



PART 19

Reverb, Part 3

Reverb on the edge

BY ALEX CASE

We know that on most sessions, adding reverb to a track is usually a straightforward task. We have an almost infinite range of conventional solutions to choose from—but there are also some long-standing and unusual studio reverb concoctions worthy of study. We'll start with backwards reverb, lovingly called "breveR."

Analog tape machines reward exploration. Tape can be cut, spliced, sped up, slowed down, and—yes—played backwards. Try it. Put your multitrack tape on upside down (swapping the supply and take-up reels) and roll it. It won't hurt the tape or the tape machine. And—as Jimi, the Beatles, Michael Penn, and others have shown—it can sound pretty cool indeed.

Here's the reverb part. With the multitrack tape playing backwards, add and record some reverb. First and most important find an empty track. Be very, very sure it's empty. This isn't easy when you've flipped the tape over for reverse play.

If you have an 8-track analog multitrack recorder, track one is on top and track eight is on the bottom. Track one of the tape machine, which you are probably monitoring on channel one of your mixer, is actually playing back track eight off tape. Track two moves to seven, three to six, and so on.

If you have the privilege of using an analog 24-track multitrack tape machine it gets even more confusing. And it isn't easy to identify tracks just by pushing up the faders and listening. Kick, snare, bass, and piano sound close to what you might expect. But it is darn difficult to identify vocals. Is this take one, take two, or what?

For reverse effects, I temporarily label the track sheet with the new track numbers by manually starting at the highest track, labeling it Reverse Track One, and counting up from there. Then my track sheet makes clear that vocal take two on track 17 will appear backwards on track 8.

Once you know exactly what track you are going to use, push up the source signal fader. Use an aux send to get it into your reverb of choice. And record the output of your reverb to the empty track(s). A good starting

point is to use an instrument prevalent throughout the song, say a snare track or vocal.

Maybe the singer sang "La la, Baby." Played backwards you hear the nonsensical, "ybaB al aL." Add 'verb and there is a decaying sound after each backwards word. Print that reverb.

Now the fun part: flip the tape back over and play the multitrack as originally recorded. The transcendental line is restored: "La la, Baby." But push up the faders controlling the backwards reverb you just recorded, and a weird 'this doesn't happen in nature' sort of thing happens. The decay now comes before the word that caused it. Reverse reverb is an effect that strangely anticipates the sound about to happen.

Figure One shows what's going on. For simplicity we consider a basic snare back beat falling on beats two and four (Figure 1a). In forward play, the reverb you add decays after each hit of the snare (Figure 1b). This creates the expected combination a dry, close miked snare plus reverb (Figure 1c). That's the typical approach. This type of reverb adds a natural ambience or perhaps a hyped explosiveness to the mix.

Let's follow these same steps for brever (i.e. reverse reverb). When playing the tape backwards, we observe our snare hitting on beats four and two (Figure 1d). That's the same back beat, only backwards. Record some reverb from this backwards playing snare (Figure 1e). Return to normal, forward play and check out how the backwards reverb now occurs before each snare hit (Figure 1f).

This elaborate process is tedious and more than a little disorienting at first. Don't experiment with this for the first time in a high pressure session in front of your most difficult client. And definitely don't attempt this at 3 a.m. after an 18-hour session. The risk of accidentally erasing a track while recording on an upside-down reel is too great. But after some practice on other sessions or on your own music, you'll be able to reach for this approach comfortably and add a bit of uniqueness to part of the project.

