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We are pleased to present our October issue.

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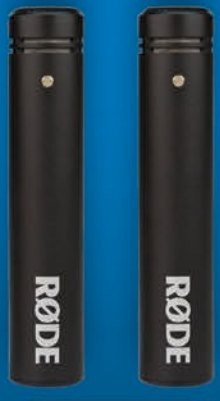

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What's in YOUR locker?

It's always fun when I can open one of my editorials with a couple of cool photos.

Paul Vnuk Jr. has been at it again, as you can see. First there's a star array of ribbon mics from (clockwise from the top right) AEA, Cascade Microphones, Royer Labs, Cloud Microphones, and sE Electronics. This comparison was done as part of the review process for the mic at the very top: the new VL37 ribbon from Samar Audio Design, which gave a pretty remarkable account of itself in the studio. See page 48 for more.

Next, it's large-diaphragm condenser time! This array features mics from the ultra-affordable to the princely. At the top and at the bottom right are the PGA27 and PGA181 from Shure, part of the new entry-level PG ALTA line and reviewed on page 60. On the bottom of the array are the recently-reviewed Roswell Pro Audio Mini K47 and the well-loved Shure KSM44, and facing off across the middle are the classic Neumann U 47 fet on the right, and the beautiful Saint Jean Baptiste mic from Cathedral Pipes on the left (reviewed on page 44).

Not shown in these photos: Audix's HT5 and HT7 headworn mics, ADK's vibrant new Z-251 and Cremona 251-T, or the Lewitt DGT 650 mic/interface—which I got to test under fire and enjoyed enough to feature in a selfie. All of these mics are reviewed in this issue, which we've subtitled "Build Your Mic Locker."

While mixing consoles may be more photogenic (see my musings from last month), mics are the iconic tools of the recording engineer. Mics turn sound into electricity, and how that happens dictates the quality of every note we record. The combination of the perfect mic for the task, and the one who knows how to use it, is a magical thing.

Note that "the perfect mic for the task" is not always the most expensive mic in the locker, the one with the most cachet, or the one that worked on the last ten tasks you used it for. The key to a great mic locker is diversity—a variety of different designs, each with its own areas of strength. It's sensible to start building up your mic collection with a couple of inexpensive ones that you'll never outgrow, and then flesh out from there. Sven-Erik Seaholm and I walk you through the process on page 24.

Of course, the most expensive mic in the world won't help you if it's not placed properly. In our special report from NRG Studios in North Hollywood that begins on page 16, Eric Ferguson returns to our pages after a much-needed vacation (two straight years of Recording Fundamentals columns was a daunting task!) to chronicle mic choice and placement for a jazz session. One warning, though: if you're a lover of vintage guitars, have a hanky handy when reading....

Also in this issue: a slate of other great reviews, First Steps with Paul J. Stamler (see page 68), and an enlightening mini-interview with gear goddess EveAnna Manley on the development process for the new Manley CORE channel strip (see page 40). There's one particular article, however, that merits extra-careful reading.

In "Studio Deliverables" on page 54, Aaron Trumm faces us with a painful truth: of all the possible products that an artist can take out of a recording studio, the finished stereo mix that's ready for the CD is probably the *least* valuable... and all too often, the stuff that's *more* valuable isn't offered by the studio or asked for by the client. This article is essential reading, both for recording musicians who want the most from their studio time and for engineers looking for ways to easily deliver products that their clients will find incredibly helpful.

As a final note, I'd like to welcome to our pages the readers picking up this issue at the 139th Convention of the Audio Engineering Society in New York. Stop by our booth and say hello, I'd love to meet you!

Enjoy the issue.

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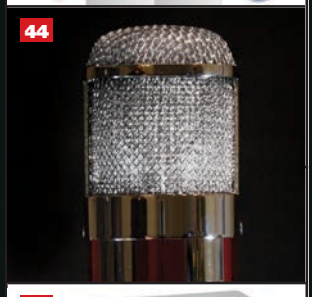

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talkback

Note to faithful writers: When sending your letters by email, please remember to include your name and where you hail from.

Sometimes one plus one equals way more than two

Hi Paul Stamler: I enjoyed your recent "First Steps" on stereo miking (July 2015). I have quite a collection of mics, but two of my favorites are the Shure KSM32 and the Neumann TLM 102, of which I have one of each. I want to buy a second mic for stereo. Which of these two would you recommend as a pair? Thanks a bunch.

Tom Hagen
Grand Rapids, MI

Paul J. Stamler replies:

Tom: I reviewed the KSM32 in July 1999 and found it exceptional for a lot of applications, including stereo miking... but of all the mics you could have mentioned as an alternative, you picked one that I like just a bit better for stereo.

The TLM 102's small dimensions make it easier to position for coincident stereo than the KSM32, and though it has a large-diaphragm capsule, it has a smooth off-axis response that I'd expect from a mic with a smaller capsule (like the KSM32's). This is similar to the behavior of the Gefell M930; like Gefell, Neumann seems to have pulled an end run around the laws of physics.

As I'm sure you know, they're both excellent mics, and my tastes might not align with yours. I suggest renting one of each and trying them for yourself. Peace—*PJS*

Everything counts in small amounts

Does the bass guitar have an overly large influence on the mix? We all know that bass and drums are vitally important, as they are the foundation of many songs. What caught me off guard was the very slight movement of a fader making a profound improvement.

When nearing the end of a mix, I make a CD to use in my home stereo and MP3 player as a reference. While playing one song back, I thought it could use a bit more bass. I moved the fader from –2.8 to –1.8. Wow, what a difference!

That leads me to my real question. How can I possibly know when I've got the best mix if touching one fader makes such a difference? I know mixes are subjective, but is it experience, luck, or what? It's rather distressing to know that I'm only a slight movement away from a better mix. Or do I simply do my best and at some point stop fiddling with the controls? Thanks,

Clark Millis
Joplin, MO

Hi, Clark. You've just discovered one of the real challenges of learning to mix, and the reason why a professional mix engineer will slave over a single song for an entire day. You've also discovered one of the best ways to meet that challenge.

There are psychoacoustic reasons why bass has a disproportionate influence on whether a mix sounds "good" to us, but to paraphrase Lenin (great motivational speaker, questionable politician, iffy audio engineer), "Everything is exactly as important as everything else." By this, I mean that the *placement* of each element in a mix—loudness, EQ curve, ambience, and panning—is as important as that of all the others. No part of a mix is unimportant, and all the parts must contribute to a mix that's a cohesive whole.

A shaker part may be a tiny piece of a huge mix, but if it's too loud or EQed wrong or panned to a weird place, you'll find it will be all your listeners can focus on. The majority of the problems Marty Peters discusses in Readers' Tapes every month center around just these issues. Need a more famous example? All Christopher Walken references aside, imagine "Don't Fear The Reaper" with a badly mixed cowbell!

Each element has the power to contribute to a great mix or to singlehandedly destroy it. Place each element while remembering the words of Hippocrates (great philosopher, decent doctor, hopeless audio engineer): "First, do no harm."

Yes, you could be only a slight movement away from a better mix, and in many cases you will be. Again, that's why labels hire pros to do mixes... they have a huge number of tools at their disposal that help them get to that better mix. Those tools aren't hardware or software, they're wetware... *mental* tools that come from experience (never rely on luck). Fortunately, in your last sentence you stumbled upon one of the best tools a mix engineer can have.

Know when to stop! An excellent mix that's out there and being listened to is better than an almost-perfect mix that's sitting on your hard drive because you can't make it perfect. Perfectionism is the enemy of excellence. Greg Ogan wrote about this in our September 2015 issue and Marc Urselli has said a lot about it... at some point, you have to stop soloing and tweaking, back up your work, then listen to the whole song and gently touch this and that to see if you can find a substantial improvement. If you screw it up, jump back to your backup *immediately*—don't pile more edits on top of a mistake! If you improve it, save it... and when you're in a good place, walk away.

I'd like to close by applauding one thing you mentioned in passing without recognizing its significance. You wrote, "While playing the CD back, I thought it could use a bit more bass." You changed a track by 1 dB and greatly improved the song. Don't be discouraged because you think that means you're fumbling in the dark. You tried a test mix and instantly found a way to improve it—that's *exactly* what a professional mixer does. You're developing the right skill set and you don't seem to realize it!

Strive to improve, learn when to let go, and your mental mixing tool kit will serve you well. Thanks for your letter, and have fun!—*MM*

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More from: BAE Audio, www.baeaudio.com

AKG Debuts C314 Multi-Pattern Condenser Mic

The well-known line of **AKG** microphones now features a new multi-pattern model, the **C314**. The new mic features a dual diaphragm design based on the capsule of the **C414 XLS** mic, with integrated suspension to reduce handling and vibration noise. The C314 claims the lowest self-noise in its class, and offers highly accurate polar patterns thanks to its computer-matched diaphragms.

The C314 offers four selectable polar patterns: cardioid, supercardioid, omnidirectional, and figure-8. The mic also has switches for a 20 dB pad and a highpass filter with a 100 Hz corner frequency and 12 dB/octave slope, plus an overload detection LED. It is suitable for applications ranging from vocals and acoustic guitars to drum overheads and piano. A review is coming soon.

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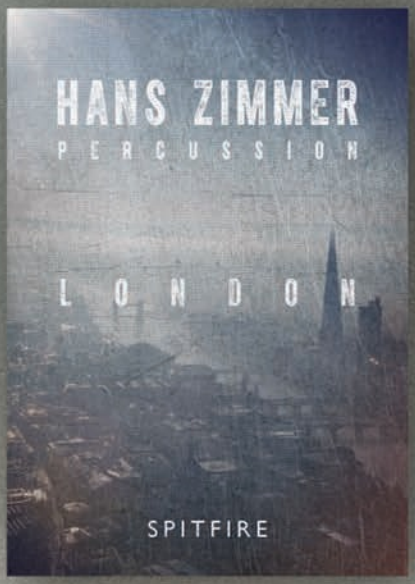

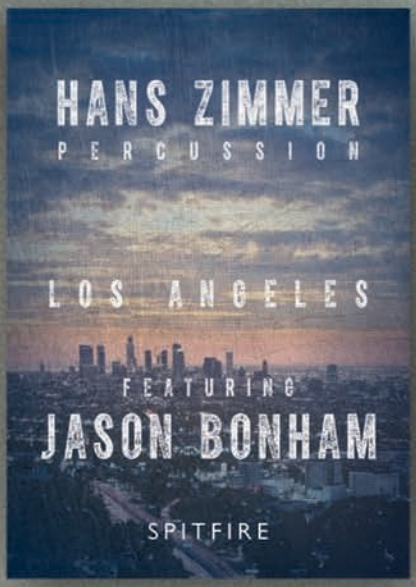

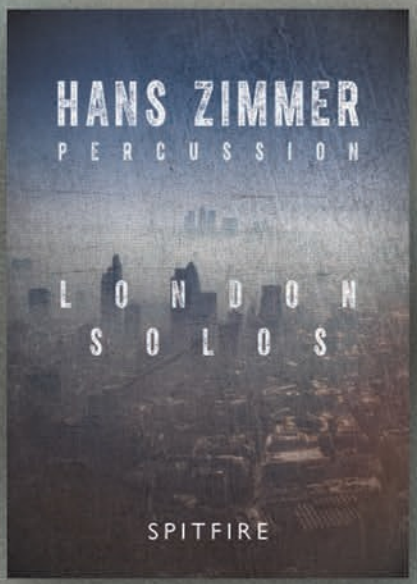

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REVIEW

BY MIKE METLAY

Apogee Groove

A seriously portable platform for serious audio listening

Apogee offers a wide range of high-quality digital audio conversion and interface solutions for many different applications. Apogee products can be found in major studios (Symphony I/O), on desktops (Ensemble, Quartet, and Duet), clipped to mic stands (ONE and MiC), on the floor (GiO), and in guitar cases (JAM). What's next? The airline seat!

Many audio professionals gripe about the fact that it's very hard to get truly consistent high-def audio from laptop computers. The audio from Macs, while quite good, isn't up to high-resolution audio playback, and PCs are all over the map depending on builder and price. Some firms, like Sony, actually give a damn, but for many other firms, motherboard audio is usually an afterthought, or worse, heavily weighted toward game audio with boom and sizzle galore. There's a real market for a reliable high-quality audio source that's always handy... which is the inspiration behind the Groove.

Features and specs

The Groove is a machined aluminum box with a nonslip rubberized bottom. It's 95 x 30 x 16 mm in size (about the size of a pack of chewing gum) and weighs 2.1 ounces. Apogee has also released a 30th Anniversary Edition with slightly better specs and a gold or silver casing. The top panel features two volume buttons and a 3-step LED ladder that serves as an input level meter and volume setting indicator. There's a micro-B USB 2.0 connector and lanyard bar on one end, and a stereo minijack on the other. It doesn't get much simpler than that!

The Groove is a bus-powered USB 2.0 device that handles up to 24-bit 192 kHz audio. On a Mac, it's completely plug-and-play; on Windows machines, there's a simple driver that's downloadable from the Apogee website. Once you plug it in, all you have to do is attach your headphones or powered monitors to the minijack and use the buttons to set your level. The LED ladder lights up bluish-purple, with each step gradually growing in intensity as you turn up the level. It's intuitive and very easy to use; holding down the buttons produces a rapid, smooth fade (about 2–3 seconds from full level to muted). When you're not touching the controls, the LEDs flicker green to indicate input level regardless of current volume setting.

As you'd expect from an Apogee device, the Groove has some pretty scary specs. It sports an 8-channel ESS Sabre D/A converter chip, using four DACs per output channel for the best dynamic range and distortion numbers possible. It's rated as having a 117 dBA dynamic range, a frequency response that's essentially ruler-flat (±0.2 dB) from 10 Hz to 20 kHz. Its THD+N (total harmonic distortion plus noise) is rated as –107 dB with a 600 ohm load at 16 dBu and –100 dB with a 30 ohm load @ 10.5 dBu. Maximum output is 225 mW into 30 ohms, 40 mW into 600 ohms.

Unimpeded by changes in impedance

One interesting under-the-hood feature of the Groove is called Constant Current Drive. This technology "provides smooth frequency response with any headphones" according to Apogee, and the fact that specs are being quoted for phones at the far ends of the impedance spectrum is pretty telling. Many pro headphones are designed with very low impedances nowadays, in order to be able to work well with the low-power headphone amps found in portable devices. Years ago, it was common for headphones to have relatively high impedance so they could be daisy-chained from a single amplifier (for orchestra sessions, for example), and some headphones of that kind are still popular.

If Apogee's claims are correct, then there should be little or no audible difference between using a low-impedance headphone and a high-impedance model with the Groove. It's impossible to do direct A/B tests under these circumstances; there's no way to quickly adjust volume levels to match. All I could do was take notes in a more relaxed listening session, switching between two of my favorite headphones: the Audio-Technica ATH-M50x (reviewed March 2014), which has a 38 ohm impedance, and the AKG K 240 M, a venerable headphone with a 600 ohm impedance.

Once levels were adjusted (the AKG had to be set a lot higher to provide roughly equivalent listening loudness), the primary differences I heard could easily be attributed to the fact that the two phones have different frequency responses. The main purpose of this exercise was to show that the Groove can deliver great audio regardless of what headphones are plugged into it, and it did just that.

Listening results

As far as general audio quality is concerned, well, it's an Apogee. I found myself grumbling to Paul Vnuk Jr. that despite what Apogee says, the Groove's primary purpose seems to be convincing me that I have to re-rip my entire music collection at higher quality! The very first thing you notice about the Groove is how astoundingly unkind it is to compressed audio files. Any MP3 format below 320 kbps is actually hard to listen to; artifacts are not only easily distinguishable but downright grating.

Fortunately, I had a lot of 24/96 audio to listen to as well; dealing with high-resolution formats, or even just 16/44.1 WAV files from well-mastered CDs, the Groove is a delight. It's crystal clear, vibrant, and gives a sense of deep and transparent detail without adding any real coloration of its own. It also proved a great listening aid when working in DAWs; suddenly I really did have a truly portable high-def monitoring experience.

There's not a lot to say beyond that. If you're working in areas where reliable high-end listening is a must, or if you just want to be able to enjoy uncompromised audio anywhere you go, you'll definitely want to get your Groove on.

Price: $295; 30th Anniversary Edition, $595

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Once More, With NRG

Tracking a jazz artist's second album starts with choosing the right mics

By Eric Ferguson • Photos by Miguel Pola

For two days in August 2015, I had the pleasure of recording composer/guitarist Drew Simpson's band at NRG Studios in North Hollywood, CA (nrgrecording.com). We had been planning to start a new record for four years, ever since completing Drew's first release, *Noteworthy,* in 2011.

Noteworthy was fun to create, with many fantastic musicians, great music, good sounds, and Drew and I becoming fast friends over the months of recording and mixing. During that time Drew and I both lived in Southern California, but since completing the project, I moved to Maine. The logistics of starting a second bi-coastal album proved challenging. Finally, in the spring of 2015, we decided to do it again.

Choosing the studio

For Drew, the first steps in the process included writing and arranging new tunes. Following this, he notated the parts and booked his favorite players for the two-day session. Drew also organized several rehearsals to ensure the various musicians—one drummer, two bassists, two pianists, two trumpeters, and one saxophonist—were all prepared.

For my part, preproduction consisted of finding a studio, determining a suitable instrument layout, and choosing microphones. Picking a studio proved to be somewhat difficult, as I could not check out the various options in person due to my residency in Maine. Making the last record, Drew and I had enjoyed working at the Castle Oaks studio in Calabasas, CA, but the facility had closed in the interim.

Unsure of where to turn, I contacted Ellis Sorkin of Studio Referral Service (www.studioreferral.com) for assistance. SRS is a unique company, offering a link between artists, engineers, and producers with recording studios around the world. I called Ellis and told him our needs and budget, and he suggested several facilities. He then called several studio managers, confirmed availability, and negotiated a discount rate. Best of all, the service was free! The studios, not the artists, pay a small fee. I highly recommend SRS if you ever find yourself in search of a studio.

The biggest challenge in choosing a studio was finding one with enough isolation booths and suitable lines of sight. The session was to have six or seven simultaneous musicians, and the music style (fusion jazz) required significant isolation. Most of the instruments were acoustic, and isolating the quiet parts (upright bass, acoustic guitar, and piano) from the louder (drums, electric guitar, horns) was essential. Also imperative was musician line of sight. Improvisatory jazz relies on eye contact, with all musicians needing to see Drew, most needing to see the drummer.

Eventually we decided upon NRG Studio A in North Hollywood. A Los Angeles staple for many years, the studio is world-class, with awesome gear, great rooms, and friendly staff. The studio (Figure 1) offered a large drum room, two sizeable


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booths for piano and upright bass, and two smaller booths for horns and guitar. Electric instruments such as bass guitar and synthesizer were to be taken direct, with the musicians placed in the main room near the drums for easy communication. The acoustic guitar booth would also house Drew's guitar amp. On acoustic songs Drew would play nylon or steel string guitar in the booth. On electric tunes, he would sit in the live room, near the drums, and feed his amp isolated in the booth.

