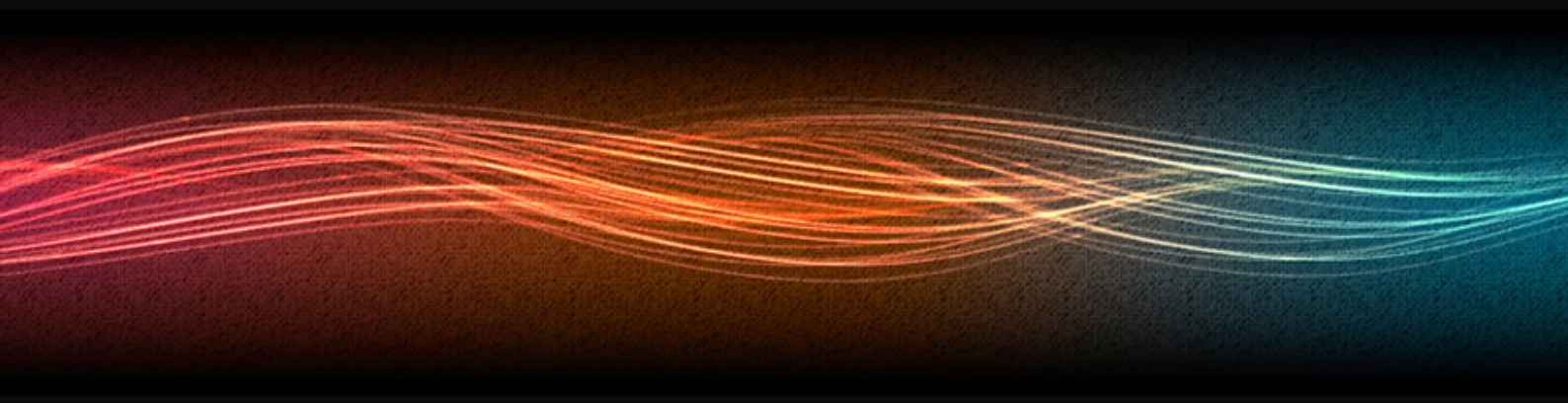
SAMPLECRAZE



THE ART OF DRUM LAYERING

THE DEFINITIVE GUIDE FOR BEAT MAKERS

WRITTEN BY EDDIE BAZIL

Art of Drum Layering: Demo Chapter

This is an excerpt taken from Eddie Bazil's book, '**Art of Drum Layering'**. To download the complete book with all audio examples, please go to:

http://www.mpc-samples.com/product.php/56/the-art-of-drum-layering/

Art of Drum Layering (Second Edition) - Contents

The Art of Drum Layering (second edition)

This book is divided into two sections: Beginner and Advanced.

I decided to split this book into two halves because it made perfect sense to allow beginners to get to master the rudimentary techniques and theories involved in layering drum sounds and then to progress to more advanced techniques using dynamics, multi track layering and so on.

As with all my books and tutorials the premise is frequency based. In other words to understand sound and how to manipulate it you need to understand what the characteristics of sound are and how sound travels in a given space.
Whereas this book is not about mixing, and therefore how sound travels could be seen as a moot subject, it is essential to understand how sound is translated in a mix context and therefore very relevant when it comes to layering sounds particularly if in a drum beat scenario whereby we are actually mixing drum sounds to create the resultant beat.

The object of all my books is to afford the reader a three pronged attack on the way the information/content is presented: text, audio and visual examples have been shown to be the most effective method in translating information across, at least for me. I have always had a better chance of understanding and remembering a principle if it is presented to me this way.
The first part of this book will concentrate on structuring projects, understanding frequencies, understanding how to manage frequencies with the tools available in audio editors, the dynamics of sound and its composites and, finally, examples of layering techniques for different drum sounds and in unison (drum loops/beats).
The second part of this book will concentrate on dynamics and how to use them when layering drum sounds. There will also be a section on stems and the tree structure and finally there will be the usual assortment of project examples.

Each stage of this book will have in depth audio and visual accompaniments and I hope they will go a long way in abating confusion when dealing with so many theories and techniques.

My primary audio editing software is Sound Forge 9. Please migrate the tools and procedures across to your own audio editor.

I would like to thank you in purchasing this book and hope the content will justify your expenditure.

Many thanks!

Eddie Bazil (Zukan)

6. Layering Entire and Complete Waveforms

The most common method of layering drum sounds is that of layering entire waveforms.

