

# Production Fundamentals

From pre-production through to guitar tuning, recording technique, and gain structure, Paul McKercher urges us to lend a concentrated ear to what confronts us in the studio.

**S**o you've gotten the call... are you interested? Totally, yes, for sure. The gig is yours, dates, venues, prices and process are discussed, and you haggle then strike a fair deal. Congratulations, and welcome to the difficult but rewarding, exhausting and sometimes extraordinary task of making a record. During an affable meet and greet with the band, you'll probably discuss the record in quite abstract terms: the colour, the shape, the tone... but let's jump ahead to where the waxing ends and the real work begins – pre-production.

## The Virtues of Pre-Production

Now, it's my belief that thorough and disciplined pre-production often makes for better records. The abilities of the band, how likeable the songs are, even the things that make a band tick are there to be discovered – provided you're prepared to spend days burrowed inside a rehearsal studio, developing a temporary taste for carpeted walls and sausage rolls. If the band is unknown, first timers perhaps, I'd use this time to research these questions. What does the band want to sound like? Does that bear any relation to how they currently sound?



Are they just dreaming or is it, with work, achievable? Is their equipment capable of realising the sounds they're after or do you need to beg, borrow or hire-in the good stuff?

In researching your task as a producer you may also develop an understanding

of the band politic. How do they interact? Are they driven by conflict/tension/competition... mutual respect? What's the work ethic like? How will I know when they've done their best? In a parallel way the band is most likely wondering similar things about you, so in the time invested away from the pressures of a recording situation – in the informal, relaxed surrounds of a rehearsal space – the record gets legs as everyone loosens up, gains confidence and mentally prepares for the upcoming recording.

## Drum Prep

Other things I'd be keen to check out are of a more technical nature. Firstly, the drums. Now drum doctors are worth every cent/pizza/beer they get and drum tuning (being one of the dark arts) is best left to one of these experts. Get your hands on at least three good snares for the recording. Drums have notes and if the snare drum you choose sits comfortably with the harmonic structure of the track, all the better. Similarly, tune toms to the song (try the fourth, fifth or the tonic), for a very classy sound. Get new skins if necessary and settle them in during pre-production 'cause no amount of engineering prowess is going to make those brutalised, pock-marked heads sound any good. (Sound Replacer might do the trick but let's not cop out yet shall we?) Check poorly manufactured bass cabinets for rattles and quad boxes for blown speakers. Has everyone got good-quality, short co-axial cables on their instruments and chunky speaker cable on their cabinets? Furthermore, and on a more conceptual level, if you don't know the lyrics, can you really understand/interpret the song? This question applies to everyone in the band, not just the producer, so soften the amps enough that the vocal can be heard and learn them.

Then there's the sticky subject of click tracks. You might like steady tempo but not a slavish performance, so sorting clicks in pre-production (where applicable) will get everyone used to the idea and familiar with the agreed pace. Get some groove into your clicks, loop a played tambo or shaker in with the tick-tock and it will be much more musical and listenable.

Depending on the band's degree of preparedness, I'd usually try to work through three or four songs a day, rehearsing hard but keeping the door open to fresh ideas. The aim is to refine the structure of songs, their parts and then rehearse them to the point of record readiness. But only if needs be. For instance, Eskimo Joe's *A Song is a City* needed only three hours of sitting around, strumming acoustics, talking about sounds and doing the odd arrangement tweak, such as the depth of work already done by them on a modest ProTools rig, with great pop sense

and an 18 month run-up. If it ain't broke... but if it *is* or needs improvement, use the 'value-added' process of pre-production to get things right before you start spending the big bucks. You'll have more than enough to concern yourself with and fret over once you get into the recording stage.

## Good Guitar Sounds

I'll always take the time in pre-production to check intonation on the bass and guitars and since this is probably the single best thing you can do to improve their sound, you'd be a mug not to. This may seem an unusual forum for me to rattle on about guitar setups but if it improves the sound, it's an engineer's concern. Here's my guide to checking and correcting intonation.

