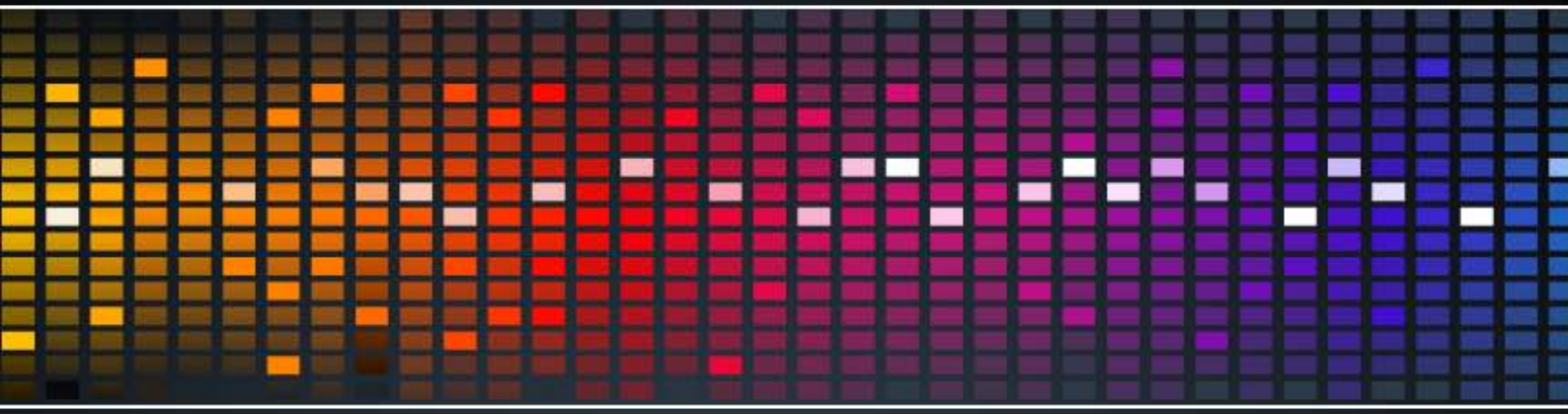
THE PRODUCTION SUITE SERIES



CREATIVE EFFECTS:

THE DEFINITIVE GUIDE FOR PRODUCERS

WRITTEN BY EDDIE BAZIL

Creative Effects: Demo Chapter

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

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Table of Contents

INTRODUCTION 4

CHAPTER 1 – REVERB 7

CHAPTER 2 – MODULATORS 47

CHAPTER 3 – DELAY 59

CHAPTER 4 – CHORUS 82

CHAPTER 5 - FLANGING AND PHASING 89

CHAPTER 6 – DISTORTION 97

CHAPTER 7 – FILTERS 126

CHAPTER 8 - PITCH MANIPULATION 154

CHAPTER 9 - CREATIVE EFFECTS 168

CHAPTER 10 - FINAL WORD 210

Introduction

I have never been good at writing songs. I can't string more than two words together. I have always envied songwriters and their ability to create poetry through music. I knew from an early age that I would never be a songwriter. BUT, I had an obsessive fascination with sound and, to my surprise; I found that I understood sound and its physics much better than words and their relationships to each other. The motion and effect of a sound was as moving for me as a whole song. The ability to take a single sound and treat it so it moved dynamically, much as a song does, and to have it evoke an emotion was exciting for me.

I decided, from an early age, that I would explore sound and try to acquire the skills to shape it. This led to countless sleepless nights studying sound and its physical properties, trying to find a happy medium between data and creativity. I decided to program as many synthesizers as I could for other people just to get the experience of manipulating sound. It soon dawned on me that there are three types of sound design areas: replicating, colouring and warping. Replicating involves replicating an existing sound like programming a horn sound on a synthesizer or sampling and designing a piano preset.