In the days of memory restricted hardware samplers sound designers would treat each layer as a voice and edit each voice as we have done in the previous chapter. In other words, using ADSR reshapes and cut and paste techniques to shape each layer to complement each other.
With the lack of editing skills that so many possess today and the sheer volume of readymade sample libraries available to all the art of layering has ended up as a long lost skill. Most people now search for a drum sound they like, find another one and so on and then try to layer them all as one single resultant layer. They then try to shape the resultant layer with EQ and compression.
Before we jump into some examples I feel it is important to point out the two main shortcomings associated with this particular technique.
The first is frequency related and includes clashing, summing and masking.
The second deals with the timeline and size of the waveform.

Layering Frequencies

When layering drum sounds it is often with the intent of using certain frequencies from one sound that are appealing and layering those frequencies with the frequencies of another sound that are also appealing. However, when these frequencies are not separated and are simply layered one on top the other then a number of anomalies will appear.

Clashing: this occurs when certain frequencies from source layers do not marry well or complement each other to form a harmonic resultant layer. They end up sounding 'wrong'. This is called clashing, i.e. frequencies that sound out of place when used together. This can reveal itself in the form of noise, frequency mush, phase etc.
You often hear this term used when certain sounds in a mix simply do not sit together well.

Summing: when two shared (the same) frequencies (from different layers) of the same gain value are layered you invariably get a boost at that particular frequency. This form of summing can be good if intended or it can imbalance a layer and make certain frequencies stand out that were not intended to be prominent.
A good way around this problem is to leave ample headroom in each waveform file so that when two or more files are summed they do not exceed the ceiling and clip.

*In terms of an audio signal, **headroom** is the difference between the maximum signal level and the maximum limit of its environment/device*.

In the digital domain we know that the ceiling is 0 dBFS, and anything beyond this incurs digital clipping.
When using extracted ADSR components the headroom is not affected as much as entire waveform layering simply because each component is already at a pre determined level and placed at different timeline location in the resultant waveform. However, as ADSR components often overlap it is still important to take into account the headroom available and not to eat into it too much.

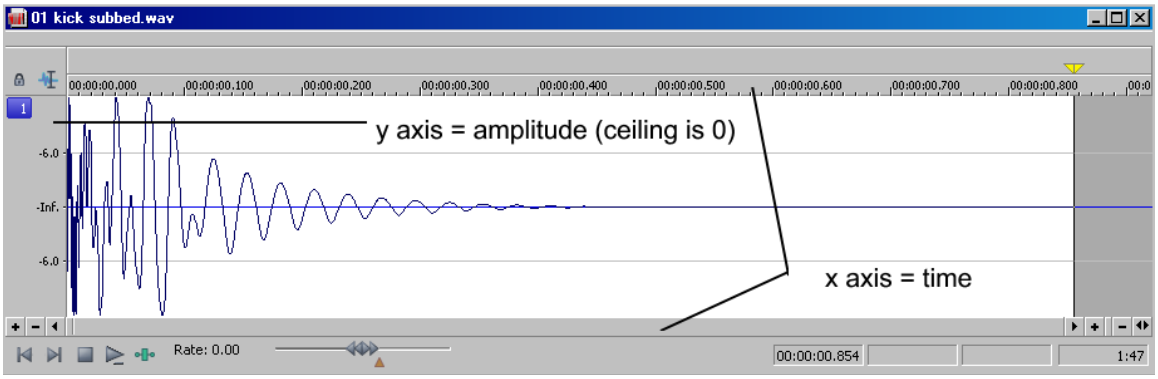
Additionally, ample headroom is required when we come to applying dynamics to a waveform. Dynamics, by their very nature, control gains and invariably are used to boost levels (compression, EQ etc). Any form of a gain boost will eat into the headroom.

Masking: when two shared frequencies are layered and one has a higher gain value than the other then it can 'hide' or 'mask' the lower gain value frequency.
How many times have you used a sound that on its own sounds excellent, but gets swallowed up when placed alongside another sound? This happens because the two sounds have very similar frequencies and one is at a higher gain; hence one 'masks', or hides, the other sound. This results in the masked sound sounding dull, or just simply unheard. A common example, in a mix context, is when a high range piano sound might be masked by a high range string sound. The same problem applies when layering drum sounds. The sustain (body) of one waveform might dominate and mask the body of another waveform when layered together.
Sensible use of filters and dynamics with a good understanding of gain management usually resolves this problem. We will come to this later in this book as dynamics and effects have a pronounced effect on frequencies and gain values.

