

## Articles

### {tab=Session prep} Pre-Flight Checklist

Just as a good and diligent pilot has a thorough and complete checklist he or she goes through before a take-off, you too should have a checklist of sorts to assure a smooth session. There are several small, rather intuitive things that should be looked over before you start a session particularly if your room is utilized by more than yourself or serves more than one purpose. With that in mind, here is my list:

- Make sure that all converters, outboard gear and tape machines have at least a half hour of warm-up time prior to the session. Aligning a cold tape machine through a sleepy converter can result in mis-adjustments up to .75 dB!
- If you have analog tube gear, check for any drift at unity gain, and, if you use tube compressors, periodically check to see that there is no image drift while applying gain reduction.
- Verify that all converters are still at your studio's operating level (you do have a standard operating level, right?). This is important, if for example, you used a converter to do a transfer and utilized the converters calibration capabilities to correct for an offset in the source material's L/R balance. Or, you use the converters different operating levels to hit tape a little harder the previous day.
- Double check left/right continuity throughout your signal chain.
- Verify that positive polarity is maintained throughout the signal chain.
- Make sure that the sample rate is set to the current projects resolution, and if using a house clock, be sure that everything is synching to it perfectly.
- If you are working on a project at 2x-8x sample-rate resolution, be sure to verify that your dual-wire AES devices are "seeing" dual-wire and that your single-wire devices are getting single-wire AES.
- Check that all of your processors are ~zeroed-out" to avoid any inadvertent filtering or processing.
- Make it a point to know your systems' noise floor and if there are any deviations from the norm, immediately investigate and fix the offending piece of gear.
- If you will be using analog tape, be sure that the tape machine has been cleaned and demagnetized.
- Have all of your supporting materials on hand, recall sheets, pens, client contact information etc.

Periodically throughout the year you should also:

- Check that the bias on all tube gear is in line and that all tubes are functioning properly and to specification.
- Exercise, burnish or treat all of the connectors within your system to maintain proper contact and eliminate corrosion. The same goes for your power cords as well.
- Check you monitor system's drivers for fatigue, particularly the surrounds of the woofers and subs.
- Clean the dust out of any gear that has fans (tape machines, computers, amplifiers etc.).

Written down, the list looks daunting and tedious but once you work in a checklist like the one I've recited above into your daily routine, it will become an intuitive and natural background activity that seamlessly integrates into your sessions. Your clients will love your professionalism you will be saved from embarrassing and potentially costly simple mistakes.

- Brent Lambert

{tab=Polarity}North vs. South - Polarity

Everyone knows of the particular sounds that emanate from our two coasts: the west coast is known for its smoothness like the kelp-smoothed Pacific and the east coast is known for its grit and edge like the layer of soot on the side of a Manhattan bus in winter. However, it seems as if no one is too familiar with the sound of the North and South. I don't mean the "dirty-south" vs. the Detroit sound; I'm referring to the sound of speakers moving in and out.

With an alarming increase in occurrence, I am continuously confronted with mixes which have an inverted polarity, or elements within a mix which are polarity inverted. Some of the causes are due to non-familiarity with hardware or software, improper wiring, bad microphone technique, inadvertent button pushing etc. In the end though, it all boils down to the engineer not recognizing the sound of an inverted signal and its deleterious effects upon a mix.

As mastering engineers, you should learn to know this sound and routinely check any suspicious sounding mixes for polarity inversion. All engineers should verify that their respective signal processing chains and monitoring systems maintain proper polarity throughout. You can do this by playing a positive impulse through your signal chain and recording the impulse into your workstation. Then, verify that the impulse (via the amplitude-waveform display) to confirm that the positive impulse has been maintained. To verify your monitoring chain integrity, play this impulse on a test CD or any other correctly recorded kick or snare drum sample and verify the speaker polarity with a polarity checking device. You can purchase one of these from a variety of manufacturers: WorxAudio Technologies speaker polarity checking system (about \$60), Autosound 2000's N-PD-9 (\$105), similar (albeit a bit more expensive) systems are also available from ASL Intercom and SMART. If you find a problem, work backwards from the end of the chain until you find the offending cable or component to correct the problem.