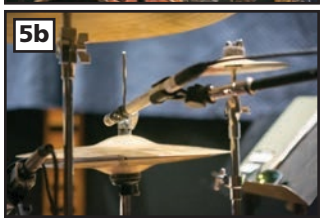
Even with all the separate booths, compromises still had to be made. While Drew originally wanted to have multiple horns performing live, I convinced him to stick to one player at a time. The size of the horn booth was simply too small for multiple players.

Choosing the mics

A key step in the preproduction process is picking mics. Philosophically, I tend to use more mics than necessary, embracing the luxurious high track count of modern DAW recording. While others sometimes judge overmiking as an inability to commit on a session, I prefer the safety of redundancy. Sure, I rarely use all of the mics when mixing, as phase problems grow with excess mics, but I love having varied choices long after recording. Sometimes it's difficult to know what the sonic footprint of the project will end up as, while still on the first tracking session.

Before discussing mic choices, let me first mention that a link to free multitrack files can be found online at the Recording website at http://is.gd/ OnceMoreWithNRG1 (a page in the *Recording* online reference library). Please download the files and check out what the various mics sound like.

Note, however, that all sources went through NRG's awesome 1970s Neve 8068 console. Most microphones, certainly the drum mics, received EQ and are not heard flat in the files. In my opinion, the whole purpose of working on a classic console is to hear it, and I'd rather employ luscious analog EQ when tracking than save the task for later via a digital plug-in. This said, my EQing is fairly subtle, and the raw tracks are pretty similar to the untreated mics. The console's EQ was easy to hear and is not very surgical in bandwidth; a little went a long way, and it sounded fantastic!



Kick

I initially feared the worst when learning the drummer was to bring an 18" bass drum. Jazz kicks are often small and wimpy, more reminiscent of a rack tom. Luckily a hole was available for miking and the drummer had great skill in making it sound incredible.

I placed three mics on the instrument. Inside, pointing at the beater, was a Shure Beta 91. A favorite of mine, this flat condenser boundary mic always delivers great snap. In the hole was a Shure Beta 52, a large diaphragm dynamic with a frequency response especially tailored for the kick. For extra redundancy, a Neumann U 47 fet was placed a foot or two in front of the drum. Using this vintage mic was a total treat for me, as they are rare, expensive, and offer a massive bottom end. See Figure 2 on page 16.

Leakage from cymbals was inevitable with the outside-the-drum Shure and Neumann, so a packing blanket "tent" was built around the two mics. A few pieces of gaff tape held the blanket to the kick, and a couple of small mic stands propped it up.

Snare

Three mics were also employed for the snare. On the top of the drum, pointing at the center of the head, was a Sennheiser MD 441. A supercardioid dynamic, the 441 offers a wider frequency response than the venerable Shure SM57. While I love a 57 on rock sessions for its midrange crack, the 441 offers the sizzlier highs and beefier lows.

Taped to the side of the Sennheiser was a Shure Beta 98 D/S. This miniature condenser, often seen on toms, also has a supercardioid pattern, allowing it to mate nicely with the 441. The shared supercardioid pattern allowed me to position the 441/98 combo so the hi-hat would be in the off-axis null of both mics, thus reducing leakage.

Some readers might be unfamiliar with the old trick of taping two mics together for the snare top (Figure 3). The purpose of this technique is to have two very different mics on the all-important snare drum. The 98 sports the transient clarity and high end response of a condenser, but can suffer increased leakage. The 441, in contrast, offers dynamic mic punch and a tighter polar pattern, but its high frequency response can be cloudy compared to a condenser. Taping the mics together, with their diaphragms as close as possible, is critical. This ensures the phase response of both mics is matched up.

The third mic on the snare, an AKG C451, captured the drum's bottom (Figure 4). Snare bottom mics always offer great sizzle and personality. For this mic, I was a bit more drastic with my use of EQ, greatly filtering the bass, scooping the mids, and adding brightness to the treble.

Toms, Hat, and Ride

Regarding toms, I lucked out when the drummer brought only two. While I love toms, the more there are, the harder they are to record and mix. The simple rack and floor tom setup also allowed me to use NRG's pair of 1970s AKG C414s. These two microphones sounded excellent, sporting vintage C12 capsules. Many types of mics work on toms, and large-diaphragm condensers such as 414s are always a nice choice. Another benefit with 414s is that they can be easily switched between cardioid and supercardioid. This grants flexibility in reducing the splash of cymbals that might be placed either to the side of, or behind, the mics.

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AKG C451 condensers were chosen for the hi-hat and ride. Also classic, these pencil condensers sound great on anything. I did have issues placing the hat mic, though, as the drummer placed a small splash cymbal right where I normally place the mic. As a general rule, I always work around the drummer's needs, and I found a suitable replacement location. The hat received copious amounts of EQ via a vintage outboard Pultec EQP-1A3.

A ride mic was also deployed. In all honesty, I rarely like the sound of close-miked cymbals, and I will only use the ride mic when necessary in the mix. This said, the AKG C451 sounded good with significant console EQ. See Figures 5a-5c on page 18.

Overheads and rooms

Two additional mic pairs wrapped up the drum-miking extravaganza. For overheads, I was blessed with vintage Neumann U 67s. Produced between 1960 and 1971, the U 67 is the one of the world's truly classic tube mics. On this session their sound was creamy and delicious. Placement was fairly low, a few feet above the drums, spread about a foot on each side of the drummer's head. See Figure 6.

As in almost every recording session, a few challenges had to be overcome. In this case the live room, while fabulous-sounding, was a bit too huge. Bright and ambient, its significant reverb was overly apparent upon initial listen in the overhead mics. While ideal for a more roomy rock sound, both the drummer and I felt it inappropriate for the intimate jazz approach of this project. Luckily it's easy to temporarily deaden a live room: the assistants and I placed carpets, gobos (portable acoustic panels), and packing blankets near the drums. This helped the closer mics, specifically the overheads, to sound tighter, while still allowing the farther room mics to bathe in reverberant goodness. See Figure 7.

To mic the room, a pair of Coles 4038 ribbon mics were spaced wide, about twenty feet apart and an equidistant fifteen feet or so from the kit. At first the pair seemed uneven in tonality, but I did not get to adjust them due to being behind schedule. Then, after recording the first song, the band took a break and I was able to move the mics closer to each other by five or six feet. Pulling the microphones away from the walls reduced modal issues and gave a more similar frequency response and stereo image.

Bass

Both electric and upright bass were recorded on the sessions, alternating between the fusion and acoustic jazz tunes respectively. Electric bass was fairly straight ahead, running direct. We did try out several DIs before the bassist and I were satisfied. We started with an A-Designs REDDI, an amazing all-tube direct box and preamp known for its warm tube sound. Oddly, we found the bass a bit overdriven through the REDDI, and ultimately we settled upon a Retrospec Juice Box.

For upright bass, I chose one of the most famous mics of all time: a Neumann U 47 large diaphragm tube mic. It sounded great, but did require position experimentation. As a general rule, large instruments are more challenging to mike, as their sound emanates over a greater space and significant sonic differences exist throughout their large near field. With an acoustic bass, miking near the F hole produces subwoofer-like boom. Alternately, sliding the mic upwards near the fingerboard captures more top end and articulations. Finding the ideal balance, while simultaneously staying out of the way of the player and his or her bow, can sometimes be difficult. See Figure 8.

In this case the challenge proved to be buzzing within the bass itself. This forced several mic movements, and ultimately I had to accept the buzz. Luckily, a second bass player was used for several songs, and his instrument was less noisy. Other than the buzz, both basses sounded good, individually unique, and both musicians were fantastic.

As a redundancy measure, I recorded both upright basses' pickups through a Retrospec Juice Box DI. While not natural-sounding, a pickup can sometimes offer a useful color when mixed with a mic.

Piano

I was initially unhappy with the studio's piano. NRG is known for hard rock, and the piano is a super-bright Yamaha C7. The pianists on the session loved the instrument, but I feared it would not be mellow enough in tone for Drew's music. Luckily, we employed a talented piano tuner to tweak the piano before both tracking days, and I eventually grew to dig its bright tone.

In search of a mellower sound, I compared a pair of Coles 4038 ribbons with a pair of original AKG C12s. The C12s ultimately won. Extremely expensive and highly sought after, the C12s sounded great. One of the mics showed its age, though, as its built-in clamp would not keep the mic at the desired angle. To solve the problem, we used a second mic stand and gaff tape to rig extra support. See Figure 9.

Miking a piano is an art itself, and this article is too short to explore the topic. This said, I tried multiple positions, balancing phase coherency, tone, and stereo imaging. Ultimately I placed the mics wider than normal, and now,

after the session, I am worried that I may have set myself up for phase issues. Several days after we finished, I woke up in the middle of the night, realizing I should have placed a second, narrower-spaced mic pair on this all-important instrument. Yes, recording engineers also suffer anxiety dreams!

Unfortunately, the studio's Pro Tools rig was limited to 28 inputs, and there simply was not enough real estate for more mics. We actually used all 64 channels on the console for this session! Maybe I should have sacrificed some drum mics for the piano. Oh well, I'll find out in the mix...!

Electric guitar

Miking Drew and his guitars was fairly simple. On his Fender Twin, I placed the ever-popular Shure SM57. Next to it, as close as possible in order to minimize phase issues, was a Royer R-121 ribbon (see Figure 10). I love a ribbon-dynamic mix on guitar amps. The 57 dynamic provides midrange bite, but rolls off gradually in the low end. The ribbon, conversely, is mellow in the top end but offers the bigger, fatter bottom, key to Drew's jazzy sound.

As a side note, there was a notable guitar tragedy on the session. When removing his Les Paul from a multi-guitar stand, his just-purchased, perfect condition 1969 Gibson ES175 fell from the stand, striking the floor, snapping the headstock clear off. Drew was beside himself, and faced an uphill battle to maintain composure. Following this disaster, we rented several incredible guitars from Brett Allen Studio Rentals, but none inspired Drew. He instead recorded all electric songs on this trusty Les Paul. Unfortunately this may mean we might need to overdub several hollow body guitar tracks at a later date. As for the ES175, we've been told that guitar can be repaired.

Acoustic guitar

Several songs featured nylon classical guitar and one sported steel string acoustic. Two classic Neumann KM84s miked the guitars, their positions changing somewhat between the nylon and steel stringed instruments. See Figure 11.

As mentioned earlier, we crammed Drew into the guitar amp booth to isolate his acoustic guitars from the drums. This proved problematic. The booth had no acoustic treatment, and significant air conditioner rumble was audible, even after turning the AC off. Resorting to the same tricks used in low-budget home studios, we gaff taped multiple packing blankets to the walls to reduce high frequency reflections. As for the rumble, little could be done, and I placed a steep high pass filter on the monitor side of the console to imitate the drastic EQ that will be necessary in the mix. Luckily, both guitars featured great-sounding pickups, which were captured through an Avalon U5 DI. The DIs provided ample, rumble-free low end to make up for the filtering on the mics.

Horns

Each song also featured a single horn soloist, and with two trumpeters and a tenor saxophonist alternating. Similar to the issues faced in the guitar booth, the horn iso was not acoustically treated, a fact I would have caught on a pre-session tour had I not lived on the other side of the country. The space sounded like a bathroom, and the horns would certainly suffer phase issues from reflections off the close, hard, walls. With no alternative spaces, we assembled a pile of blankets and foam and did our best to treat the room. Unfortunately, under time pressures to get recording, it wasn't until the second day that we squeezed a gobo into the booth, finally swallowing the room's low mid resonance. This meant the sax tracks, only recorded on day one, all sound honky to me. I hope mix EQ can save the day.

As for mics, the horns were captured with a vintage Neumann M49 tube condenser and a Royer R121 ribbon (see Figure 12). The horn players preferred the ribbon, but the room issues are more significant with that mic, as its bi-directional pattern captured the ambient reflections off the front wall at the rear of the mic. Unfortunately, the size of the 49 meant I could not get the two mics' capsules close enough together to mix them without phase issues. Thus I learned another important engineering lesson: if I am going to use two simultaneous coincident microphones, make sure they are small enough to both truly occupy the same location!

Talkback

While not recorded, multiple additional mics, all Shure SM57s, were placed at the musicians' stations for talkback. This meant that communication could easily be heard in the headphones and control room between songs. I would simply mute the talkback mics on the console whenever recording commenced.

Moving forward with the project

Despite the technical challenges, the two days of recording went quite smoothly from a musical standpoint, and Drew and the others are pleased with the outcome. At the time of this writing it is still too early to know if all eleven songs are keepers. With dozens of takes to sort through, it will be a while before we know if an additional tracking session is required for the record.

Overdubs also await, including horn sections, guitar layers, and possible solo fixes. I'll keep you posted, as this should continue to be a very interesting project.

Eric Ferguson (ferguson@recordingmag.com) spent a dozen years as a freelance audio engineer in Los Angeles, and is now on the faculty of the New England School of Communications (NESCOM) in Bangor, ME.

Eric would like to thank Miguel Pola for his fantastic photography; learn more at www.miguelpola.com. Drew Simpson's music can be heard online at www.drewsimpsonmusic.com.

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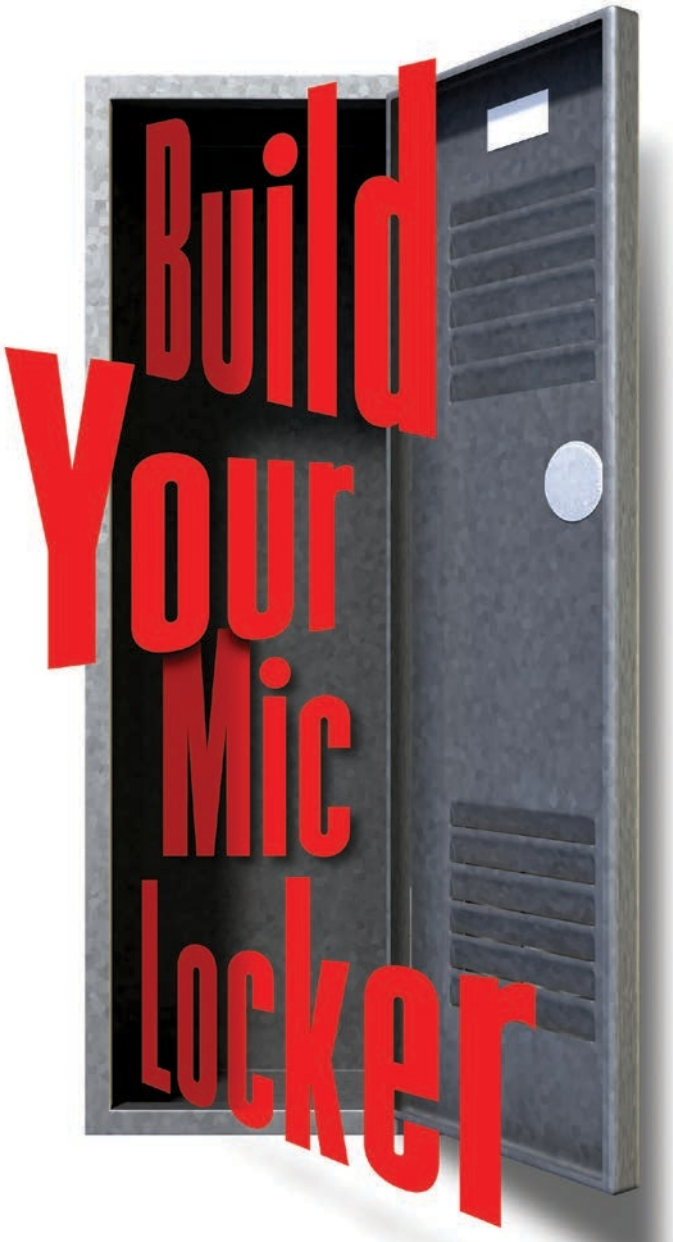


—from small budgets to the big leagues

By Sven-Erik Seaholm and Mike Metlay

In the battle to capture the truest audio and make the best recordings we can, microphones are our troops on the front line. Quality preamps, EQ, compression, and other sweetening can go a long way towards improving the audio we record, but the closer we start to where we want to be, the less we'll have to do to get there later. We must start with the right mic (in the right place, but that's another discussion for another time).

Good mics aren't always cheap and acquiring a collection of them quickly adds up to a financially daunting task. Fortunately, there are some very good mics that don't cost a lot. We can start our mic locker with those, and they'll still be useful when we add more costly mics to the mix.

In this article, we'll track the steps to building a great mic locker, starting with the absolute basics and working our way up, stopping at around $3000. (There are some amazing mics above this price point, but that's also another discussion for another time.) We're quoting very rough street prices below; you may find better deals if you shop around.

First: a cardioid dynamic ($100 and up)

Picture a speaker vibrating and reacting to the music it's reproducing. Dynamic mics are tiny speakers in reverse. When a dynamic mic's diaphragm vibrates, an attached coil moves within a magnetic field, producing a signal. Due in part to their old-school mechanics, these models are extremely robust and can withstand very high sound pressure levels. A mic like this has a cardioid pickup pattern that rejects sound from behind it, helping to prevent feedback in live situations and minimizing leakage between neighboring mics. These mics also exhibit quite a bit of *proximity effect,* which can be heard as a pronounced buildup in lower frequencies as the mic gets closer to the source.

Ask almost any working recording engineer or sound man what they would consider their 'desert island' survival mic, and the response is so consistent that it's almost a cliché: the Shure SM57 ($100). When you need to get in close to a loud source, this is the one you want, making it one of the best-selling microphones in the world. Ironically, this mic was designed to mike orchestras (the SM stands for "Studio Microphone"), which may explain why just about anything sounds acceptable through it. It's most famous for its use on guitar amps and snare drums, but toms, bass drums, piano, and organ are all well-matched to this instrument mic. Some vocalists, like U2's Bono, swear by the SM57.

Naturally the SM57 isn't the only mic of this type out there. Many engineers keep the Audix i5 ($100) handy for guitar amps, toms, and snares, as a tonal alternative to the SM57. If you want a mic with a hypercardioid pattern for even more side rejection (at the cost of a bit more sound input from the rear), Audio-Technica's ATM650 ($100) is a great option. At the high end of this range, Telefunken offers the excellent M80 ($400), in a standard size and a "short" version ideal for use on drums. Sennheiser is famous for the MD 421 ($400 for the MkII version), which is great on everything from guitar cabinets to toms.