Timeline and Size of Waveforms

Every waveform is measured as amplitude by time. In other words, when looking at any of the examples used in this book you will see that a waveform is represented as time across the x axis and amplitude across the y axis (**Fig 6**).

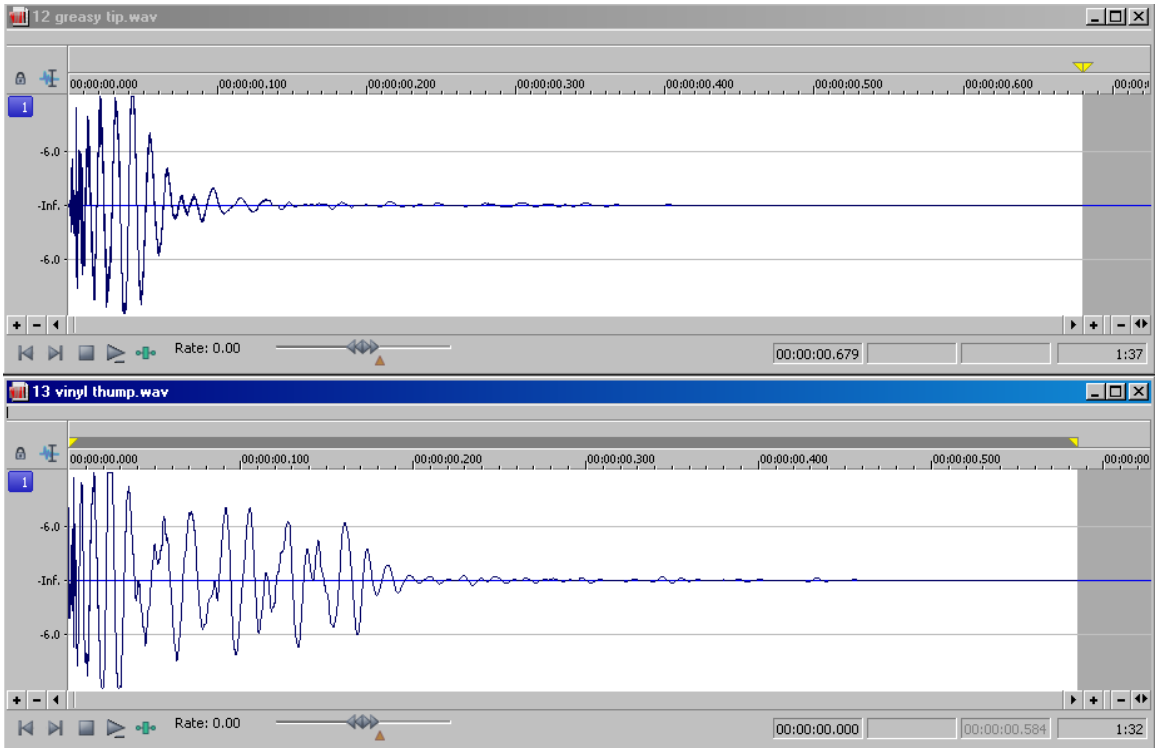
Fig 6 shows the x and y axis displaying time and amplitude.



The 'length' of the waveform is displayed horizontally from left to right and the amplitude is measured vertically.
Amplitude we have already covered in terms of headroom but even more important is the wavelength.
When layering two waveforms the time factor becomes crucial as varying lengths will exhibit a mismatched resultant layer.

The best way to explain this problem is with an example.

Fig 6.1 shows two waveforms with different wavelengths.

