

Making it Loud

So you thought your mix was bangin'... then you played it next to your favourite tracks and discovered it's actually limp and timid. We have some remedies



We've all felt it: the physical pain and disappointment of hearing a mix we've slaved over for days and weeks pale into the quiet shadows beside a commercial CD, and no matter what we do, nothing seems to bring it up to par in the loudness stakes.

Well, here we're going to run through some ways to sort that out, but before we start, let's pin down what we're actually talking about. 'Loudness' is a very subjective interpretation of physical sound pressure level, and how loud a listener perceives a sound or track to be can be influenced by all manner of tricks – it's not just about turning everything up to 11.

So, what follows is a look into some of the mixing mind games we can play to make our songs seem loud and exciting without nailing everything flat to the ceiling.

Volume wars

The art of getting your mix loud traditionally lies in the mastering domain, but in these days of home mixing and instant recall, where you can continually refine mixes and compare them to reference tracks, mastering is being absorbed into the mixing stage. Many music producers now maintain that mastering is only necessary when you're putting together tracks for an album, say, and they need to be put in order and levelled.

The battle to make your mix the loudest has never been so fierce: we're now dealing with a finite headroom of 0.0dB, beyond which no-one can go. So it's all about learning how to pack as much volume by impression into that headroom. Every last tenth of a decibel is vital. The trouble is, the more sustained volume you pack into a track, the less dynamics it has, and it may suffer from a lack of contrast as a result. So you're always trading overall volume off against dynamic change.

It's not just about pushing the mix, either: the tricks start right back at the recording stage. It might sound obvious, but the major factor in making something sound

exciting is in the way it's played or sung. You're going to hit a wall of trouble trying to bring vitality and punch to a part that was originally performed at a lower temperature than required. Hit drums hard, play guitars positively, sing out... This is where good production skills come in: you need to recognise the level of energy needed to make a part come across well in the final mix. Much of what we do with mixing tools is trying to compensate for under- or over-playing.

That said, we'll now run through some examples of how we can best use those tools to inject maximum excitement into our tracks, starting with the producer's best friend: the compressor...

COMPRESSION



▲ ENERGY INJECTION

The first (and most important) tool for injecting a part with energy and excitement is the compressor. This essentially reduces the level of loud bits relative to quiet bits so that you can raise the overall volume of the individual track. For example, you can use a setting like this to make a vocal consistently loud to dominate a mix and maintain the listener's attention throughout a track. >>



▲ LIFT YOUR TAIL

Loud-to-quiet relativity works within the hit of a drum too. Making the tail lift in volume compared to the start of the hit ups the sense of volume. Our brains perceive short transients as being much quieter than long ones, even though physically they may actually be at the same level. >>



▲ VARIABLE THRESHOLD

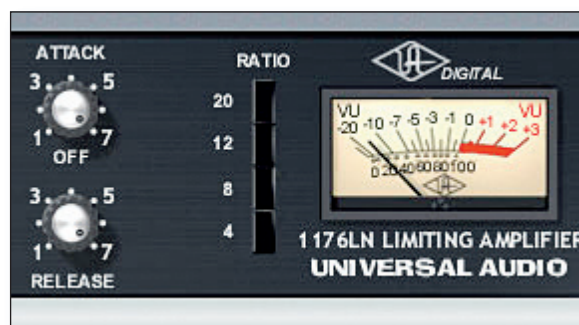
The compressor in our previous example uses a variable input and fixed threshold, so you'd turn the input up to get more compression. This one uses a variable threshold to let you set the point where the compressor acts on the incoming signal. (Neither method is better than the other.) Here, we'd lower the threshold for more compression. Auto-gain brings the level back up after processing. >>

PUMPING COMPRESSION ON DRUMS



▼ PEAK LEVELS

Peak rather than average level sensing is best for compressing drums and percussion. The detection circuit uses the peak level of the input signal to determine the onset of compression, which makes it more severe. Hard knee response is also your best option here – it's much more impolite and obvious. Always use the fastest attack setting. >>



▲ GET PUMPING

Radical pumping compression on drum kit overheads or room mics can bring a whole new sense of excitement and space to an otherwise ordinary-sounding instrument. The sound pumps and breathes with the attack and release of the compressor. Subtle changes to the release time affect the way we perceive the urgency of the drumming. >>



▲ TRY A LIMITER

One of the most popular processors in pro studios for this sort of thing is the classic Urei 1176 compressor with all buttons in. This is effectively limiting, and it really gets the kit sucking and breathing. This can be achieved with software versions by holding **Shift** and clicking on the black ratio buttons. >>

SUSTAINED TRANSIENTS



▲ ADD SUSTAIN

A kick or snare drum can often be made to appear louder by impression if you add sustain to the tail of the sound. This is workaday stuff for a compressor, but it should always be left until after the drum is recorded, as it's hard to uncompress something that's been squashed too much. Here's a typical setting. >>



