Mastering

by Jim Braukmann

What is the point of mastering?

Mastering became especially important in the late 1940s because it was very difficult to fit six or so dynamic songs onto one side of an LP record.

The grooves only had so much dynamic range available before the cutter head (making the master) would break through to the previous groove spiral. And if the grooves became too wide, as they were spread out a little farther apart on the vinyl, the needle playing the recording later couldn't keep up, and would rattle around in the groove. Of course the playing time would be reduced with less grooves per side.

Turning the bass down helped keep the groove narrow. But the music suffered. Mastering engineers cleverly used hardware EQs, compressors and limiters to fit the most dynamic performance into the available groove space. They are still doing that job for vinyl LPs today.

As we moved away from vinyl, cassette tapes didn't have much more dynamic range available, and similar mastering was still required.

But as we moved to digital sampling and started to increase the available dynamic range, the race was on to make each song louder than the competition.

The ear+brain connection tends to jump to the conclusion that louder is more desirable, at least for the first few moments. Producers knew loudness gave their product a bit of an advantage. This became the goal of mastering. Of course, the resulting music had less and less dynamic range. With every part of a mix being maximized for level, the dynamics of the music was lost. The music was less musical.

Then Apple Music happened. Actually Apple is only one example. Streaming services are now setting their own levels song to song in an effort to make the listener's experience less haphazard. So they developed algorithms that adjust the average level of each song so that levels in a playlist are more or less even. More highly compressed music lost its advantage, as it simply had less dynamics at a new lower level.

In response, mastering is now concerned with finding the best balance between natural musical dynamics, "performance dynamics" if you will, and a robust level. This is probably a good thing.

Mastering goals

1. Creating cohesion from song to song, or from file to file
Creating a consistent style or feel.

2. Making songs sound as if they were recorded in the same space, and same time, even if they were not.

3. Improving the sound if necessary.
Making it warm, punchy, highlighting details.
Removing or reducing noise.

4. Making it sound good on all types of playback systems,
Large or small speakers, headphones or earbuds.
Clever mastering can make this happen!

5. Adjusting the songs the "optimum level."
One popular system is the LUFS loudness weighted scale ("Loudness Units Relative to Full Scale")
-14 LUFS for Spotify, -13 LUFS for YouTube,
-12 or so for Apple. But these targets are changing.
Mastering engineers keep up with the latest streaming algorithms.
You can get a free LUFS meter plugin from Youlean.

Mastering activities

Adjusting overall compression and EQ
Remixing individual tracks if necessary
Normalizing levels, EQ adjustment, limiting transient peaks, balancing all these across the whole album / or set of albums / or set of files.
Adjusting the spacing on a CD version

Often mixing happens at one studio, mastering at another.

A mastering engineer is someone with experienced ears, much practice, good judgment, and the best of software and/or hardware tools. Of course, sometimes just having fresh ears can bring improvements to a mix.

Bringing your files to be mastered elsewhere?
Here is good advice:

Have a good mix to start with.
-Play your mix at home, in car, everywhere, first.
Don't do lots of compression. Let them do that.
Bring an example of a project or album or commercial mix you like.
If unsure, bring two versions.