



# NUTS and BOLTS

**PART 18**

## Reverb, Part 2

Distilling the Options

BY ALEX CASE

**W**hat does reverb sound like? There are so many kinds; Figure 1 breaks it down into some logical categories.

So far so good. Once we learn what a hall sounds like, and a plate sounds like, we'll start to master the topic of reverberation. We've got our work cut out for us, though, precisely because there are so many kinds. And we're all dying to know what sort of reverb they used on the new Tattooed Waif album, Pierce Me Herd. Let's break it down.

Reverb devices in general might be broken down into four broad categories: spring, plate, digital reverberator, and special effects. We discuss the first three here, saving special effects for next month.

As we discussed in last month's Nuts & Bolts thrill ride, reverbs that rely on a mechanical device like a spring or a plate to generate ambience define their own class of reverb. They each have such a unique sound that they deserve a category to themselves. Learn what they sound like and reach for them whenever the creative urge hits you.

Stevie Ray Vaughn offers a case study on both spring and plate throughout his debut album, Texas Flood. In general, his guitar has classic spring reverb and his vocal has plate reverb—with predelay that sounds likely to be tape-based. From the opening guitar notes and vocal line on the first tune, 'Love Struck Baby,' these two classic reverb sounds make themselves known. And there's no reason not to send the guitar to the plate, the snare to the plate, and so on.

But that right-most category on Figure One, digital reverb, is a little vague. When the reverb comes in a digital box, as small as half a rack space, it becomes trickier to classify.

Just modifying a single reverb patch opens up a nearly infinite set of possibilities. Reverb times can range from maybe a couple hundred milliseconds up to 20 or 30 seconds. Predelay is adjustable from 0 to maybe a second or two.

Part 1 of this series on reverb introduced a number of reverb parameters: bass ratio, predelay, equalization, filtering. Where do we begin?

### Time & space

Digital reverbs can be defined based on the size of the architectural space they simulate: large hall or small room. In between, well, there's medium room, big brother's room (which is larger than my room), the laundry room, the basement, and the gym. Aack.

It goes on: stadium, canyon, locker room, live room, etc. So we draw a line in the sand separating large from small. Reverb times (RT) greater than about 1.5 seconds (and they can go as high as a positively insane 30 seconds or more) make up the 'large' reverbs. Naturally, reverb times of about 1.5 seconds and less are 'small.'

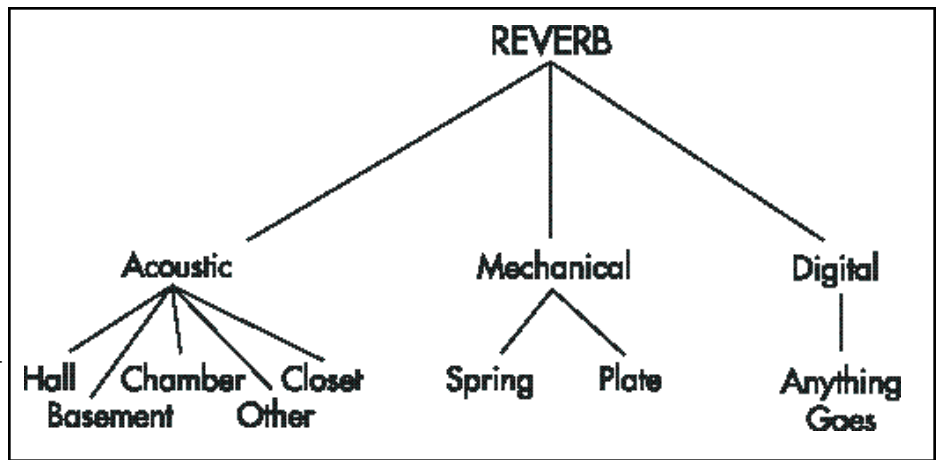


Figure 1

Large takes many names: hall, warm hall, bright hall, cathedral, Taj Mahal, and such. Small includes things like chamber, medium room, tight booth, and such. As each has its purpose, it isn't a bad idea to start a session with one large and one small reverb set up and ready to go.

The names of the reverb presets might seem nearly meaningless; you know they can all be adjusted to almost any reverb time. Medium room. RT = 1.3 seconds. It's no big deal to change it to 2.2 seconds and convert it into a hall, right?

