UNITED KINGDOM

Fighting the loudness war

Music is getting louder, but what should be done about it, asks **Mike Collins**

Adam Sherwin, writing in *The Times* last summer, after speaking to top engineers Geoff Emerick and Peter Mew from Abbey Road, concluded that "Dad was right all along – rock music really is getting louder. Now recording experts have warned that the sound of chart-topping albums is making listeners feel sick. Oasis started the loudness war and recent albums by Arctic Monkeys and Lily Allen have pushed the loudness needle further into the red." Tim Anderson, writing in the *Guardian*, quoted Roland Stauber, a 39-year-old music lover, as saying "I can't stand the sound of today's CDs. They sound harsh and loud. I hardly buy new releases any more."

When these issues get into the mainstream media, with consumer journalists complaining that today's recordings are suffering from a lack of dynamics compared with classic recordings from yesteryear, it is surely time that audio professionals and music industry decision makers got their heads together to sort this out.

The issues were debated thoroughly at recent seminars organised by the MPG at Alchemy studios and at the APRS in London.

"There is a good reason why music lovers favour original CD releases rather than remastered ones," says TC Electronic's Thomas Lund, who has spent many years researching the issues. One of the problems is that most of the music on today's CD releases is being squashed into the top 5dB of a medium that has more than 90dB of dynamic range,

which was generally not the case if you go back 10 years or so.

Lund points out: "The recent detrimental use of limiting, clipping and loudness optimisation on CD re-releases outweighs the positive effect of all our better converters and high-resolution processors combined. Think about it: mixes captured with non-over-sampled 14-bit converters, brick-wall analogue filters and a L/R timing offset of one sample (Sony Fi) sound better than new pop tracks." Generally speaking, louder sounds command attention and sound 'better', at least in the short term. "If you A/B listen, and don't listen at equal loudness to processed and non-processed, every A&R guy, artist or even engineer will prefer the processed, i.e. louder, version," explains Lund. "Take loudness out of the equation and we can start talking audio quality."

So was it the mastering engineers, the artists, their managers, or the A&R people who started the loudness wars? MPG panel member Tim Young blames the current generation of A&R staff. "They have absolutely no technical training, so they just don't understand!" he says. "Plug-in limiters and multi-band compressors in Pro Tools also have a lot to answer for!"

Kevin Metcalfe at Soundmasters blamed US engineers for starting the trend: "Everyone's looking for a scapegoat, and mastering engineers get the blame. But it's not their fault, it's the result of many factors. In particular, changing recording, mixing and mastering methods in America have led everyone else to feel the need to follow suit."
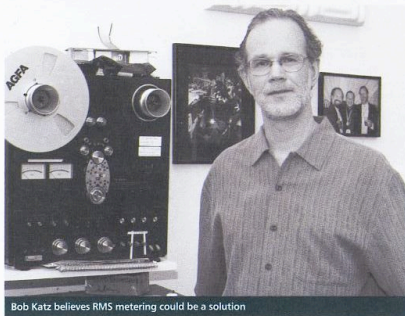
Bob Katz believes RMS metering could be a solution

Thomas Lund, TC Electronic, wants quality not loudness

Spreading the blame

New York-based mastering engineer David Kutch, who works with artists such as Natasha Bedingfield and Alicia Keys, feels that he knows where the guilt lies. "Initially, the guilty parties were certain mastering engineers. More recently, it's the mixing engineers, who are getting the 'Can you make it LOUDER?' demands at the mixing session. I receive mixes today that are so loud, compressed and distorted that I cannot do anything to them. I simply import the file and apply some de-essing via a plug-in if needed. Clearly, this sound is what the artist, label, producer or engineer intended, so I'm not going to change it – I can't."

Kutch has developed a mastering chain that allows him to achieve louder levels to please his clients while striving to maintain a musical sense of dynamic range. "My trick is to add multiple small bits of compression in the analogue and digital domains with an analogue chain centred around a Dangerous Master system and a digital chain using a TC 6000," he explains.

Questions were asked at the MPG seminar about the inter-sample problem that can lead to distortion during CD playback. One mastering engineer confidently stated that as long as the level was 0.2dB less than full scale, this would be avoided. According to Lund, this is not true. "If you apply the old-school sample peak detection methods of measuring level, peaks need to stay below -3dBFS when delivery is linear, i.e. via CD, and below -5dBFS when

delivery is via MP3 at 128kbps. That's not even always enough headroom – but 95% of the time it would be."

Lund's comments reflect the latest academic and industrial research taking place around the world – information about which may not have spread fully in the mastering community. If top mastering engineers are not aware of these issues, or are in disagreement, what chance does the average mix engineer stand when asked to make a louder listening CD?