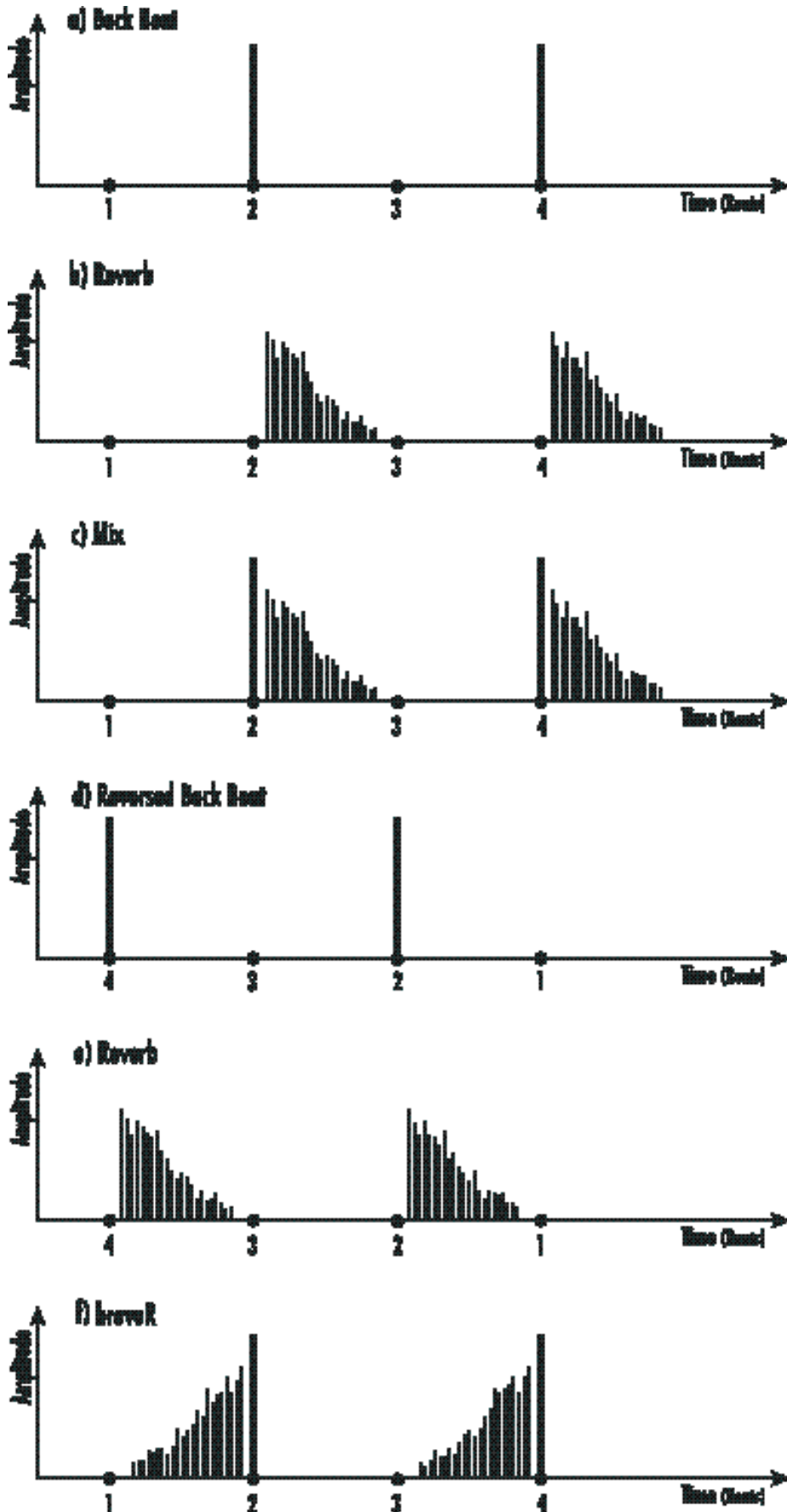


Figure 1

It takes a fair amount of trial and error to get the effect you want. It's hard to predict how it will sound when you dial in a reverb while the vocal sings gibberish, "htnom yreve stlob dna stun daer." It's not until you record the reverb and play it back forwards that you can really tell if you like the reverb type, reverb time, predelay, bass ratio, etc. Used carefully and sparingly you can offer your listeners a wild ride. (This works with echo, too, by the way—check out the incoming/outgoing vocal echo effects on "It Can Happen" on 90125 by Yes.)

