



NUTS and BOLTS

PART 11

The Session

BY ALEX CASE
Preproduction and Live recording

Surely part of the pleasure of music recording is that it is such a free, liquid, no-rules sort of endeavor. In this episode of 'Nuts & Bolts' we look at the actual process of recording. (Yes, I know we probably should've done this before looking at a mix the way we did last month, but it was Mixing's Art And Science Month in April and those Editor guys asked so nicely...)

Armed with the specific knowledge of components of the recording chain discussed so far in this series, let's discuss the actual session and our creative and technical options along the way. Throughout this article I'll be dispensing advice and then making the case for it; while this is all based on experience, bear in mind that different producers and artists have different ways of working. So don't get mad if you disagree.

Begin at the beginning

Perhaps the single most neglected part of making a good recording is preproduction. It is an investment that all bands and producers should make. And I'm a fan of involving the recording engineer during preproduction as well.

Big budget artists as well as struggling up-and-comers need to scrounge up the time it takes to work off-stage in a cheap studio, rehearsal space, or garage, and make rough recordings of the songs they plan to record later.

Think about it. The way most people hear our music is by listening to the recording over loudspeakers. The way the band listens to the music of other artists is by listening to those recordings over loudspeakers. But the way the band listens to their own music is live at the gigs, or during rehearsals and jam sessions. There is an unfortunate inconsistency here.

Talented, passionate new artists often create a band that is simply thrilling live. Then the album fails to "capture" this. Quite possibly all that has gone wrong is that the band hasn't had a chance to listen to themselves the same way they listen to all the bands they love—the same way their future fans will listen to them: on loudspeakers.

Give the artists a chance to react to themselves as they appear in loudspeaker playback and they'll often make the appropriate adjustments necessary to sound great on a recording. The same band that really works the crowd live can often work the loudspeakers through their recordings; they just need a chance.

Preproduction requires just a few mics and a cassette deck. Working with more mics and a DAT or 8-track recorder is sometimes even better. The mission of preproduction is to capture the performances on tape for study and evaluation later.

Many bands have never actually heard themselves until the first take in the studio on the first song of the first session for their first album. There is already a lot of pressure built in to that first studio situation. It's a lot of money. There are a lot of mics all over the place. There is a lot of gear in the control room with lights and meters evaluating every thought the musicians have.

For the first-time recording artist, an understandable paranoia sets in. An overwhelming fear of making mistakes that will be captured, amplified and mocked by every mic, meter and loudspeaker in the studio leads to a performance that is more conservative, less exciting. That's not the sort of vibe that will lead to a Grammy-winning performance.



If the band has never heard themselves before, get ready for some challenges. Think back to the first time you recorded yourself. When you aren't playing, and you are just listening, you start to hear things that have perhaps gone unnoticed for years. I drift flat when I sing loud, I rush during the solo, and I do this funny thing at the end of the bridge that just sounds awful—I always thought it sounded awesome.

The band deserves a chance to work these things out ahead of the album sessions. The fact is, musicians will fix many technical issues on their own if you just give them a tape of some rehearsals. The drummer will stop rushing during the chorus, the singer will plan out some of those "oohs" and "ahs" at the end, etc. Make a rough recording of the preproduction session for every member of the band.

The songwriter also benefits from preproduction. Most pop music songs are studied on paper: meter, rhyme, word choice, and structure are evaluated with the same care given a poem. Songs differ from poetry in that they are set to music. The songwriter should therefore get the chance to study his or her work as it lives on loudspeakers. Make a rough recording for the songwriter.

The project engineer also benefits from doing the recording during preproduction. The audio quality of the final product will improve markedly if everyone gets to hear what they and their instruments sound like coming back off tape.

The drummer may not notice the squeaky kick pedal during performances, but during playback everyone will. The guitarist may not seem to know that the strings on her guitar are replaceable, but during playback the sad, lifeless tone might motivate the effort.

Record the instrument and you'll find its every weakness—guaranteed. If the squeaky pedal and dull old strings are discovered before the big session, then the problem can be addressed. If it happens in the heat of the actual album-making session,

you'll find yourself trying to smooth over and hide a problem or wasting precious studio time and creative energy waiting for someone to run to the music store for the \$5 solution.

It is, but it isn't

The rules for the preproduction session:

First, treat it like the actual session. Every one must put their hearts into the session 100% and make it count.