Having the correct intonation on a guitar or bass means that fretted notes anywhere up the neck will be in tune. The instrument will have a sweet chime; chords will ring true and clear and will sound better acoustically as well. The principle is string length. If a string is too long, the frets will sound flat. Conversely if it's too short, the frets will be sharp. Perfect intonation will mean the 12<sup>th</sup> fret (the octave) will be exactly half way between the bridge and the nut. Though in practice, it will be slightly closer to the nut to allow for the sharpening of the string caused by finger pressure.

To check, tune the open string then fret lightly at the twelfth (the octave), if the fretted note is flat then the string is too long. If sharp, your string is too short. Now grab a small Phillips head screwdriver and turn the screw that's connected to the string's bridge piece clockwise to lengthen, counter-clockwise to shorten. After every full turn, retune the open string and again check the pitch of the 12<sup>th</sup> fret. Continue this process until both the open string and the fretted octave are correctly tuned. Listen closely to the two notes, don't look at the tuner, listen really closely. Can you hear the symmetry, the beauty of it? Learn to recognise this and you'll know immediately if unfamiliar instruments need a setup. Now repeat this process for all the strings.

Another tip for tuning guitars: always approach correct pitch from below. This is so that evenly distributed string tension is spread around the tuning post and across the nut. If you simply loosen the peg to flatten a sharp string, you'll have areas of slackness and tightness around the peg, which won't settle until you pull a string or strike it hard. Don't use 2<sup>nd</sup> or 3<sup>rd</sup> harmonics to tune either, they sound flat and will lead you astray. Using a good tuner first and then using your ears, not your eyes, can help develop them to be better judges of pitch. Listen as hard as you can. Are all the chords of the song ringing true? Use tuning as a chance to train your ears and develop your memory towards perfect pitch.



As far as which part of the note to tune to, consider that plectrum hits give notes a sharp beginning by way of the tension they apply to the string, then once contact ends the string settles and sustains. If the part has a lot of plectrum hits, tune to those rather than the sustained part of the note. Conversely if the part is full of long held chords, tune to the sustain of the string, not the attack. It's also worth noting that some cheaper tuners change the tone and can add a low level distortion to your sound. Do some comparative tests with the possible offender taken out of circuit to check this. I'd recommend the Boss 'stomp box' style of tuner or any of the Korg rack-mount range. Notably, a strobe tuner is about 100 times more accurate than the pedal/pocket type. So how much do you value accurate tuning? I'd say it's the most important part of a guitar's sound.

Avoid a hidden trap by checking the calibration of all tuners on the session. All set to 440Hz? Be aware too that judging pitch can be difficult at high volumes; so tracking vocals at loud monitor levels may not seem like such a great idea, not to mention the possible spill. Nor would the use of headphones, for that matter, given their ability (through reasons of proximity and facial coupling) to give false impressions of pitch... but I digress and that's a whole *other* can of worms.

Guitarists need to tune thoroughly after every take, taking care not to knock the necks and having stands to rest them in. Assistants can help by keeping doors shut and temperatures/air-con levels constant. If I appear to be labouring the point then jump forward to the end of the recording when you've recorded hundreds of takes but kept only a few handfuls. Here's the payoff – you've not only got the best performances, but they're all in fine tune. Thanks to a 'no lazy ears' and 'no lazy tuning' policy, the track as a whole has taken on mystical emergent qualities, like it's an instrument itself, where the harmonic latticework has an aligned structure and a resonance that you might, in a moment of self satisfaction, call 'magic' or perhaps just 'good sound'.