You would not believe how many times that I get mixes where the snare or kick polarity is inverted relative to the mix. When this happens there really is nothing that you can do except to inform the mixer or producer and ask them to remix. This relates to another article found here about studio efficiency; you should always make an effort to screen projects prior to the booked mastering date. If you don't catch a mistake like this prior to the date, you could end up losing a day of billable time. The bottom line is that mixers should definitely be meticulous about checking the polarity of individual tracks while mixing.

Mastering engineers, if you learn to recognize a polarity inverted mix you can, at the flip of a button, instantly make a mix come alive and start pushing instead of sucking air. You can help to educate your clients and make everyone sound better. Get familiar with the north vs. south sound, it can make all the difference in your final masters.

- Brent Lambert

{tab=Reconstructing fades}  
What to do with a Bad Fade?

You just finished putting the finishing touches on a great sounding track and it sounds just stellar. The client is beaming and singing your praises as an auditory magician. You're grinning, taking in all of the complements when suddenly, you notice that the mix engineer gave you all of a 2 second fade at the end of the song simply ruining the entire mix in the last couple of seconds. The abrupt fade just jolts the listener (and you) out of that space the song had lulled you into. You ask your client: "are there any alternate mixes?" The reply is: "no, and there are no other versions of this song". What do you do? This is a completely realistic situation and happens way more often than it should. To rectify this situation you will need to rely on your creativity, musicality, and sharply critical ear.

Obviously, if there were other alternate mixes (perhaps one with a better fade); you could simply substitute the final chord(s) for the bad fade and be done with it. An other simple option would be to utilize another song that ends in the same key (rarely does the instrumentation actually match-up but it has happened).

In this instance, neither of the aforementioned scenarios applied and therefore I was left with few alternatives. I have tried pitch shifting a final chord before using the ending of another song and this has worked in the past with limited success. I must say that I still haven't heard a polyphonic pitch shifter that sounds totally transparent and like analog tape vari-speed for this chore. If you do not have this luxury, you may be able to get away with the digital vari-speed. This is where your critical ear comes in; if the result in the least bit sounds fake or calls attention to itself, then it's not worth doing.

Another easy technique is to apply a good ambience or reverb to just the final chord. This works sometimes if the final chord of the song is very to moderately staccato (short and abrupt). Be sure to tailor the reverb to the mix by rolling off high-end either within the reverb algorithm itself or by equalizing the reverb send. It really will sound a lot more natural to keep the top-end out of the reverb as in a real-life hall or room. I typically roll-off anywhere from 800Hz to 2 kHz depending on the source material. Decay times in the .8 to 5 second range will work. Keep in mind the relative tempo of the song and the goal of trying to keep it sounding "real".

The technique with which I've had the most success with while addressing short fades, is to not only apply ambience to the final chord, but to also add sine waves; typically the fundamental and octave (very occasionally the fifth of the tonic) to the last chord.

Step by step this is how I do it: first, I will tailor the fade to make it actually sound more uniformly abrupt. Next, I will add the sine waves (for example if the song ends with an 'A' chord I would add 55Hz and 110Hz. If this was a rock song and there were electric guitars playing the final chord, I might add the fifth or 'E' at 164.8Hz). Then, I adjust the levels of the sine waves to match the mix level of the bass and/or guitars. And last, I'll run the whole modified final chord through the reverb unit and record this back into the workstation. Once this is complete, I will edit-in and re-align the new "enhanced" final chord to account for any processor latency, and finally, run the whole mix through my signal chain and selected equalization for the track.

It simply is a reality that everyone is now working on less than ideal mixes at least some of the time and undoubtedly you will run across a bad fade in the near future. At the Kitchen we now try to preemptively weed out these problems by giving a quick listen to clients mixes prior to the session. Unfortunately, we don't always have this luxury and perhaps you don't either. When this happens, hopefully these techniques will keep your clients thinking that you really are an auditory magician.

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Above you'll find a number of dicussions and articles relating to recording and the recording process.