Variations on the theme

Backwards-like reverb effects appear as presets on some reverb devices. Often called 'non-linear' reverbs, these reverbs don't decay from loud to soft after a sound. In fact, they do the opposite. Instead of getting gently softer as they decay, non-linear reverbs get louder as they decay.

Say what? I know it's weird. Since digital reverbs are controlled by software, not room acoustics, they can do some pretty bizarre, non-intuitive things. A regular decaying reverb can be compressed and amplitude-modulated (with a single cycle of a sawtooth wave) as shown conceptually in Figure 2, making a reverb swell soft to loud. Patch this up or look for a preset in your digital reverb to create this effect.

Of course, you can use non-linear reverb wherever you like, but look first at percussion instruments in pop music settings. The sound of a conga, triangle, clave, or other sharp percussion instrument lasts mere milliseconds. It is a mixing challenge to make such a short waveform noticeable in a crowded pop mix full of synths, strings, guitars, and layers of background vocals.

Use the non-linear 'verb to lengthen the perceived duration of the percussion event slightly, making it easier to hear and therefore easier to slide into the mix. A heavy dose of the non-linear reverb sounds like a wacky effect—sometimes appropriate, sometimes not. A subtle dose can retain the naturalness of the instrument and still accomplish the mix goal of getting the sound noticed. Create the sound you like best for the tune at hand.

Playing tape backwards to create reverb that in turn is played forwards is a lot of trouble. Tape machine manufacturers have sometimes built in the ability to play and

NUTS and BOLTS

record backwards to make this exercise a little easier. But armed with a sampler or digital audio editor, you can record, reverse, cut, and paste with ease. All your effects units just doubled the number of patches they have. You can sample them and play them backwards.

With apologies to the engineers who so carefully figured out how to digitally simulate the sound of that gorgeous symphony hall, squish it hard with compression. Change the sound of your dry tambourine into a driving, grooving, agitating, in-your-face tambourine surrounded by the surging, distorting, fizzling sonic aura of compressed reverb.

Gated reverb

Send the snare drum to an aggressively compressed, very long reverb patch (maybe a plate program modified to a ridiculous reverb time of five seconds or so) and you