Next: a workhorse large-diaphragm condenser ($100 to $400)

When you're ready to lose the midrangy toughness of your dynamic mic in favor of something better suited for acoustic guitar and non-hard-rock vocals, with a clear and extended high end and a frequency response that flatters the upper mids where acoustic instruments soar, it's time to consider a large-diaphragm condenser mic, usually a cardioid. These mics have a thinly stretched membrane over a backplate that acts as a capacitor (a condenser in old-school terminology), translating vibrations in the membrane into current. These diaphragms are very responsive compared to dynamics, so their transient response and high end are superior.

Prices run the gamut from (way too) cheap to (way, *way* too) expensive; we'll start with models that give lots of bang for your limited bucks. But we're emphasizing real value here. There's a flood of cheap microphones filling stores now—they have harsh sibilants, odd resonances, grainy high end, and inconsistent performance. It takes some hunting to find a mic that's both affordable and something you'll want to keep using forever—a true workhorse, something that you can use on just about anything you need to record.

Two of the absolute standouts in this arena are from RØDE in Australia. The NT1-A ($230) has a rich yet overall neutral sound and handles SPL up to 137 dB. Much newer and perhaps more remarkable (it still has to carve its niche) is the NT1 ($270), an updated and quieter design. Both sound amazing on everything from vocals to guitar amps, horns, acoustic guitars, and more, and each ships with its own shockmount, cable, and pop filter.

Another good do-it-all model is the AKG C214 ($400), a smaller cardioid-only version of the workhorse C414. Audio-Technica's AT2020 ($100) is exceptionally affordable and versatile. Shure has a number of affordable mics in this range, the SM27 ($300) being particularly noteworthy. Samson's MTR231 ($250) is a remarkable value; unlike the other mics we've mentioned in this price range, it offers a choice of polar patterns: cardioid, omni, and figure-8. The same is true of the well-established Audix CX212B ($400). And if you want something really new with a nice vintage flavor, consider the Roswell Pro Audio Mini K47 ($300).

Go deep: a kick mic ($200–$400)

As you begin recording bands or working with more complex arrangements, you'll want to make sure that your bassy instruments are being well-represented in the mix. Maybe you're looking for a deeper resonance to the kick drum, or a bass amp tone with more body and aggression. Now it's time to look into getting a "kick mic."

A mic like this one brings *focus* to these frequencies. It's not just that it captures all of that the lower bass, but it tames and tightens it as well. The bass seems subsequently more usable and allows us to bring more of that depth and dimension into our recordings. Every maker tailors the response of this type of mic differently, so as to pick up more or less beater snap vs. drum boom or pick noise and harmonics vs. bass fundamental. There are many flavors, and you'll want to find one that suits your tastes.

The really famous mics in this realm are the AKG D112 ($150 for the MkII version), Shure Beta 52A ($190), and the $170 Audix D4 (and its even more powerful successor the $200 D6). These are all dynamic designs, and each has an upper-mid response that's slightly different than that of the others; the D112, for example, has a slight 4 kHz peak that sounds amazing on djembe and even tuba!

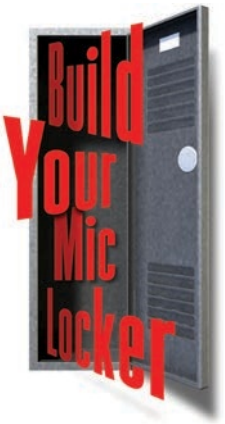
Go high: a pair of small-diaphragm pencil condensers ($300-$3000)

We have two ears, so it makes sense that being able to record in stereo has great benefits in creating a realistic soundstage. Even when we're not doing a strict "stereo" mic array like spaced-pair, XY, or ORTF, there's a big advantage to putting two mics on the same source. Miking an acoustic guitar for instance, can offer a "truer" perspective in that the harmonics, overtones, and

finger squeaks all sort of happen where we'd expect the player's fretting hand to be, while the other side highlights pick and finger attack as well as the guitar's fundamental tone. Acoustic guitar and drum overheads, which capture cymbals and an overall picture of the kit (augmented by mics on the kick and snare), are the most famous applications for stereo pairs, but there are many more: instrumental ensembles, orchestras, choirs and vocal groups, horn sections....

While some engineers like to use a pair of large-diaphragm condensers in these arrays, the small size and smoother off-axis rejection of small-diaphragm "pencil" condensers makes them too handy not to have, so here's our next investment!

The most famous mic of this type is probably the Neumann KM 184; they and their predecessor the KM 84 are fantastically popular, but at around $800 each they're by no means your cheapest option. Recently we've seen a couple of truly exceptional new designs in the affordable-pencil realm: the RØDE M5 ($200/pair), which brings quality near that of the well-known NT5 to a very low price point, and Blue's new Hummingbird ($300/pair), which features a pivoting capsule for ease of placement.



There are lots of others: the Russian Oktava MK-012 ($600/pair) is a famous stalwart in this application, as are the Audix ADX51 ($450/pair), Studio Projects C4 ($700/pair), Shure SM81 ($700/pair), Earthworks TC20 ($1000/pair), and AKG C451B ($1000/pair). Many of these mics either come with interchangeable capsules for different polar patterns or offer them as purchasable options, expanding your capabilities.

If you want to spend a bit more on pencil condensers that feature the warmth and character of tube electronics, consider the Mojave Audio MA-100 ($1600/pair).

Go big: a large-diaphragm condenser ($400–$3000)

You next upgrade may well be your studio's new "flagship" mic. While many of the previously discussed acquisitions were focused on the versatility and being able to capture a wide variety of instruments, a high-end large-diaphragm condenser mic is more about *focus*.

Most musical forms feature either a vocalist or instrument that leads us through the arrangement. This added musical responsibility heightens its importance and that emphasis can bring the microphone you're using under closer scrutiny, with all its warts and wonders.

A quality large-diaphragm condenser mic is the accepted standard for delivering the goods on these sources, and prices range from the high end of our previous "workhorse" range to more than the cost of a car.

Tube mics are often praised and prized for their full-bodied lower midrange and extended upper highs, as well as their extremely focused and detailed upper mids—sort of a "smile curve" with a slight bump in the range of vocal intelligibility. Solid-state mics tend to have a different tonality, one that's neither better nor worse than what you get from a good tube mic.

While some folks may be willing to mortage their houses for a vintage Neumann U 47 tube mic, the rest of us have so many fantastic options at more approachable prices that the options can make our heads spin. Hopefully without slighting anyone too badly, here's a selection of mics we've used and loved.

If you've always wanted a large-diaphragm Neumann but balked at the $2900 a new M 147 tube mic would cost you, there are now some solid-state Neumanns that offer great value. The TLM 107 ($1700) is a modern design with a great sound and easy-to-select options for polar pattern, pad, and highpass filter. The TLM 103 ($1100) was famous as the first "affordable" Neumann, but in recent years it's been overshadowed by the $700 TLM 102, a compact and exceptionally versatile cardioid mic.

The MXL Genesis ($600) has been a personal tube mic of choice for a few years now. I call it "Ketchup", not just because of its bright red body, but because it tastes good on everything.

Mojave Audio makes tube and solid state mics that boast many of the desirable qualities of vintage designs at way more approachable prices. The tube MA-200 ($1100) is the best known of an expanding range of great choices.

Lauten Microphones is well known for its lush-sounding mics. A real standout is the Atlantis ($1500), a FET condenser mic which features special electronics that allow for multiple voicings for different sources.

Audio-Technica's AT5040 ($3000) is stunning on vocals, a result of a unique diaphragm made up of four smaller elements in a grid. If that's too rich for your blood, consider the solid-state AT4047MP ($850).

Telefunken has made its name on amazing mics over a history of many decades. One of its most popular modern designs is the AR-51 ($1900), a rich-sounding take on the classic (and nearly priceless) ELA M 251 mic of yore.

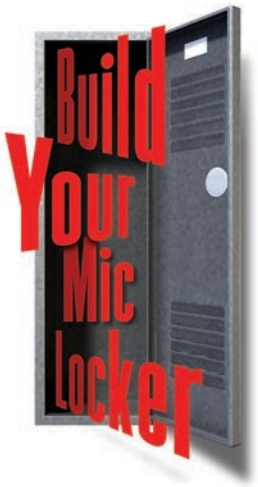
Blue is famous for its large-diaphragm condenser mic designs. While the Bottle is way out of our range, the Kiwi is an amazing multipattern solid-state mic at $3000.

ADK has a wide variety of large-diaphragm condenser mics that riff on vintage designs; one recent favorite of ours is the Z-67 ($3000), an homage to the classic Neumann U 67 tube mic.

Pearlman Microphones are handmade boutique mics that hark back to the glory days of vintage tube designs; most are beyond the price range of this article, but the excellent TM1, at $1800, is an exception.

Bock Audio is famous for its very high-end mics, but also offers the $1200 Bock 195, a solid-state mic with switchable tonal profile for greater versatility.

Speaking of switching sounds: one of the most recent arrivals in the microphone arena is Austrian firm Lewitt, whose LCT 940 ($1700) is actually two mics in one, offering a choice of real tube and solid-state sounds with the click of a switch.



Go vintage: a ribbon mic ($300–$3000)

In recent years, there's been a huge resurgence of interest in these microphones, for their smooth and flattering character that's so unlike the punchiness of most dynamics or sparkle of condensers. They generally have a figure-8 pattern that picks up room ambience along with whatever they're aimed at.

Ribbon mics are based around a "motor" that consists of a very thin strip of metal floating between two magnets. Early models like the RCA Type 77A were very fragile—a puff of air could stretch and ruin the ribbon—but had better fidelity than the dynamic mics of the day and were popular for recording and broadcast applications. The oddly shaped Coles 4038 ($1350) was a staple in the days of the Beatles and is still being sold today with nary a change under the hood.

The modern rebirth of the ribbon began with the Royer Labs R-121 ($1300), using a new design that was considerably sturdier than the old RCA ribbons. This was followed by the R-122 ($1850 for the new MkII version), which conquered the impedance matching and low gain problems of traditional ribbons by incorporating a built-in head amplifier: an active design, which spawned dozens of imitators. Royers are everywhere now, beloved for their low noise and extended tonal range; they're the go-to mics for guitar amps.

Not to be left behind, the RCA designs have been updated into a modern form thanks to Audio Engineering Associates (AEA), with a sound that very much harks back to the golden era of ribbon mics. These mics include the classic R84 ($1040)

and modern designs like the songwriter-friendly Nuvo N22 ($900).

Cloud Microphones offers another modern take on the RCA model; the 44-A ($1900) combines an RCA-style motor with active electronics.

Audio-Technica's AT4080 ($1000) is a figure-8 active design using a ribbon material that provides more reliability under hard use than traditional ribbons, a claim shared by the Shure KSM313 ($1300). And if you want to give ribbons a try with a lower initial investment, you could do a lot worse than the affordable and great-sounding Cascade Fat Head ($229 for the MkII version), a modern classic with plenty of followers.

Go crazy: unique mics

Sometimes it's worthwhile to have a mic or two that doesn't fit the usual categories. You might want one just because it is particularly good for one specific application that you require more than most folks. Or it may have a particular character that no other mic can impart… or it's just plain fun… or all of the above.

Perhaps the most interesting "unique" mic, simply because it's unlike any other mic out there yet does so many things so well, is the Electro-Voice RE20 ($450). It's a large-diaphragm dynamic mic that's designed to have little or no proximity effect plus exceptional off-axis rejection. It does wonders on everything from vocals to horns, floor toms to kick drums, even guitar amps—a secret weapon in your arsenal if there ever was one!

If you do a lot of harmonica recording, consider Shure's 520DX "Green Bullet" ($120) or Audix's FireBall ($150). Do you need to mike acoustic instruments unobtrusively but with great clear sound? DPA Microphones makes the d:vote 4099 instrument mics ($620 and up) with a wide variety of attachments for violin, guitar, brass, and much more. If you do a lot of broadcast voice work, the dynamic Shure SM7B ($350) is the famed "voice of God" mic. You can do cool room miking and distant pickup with a boundary mic like the AKG PZM30 D ($400). And for the ultimate in unique tonality, Placid Audio's Copperphone ($260) can give your vocals a retro feel that no plug-in can match.

A parting thought

Although drooling over the sound and specs of all these mics is fun and informative, it's good to remember that they don't really do the work of making good recordings for you. They simply make it easier to get to where you need to be, sooner. A practiced and experienced engineer with a cheap but good mic will obtain a better recording than a careless and ignorant engineer who doesn't know how to place a fantastic mic.

In the end, there's really no substitute for putting your ears on these mics yourself. Many cities have studios that will let you try out their mics for the cost of a brief session, and larger markets will have rental companies that will make it easy for you to try before you buy. Make use of these resources to train your ears, and step by step, you will build a mic locker that will do its job for you as you get better at your craft.

Sven-Erik Seaholm (seaholm@recordingmag.com) is an award-winning producer and recording artist from San Diego, CA.

REVIEW

BY PAUL VNUK JR.

ADK

A legendary sound in your choice of flavors—tube or solid-state

Custom Shop Z-MOD Z-251 and T-FET Cremona 251-T

ADK is an American microphone company helmed by collector, connoisseur, and mic expert Larry Villella. Back in 1998, ADK was one of the first companies to introduce great-sounding low-cost import microphones into the mic market, which in turn fueled the home studio revolution.

ADK quickly left behind its entirely-import designs and moved into a hybrid approach to design and construction. High-quality globally sourced parts are married to Asian-made capsules and bodies, which are then assembled, tweaked, and quality-controlled in the USA. ADK has been at the forefront of this trend as well, not only sourcing upgraded parts worldwide, but also scanning the globe for the best designs and designers.

All of this has culminated in ADK's Custom Shop mics. For years now, it's been possible to order off-the-shelf ADK models and have them upgraded with specialized parts of your choice. Moving one logical step further, now ADK offers preconfigured custom models in the tube-based Z-MOD series and the solid-state T-FET series. These mics can even be further customized to taste. No, I'm not kidding... at ADK you can customize the already customized custom mics!

Z-MOD and T-FET

We first looked at these two new ADK series back in our May 2014 issue. Just to illustrate how global sourcing works, microphones in both series may contain the following:

~ Capsules designed over a 5-year period by the ADK/3 Zigma team, centered in the US with contributors in other countries;
~ Circuit and amplifier designs from the USA and Belgium;
~ Transformers built in the UK, Sweden, and the USA, based on design tweaks chosen through consultation with famed engineers like Chuck Ainlay and Michael Shipley;
~ High-end components such as Wima Capacitors and resistors costing up to $6 each;
~ Asian metalwork.

Finally, all microphones in both of these product lines are hand-assembled and tested at ADK's Custom Shop in Tacoma, WA, by master technician Kevin Dale.

Larry has been outspoken for years about focusing on quality and performance over bling. Until last year, all ADK mics came in simple black or silver finishes. With the advent of the Z-MOD and T-FET series, however, the mics now come in a gorgeous selection of powdercoat finishes adorned with a black and silver 3Zigma badge. They are beyond solidly built, and have I mentioned they look stunning?

There are five models in each series, each inspired by one of the five most famous mics of times past. The models are: the Z-47 and Berlin 47-T (Cream), the Z-251 and Cremona 251-T (Yellow), the Z-12 and Vienna 12-T (Ruby), the Z-67 and Hamburg 67-T (Powder Blue), and the Z-49 and Frankfurt 49-T (Black). We reviewed the Z-67 and Hamburg 67-T in our May 2014 issue.

The whole package

All Z-MOD models come with the following:

~ Aluminum flight case
~ Velvet lined, wood microphone case
~ Elastic large thread shock mount
~ Low-profile large thread hard mount
~ Foam windscreen
~ Gooseneck style corrugated pop filter
~ Power supply
~ 5 meter Accusound Silver Studio Pro 7-Pin mic cable (mic to power supply)
~ 5 meter Accusound Silver Studio Pro 3-Pin XLR mic cable (power supply to preamp)
~ three bonus tubes (usually Mullard, Tungsol, JJ Audio, or Electro-Harmonix, depending on availability).

The T-FET mics come in a similar package, scaled down a bit as there is no need to provide spare tubes or a dedicated power supply. The aluminum flight case contains the mic, shock mount, hard mount, foam windscreen, a nylon-style pop filter, and a 5 meter Accusound OFC MX-4 Quad 3-Pin XLR cable.

Meet the 251 family

This month we are focusing on the 251-flavored mics in each series, inspired by the original Telefunken ELA-M 251.

Back in the late 1940s and 1950s, Telefunken was the US distributor of the famous Neumann U 47. Most USA U 47 mics from that era feature a Telefunken badge rather than a Neumann one.

Accurate. Sweet. Powerful.

To honor the man who invented multitrack recording, Gibson designed these monitors from the ground up to be what Les Paul is to guitars. The accuracy, solid imaging, detailed transient response, and sweet sound make even the longest sessions a pleasure. These monitors are truly worthy of the Les Paul name.

Les Paul Monitor 4"

Compact enough for the smallest spaces, and for taking the Les Paul Monitor experience wherever you go.

Les Paul Monitor 6"

Ideal for most studio environments, with the "sweet spot" of accuracy, size, and power.

Les Paul Monitor 8"

Suitable for even large control rooms, with accurate bass extension that will make people wonder where you hid the subwoofer.

All three models feature ample reserve power and new cone technology, flat response to 20 kHz and beyond, sweet high end from a new titanium tweeter design, and accurate bass response. Whether for mixing or mastering, the Les Paul Monitors deliver the Les Paul experience…no strings attached.

Gibson BRANDS

www.gibson.com

ADK Z-251 and Cremona 251-T REVIEW

When Neumann ceased US distribution with Telefunken in 1958, Telefunken went to Austrian mic builder AKG to create a Telefunken branded U 47-style replacement. Using a C12 AKG capsule (itself a classic), the resulting microphone was the ELA-M 250 2-patterned mic, soon to become the ELA-M 251 3-patterned version.

The ELA-M 251 is therefore something of a sonic love child of the AKG C12 and the Neumann U 47. Production of the mic ceased in 1965; today, vintage working models fetch obscene amounts of money, often much more than vintage U 47 and C12 mics. Luckily for us, the modern mic world offers a variety of close imitators and "inspired by" versions of these classic mics, of which the ADK Z-MOD and T-FET mics are among the very finest.

The Cremona 251-T (revisited)

We will start with the solid state Cremona 251-T. We're actually returning to this model a second time; back when this design was part of ADK's former Audiophile series, it was called the Cremona 251 Au, and I reviewed it in September 2010. The Cremona 251-T is internally identical to the mic I reviewed, sporting the T-FET accessories and a beautiful yellow finish; it was included in this review to provide a familiar point of reference for the new Z-251.

It offers a choice of omni, cardioid, and figure-8 polar patterns, a 2-position pad switch with up to 16 dB of attenuation, and a two-position highpass filter. Its internal components include Oxford transformers from the UK and a Philips Norelco FET.

In my 2010 review, I found this mic to offer an open, airy sound with sweet even mids. It has a healthy forward boost in the 10 to 15 kHz range, but is very neutral across the middle, with no low-end hype.