As mentioned in the February issue of *PSNE*, Lund's advice for mix engineers is simple: "If you mix to digital, don't peak higher than -3dBFS, a guideline already given by EBU." Engineers need to keep in mind that highly processed masters with certain higher frequencies and high peak levels or clipping are likely to lead to levels in excess of 0dBFS when reproduced at the outputs from typical D-A converters. This can lead to further distortion if there is insufficient headroom in the converters. Or whenever the signal crosses domains, such as in conversion to MP3. Inter-sample peak metering to view and protect from these types of peaks is now available from TC Electronic in its System 6000, from RME in its "Digicheck", and from Sonnox and PSP in their peak limiters.

New tools such as those are undoubtedly needed to help prevent the hyper-compression (squashed, loud mixes and masters) arising as a consequence of super-high average levels and low peak-to-average

ratios. US mastering 'guru' Bob Katz has plenty to say on this subject: "The invention of digital audio started the accelerated loudness race which raised average levels almost 20dB in 20 years. This was caused by the new ability in digital audio to normalise to the peak level. We need to return to the concept of headroom and standardise on an entirely new type of meter that is calibrated to true loudness and which allows for adequate headroom, with the true peak level hidden from the user."

Katz is referring to the situation that peak-only metering, especially in software DAWs such as Pro Tools and in typical CD players and other digital equipment, is no longer 'fit-for-purpose'. Katz's proposed alternative, the K-System, incorporates RMS metering and is co-ordinated to a calibrated monitor gain. RMS metering is more accurate than simple averaging, although not as accurate as a true loudness meter – which requires more DSP or CPU power and causes more latency. K-System RMS meters are available from many manufacturers, while TC Electronic's even more revolutionary LM5 true loudness and loudness history meter is available for the Pro Tools HD platform.

Use your ears

According to Katz, mixing engineers would be better off dispensing with meters altogether and using their ears instead! He explains: "Having calibrated monitor gain is just as important as metering peak-to-average ratios. It is possible to mix an entire album 'blind', without any metering at all, yet never overloading the digital system! All you need to do is set a sufficiently high monitor gain (e.g. 83dB at -20dBFS RMS). When mixing this way, engineers can use their ears without the arbitrary constraint or influence of meters. The resulting mixes will likely have a better crest factor (peak-to-average ratio) than typical mixes made while watching meters and in mastering should produce louder masters with far less sonic compromise."

With the next (and even some current) generations of digital audio broadcast and consumer replay equipment, listeners will be given options to select dynamic ranges for replay. Consequently, music that has been squashed dynamically to sound louder will not sound louder, but will sound harsher in comparison with music that has not been so badly 'mangled'. So, hopefully, the 'loudness wars' will become a thing of the past when consumer replay equipment puts the choice of dynamic range firmly in the hands of the end-user.

An important question posed by an A&R man at the MPG seminar (obviously one of the more enlightened ones) asked what the loudness levelling option in iTunes might do to iPod users' music. There was mention of the new Dolby Volume dynamic range controller chip on the horizon for next year in consumer equipment. "The levelling option in iTunes, though a bit crude, is certainly better than peak level normalisation," explains Lund. "The new ITU-R BS.1770 standard; the Dolby Volume chip; and other consumer chips of that kind; will all be steps in the right direction – taking the 'loudness advantage' away from hyper-compressed music and levelling the playing field."

These days, just about every piece of audio software has plug-ins that will let you apply mastering processes, such ►
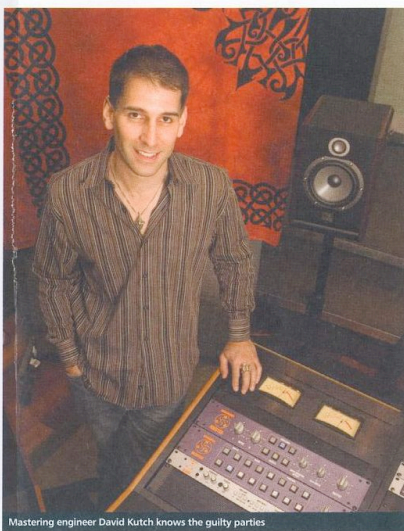
Mastering engineer David Kutch knows the guilty parties

Clean living

office, where things need to look right. So the look was important to us too. Most speakers are pretty ugly – just boxes! When you have something that has a form, and that has to fit a space, that's a big thing." So the 8250s look good, sound good, and have that extra bit of tech to give them that extra functional edge. Simple as that.

