

In The Studio: Gipsy Kings Guitarist Tonino Baliardo

RECORDING

The magazine for the recording musician

Let's Get Started!

» Setting Up Your First Recording Rig

» Easy Tricks To Record
Guitar Amps • Drums • Vocals

» Keys To A Successful
Recording Session

a first look inside NAMM 2007

Getting to know Ableton Live



Behringer XENYX 2442EX Mixer

11

New Product Reviews

AKG Perception 400 mic

AEA The Ribbon Preamp

E-MU 0404 USB interface

SE Electronics Reflexion Filter

Klein + Hummel O 110 monitors

SPL MTC 2381 monitor controller

Cakewalk Dimension Pro and Rapture

Pop Filters from Stedman and Middle Atlantic

\$5.99US \$6.99CAN 03

71486 03050 8

VOL. TWENTY
NUMBER SIX
MARCH 2007
USA \$5.99
CANADA \$6.99



This follows on from Part 1 in our July 2006 issue, to conclude our 2-part look at mixing lead vocals. Since then I've discussed some of these ideas as applied to backing vocals, in the December 2006 Vocal Column—now it's time to return to the lead vocal once more. Last time we discussed the philosophy of vocal mixing and basic concepts of lead vocal editing, panning, and dynamics treatment. Let's move down the signal chain....

Equalization

Equalization, eq for short, is another really basic adjustable parameter of a lead vocal (or for that matter any other) track.

The term refers to the process of equalizing—evening out—tonal discrepancies. A well-recorded vocal shouldn't need dramatic eq, as long as a world-class mic and preamp were used in capturing it. But even when I'm working on a vocal that has been recorded well, I'll often adjust eq in just tenths of a dB; this might be to remove unwanted coloration from the room or proximity effect (generally anywhere from 90–250 Hz), to adjust its cut (generally anywhere from 900–2500 Hz), or to give it more edge or air (generally 2500 Hz and up).

For fine-tuning of the vocal eq, I usually wait until the rest of the tracks have been eq'd and otherwise mixed. Ultimately the lead vocal eq can be adjusted, first to remedy problems inherent in its recording, then to fit the rest of the mix. If you're working on a system that doesn't have much DSP headroom, you might want to instantiate one of your best equalizers on the lead vocal track at the beginning of the mix process, so you know that the most important track in the mix will be well-cared for when it comes time to address its eq.

Filters and bands

Different engineers approach applying eq in different ways. Mixing in Pro Tools, my favorite eq at this point in time is the Sony

Vocal Alchemy – Part 2

By Bruce Kaphan

Oxford. I love the architecture of this plug-in. Typically, on a lead vocal, I'll begin with the vocal in solo, then first I'll engage the highpass filter. Often I'll leave it minimally set, but I'll set the high pass to sit somewhere below the fundamental frequency of the lowest note the singer sings, especially if there's low-frequency leakage from a loud drumkit in the next room, foot-tapping on a not-particularly-solid floor, truck rumble from the nearby freeway, whatever it may be.

Next I'll engage the low mids. I adjust the Q to the narrowest possible, then turn the gain up until the effect on the track is past ridiculous. Then I sweep frequency, looking for particularly resonant frequencies. Generally most rooms get involved in a negative way with human voice in the range from about 125–250 Hz. If I find a particularly resonant frequency—when I notice the vocal getting really loud and kind of honking—I'll then play with a slight cut at the most offensive frequency. I'll toggle back and forth, adjusting the gain and Q knobs until I find a setting that leaves the power of the vocal intact but reduces unwanted coloration.

At this point, I'll take the vocal out of solo to see how my changes influence the vocal's relationship with the track. Assuming these changes



Vocal Alchemy

worked, I might either be finished, or I may want to continue tweaking. With the low mids I—more often than not—tend to slightly cut; it's different when I work with the mids, where it tends to go either way. If the vocal sounds nasal, I again adjust the Q to the narrowest possible, turn the gain up massively and I sweep frequency looking for particularly resonant frequencies that contribute to the nasal quality, then I cut at that frequency until I feel I have reduced the problem.