Not exactly. There's a bit more to it than reverb time. A hall sounds different than a room. Reverb designers have gone to the trouble to capture those differences—the time delay between the direct sound and the onset of reverberation is greater in a hall than in a room because the walls are farther apart.

And as the distance between room boundaries is greater on average for a hall than it is for a room, the general pattern and density of early reflections is different for a hall than a room. There are countless, however subtle, differences between a large hall and a small room. Our ears (and brain) are excellent at catching those subtleties.

As a result, reverb designers go to great trouble to capture and/or simulate those magic little differences that define a space as a hall, an opera house, a medium sized room, and so on. So when you dial in a preset reverb that says hall, not room, be assured that someone has taken the time to try to capture those differences.

Gorgeous (i.e. expensive) hall programs will sometimes sound flat out bad if you shrink their 'size' down to room-like dimensions. Likewise, lengthening a great sounding room patch to hall-like reverberation will often lead to an unnatural, unconvincing sound full of strange artifacts.

Having said that, I can be pretty sure you are all going to try it on your next mix. That's okay, because music and music technologies reward that sort of innovation and chance taking. But it's important to know when you are stretching boundaries and what to look out for.

So what do we do with a long 'verb, a short 'verb, and so on? That's a little bit like asking "What's a D minor 7 chord for?" You use it when it sounds right to you. And you can use it when the theory supports it.

What follows is some discussion of good uses of different types of reverbs. Listen carefully to recordings you like and learn by example.

# NUTS and BOLTS

Try similar approaches, and armed with that experience, create your own bag of reverb tricks.

## Magic dust

Sprinkle long reverb onto a vocal or a piano or a string pad for some hype, polish, and glitter. It will almost certainly put the 'studio' stamp on your recording, but the slickness of a huger-than-huge reverb can add a bit of professionalism to the recording you are trying to make.

Typical modifications to the standard large hall come courtesy of the bass ratio control (discussed in last month's column) and good ol' equalization. Brighten it, warm it up, or both.

Bright reverbs are often a standard patch in your digital reverberation device. The slightly peculiar thing is that they don't really exist in natural spaces. As sound travels through the air, the highest frequencies attenuate first. As the sound propagates, it is the lowest frequencies you hear last.

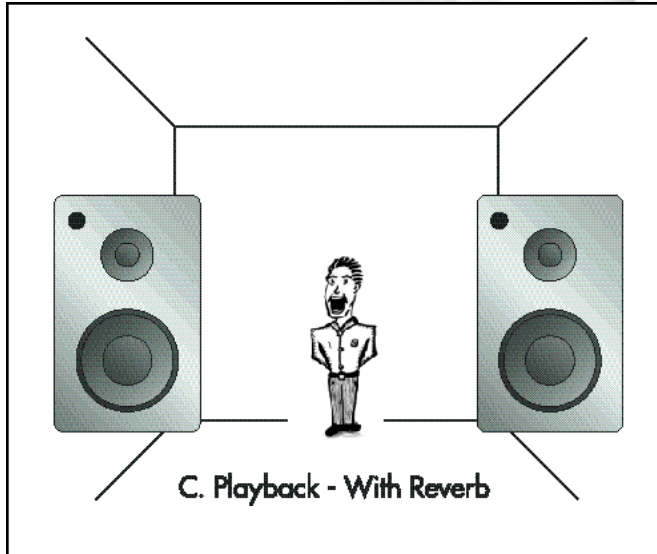
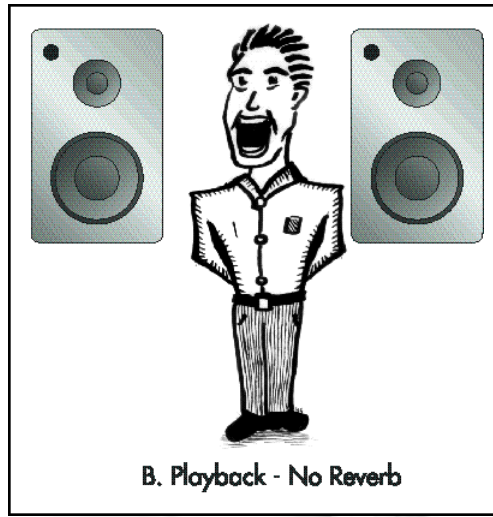