The second rule—and this is ironic—is to make sure everyone knows that it's not the actual session. A line must be drawn between preproduction and session work. The best way to extract all the benefits of preproduction is remove the temptation to keep some of the takes or some of the tracks.

At first it seems perfectly logical: record the preproduction session to DAT, and if they nail a take we'll use it on the record. Record the rehearsals to multitrack, and if we get a killer vocal take we'll use on the album.

Beep/Quack/Eep or whatever noise your computer makes when an error is made. Trying to rescue the vocal take from preproduction and use it on the album will draw so much attention and require so much effort that you'll fail to properly evaluate the rest of the recording; the whole reason for preproduction is undermined.

How can the songwriter change a word or two later if the track is already recorded? "We'll just punch in the new words," someone says.

Beep/Quack/Eep. Matching the sound of the vocal will be a lot of trouble when you leave the rehearsal room and go to the fancy, acoustic paradise of the recording studio, when you leave the live vocal mic (the Indestructo X2000) in the van and start using the sweet vocal mic (the Delicato Tube2k) in the studio. And asking even world-class drummers to overdub their drum performance to an already existing vocal take is rarely successful.

The point of preproduction is to document with adequate sonic quality all the music and performance ideas that the band has as of today. Then these ideas are evaluated during playback over loudspeakers, wherever people prefer to listen: turbo-tweaked mega-hi-fi systems, in the car, in headphones, anywhere where you do a lot of listening to the recordings you buy.

Mistakes become audible, and are most always fixable before the album sessions. And more exciting, this band that you like so much live will come up with ideas for modifying

the arrangement, song structure, guitar tone, lyrics, and so on that will blow you away. Give them a recording of how they sound and let them do what they are really good at: making their own music sound great.

Preproduction also gives the producer and engineer a chance to contribute meaningfully to the creative music making process. The jobs of production and engineering happen in the studio. Producers and engineers have a familiarity with the gear of the studio like musicians have with their instruments.

Perhaps the band hasn't had a chance to listen to themselves the same way they listen to all the bands they love—on loudspeakers.

The studio experience of the production and engineering team enables them to make musical suggestions that are unique to recorded music. Double the vocals in the choruses, add slap-back to the guitar during the solo, use some gated room mics on the drums, run the piano track through a Leslie cabinet, etc.—there is a vast sonic palette to choose from.

These are creations that rely on the studio and its equipment to be created. They rely on loudspeaker playback to be realized. It is imperative that the producer and engineer look out for these audio concoctions that will contribute to the music and translate it into an action that the band understands and appreciates.

The band is expected to have an opinion on how appropriate such sounds are to their music, but it is the job of the studio cats to be able to create them. Preproduction gives the producer and engineer their first chance to start making these studio decisions.

Strategize: who, what, when, where, why?

Before the actual album sessions begin, the producer, engineer, and band should develop a recording strategy. It's just a schedule of who records their instruments and when. In what order should the songs be recorded? Which tracks get recorded first, and which are overdubs? These sorts of decisions are important to work out.

Like so much in music, there is rarely a single right way to do things. But some approaches are more use-

ful than others. You've got to decide among the live to 2-track, live to multitrack, basics, or overdub sessions. This month we discuss the live sessions. Next month's 'Nuts & Bolts' takes on basics and overdubs.

Live to two

It isn't always necessary to record to a multitrack. If you are recording a single, simple instrument, you can record it straight to your 2-track master machine—probably a DAT. Solo piano, voice, or guitar are obvious examples.

Without the distraction of other instruments and performers, the engineer can really focus. Mixdown won't be necessary, as there is nothing to mix the solo instrument with. Capturing the tone and adding just the right effects is the sole priority of a live to 2-track session.

Your decision to go live to two shouldn't be based on engineering convenience or desires alone. The recording strategy must also factor in the musical advantages and disadvantages as well. In a live to two the performer is as focused as the engineer, chasing that elusive goal—their best performance.

An important musical benefit of the single player live to two session is that there are no other musicians around. Other players often add pressure, stop takes, or require compromise:

The final product will improve markedly if everyone gets to hear what they and their instruments sound like coming back off tape.

Singer: "Let's use take 17! Listen to how I phrased the opening line."

Drummer: "But I fumbled that fill in the first chorus. I'm really digging take 12."

In many live to 2-track sessions it is just an engineer looking for a sweet sound and a musician searching for his or her personal best.

