

BEYOND CALM

DID SOMEONE SAY COMPLIANCE?

It is difficult to mention digital television audio without the word “compliance” dominating the conversation these days, a result of loudness regulations and legislation primarily designed to keep viewers from spilling their popcorn as they lunge for the remote to turn down blaring commercials before the baby wakes up.

On the upside, laws like the CALM Act in the U.S. have addressed a legitimate concern and elevated the importance of audio to broadcasters and viewers alike.

While Sir Isaac Newton was referring to physical motion more than three centuries ago when he pointed out that “for every action there is an equal and opposite reaction”, that truth neatly applies to what has happened to television audio in response to CALM. Broadcasters are finally getting a handle on the loud commercial problem and are making every effort to be compliant, but often at the expense of over-processing the audio.

To some degree this is due to misconceptions about the law and misinterpretation of the recommendations upon which it is based. Because no one wants the distinction of being the first station to be cited for non-compliance, many broadcasters have taken the “better safe than sorry” approach.

THE MYTH OF MINUS 24



One of the most common fallacies about compliance is the notion that the meter measuring a station’s audio must constantly read a steady -24dB LKFS like the mod monitor of an FM radio station engaged in a “loudness war” whose goal is to never let the meter dip below 100%. It is quite possible to do this, but it is unnecessary and - if we’re being honest - results in some pretty unpleasant-sounding audio.

ATSC Recommended Practice A/85 lays out all of the ground rules for what is really required, and while it’s a lengthy document, it bears reading by anyone wanting a full grasp of the guidelines

that form the basis of CALM. But summed up in a single easy-to-digest sentence, it says that a commercial cannot be louder than the surrounding programming in which it is aired. Nowhere does it say that a station must busily chase -24dB LKFS around and hide fearfully in the corner if the meter ever reads anything but.

BETTER SAFE THAN SORRY?

Broadcasters are understandably concerned about compliance. At minimum they seek to protect their licenses and avoid citations and fines. They understand the responsibility they have to their viewers and have a genuine desire to do right by them. In an effort to stay off the radar and minimize or eliminate viewer complaints, the safe approach is to measure and process every bit of audio headed for transmission. Typically this includes loudness correction in the file domain for stored content and a real-time loudness controller in the audio path for everything else.

Consider the incredibly wide range of program sources found in a typical television plant: Local newscasts with live cut-ins, network feeds, national commercials, locally produced spots, syndicated programs, live events – the list goes on. It’s no wonder why many stations employ more aggressive processing than would otherwise be necessary just to ensure that whatever comes along doesn’t startle their viewers into picking up the remote (or the telephone).

“GOOD” LOUD VS. “BAD” LOUD (AKA “CAUGHT IN THE FRIENDLY FIRE”)

Producers and mixing engineers often go to great lengths to creatively use dynamic range to enhance the television viewing experience. The audience is supposed to jump a bit when the proverbial hand comes out from under the bed and grabs someone’s ankle. That’s the “good” kind of loud.

This should not be confused with the commercial for the local flea market or the latest kitchen gadget that was recorded at -16dB LKFS and inevitably follows the tender love scene at the end of a sad series finale. That’s the “bad” kind of loud.

Traditionally, there’s been no good way to differentiate between the two, so broadcasters process for the worst-case scenario. The unfortunate side effect of this approach is that the good dynamics get reduced or eliminated along with the bad, becoming victims of friendly fire. The carefully crafted aural artistry of a well-produced program is undone and viewers get a steady drone of compressed audio, all in the name of compliance.

THE INTRODUCTION OF INTELLIGENT DYNAMICS™

In Hollywood westerns, it was easy to tell the hero from the villain: The good guys wore white and the bad guys wore black.

If only a processor could tell the difference between a well-produced program and a poorly produced commercial just as easily, we’d be well on our way to leaving the former alone while still controlling the latter.

That would be an all-around “win” for content producers, broadcasters, and viewers alike.

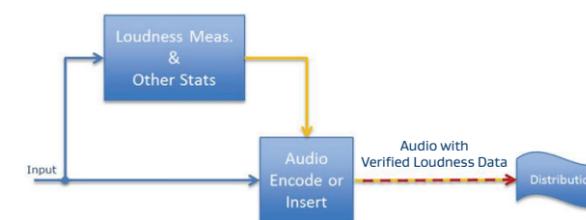
And as long as we’re dreaming, wouldn’t it be nice if the broadcaster could make some of the processing reversible so that viewers watching in 5.1 in a home theatre could enjoy an immersive audio experience while those listening through tiny TV speakers and trying not to wake the rest of the house could simultaneously choose less dynamic range?