Figure 2

You've heard the dominance of low frequencies over high frequencies if you've ever stood beside a busy street and listened to the sound of the car radios leaking out of the vehicles. You can hear the thump and rumble of the kick and bass—but not much of the rest of the music—from one car. As for the talk

radio addict sitting in the other car nearby, it sounds a lot like the teacher in Charles Schultz' Peanuts cartoons, "Wawa waaaawuh waaa wo wo wawa waaaaa." That's the sound of speech that is mostly vowels (lower frequencies) and that lacks consonants (higher frequencies). As sound breaks out of these cars and into your neighborhood, the low frequencies start to dominate; the high frequencies start to evaporate.

Believe it or not, the bright reverb, full of sizzle and shimmer, is a rock and roll protest. It is the sound of an acoustic space that doesn't naturally exist. It's what it would sound like if high frequencies win out over lows. And for some applications it sounds pretty good.

Paul Simon has such good diction that, rumor has it, he is de-essed at tracking, mixing, and mastering. Using his super human S's to zing a bright reverb was too interesting an effect to pass up. Listen to the down tempo songs on Rhythm of the Saints. A shot of high frequency energy ripples through the reverb with each hard consonant Paul sings.

The other option, if you aren't brightening the reverb, is to fatten it. Adding a low frequency bias to the sound of your long hall reverb patch adds a warm, rich foundation to your mix. This comes closer to physical, architectural reality as it is often a design goal of performance halls to have the low frequency reverb time linger a bit longer than the mid frequency reverb time. And if it's good enough for Mozart, it's good enough for pop.

Naturally, we are allowed to select all of the above for a warm and sparkly reverb sound. Be careful, though. If the decay of the reverb fills the entire spectral range of your mix, high and low, it will leave no room for the bass, the cymbals, the vocals, the strings, and so on.

Divvying up the spectral real estate is a constant challenge in pop music mixing. And while it might always be tempting to use a full-bandwidth reverb that sings across the entire audible spectrum, it can be wiser to limit the harmonic 'size' of the sound of the reverb and assemble a full multitrack arrangement that, in sum, fills the spectral landscape.

The third principal variable after reverb time and reverb tone is predelay. That gap in time between when a sound begins and when a physical space is energized and starts reverberating is an excellent parameter to manipulate. To change it in physical space requires moving walls and raising ceilings.

The results are ethereal. Think ballad. Start with a long reverb preset on a voice, maybe the "Oooh" or "Aaaah" of a background vocal. Listen carefully as you stretch the pre-delay from maybe 20 milliseconds to 40 milliseconds, 60 milliseconds, on out to 100 milliseconds or more. The feeling of reverberation certainly increases as you lengthen the pre-delay. So does the feeling of distance and loneliness.

Here we've stumbled onto one of the most interesting parts of the recording craft. By manipulating pre-delay, which is a variable in the studio (but not in the opera house) we've created the feeling of a longer reverb



# NUTS and BOLTS

When you find yourself noticing and liking the ambient sound of a room, capture it in your recording. Two approaches: place microphones so as to capture a satisfying blend of the instrument and the room, or place microphones to just plain capture the room.

without lengthening the reverb. If it sounds like we get to violate the laws of physics and architecture in the studio, it's because we do.

If you've ever suffered from a mix that became overly crowded, confusing, and messy as all the tracks and effects were added, you may wish to remember this: pre-delay can be used to separate the reverb tail from the direct sound by a little extra bit of time. This slight separation makes the reverberation easier to hear. The result is the addition of extra reverb in feeling, without the actual addition of mix-muddying extra reverb in reality.

## Far out

Adding reverb to some tracks is like adding garlic to some sauces: yum. Sometimes, though, we are a little more strategic in our motivations to use reverb.

With the help of Figure 2, picture in your mind's ears the sound of a voiceover you just recorded in your studio. For this example we close-miked the talent in a relatively dead room. Play back the track and you hear, well, the sound of that person speaking, and he or she sounds nearby. Recorded by a microphone maybe six inches away from the voiceover artist, it isn't surprising that the voice sounds close and intimate.

Now add a good dose of reverb (hall-type patch with a reverb time of about 2.0 seconds). Perceptually, the voice now sounds more distant. The loudspeakers didn't move, but our image of the sound coming out of them sure did. As we use pan pots to locate discrete tracks of audio left to right, we use reverb to locate elements of the music front to back. Your mixes take on an unreal depth as you master this technique.