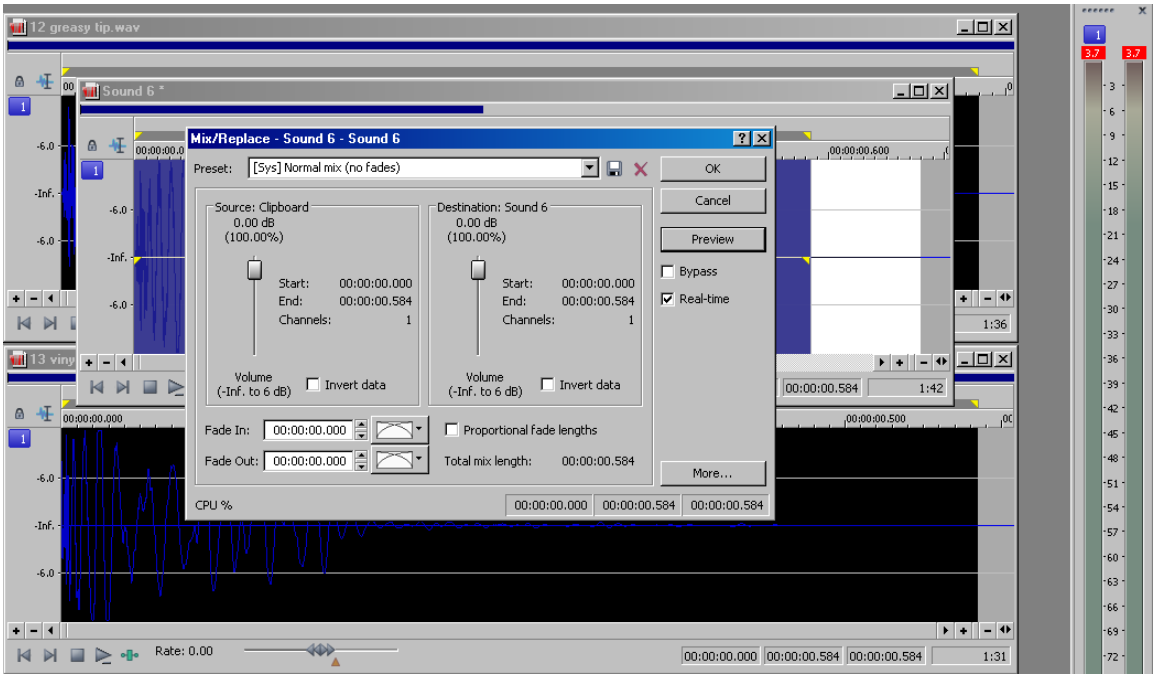


12 greasy tip
13 vinyl thump

If you look across the x axis you will notice that both waveforms have different wavelengths. They both exhibit different ADSR components as well.

By layering both waveforms, complete and as they are, to create a new resultant layer the issue of both time and amplitude comes into consideration.
As both waveforms peak at near to 0 it is easy to deduct that once summed they will exceed the ceiling and clip.
As before please create a third envelope so that the two waveforms can be mixed and summed into it to create the resultant layer.
By using the menu options Edit – Paste Special – Mix the waveforms can be mixed to a new resultant layer. Please take a careful look at the meter readout in **Fig 6.2** which clearly shows exceeded gain values of the two summed waveforms.

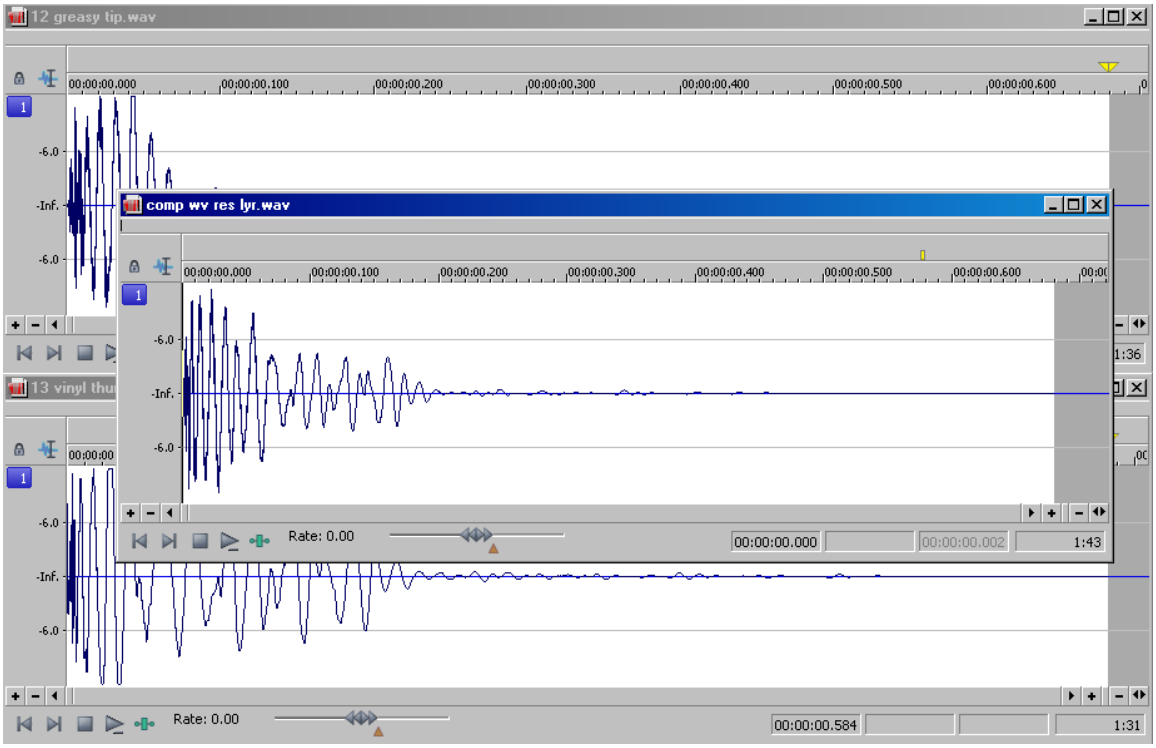
Fig 6.2 shows the Mix tool and the meter readout.