In that review I liked it best on acoustic guitar, violin and strings, as well as folk style vocals, especially female. I concluded back then that it was probably the best choice as a studio workhorse out of all of the Audiophile mics, and I still love it.

The Z-251 (hello!)

As a tube mic, the Z-251 is an even closer approximation of the original ELA-M 251 than the Cremona 251-T. As part of the Z-MOD series, it shares the same body and build as the rest of line. It's distinguished only by its yellow color, which ADK calls "Top Banana". It is housed in a 2.1" x 8.9" body with a weight of 1.5 lbs. It is very solid and well damped with a great fit and finish; I love the large mic-stand threading it uses.

It has an ADK-designed GK-67D center terminated dual diaphragm capsule. The mic I was sent made use of a USA-made Jensen transformer, which is the recommended transformer for the Z-251. ADK's web site offers great descriptions of each available transformer's merits; ADK will customize transformers and voicings to your needs.

Its specs are the same as the rest of the Z-MOD line, with 9 polar patterns (selectable on the power supply) with figure-8 and omni on the ends, cardioid in the middle, and three intermediate steps on each side. It has a 20 Hz to 20 kHz frequency response, a 14mV/Pa = –37 dBV (0 dBV = 1v/Pa) sensitivity, <250 ohm impedance, a 125 dB max SPL level, a 17 dBA noise level, and a signal to noise ratio of 1 Pa: 76 dB.

In use

If you have read any of my reviews in the past few months, you will know I am in the middle of tracking a classic "Jeans and T-Shirt" rock album with Les Pauls, Strats and

Teles run through Fender Twin and Princeton amps, 4-piece drum kits, Martin acoustic guitars, percussion, Hammond B3/Leslie, piano, and vocals.

In that mix I have made use of the Z-251 on acoustic guitar, as well as lead and backing vocals on some of the tracks. Concurrently I also tracked a few all-acoustic folk style songs and have used the Z-251 on front-of-kit, the "snare side" of a cajon, shakers, tambourine, congas, and even more acoustic guitars and vocals.

In all of the above it offers a very honest, even, almost out-of-the-way tone, with a great open top end that's where I believe the magic of this mic lies. It's a top end that is naturally forward and very real, but not as crisp or sibilant as a C12 style mic, to say nothing of the many shrill modern mics out there.

Side by side with my U 47-style mic thrown up for comparison, it is much more open on the top end and lacks the 47's upper mid push. Compared to my usual 251-style mic, a Telefunken AR-51 (with the original capsule), the ADK was tighter and a little less airy but with a more even weight on the low end. This is a relatively small difference; you can tell that both mics live comfortably in the 251 arena.

Patterns and proximity

The Z-251 has a nice neutral proximity effect in cardioid mode that thickens up minimally as you get closer to the capsule; it's not as pronounced as the proximity effect of a 47ish or 67ish mic like ADK's Z-67. It also has a gentle off-axis rejection.

It becomes even more open and neutral in omni mode, so much so that this is one of the few large-diaphragm mics that I like in omni mode. Again I can best describe it as "out of the way," but it's not a sterile sound at all. If you need a touch more of a chesty presence for a vocal or bass cabinet, then figure-8 mode is the way to go. The pattern switching is quite smooth, with little more than a gentle click and a second of sonic adjustment.

Placing the Z-251 and Cremona 251-T side by side, I was impressed by how similar their overall sonic signatures were. They are definitely cut from the same cloth, with the tube version having a nice touch of added top-end air and overall opulence. The 251-T sounds like it has an ever so slightly forward hi-mid range, but this may be due to its lack of air than actually being more forward. Overall it's just a tad cleaner and tighter than the Z-251, but it does lack that special something that the Z-251's tube brings to the game.

Conclusions

ADK has done a great job of capturing the feel and sonics of the 251 family of microphones in both models. In my opinion, the opulent air and solid tone of the Z-251 really sets it apart, and that's why it is twice the price of the Cremona 251-T.

I noted in my previous review that for my particular needs, tastes, and uses, the Z-67's unique sonic personality was my cup of tea. I still miss it a year-plus later and lament having to send it back. That being said, there's no question that the Z-251 is easily better suited to a wider variety of sources, with a more versatile sonic signature than the Z-67. It stacks incredibly well in a "this is my only mic" situation.

While each of the Z-MODs and T-FETs offers its own flavor and I haven't yet tried them all, I suspect that for most people looking for the true natural workhorse of the line, this is it! There is no source, especially acoustic instruments and vocals, where I couldn't make the Z-251 sound magical—whether on its own or with a dusting of EQ here and there. I wonder which Z-MOD/T-FET pairing I'll be able to try next...?

Prices (as reviewed): Z-251, $2999; Cremona 251-T, $1499

More from: ADK Microphones, www.adkmic.com

Paul Vnuk Jr. (paul@recordingmag.com) is a recording engineer, sound designer, producer, and gear junkie, living and working in Milwaukee.

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REVIEW

BY PAUL VNUK JR.

Focal Trio6 Be Monitors

Power, accuracy, beauty, detail... and did we mention the power?

In April 2015, *Recording* was invited to a special product launch in Las Vegas at the prestigious Studio at the Palms. It was there that the folks at Audio Plus Services gave us a sneak preview of new products in its distributed lines: a new mic from Lauten Audio, new interface and processing hardware from SPL... and the new Trio6 Be speakers from Focal.

Focal is a French speaker company that makes some of the most popular pro studio monitors on the market today. The company's lineup ranges from the affordable entry-level Alpha series (reviewed December 2014) to the SM6 series with its popular Twin6 Be (reviewed July 2008), to the flagship SM9.

The Trio6 Be is the new top end of the SM6 series, positioned between the Twin6 Be and the SM9. It's an active 3-way monitor with an 8" subwoofer, a 5" woofer, and one of Focal's famous 1" beryllium (Be) inverse dome tweeters.

The insides: brand new, powerful, fast, and toxic

Both of the drivers are a brand new W composite sandwich cone design made specifically for these monitors. A dual glass fiber design, each cone is made up of two thin layers of woven glass fiber sandwiched together onto a structural foam core. According to Focal, this is a more homogenous and flexible design than cones made from Glass Aramid or woven Kevlar.

Focal both pioneered and perfected the beryllium tweeter design. Incredibly light and rigid, beryllium is said to offer a faster, more linear transient response than titanium or aluminum designs. Its only real downside is that it's poisonous if ingested, so no licking the tweeters... and no, you're not supposed to touch them, either!

The Trio6 Be is a triamplified active design. There's a 200 W Class G amp for the 8" driver, a 150 W Class G amp for the 5" driver, and a 100W Class AB amp on the tweeter. The Trio6 Be has a range of 35 Hz to 40 kHz with a 115 dB SPL. In Focus mode (see below), the range is 90 Hz to 20 kHz at 105 dB maximum SPL. Its crossover points are set at 250 Hz and 2500 Hz.

Like other models in the Focal line, the Trio6 Be offers a power saving mode known as Automatic Standby. The cabinets power on in standby, and return to it if no audio signal has passed through them in 15 minutes. Think of it as screen saver/sleep mode for your speakers; when in this mode, power consumption of each monitor is less than 0.5 Watts. When signal is detected, the Trio6 Be wakes back up with a gentle fade in and resumes work.

The outsides: cabinet, connections, and controls

Each cabinet is made from 22mm (0.86") thick MDF finished in a textured gray. They measure $20^{1}/_{2}$" x $10^{15}/_{16}$" x $14^{3}/_{16}$" inches and weigh 44 lbs. each. The 8" subwoofer is in its own chamber and isolated from the 5" cone and tweeter. Each section has its own front-firing bass ports: there is a large bass port below the 8" woofer, similar to the ones found on other Focal cabinets, and there are two small matched ports flanking the 5" driver. The latter are similar in size to those on the Alpha series monitors.

Input is handled around back by a single electronically-balanced 10 kilohm XLR input jack, complete with an input sensitivity switch with settings for –10 dBV or +4 dBU levels. Also on the back are three recessed, screw driver accessed tone shaping controls. Each one offers ±3 dB of attenuation or boost. There is a 35 to 250 Hz Low Shelf, a 4.5 to 40 kHz High Shelf, and a Low Mid bell filter set at 160 Hz with a Q factor of 1.

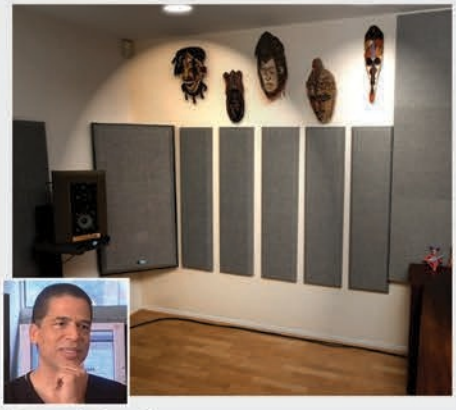
Also on the rear is a standard IEC power socket, as well as a pair of $^{1}/_{4}$" jacks labeled Focus Input and Focus Output.

Sorry, no "Hocus Pocus" jokes

One of the Trio6's main features is Focus mode, first introduced on the SM9. This mode effectively gives you two sets of monitors for the price of one.

Primacoustic... better design, better performance, amazing results!

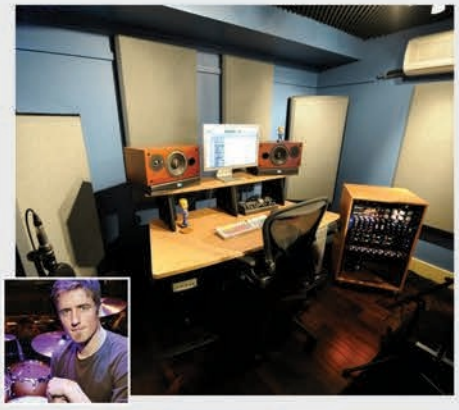
"The ease of install really allowed us to experiment with placement and with the quality of the treatments, we achieved the sonic balance we were looking for!"
~ Tommy Lee
Founding member - Mötley Crüe.



"Being able to fine-tune a room on site makes all the difference. The Impaler mounting system make the panels easy to install and let you make adjustments without trashing the surface. It works!"
~ David Rideau
Engineer/producer - Janet Jackson, Sting, TLC, George Duke and Jennifer Lopez.

"The Primacoustic is up and kicking butt at my new studio in Santa Monica. I love the way the control and tracking rooms sound now... and so does everyone that records here!"
~ Butch Walker
Engineer/Producer - Avril Lavigne, Fall Out Boy, Pink, Sevendust, Hot Hot Heat, Simple Plan, The Donnas.

"I love the way the control and tracking rooms sound now... and so does everyone that records here!" ***~ Butch Walker***



"I put up Primacoustic Broadway Panels on the walls and MaxTraps in the corners. The difference was amazing… the room went from unruly to tight and controlled!"
~ Daniel Adair
Drummer - Nickelback.

"We've got a mixture of bass traps, diffusion and clouds and the result was phenominal. It ended up costing less than 25% of the custom solution and it turned out very cool."
~ Keb' Mo'
Roots music legend

"Not only does my room sound amazing, it's also really beautiful!!!" ***~ John Rzeznik***
Performer/artist/producer - Goo Goo Dolls.

"Not only does my room sound amazing, it's also really beautiful!!!"
~ John Rzeznik

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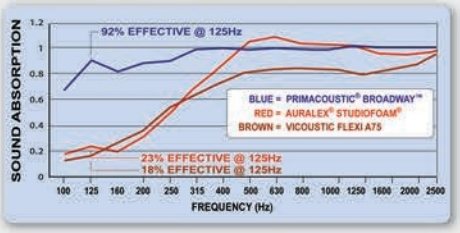

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Focal Trio6 Be Monitors

When Focus is engaged, the 8" subwoofer is muted and the Trio6 becomes a compact 2-way box with a more limited frequency response. This is great for checking mixes and hearing how they might sound on smaller consumer-style systems. I found it fantastic for really checking where the bass and kick sit in the mix, as well as zooming in on the mids.

This 2-Way/Focus setting on the Trio6 Be is much fuller and more balanced than a single driver check box, and as such is not even remotely similar in sound or use to the many sealed-single-driver speakers like Auratones, Avantone MixCubes and the like.

Focus mode is activated by plugging in any simple third-party single button foot switch into either speaker's Focus Input and then daisy chaining one speaker to the other, Output to Input, via an additional instrument cable. (Note that neither is included and there is no way to turn on Focus mode without them.) You can visually tell when Focus mode is activated due to a front-located LED, which sits below a power/clip LED.

Turn, turn, turn

Big Feature Number Two of the Trio6 Be is that it is specially designed to work properly in both vertical or horizontal use. Of course, for better or worse, engineers have been placing vertically-designed speakers horizontally for years, and companies like Focal even offer horizontal-only models. However, few cabinets on the market are purposely built to excel in both positions.

The positional versatility of the Trio6 Be is made possible by a 360° rotating baffle. This section, which holds the tweeter and 5" driver, is held in place by 4 Allen screws. Removing the screws allows you to gently lift out the baffle, rotate it in 90° increments, reseat it, and screw it back in place.

This choice of positioning allows you to keep the tweeter above the driver at all times, regardless of whether you position the speakers horizontally with the 8" drivers facing out or facing in. Focal recommends placing the tweeter/mid sections on the inside (nearest to each other) in a small room, or the reverse in a larger room, but this choice can also depend on the imaging you are after.

A practical note about the rotation process: it is simple and Focal even includes the Allen wrench, but be careful and take your time! The speaker and tweeter are attached to wires, and this baffle has no retaining clips or rotation track. You do not want to have it fall out or drop it.

Get all of the screws loose (just on the verge of release), hold the section steady (note that the two bass ports make great finger holders), finish unscrewing the speakers, and then slowly and gently lift the assembly out by about $^1/_2$", rotate to its desired position, and tighten the screws. Remember, do not touch the tweeter! If you fear tweeter damage or contamination, the Trio6 Be ships with a tweeter guard on it. Leave it in place until after you position the speakers, and save it for when you need to move the speakers or change their orientation..

On the subject of speaker guards, Focal also includes a set of stylish snap-on speaker covers. These give you more protection for the woofer and subwoofer if needed... if, for example, your room is likely to contain kids, pets, or drummers.

Sound and use

Unlike many monitor reviews I have done, where I rarely get to hear them outside my own personal listening environments, it was great to get my first taste of the Trio6 Be with two pairs set up in both rooms at the Studio At The Palms. The Focal crew gave us all a lot of time and freedom to audition songs ranging from the stellar soundtrack work of film composer Armand Amar all the way to AC/DC's classic "Back In Black", with various EDM, Hip-Hop, Classical, and Jazz tracks thrown in as well. We also got to hear them in a simple vocal/acoustic guitar tracking session when demoing Lauten's new Eden mics (review forthcoming) with producer Fab Dupont and singer/songwriter Will Knox.

The monitors easily held their own in these large, professionally treated spaces, with fantastic wide imaging, full and natural low end, and stupid amounts of headroom and volume. This makes sense, of course, as the Trio6 Be is a 3-way design with a pro-studio build, pedigree, and price tag. It was that volume and low-end fullness, however, that made me wonder how they would fare in smaller project rooms, home studios and such.

My mix room at Moss Garden Music measures 12.5' x 15.5'. It is fully trapped and treated, but it is still a converted office space and just a tad larger than many bedroom studios I have used. I set up the Trio6 Be, did 48 hours of continuous burn-in, and came back two days later, fearing that these speakers would simply pack too much power for my room, as 3-way monitors often can....

KaBOOM!

The Trio6 Be can and will get loud! Thanks to their headroom, even without the clip protection it is quite difficult to feed these speakers a signal so loud that they will distort (or worse yet, fart out on the lows) like so many less expensive monitors.

One of my mix setups for over seven years has been a set of 2-way 8" KRK E8b monitors with the matching 12sHO subwoofer, so I am used to, and love, a solid bottom end. Surprisingly the Trio6 Be monitors held their own in every way—no sub needed or wanted, and the sound was more focused and direct than one often gets with a satellite/sub rig.

Unless you want to level buildings, I see zero reason why you would need a sub with the Trio6 Be. It has low end for days—and that low end is usable low end. It is a full and gently focused bass response that sounds impressive to clients when cranked, but natural and honest at low levels for mixing.

High yet clear

The tweeters in my older KRK monitors are also of the inverse dome beryllium variety. They are clear and open, but they do have more than a touch of that "things are brighter in the mirror than they are in reality" studio monitor sheen to them. I assumed that I would hear something similar from the Focal tweeters. Well, I was half right... clear and open, very much so, but worryingly bright? Not so much.

The Trio6 Be uses the same TB872 tweeter as the more expensive SM9, and it shows. This tweeter is still clear and open, but it is noticeably less edgy than some. I would say these hint at a studio monitor brightness but are much easier on the ears, especially for long periods of mix time. Bright '90s guitar rock, trumpet-based jazz and the like will not take your head off when played on the Trio6 Be.

If I had to distill the sound of these monitors down to 3 words, it would be powerful,

even, and full. The mids are very smooth, being neither scooped sounding or too pushed forward. The one word I would *not* use is "punchy"; they don't sound hyped or in your face. For all of their power and volume, they are well balanced and very pleasant to work on, even in my relatively small room.

As I'd done at the studio in Vegas, I spent quite a bit of time listening to music and mixes that I know well. I was pleased to hear that there is no style of music the Trio6 Be can't handle, either when cranked or at moderate listening levels.

The mix

With all of this pleasant impressive sound, I was a tad worried how mixes would translate. Would I overmix the highs to maintain the studio brightness I was used to? Would I undermix the bass since these monitors were so sub-like?

I jumped in and mixed a song I just finished tracking with multiple passes of classic rock guitars, vintage Slingerland 4-piece drums, miked bass cabinet, male vocals, and real Hammond B3. For "trial by fire" purposes, I did not do any mix checks or tweaks with my second and third sets of monitors, although I did use Focus mode often.

After a few hours of mix time, the final mix I heard in my studio sounded almost spot-on in my car, on my iPhone, on my wife's Bose Bluetooth speaker, and more. I did overmix the vocals a bit, but that was an easy and quick fix. I am not saying that I don't expect a bit of a readjustment and learning curve as I do more tracking and mixing on them, but for a quick mix right out of the gate, I was quite satisfied with the results.

What a Trio!

The more I mix on these monitors, the more I appreciate their versatility, their evenness of tone, and of course their bass output, which can "give good client" one minute and provide accurate clarity for mixing the next.

As expected, being at the top end of the SM6 line means the Trio6 Be monitors are not cheap. But real quality rarely is. If you are ready for a pair of uncompromisingly high-end 3-way monitors that work great at any volume and translate beautifully, these are well worth taking out for a spin.