The patented Linear Acoustic® Intelligent Dynamics™ hybrid metadata processing technology found in our AERO.1000™ Audio/Loudness Platform and AERO.2000™ Audio/Loudness Manager does exactly that.



Linear Acoustic® AERO.1000™ Audio/Loudness Platform
AERO.2000™ Audio/Loudness Manager.

TWO ELEMENTS TO INTELLIGENT DYNAMICS:



One example showing insertion of Verified Loudness Data.

The first uses new techniques which are part of the Intelligent Media Framework developed by Dolby® Laboratories. Automatic loudness measurements compliant with ATSC A/85 and EBU R128

are combined with other important details to create so-called Verified Loudness Data which is then used to “sign” content for quick and automatic downstream authentication. Uniquely, this data is carried as part of the audio via a combination of several methods and is completely codec agnostic – it works with all audio formats.

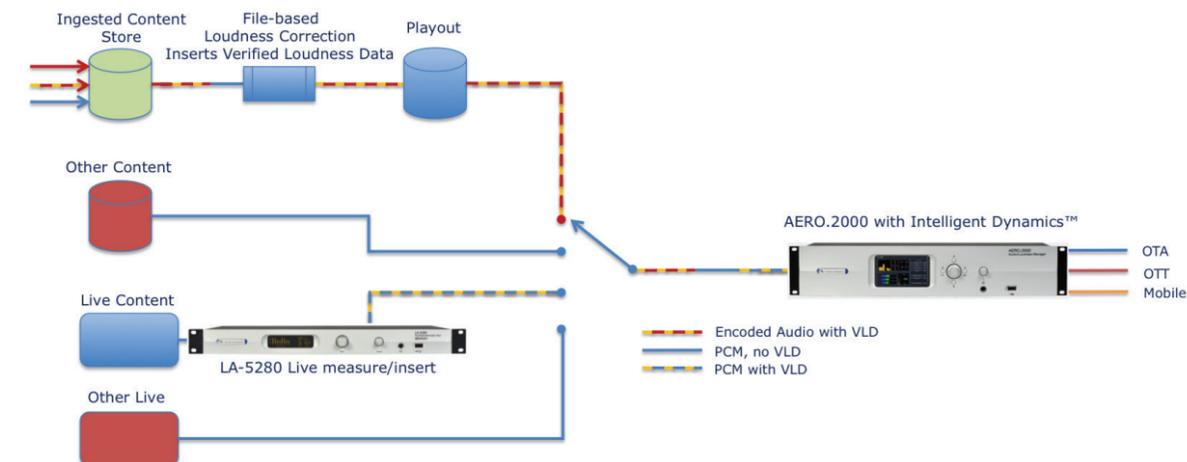
The second part of Intelligent Dynamics is a patented process exclusive to Linear Acoustic. By generating new metadata dynamic range control via traditional processing techniques, it is now possible to make that control permanent, reversible, or anywhere in between, allowing broadcasters to give viewers a say in how much (or how little) processing they prefer. The process does not rely upon any upstream or local metadata to function properly and will always produce predictable results, just like a permanent single-ended processor.

The AERO.1000 Audio/Loudness Platform and AERO.2000 Audio/Loudness Manager can instantly read the Verified Loudness Data – or just as importantly, respond to its absence – and can then make processing decisions based upon that information. If the content has been verified as “safe” and well produced, processing can be throttled back, or made more reversible or completely bypassed – all automatically. If the content isn’t marked or has been modified, single-ended real-time processing is automatically employed to keep loudness under control.

Intelligent Dynamics - the combination of Verified Loudness Data with a DRC system that can vary the percentage of permanent processing - finally allows programming to be processed to the degree and permanence dictated by the programming itself.

THE END RESULT:

Content creators can have their work delivered as intended, broadcasters can still achieve compliance, and viewers can transparently experience higher quality audio tailored to their liking.



Signal flow with showing Intelligent Dynamics where Verified Loudness Data accompanies audio through a simplified broadcast chain. For live content, a unit such as the LA-5280 can automatically generate and insert verified loudness data – in addition to acting as a loudness meter. Downstream devices like the Linear Acoustic AERO.1000 and AERO.2000 can use the inserted data to vary the processing applied to the audio in addition to creating specifically tailored versions for Over the Air (OTA), Over the Top (OTT) and Mobile platforms