The Mix tool allows for the gain value of each waveform to be adjusted so that when summed they will be below the ceiling.

To render these two waveforms without exceeding the peak you simply move the source and clipboard gain values until the desired level is attained. I have made sure to keep both waveform gain values identical no matter how much I reduce (attenuate) them.

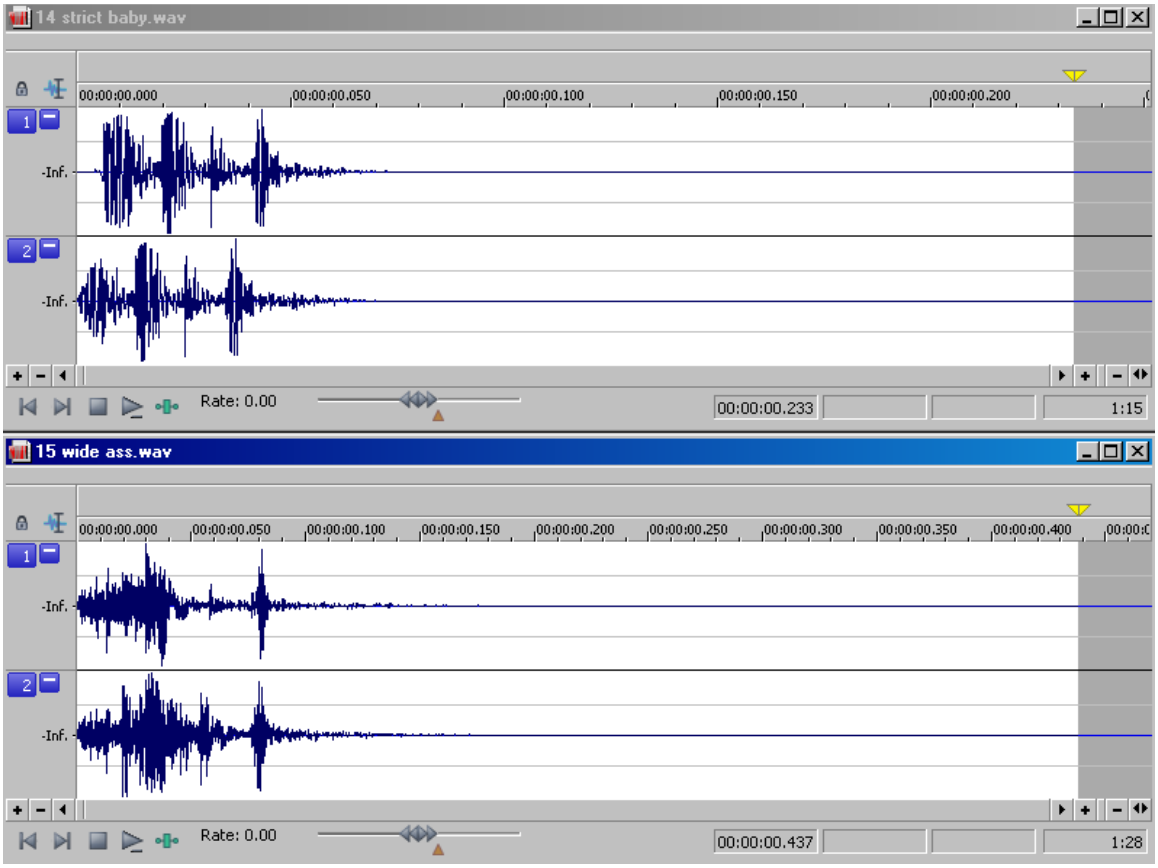
Fig 6.3 shows the two source layers and the resultant layer.