Of course, there is still opportunity to modify and enhance the live

recording. Post recording processing consists of two options: editing and mastering.

You can cut and paste together (literally or digitally) the best parts of all the takes into a single best take. And you can master the 2-track tape just recorded. That is, you can still modify the sound of the recording with a final dose of any effects you desire—typically equalization and compression, but there is no reason not to add reverb or more elaborate effects as well. Do whatever you think sounds best.

To achieve simplicity and intimacy, we plan on a live to two recording session. But live to two isn't just for solo instruments. We can certainly record more complex arrangements and bigger bands live to two tracks.

Let's put it in context by skipping ahead for a moment to that common multitrack session, the overdub. Say drums, bass and guitar have been recorded. Time for a saxophone overdub.

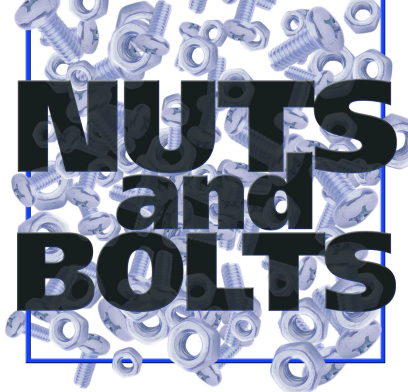
Consider the vibe at the overdub. The saxophone player is all alone in the studio, playing into perhaps a single microphone, living in a musical world that exists within the headphones. It isn't easy to find the killer solo that will take over the world when you're playing all alone in headphones. Certain components of music feed off the live interaction of other musicians.

This sax solo might benefit from being recorded at the same time that the rest of the band plays. Record it live.

And there are other instances where the live to two is tempting. Drummers and bass players are often so musically interactive that they prefer tracking together (don't miss our discussion of the Basics session

next month). If you can record the solo during the inspired groove of the live session, you'll find more expressiveness, more power, more emotion.

Certain styles of music are built on a foundation of interaction: jazz, blues, and power trios often like to be recorded all at once. Highly improvisational music is difficult to pull off musically through an assembly of overdubs.



Live to two becomes a much more intense session now. Two tracks of recorded music can easily come from more than a dozen microphones aimed at any number of instruments playing live, at once. And elaborate signal processing might be required.

Skip the coffee. You'll have plenty of adrenaline as you adjust the levels on all those microphones; dial in equalization that is just right for each of them; set up compression on half, probably more of them; send the snare to a plate reverb, the Rhodes to a quarter note delay, and the vocal to both the reverb and delay; and so on.

You've got to hear every little thing going on microphone by microphone, instrument by instrument, and effects unit by effects unit in the live to two session.

In addition, you must somehow hear the big thing: the overall 2-track mix itself. Back in the day, entire orchestras were recorded live with a single well-placed microphone. It can be done, but it's always something of a thrill ride. Consider these ideas to help out.

Safety net? What safety net?

Two tracks of recorded music can easily come from more than a dozen microphones aimed at any number of instruments playing live at once. Skip the coffee—you'll have plenty of adrenaline.

First, know the tune. Try to get a chart, attend a rehearsal, get a tape from the preproduction session (see above), and/or just plain learn the tune in detail during the first couple of takes. You've got to know what the song is about and memorize the arrangement: know who is playing when, when the loud parts are, when the soft parts are, and ride the faders accordingly.

Second, take a "live" approach to the recording technique. We know that in a live to two track session there will be no mixdown later. The good news is that in a live to two-track session we don't perform overdubs.

Musical issue: it's hard on the performers. They've got to get the performance just right, as there can be no fixing of mistakes, just repeated attempts at the tune—"Okay. Here we go again. Take 94...rolling..."

But it's good news for the engineer. It's fine if the vocal leaks into the guitar mic and the drums leak into the organ mic. We'll never rerecord one without the other, so such co-mingling of sounds—we call it leakage—often isn't a problem.

Live recording liberates the engineer of all those headaches associated with trying to separate the players and get clean tracks. Bye bye booths. Goodbye gobos. No need to hide the guitar amp in the closet and the bass amp in the basement (isn't that why it's called a basement?).

We constantly go to such trouble to achieve isolation in multitrack sessions. And those habits die hard.

You've gotta try it live and loose. Stick all the players in one room and live it up. They can arrange themselves in the way that is most comfortable for them—probably the way they rehearse, the way they write the songs, or the way they play live. Arranged this way, they are so comfortable they might forget they are being recorded. This is a good way to capture something special on tape.