Price: $2795 each ($5590/pair)

More from: Focal, www.focal.com; dist. in North America by Audio Plus Services, www.audioplusservices.com

The Editor gives special thanks to the staff at Audio Plus Services for making Paul Vnuk Jr. welcome at its product premiere event in Las Vegas.

REVIEW

BY PAUL VNUK JR.

Manley CORE Reference Channel Strip

An all-in-one tracking solution at a very approachable price

Manley Laboratories Inc. needs little introduction to experienced studio hands. The "Tubes Rule" folks at Manley have brought us high-end pro audio and hi-fi products for over 20 years. Most recently (February 2015) we reviewed the well-established Massive Passive equalizer as part of a thorough side-by-side comparison with Universal Audio's Massive Passive plug-in.

Manley Labs' 11,000 sq. ft. facility in Chino, California ("Chino, *not* China," as the website proudly states) is manned by a staff of over 30 people who build every Manley box by hand in-house. Manley HQ has its own machine shop, R&D department, and even a warehouse full of zillions of vintage tubes that all get tested by hand! Everything from circuit boards and custom transformer winding to panel engraving, silk screening and more is done in-house. The chassis and additional metalwork is handled by a CNC shop literally down the street.

I point all of this out to highlight the fact that most Manley gear comes unapologetically with a very healthy price tag. The VOXBOX retails for $4600, the Massive Passive is $5600, and the SLAM! compressor is a humbling $7400.

Luckily for those of us who wish for this kind of quality at a less daunting price, company President EveAnna Manley and her team have been working on a more cost-conscious lineup of boxes aimed at project studios and even home-based recording artists. So far there are two pieces in this new series: the CORE Reference Channel Strip reviewed today, which sells for $2000 street, and the FORCE 4-channel mic preamp (review forthcoming), which sells for $2250 street.

That's not taco money, but keep in mind that both units sell for less than half the price of most other Manley fare. How did they manage to pull it off? In the sidebar interview, EveAnna Manley tells us how the company was able to achieve its cost-conscious goals for the CORE without sacrificing its essential quality.

Looks and build

The Manley CORE is a tube-based channel strip with a microphone preamp, instrument DI, opto-compressor, Baxandall EQ, and FET brickwall limiter. Manley bills the CORE as a "greatest hits" package; most of its sections borrow heavily from past Manley products in both inspiration and design.

The CORE is a 2-space 19" rackmount box and features the exact same thick brushed-blue face plate, the same knobs, buttons, and switches, the same VU meter, and even the same smooth-yet-nicely-resistant Bourns potentiometers as you would find on any of the company's other boxes. In other words, no quality compromises here. Internally it also makes use of Manley's own custom-wound 1:8 MANLEY IRON® transformer.

Preamp

The Preamp section on the CORE is an all-tube audio path with a 12AX7WA for input gain and and a 6922 White cathode follower tube on the output stage. It runs on 300V B+ rails with lots of headroom.

The Preamp section starts with a knob labeled Input Level. This is followed by 5 buttons for: Mic/Line input selection, 120 Hz Highpass Filter, Hi/Low Gain, 48V Phantom Power, and Phase Invert. There is also a front mounted 1/4" instrument input; note that this 1/4" input is self-switching, and supplements a pair of separate individual XLR inputs for Mic and/or Line in that can be found on the rear panel.

Also on the back are the Main Output (on XLR) and the Direct XLR output, which sends the signal output from the mic preamp and compressor prior to the EQ and limiter. There is also a 1/4" TRS send/return insert jack for adding further processing into the chain between the preamp/compressor and EQ/limiter sections.

Getting the hang of the gain

Before we move on, it's important to know how the input of the CORE works. Unlike most mic preamps, the CORE's Input Level knob is not an input gain knob, but an attenuator. Also, the Hi/Low button is not high/low impedance switching, but is a simplified version of the multiple gain stage levels offered in the preamp section of the Manley VOXBOX.

When the Input Level knob is fully clockwise the preamp circuit is wide open with a gain of 40 dB; turning it counterclockwise attenuates the signal down to zero. In many respects it is essentially a variable 40 dB pad knob. The Hi/Low button increases the input signal by 20 dB, giving the CORE a maximum mic input of 60 dB, which is great for low powered ribbons and dynamic mics if need be.

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REVIEW

Manley CORE Reference Channel Strip

When engaged, the Hi/Low GAIN switch will also amplify the input noise, so what you want to do is only add the +20 dB when needed. Don't start with it engaged and bring the Input level down; start with the Hi/Low off and Input level turned up for the cleanest signal, only engaging the Hi setting when and if necessary. Note that the levels are 20 and 40 dB in line mode.

Overall I found this preamp clean, open, hi-fi and opulent. This is not a dusty, gritty, thick vintage-tube box. Instead, like all the Manley gear I've worked with to date, it offers the clean, airy sonic depth that good tube gear offers. The instrument input, which engages its own circuit, is very clean, solid, and dimensional. I especially enjoyed working with it on direct bass guitar.

Compression first

Just as unique as the input attenuation arrangment of the CORE is the fact that the Compressor comes before the microphone preamp, which has caused confusion on some web forums. The best way to think of it is that the preamp and compressor are actually the same circuit, and the only part of the compressor that comes before the mic preamp is its Vactrol photocell. It's not like having a full-on separate compressor in the chain prior to the mic pre. This design was first implemented on the VOXBOX and keeps the input signal from clipping the unit.

The compressor itself is set to a fixed 3:1 ratio with controls for Attack (60 ms to 5 ms @ 6 dB), Release (1.5 sec to 100 ms @ 6 dB) and Threshold. It can also be completely bypassed. It's a very modern opto-compression sound compared to what you'd get on a vintage LA-2A; it retains an "opto" smoothness, but it can be very fast and grabby when you need it to be. It is a great and subtle compressor for tracking, to control peaks and prevent clipping; it's also fantastic on mixdown as well, even when hit nice and deep.

Baxandall EQ

The EQ section of the CORE is a simple "sculpting" style 3-band EQ. It features two Baxandall shelves with corner frequencies of 90 Hz and 12 kHz and boost or cut of ±12 dB. The mid section is a bell curve with a choice of two switchable frequency ranges—a low setting of 100 Hz to 1 kHz and a high setting of 1 kHz to 10 kHz. In either range, the bell provides ±10 dB of boost/cut.

This EQ section, while simple, offers a wide throw of band overlap, great for gently sculpting and carving your tone. It can add air with ease or softly tame the highs, and it can add a wide heft or gently lessen bass buildup. I found it highly adept at seating vocals in a mix, gently thinning the mud and adding a touch of air to acoustic guitar, and more. As with the Massive Passive, the power in this EQ is all in subtlety and band overlap—a power in simplicity.

Note that the EQ, unlike the compression, is not defeatable. This is the only issue I found with the CORE that I did not like. EveAnna let me know that (even though the pots are not detented) setting the gain controls to their 12 O'clock position is the same as turning the EQ off. Still, it would have been nice to be able to quickly compare and audition flat vs. EQed signals at the flip of a switch.

Limiter and...

The Limiter section offers a min-max limiting control (threshold) and a release control. There is also a red LED that indicates when the Limiter clamps down. The Limiter's attack is preset at 115 s with a selectable release of 300 ms to 2.3 ms. Unlike many lower-cost limiters, this one does not clip and distort easily unless really pushed hard. Even then, it just pins the signal in a harmonically saturated, almost syrupy way, rather than fizzing out like many others do.

The last knob on the CORE is the output gain control. It has a 10 dB throw of –6 dB to +4 dB for final level tweaking.

The bright blue backlit 3-function meter not only has settings for gain reduction, but it can also be set to show the input level or output level, making it essential for proper calibration and gain staging. Note that as the CORE's meter is an analog device, Manley reminds us that 0 on the VU meter should be equivalent to –18 dBFS in your DAW, not digital zero.

Final thoughts

I spent a few months with the CORE, using it for tracking as well as for mixdown. I discussed my sonic impressions of each of its modules above; if I were to discuss the sound of the CORE as a whole, the adjectives that come to mind are pure, clean, airy, and hi-fi. I quite liked it for tracking vocals of all sorts, acoustic instruments and more.

At the end of the day, the design choices made to bring this unit in at its asking price were great ones. The CORE is a class act from stem to stern: a fantastic channel strip with exceptional audio quality, creativity-friendly settings, and the unique sonic stamp that has made Manley a go-to name in audio for decades.

Price: $2250

More from: Manley Laboratories, www.manley.com

EveAnna Manley On The CORE's Heritage And Design

I really enjoyed my chat with EveAnna, who covered a lot of territory with depth and insight. Here are the essentials from our interview.—PV

This is obviously not a "budget" piece, but it is a less expensive way for someone to get into Manley gear. The most obvious question is, how did you pull that off without compromising the Manley sound and quality?

EveAnna Manley: The VOXBOX was designed back in 1997. Knowing what we knew and how we'd built things before, we just took everything to the Nth degree in the VOXBOX. It was designed to be the most badass unit... we chose to put transformers on every input and every output, there was complicated routing where you can come in and out of the preamp and compressor, out of the EQ and limiter, so much creative stuff going on... all without worrying about cost.

We're not stupid, we realize that if we could get the retail price down on stuff, we'll sell way more. We can reach the musicians in their home studios. There are way more of those guys out there than there ever were in the big recording studios, right? So if we could get to an affordable level, they're going to buy tons of them.

With the CORE, we started with a target price: "Okay, here's what the competition looks like. Man, if we could build something that does this stuff *our* way for, say, two thousand, two and a half thousand bucks retail, we're going to have a winner on our hands." And from there, we said, "What's really expensive in the unit? Transformers? Then let's minimize those. Let's adjust our circuitry so that's not required."

We developed a less expensive chassis. We kept the beautiful faceplate and all the machining; we know what guys want from us—they want it to look and feel like a Manley product, they want it to be like jewelry, right? But when it's racked up, they're not going to care as much about the chassis. We developed a shorter chassis, eliminated all that hand-wiring between the inputs and outputs. We realized how many man-hours it takes to put a piece together—a dual mic preamp takes nine man-hours. The CORE pops together in like an hour.

Wow!

There was substantial cost savings with that. All of these things, combined with the strategy about developing the product, led us to develop a really kickass product, made in America, for not a lot of money. A lot of factors went into developing the unit to cost a certain price, but the key is that we started with that target, instead of playing with the circuitry and seeing where it went, like we did with the VOXBOX.

And yet I noticed that while it's simpler in features than the VOXBOX, the knobs, buttons, switches... they feel just like the ones on the Massive Passive. It's the full Manley experience.

I'll tell you about those pots... at first we had a mandate from the designer that he wanted center detents on some of the function knobs. But Bourns, which makes every pot on every Manley product, don't make one with a center detent. We got other pots and we tried to work with them, made prototypes with them, and they didn't feel really good and they weren't as reliable and consistent from one to the next.

I had major problems with that. I've been using Bourns pots for over 25 years. They're the most bulletproof component we use, you know what I'm saying? So—screw the center detents, sorry, we're using the Bourns.

Now, that said, the feel of the unit is incredibly important to me, and the user experience. The first thing the customer does is to turn a knob—even if it's an awesome pot, if it doesn't feel sexy, he'll just say, "Oh, it's a cheap pot," and reject the whole unit based on that one touch. And it's a bit unfair. You can't always judge the sonics or reliability or electrical quality of a pot based on how they feel. But people do!

The Bourns pots are amazing, but right out of the box they feel a little loose. So we put an O-ring under the knob with a little grease, and it feels a little sexier that way. We dress 'em up a little bit. *[laughs]* My parents had an old Fisher receiver. I remember pulling the knobs off it as a kid, and there were little felt washers under the knobs; that's where I got the idea. It works—they feel as sexy as they sound now.

One of the things I've always liked with other Manley gear is that every subsection has its own sound that's compounded when you put them all together, similar to what happens with all the transformers and op amps in an API console. The VOXBOX had transformers on every stage, which is part of why it cost so much... what about the CORE?

In the mic pre / compressor, we come in with the same mic input transformer that you find in the VOXBOX. But the other sections are transformerless, even though the block diagram, the topology, is the same as in the VOXBOX.

The CORE harks back to the Mastering Lab line preamps, the first circuit that the VOXBOX was based upon. Back in 1989 and 1990 we were working with Steve Hazelton; not a lot of people know that a lot of the circuits we still build today were hugely influenced, if not full-on designed, by Steve. With the CORE, we decided to go back to that Mastering Labs mic pre... it's a little cleaner, a great-performing circuit that'll put out +32 or something like that. It's a super good-sounding circuit—huge high headroom, very clean, low distortion.

I've been tracking an album for the last three months, and I've used the CORE on vocals, using the compressor and EQ for tracking. I've plugged signals into the line input and used it as a compressor and EQ for guitars and drums... it sounds great.

We've really worked on that, knowing where the dollars go to keep the integrity of the sound and the reliability of the whole unit. It's all about the integrity at the end of the day, right? It's what we pride ourselves on.

REVIEW

BY PAUL VNUK JR.

Cathedral Pipes Saint Jean Baptiste Vintage FET Microphone

The maker of the world's most eye-catching tube mics premieres a FET design

Back in February 2015, I had the pleasure of introducing our readers to mic maker Cathedral Pipes, thanks to a review of its glorious flagship tube condenser mic, the Notre Dame. Cathedral Pipes also sells the Regensburg Dom tube condenser and the Seville ribbon, but this month we're looking at its newest baby—the Saint Jean Baptiste, the first Cathedral Pipes FET condenser mic.

Cathedral Pipes microphones are handmade in California by Charles Dickinson. I'll say that again: when you order a Cathedral Pipes mic, Charles will build it for you, by hand. Keep that in mind as I walk you through what the Saint Jean Baptiste can do... and definitely keep it in mind when you see its price.

Well, ain't that shiny

Setting aside build and sound quality for just a moment, Cathedral Pipes microphones have three unique defining features that set them apart from most other boutique mic companies.

1. Bright LED lit capsules. The mic literally glows with a beautiful white light from inside the grille. (Charles Dickinson told me that the idea started with a joking response to a client who wanted his mic to be "brighter"!)

2. French Gothic Chrome exteriors. Each Cathedral Pipes mic features lots of shiny chrome mingled with varied white enamel designs, most of which have a vintage family crest / medieval look.

3. Possibly the best included accessory packages in the business. For instance, the previously reviewed Notre Dame mic came with a large Geiger counter-styled power supply with a voltmeter-styled pattern sector, a large robust flight case, and more. These accessories are of the highest quality, look, and build, and you don't pay a penny extra for them.

Inspiration without slavish imitation

While the tube equipped Notre Dame and Regensburg Dom offer modern variations on the Neumann U 47 tube mic design, the Saint Jean Baptiste is Charles' take on the U 47 fet model (recently reintroduced—see February 2015 for that review, too).

All three mics fall into the "inspired by" category, rather than the clone category. In the case of the Saint Jean Baptiste, the mic's diameter and head basket are a match to the original. Everything else, inside and out, is a completely new design.

Inside: capsule and components

It all starts with the microphone's M7 capsule. Many current mics on the market use Asian capsules that are tuned and tweaked in the States (or used as is to save money). In contrast, the M7 capsule in all Cathedral Pipes condenser mics is handmade in the company's Orange County headquarters.

It is based on the original Gefell M7 design and is a center-terminated 32 mm dual diaphragm capsule. The diaphragms are made of 6-micron thick Mylar. They are 26.5 mm in diameter and are glued onto a single brass backplate.

Of course, the original U 47 fet used a K47 capsule, not an M7, so right off the bat there were some design differences that Charles needed

to wrestle with. According to the Cathedral Pipes website: "We wanted to use our own M7 inside the original design of the FET; however the polarization voltage drawn from the shared wimpy 48V phantom proved to be a challenge. We use a custom booster circuit to get around the issue and a current limiter to carefully portion out the current to each section of the design."

Internally the Saint Jean Baptiste is a brilliant balance of vintage craftsmanship and modern design. One side of the mic's circuit (the high-impedance portion) consists of point to point wiring and components like Wima MK4 and polystyrene capacitors, all attached to old-school ceramic rails. Literally on the flip side of said rails is a modern circuit board using surface-mount ICs and components. All of this flows to a large, weighty Cinemag CM-13101 output transformer.

Outside: checkmate!

The outside of the mic is dressed in an alternating checkerboard pattern of chrome squares and white enamel squares with the Cathedral Pipes family crest in the middle. All of this is protected by a lacquer coating to help with finger prints and discoloring.

The mic measures 7.75" by 2.25" and its chrome-plated triple mesh head basket is visually a match to that of a vintage U 47 fet. Inside this capsule are the small LEDs that glow beautifully in bluish-white light when the mic is fired up and receiving phantom power.

Outside the outside: the toolbox

The mic comes in a large red toolbox that is generously lined with thick gray foam, trimmed with a layer of red foam for looks. Like the Notre Dame, the Saint Jean Baptiste comes with a custom red and white Rycote Invision shockmount and a special custom-made red XLR cable.

This cable is also made in house by Charles out of OCC (Ohno Continuous Cast) copper wiring. As with an old-school vintage mic, the cable screws onto the microphone with a special Binder style 3-prong end. The kit finishes out with a cloth drawstring bag to hold the cable, which is secured inside the lid of the toolbox via tiny bungee cables. The only thing I think Charles should add to his mic packages is a polishing cloth to keep the mics shiny and fingerprint free.

Sound

The first thing I noticed about the Saint Jean Baptiste, despite it not being a spec-for-spec reissue or clone of a U 47 fet, is how close it actually gets to the sound of the original. In side-by-side tests it can trick the ear into thinking it is the real thing. However, upon more careful listening you will notice that the Saint Jean Baptiste has a nice hint of clearer modern highs as well as a touch more low end. It's a gently extended clean low end that you feel, rather than just a big woofy bass boost. Overall this is a more modern, open variant of a U 47 fet. We are talking 5–10% difference, but it's there.

The Saint Jean Baptiste has a good smooth off-axis rejection. Its proximity effect is a bit more pronounced, almost like adding a hint of a sub to a monitoring system, thanks to the mic's slightly extended bass response. One last difference between it and an original/reissue U 47 fet is that it does exhibit a more pronounced low-end body resonance when tapped, than the almost zero resonance of the real thing.

In use

Let's get the obvious question out of the way first: can you use the Saint Jean Baptiste everywhere you'd use a real U 47 fet? Absolutely! It works fantastically on kick drum, guitar cabinet, brass, and—my personal favorite for this mic—bass cabinet.

I also had great luck with it on male vocals, and on the inside of a baby grand piano where I used it in tandem with Neumann's U 47 fet reissue. I had the original on the top end strings on the left and the Saint Jean Baptiste on the lows. Both mics worked so well together here that no one could tell that it was two different models and manufacturers.

But we won't stop there. Since it is just a hair more open on the top end, the Saint Jean Baptiste is slightly more versatile than the original. You can add acoustic guitar, shakers, tambourine, congas, and more to the list of things it records well. About the only place I did not like the Saint Jean Baptiste was on front of kit and on drum overheads, where it was too blunt and mid forward for my taste.

