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## RECORDING BASS GUITAR

Although most modern synths come with good bass guitar patches, there's still nothing quite like the real thing played well -- provided you know how to record it. Paul White examines a few alternative approaches.

There used to be a common joke among musicians aimed at bass guitar players, which ran "What's the similarity between playing a really good bass line and wetting yourself? You get a nice warm feeling, but no-one really notices!". These days, however, bass plays a prominent role in many musical genres. Dub reggae wouldn't get far without bass, and nor would many rhythm-heavy styles such as those found in Latin and South American music. But even outside these styles, bass can be crucial to the sound and 'feel' of a track. A well-played and well-recorded bass is vital to any rhythm section, and it's worth making the effort to achieve the right sound.

A good bass guitar sound starts with a reasonable-quality instrument played well. Given that starting point, you then have to decide whether to mike up a bass guitar amp or to adopt one of the possible DI methods -- or you could combine both, as do many professional engineers.

The simplest recording method is to DI the bass, but unless the instrument has active pickups (if it needs a battery, it probably has), you can't just plug it into a mixer input and expect good results as there will be an impedance mismatch. The right way to do it is to use a DI box with an input impedance of at least 500k(omega) and preferably higher than 1M(omega). Virtually all active DI boxes that feature an instrument input fulfil this requirement, and a number of passive transformer-based models are also suitable.

With the right instrument and good playing technique, this simple approach can produce good results, but in my experience, the sound tends to lose power when the other instruments are added to the mix unless the arrangement is very sparse. What's more, the tone you get isn't the same as if you used an amp, as guitar/bass amps don't have a flat frequency response. The EQ on most simple consoles isn't able to emulate a guitar amplifier very accurately, so an outboard processor is a better bet. Placing a good quality graphic or parametric equaliser after the DI box (usually via the mixer channel insert point) can improve things greatly. Most musicians know that adding an 80Hz boost will fatten up the low bass, but if you listen to the bass sound on records, you'll probably find there's also quite a lot going on in the mid and lower mid ranges -- most domestic hi-fi speakers can't reproduce deep bass anyway. The key is to experiment with the EQ in the 120 to 350Hz region as this is where the real character of the sound is defined. Though bass guitars do generate high-frequency harmonics, most of these would naturally be lost when the instrument was played through an amp and speaker cabinet as guitar speakers have a fairly limited frequency response. You can leave them in if you like the result, but often you'll find that finger and string noise becomes irritating and that you can roll off quite a lot "...if you can save the EQ until you mix, you'll keep your options open." of high end without significantly affecting the main body of the sound. This usually makes the bass sound tighter and cleaner.

Another useful technique involves combining the equaliser with a speaker simulator such as my personal favourite, the all-passive Palmer Junction Box. Speaker simulators are designed to duplicate the high-frequency rolloff of real speakers, so you can still use your outboard EQ to shape the low and mid sounds, then allow the speaker simulator to take care of the top end. A well-designed speaker simulator will take away all the grittiness from the sound without killing the transient attack, and will often sound more natural than using EQ on its own.

## Compression

Most engineers use a degree of compression with bass guitar, which is a good idea for a number of reasons. If the player uses a slapping or pulling technique, the note attacks can be very loud, so if you don't compress or limit, you either run the risk of overloading the recorder or you have to set the record level so low that the main body of the bass sound is too quiet. This type of playing is best dealt with using a compressor that has a separate limiter, as the traditional way of making a compressed sound retain its attack characteristics is to set the compressor attack time to several tens of

experiment. Auto-attack and release settings (where available) also produce good results on bass guitar as they can adapt to the changing dynamics of different playing styles within the same song.

Allowing the transients to sneak past the compressor might produce a great sound, but it's those same transients that cause recorder overload problems, so having an independent limiter section following the compressor is very desirable. The limiter threshold should be set just below the overload level of the recorder so that limiting takes place only on very loud peaks.

Even if the bass is played in a more traditional way, compression is still beneficial as it evens up the levels of different notes and, equally importantly, it increases the average energy level of the sound -- making it seem louder for the same peak level. You can still back off the compressor attack a little to accentuate the start of the note, but keep an eye on those recording levels. A useful tip if you don't have a compressor with a separate limiter section is to use a dual-channel compressor and feed channel one's output into channel two's input. Set channel one up to compress as normal, but set channel two to limit by using the highest ratio possible combined with a fast attack time and as fast a release time as you can get away with. Adjust the threshold of channel two so that gain reduction only occurs when the level is within a few dBs of hitting the overload region on the recorder's meters. Of course those still using analogue tape can afford to be that bit more casual about levels -- indeed, a little tape saturation can do wonders for a bass sound. Which leads nicely into...