Of course, once mids are adjusted, checking the vocal in the mix makes sense. At any point in tweaking the vocal eq, it makes sense to toggle the bypass with the vocal in the mix. Do the changes I've made make it sound better or worse?

I generally approach high mids in a slightly different way than any other control. Leaving the Q set to its default (12 o'clock) setting, if I feel the vocal is a hair too dark, I'll turn the gain up a little and sweep frequency until I think I've made an improvement. If either gain or Q need tweaking, I adjust accordingly. Similarly if I feel the vocal is a bit harsh, I'll consider cutting high mids subtly. When I think I'm all done, I'll toggle bypass on and off once again, to make sure that I'm *really* making the track sound better than it did flat.

impactful lyric into one that literally screams at the listener. It's a great purveyor of anger or frustration.

If a vocal track calls for distortion and it wasn't originally recorded that way, it can either be re-recorded using a distorted guitar amp or other sound reinforcement amp or it can be processed through any number of distortion devices, whether a guitar player's stomp box or a plug-in such as Line 6 Amp Farm or IK Multimedia's AmpliTube. If I have anything to say about distorting a vocal *before* it has been recorded, I love to give a singer a crappy dynamic mic and a distorted guitar amp and let them hear themselves tearing it up as they go. Psychologically, there's nothing like giving a performer immediate feedback with something like this—hearing the effect while cutting the track has the potential to transform the track in a powerful way.

Links in a (signal) chain

All of the processing that has been described thus far alters the original sound of the track being processed. In other words, it's not an additive process, it's a process that transmutes the original signal. In an analog setting, this type of processing would either be inserted into the signal chain between the recorder and console or in a channel insert in the console. In a DAW setting, since there is no patch point between recorder and console, all of this type of processing takes place in the insert section of the mixer. That allows a lot of flexibility in ordering effects as the audio passes through them, creating a signal chain that gives the best result for each task.

The order of a chain of signal processors can make a huge difference. Limiting, multiband compression or a

When I used to record on analog tape, keeping the noise floor down by means of muting channels not in use was always a high priority. In the DAW world this task has become far easier and more precise.

Generally, I tend to adjust lows and highs in shelving mode. I just find that once I've adjusted low mids and mids, resonance isn't much of a problem, so subtle shaping of the overall blend of top and bottom makes sense. I may do this before treating the high mids.

Harmonics processing and distortion

The Aphex Aural Exciter and other processors of this sort generally work by emphasizing harmonics. Depending on the particular model, the user can control whether the emphasized harmonics are odd or even, where the center frequency is, and so on. I usually find the sound of an exciter to be a little artificially harsh or raspy for my taste. Occasionally, if I'm mixing a vocal that was particularly poorly recorded and as a result has a lifeless quality, or if I'm working on really heavy rock where all of the sounds are pressed up against the listener's face, where giving the vocal a final little extra bit of edge helps make it a little more discernable, I might instantiate one of these.

Distortion for vocals? Yes, intentional use of distortion can occasionally be just what a lead vocal needs to make a strong impact. Obviously most useful in heavy-hitting music like heavy rock or punk or various urban music forms, distortion can heighten a vocal track's urgency and strangely, sometimes its intelligibility. It has the potential to transform what might otherwise not be a particularly

de-esser (if used) come first: I think of them as science-side problem-solvers rather than art-side enhancers, and I want to solve problems before I get to enhancing the track. If more than one of these problem solvers is to be used, I carefully consider the order based on how I think one device's processing will affect the next device's.

Should eq come before or after compression? This decision requires experience in listening. One effect of placing eq before compression is that a broadband compressor simply reacts to whichever part of the incoming signal is loudest. Of course the opposite is also true, in that the compressor won't react to the part of the incoming signal that fails to reach the threshold of the detector circuit. So if you have cranked a particular frequency range in the eq, only regions of the track that contain large amounts of that particular frequency may be strong enough to trigger compression. This can be useful but is also easily overdone. Assigning eq after compression has its pros and cons as well. If eq is boosted too aggressively, with no compression to contain it, there may be a few just-too-loud spikes in the track.

