It’s the summer holidays, you’re sitting around relaxing with relatives and it somehow gets mentioned that you’re a sound engineer. Next thing you know you’re being held personally responsible for all the deafening and irritating television commercials and forced to endure a tirade from the seniors in the group (who ironically should possess less acute hearing and be less worried by the trend). Why do we have to endure this persecution? After all, we don’t like dynamic range compression any more than they do, but it’s a necessary evil, right? What other ways are there to monitor and control levels without human intervention?

There’s been a shift in thinking on this topic over the last few years and new software tools and systems have been developed and refined that help with the problem of momentary peak levels not truly reflecting our perception of overall loudness. It’s all about measuring sound signals differently...

MEASURING PERCEPTUAL ENERGY
Loudness is all about measuring the perceptual energy of sound, as opposed to quantifying its purely peak or RMS-measured electrical level as a signal. Instead of measuring it at any instant in time, loudness is calculated over an appropriate period of time – more analogous to how the human ear and brain interpret sound. In a purely technical sense, loudness is quantified using the LKFS (Loudness, K-weighted, Full Scale) metering scale – a complex algorithm (specified in ITU standard BS.1770) that measures electrical energy, interprets it as audio data and monitors specific frequency bands over time. This then relates such a measurement to how the ear behaves, and comes up with a value (ongoing refinements to these algorithms are continuing that will hopefully lead to the adoption of a Loudness Units and LUFS scale).

So how does a broadcaster use these LKFS measurements? They use normalisation! Let’s say your program has a wide dynamic range, like a film or some orchestral music, that is perceived to be relatively quiet most of the time. In this typical scenario the program might have a low loudness value over time – say –31LKFS. Playing straight after it is a TV commercial that’s heavily compressed and perceived to be very loud. This will have a much higher loudness level value of say –15LKFS. One of the intelligently designed aspects of this system is that the unit of measurement – 1LKFS – is roughly equivalent to 1dB. So in the example above, if the commercial is attenuated by 16dB before playback, there will be no significant level jump for the listener achieving the goal of consistent loudness on broadcast. Loudness monitoring equipment is currently being rolled out amongst broadcasters worldwide that will give them the capacity to measure program material and either normalise it before broadcast or send it back for remixing to meet their loudness specifications.

KNOW YOUR LKFS
Importantly, loudness can be measured either across the whole frequency range of your program or specified in terms of Dialog Level, where measurements of loudness are only considered within the range of the human voice. If you’re delivering something that requires a pre-ordained LKFS level, be sure to check which of these two types of measurement you need to mix to – generally advertising material is measured across the whole program while longer form material is typically determined with respect to Dialog Level loudness.
If you’re mixing for TV, do you know if your program is going to be analysed with respect to its loudness? Will the broadcaster normalise your material to adhere to its loudness specification or will it expect you to deliver it at the right LKFS value? (In Australia, a standard for digital transmission on the FreeTV network was adopted last year specifying average loudness at –24LKFS for broadcast.) Depending on the job, you may need some loudness meters to check your mix before handing it over.

SEVERAL METER OPTIONS

So where do you find a meter that measures in LKFS? In ProTools perhaps? No. Don’t bother opening the standard ProTools Phasescope; it’s not there as a ballistics option. The closest thing you will find to it is ‘LeqA’ which is an early precursor to LKFS.

The good news for producers working in the box is that there are now quite a few LKFS metering options, some of which are very cost effective. Also, don’t panic about changing the way you work – due to the relationship between the decibel scale and the LKFS scale, you can mix and produce the way you always have. When you finish mixing your project, simply measure its LKFS value in software and normalise the program up – or more likely down – by the required dBFS trim to achieve the magic –24LKFS number.

DOLBY MEDIA METER

The first loudness metering plug-in on the market was developed by the company close to the heart of the technology, Dolby. The Dolby Media Meter (now in version 2) measures whole program loudness, dialog level, loudness range, long-term vs short-term values, and is easy to configure visually. With graphing functionality you can see exactly where your program is triggering overs, and work both in real-time and offline – the offline analysis is achieved either using the Audiosuite version of the plug-in in ProTools or a standalone version with other DAWs.

