

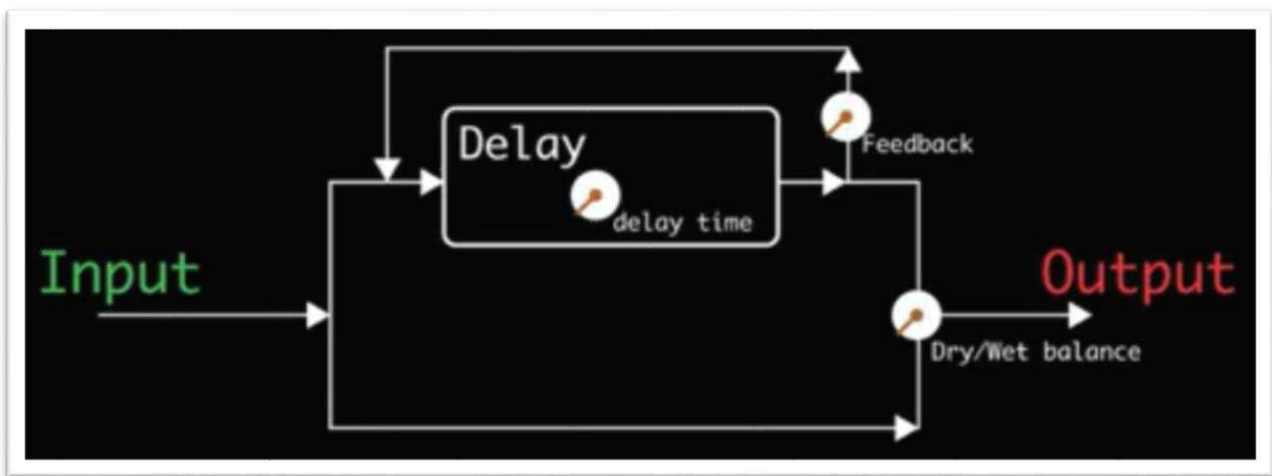
INTRODUCTION TO MUSIC PRODUCTION – WEEK6

FLANGERS & CHORUSES

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The delay effects when added with oscillators can come up with extra-ordinary sound effects that resembles well organized, subtle sound structure for music production.

Modulated short delays works on the principle of phase modulations. Flangers & choruses are almost similar except few differences.

**Parameters to control:**

- ✓ Delay Time - Low values give a jet-like sound whereas high values are metallic. Adjust to taste.
- ✓ LFO (Rate & Depth) - Use low rate settings with higher depths for slow moving sounds. Increase the rate for vibrato effects. Higher depths increase the amount of detuning. Usually the rate and depth settings should be varied inversely.
- ✓ Feedback - Increasing the feedback can give the Flanger a metallic quality as it produces sharp resonances in the frequency response. Note that excessive values can result in marginal stability and may even cause oscillation. Decrease the feedback if this occurs.
- ✓ Dry/Wet sections - Adjusts the delay time of the dry signal. This, in conjunction with the TIME parameter can be used to achieve “Through-Zero Flanging” (TZF). By experimenting with combinations of TIME and DRY DELAY you can achieve wild TZF effects.

1. FLANGERS:

History of Flangers:

Flangers initially were created by feeding the same musical piece to two tape recorders and then combining their delayed outputs while varying the difference between their delay times.

One way of varying the delay between them is to slow down one of the tape recorders by placing the operator's thumb on the flange of the feed reel, which led to the name flanging. A comb filter can be modified to create the flanging effect with the introduction of time-varying delay.

Process flow & function:

This is a phase shift modulation with a non-linear phase response.

A flanger uses a shorter delay time and feeds back some of the effect signal back to the input. A great example of this is in the Doobie Brother's song "Listen to the Music" during the bridge.

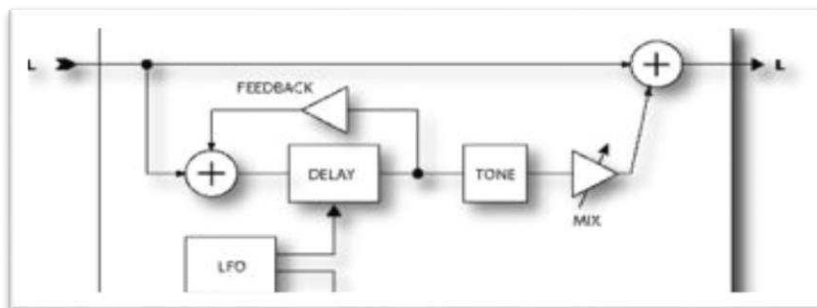


Fig1 Delay based effects model for flanger

Delay time: 0 ms – 15ms (ms: milliseconds)

Other parameters are adjustable based on interests & based on trial-error method.