Colouring involves using a replicated sound and creating variations of it but in a more creative manner thus giving rise to a new version of the same sound that still falls within the parameters of a replicated sound but with a new twist in representing it. Warping involves creating a completely new sound that doesn't fall under the replication criteria but can use the replicated sound as a source. This involves total reshaping into a new texture and one that evokes a specific emotion. Whereas the replicated sound is about recreating an existing sound, warping is about twisting it into a new and detached sound.

All forms of sound design start at the waveform stage whether sample based or pure. But reshaping, colouring, mangling, or warping an existing sound involves the use of dynamics and effects and how the modulation matrix can best make use of existing synthetic design tools. Of course, we can mangle a sound within the modulation matrix using the basic tools that come with the synthesizer but that can be limited and too specific. It is the area of effects that opens up the world of sonic mangling and if the effects can then be modulated and routed within a matrix then a whole new world of sound design opens up and you are limited only by your imagination. It doesn't end there. Sonic mangling is one thing but creative production is another ballgame entirely and this is heavily reliant on effects and dynamics not just for corrective tasks but for creative ones as well.

An integral part of mixing and production is the area devoted to effects.

Effects are used not only to colour sound, but to create an aural illusion. How this is achieved is dependent on the effect being used. But before we can delve into the wondrous world of effects we need to define what an effect is.

What is an effect?

An effect is a 'process or device' that adds to an untreated/dry signal by a user defined amount, whereas a 'signal processor' treats the whole signal and does not add to it. In the old days of patching analogue mixers the auxiliaries were used for effects like reverb etc and the inserts were used for processors such as compression. The distinction, in terms of processing, is quite obvious. The device, let us take reverb as an example, adds to the dry signal and outputs the mix of both dry and wet signals whereas the compressor treats and processes the entire signal and outputs the result. Even in today's DAWs (digital audio workstations) this form of 'patching' still exists and is commonly used.

You may think that I am being a little pedantic here but in today's diverse world of audio technology, terminology and description can often be confusing and general. Additionally, a number of manufacturers have taken it upon themselves to 'rename' conventional terminology in favour of sounding 'hip and now'. Sadly, this makes it a nightmare for tutors to stick to a standard and it can get extremely confusing trying to reference new terminology against old and to decipher today's manuals. To add to the headache most manufacturers now include additional non conventional features into their products to give added value and not outgun the competition.

Effects are excellent sculpting tools and a number of genres today have made their mark because of the type of effects used within the genre.

Trance would be a good example of the use of delays and reverbs. Distortion is prevalent in the Rock genres etc. Effects can be used globally on the whole mix, or individually on single tracks or events, or as a combination of both.

Effects can be used creatively to evoke an emotion, or, for example, correctively to encompass space where space is lacking. In the former, a big reverb on strings can result in the strings sounding huge and warm, or bright and exploding. In the latter, sensible use of reverb can add space to a certain sound in a mix that sounds too dry compared to the surrounding instruments that may have been recorded with space.

Chaining effects can lead to dramatic results. One effect feeding into another and so on is a great way to enrich a sound and make it evolve. The effects can run in series whereby one effect feeds or morphs into another or in parallel so that more than one effect is running at the same time. However, soft and subtle use of effects can result in track strengthening qualities. Using a chorus on a bass sound can thicken the bass. Adding a slight amount of delay to vocals can make the vocals sound fuller and deeper.

It is limitless what can be achieved with effects. You are only limited by your imagination, and of course, which tools you use. Understanding how best to utilize an effect is reliant on understanding the mechanics of the effect, what it does and how it works, and in what quantities to use it for optimum results.

This book has been written to demystify and simplify the obstacles contained above and to offer the reader a thorough, yet basic, approach to both understanding and utilising effects. Wherever possible audio and visual examples have been provided in example and exercise formats. I have found, through years of teaching, that theory coupled with audio/visual exercises is the best approach to understanding how a process works. Using different devices with different parameters and terminology is only best impressed when used in conjunction with screen captures and before and after audio files.