## Recording Guitars

A guitar amp is a fairly simple sound source to deal with. The sound comes out the front in a fairly well-focussed beam and

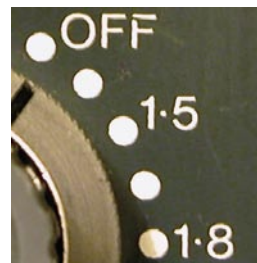
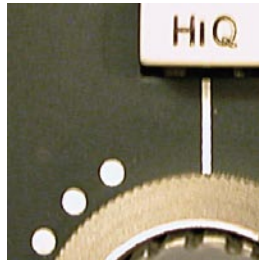


it has a limited dynamic range, when compared with acoustic instruments. As such, I've a straightforward approach with no more than two close mics and the remote possibility of a distant room mic. I'll do the occasional shootout but generally it's a Shure SM57 paired with a Neumann U67 or a good ribbon. If I want a more spatial sound, rather than use room mics I'll put the amp in a spacious room and maybe back the mics off a bit, but I

don't like the sound of messy phase, so mics are always equi-distant from the amp. Use a ruler or one of the wrinkles on your finger for accuracy. Neither do I mic as close as the grille. Between 10 to 15cm is where the treble from the dome and the bass from the cone bind together in the air and I'd start by pointing the mics at the intersection of the two. Then I'd have a listen. If it were too bright I'd move more toward the edge, then listen again. Lots of EQ is no substitute for good mic placement, so don't be lazy. Use proximity to increase bass if you're happy with the treble content. You'll find a move of just one centimetre has a marked effect on tone and after much shuffling and listening, decide upon the best position, plonk a sandbag on the stand's base then do it up tight. If the studio has a bunch of 57s, don't assume that they all sound the same. Do a shootout.

## Preamp & Compressors

Next step is to confirm your preamp choice; I love old Neves on guitars for their rawness but go for another shootout if you've got the choice. Spend the necessary time on mic selection and placement and you shouldn't need to EQ, but if you do, keep it simple. I usually print flat but I *will* compress and the tone or distortion content of the compressor often dictates the choice. For instance 1176s roll out subs and add distortion, making them a good choice for a 'too pretty' acoustic, but may not suit a heavily driven Marshall. Neve 2254s have legendary warmth and a clean sound while [Empirical Labs] Distressors are neutral sounding with adjustable distortion settings and



can be the ultimate weapon against shrill quad boxes. A good rule of thumb for attack and release times is that if the instrument's envelope has a medium attack and slow releases (e.g. a bass), use the same medium attack and slow release on the compressor. This is a good starting point but your ears will be the

final judge for fine tweaks. Fast release times on guitars can help create false energy but be wary of crackle in the decays. Also you can't restore attacks that have been flattened by a compressor's fast attack time and remember there's no undoing over-compression, so go easy. I'd rarely use a ratio higher than 4:1 and if tracking two mics I'd use similar compressors so that the resultant envelopes were comparable and the two signals could be panned L-R while still providing strong mono.

Should you track with effects? A few pedal stomps or a gain change within a guitar take sounds real to me, so I'll spend time tweaking pedals and amps to get the changes to work within a realistic monitor mix. Delays sound cool coming out of an amp and much more interesting than a garden variety DDL slapped on in the mix. The only effects I'm really wary of are digital multi-FX boxes with cheap, brittle A/D, D/A converters like those found in a Discman. Analogue pedals sound much better on a complex waveform like a guitar and usually have a hard bypass rather than an 'FX to 0%' switch, so they don't chew your tone. Keep your cable runs short and if you're tracking in the control room, place the head in there as well, running long speaker cables to the cabinets in the studio. 240V cables are full of copper and, with a jack soldered on each end, do this job well. If the guitar is old, poorly earthed and is buzzing unduly, connect a wire from the bridge to the output jack by wrapping the open ends around each point. If a buzz appears when the guitarist lifts their fingers off the strings and de-earths, connect a wire between the output jack and their bum crack,

