

DIGITAL NOISES ESTÚDIO

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BASS

Your beat may be big, your garage may be speedy, but does your boom shake-shake-shake the room? If you want to make the most of your bass module and try your hand at creating some stomach-rumbling, heavy analogue bass sounds, then let Matt Thomas take you way on down...

People often stop me in the street and ask me how to get a bigger bass out of their synth. (Well, actually they don't, I just harangue passing strangers on the subject until the police drag me off, but there you go.) Anyway, in an effort to curb my anti-social behaviour the site editor has bailed me out one last time so that I can pass on a handful of low-frequency related hints and tips.

The easiest route to bigger bass is via the medium of analogue synth, so if you can put your hands on one, it'll be to your advantage. However, even the humblest digital synth can make good use of these techniques, as long as you have at least two oscillators and a resonant filter.

The science of squelch

An understanding of filter resonance is essential for producing good bass, as clever use of resonance lies at the heart of many great bass sounds. The resonance control on your synth acts a bit like an EQ that emphasises the frequency just inside the filter cutoff. You can use this EQ to add welly to the frequency of your choice. The higher the resonance, the louder the boost, until eventually the resonance self oscillates, producing a constant tone at the cutoff frequency. By changing the cutoff you can change the pitch of this sine wave, from an incredibly high pitched whine to a sub-sonic vibration.

Many synths allow velocity to modulate the filter cutoff, making the cutoff open wider the harder a key is struck. This is an invaluable way of adding accents and movement to your bass sounds. The filter resonance is set high, but just short of self-oscillation with note velocity assigned to the cutoff. When using these sort of sounds, it pays to reduce the effect of velocity on the sound's volume, otherwise the deeper sounds will be almost inaudible.

One side effect to watch out for when using filter resonance is a loss of bass energy from the oscillators when the resonance is increased. This is all right if you're using the filter to fill out the bottom end, but it will weaken your bass if the cutoff is set high. Not all synths suffer from this problem but many do, so make sure you listen carefully to your gear before starting work.

Three of a kind

By way of example we're going to look at a few classic bass sounds and see how changing the resonance can shape the sound. First up is a cheesy 70s 'pimp bass', the sort of bass sound that's back in vogue with people like the Beastie Boys and Jamiroquai. Use a sawtooth wave for one oscillator and a triangle wave for the second, transposing the triangle up one octave. Set the amplitude envelope to zero attack, decay and release with full sustain (referred to as an on/off envelope hereafter) and the filter envelope to zero attack, sustain and release with a long decay. Increase the filter resonance to just below oscillation and set the cutoff very low.

Now increase the depth of the filter envelope's effects until you

Aces of bass

There's no shortage of fat-bottomed synths out there, but here are a few of the classics you should look out for. Current values are given as a guide and are based on typical dealer prices.

Roland SH-101 An absolute must-have for any serious dance producer, the 101 is a bottomless well of bass. Its deceptively simple voicing allows even the most experienced programmer to produce everything from shrill acid squeaks to the deepest of subs with ease. Add the simple step sequencer for semi-random doodling and you're on the fast train to bassline heaven. £200-£275. (For about the same money its smaller brother the MC-202 Micro-Composer uses almost the identical voice chips; you don't get keys but you do get a better sequencer.)

Jen SX1000 One of the most impressively useless synths ever built, the SX1000's only redeeming feature is its square wave. It has the fat 'hollow' sound so beloved of jungle bass junkies and earned the machine a brief revival on these grounds. Following a period of insanity when the price reached about £180, SX1000s can once again now be picked up for between £60 and £100.



Korg Mono/Poly One of the unsung heroes of bass, the Mono/Poly has four fat oscillators, each with independent waveform and tuning. Layer them up, detune them and stick them through the brutal filter for instant bass obesity. Starting to gain notoriety so prices are quite high, around £350 to £450.