I sincerely hope that after you have meandered through this book you will have a good grounding and a basic understanding of how effects work and how to get the best out of them. But more than anything, I hope you can share some of the obsessive passion I have for using effects to change a sound and that at some point this becomes a fun and creative process that will give you a new outlook on sound.

Using This Book

Throughout the book I will often ask you to listen to specific audio files; these will be highlighted in red along with a speaker icon:

 **audio file.wav**

All audio files can be found in the associated folder for the chapter you are reading.

Additionally, have included hi-resolution copies of all screenshots found within the book, found in the related 'Images' folder for each chapter.

Thank you and I hope you enjoy the book.

Eddie Bazil

Chapter 5 - Flanging and Phasing

Flanging

A flanger is another modulation effect whereby the delayed signal, which is added back to an equal amount of the dry signal, is modulated by using a LFO. If you add the output back into the input (feedback) you get resonance with the **comb-filter** effect.

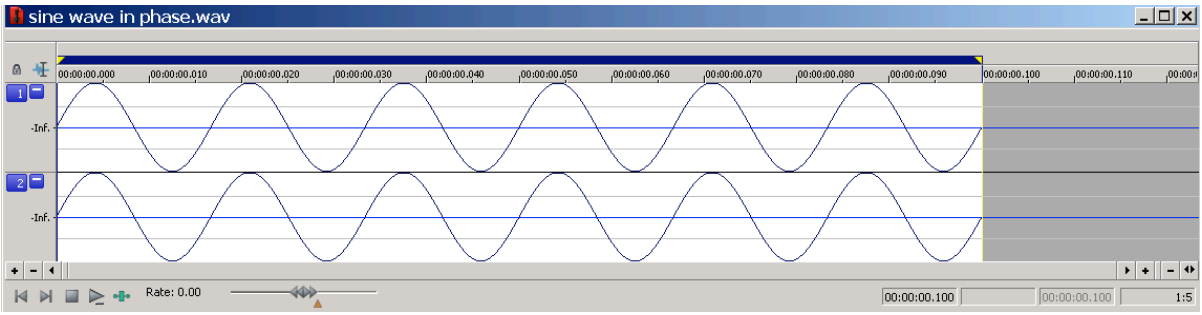
Comb-filtering occurs when the delayed signal is combined with the dry direct signal. The comb filter creates peaks and troughs in the frequency response. If the polarity of the dry signal is the same as the delayed signal we call this **positive flanging** and if the polarity of the delayed signal is opposite to the polarity of the dry signal we call this **negative flanging**.

If the feedback is greater then you get what we call **resonant flanging**. The more feedback applied the more resonant the effect. This is a bit like increasing the resonance on a normal filter.

Feedback also has **phase.** If the feedback is in phase then it is called **positive phase**. If the feedback is out of phase it is called **negative feedback.** Negative feedback has odd harmonics whereas positive feedback has even harmonics. Some flangers will have a phase parameter to control the negative and positive phase and this has quite a dramatic effect on the overall effect. The best way of explaining this is using examples. Additionally, the phase controls can also alter the degree rates and therefore have a dramatic impact on the way the effect is output.

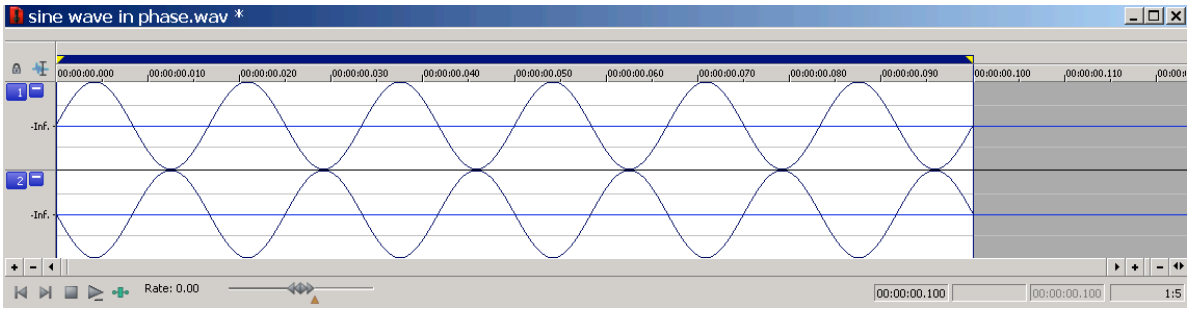
Phase occurs when two signal are time shifted. In other words, one signal will be offset by a specific amount to another. Basically, the phase is the progression along the cycle of the waveform determined as degrees. A 360 degree phase is one complete cycle of a waveform where 0 degrees is the start of the cycle. If two signals are aligned exactly in time and location then they are deemed to be **in phase**. If they are not then they are deemed to be **out of phase.**