In any event, always try to understand the function of any processor you wish to use, and try to put the processors in an order that makes some sort of conceptual sense to you. Mess around with the order to see what happens and as always, keep what you like and toss what you don't.



Vocal Alchemy

Last but not least, don't forget to compensate for plug-in delay! Some high end DAWs offer a "Delay Compensation" feature. If your DAW doesn't offer this, you'll be amazed by how much better your mixes will sound if you manually compensate your mixes. First, investigate how many samples of delay are associated with all of your plug-ins. You can do this by reading the manual, investigating online, or contacting customer service at the plug-in's manufacturer. Once you've added up the total plug-in delay per track, set your nudge control to samples, and nudge each track upstream by this total number.

Excerpted from the March edition of Recording Magazine 2007
©2010 Music Maker Publications, Inc. Reprinted with permission.
5408 Idylwild Trail, Boulder, CO 80301 Tel: (303) 516-9118 Fax: (303) 516-9119
For Subscription Information, call: 1-800-582-8326 or www.recordingmag.com

Time-domain processing

I refer to reverb, delay, harmonizers, etc., etc.—devices that copy a signal, then generate one or more processed copies of that signal—as time-domain processors. In an analog studio you may only be able to afford one such device of each type, and use it on a shared bus. Plug-ins can be used as channel inserts, as many as your computer can handle, but if you run up against too many limitations, I heartily recommend getting used to setting up time-domain processors in a send/return configuration, as in the good old days.

Time domain processing is very subjective—my clients' tastes in time-domain signal processing often surprise me. Some people are totally opposed to reverb, or at least the concept of it; some people can't live without it. Regardless of individual taste, time-domain processing can dramatically alter the perception of space in a mix.

There is another way to get a room sound, of course—the "real" way: even with convolution reverbs suddenly making reverb a whole lot more interesting for me, the longer I've been at this kind of work, the more I appreciate a good-sounding room well-covered with distant stereo miking. That said, I almost always use at least one reverb and one delay when mixing a lead vocal. Probably my all-time favorite reverb is a good old-fashioned honest-to-goodness analog plate. Of late, when I've finished mixing a project I've actually been booking an hour or so at a local studio with an assortment of EMT plates just to print EMT on my lead vocal tracks.

I've been a long-time user of Audio Ease Altiverb, and more recently I've added Digidesign's TL Space, Reverb One, and ReVibe to my arsenal. I love these for their versatility and sound quality. If time ever allows, I think it would be a blast to create some of my own impulse responses. As for delays, I most often use Line 6's Echo Farm and Sound Toys' Pitchblender or Timeblender.

I find dynamic delay to be the most useful for lead vocals. A dynamic delay is a self-ducking delay that allows the engineer to set controls which determine how much and when the echo is allowed to output, based on what's happening at its input. This helps give a delay tail only when the vocalist stops singing. If I find that the echo is annoyingly present at a few spots in the track, I'll go through the track automating the send level.

There are so many different reverbs and delays and presets, perhaps a discussion of the intricacies of these devices is better left for a separate article.

Pitch processing

Pitch processing is a specific type of time-domain processing wherein the original signal is copied, and then a pitch-shifted version output. In the pre-DAW era, the most ubiquitous such processor was made by Eventide. Many models of the Harmonizer were and are still being made, with the most recent being the H8000. Harmonizing is a sound unto itself. It shares some similar qualities with chorusing, but it isn't automatically modulating as chorus is. Restrained use of a harmonizer can help thicken a lead vocal without making it sound artificial. Heavy-handed use of a harmonizer, on the other hand can make the vocalist sound like a robot.

