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"PHASE AND MONO COMPATIBILITY" (SEPT 2009)

NOTE: This article assumes the reader has basic skills when it comes to using DAW's (Digital Audio Workstations) and is familiar with how to setup and operate plug-ins.

Welcome lab techs . . . had the website up for almost a year and I'm just now making time to write an article. Pretty sad, but work, making the music on the site, and just trying to enjoy life keeps me busy. But enough about me, lets get to the info.

When I first started creating music, I didn't know much. Making a song or instrumental was one thing, but actually creating a track that sounded good on multiple pieces of playback equipment was entirely different. One issue that can make your track sound completely different on one setup from another is "Phase Cancellation". If you're not careful, you can create a track that sounds great on your setup, but at your friend's house you can't even hear the cool guitar riff or smooth background vocal.

There are plenty of articles out there that explain exactly what phase cancellation is if you want to learn more. Perform an internet search for "audio phase cancellation" and several articles will pop up. I will give a brief overview of what it is, but this article will focus mainly on techniques I use to spot potential phase issues and tools I use to solve the problem.

We're going to assume your track is finished and you think it sounds great. You play it over and over on your studio monitors and you think it's almost ready for a demo. Before you bounce it to an MP3; though, you should probably check your track for phase problems. Many people call this "checking for mono compatibility." Mono compatibility means that if someone sums your stereo track into a mono signal for use over a mono speaker or playback device, that all (or

most) of the musical characters can still be heard with little alteration. If the sound changes drastically, that means phase cancellation is taking place.

In order to avoid these cancellations, you have to have a keen ear (which I don't) or have tools available that can "show" you where your audio is in relation to each other. One of the tools I use is Flux Stereo Tool ® (available for FREE in VST, RTAS, and AU at www.fluxhome.com)

Figure 1

If you look at the figure, you'll will see several indicators. The circle with the compass-like lines indicate the stereo image in real time. A straight line up and down would indicate a mono signal (in phase). The "L" and "R" labels indicate 45 degrees (at this point you'll start to hear some phase cancelling). The horizontal

line across marked with “+S” and “-S” would indicated that the signal is completely out of phase (if you listened to this type of signal on your speakers in mono you would hear close to nothing). In general, you want all signals to lie somewhere in between the “L” and “R” regions. See the figure below for an example.

Figure 2

If you look further down on the Flux Stereo Tool you’ll see another indicator with a “-1”, “0”, and a “+1”. This is another way of indicating phase without showing it in graphical form. If you want to ensure your music plays well in mono, then verify that the yellow indicator stays close to the “+1” marker.

Now that you understand how to read the meter, you need to decide if your mix needs adjustment. It may help to throw the Flux Stereo Tool on each track on your mix, and disable different tracks while you demo the mix to understand what instruments/vocals/sounds are out of phase. You may only need to fix one particular item—not the whole mix.

Once you find the problem area, you need to fix it. The Flux Stereo Tool can be used to invert the phase on the left and right channels by pressing the “Phase” buttons found in between the “Input Gain” and “Pan” knobs. This may make the output better or worse (this usually only works in extreme cases). Your other option is to adjust the stereo width, by moving more of the sounds toward the mono region. This can be done in Flux Stereo by adjusting the width slider. Look at the figure below. It is a snapshot of the same sound that was playing in Figure 2; however, with the width slider pushed to the extreme left, the sound now has been pushed almost completely in phase.

Figure 3

Experiment with this tool and find what works best for a particular track or mix. If you know the venue where your music will be played, leaving certain sounds out of phase may be a good thing to make the music more engaging, but if you are looking for compatibility, always check your audio phase. Your DAW should have a “MONO” button or “Stereo Separation” setting on the mixer, so you can

simulate summing your stereo channels. If you have phase issues, you'll be able to hear it. This is a great way to hear what you see in the Flux Stereo plug-in.

I have one more final note: There are other programs out there that have phase meters/scopes as well as more accurate phase adjustment features. Your DAW may have some built in or you can perform an internet search.

Here are a couple plug-ins you should research if you're interested in analyzing and adjusting phase in your DAW:

- Voxengo MSED
- Voxengo PHA-979
- Gonio 3
- otiumFX Basslane

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