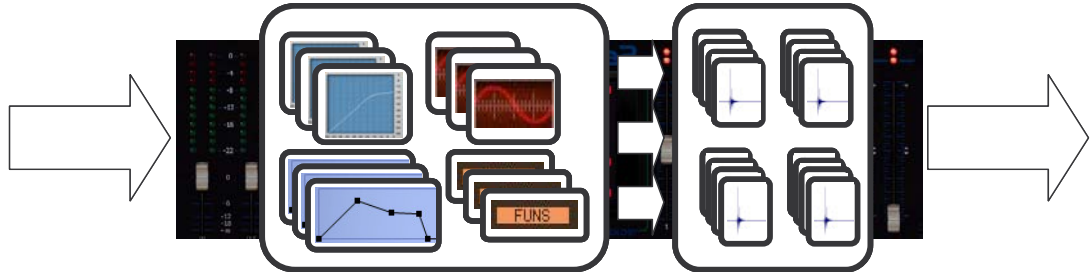
Instead of a photographic camera, here you need a computer standalone application called "NebulaSampler":





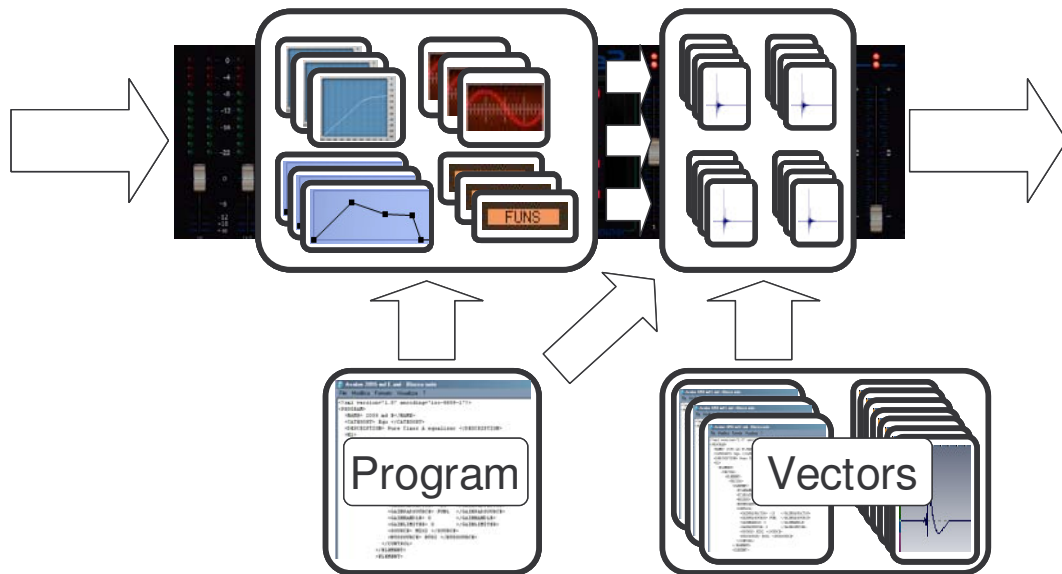
It's like a sampler, but it samples the behaviour of the system.
Finally, the Kernel Engine is controlled by the **Vectorial Engine**:

*Vectorial
engine*



The Vectorial Engine is a purely a control mechanism; it doesn't produce a single audio waveform. Inside it you'll find the same modules you could find inside a synthesizer: LFOs, envelopes, signal compressors, functions.

The final structure is shown below:



Nebula parses plain xml files (files you could open with an internet browser or a text editor) and waveforms. The main xml file is called **Program File**, remaining files are organized in a directory-like structure called **Kernel Vectors** or **Vector Folder**.