Short of going into an epic debate about the subject of phase it is probably best to explain what happens when signals are either in or out of phase. I will use a basic sine wave in stereo and then show you what happens when it is in phase and then 180 degrees out of phase (**total phase cancellation**).

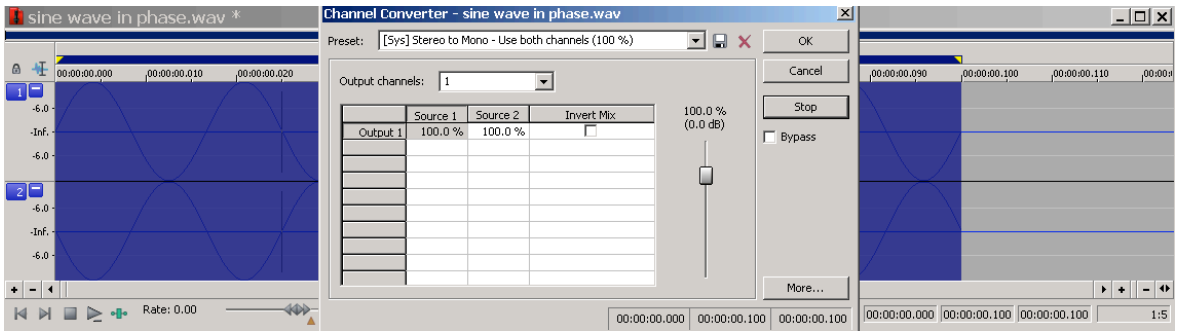


sine wave in phase.wav

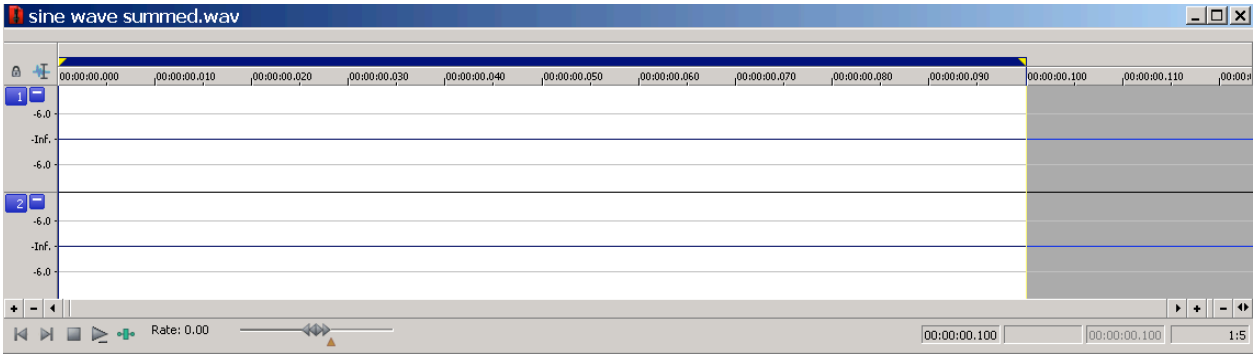
Both sine waves are in phase and aligned perfectly.