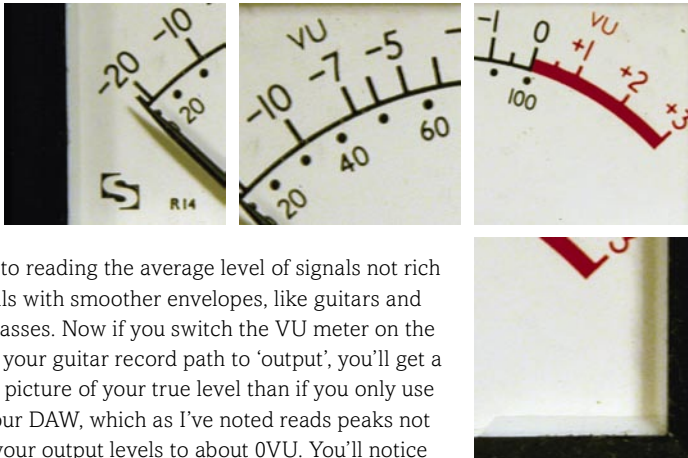
which (for reasons which need no explanation) is an excellent conductor of current. Find the best direction to face such that single coil pick-ups are at their quietest and make sure you're present when the song ends so you don't hear earth buzzes in the final decay.

## Keep a level Head

A common mistake with many DAW recordings of guitars is that the levels are overcooked. Sure there are no digital overs, but the recordings sound edgy and clipped. In explaining what a good level is we should consider the difference between Peak Program Meters (PPMs) and Volume Unit meters (VUs) and the distinctly different tasks they perform.

PPMs, the bouncing bar graphs found in digital recorders, DAWs and some consoles read instantaneous peaks; they aren't weighted and will read any peak no matter how short, crucial in a digital system where peaks can cause overs. What they don't do

well is read average or RMS levels and this is where the VU comes in handy. Being slow and weighted



it's well suited to reading the average level of signals not rich in peaks, signals with smoother envelopes, like guitars and in particular, basses. Now if you switch the VU meter on the compressor of your guitar record path to 'output', you'll get a more accurate picture of your true level than if you only use the PPM on your DAW, which as I've noted reads peaks not averages. Set your output levels to about 0VU. You'll notice that your DAW's PPM is reading quite low, maybe only half to

two thirds up the scale. This is because a guitar, especially an overdriven one, has few peaks. Expect a bass, which has a very smooth envelope, to read even lower. Don't feel the need to crank up your compressor output in order to soak up all that headroom, you'll most likely distort it and a glance at your VU meter will confirm this with searing VU levels metering quite modestly on the PPM. To further contrast the difference, next time you record something really peaky, a snare drum for instance, check the compressor's output VU again; a PPM might be reading a strong level, just below clip, but the VU will only read -10 or so, which again reflects the two distinct tasks the meters perform. PPMs for peaks, VUs for averages.

I'd try to use a VU meter when recording most anything except drums, pianos or percussion and the like (all very peaky) to a DAW. But if I don't have a VU on hand, I'll record basses, vocals, guitars, keyboards so they meter between half and two thirds up the PPMs, listening for differences in sound as I approach the hotter side of things, going for the sweet spot which most gear has. As part of the same approach, I'd also be conscious of peak and average levels at the preamp part of the record path. For instance, when recording a vocal, I would run the mic pre at lower gain than that for a bass because I want to catch the peaky sibilance, which can be 15dB louder, without distortion. A guitar that isn't likely to have much peak information wouldn't need the same safety margin, so I'd run the preamp hotter and look for the sweet spot.

Much of what makes a good engineer lies in the understanding of complex analogue signal paths, so get those record paths running right. Focus more on the sound of your analogue gear and getting good recordings rather than using up all the digital headroom and knowing lots of hotkeys. Use your ears, not your eyes, and listen hard. Build up your concentration spans through practice, trust your instincts; they are usually right, but ask yourself, what can I do to make it sound better? Recording is an adventure, a quest. Enjoy it. Till next time.