FutureMusic KNOWLEDGE BASE

A Short History of Low Fidelity

There's a lot more to lo-fi effects than just poor sound quality. ***Greg Scarth*** brings the noise...

Lo-fi is the process of deliberately making a poor quality recording, capturing the noise, distortion and inaccurate frequency response of inferior equipment. While they may be considered technically flawed by many, the character and vibe of lo-fi recordings make them a useful creative technique for any genre. In this month's *Knowledge Base* we'll look at the history of lo-fi music, check out the sonic characteristics of classic lo-fi sounds and then look at some of the ways they can be recreated using vintage gear, modern hardware and software plug-ins.

Roots

The idea of the lo-fi record is a relatively recent phenomenon. From 1920s Delta Blues to 1960s Garage Rock and 1970s Punk, lower quality recordings had often found their way to record shops. However, it's debatable whether many of these releases were deliberately poor quality. Low-fidelity recordings have existed since Thomas Edison first started messing about with tin foil and wax cylinders, but the term lo-fi implies an active choice to record at lower quality, rather than simply making a poor quality recording due to technical restrictions or lack of knowledge.

A major turning point occurred with the release of Bruce Springsteen's 1982 album *Nebraska*. Having recorded demos at home using a cassette-based Teac portastudio and a couple of Shure SM57s, Springsteen went into the studio to re-record the tracks with the E Street Band.

After completing the recording sessions, it was decided that the studio versions lacked the energy and vitality of the demos. They were too clean, too perfect. The original demo recordings were judged to capture the spirit of the songs better than the studio versions, and Columbia records agreed to master and release the demos rather than the hi-fi versions.

Nebraska wasn't the first lo-fi album, but it marked the first time a major artist deliberately chose to release a lo-fi recording for the sake of vibe and character. Since then, countless artists have followed The Boss's lead, and entire genres have been built around deliberately sacrificing polished production values in order to focus on vibe and authentic DIY sound.

The Springsteen example perfectly demonstrates the appeal of lo-fi character and vibe, but these aesthetic characteristics reflect the measurable, definable sonic characteristics of lo-fi sounds: altered frequency response, reduced dynamic range, distortion and saturation, and the lo-fi characteristics associated with lower quality digital sampling and recording.

Lo-fi approaches

When it comes to practical techniques, there are two main approaches to making lo-fi recordings and creating lo-fi effects. Essentially, you can do it for real or you can fake it. We'll get round to the latter approach shortly, but first let's look at using real vintage gear to create the desired sound. The best way to achieve an exact recreation of the sound of vintage lo-fi gear is to go back to the source. Just because we're working in the context of a modern production environment and generally striving for clean, polished sounds doesn't mean we can't also use lower quality gear to add a touch of lo-fi. Genuine lo-fi effects are easily achieved using low-fidelity sources, recording devices and processing units. The list of equipment which can be used for the purpose is practically endless: vintage digital reverbs, tape recorders, preamps, samplers, distortion units and many more provide real lo-fi sounds just by running your signal through them on the way into your DAW.

Of course, it's possible to abuse the equipment as well as use it – overloading inputs and outputs or dialling in deliberately obscure settings can allow you to exaggerate the distortion and tone colouring effects of pieces of gear.

Re-recording sounds through old amps and speakers is one of the most effective approaches, capturing the sonic characteristics not only of the reproduction equipment but of the microphone and preamp used for recording. For ultimate lo-fi results, it's also possible to use a cheap old mic and preamp to colour the sound on the way back in. As with all of these techniques, faulty gear need not be a problem – as long as the sound passes through and gets changed, it can be used. Lo-fi options aren't restricted to signal processing effects. Synths and drum machines generally aren't considered to be lo-fi in and of themselves (although



Early digital samplers like E-mu's SP 1200 added grit through inaccurate conversion

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Lo-fi Formats

Some of the best lo-fi effects make use of cheap or obsolete recording formats. Any cassette player with a line input can be used to process audio, simply by recording to a cassette and then back into your DAW. Likewise, cheap vintage reel-to-reel tape machines and even VCRs can be employed to similar effect. Record audio onto a used VHS tape then back to your mix and you'll add all the dropouts and frequency loss of an old video tape. Of course, digital recording techniques can work equally as well. Vintage samplers and sampling drum machines might offer the most glamorous solution, but any device which records audio – from children's toys to cheap sampling keyboards and dictaphones – can be used to process sounds and take the clean, polished edge off your hi-fi audio recordings.