Overall, Charles did a fantastic job of voicing the Saint Jean Baptiste to the original and capturing its spirit. It's not a clone so much as a rethink and expansion of the U 47 fet's sound, purpose, and applications.

The bottom line

Remember how at the start of this review, I suggested that you keep in mind that this mic is hand-built to order when you see what it costs? It's not for the reason you might guess... not because this mic is extremely costly, but because it's unbelievably affordable.

Most mics of this ilk cost $1800 and above, and that's without a case, shockmount, or cable. It blows my mind that Cathedral Pipes sells a completely handmade U 47 fet style mic with a non-sourced capsule and all the trimmings for way less than that, but I'm not complaining... and you shouldn't, either. If you want your own U 47 fet-flavored mic, the Saint Jean Baptiste needs to be at the very top of your "listen" list.

Price: $1300

More from: Cathedral Pipes, www.cathedralpipes.com

REVIEW

BY MIKE METLAY

Gibson Pro Audio

Les Paul 4 and Les Paul 6 Reference Monitors

An iconic name and a unique look decorate some pretty remarkable speakers

Several years ago I attended an open house for a recording studio in San Francisco. As is all too common with huge parties held in studios that aren't meant for them, I found myself trapped in a traffic jam on an overcrowded staircase. As people slowly shuffled up and down the stairs with many grumbled apologies, balancing drinks and plates of snacks, a frail old gentleman just in front of me turned to look at me with a mischievous gleam in his eye. He winked and said, "I'm not waitin'. Cover me, kid, I'm slidin' down the bannister." As fond memories go, that last time I saw Les Paul is a pretty good one.

If you're new to the world of audio recording, you might wonder why something like a studio reference monitor would be named after Les Paul. After all, he played and designed guitars, didn't he? Yes, but Les was also a pioneer in multitrack tape recorder technology and a well-respected recording engineer. So a line of reference monitors with the Les Paul name isn't all that farfetched.

A very "Les Paul" look

The Les Paul monitors are designed to invoke the spirit of Les himself and the famed guitars that bear his name. Each features an exquisitely detailed flame-maple front fascia, carved in a manner reminiscent of an archtop guitar and decked out in one of three classic Gibson guitar finishes: cherry, cherry sunburst, or tobacco sunburst. Photographs don't really do these finishes justice—you have to see them for yourself in good lighting to appreciate just how beautiful and tasteful they are.

The LP monitors are 2-way biamplified designs with dual front ports. They're numbered and differentiated by sizes of their non-woven carbon woofers: 4" on the Les Paul 4, 6" on the Les Paul 6, and 8" on the Les Paul 8. For this review, I worked with the LP4 and LP6 for several weeks.

All three monitors have the same 1" carbon-coated titanium tweeter, placed inside a custom waveguide for smooth treble dispersion, while the woofer is set back into the cabinet and covered with a protective mesh grille that only partly obscures the Les Paul signature on the woofer. The "archtop" carving of the front fascia isn't just for decorative purposes; it combines with the placement of the tweeter and woofer to provide a surface that's free of nasty edge-distortion effects while simplifying the shape and build of the rest of the enclosure.

The rear panel of all three speakers features the same inputs and controls. A combination input jack allows for balanced XLR or 1/4" TRS cabling, and an unbalanced RCA connection is available as well. There's a rear-panel Volume knob, 7-position click knobs for Bass and Treble adjustment (both –4/–2/–1/0/+1/+2/+4 dB), a Standby pushbutton that when engaged puts the speakers to sleep after 30 minutes without audio, and a power switch with standard IEC 3-prong power cable socket.

All three speakers quote a frequency response topping out at 47 kHz (–10 dB, a rather generous tolerance compared to the ±3 dB quoted in most speaker specs); the low end (also –10 dB) is listed as 55 Hz for the LP4 and 37 Hz for the LP6. Both speakers are rated at greater than 92 dB signal/noise ratio; maximum rated SPL before the built-in limiter kicks in is 109 dB for the LP4 and 117 dB for the LP6.

The Les Paul 4

Compact and weighing in at 10.5 lbs. each, the Les Paul 4 speakers are well suited to close-in monitoring setups where space is at a premium; I tested them in my standard work-desk environment, mounted on IsoAcoustics speaker stands and angled so the tweeters were aimed at my ears in an equilateral triangle roughly 36" on a side. I burned them in for 48 hours before doing any serious listening; the woofers did loosen up just a bit, nicely mellowing an initial harshness in the mids.

The LP4s have a usable sweet spot that is very wide for such a small speaker, and when you get outside it, the first thing you notice is thinning in the bass. Normally you'd expect to lose treble first, since highs are more directional than lows. The woofer's recessed position behind the carved fascia makes the lows more directional, and the tweeter's waveguide gives a broad dispersion so that the lows are actually slightly more "beamy" than the highs! Given the very wide sweet spot the LP4s have to begin with, this behavior is interesting but absolutely not a problem.

As you would expect from a monitor with a 4" woofer, bass on the LP4 isn't as strong or extended as you'd need for it to serve as a do-it-all system without help from

a subwoofer. What low end there is comes across nicely defined and clear; you hear higher harmonics in bass guitar and kick drum snap that lets your mind fill in the lower details.

The mids are notably forward and detailed; there's no weirdness at the 2.4 kHz crossover frequency that I could hear, and the LP4 speaks with authority on rock material with electric guitars and in-your-face vocals. This is a great little speaker for listening to potential problems in the critical midrange.

The broad and smooth dispersion of the waveguide combines with a very fast transient response in the tweeter itself to give a nicely extended treble that's free of shrillness or spittiness but has plenty of detail. Edit clicks and digital conversion artifacts have nowhere to hide, but if your audio's well-recorded in the highs, the LP4 will let you hear it properly.

The Les Paul 6

At a nicely-manageable 18.5 lbs. each, the Les Paul 6 is a solid monitor for smaller listening spaces that would be overpowered by an 8" woofer. I set them up in my studio at the *Recording* offices, in an equilateral triangle roughly 48" on a side, angled for proper alignment on IsoAcoustics stands. Like the LP4s, they had a little bit of midrange harshness that went away after a 48-hour burn-in period.

The extra oomph from the larger woofer in the LP6 makes listening a markedly different experience than with the LP4; the LP6 delivers solid, powerful bass. I didn't find myself missing the really low lows that a subwoofer delivers on any material other than the very bassiest dance music.

The LP6's woofer is also recessed into the cabinet for increased directionality, but in this case it matches up very well with the dispersion of the tweeter waveguide. The result is a sweet spot that is not only very wide but also exceptionally well-behaved as you move to its limits and beyond. This is a great monitor for situations where the engineer may have the artist sitting next to him or her and listening along; you don't have to worry about things getting strange if you're not perfectly situated with respect to the speakers.

The LP6 has a crossover frequency of 2.7 kHz. As with the LP4, there are no obviously audible artifacts in the vicinity of the crossover. Here, the beautifully clear and defined highs blend with the powerful mids and lows to produce a frequency response that's notably mid-forward, again great for working with rock mixes. If you feel that too many monitors these days have scooped mids in contrast to overemphasized highs and lows, then you're really going to like the way the LP6 presents your music.

Final thoughts

The Les Paul speakers feature a plethora of nice touches. I did most of my listening with the rear-panel tone controls set flat, but tiny boosts and cuts to account for placement near boundaries worked well for me. The illuminated Gibson logo under the woofer flashes slowly when the speakers go into Standby mode, and they wake up in a matter of a second or two with no nasty pops or clicks.

I worked with a variety of material and did a lot of listening to my own tracks and mixes, especially through the LP6, which very handily replaced my usual studio speakers for the review period and quickly became a trusted part of my monitoring environment. One particularly critical task—auditioning a recently rediscovered live concert recording for potential release, picking out digital artifacts and edit points for a future mix session in a larger studio—was accomplished swiftly and satisfyingly with the LP6, and a crosscheck on the LP4 was nicely consistent with my results on the larger speakers.

The Les Paul 4 provides a high-quality listening experience for the desktop rig that needs accuracy in a very small space. You'll need to check your work on larger monitors and/or add a subwoofer to fill in the lows, but the LP4 provides a great sonic picture within its tiny frame.

The Les Paul 6 is a beautiful choice for a serious studio's primary monitor. It's got plenty of clear lows, a forward but detailed midrange, and a smoothly extended high end that's non-fatiguing and microscopically clear. If you're doing music that's very heavy on the kick drum and low bass rumble, a subwoofer would be an appropriate addition, but for most genres of music the LP6 will give you what you need without help.

Gibson Pro Audio's first entries into the reference monitor market are impressive all around. I can just see Les now, listening to them with that gleam in his eye...

Prices: Les Paul 4, $599 each; Les Paul 6, $799 each

More from: Gibson Pro Audio, www.gibson.com/Products/Pro-Audio/2015.aspx

REVIEW

BY PAUL VNUK JR.

Samar Audio Design VL37 Ribbon Mic

A boutique maker's newest ribbon offers elegant performance and unique tonality

Samar Audio Design is a ribbon mic manufacturer based in Salt Lake City, Utah. Founded by Russian recording engineer / electronics engineer / concert pianist Dr. Mark Fouxman, Samar describes itself as making microphones "built in an artisan tradition." Each Samar mic is made completely in-house, from its stainless steel endcaps to its custom-wound transformer, and sold direct to customers rather than through distributors or dealers.

Samar's flagship mic, which I got to see and hear briefly at the 2013 AES Convention in New York, is the boutique and unique MF65. It is a high quality precision build with an integrated stainless steel shockmount and stunning maple box, the kind in which high-end wines or liquor might be sold. It has a reported frequency response of 20 Hz up to higher than 25 kHz. That gives the MF65 perhaps the widest frequency response of any figure-8 ribbon mic on the planet.

Of course at $1999 a pop, the MF65 is a pretty serious investment. That is why Samar took on the task of designing a new model that offers exactly the same internal components and many of the MF65's body design elements and boasts the same specs, but cuts costs by removing many of the hi-end extras—the maple presentation box, the shockmount, and so on. This new model is the VL37, and I had a period of several months to work with a pair; all of the photos accompanying this review were taken in my studio as I put the VL37 to work on all manner of sessions and sources.

Meet the VL37

The VL37 is a figure-8 passive ribbon microphone. Its body is made of precision machined stainless steel. It measures 6.375" long with a diameter of 1.3" and is a solid 8.2 oz.

It uses a rigid honeycomb style corrugated grille with a second tighter weave/perforated grille in the inside (that works as a built-in air-redirecting pop filter). Its fit and finish are so well done that if it weren't for the small recessed Allen screw holes, you would be hard pressed to tell where the top and bottom end caps are attached... and I'm told that current runs of the mic actually screw together like the MF65, so even those screw holes will be gone!

Everything about this mic feels classy and well built. It comes in a small foam-lined wooden box with an off-the-shelf third-party shock style clip mount. AEA uses this same mount for the Nuvo series ribbon mics.

Internals

Internally the VL37 uses a proprietary corrugated ribbon that measures 2" x 0.25" and is 1.5 microns thin. The ribbon appears to be internally protected by another thin layer of screening and uses a proprietary fine-tuning adjustment which helps maintain consistency. Samar claims that its sophisticated ribbon motor has the "shortest front-to-back path ever seen in ribbon microphones."

Its specs include a sensitivity of 2mV/Pa and an output impedance of 250 Ohm. There are no other specs listed on the site or provided with the mic, although Mark Fouxman says it's been tested with a 140 dB SPL source and showed no distortion at all, so its maximum SPL *could* be as high as 160 dB. Still, while specs are nice, we listen with our ears...

I can say that while the VL37 is not the hottest passive ribbon in my collection, through my Millennia Media HV-3D set to 49.5 dB of input gain, I was still able to do spoken word tests and achieve average levels in my DAW of –6 dB with next to no added noise. In practical terms, that means that this is a very clean and quiet ribbon with a good output level that is low compared to most condenser mics, but still in line with most passive ribbons. If that's not enough, consider pairing this mic with a Cloud Microphones Cloudlifter CL-1; I did, and the Cloud inline amplifier made the VL37 almost frighteningly strong and clear!

Frequency, proximity, rejection and lobes

The VL37's frequency response is surprisingly close to that of its more costly sibling. It is pretty much ruler flat from 20 Hz up to 5 kHz with only the slightest of occasional rises and falls. From there, there is a slight 1 to 2 dB rise around 10

kHz, followed by a 5 dB dip to 18 kHz. Here, unlike most ribbon mics, rather than rolling off completely the level starts to rise again... up to 25 kHz and possibly beyond. Apparently the company that did Samar's graphs and tests had equipment that topped out at 25 kHz, so no one knows how high it really goes, and I wasn't able to bring in a dog or a bat to test it in my studio.

I found the VL37's proximity effect to be very mild from a few feet up to a few inches away. It only got noticeable when a source was right up on the mic—which, thanks to all of its layers of screening, was never a problem. Even plosive issues were few and far between. The mic has a tight null for its side-axis rejection, making it easy to position so as to reject bleed from nearby sources. The rear lobe was a touch more bass-heavy than the front, as is the case with many modern figure-8 ribbon mics.

Sound and use

Over the last three months, I have found lots of great uses for the VL37, from drum overheads to male vocals, on vintage Fender and VOX guitar cabinets, capturing acoustic guitar and mandolin, on congas, shakers, and cajon, and pressed into service as a room mic. It does exhibit a smooth even ribbon tone, but as I mentioned above, it is not as big and thick in the lows as many ribbon mics. It is also, as you might expect from the frequency response, easily the brightest and most open-sounding ribbon mic that I have ever heard or used.

By "bright", I mean "clear" vs. "harsh" or "spitty". The VL37 sound is highly detailed in the treble, but still ribbon-smooth. Previously my modern bright ribbon of choice was an sE Electronics Voodoo VR1 (reviewed May 2011), but the VL37 is more open and brighter still. This is definitely a ribbon mic made for people who want something different than the thick, natural, rounded sound of classic ribbon mics, and who want a top end that's clear and present without the peakiness of many condenser mics.

I usually use and love ribbon mics as overheads and room mics on vintage, classic rock, and jazz drum tracks, but move back to condenser models for modern rock and pop songs. These VL37 mics, though, give most condensers a healthy run for their money. These are the type of overhead/front of kit mics where you can get great-sounding

results and imaging by starting with just a pair of VL37 mics in the mix, then bringing up the kick and snare to taste.

Again, thanks to the layers of screening, the VL37 makes a wonderful vocal mic; you can get right up on the mic for an open, natural, and intimate vocal take. While I feared the VL37 would be too bright for screaming electric guitars, I was surprised by how much I liked the results when blended with a Shure SM57, Audix i5, or Telefunken M81. The dynamic mics grabbed the punch and forwardness and the VL37 brought out an even clarity.

Conclusion

The VL37 of course sounds nothing like a Royer R-121, or even your typical Big Ribbon from AEA. That's what makes Samar's newest mic so beneficial; it literally opens up new sonic territory in the world of ribbon microphones.

While $899 is well above the usual import/beginner ribbon range, it's also $200 to $400 less than the average professional ribbon mic. Not having one for comparison, I can't say how well the VL37 does or does not compare to Samar's upper-end MF65 in sound... but the VL37 sounds so good that it really doesn't matter.

Price: $899 (limited-time introductory special price $749)

More from: Samar Audio Design, www.samaraudiodesign.com

REVIEW

BY PAUL VNUK JR.

Retro Instruments Doublewide 500 Series Tube Compressor

Yummy tube goodness for your 500 rack—1950s style

In 2006 Phil Moore re-created, redesigned and re-released the famous 1956 Gates Sta-Level compressor. At that moment Retro Instruments was born. In the years since then, Phil has remained true to the company name by bringing products to market that are modern recreations of vintage fare—such as the Sta-Level, the Retro 176 tube compressor, and the OP-6 portable mic preamp.

Additionally, Phil has crafted brand-new designs that make use of old-school design techniques, components and more. These include the Powerstrip Recording Channel, the 2A3 Dual Program EQ, and the unit under review today—the Doublewide.

The Doublewide is a vintage-inspired tube compressor designed for use in an API-format 500 Series enclosure. Its name is quite apropos because it's a 2-slot module, and is, in fact, doublewide!

Tubes, transformers, and more tubes

This is not a simple, single-tube starved-plate box, where the tube is meant to add drive or distortion characteristics. The Doublewide needs every inch of its real estate—it's a full-on variable-Mu design, with four tubes and two full-size transformers inside!

Unlike an optical photocell or a FET circuit, a variable-Mu design uses the tubes for the gain reduction in a true push-pull fashion. There are four NOS RCA 6BJ6 inside that are set up in two gain stages, with Cinemag input and output transformers.

Guided tour

The unit is finished in "Retro-Gray" with white lettering and accents. It is dominated top and center by a full size VU gain reduction meter, similar to the one found on the Sta-Level; this one goes to –30 dB, vs. –40 dB on the Sta-Level. There are vents on each side of the meter that glow red when powered on; they're LEDs for looks alone, since a proper tube design usually won't provide enough glow to look sexy across a studio. (Beware of "real glowing tubes" with orange LEDs hidden behind them....) [*Phil Moore reports that most units will give you a gentle glow, but one recent run does have super-bright LEDs: "We let it blast on the last run."—Ed.*]

Below the VU meter are the orange power LED and four fully variable (unstepped) knobs for Attack, Recovery, Input Level, and Output Level, and two toggle switches: Active/Bypass and Single/Double. The knobs are marked arbitrarily from 0 to 100 for the purpose of recalling settings from a written log; the numbers don't relate to levels in dB or times in seconds.

Note that the unit can be powered completely off with a hearty click when attack is set fully counter clockwise. This may seem like an odd feature on a 500 Series box when most modules power on and off globally with the rack. However, the Doublewide is a tube device—this is a great and well-considered feature, as it lets you save on tube life when the Doublewide's not needed, even when the rest of the enclosure stays fired up.

The Active/Bypass switch is useful for checking pre- and post-compression levels. The Single/Double switch refers to two settings that are taken directly from the Sta-Level. They alter the behavior of the compressor's attack and recovery times; Single is smoother and slower while Double is faster and more punchy.

In use

I have owned a Retro Sta-Level since 2008, and I couldn't wait to see how the Doublewide compared. In my studio, the Sta-Level stays almost permanently dedicated to my bass guitar bus; on occasion it swaps places with an LA-2A for vocal duties.

On bass, the Sta-Level is simply magical. It can compress the signal by up to 30 dB, pin the bass in place, and yet not sound overly compressed or unnatural. It adds a nice thickening mojo as well. It also adds weighted control to vocals, again with gobs of compression, but not sounding too pumped or over-squashed.