## Distortion

Some of the best bass guitar sounds come from valve amplifiers, and as all guitarists and bass players know, valve amps distort rather musically when you drive them hard. A number of modern studio processors either include valve stages or offer 'tube emulation' with varying degrees of success. You can even get valve DI boxes, such as the Ridge Farm Gas Cooker, and using any one of these can help beef up a bass sound without making it sound obviously distorted. Of course, if you want the Stranglers' bass sound, a suitably-set overdrive pedal might well do the trick. Where you place the valve device or valve emulator in the signal chain is really down to where it sounds best, but if you want to be purist about it, it should come before the speaker simulator if you use one. That's because in a real amp, any distortion created within the amplifier circuitry is filtered by the limited high end response of the speakers, and if there's a lot of distortion, it is important to remove the high end to prevent grittiness.

If you like an easy life, some preamps designed specifically for recording guitar also work well with bass. Last month I reviewed (and subsequently bought) the Line 6 Pod physical modelling digital guitar preamp, and initially wondered why they didn't make a bass version. However, after a little experimentation, I found that by using a Fender Bassman amp model combined with a 4 x 12 speaker cab and no effects other than compression and a little amp drive, I could get a very convincing miked bass amp sound. One practical advantage of a digital product of this kind is that you can be quite certain of the maximum output level as you can never get louder than 'all bits on'. If you deliberately overload the input by plugging in a hot synth so the clip LED comes on, whatever comes out is your maximum level! You can safely set your record levels with reference to this level. Then all you need do is plug in your guitar, make sure the input clip LED isn't coming on, and you can play in the knowledge that your recorder will never clip, no matter how you adjust the preamp drive or tone controls.

## Miking The Bass

Of course, there are those purists who say they'd rather eat their own ear wax than DI a bass! Miking a good bass amp isn't a problem providing you're working in an environment where you can play the thing loud enough, and of course you need a decent mic. Though you could use a general-purpose dynamic vocal mic to capture the bass guitar, you'll find that most of these have a deliberate low-frequency rolloff to compensate for the proximity effect when used up close. Because of this, unless these are placed right up against the

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speaker grille, you could find the bottom end tends to lose power. A better bet is to use either a non-vocal dynamic mic that has a reasonably flat low-end response or to try one of the dedicated bass/kick drum mics, placing it around six to 12 inches in front of the best-sounding speaker in the cab. If you look at the frequency plot of a kick drum mic, you'll find the frequency response looks like the back leg of a donkey that's just been hit by a truck, but the results are often flattering and powerful, which is far more important than any misplaced notions about accuracy! If you're using a valve amp, you may find

you don't need to add further compression, or at least not much, but if the amp is solid-state and doesn't have a compressor of its own, then it's probably a good idea to at least try adding compression to see what can be achieved. The safest approach here is to leave the compression until you mix unless the levels are so erratic that clipping might be a problem.

Tonal changes can be made by moving the microphone -- the brightest sound is found by pointing the mic at the centre of the speaker, while moving it to one side will produce a warmer, less in-your-face result. It's also worth varying the distance to see what result that has. Try adjusting the mic position for the best results before adding any EQ at all, and if you can save the EQ until you mix, you'll keep your options open. After all, what may sound great in isolation may not sound so right when the rest of the mix is up and running.

### Best Of Both Worlds

If you really want to go to town on the bass sound, try combining a miked amp with one of the DI techniques described earlier. Often you can get away with a smaller amp than if you rely on the amp sound alone, as the DI will provide all the bottom end you need. This combined approach is taken by many professionals. The relative phase of the miked and DI'd sound has a profound effect on the final result, so you may need to phase-reverse one of the sources to get the best result. Also, experiment with the EQ of the individual sources as well as their balance, as the EQ controls may not have the same effect as they do when the sources are heard in isolation. Similarly, changing the mic-to-speaker distance will also affect the phase of the combined sounds, so this can be useful in fine-tuning the result.

As you can see, there are several ways of recording the bass guitar, but if you like to keep your options open until the final mix, there's nothing wrong with DI'ing the bass flat via a DI box, perhaps in combination with a limiter to catch any excessive peaks, then applying one of the techniques outlined here at the mixing stage. Or if you have enough spare tracks, you can record the processed and the clean version of the sound on different tracks. I'd certainly try to do this if I was miking the amp -- all that's needed is a DI box between the instrument and the amp (most have an audio thru connector) with the DI out connected to a spare recorder input. Computer users also have several options open to them when it comes to treating sounds after the event: in addition to the usual compression and EQ, there are now numerous software amp simulators that can produce very convincing results. The beauty of the home studio is that you don't have the same time pressures as a commercial facility, so you can afford to experiment and see what method works best for you.

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