Arranged this way they can see each other. Moreover, they can hear each other acoustically. So you can get rid of the headphones. Headphones are a distracting part of any session for the engineer. Musicians don't like 'em much either. They don't make for a very exciting or comfortable environment to jam. Headphones are a necessary evil in multitrack production. But live recording often permits you to dispense with them altogether.

What should we watch out for when we put the band all in one room? First the good news. When an instrument is picked up by microphones other than its own, a magic thing starts to happen. This leakage into other mics starts to capture a different view of the instrument than a closely placed mic can manage alone. When it is working it starts to make the instruments come together into a more compelling single sonic ensemble. The band will sound tighter, the song will gel.

The live recording might lack the precision that can come from well-isolated tracks, but it gains a more integrated, more organic total sound that is often well-

aligned with the aesthetic of the music being recorded. The music we tend to record live to two, this highly improvised, highly interactive sort of music benefits from being recorded in this sonically integrated way.

Manning the board

Recording the band all at once in a single room requires you to keep in mind two key issues: processing and panning. If you plan to apply some heavy processing to a single instrument, you need to minimize leakage into its microphones.

For example, the vocal signal is probably going to get some careful signal processing. Perhaps you want to use eq and compression to keep it strong and audible in the mix. If there is too much bass leakage into the vocal mic you might find yourself getting into some trouble.

When you try to eq in some low end strength to the voice itself you also bring up the unwanted low frequency bass leakage. If the snare stumbles loudly into the vocal mic, it's going to cause the vocal compressor to react differently. If the singer were facing the band and singing into a cardioid microphone, maximum acoustic rejection could be achieved and the problem avoided.

The lead vocal deserves special attention. On the other hand, the microphone sitting bravely in front of the Fender Twin Reverb won't notice a bit of vocal. You've got to minimize leakage into the quiet instruments, especially the ones getting extra processing, but most of the other leakage isn't a problem at all.

The second issue to manage in a live recording situation is panning. As instruments are panned left and right (and rear for you surround sound experimenters out there), you've got to listen for the impact it has on the sound that has leaked into the mic.

Consider the good ol' snare. The sound of the snare is going to be audible in pretty much every microphone

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that is in the same time zone. If the snare leaks loudly into the guitar and you pan the guitar to the left, then you'll hear the snare image drift left. If the snare sound also leaks into the piano that gets panned right, the overall snare sound can stay more centered.

In fact, the sound of the snare in the more distant microphones often sounds fantastic. You might want to plan your panning strategies so that leakage like that of the snare can be kept under control. You may have to back off on the extreme pan pot settings, pulling things in closer to center to keep the stereophonic image of the band tighter.

Alternatively, you might use leakage on purpose. Knowing that the snare will leak into the acoustic guitar track that you want to pan left, you might use an omnidirectional mic on the piano panned right to pick up extra snare leakage on purpose.

With a little attention to these strategies on processing and pan-

ning, you'll find recording the band all at once in a single room is a liberating way to work.

Live to multi

Sometimes it just isn't possible to meet the audio demands of the project in a live to two. Wild and complicated arrangements and large bands make getting the mix right while recording nearly impossible. If you've got drums, bass, guitars, keys, a horn section, a chorus section, lead vocals, and miscellaneous hand percussion, the session is probably too complicated for a live to two track approach.

The live feeling and sonic benefits of a live to two session can also be captured in a multitrack environment. Just because the music needs to be recorded all at once doesn't mean the engineering has to happen all at once. That is, we can record the band with all the live and intimate approaches described above and still mix it down later. Record the live session to multitrack. Old timers like me call this 'live to 24,' but as my digital audio workstation goes to (a not yet utilized) 64 tracks, it seems safer to call it 'live to multi.'

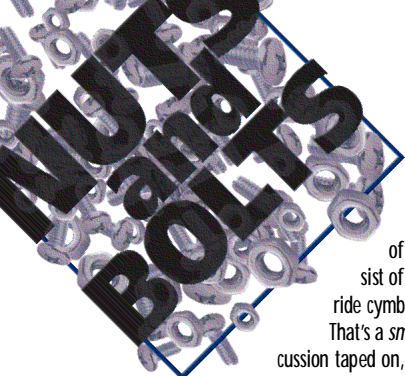
All or most elements of the tune are recorded simultaneously so that the

musical benefits of the live session are captured. Record with similar strategies. Arrange the musicians to maximize their comfort and encourage their creativity. Seek advantageous blending of the instruments in the room through strategic mic placement that captures the tone of the instruments and a good dose of acoustic leakage. But do avoid too much leakage on those tracks destined for a good dose of signal processing or aggressive panning.