While the Doublewide looks kind of like a Sta-Level hit with a shrink ray, it is in no way a Sta-Level-Lite! Yes, it offers similar Single and Double control settings, but it is a new design from the ground up and does its own thing proudly. A major functional difference is that it also has attack and recovery controls, where the Sta-Level is a simple input-output affair.

Having said that, I could actually match the ballistics of the Sta-Level and the Doublewide so they were fairly close, simply by adjusting the Doublewide's attack and recovery to their fastest settings in both Single and Double mode. Beyond that, though, the Doublewide sonically has a touch less thickness and weight, as well as a lower noise floor.

Patient and slow

Even adjusting the attack and recovery settings as fast as they can get, the Doublewide is still quite slow by modern compressor standards. Rather than having "fast" and "slow" as other compressors do, it's more in the realm of "hang on" and "I'm getting there"!

[*Phil Moore comments: "The Doublewide is capable of going pretty slow, but it is also capable of going fast. It just doesn't clamp hard on peaks like a limiter. The meter shows how fast it is... the feeling of slowness is due to a dynamic ratio on the attack impulses. It creates punch."—Ed.*]

As with the Sta-Level, it is very easy to dig into deep reduction levels with out sounding over the top or overbaked. Comparing the Sta-Level and Doublewide, my analogy would be: if the Sta-Level is molasses, the Doublewide is maple syrup.

In use

On vocals I could get the Doublewide behaving like the Sta-Level but with a touch less weight to the sound. In other words, while it's not equivalent to the Sta-Level, it does serve as a great vocal control box, just like its big brother does.

On drums, it's an instant snare fattener. Unlike a Universal Audio 1176LN or Empirical Labs Distressor—both of which make snare drums snap, crackle and pop—the Doublewide makes the snare big and slow, as if the sticks weigh 100 pounds each. Experimenting with Single and Double modes on snare, I found Double to be faster and more meaty, while Single is slow, even, and buttery. Playing with the attack will shape the snare sound from smacked and chunky to gentle and huge. Changing the recovery can take it from slow and sluggish to a state of nearly suspended animation.

I really liked the Doublewide on a baby grand piano miked with an Advanced Audio CM49 (review forthcoming) about 7' up from the open piano lid. With 10 dB of gain reduction, an attack of 80, and

recovery of 100, in Double mode the pounding rock-style line was forward and solid with a beautiful gentle pumping. Put in Single mode, the pumping went away and the playing was smooth, yet firmly controlled.

It's a similar experience on strummed rock acoustic guitar with 3 to 10 dB of reduction in Single mode. Setting the attack to 40 with a full, fast release, you get a consistent big controlled sound. On bass it works well too, although I will say that to my ears it just doesn't have quite the massively weighted magic of the Sta-Level. It's a nice electric guitar thickener; set the attack at its slowest and the recovery at its fastest, in Double mode, and go for about 8-10 dB of gain reduction.

I could keep going all day; there is really nothing that the Doublewide won't work its magic on... as long as you like your compression big, smooth, and slow-feeling.

Conclusions

Even though the Doublewide is not as magical as the Sta-Level on a few sources, it is easily the more versatile jack-of-all-trades of the two. Considering that the Sta-Level costs $2700 and the Doublewide is $1000, that's saying something. You could get a pair for stereo (although they are not linkable), and still be financially ahead with a brilliant versatile tube compressor in its own right.

If you're looking for real tube character and that lovely massive smoothness of a variable-Mu design in your 500 Series rack, the Doublewide can put you in the interesting position of buying a brand-new compressor... in order to go Retro.

Price: $995

More from: Retro Instruments, www.retroinstruments.com

REVIEW

BY PAUL VNUK JR.

Most of our Audix coverage in the past year has been focused on the classic workhorses of the line—everything from newly created packages containing the i5 and D6 dynamic mics to the special anniversary edition of the D6. In addition to the aforementioned studio workhorses, though, it's good to be reminded that

Audix HT5 and HT7 Over-Ear Condenser Microphones

When a conventional handheld mic won't do the best job—try these

Audix offers a selection of specialty microphones as well. These include miniature podium mics with or without state-of-the-art carbon fiber boom stands, similarly equipped choir mics, and the mics we are looking at today: head-worn/over-ear condenser mics.

Remember that the world of professional recording often extends beyond the studio and concert stage. There may come a time when you are called upon to record a speaker giving a seminar in a banquet hall, a pastor, priest or rabbi in a large sanctuary, a CEO in a boardroom, or a cast of singers and actors in a musical stage production. When that happens, these are the sort of microphones that you will want to have handy.

Both mics use an omnidirectional capsule. The mic is at the end of a flexible armature that extends down the wearer's cheek and should be positioned just at the side corner of the mouth, not in front.

You may be wondering why we would choose omnidirectional mics when they will be used in large reverberant rooms with the potential for feedback. The reason is simple: omni mics are more consistent in their behavior than cardioids. They're less prone to air blasts and plosives, they have no proximity effect, and head movements are much less likely to make the speaker's voice in the capsule change dramatically as the mic moves with respect to his or her mouth. Yes, there can and most likely will be feedback issues to sort when setting levels... but in this situation, EQ, compression, and soft gating are your friends. And feedback might not be nearly as bad as you'd fear, since the capsule is so tiny and so near the sound source.

HT5

First we have the older model of the two, the HT5. It sports a 20 Hz to 20 kHz frequency response, a 12 mV/Pa @1 kHz sensitivity, 1000 Ohm impedance, and can handle SPL of 140 dB or greater.

The HT5 is a dual-ear model and is the more robust of the two in every way. The 5mm mic capsule is attached to a miniature gooseneck armature that terminates in a 3' cable, to which you can add an adaptor for use with the wireless or wired system of your choice.

The armature is a simple, highly rigid wire design that slips around the back of the head over both ears. It is firm and tight and once in place this mic will stay put even under heavy calisthenic use. It is available in beige or black and includes a foam windscreen.

HT7

The brand-new HT7 also has a a 20 Hz to 20 kHz frequency response. Its has a sensitivity of 17 mV/Pa @1 kHz, a 2000 Ohm impedance, and can also handle high SPL with ease.

The HT7 is a single-ear model. The mic is held in place by a soft yet firm rubber earpiece that can be worn on either the left or right ear. The entire mic is modular: the earpiece can detach from the thin wire mic armature, the 4' cable is detachable, and so is your chosen mic pack adaptor. This is a good place to note that in addition to supporting the many companies who offer wireless systems, Audix has multiple wireless systems of its own, such as the RAD360, which work hand in hand with the HT5 and HT7.

The HT7 comes in beige or black and ships with a foam windscreen, all in a simple compartmentalized vinyl zipper case.

Practicalities

In my job as a the tech director of a church with a 1200 to 1800 seat facility, I make use of over-the-ear mics often for sermons, seminars, musical skits, and video interviews. In our church, at least, the days of lavalier mics are long gone except on the rarest of occasions. The over-ear is closer to the mouth and gives more gain before feedback.

In use, both the HT5 and HT7 have their pros and cons depending on your

needs. The pros and cons have everything to do with form and function, however, not sound.

While many speakers love over-ear mics, I have seen lots of unpleasant scenarios: mics falling off the ears of overactive speakers and presenters, the wire armature getting bent and moved by a speaker brushing or scratching his or her face... or, all too commonly, not everyone's ears are conducive to holding a single-ear model securely. It's for these situations that the HT5 is the better choice. It is quick to put on and take off, it is tight and rigid and stays put, including the miniature gooseneck mic arm that can be moved and adjusted with ease. The downside to the HT5 is that some may find it too tight for comfort; it stays put, but it is not easy to relax and forget that you're wearing it.

In contrast, the HT7 has possibly the single best soft molded ear holder I have ever used. It's a perfect balance of snug and comfortable, so much so that it's easy to forget you are wearing it. The downside is that its near-invisible wire arm is so thin and malleable that it bends easily, and if not handled gently it can also develop nasty kinks. It can be straightened gently on the edge of a table, though, if need be. For the most part, if not manhandled too much, it stays put.

Sound

Both models are clean, quiet and clear. They are very controlled on the low end and not as chesty as some other models I am used to. They take EQ well, and I have had no more issues tweaking these out for our room over any other models.

Between the two, the HT7 is about 10% richer sounding; both are nicely resistant to facial noise like rubbing against beards, stubble and such. Recordings captured with both mics have been natural and clear-sounding. Thanks to the omni capsules and their lack of proximity effect, voices recorded with these mics have a great conversational feel to them vs. a radio announcer's thickness.

Conclusions

Both mics sound clear, natural and great. Normally I am a bigger fan of dual-ear models, since the mic stays put better and they are more repeatable and predictable from week to week. Having said that, however, the HT7 is a clear winner here—both sonically and in its combination of firm grip and feather lightness. If security under heavy motion is your priority, the HT5 is a solid standby that won't let you down, but the new HT7 is very appealing and well worth a try for most speaking and theater applications.

Prices: HT5, $390; HT7, $345

More from: Audix, ww.audixusa.com

Studio Deliverables

That finished stereo mix of your song is only the beginning...

By Aaron Trumm

When people talk about making money with music, they talk about two sources: gigging and CD/download sales. If you have a great live act and you're very popular, gig money can be significant, but it's no secret the sales side is hardly ever big, and much has been made of its imminent demise. That part's debatable, but it's a fact that record sales have never been the main revenue stream for major labels or the companies that own them. Not to mention that few of us are rock stars, and believe it or not, some people don't want to be! In short, the rock star business model is non-viable, and even labels know this. Thankfully, there are many other ways to generate revenue from music.

Alternative music income is talked about a lot, but what can musicians do to maximize it? In this piece, I'll focus on the first part, the part without which nothing else can happen: the product. Specifically, what do you need to leave the studio with in order to maximize earning potential—in other words, what are the studio's "deliverables"?

I cringe when I think about all of the hopeful bands that have come and gone at studios where I worked, who went away with only stereo mixes. They'd leave the studio with a brand-new set of songs, mixed to perfection, hoping to strike it rich. Not only is that not enough, that's the only result of the recording process that probably isn't valuable financially! So if amazing songs, sung with passion and purpose and mixed to perfection, aren't what you want to leave the studio with, what is?

I cringe when I think about all of the hopeful bands that would leave the studio with a brand-new set of songs, mixed to perfection, hoping to strike it rich... when that's the only part of the recording process that probably isn't valuable!

In this article, I'll run through some ideas. I will do this primarily from the band's point of view (here's what you need to take away with you to maximize your earning potential), but it's easy to recast a lot of it from the studio's point of view (here's more value to offer your clients so they get more from the experience, spend more, and happily come back for their next project).

Radio mixes

First off, of course you need those main mixes. You might refer to them as album or straight mixes. These are the songs that go on your CD, go out to iTunes (don't forget Mastering For iTunes!), get put up on your website and go on the radio... right? Not quite.

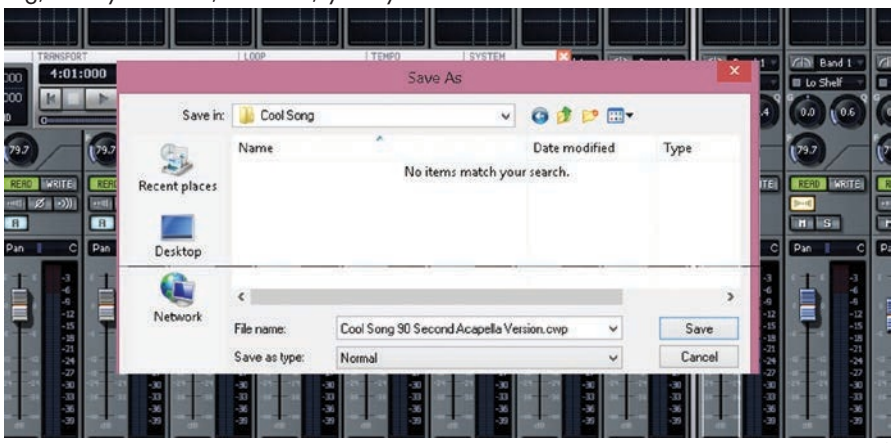
Your album mixes aren't necessarily the ones that go on the radio. So your first new deliverable is radio mixes. Obviously, you need mixes with no cuss words. With a DAW, it's no problem to do a "save as" and save a radio mix, where the engineer cuts words from the vocal, or reverses them, or does some other magic to "censor" your song. Even better, write a version of the song with no cussing, and when you're overdubbing vocals, record the "clean" version with the same mic setup, same vocal style, etc. This is the method Dr. Dre and Snoop Dogg used to make palatable versions of otherwise un-airable songs, which also didn't sound edited or censored. The benefit was multiplied when anyone who bought the album heard a new, harder-core version of the lyrics.

Lyrics are not the only thing at play, though. While it's not universally true if you include avant-garde shows, you might as well tell yourself that no one will ever air a song over 3 minutes long. That doesn't mean the 4:20 album version needs to be thrown away—that's another opportunity to give a fan something more. But whenever possible, do yourself a favor: do another "save as", and edit a version with less intro, a shorter guitar solo, whatever it takes to get in the 3:00–3:10 sweet spot. Just like with lyrics, it may help to perform this ahead of time.

Alternative mixes

One of the biggest possible revenue streams requiring the least amount of fame, as well as one of the best ways to develop great industry connections, is licensing. This is another hot topic lately, and for good reason... but all you have to do is watch TV for an hour, and you will realize that however clean you made that previously raunchy lyric, you probably won't hear it behind a movie or TV scene.

You may want to write instrumentals, but first do another "save as" and print your mix without vocals. You can also do one with the backing vocals in, but make sure you've got one that has zero words whatsoever. Great lyricists may resist this, but a song without words is usually more valuable to a video production. Why? Two reasons: one, movies and TV shows have dialog, and lyrics clash; and two, your lyrics



tell a story, and that story probably doesn't fit. Without words, though, your track might go great with the story on the screen.

As an added bonus, if you're a vocalist with no band, you can use instrumentals as performance mixes for live shows. If you're very detailed, you might print an instrumental with less reverb on the instruments, for venues where the room is already pretty live. Oh, and don't forget that DJs like to have a cappella versions they can pair with alternative beats, so print a vocal-only mix.

That's not the end of alternative mixes. Remember when you edited the length of your radio mixes? You'll want to do that again for licensing libraries. Start with 30, 60 and 90 second versions. While you're at that, you'll probably want some 30–45 second promo clips for your website. Make both vocal and non-vocal versions of these.

That's not all. Let's say a big movie needs a song about being crazy, and your song is actually called "I'm Crazy"? It's perfect, but it has a horn solo, and the movie wants a bridge, no solo. No problem, if you've done another edit or performed a version that has a bridge and no solo. You may also want an acoustic version.

Breakdowns

One of my favorite deliverables for any song in any genre is a bunch of ready-to-use breakdowns. Save versions of the songs with just the drums and bass, just the drums, a drumless mix... use your imagination. Remember to pay attention when you're editing breakdowns to keep things sensible—a fade in may have worked in the full mix, but not with the drums alone, or maybe there's a 4-bar drum solo which will turn into inexplicable silence in a drumless mix. Track wisely in anticipation of this. If your drums bleed into your vocals, you can't use that track for your drum-free mix. You might have to actually track multiple versions to have multiple versions available later. (For more flexibility and responsiveness, see the sidebar where I talk about separations.)

When it comes to alternative mixes and breakdowns, the point is to leave the studio with a lot of material in hand, so you can respond to industry needs quickly. You don't want to be stuck waiting for studio time to reprint an instrumental if you're asked for it. Not only is that inefficient, it's not as cost-effective as leaving the session with what you need.

Other deliverables

The point is to maximize the amount of valuable material that comes out of what you were doing anyway. To that end, there are a couple of other things to consider—things you may not need to spend costly studio time on, but could prove valuable.

Lead sheets, tabs and sheet music: It took me a long time to see any value in having written music as part of the package of material that goes with a release, but this can be crucial. If you're a solo artist who needs musicians for live settings, lead sheets or sheet music are critical for efficient learning. Tabs and sheet music are also publishable, giving you a possible new revenue stream, and if you're submitting demos to publishing companies, they often require lead sheets and lyric sheets. It's very valuable to have proper musical documentation. For natural improvisers, this can be tedious, but I highly recommend putting in the effort.

Video and photos: Behind the scenes footage or footage of performances in the studio may not always be directly monetizable, but it's well known by now that YouTube is a critical part of a musician's promotional arsenal, and there is some possibility of revenue from YouTube advertising. Besides, pictures and video clips are a huge value-add for band and label websites and other promotional material. Heck, you might as well shoot your next 8x10 glossy with a cool mix desk in the background while you wait for the engineer to set up mics... or if you're the engineer, suggest that the band do it while they're waiting for you!

Surround: I'd be remiss not to mention surround sound. It would be false to claim that surround mixes are a necessary part of a production's deliverables, because for the most part they're not asked for, and there's virtually no consumer market. However, if you happen to be in a studio that has the capability, doing another "save as" and creating a 5.1 version of a mix could be a cool addition to what you offer. I highly recommend starting with the finished stereo mix and enhancing from there (although one could argue in favor of other methods), since you want to create the same basic musical experience. Especially if you're going after movies, 5.1 versions could be valuable, but consider your potential cost/benefit ratio before moving ahead.

Documentation and project files

Last but not least, never leave the studio without copies of ALL your project files, raw tracks and any notes or documentation. Copy the folder the DAW project is in, and make notes of the software version, hardware, and especially the plugins used. You need this material in your hands, not just stored at the studio. You never know if the studio will lose your stuff, or if you may be halfway around the world needing to fix something at the last minute. Unless it's owned by a label (in which case this advice is for them), you put yourself in a much better place by keeping your material on hand.

Hopefully now you can see how much more value you can pull from your studio time. If you're efficient, it won't cost much more to get everything you need. Then your living needn't be tied to your fame, and that, in my humble opinion, is a huge relief! Happy monetizing!

Aaron Trumm (trumm@recordingmag.com) was once the 10th-ranked slam poet in the world, created NQuit Music and techno/classical/poetry fusion act Third Option, and is now the front man of the imaginatively named Aaron Trumm Trio. Visit aarontrumm.nquit.com to learn more.

Separations

Since I work in various DAWs, I'm a huge fan of separations. When I'm the client, I leave the studio with full separations of a mix, so I can call it up and deliver breakdowns or alternate edits at will in any software, without going back to the original tracking studio. I also sometimes send full separations to the mastering engineer, so he has better control (although many mastering engineers dislike what they perceive as being asked to remix and master at once... ask first). When I'm the engineer, I offer full separations as an option for a reasonable added fee and explain to my clients why they might find them useful.

Full separations means every track is separated; kick, snare, guitar, vocal, etc. These tracks can import into a DAW, set at zero with no processing, and the mix sounds exactly like the finished stereo mix. It's easy to mute a few tracks and create a breakdown, or edit an new version. You can also take the separations to a totally different studio to do surround versions later.