## Gel

The sound of the immediate space around a band can be very evocative of, um, the band in a room. Common on drums and almost any section (strings, horns, choir, kazoos), room ambience can help unite 32 tracks of overdubs into a single, compelling whole. Dial in a room patch with a reverb time of about 1.3 seconds or less and start gluing tracks together. The trombone lines that were recorded two months and two hundred miles away from the original saxophone parts will fall into the mix.

As reverb gets this short, it is time to ask ourselves "Why synthesize it?" Recording studios, large living rooms, converted garages, and renovated barns can make a contribution to the sound you are recording. It makes sense, therefore, to record it.

The first approach is one of the joys of recording. To record the music and the room, you abandon the pop music tradition of close miking and start recording instruments from a distance. Ambient miking approaches abound and are a topic of an upcoming Nuts & Bolts column.

It is worth mentioning that this ain't easy. To pull the microphones away from the instrument is to abandon some control and consistency in our recording craft.

Perhaps you've recorded your husband's ukulele a million times and know exactly where to put the mic to capture the sweet ukulele tone that always satisfies your clients. You've worked hard to find that perfect mic placement location that works anytime, anywhere, any gig. It is no doubt a mic position placed very close to the instrument—so close to the ukulele itself that it 'ignores' the sound of the room. There is comfort in the close miking approach.

But exploring ambient miking techniques will pay dividends, sometimes setting the vibe for the entire tune.

Capturing those tracks requires experience, quality equipment, and good acoustics—and a bit of good luck doesn't hurt. Explore this path only when a project has the time and creative motivation to do so.

The second, slightly safer option for capturing actual acoustic reverb instead of simulating it is to record the ambience of the room onto separate tracks. Place a mic or two anywhere in the room—the other side of the room, on the floor, at the ceiling, in a closet, down the hall... Record the room in a location you think offers a musical contribution to the sound of the instruments.

Of course you need spare tracks for this, but it enables you to close-mike the instruments as you always have and to capture some of the sound of the room too. You may end up with the opportunity to create unique sounds on mix-down.

Spring, Plate, Large Hall, and Small Room. Those are the obvious reverbs. And they offer a limitless set of sonic possibilities. Next month we'll look at the more bizarre reverb tactics: to reverse it, distort it, compress it, and who knows what else. Hopefully the audio police won't pull us over.

Alex Case wonders: before Reverb, does it just Verb? Offer help via [case@recordingmag.com](mailto:case@recordingmag.com).

## Technique

Major warning: a classic mistake that inexperienced recording engineers make is to add too much reverb. For me, learning how to use reverb was a little bit like when I learned to make chocolate milk a couple (maybe more) years ago. On the second try (without mom watching) I doubled the recipe. On the third try (sorry mom), the chocolate to milk ratio went decidedly in favor of chocolate (who needs the milk part anyway?). Such is the life of a kid.

This 'more is better' approach to life might work for chocolate milk, but it doesn't work for reverb. Too much of a good thing sounds cheap and poorly produced. It's literally the calling card of a young engineer.

Don't sweat it, though. Reverb will fool you the first few times, but here's how to outsmart it. Do a mix and add as much reverb as you want. Don't hold back. Turn up the reverb until you hear it and like it. Print the mix. Three days later, listen to the mix. There's nothing like the passage of time to clear our ears and let us hear things as we've never heard them before. You'll say "What was I thinking?" as your mix swims in reverberant ooze. We've all been there.

It's pretty fascinating that we could be in the studio, leaning into the speakers, ears wide open, adding what sounds like an appropriate amount of reverb only to discover, well, oops. It's something of an audio illusion. The more you listen for it, the harder it is to hear it. You get control of the reverb (and other effects) in your tracks only when you learn to listen confidently. Relaxed, you'll hear everything you need to hear, and, with experience you'll know how to adjust the equipment accordingly.

The fact is, reverb is something we have to learn to hear. For most humans reverb is not a variable, it is a fact. Our hearing system hasn't evolved with the concept that reverberation is adjustable. Recording engineers must discover and develop this ability. So much of audio (especially compression and equalization) is this way. Give yourself the chance to learn by making some fat, juicy mistakes!