▲ FAST RELEASE

This is a kick drum waveform before and after compression with the aforementioned setting. Notice how much louder the tail is compared to the initial spike of the transient. This is achieved using a fast release, with the attack set to allow the small amount of the initial transient through unchecked for impact. >>



▲ BEWARE OF HEAVY COMPRESSION

And here's a snare drum before (left) and after compression with a slightly different setting. Note how much louder the 'ring' of the snare is and how much louder the following kick drum spill has become in the tail of the snare. This can become a problem with heavy compression. >>

The psychoacoustics of loudness

The subject of psychoacoustics is very relevant to anyone striving for a louder, more exciting mix. We've already talked about how we interpret transients as being quieter than sustained sounds of the same level. This is just a small part of a subject that covers all the weird anomalies of the human brain in its attempts to make sense of all the modulating air flowing into the ears.

The actual range of sound pressure levels (from quietest to loudest) that we have to accommodate is so vast that we've evolved a built-in compressor to cope with it and protect the ear. Roughly speaking, to increase perceived loudness by the same amount each time (eg,

three to four to five on the volume dial) you have to double the power. So, going from a 30W to a 60W amp would give the same step up in apparent loudness as going from a 60W to a 120W amp.

This suggests that we're more sensitive to loudness variation or dynamics at low volumes, which has implications throughout the recording process. As you balance up a mix, the relative loudness of instruments will change as you turn the monitor volume up and down. Theoretically, then, you should be able to do the best job of balancing at a low volume, although you can argue that the average listening level is best for truest dynamics. What is clear is that loud

volumes are not good for creating an accurate balance because everything seems closer.

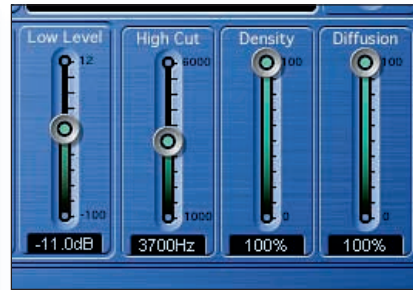
Another such anomaly is the way we interpret reflections in an enclosed space. Reflections arriving within 50ms of the direct signal are reduced in level in the brain by about 10dB. This is an evolutionary development to help bring definition and clarity to speech. Reflections arriving after 50ms and before the onset of diffuse reverberation increase the impression of loudness. The thicker and denser these reflections, the louder it appears. Adding them either artificially or naturally, when recording or re-miking through an amplifier, can help the loudness con.

EARLY REFLECTIONS



▲ ADD REFLECTIONS

Adding early reflections can, with care, increase the impression of volume. This is one such reverb plug-in that lets you add them without adding the later diffuse reverb tail, by adjusting the balance between the two. This only works with reflections beyond 40 or 50ms. »



▲ SMOOTH IT OUT

This technique can be a bit tricky on drums, because delays of such a length are perceived as repeats. Experiment with diffusion, density and the filter to create something that sounds smooth and even (and not like a clattery mess, which it often does). These sorts of settings can produce something workable. »



▲ REINFORCEMENT

Instruments and vocals can be more successful subjects of this method, but again, you want to make it a reinforcement rather than a feeling of space, which it can easily become. A sharp low-pass filter can glue the later reflections into the direct signal and, by impression, make it fatter and louder.

Back to the brain, and the way loudness is associated with frequency. One thing that doesn't have much to do with getting your mixes louder (but everything to do with getting your mixes right tonally) is the way we hear tonal balance at different volumes. At low volumes, bass and treble are quiet, relative to the mid-range. As you crank it up, the level of top and (even more dramatically) bass, increases relative to the mids. It's to compensate for this that hi-fi systems have 'loudness' buttons – so you can listen at low levels and

still get a bit of bass experience and top-end clarity. Google 'Fletcher-Munson equal loudness contours' to see some subjective graphs, if you're interested.

More relevant here is the way our brains analyse sound. The brain divides sound into roughly 1/3-octave bands. The more these bands are taken up with a signal, the louder the sound will appear to be. As an extreme example, a jet plane will appear to be much louder than a sine wave of the same physical level because the jet's noise will cover many more

bands than the single one that the sine wave occupies.

Relating this to our mix, the fuller the frequency response of the mix, the louder it's going to appear to the listener. This is as much down to getting the arrangement right as it is to mix processing, but a common mistake in mixing is to squeeze everything up into the presence range because it feels like it will be more exciting. The result is usually a thin mix with no space. The more successful mixes are those with individual parts EQ'ed into their own tonal space,

and an even spread across the spectrum, because not only are they fuller, they're also louder.