Moog Taurus Despite being simply the fattest Moog bass ever, the Taurus has never taken its rightful place as 'King Of Bass' for two simple reasons. Firstly, it's incredibly rare and secondly you have to play it with your feet. Modelled after classical organ-style bass pedals, the Taurus is a 13-note floor-mounted bass synth requiring the sort of nimble footwork that would get you into the cast of Riverdance. It'll cost between £450 and £600 if you can ever find one. Korg DSS1 Although the DSS1 is a digital sampler, it has what may well be Korg's finest analogue filter. Welly up the resonance and roll down the cutoff for some of the purest sub bass known to synths. On a large pair of speakers it is possible to see the bass

reach something that sounds dirty. For a final touch of cheesy sleaze add a touch of fast portamento.

Next up is the classic acid house bass, used by absolutely everybody ever. Unless you've spent the last ten years dead you'll know that this is best done on a 303 or something similar. This is fine if you've got one, but if not you'll need to try and fool your synth into thinking it's a 303.

Use just one oscillator (square or sawtooth) with an on/off amplitude envelope. Set the filter envelope to zero attack, sustain and release and vary the decay and the envelope depth to fit your track. The 303's filter never quite self-oscillates so remember to watch the resonance. Set portamento time to quite fast and use a legato playing style so that slide notes bend from one to the next without retriggering the filter envelope.

The 303's other quirk is its 'accent' control, used to stress certain notes. Copy this by only using two different velocity settings in your sequences: one for accented and one for normal. The accented notes should be louder, with a very fast decay on the filter envelope. More sophisticated synths may allow you to replicate this by assigning note velocity to filter envelope decay, decreasing decay length the harder the note is played.

Incidentally, if you actually have spent the last ten years dead then you might want to listen to Hardtrance Acperience by Hardfloor, Higher State Of Consciousness by Josh Wink and Everybody Needs A 303 by Fatboy Slim for an idea of what you're after.

Finally, a bass sound that has no official name but which I normally call 'one of those housy sort of donks'. Catchy eh? Start off with a square wave (or two slightly detuned) and roll the filter cutoff down very low. Increase the resonance until it is just short of oscillation and set the filter envelope to a longish decay with zero attack, sustain and release. Now use the same settings for the amplitude envelope, giving it a slightly shorter decay. The end result is a deep bass with a loud harmonic from the filter.

You can slightly adjust the cutoff to finetune the harmonic into the key of the bassline or set it to a dissonant pitch for more of an old jungle bass sound.

How deep is your bass

Sub bass is a generic name for a bass sound with no top end and very little mid frequencies. It's the sound that makes speaker cones shudder at a club and which you can feel as well as hear.

Setting up a sub bass is simple. The waveforms you use are immaterial as it is the low-pass filter and not the oscillator that provides the sound. First turn your resonance to full until it self-oscillates and then roll the cutoff right down until all the top end has vanished. You'll be left with a deep rumbling hum which you can tune into your track with the filter cutoff.

If you want to play a riff on the sound, you'll need to set the filter's keyboard tracking. Keyboard tracking is used to make the filter open the higher up the keyboard it is played. Using another synth as a reference, tune your sub bass into middle C with the cutoff. Now play the C above and use the keyboard tracking to tune it in an octave higher. This can be fiddly so persevere. If the sub bass lacks definition within the mix, a small click can be added to the front end by setting the filter envelope to zero attack, sustain and release with an extremely short delay. Vary the depth of the envelope's effect to vary the brightness of the click.

A common variation is the sliding sub bass, used a lot in big beat and drum n' bass. Alter the previous settings so that the filter envelope has a medium length setting on the decay then set the depth of the envelope's effect on the filter. Start out gentle then

cones still vibrating like mad, long after the frequency has passed below the limits of human hearing. On smaller speakers, the same trick will result in the sigh of the bass cones shooting across the studio trailing fire. Wildly varying in value, in the wake of the current sampler price wars, anywhere from £200 to £450.

Moog MiniMoog Three oscillators, one overdriven filter and a sprinkling of Bob Moog genius produced the MiniMoog, the standard by which all monosynths are judged. The Mini's sound is as warm and punchy as Mike Tyson in a sauna but with the added benefit that it won't try to bite your ear off. Moogs never sounded as aggressive as Japanese synths, so if you're after a techno terror, look elsewhere. For fat depth though it just can't be faulted, except maybe on price. It'll cost you between £900 and £1,100 to take a MiniMoog home, so don't bother with your piggy bank, get out there and rob a real one.