"And with this set up we can easily upgrade to 6.1 or 7.1, because of the digital nature of the speakers, without too much fuss."

There are a pair of 8250s, and another 7270 sub, in the playroom too. That's where Silencio turn into Acid Kings for the second part of the interview and play some of their searing techno. After mastering on the Genelecs, the natural counterpart (says the band) is to go to the Red Room club in the city where a Funktion One system provides critical listening in an actual club environment.

"Minimal stuff, techno – Kraftwerk, that type of thing – sounds very, very good through the Genelecs," says Salonen. And that's when they show *PSNE* the footage of the Acid Kings playing at a French festival, wearing nothing but, well, masks, and covering their modesty with Roland machines. It's very weird.

Do you have other bands in here, other artists, I ask?

"No! We want to keep it all clean!" ●
www.silencio.fi

TC Electronic's LM5 loudness meter

► as multi-band dynamics control and peak limiting. More people are tending to use these, often without realising the consequences. There was much discussion at the seminars about where the sources of distortion were most likely to be: on the DAW mix bus or in the plug-ins, in the various dynamics processors, or even inherited from sample libraries used during the tracking/mixing of the recordings – or during the mastering process?

Lund points out: "Sample libraries often contain 'contaminated' stuff, i.e. audio that doesn't obey the sampling theorem, which contributes to the harsh sound of much of today's music." Many fingers of blame were pointed at plug-ins. "When people use plug-ins, they don't use them sensibly," complained Alchemy's Ray Staff. "People should listen to what the plug-ins do! Even before applying the process they can have a bad effect on the sound." Staff then spelt out

his philosophy of mastering, saying: "Mastering should be about making delicate adjustments to what people have recorded to make it sound as good as possible. Since about 10 years ago, clients have been looking for more from mastering – they expect to hear a big change in the sound."

It is easy to recognise the fatigue-inducing sound of many of today's dynamically 'squashed' and distorted CDs. Even many older recordings newly reissued on CD are being messed up in this way. This surely has something to do with falling CD sales – people who listen must be experiencing these fatiguing effects even though they are not aware of it. It is all too easy using Pro

Tools, or Logic, to just slap compressors and limiters everywhere – not just on the mix buss – and lose the focus on the effect that all this is having on the overall sound quality, not to mention the potential for overloads and running out of headroom within the hordes of individual plug-in processors.

Some people are proposing that things will change only if the listening public demands better sound quality. Obviously, this would be ideal. But it is unlikely that sufficient numbers of people even think

about things in this way. Audio quality, apart from for a small group of audiophile listeners, has almost never been a factor that has made anyone listen to music, or buy music. The only thing that makes people want to buy music is if they LIKE the music; they mostly don't give a damn about the audio quality unless it is so poor that it seriously gets in the way of them enjoying it. And it has to be of very, very poor quality to reach that level!

As audio quality slides lower, the chances of audiences listening for long enough to grow to like the music recedes due to the hidden effects of listening fatigue. This is surely a factor that will reduce CD sales. If it sounds worse each year, people will buy less each year – even

> "Mastering should be about making delicate adjustments to what people have recorded. Since about 10 years ago, clients have been expecting to hear a big change in the sound"

without knowing why. So, either the music industry has to sort this out internally, or the situation will continue to deteriorate until things get so bad that there is a public outcry!

Katz offered this perspective: "Although the public does not listen in the same way as professional engineers and producers, there is a peer group of listeners who have an influence on what the public buys. While the average person may not be a critical listener, it is the 1% or 2% of critical listeners who do

appreciate good sound and music who have a meaningful influence on the rest of the public. This happens via reviews and word of mouth. So if you want your music to be heard by the largest possible group, make sure it sounds good to the critical listeners."

So what should those in positions of responsibility in the music industry be doing about this? As student engineer David Viney at the MPG seminar suggested: "There needs to be proper communication about these matters between artists, management, A&R, mix engineers, mastering engineers and broadcast engineers."

Well said – but will this happen? From a practical perspective, engineers should mix and normalise to -3dBFS, always avoid digital clipping, use low-level dynamics processing and use up-sampled limiting (or process in the analogue domain) along with up-sampled peak metering. It would also help to use loudness calibrated speakers and proper loudness metering.

Ultimately, a major educational onslaught on the decision makers who dictate that these things will be done is needed: i.e. the A&R staff, bands and artists, producers and remixers who don't know any better (and, in fact, may be convinced that this is the sound they want and that their listening audiences demand). And, for the sake of future generations, the people running audio courses should make sure that they are teaching their students how to avoid these mistakes. One of the key issues here is teaching people how to use their ears! ●