The live to multitrack session takes some of the pressure off the engineer as the priority is all about session vibe, musician comfort, and awesome raw tracks. The mixing of the tracks will get to happen in a separate, less crowded, lower stress session.

Next month we explore the more typical production process: recording to multitrack and then overdubbing any number of additional tracks so that they can be mixed into a powerful, polished, and professional stereo master release.

Alex Case thinks they should call that TV show 'Saturday Night Live to Two.' Request Nuts & Bolts topics via case@recordingmag.com.



Learn By Drumming: Live To Two

The drums are easily the most difficult part of the live to two challenge. A small kit might consist of kick, snare, hi-hat, two rack toms, a floor tom, a ride cymbal and a crash cymbal.

That's a *small* kit. It might also have more drums, hand percussion taped on, two kick drums, a couple of snares, as well as a long list of additional toms, cymbals, gongs, trash can lids, cereal boxes, buckets and beer kegs.

What a mess. It's an engineering challenge: one player, many instruments. And these instruments are all in close proximity to each other.

Mic placement

You might want to abandon the idea of close-miking every piece of the kit in a live to two session. Try instead to capture the entire kit with a pair of *overhead* microphones placed above the drum set. Placing just a couple of mics to capture so complicated an instrument is a skill acquired through experience, so try to give yourself room to make and fix mistakes.

For the stereo image to work in loudspeakers you must arrange mics symmetrically about the kit. Place the mics so that the snare and kick remain as close to the center as possible.

These overheads might be *coincident* (the two directional capsules placed as close to each other as possible but oriented in different directions) in either XY or MS configuration. Or they might be a spaced pair of microphones, looking down on the kit and the room from above and off to the sides. Please refer to the 2/97 issue for more about stereo miking configurations.

How high? To make this determination you've got to wrestle with two conflicting trends. First you've got to find the right drum sound versus room sound combination. As you move the mics away from the drums (higher or farther) they'll pick-up more and more of the ambient sound of the room. The amount of ambience is a matter of musical judgement. Make sure it supports the mood of the song—somewhere between tight/focused and wild/out of control.

The second issue is that moving the overhead microphones will adjust the relative balance between cymbals versus snare/kick/toms. When the overheads are in close to the cymbals they act more like 'cymbal mics.' As you back the mics away from the kit they start to view the whole kit without preference to the cymbals. With the mics down close the snare might be four times farther away from the overhead mic than the crash cymbal; pull the mic away and the relative distances from mic to snare and from mic to cymbal converge.

So placement of overheads determines the cymbals vs. drums balance and the drums vs. room combination. Listen to both trends as you move the overhead microphones and you'll find the sweet spot that solves both problems.

Mic type

Condenser mics are the most popular choice here because they tend to be best at capturing transients. The drum kit rattles out transients from down beat to fade out.

Ribbon microphones, with their unique high frequency detail, are also a good choice—if they can take the sometimes very high sound pressure levels booming out of the kit. New ribbon microphones can handle this; old (and nearly irreplaceable) ones probably can't. Power rock and roll playing will crush them; more laid back jazz and brushwork are no problem.

Moving coil dynamic microphones certainly aren't ruled out for the pair of drum overheads. These days they often have a terrific transient response, so they are up for the job of capturing the percussive detail of the drums accurately.

And sometimes we throw accuracy out the window. Dynamic mics can act a little like compressors when highly transient waveforms hit their capsules. And what musical compressors they are! Rock drums can benefit from being carefully captured by a condenser or ribbon, and they make a make a musical statement when massaged ever so by our indestructible friend the moving coil dynamic.

Pick-up pattern

Anything goes here. Cardioids let you 'aim' the microphones to tailor the sound. Too much ride cymbal and not enough toms? Just rotate the microphone so that it faces more toward the toms and looks less directly at the cymbal.

Figure eight patterns let you do some 'aiming' as well. The bidirectional microphone is most sensitive to sounds directly in front and directly behind the capsule; it totally rejects sound incident from the sides.