16 comp wv res lyr

The following example will concentrate on masking and for this we will use two clap waveforms that are very different in terms of time and frequency content. However, one of the waveforms shares a lot of the frequencies with the other and when mixed will be almost inaudible.

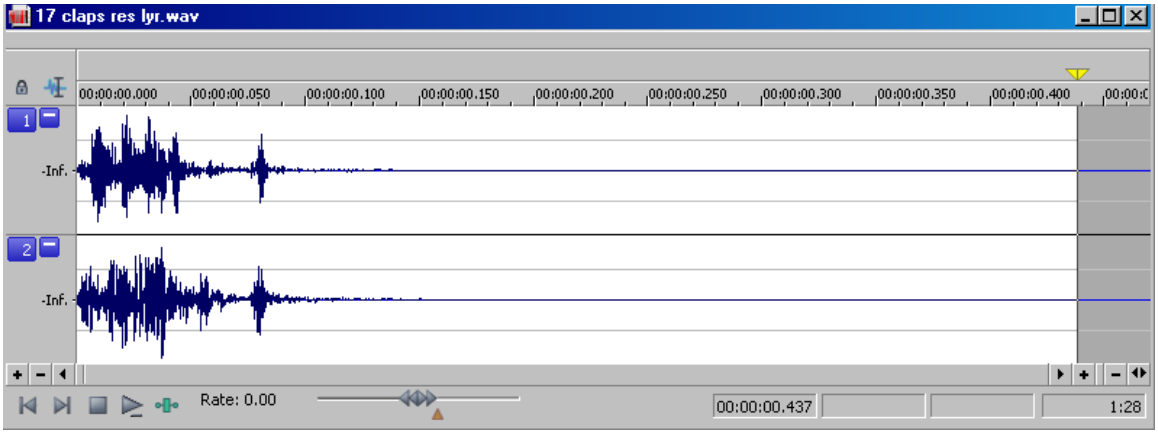
Fig 6.4 shows both waveforms. Please note the differences in the wavelengths.



14 strict baby
15 wide ass

Using the same Mix tool and adjusting the gain values equally the resultant layer will clearly display what masking is.

Fig 6.5 exhibits masking.



17 claps res lyr

The resultant layer looks completely different to both waveforms but sounds very much like **15 wide ass** because **15 wide ass** has masked **14 strict baby**.

Layering entire waveforms can be a very useful process so long as one of the waveforms exhibits different sonic qualities. In the event that the same waveform is layered with a copy of itself, as some people like to do, then it is helpful to understand what actually takes place.

When the same sound is layered onto itself the gain values are summed and it is a misconception to assume that frequencies are added to or subtracted from. One of two things happens: the gain values are summed if both waveforms are used with equal peak values or one waveform is masked if the gain value is lower at the layering stage.
The real power, when layering the same waveform onto itself, is when the sonic characteristics of one of the waveforms are altered either via an ADSR reshape, or via a dynamic process which we will cover later in detail. However, for now, I would like to show you a quick example of this using a simple filter to change the frequency content of one of the layers and then to use the Mix tool to create a resultant layer.

Fig **6.6** shows the same waveform copied with the Blue Filter being applied to one of the layers.