By moving the other sine wave by 180 degrees (inverting), which is halfway along the cycle, we are able to see what happens when they are summed. This waveform is now 180 degrees out of phase. That means it has moved 180 degrees (upside down or inverted). In other words the peaks of the cycle coincide identically with the troughs of the other cycle. If I now sum these two channels to one mono output I should get silence (cancel out). This is called **total phase cancellation**.



Once the channels are summed you get the following; total phase cancellation.



sine wave summed.wav

Because total phase cancellation has taken place the result is simply silence.

If you vary the amount of phase by degrees you get partial phase cancellation and so on whereby some frequencies are cancelled. This teaches us what happens with phase and how varying amounts of it affect the result. In terms of using phase in effects the results can be honed to taste depending on how much and what type (positive/negative) are used.

One of the simplest and best flanger vsts is the Blue Flanger as it has a dedicated Phase switch which at normal is positive and at inverted is negative. Positive phase will impart a more metallic effect whereas negative (inverted) phase will hollow out the sound and make it thin. Additionally, the amount of phase can be altered to provide different textures to the effect. The modulation is controlled by a LFO which can be set, in the case of the Blue Flanger, to be either a sine waveform shape or a triangle waveform shape. This may all sound a bit confusing but with the following examples I am hoping things will become much clearer.

drum beat2 dry.wav

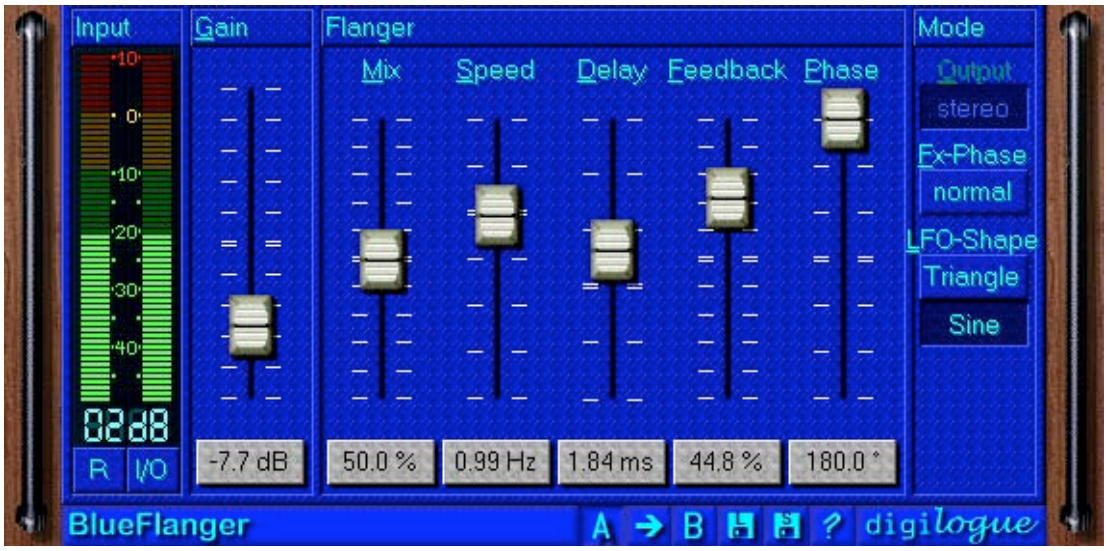
drum beat2 blue flange normal phase.wav

This is a basic example of using a flanger with a 50 wet/dry mix, heavy feedback so at to accentuate the effect but keeping the phase both normal and at 0 degrees. If you consider that 180 degree phase is total cancellation then 0 degrees denotes in phase. If I now invert the phase to a negative phase then you will hear the hollow type of effect discussed earlier.

drum beat2 blue flange inverted phase.wav

The flange effect is almost abated and the kick has hollowed out considerably.

Let us go for a heavy flange effect using the same drum line.



drum beat2 blue heavy flange.wav

Using a faster speed for the modulator, which I have changed to a LFO sine

wave shape, normal phase but at 180 degrees I am able to create the well known but heavy flange effect.