While it's typical to think of them as 'hearing' mostly what's in front and what's behind, I find it helpful to focus on what they don't hear. Think of the bidirectional mic's rejection off to the sides as your tweaking tool: for instance, for less ride cymbal, rotate the figure eight pattern so that the ride falls a little more into the side rejection area.

Omnidirectional patterns are also a good choice for overhead microphones, though they are a little more difficult to place. Capturing acoustic energy from all directions, they'll grab more ambience than a cardioid or figure eight. As a result, to get the same balance of room sound versus kit sound, omnis will need to be closer to the kit than more directional mics.

Less obvious is the fact that the omni mic is a simpler, arguably purer device than the cardioid mic. Directional mics require a little signal processing to achieve rejection in certain directions. It's usually very careful, clever, and excellent sounding, but even acoustic signal processing of the highest quality pays a price. To over-generalize grossly, omnis often have a sweeter low frequency character than a lot of directional microphones, but of course this sort of thing varies from one mic model to the next. There are cardioids with fantastic low end and omnis that are low frequency deficient. What I'm really trying to say is that choosing between omni, bidirectional, and cardioid isn't just about pick-up pattern, it's also about frequency response.

Compare not just the blend of cymbals versus toms and drums versus room sound, but also the sound quality of the drums coming through the mics. Listen to the spectral and timbral effect of choosing a different pick-up pattern.

More than two drum mics?

It is possible to capture the entire kit with just a pair of overheads. In fact a single microphone can work, placed either overhead or down in the kit tucked between the snare and the rack tom opposite the hi-hat.

Using so few microphones on so broad an instrument requires that you have time to really tweak the mic placement and that you have a nice sounding room to help balance the sound. For this sort of work, first listen to the kit in the live room, then position the mics, and finally listen in the control room. You've got to listen to the whole kit as well as all its individual pieces.

If you don't like what you hear, return to the room with a specific objective in mind (e.g. too much crash cymbal, or snare pulls left) and move the mics (or change the mics, change the pick-up pattern, move the kit, etc.) in a way that you think will help. Return to the control room, listen, and repeat...and repeat...until you love the overall balance of the kit.

This sort of judgement also requires experience. Just using one or two overhead mics on the drums requires finesse. More typically, we support the overheads with a couple of close mics, even in a live to two-track session.

First, the kick drum welcomes a dedicated mic. To extract a decent amount of low end thump without too much messy room ambience, you've got to get a microphone in close. The kick is loud, so you'll need a mic with the ability to handle high sound pressure levels (up to and above 120 or even 130 dB SPL). Many condenser mics these days can take it, but most of the time the kick demands the robustness of a dynamic.

The snare, so important musically, also gets the special attention of a close mic. In the heat of a session you may not be able to count on the drum balance that you can pull out of the overhead microphones alone. Sticking a mic in close to the snare lets you ride a fader to change the amount of snare in the live mix—a handy thing.

A dynamic cardioid mic is up to the job, and especially for rock it grabs a present tone that will sound exciting. Condensers and ribbons are also desirable for the high frequency detail.

If you go for a condenser, it probably needs a pad to prevent nasty distortion of the microphone's electronics. If you use a ribbon mic (especially an old one) on the snare, take out some insurance or book the studio under a false name—one hit, one shredded ribbon.

Effects

For multitrack sessions it is common to eq and compress every single drum track on its way to the tape machine—in pop and rock, anyway. For a live to two, you've got to back off on this approach; it's suicidal to dial up a stack of effects in a live to two session.

If you've just got overheads up, gentle compression is probably welcome. Three goals:

1. *Safety*: use compression to prevent the distortion that comes with levels to tape/disk that are too hot.
2. *Punch*: use compression to tighten up each hit of the drums and add a bit more attack.
3. *Care*: not too much compression or you'll hear the decay of the cymbals become unnatural, pumping softer then louder as the compressor rides the gain too aggressively.

These conflicting goals force us to back off the compression on the overheads significantly.

If you've added close mics to the kick and snare, go ahead and compress them hard so that they add punchiness, clarity, and attack to the overall sound in the overheads. The idea is to get maybe 80% of the drum sound from the overheads. Sneak in the close microphones to add that extra little power and detail.

This two to four microphone approach should enable you to get the kit under control in pretty short order, freeing you to focus on the bass, and the guitar, and the vocal, and...

Isn't live to two a blast?