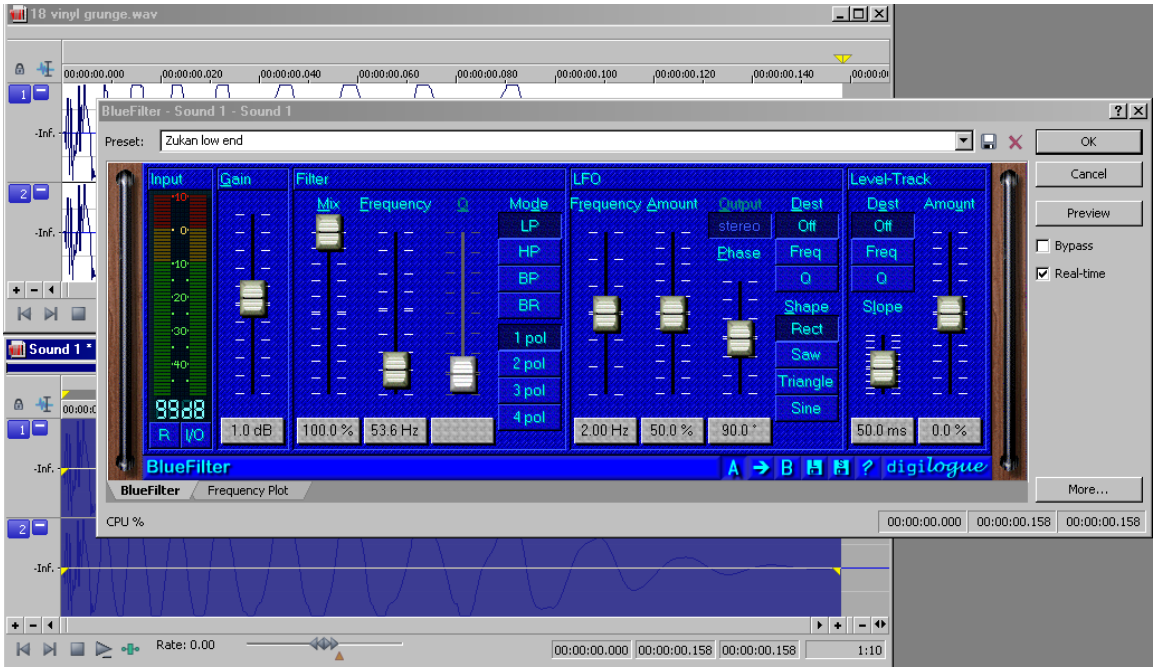
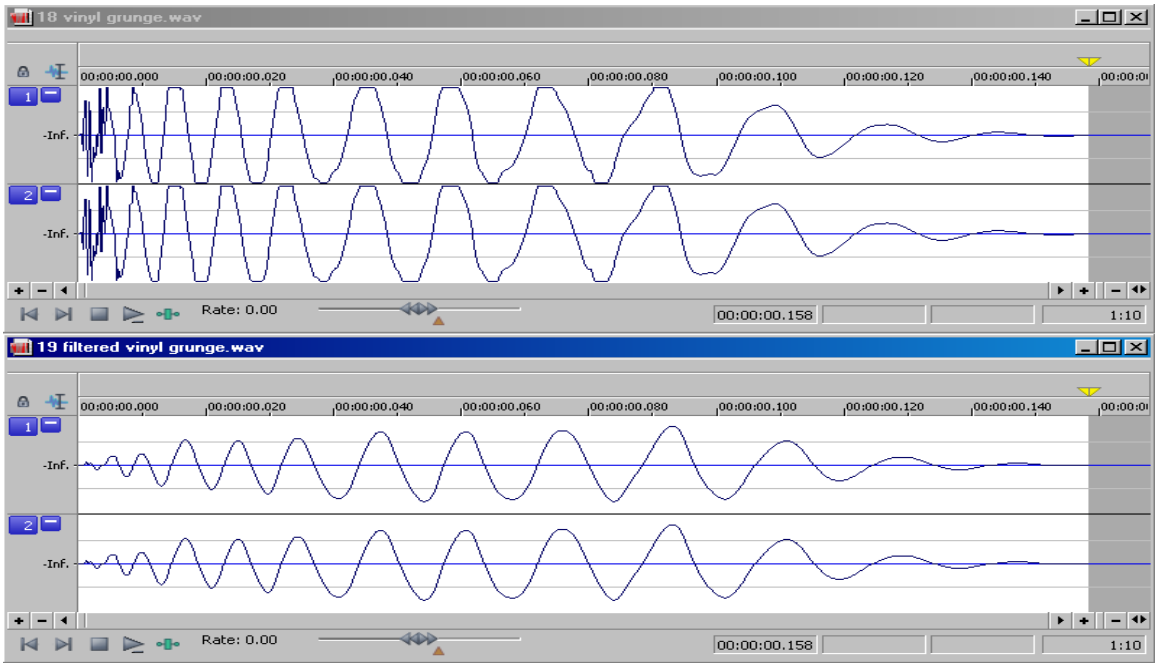


Fig 6.7 shows the original unaltered layer and the copy layer that has been filtered.



18 vinyl grunge

19 filtered vinyl grunge

And by creating a third envelope and using the Mix tool it becomes easy to vary the gain values and create a new sonic waveform as the resultant layer.

Fig 6.8 shows the two waveforms (one copied) and the Mix tool with the varying gain values.