Juno 6/60/106 Although it's a polysynth the Juno is an ideal bassmonger for much the same reason as the SH-101. Its famously fast envelope attack gives it a punch at the front end, while the built-in chorus warms things up nicely. The slightly fatter sounding Juno 6 and 60 can be had for between £200 and £325 while the MIDI-equipped 106 will cost you around £400.

Yamaha CS15 Despite fairly weedy oscillators the CS15 still turns out a nice line in identical deep squelchy basses, mainly thanks to its two filters. Set them to full resonance and identical deep cutoff for plenty of thump. Not one for beginners as the bass sounds can be hard to find. Still pretty cheap, between £200 and £300.

Sequential Circuits Pro-One The Pro-One is a single-voice version of the Prophet-5, Sequential's classic polysynth. The Pro-One has the typical warmth of an American analogue synth, combined with flexible features for a wide variety of sounds. Like the Mono/Poly it offers both oscillator sync and cross modulation and, like the SH-101, it features a simple step sequencer. Currently changing hands for around £350 to £400.

Roland TB-303 Despite its 'Bass Line' tag, the 303 seems to be used for everything but bass. Its sound repertoire is fairly limited (ranging from mild freakout to psycho mad bastard) but some solid bass sounds can be coaxied out, as long as you can resist the lure of the resonance knob. The impenetrable sequencer and unique 'slide' all add to the mystique and individuality that's turned a small silver fart machine into a shrieking synth messiah. Reality is slowly re-asserting itself on the price side, with 303s now ranging from a costly but feasible £600 to a totally insane £1,100.

Where are they now?

increase it until you get a deep resonant slide. If you set the depth too high you'll get an unpleasant squeal without much bass appeal.

You might think there'd be no use for a high-pass filter in a bass sound but you'd be wrong. Setting the cutoff as low as possible will let the resonance work on the bottom end while leaving the higher frequencies, but this method will give you a clearly defined punchy bass. For extra front-end thud, set the filter envelope as for the sub bass.

Lay it on me

Of course, resonant basses aren't the only fatboys on the block. Layering and detuning are two words dear to the heart of any bassmeister. Layer three or four oscillators set to the same wave, then slightly adjust the tuning on all except one so that the sound becomes much fatter. This is the same principle as a chorus effect, so if you haven't got stacks of oscillators, stick the whole thing through a chorus or a flanger. However, listen to the result very carefully as some bass sounds don't agree with chorus or flange and lose a lot of the deepest frequencies.

If your synth boasts a pitch envelope then you can borrow a trick from analogue kick drums to add a solid thump to the front end. Set the pitch envelope to zero attack, sustain and release with a very fast decay. Now increase the depth of the envelope's effect until you hear a 'thud' and you suddenly have a perfect techno kick bass. If you are thwarted by lack of pitch envelope you can use the filter at self-oscillation with the filter envelope to do the same thing.

Return to bass

So that's about it. If you combine all these hints into one monster patch you should be getting near to the perfect big fat synth bass. Now, all you've got to do is compress it, EQ it, run it through a subharmonic 'boom box', mix it into your track and then compress the whole thing to produce The Bass That Ate The Earth... Good luck.

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Rebirth's 338 software

For those of you without the necessary thousands to buy yourself a bevy of bass originals, help is at hand. Synthasia 2 from m F-Lab is stuffed full of more basses and basslines than you could ever use in a single lifetime, sampled from every synth imaginable. The sounds cover most dance styles, while the loops cover a range of bpm's.

Among the current crop of analogue and analogue-style synths, several lead themselves to dabbling at the deep end. The Novation Super Bass Station, Orgon Energiser, Waldorf Pulse Plus and Doepfer MS-404 are all genuine analogue monosynths with plenty of bass power, while the Roland MC-505 and Quasimidi Rave-O-Lution 309 combine an analogue-style monosynth and drum section.

Among the 303 clones, the Syntechno TeeBee MarkIII and the **ReBirth RB-338 software** from Steinberg (are held to be the most faithful to the original sound, while the FAT Freebass 383 is also worth a listen.