What flavour do you prefer? Nugen Audio provides two flavours of VIsLM: one with data logging and one without – available across all platforms (RTAS, VST, and AU).

Benefits

• Fits any large-diaphragm recording microphone with a diameter between 18 & 55mm
• Complete Pop Filter & Suspension System
• USM offers up to 12dB better isolation against unwanted vibrations

“It’s the BEST shock mount ever made! This mount is truly awesome. This thing is incredible and works on everything”.

Fred Coury – Drummer/Engineer Producer
The first loudness metering plug-in on the market. Now in v2, the DMM measures whole program loudness, dialog level, loudness range, and long-term vs short-term values.

**NEED TO KNOW**

"What other ways are there to monitor and control levels without human intervention?"

Another great loudness meter is produced by TC Electronic – the LM5D plug-in. This meter runs on ProTools HD (unfortunately there’s no native version as yet) and not only includes the true peak and LKFS information but presents its results as a visual graph over time, revolving in the centre of the GUI. The LM5D ‘radar’ meter is also at the heart of TC Electronic’s loudness monitoring hardware, the TC Touchmonitor TM7 and TM9 and the LM2 Stereo Loudness Meter. The LM5D also displays its measurements to within 0.1dB, a useful difference, but will only measure in real-time due to DSP usage.

**NUGEN AUDIO**

Moving to the more affordable end of the spectrum, Nugen Audio provides two flavours of its VIsLM, one with data logging and one without. Importantly, it’s also available across all platforms (RTAS, VST, and AU) like its more expensive counterparts. The team at Nugen Audio have been closely involved with the EBU, even co-presenting their solutions on the official EBU stand at the recent IBC trade show. Their plug-ins have been developing rapidly over the last year and the team is quick to adopt changes to specifications as and when they occur. They also support Audiosuite file analysis like the Dolby Media Meter.

**VSONIC & AUDIOLEAK**

Another option on a budget is VSonics’ VMeters, also available on all platforms. Interestingly, VMeters is the only option that not only provides loudness information but also meters configurable to the Bob Katz ‘K-Metering’ standard (worth reading up on if you have a spare few minutes).

The third budget solution is the Mac-based AU tool ‘Audioleak’ from Channel D. There are actually two versions of Audioleak that measure LKFS, the difference being support for 5.1 measurements. Although Audioleak doesn’t work natively inside ProTools, it’s a simple matter to drag and drop files onto it for analysis.

So whether you’re delivering a small slice of program involving these specifications once in a blue moon, or fully immersed in the cut and thrust of broadcast audio day in and day out, there are plenty of tools available to help you grapple with the new loudness measurements. Obviously a big influence on your mix is the desired instantaneous peak level of your program contending with the loudness over time. The balance between the two will largely dictate your compression strategy and consequently the dynamic range of your program.

The tools listed above will all provide you with what you want to know and when you want to know it. Fingers crossed, the wider audio community will embrace an arguably smarter way of measuring our perception of sound and, in turn, gradually move us beyond these dark days of the Loudness War.

**Price**

- **Dolby Media Meter** v2: $972 (Syntec International: $800)
- **TC Electronic LM5D**: $419
- **VIsLM**: US$499 without logging, US$449 full version
- **VMeters**: US$979 stereo only, US$129 surround-capable
- **Audioleak**: US$536 standard license, US$137 pro version

**Pros**

- Many options that scale according to usage and budget
- Measuring loudness rather than peak means less compression is needed to hit the target values
- Over-compressed material gets pulled down, so maximising is no longer desirable

**Cons**

- Some of the plug-ins only support real-time measurement

**Summary**

Measuring sound the way the ear perceives it could be the industry shift we desperately need to save us from over-compression and ear fatigue. It will also save us from those angry relatives.

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No leaks here! The Mac-based AU ‘Audioleak’ from Channel D comes in two versions, one of which supports 5.1 measurements. It doesn’t work natively inside ProTools – simply drag and drop files onto it for analysis.

V Sonics’ VMeters are available on all platforms and is the only option that not only provides loudness information but also meters configurable to the Bob Katz ‘K-Metering’ standard.