Flanging effect - songs:

1. *Itchycoo Park* – The Small Faces -
<https://www.youtube.com/watch?v=kPDmnIF8dU>
2. Jimi Hendrix's "Bold as Love" (1967)

2. CHORUSES:

History of Choruses:

The chorus effect is achieved when several musicians are playing the same musical piece at the same time but with small changes in the amplitudes and small timing differences between their sounds. Such an effect can also be created synthetically by a chorus generator from the music of a single musician.

A simple modification of the digital flanger filter leads to a structure that can be employed to simulate this sound effect. Implementing very slow rather long range of delay to flanger can give a chorus effect.

Process flow & function:

A chorus subtly delays the input signal by a varying amount and mixes it with the undelayed signal. The varying delay slightly detunes the signal so the result is one of multiple instruments playing in unison. The Chorus is a stereo chorus. It uses a very computationally demanding algorithm but delivers exceptionally smooth sounding ensemble effects.

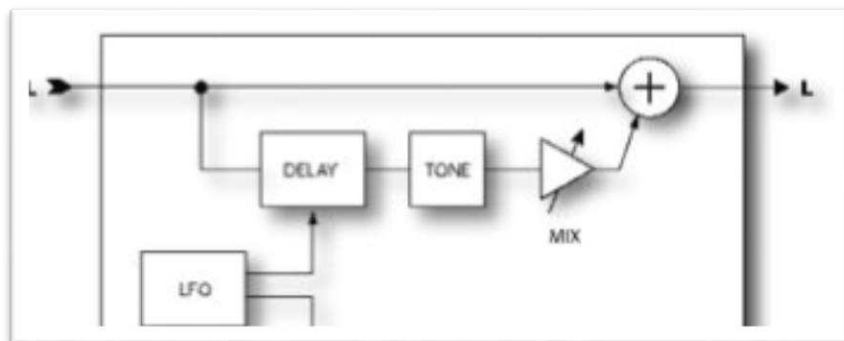


Fig2 Delay based effects model for chorus

Each stereo channel in the chorus can have from one to four voices. Increasing the number of voices increases the fullness of the effect. For classic chorus sounds use two voices (one per side). For thick, full chorus effects use four or more voices

Delay time: 10ms – 25ms (ms: millisecond)

Other parameters are adjustable based on interests & based on trial-error method.

Chorus effect - songs:

1. Satellite Party's "Mr. Sunshine" -
<https://www.youtube.com/watch?v=UsKcPYyu9To>
2. Nirvana's "Come As You Are" (0:00, clearest at 0:52) -
<https://www.youtube.com/watch?v=YqN0ZOE09oI>

ADDITIONAL INFORMATION:

1. Delay effects with their ranges

Effect	Delay Range (ms)
Resonator	0 ... 20
Flanger	0 ... 15
Chorus	10 ... 25
Slapback	25 ... 50
Echo	> 50

Fig3 Difference between the Delay effects

2.Reverb vs. Echo vs. Delay

Delay — can produce a similar effect but there is one very important feature that a simple delay unit will not produce: The rate of arriving reflections changes over time. Delay can only simulate reflections with a fixed time interval.

Echo — implies a distinct, delayed version of a sound, E.g. as you would hear with a delay more than one or two-tenths of a second.

Reverb — each delayed sound wave arrives in such a short period of time that we do not perceive each reflection as a copy of the original sound. Even though we can't discern every reflection, we still hear the effect that the entire series of reflections has.

3. Ordering of effects in a studio environment:

Selection of effects and the ordering is a matter for the sound you wish to create. There is no absolute rule for the ordering.

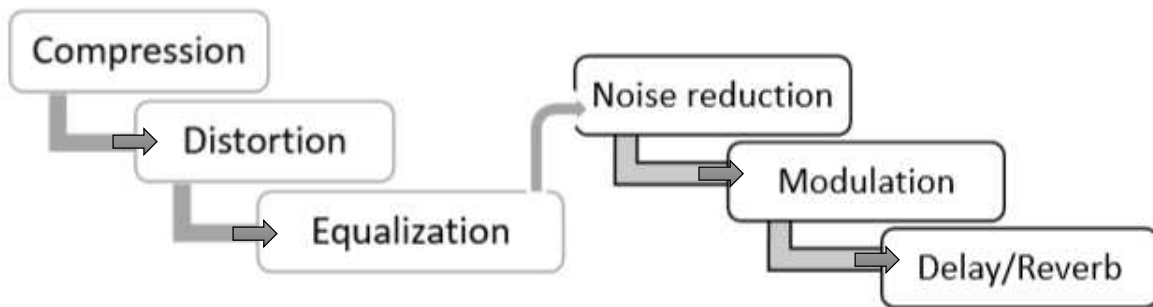


Fig4: The best practice of sequential steps followed by music masters