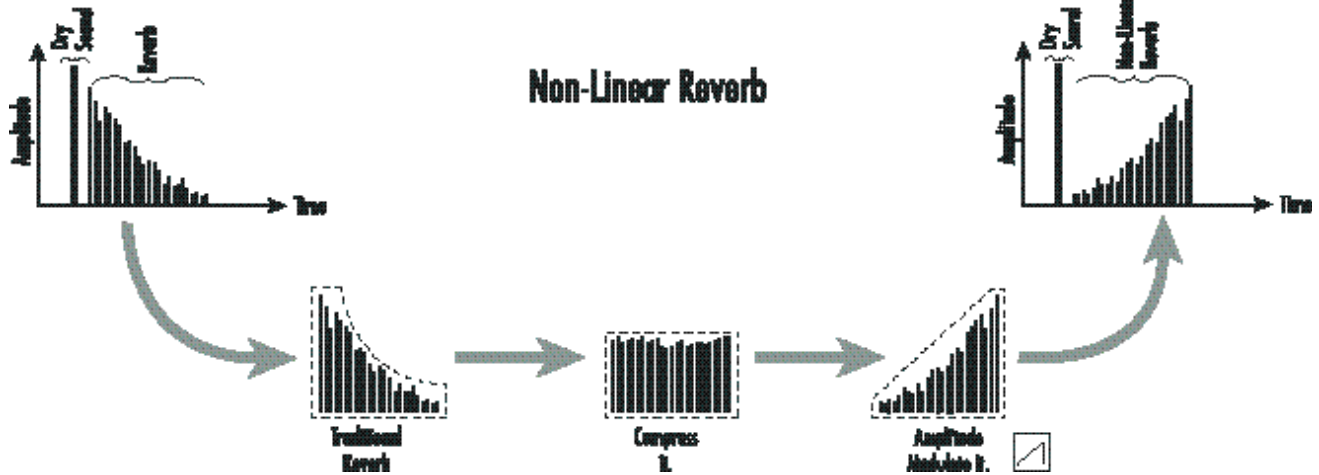


Figure 2

Squished reverb

The inexplicable magic of the delicate decay of sound within an ornate European music performance hall also responds well to—I'm serious here—compression. Why the heck not? We discussed the Nuts & Bolts of Compression back in Part 9, 3/2000. Using compression to alter the way a waveform attacks and decays is old hat. Reverb is the decay of a sound. Compressing reverb enables you to change the decay of this decay. As the compressor changes the amplitude of the reverberant wash, the musical impact of the reverb changes too.

For example, it is perfectly normal to record a tambourine in a dry (i.e. no natural reverberation) booth, bedroom, or basement. No problem. Add some bright hall to it at mixdown, right? So far so good.

But maybe you've experienced the problem of a distant, weak reverb. That is, adding reverb to a rock 'n roll tambourine diminishes the impact of the percussion instrument, adding distance between the tambourine and your listener.

This isn't surprising. As we discussed last month, we sometimes use reverb with the intent of pushing a particular sound farther back toward the sonic horizon. Adding reverb to our tambourine can rob it of its power, sliding its contribution to the groove away from the rhythm section and away from the listener.

Slamming drums, huge bass, a wall of guitars, screaming vocals... and that dude way back over there tapping his tambourine. Not so compelling, as rock and roll statements go.

Compression to the rescue. Slam the reverb through a compressor, and it turns into an entirely new kind of sound. Low threshold, high ratio, fast releasing compression changes reverb into a burst of noise and energy associated with every hit of the tambourine (or slam of the snare, or strum of the guitar, ...).

can create a bed of noise that seems never to decay. Each snare hit re-energizes the reverb. The long reverb time altered by heavy compression makes sure the sound lasts and lasts.

Do this in a mix, and you'll find that after snare hit number one it is no longer possible to hear the guitars or understand the vocals. Bad news. This reverb takes over, obliterating all delicate elements of your arrangement that dare to come near it. The reverb essentially becomes a new, loud noise floor.

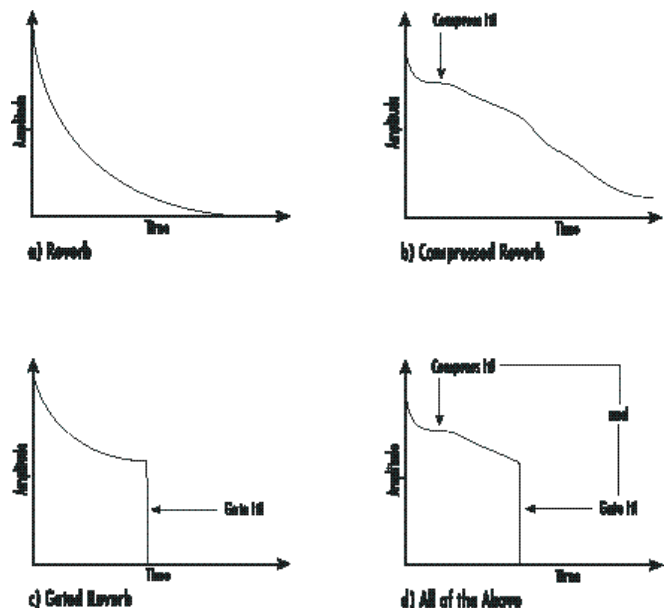


Figure 3: Changing the Shape of the Delay

Seems a little irrational to add noise to a mix, doesn't it? Yup. So when you add this much noise to a mix, also use a noise gate. Gates get rid of the noise. First we add an insanely long reverb to the mix. Then we compress it to bring the level of that reverb/noise up. And finally we add a noise gate to get rid of most of the wacky reverb we created.