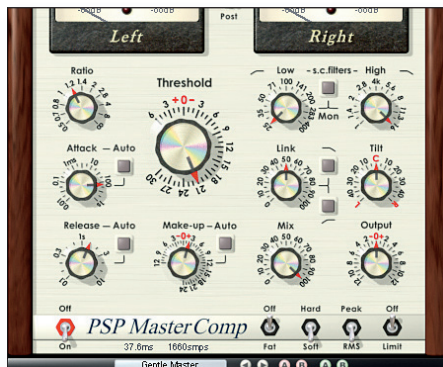
This characteristic has been used to great effect to create mix dynamics without much actual change in level. The 'empty verse, full-on chorus' technique is based on this. The verse isn't actually much lower in level than the chorus, but because the chorus is much fuller across the frequency spectrum, it seems a lot louder. Of course, it can be compressed to death to get a high overall volume, but the dynamic jump won't die.

Mastering for loudness



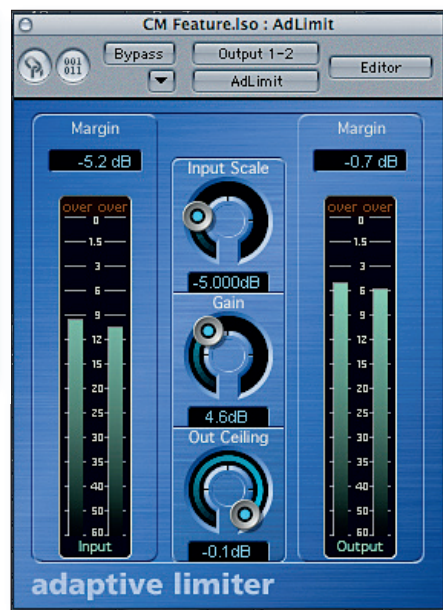
▲ GENTLY, GENTLY

Mastering commonly involves the use of a compressor at some stage to help up the overall volume of a track. Generally the settings are much gentler than those we use on individual parts. Ratios of 2:1 and less, and very low thresholds to scale down the whole range, are the norm for getting the track louder without creating obvious side effects. »



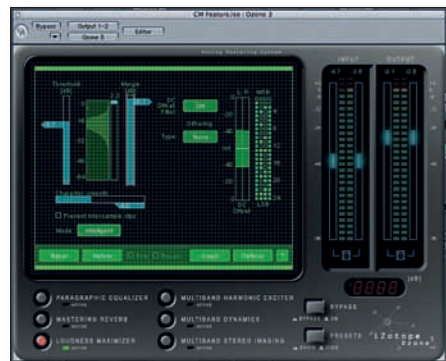
▲ GOING RADICAL

But you can go more radical if you're not so precious about maintaining the innate dynamics of the mix. Ratios up to 4:1 with a higher threshold will work more on bringing down the peaks. This will certainly make it louder overall, but you might start to lose the nuances of the music. »



▲ LEVEL THOSE TRANSIENTS

For getting the most level into the available headroom, you need to work on levelling the transient spikes that take up much of the precious dynamic space. These can be dropped in level without affecting the overall dynamics too much, and the whole track can be taken up closer to the ceiling. Bring on the limiter. »



▲ UNWANTED SIDE EFFECTS

Limiters and maximisers can make a real difference to the volume of your mix, but they can bring on some crunchy side effects if you give in to the temptation to over-use them. The best ones include Waves' L3 Ultramaximiser, Digidesign's Maxim and this, part of iZotope Ozone 3. Maximisers are limiters with auto-gain features. »



▲ AVOID CLIPPING

A common mistake that affects all mastering plug-ins is having the mix buss input too hot. This can cause clipping before they've had their go at it. Collectively pull all relevant channel faders down so the mix buss has a very clear headroom of 3-6dB. You can then set the maximiser to safely take it to the ceiling. »



▲ BE CAREFUL WITH MULTIBANDS

Multiband compressors are often cited as being über-mastering plug-ins but mastering engineers rarely use them, except for occasional repair work to tonal balance. They're very dangerous in the wrong hands and your tonal balance can be seriously messed up if you don't know what you're doing. »



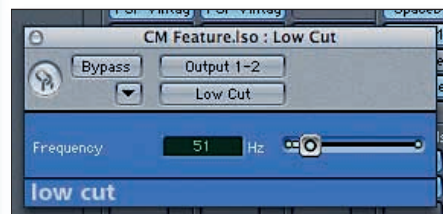
▲ GIVE EXCITERS A GO

Even more dangerous, but occasionally necessary, are exciters. If you're trying to bring out a vocal more, for example, but there just aren't the frequencies there, an exciter used in moderation can cure the problem. The danger is that it makes everything seem louder because of what it's adding, but it all ends up thinner. »



▲ WARM UP

One plug-in that works well and gently in multiband mode is the PSP Vintage Warmer, which will compress the low-end without affecting mid and high balance. It still needs a very subtle setting, but it can get results without taking you way off course. Use small amounts of the knee setting to help the overall volume. »



▲ HIGH-PASS FILTER

Finally, a high-pass filter inserted at the start of the chain of mix buss plug-ins can roll off unwanted subsonic frequencies that aren't necessary but are taking up a lot of the headroom (because they're so high energy for their volume). To judge this, you need some good, big monitors, but a gentle 50Hz high-pass can often work wonders. **cm**