SOUND ADVICE

The Art Of Mastering: Part 2

by Marisa T. Déry

A few years ago, I wrote an article for *PS* about the art of mastering and how it was evolving. No longer are we there just to make sure that the technical restrictions of the record era are in check; we are now an important part of the creative chain.

Lately, however, I have been seeing an alarming trend: people who, thinking that they can bypass any formal training in engineering, are buying mastering software and instantly calling themselves a "mastering engineer."

This is a dangerous trend.

Firstly, the mastering engineer brings a fresh pair of ears to a project that probably feels like it took an eternity to make. Having that unbiased perspective is priceless to any project.

Secondly, the mastering engineer is not only the last of what seems to be an interminable parade of engineers, but he or she is also a skilled technician/editor/musician who has spent many hours listening to music, and understands what people want to hear in their music, and how they want to hear it. They understand why a Latin mix should be bright and why a hip hop track needs to be bassy.

Mastering is understanding every item in your toolbox and knowing when to use it, how to use it, and even whether to use it. If one doesn't understand the principles of compression, how can one possibly use a compressor properly? If one doesn't truly understand "Q", also known as bandwidth, how can one properly equalize a mix without phase cancellation? Improperly mastered music sounds over-compressed, out of phase, and has too many highs and too many lows. And it's distorted.

This distortion is my biggest concern.

Because the music is so terribly over-compressed – thanks to plug-ins like the Ultramaximizer and others similar to it – one gets tired after just a few songs because of ear fatigue; without peaks or valleys in a song, the ear becomes physically tired and listening to the music become tedious. In addition, when one crosses the line with that software trying to make it louder and LOUDER, there simply isn't any more room for the sound file to fill, and it begins to distort. It is at that point that the output just isn't musical anymore. It's noise.

I am not against all the software that is now generally and affordably available to all; it is a wonderful tool for writers, musicians, and engineers.

When one spends the time learning about how to use these tools properly, as does a mastering engineer, it is amazing how wonderfully clear and professional-sounding music can be. After such a long process, wouldn't you want your project to sound its best?

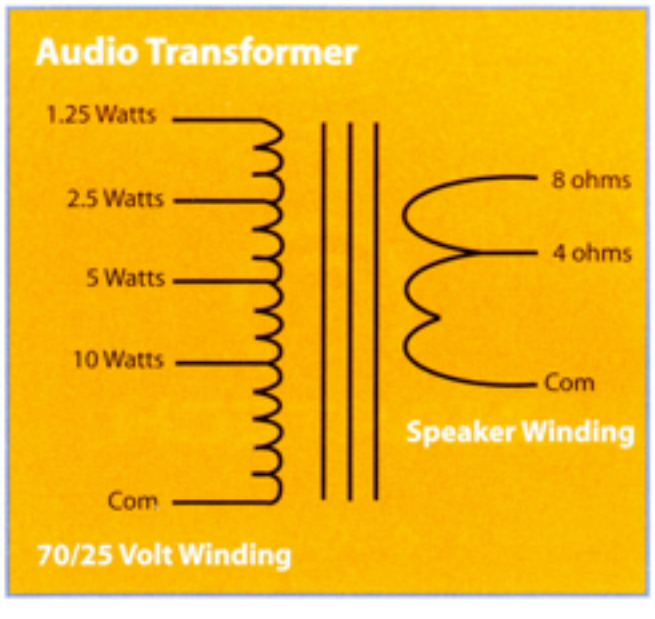
Marisa T. Déry, a native of Ottawa, ON, is the owner and engineer for Tamar Mastering in Boston, MA. A graduate of Berklee College of Music, her clients have included The Mighty Mighty Bosstones, Tugboat Annie, and RUSHYA. She has also mastered soundtracks and TV scores that have appeared on ESPN, TLC, Animal Planet, and in the Boston Film Festival. Also, she currently works in the Audio Preservation Studio at Harvard University. For more information, check out www.tamarmastering.com.

70-V Audio Distribution: Part 1

by Al Whale

When required to connect speakers over large areas with non-interacting area controls like halls or classrooms, the 70-V system is ideal, although it should be noted that some places consider 70-V systems to be unsafe, so the 25-V system is used instead.

Transformers are used at each speaker location to convert from the 70(25)-V system to the speaker impedance (eg. 8 ohms).



The 70(25)-V line from the amplifier is applied to the input of the transformer. The input selected is based on the maximum power needed from the speaker. Each speaker location comes from this same 70(25) volt line source (in parallel). The sum of the power setting of all transformers used should be less than the maximum power of the amplifier.

Be warned: if the total is over the maximum setting, the amplifier will be overloaded and there will no longer be a constant output. Switching a group of speakers in this situation will then affect the other speakers.

$W = E \times I \qquad I = \frac{V}{R}$

Therefore $W = \frac{E^2}{R}$

W = Watts E = Voltage
I = Current R = Resistance

For 70 volt systems

$E^2 = 70 \times 70 = 4900$
(or approximately 5000)

Therefore use

$W = \frac{5000}{R}$ or $R = \frac{5000}{W}$

From the above calculations, the 10-watt tap will be 500 ohms, and the 5-watt tap will be 1,000 ohms. When wiring, a smaller gauge wire can be used to go long distances without affecting the audio due to line loss.

Example: If the total load on the 70-V line is 100 watts, from the above formula, the impedance would be 50 ohms. Using the practice of 5% max, the wire would have to be under 2.5 ohms. Checking wire tables, for 50-ft. run, the wire would only need to be #22 gauge (1.614 ohms). For 500 ft., the wire would be #12 gauge (1.588 ohms). This is far easier than using 8-ohm lines – #16 & #6 gauge, respectively.

Al Whale is Broadcast Technologist and Assistant Chief Engineer at CHBC-TV. He also performs maintenance, design, and installation set-up. He has operated and taught sound in many church settings. Visit Al's website at: www.whalco.ca.