In the analog era, well-known mixing engineers such as Bob Clearmountain were known to use the pitch-shifting capabilities of the Eventide Harmonizer to tune tracks that the producer or engineer had for whatever reason not tuned. Of course in the DAW era, plug-ins such as Antares' Auto-Tune or Celemony's Melodyne can actually automatically tune a lead vocal track, albeit with some significant limitations. I haven't yet had the opportunity to try Melodyne, but I've grown pretty frustrated with Auto-Tune, at least for use on lead vocal; if I feel I have to tune a track during mixdown, I'll usually give Auto-Tune a quick shot; if it doesn't work to my satisfaction, I'll usually use Serato Pitch 'n Time to manually adjust the pitch using my ears.

Cleanup on Track Seven...

Gain riding and muting (track cleanup) can make a huge difference to a lead vocal. Gain riding started in the old days with the engineer making detailed fader adjustment during a mix or a transfer—listening intently and adjusting the volume on the fly. Even when I found myself mixing on consoles with automation, I always longed for the day when a system more articulate than faders might come into existence.

When I set up my home studio in 1998, I made the commitment to mixing in the box and haven't looked back since. To this day I'm still perfectly happy drawing volume automation with a mouse. With the aid of the

wonderful graphic interface made available in most DAWs, I can almost level a lead vocal without listening to it, not that I would....

These days, more so than "gain riding" I call this process of detailed lead vocal level management "leveling". Take a look at the graphic for a typical lead vocal leveling automation display (see Figure 1 on page 32).

When I used to work in analog, keeping the noise floor down by means of muting channels not in use was always a high priority. Back then, a perceptible amount of noise was heard even from tape that had never

been recorded on. Console automation made this task easier and more precise. In the DAW era, this process can be even more exact. For isolated or overdubbed solo vocals, this is somewhat less complicated than it usually is for a vocal that is tracked while other sound is being made—probably the most ubiquitous example is the self-accompanying guitarist/vocalist.

For an isolated vocal track, the ambient sound of the room and the mic and preamp self-noise shouldn't be terribly problematic if left in the final mix. Whether or not the mix

Excerpted from the March edition of Recording Magazine 2007
©2010 Music Maker Publications, Inc. Reprinted with permission.
5408 Idylwild Trail, Boulder, CO 80301 Tel: (303) 516-9118 Fax: (303) 516-9119
For Subscription Information, call: 1-800-582-8326 or www.recordingmag.com



Vocal Alchemy

engineer chooses to mute or clean (actually edit out) the regions between vocal sections is a function of both time and the art-side decision of whether the ambience is useful or not. I'm almost always in favor of removing idle noise—I think it clarifies the remaining tracks. In addition, I like the sense of intimacy that the appearance or disappearance of a noise floor induces. It's almost like being aware of the noise floor is part of paying attention to the lead vocal.

For example, let's say there's a musical interlude between one vocal section and the next. If the noise floor is subtly perceptible when the vocalist is singing, then it is deftly tailed out as the musical focus turns to the soloist in the interlude, it helps turn the listener's attention away from the presence of the vocalist, as one's visual interest would be swayed away from the vocalist to the soloist in a live setting. The subtle sound of the noise floor either returning with or slightly presaging the vocalist's return gently nudges the listener back into an awareness of the vocalist's reappearance.

Cleaning or muting a vocal track that was recorded in the midst of other sounds is more complicated. For example: let's say you need to mix a lead vocal track that was cut by a singer who was playing acoustic guitar in a not-so-soundproof booth while a full, loud band played in the adjacent room. You've got plenty of guitar and a little bit of drum leakage in the vocal track. Chances are pretty

good that neither the guitar nor drums sound all that great as portrayed by the vocal mic, but these sounds are immutably tied to the vocal sound. You have to blend this sound together with the mics that were intentionally used to record the guitar and drums. In contrast to the previous scenario, in which muting the vocal between vocal sections was an elective and subtle choice, here it could mean a drastic change in the timbre of these other instruments. If a fair amount of compression is used on the lead vocal mic chain, this problem is only exacerbated as the peak level control allows the background sound level to be relatively louder in the absence of the vocal. What to do?

First I'll try adjusting the phase of the lead vocal to see if there's any cancellation advantage to be gained. Of course the downside to this would be in the potential of creating phase problems in the relationship with the guitar. You just have to use your ears.