Record individual sounds to a device then re-sample them and play them as sampler instruments, or bounce entire audio tracks out to hardware before mixing them back into your production. One of the most interesting lo-fi approaches was used heavily by mid-90s Trip Hop pioneers Portishead. With their sound being so reliant on samples of dusty old funk and soul records, the group had their own recordings pressed to vinyl, then scratched and played them back into their finished mixes in order to create a cohesive, integrated lo-fi sound.

With one-off dubplates costing around £30, it's a relatively cheap way to add a bit of genuine lo-fi grit and vibe to your work.



More and more plug-ins are focussing on 'degrading' sound

there are some exceptions, particularly in the case of very low-budget products originally aimed at home users and hobbyists), but sound generation can still be lo-fi. 1980s and 1990s sampling hardware provides one of the easiest routes into versatile lo-fi sound generation. With digital equipment, much of the lo-fi effect comes from low bit depths, slow sampling rates, aliasing and the sonic artefacts introduced by inaccurate AD and DA conversion. Triggering samples from vintage sampling drum machines, keyboards and rack-mount samplers allows any source to be processed, adding a layer of digital noise and scuzz before any processing has taken place.

Unfortunately, the vintage sampling approach doesn't tend to be the cheapest. The more highly sought after vintage samplers such as E-mu Emulators and SP-1200s, early Akai rackmount units and even MPC60s are starting to command higher and higher prices on the second-hand market. For a cheaper option, consider the limited but excellent sounding 8-bit Ensoniq Mirage, or widely available 16-bit Akai units such as the S1000.

> "The realisation that not everything has to be perfectly recorded is a liberating moment"

Lo-fi effects

The second approach to creating lo-fi effects doesn't involve any vintage equipment or desirable retro gear whatsoever, but instead uses common effects to reproduce the frequency, distortion and dynamic range characteristics of low-end gear. Mild overdrive plug-ins, subtle compressors which introduce distortion, saturation effects, EQs and filters, amp simulators and many more help to create analogue lo-fi sounds. For a more digital sound, bitcrushers and sample rate reduction, clipping distortion and even bad algorithmic reverb plug-ins can be used to add some of that '80s digital vibe. For the spirit of older recording methods, emulation effects such as Massey's TapeHead and iZotope's Vinyl can be used to add the feel of analogue tape or vinyl records respectively.

One of the best techniques is slightly less obvious: convolution reverb effects can be used to emulate the sounds of a piece of hardware in exactly the same way they emulate the acoustic characteristics of a space. Feed an impulse through a piece of lo-fi outboard, load the resulting sample back into the convolution effect and use it to add similar frequency response and harmonic characteristics to any signal. Many DAWs now include a convolution effect (such as Space Designer in Logic and REVerence in Cubase) but if you don't have one a plug-in like Audio Ease's Altiverb will do the same job.

Alternatively, some of the most convincing (and, conveniently, the easiest) methods of creating lo-fi sounds are to be found in the new crop of emulations and modelled effects aimed at recreating the sound of vintage gear. The Vintage Sampling Modes on Native Instruments' Maschine sampling workstation, for example, offer incredibly faithful recreations of the sound characteristics of the Akai MPC60 and E-mu SP 1200 (12-bit/40kHz and 12-bit/26.04kHz respectively).

Conclusion

The realisation that not everything has to be clean, perfectly recorded and expertly polished is a liberating moment. Working lo-fi elements into tracks allows us to take advantage of a range of different sounds without always striving for perfection and ultimate sound quality. Entire tracks can be created with lo-fi production values (and whole genres have been based on that approach), but the listener won't necessarily know that you're deliberately creating a lo-fi sound. Sometimes it's worth reinforcing the fact that you're capable of producing hi-fi tracks if you choose to do so, and the most effective results can often be achieved by creating a distinction between hi-fi and lo-fi elements in the same track.

For example, a well-produced track with a lo-fi drum loop or heavily processed sample repeating throughout a track can capture some of the spirit of the lo-fi sound while also achieving impact and energy. Alternatively, a lo-fi breakdown or bridge can help to build tension before hi-fi production values kick back in at the drop. Like so many other production techniques, the best effects often come from building and releasing tension between contrasting sounds. A combination of hi-fi and lo-fi techniques is a great way of incorporating contrast. With a few pieces of cheap vintage gear, a couple of well-chosen plug-ins or just a good emulation, you can embrace the appeal of variation. **FM**

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