The result is a gated reverb, shown in Figure 3. The snare drum hits. The noise gate opens up (triggered by the snare). The burst of reverb commences. An instant later (at a time set by you on the gate) the noise gate closes. The noise goes away, revealing those other elements of the mix (ya know, like the vocals). The snare hits again. Repeat.

sound hits. Dial in a very fast release time so that the compressor pulls-up the sonic detail of the decaying tail of the reverb.

Finally, hardest of all, you've got to get the noise gate to cooperate so that it opens only on the snare. If it's MIDI tracks you're using, it's pretty straightforward to find the threshold, attack, hold, and release times for the noise gate that make musical sense.

If you're using live drum tracks, the trick is to make sure the gate isn't fooled into opening when other nearby instruments play—like the kick or the hi-hat that might be leaking into the snare mic. Often a simple filter set lets you remove those sounds that are mostly lower (e.g.

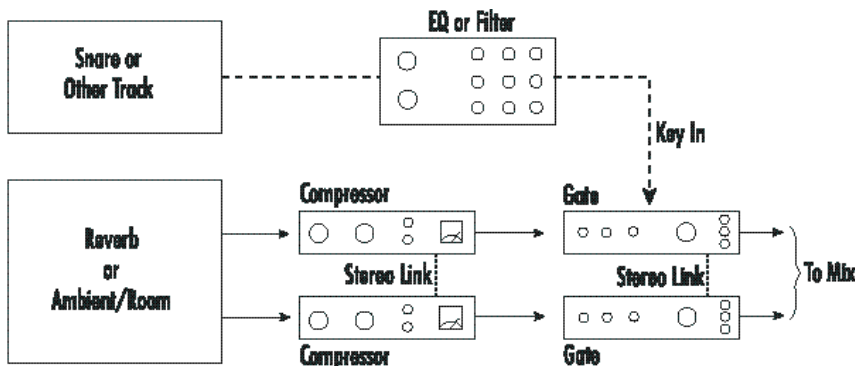


Figure 4: Signal Flow

Adding a gated burst of reverberation through this fairly elaborate signal path can convert a wimpy snare blip into the powerful snare of God. It's common to set the gated reverb to a musical note value—maybe giving the decay on the snare a dotted eighth note time feel, for example. Then the gated reverb isn't just loud and energetic, it's also grooving hard.

Explore compressed and gated reverb and you'll see how the non-linear reverb patches we discussed above are created. They don't play reverberation backwards, they just aggressively manipulate the loudness of the decaying reverb over time.

As Figure 4 shows, there is a lot to patch up to make it work. It also takes time to tweak it into control. You've got to find a good sounding reverb. Gated reverb rarely sounds natural, so you are free to choose a wild sounding reverb patch to start with; skip the sweet, high fidelity ones and go for the rowdy, out of this world sounds.

Next, you've got to dial in the right amount of compression. Set the threshold well below the level of the initial burst of reverb so that the compressor is still attenuating the signal well after the initial snare

kick drum) or mostly higher (e.g. hi-hat) than the instrument your are using to open the gate (e.g. snare drum). Filter out the lows of the kick and the highs of the hat that leaked into the snare signal you are using to trigger the gate, and you'll be able to get the gate to cooperate.

And what's good enough for artificial reverberation is good enough for natural reverberation. If you have recorded some natural room sound on to other tracks during the session, remember it will respond well to compression and gating too.

In the end, reverb isn't an effect. It's a family of effects—some obvious, some not so obvious. It rewards those who take the presets in different directions and those who dare to combine it with some eq, compression, gating, delay, flanging, distortion, and so on. There are no boundaries.

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