Second, I almost always deal with this kind of background noise problem by automating the fader volume of the lead vocal track. I set this level by turning all of my focus to the background sound level, while ignoring the lead vocal to the best of my ability. I try to match the perceived background sound level when the vocalist is on top of the mic (and the compressor is working) to the level of background noise when the vocalist is off the mic and the noise floor (unchecked by any compression) is at its highest. I try to sweep this change under the carpet by gracefully fading into and out of the vocal regions. Often at least 6 dB of unwanted extraneous sound can easily be reduced this way, and you'd really have to be paying explicit attention to this particular attribute of the mix to even notice that any monkey business was afoot.

It's a wrap!

As is the case with every aspect of recording, an incredible array of factors are at work even when considering the sound of just one track at a time. Creating a vibrant, emotive, interesting mix requires thousands of instinctual decisions, in the hope of eventually evolving an amazing invisible tapestry of moving air.

I'd have to guess that the odds of two mixers mixing the same tracks, choosing exactly the same tools and setting them exactly the same way, are astronomical at best. One of the things I love most about music and recording is that it doesn't matter what you've accomplished or what you haven't, each of us can always know more, be more experienced and be more creative than we were the day before. Have fun! ☺

Bruce Kaphan (kaphan@recordingmag.com) is a freelance producer/engineer/composer/musician living in the San Francisco Bay Area. His pedal steel playing can be heard on the recordings of Sheryl Crow, R.E.M., Jewel, American Music Club, The Black Crowes, and others. He "adapted the underscore" to Bob Dylan's Masked & Anonymous and has toured with David Byrne and American Music Club.

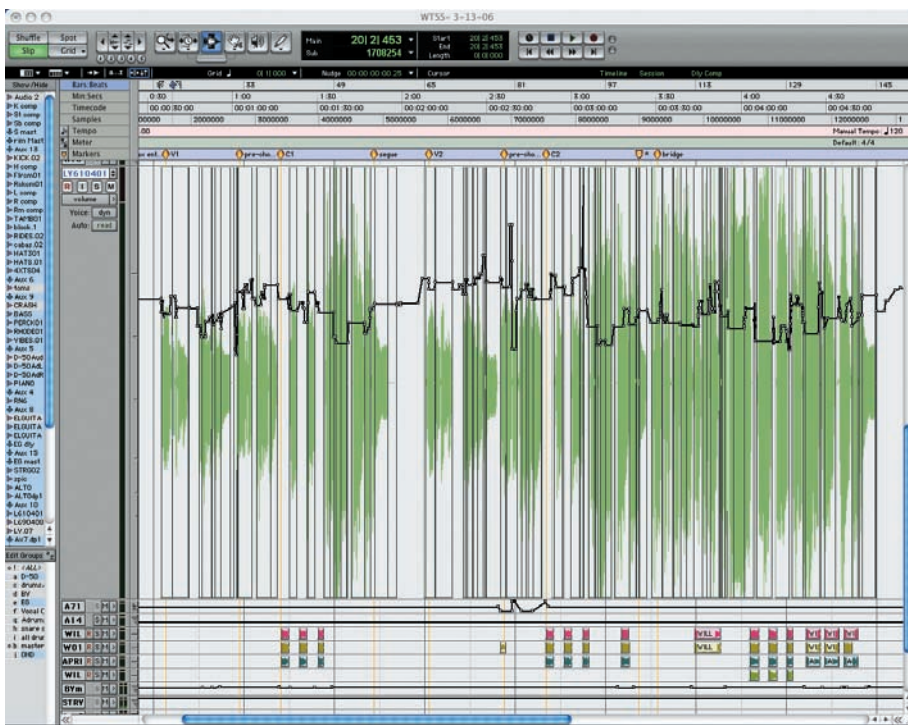


Figure 1. Automated gain changes within the DAW allow for a very fine level of control when riding the level of a lead vocal. The stretch of vocals above is just over four minutes long, but has dozens of fine level tweaks to get the best result.