Finally, let us use the Kjaerhus Flanger to create a dynamic flange effect over time.

drum beat2 kjaer crazy flange.wav

This effect has been created by using maximum depth and delay time variances but keeping a wet/dry mix at 50%. As this is a dedicated flanger vst the modulation is set and the timing variances are governed by the delay time and rate.

Phasing

Phasing behaves in much the same way as chorus and flanging but with shorter delay times and the effect itself is far more subtle. Because phasing works with shorter delay times than chorus and flanging the impression is that there is only one sound as opposed to two distinct sounds and because the LFO modulates frequencies (peaks and trough, also known as notches) the filtering effect is quite pleasing.

Unlike flangers which use delay lines phasers use all pass **networks/stages** which are all pass filters and by adjusting the frequencies, and phase, of the stages different phase effects can be created. By going back to the principles of phase earlier in this chapter we can then see how certain frequencies cancel each other out and therefore create different textures.

Phasers can be used to add swirls to sounds or to completely maul a sound into something else. Because it is a subtle effect it doesn't mean you can't extreme it for sound design purposes. As with all effects and dynamics it is up to the individual to explore and experiment.

Let us start with a nice but static pad sound:

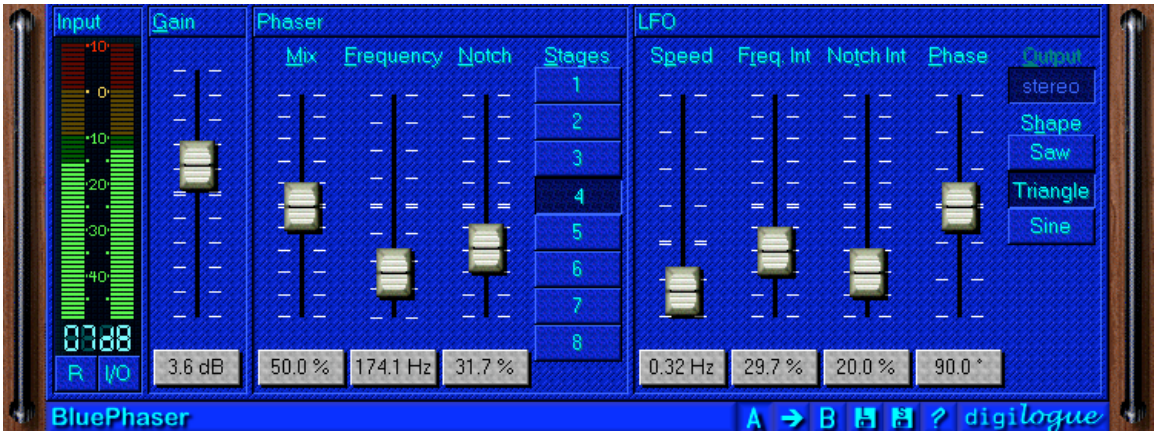
pad dry.wav

We can now add dynamic movement to the pad sound simply by applying the phaser.

pad phaser.wav

Using 10 stages, very little feedback and low rate we can emulate movement across the pad sound simply by altering the phase of the stages and processing the phase relationships.

We can also move the effect across the stereo field by selecting the right frequencies, notches and modulating using the LFO and in this instance set to a triangle shape waveform. By using fewer stages the sound is not as dense and evolving and comes across as far more subtle.



pad phaser movement.wav

Keeping low frequencies, 4 stages for simplicity and sparser effect and adjusting the notch intervals with a triangle LFO shape waveform we can create a nice movement across the stereo field with a sweet swirling effect.