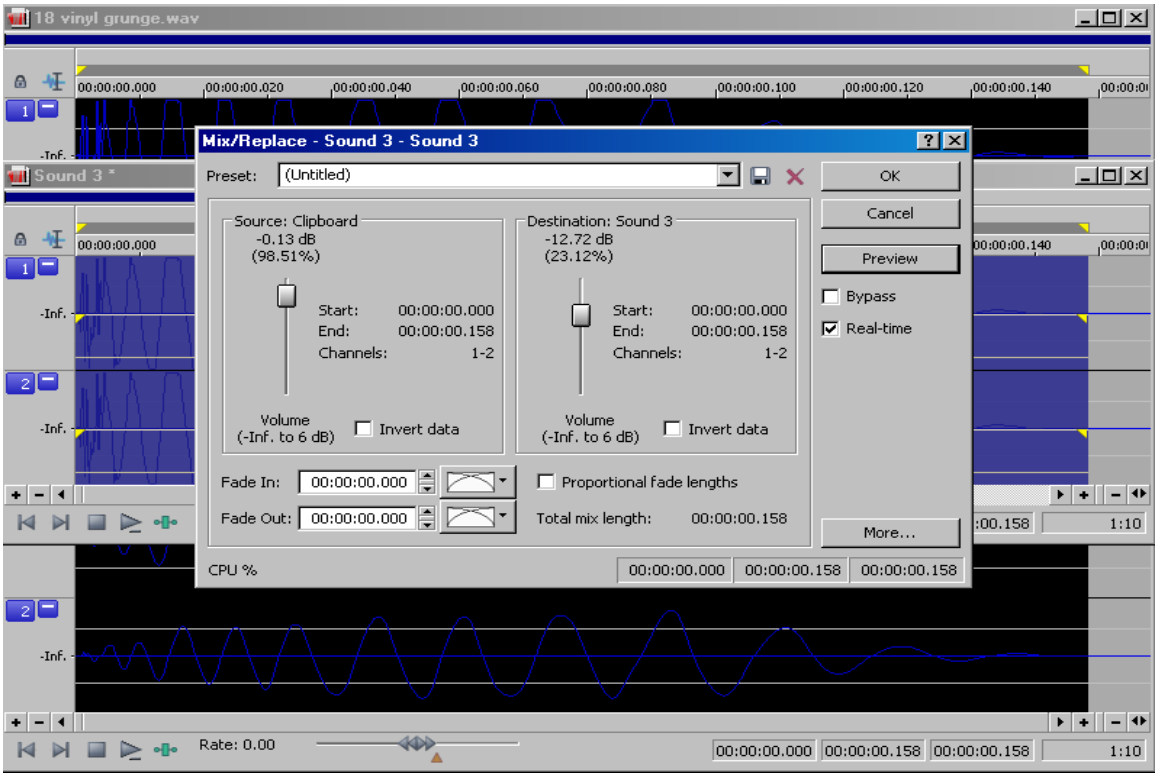
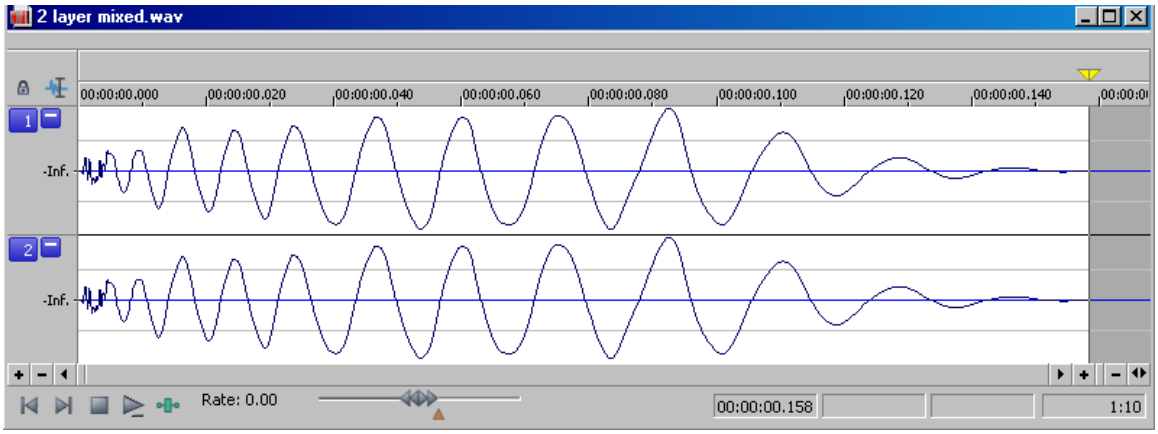


Fig 6.9 shows the resultant layer.



2 layer mixed

Later on in this book, when we explore dynamics and effects, I will go into far more detail and provide more working examples.

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