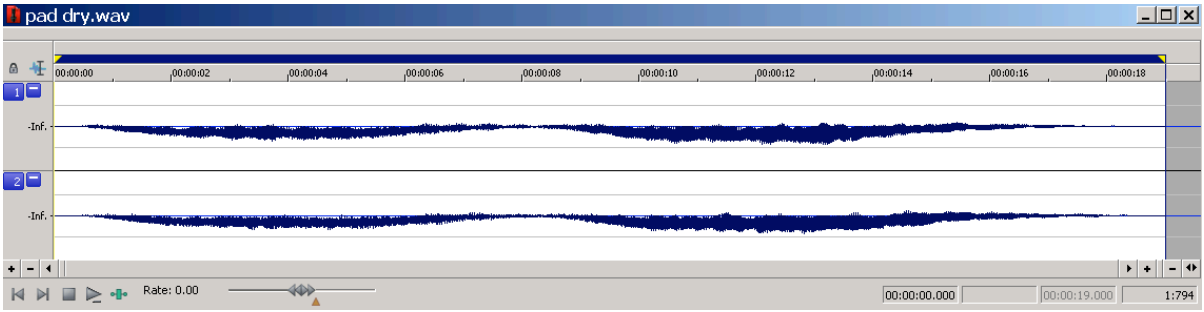
And just for fun let us create a nice little wobble effect using the same pad line.

pad phase wobble.wav

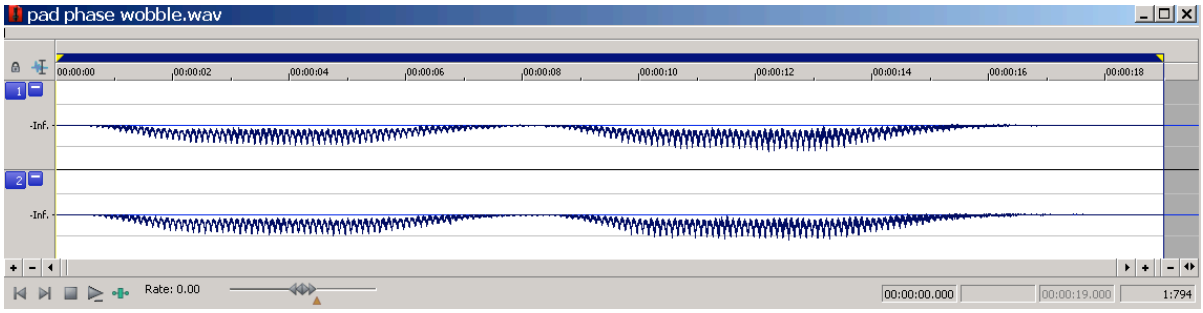
Lowest stage count plus a heavy feedback timed with a high rate gives us this interesting wobble effect. A good way to see what happens in terms of notches

and their intervals is to study the next two images which show the pad sound dry and affected with the settings above.

pad dry waveform



pad wobble waveform



The notches and intervals are clearly visible in the wobble waveform. Of course, this isn't just about the notches but also how the phase is displayed with specific frequencies getting cancelled. The frequency response is very different to the dry version.

Now we can start to have some fun using a keyboard sound:

electric keys dry.wav

electric keys phase weird.wav

Maximum feedback with 4 stages and filter adjustment creates this really nice metallic effect. Let's make the keyboard cry!

electric keys phase cry.wav

If you compare the two images above, one for the weird and the other for the cry, you will notice that the only two parameters that I have adjusted are the stages and filtering frequencies. The effect is a sweet but wailing one.

And finally we will end with an example that displays one of the most common uses for phasing; electric guitar.

tele 2 dry.wav

tele 2 phased

A standard phasing effect that sounds more like tremolo than phasing. I am sure you recognise this effect particularly from the earlier days when guitarists were limited with the types of effects available to them. Low depth, no feedback but a high rate and midway count of stages gives this distinct effect.

Flangers and phasers have many uses in both live and mix environments and although I have a preference for phasers when it comes to washy types of sounds or shimmering effects I do love to abuse the flanger for specific sound design projects, but as with all effects and dynamics, experiment and abuse to taste. However, both of these effects really come alive when used in conjunction with other effects which we will cover in the final chapter.

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