With separations, even if you don't have the same rig as the studio, you can do breakdowns and re-edits to your heart's content without having to go back. This is a great way to be able to quickly deliver what's needed to a client without having to own a full-fledged studio yourself.

Exporting full separations, however, can be a long process. Some software (and tape) can only mix down in real time, which means you have to mute all but one track and mix down over and over to achieve full separations. 24 tracks equals 24 passes, which for a 3-minute song is 72 minutes—over an hour of studio time. (This is why the addition of faster-than-real-time Bounce To Disc in Avid Pro Tools 11 was such a big deal!)

Also, if you've got processing like EQ or compression on the final stereo buss, running just one track through that processing will hit differently than the whole mix, so your final set of separations may not be what you thought. Some software like Cakewalk SONAR will allow you to export all busses at once, so strategic buss assignment can speed things up, but you still need to be careful about overall processing.

If you have a home setup but you do certain kinds of tracking at a larger facility, you might want to consider buying and installing your own copy of the software and relevant plug-ins found in your favorite studio, so you can call up projects as is and deliver new edits. You don't need the whole studio to do this, only the same software. That can still be pretty expensive, but may well pay for itself after a few sessions.

It's best to proceed with caution so you get what you need without spending (or having to charge) a fortune, but consider whether full separations represent a good value for your particular project.—*AT*

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REVIEW

BY MIKE METLAY

USB microphones can be very handy for certain kinds of recording—capturing live shows or podcasts, jamming with friends, and working up demos away from your studio. A USB microphone combined with a computer gives you the chance to work with your DAW right on the spot—overdubbing, editing, and so on. While a dedicated field recorder is a more compact solution, it gives you a lot less on-the-spot flexibility, and while you could combine a conventional mic with a small bus-powered audio interface, you might find your options limited by what the interface can't do.

So the question then becomes: how much utility can you pack into a USB microphone and still have it be easy to carry and use? Austria's Lewitt Audio has a brand-new answer to that question: the DGT 650.

Lewitt DGT 650 (and Lewitt Recorder for iOS)

More than just a USB mic—a complete recording solution

Opening the box

The DGT 650 is a full recording rig, combining a high-quality stereo condenser mic with a headphone monitor system, line/guitar input, MIDI input, and all the accessories you'll need to get set up and going. The mic comes with an interface breakout box, folding steel desktop tripod, custom elastic shockmount, foam windscreen, and cables for USB (Mac OS X or Windows) and Lightning (iOS).

Lewitt products tend to score on first impressions due to their beautiful build quality, and the DGT 650 is no exception. The mic's fit and finish are simply gorgeous, the shockmount is first-rate, the stand is sturdy and well thought out, and the cables feature locking connectors. The breakout box has amenities like heavy-duty strain relief on its attached cable, nonslip feet, and even a removable/adjustable fabric strap with hook/loop fasteners to let you strap it to something stable (like a leg of the tripod) so it doesn't move around in use. Everything exudes class.

The mic

The DGT 650 itself is an XY coincident stereo electret condenser mic with 17mm diaphragms (about $^{2}/_{3}$ of an inch, more "medium" than "small"). That's a good compromise, offering the smoother off-axis behavior of a small diaphragm with some of the character of a large diaphragm.

The mic has the usual Lewitt LCT look—a rectangular body with beveled edges and a dual-mesh grille. The body is nicely nonresonant, yielding only a soft 'tic' when tapped with a screwdriver. It measures 5.43 x 2.04 x 1.42 inches and weighs just under 11 ounces, solid and hefty. An onboard control panel with push-click thumbwheel lets you set, among other things, the mic's pad (0/10/20 dB) and highpass filter (12 dB/octave with 80 or 160 Hz corner frequency).

Some specs: 20 Hz–20 kHz frequency response (albeit with no tolerances given); 110 dBA dynamic range; up to 140 dB maximum SPL depending on its gain settings; and self-noise of 30 dBA or less depending on gain.

Breaking out

The breakout box attaches to the DGT 650 with an 18-pin locking connector. The other end of the box has a jack for the cable that runs to your computer or iOS device, and three I/O jacks: a mini-jack headphone output, $^{1}/_{4}$" TRS Line Input, and a 5-pin MIDI In.

The Line input deserves a closer look. Its input impedance is rated at over 1 Megohm, which means that a guitar or bass can be plugged into it directly without harming the instrument's tone. You can record a stereo keyboard or submixer over TRS, or use a standard TS instrument cable to record a guitar in mono along with the mic (see below).

Controls and Modes

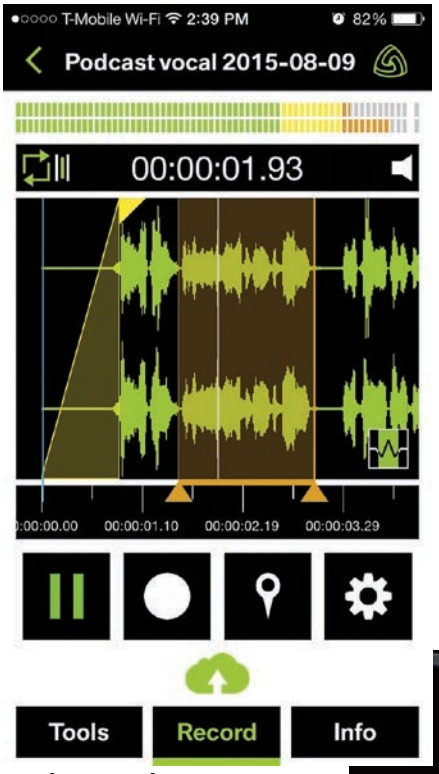
Clicking the thumbwheel cycles through headphone output volume, input gain, Recording Mode, zero-latency monitor mix (Return from the computer blended with Direct from the mic), filter, and pad. A small horizontal bar graph and clearly labeled icons tell you all you need to know.

So what are these Recording Modes? They're four ways in which you can use the DGT 650's two input channels. Stereo Mode and Cardioid Mode produce XY stereo and cardioid mono input, respectively, while disabling the Line input. Singer/Songwriter Mode records the mono cardioid mic signal on Channel 1 and the left (Tip) Line input on Channel 2, and lets you record one side of a stereo keyboard or a mono guitar/bass. Finally, there's Stereo Line-In Mode, which of course disables the mic.

This selection of Modes is the key to the power of the DGT 650. With a multitrack DAW capable of overdubs, you can easily build an entire song from stereo band recordings, vocals or acoustic guitar playing in mono, electric guitar input in mono, and stereo keyboards. There's nothing to get in the way of any source you might want

to record... and the MIDI Input is active in all Modes, so you can plug in a synthesizer or controller and play virtual instruments as you record your audio. A singer or acoustic guitarist, an electric guitarist or bassist, and a keyboardist can capture a take at the same time. There are a lot of bus-powered interfaces that can't handle that!

The DGT 650 is Core Audio compliant and works on Mac OS X 10.6+ and iOS without driver installation. There's a downloadable ASIO driver for Windows, as well as a PC program called DGT Control Center that lets you remotely control the mic (a Mac version is reportedly on the way). The DGT 650 is bus-powered from a Mac or PC; for use with iOS devices, the DGT 650 has a built-in rechargeable battery, which will supply over 3 hours of record time. There's a USB Micro-B port on the side of the mic that's used to run or recharge the mic; any suitable cable and USB charger will do the job.



Lewitt Recorder

Lewitt rounds out the package with an iOS app called Lewitt Recorder. This is a basic but very neatly-designed stereo recording app that may well be appealing even to folks who don't own a DGT 650.

Up to 32-bit/96 kHz audio recording is supported (the DGT 650 is a 24-bit device that supports 44.1, 48, or 96 kHz sample rates). Recordings can be tagged with keywords or photos, and quickly recalled from a browser. The edit window allows for recordings to be cut, cropped, looped in playback, overdubbed or overwritten, and includes a waveform display with multiple markers and draggable handles for fades. Forthcoming features include reverb, compression, and the ability to play back an audio track and record new audio while listening to it and playing along.

The app can be tried for free, but only the Pro version's recordings can be exported or shared via iTunes, email, or SoundCloud. This can be permanently activated with a $4.99 in-app purchase; alternatively, the app activates it for 3 days every time you plug in the DGT 650.

In use

I have a reasonable selection of mics and interfaces, but sometimes I'd prefer a simpler way to do audio work on the road. The DGT 650 won me over in a hurry.

Setup was trivially simple, and would be even for a total beginner. The breakout box recorded my keyboard submixer or my guitars clearly and easily while the MIDI input fed my DAW. The mic itself was a treat: it offered wide stereo recording with a good sense of imaging or mono recording with smooth off-axis rejection, very little noise, and great resistance to floor rumble and handling. The windscreen works well on wind and breath noise, but a pop filter wouldn't be out of place for vocal recording.

One night I was stuck miles from my studio with my weekly internet radio show fast approaching. I didn't have my DAW, my studio computers, or my mics... I just had my laptop and the DGT 650, which I'd been testing earlier that day. I sat down in a booth at a coffee shop, fired up the DGT 650, and did my show. Listeners in the show's chat room complimented me on the quality of my voiceovers, and asked what mic I was using. Several suggested that I keep doing my shows with the DGT 650, as it sounded so much better than my usual mics!

There's something wonderful about a genuinely complete and comprehensive recording setup, including a high-quality mic, that you can pick up with one hand, fold up neatly, and tuck into a messenger bag with your laptop or iPad. Rather than being a solution looking for a problem, the DGT 650 is an elegant solution to recording problems you might not even know you have yet. It's by no means the cheapest USB miking solution out there, but it just might be the best.

Price: $579

More from: Lewitt, www.lewitt-audio.com

REVIEW

BY PAUL VNUK JR.

Shure PGA27 and PGA181 Condenser Microphones

The new PG ALTA mic series is well represented with these two fine offerings

Shure is best known for microphone staples such as the SM57 and SM58, the popular SM7B, or even their high-end KSM line of professional condenser mics. However, for years Shure has also offered the option of ultra-affordable beginner microphones in all shapes, sizes and styles. The Beta-Green line led to the PG series, and as of NAMM 2015, Shure's entry level is now represented by the PG ALTA™ mics.

The line offers 14 different models, from handheld vocal mics and side-address condensers to specialty mics like gooseneck clip-on drum mics. The least expensive mic in the line, the handheld PGA48, is an astounding $39 (with cable), while the most expensive of the bunch, the PGA27, tops out at only $199. There are various drum and studio multi-mic packages in the line as well—look for a forthcoming review of the new $499 drum package.

This month we will be looking at the top two condenser models in the PG ALTA line, the aforementioned PGA27 and the PGA181 ($99 with cable). Both models are side-address cardioid condensers; each one is an entry-level version of a more expensive Shure model.

PGA27

The PGA27 is, for all intents and purposes, an update/rebrand of the PG42, which was a step up from the now-discontinued PG27. The numeric designation 27 has been used on three other models over the years: the KSM27 (reviewed April 2002), which evolved into the SM27 (reviewed November 2009), and its slightly more expensive super-cardioid Beta 27 variant. All the other "27" models are cardioid.

All of the PG ALTA mics are made to Shure's design specs in China and use modern surface mount technology for consistency and affordability. The PGA27 uses a unique single-piece diecast zinc body and internal frame with a multi-layered mesh grille that is riveted in place. Despite its affordable status it is still "Shure tough" and will easily withstand the beatings of studio and stage.

Like the earlier "27" models, the PGA27 has a slightly oval-egg shaped appearance, measuring 6" long and 2" at its widest. It weighs 16 oz. and comes in a custom foam-lined zippered vinyl case with a custom Shure heavy duty shockmount. Unlike the ones with the original KSM27 and SM27, which used rubber suspension bands that broke easily, the PGA27 shockmount uses tight, nylon-wrapped bands. There are few other mics on the market under $500 that come with shockmounts this nice.

Capsule and specs

The PGA27 uses a 25 mm (1"), 6-micron thick gold-sputtered diaphragm that is center-terminated. The mic has two plastic rear-mounted switches, one for a 15 dB pad and the other for a 120 Hz (12 dB/octave) highpass filter. It has a 20 Hz to 20 kHz frequency response, a maximum SPL of 145 dB, 18 dBA of self noise, and a –35 dBV/Pa (17.8mV/Pa) sensitivity.

Looking at the supplied frequency response plot, the mic is fairly flat and even from 40 Hz to 1 kHz. Then there is a gentle rise which builds up into healthy 5 dB peaks at 4 kHz to 7 kHz and 10 kHz to 18 kHz before rolling off.

Sound and use

The PGA27 is full and solid with a forward top end with a touch of crispness. It is well suited to vocals and acoustic guitars as well as percussion and string instruments, where detail and sparkle are a worthwhile goal. This is a great first condenser mic for the home studio and stage, affordable enough that getting a pair for stereo applications shouldn't break the bank.

Having said that, as nice as this mic is in the entry level arena, for $100 more one might also consider the Shure SM27. It has a slightly more rounded top end, and is one of the very best affordable cardioid condensers on the market.

PGA181

The PGA181 is a new design in the PGA series; it's a direct descendant in name and visual style from the Shure Beta 181 (reviewed August 2011). Both mics are side-address, small-diaphragm, lollipop mics with electret condenser capsules. Where the Beta 181 has a choice of four detachable heads, each with a different pattern, the PGA181 has only a fixed cardioid head.

The PGA181 is a simple condenser with no controls, pads or switches. It has a 6" long zinc die-cast body that is 1.5" at its widest, tapering down to 1" at its base, and it weighs 13.5 oz. Its lollipop head measures 2" in diameter; capsule diameter isn't available from the Shure website but appears to be in the 3/4" range.

Its large tapered body fits perfectly into one of Shure's WA371 wireless mic clips, which is included in the box along with a 15' XLR mic cable and a standard Shure vinyl pouch.

Specs

The PGA181 has a 50 Hz to 20 kHz frequency response, a maximum SPL of 138 dB, and a

–38 dBV/Pa (12.7mV/Pa) sensitivity. It has a slightly scooped low end from 70 Hz to 400 Hz, and it rises gently at 1 kHz where it builds to a 5 dB peak 4 kHz and at 6-9 kHz. Its frequency response then falls back slowly to zero, then shows a slight 2 dB spike at 18 kHz before rolling off.

Sound and use

Compared to the PGA27, this mic is tighter and more rolled off in the highs, with a noticeable upper mid forwardness. It also has a more laid back low end. Interestingly I found its top end similar to that of my KSM44 (a high-end, multipattern version of the SM27).

The PGA181 is best suited to electric guitar cabinets, hand percussion, and drum overheads, where it captured the kit well and was just rolled off enough to keep the cymbals nicely under control yet still punchy. I also liked it on acoustic guitar, but it was more of a tight forward rock'n'roll sound suited to rhythm guitar. This is in contrast to the more open jangly tone of the PGA27, which I would choose for folk or solo acoustic guitar recording.

Conclusions

In this arena there are a lot of entry-level mics vying for your dollar. Nowadays, most of them sound decent enough as starter mics for your home recording needs. Beyond that, your choices will come down to things like looks, build, brand preference, and accessories in the overall package.

In my opinion, these new PGA models are overbuilt in true Shure fashion; longevity of use should not be an issue. They sound good enough to want to own, and to keep using even after you add more mics to your locker.

As to the packaging, in its class the PGA27 is hard to beat. It comes with one of the nicest shockmount designs at this price point, beating many shockmounts on $1000 import mics. I also like the soft case it comes with; it's much easier to store than your average low end aluminum flight case.

Dollar for dollar, I find the PGA181 to be the real star of the PG ALTA line. For less than $200, you can get a pair of these and you will cover most of your non-dynamic instrument miking needs for a long time. I would recommend a pair not only to home recordists, but to churches, schools, and clubs that need decent overheads and instrument mics that are rugged, long lasting and won't break the bank.

This is a mic with a unique enough sound that you will find other specialty uses for it as your collection grows. I have been using the PGA181 live for hi-hat, congas, and cajon quite regularly since it arrived, with zero complaints. That bodes well!

Prices: PGA27, $199; PGA 181, $99

More from: Shure, www.shure.com

READERS' tapes

By Marty Peters

(and Uploads, CDs, MiniDiscs, DATS...)

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Send physical submissions to: Readers' Tapes c/o Recording Magazine, 5408 Idylwild Trail, Boulder, CO 80301. Please be sure to include: a) a CD, CD-R, cassette, DAT, or MiniDisc with only one song preferably no longer than 3:30 in length (or tell us which track you want reviewed); b) a credit list (who did what); c) a list of equipment used. Remember that CD-Rs with unevenly applied paper labels, smudges, or scratches won't play back reliably.

PLEASE state which part of your contact info we can publish (address, phone, and/or email)—if you don't tell us precisely, we won't print anything at all.

L.J. David

Equipment: Windows PC with Zoom R16 and M-Audio Fast Track interfaces, running Cakewalk SONAR X3 Producer, Native Instruments Guitar Rig and Overloud TH2. Mics: AKG C214 (lead vocals), Shure SM57s and Beta 58A. PreSonus TubePre preamp used for some vocals. Behringer MS16 monitors, Bose and Sony headphones for mix checking. Fender Stratocaster, Mustang IV amp, and Precision bass. Drums played on Roland electronic kit, using samples chosen from Toontrack EZdrummer, Steven Slate Drums, and XLN Audio Addictive Drums.

Music: "Promisemaker Pete" is a male vocal rock song. L.J. did it all at his home studio.

Recording: Quite the fine one-man-band effort here overall, although not without a few small areas that could use a little attention. First off, kudos to L.J. for the smart, concise arrangement. He presented his ideas succinctly and built the track's dynamics in a very musical way from start to finish. As for the sound sources, we really loved the uber-present feel and tone that L.J. got from his lightly distorted/heavily compressed Fender Strat. Kind of a cross between The Cars and Tears for Fears' "Everybody Wants to Rule the World"!

The rhythm section (while basic) provided a strong overall tracking bed. However, we did hear some slight distortion on both the drums and the bass. We also heard a fair amount of smear on the cymbals as the song got "heavier". In our opinion, the vocals were a mixed bag—while the performances were totally solid, particularly on the Beatlesque backing vocals, we did notice some sibilance and proximity effect on the lead vocal, especially during the more exposed parts at the end of the chorus sections.

Suggestions: In his gear notes, L.J. gives us a nicely detailed description of his tools and working methods. While we know the origin of much of his drum sound along with his bass, we are less informed as to their treatment during the mixing process. Our guess, and this is purely a guess, is that L.J. may have been going for the infamous Abbey Road "smashed through a Fairchild limiter" sound that was so vital to the Beatles rhythm section during the Rubber Soul/Revolver era. If this is indeed true, and the drum sounds are an homage, well... hats off to you, sir! If not, we would suggest that you check for some signal path overload, either in the tracking or mixing stage.

Regarding the cymbals, while there have been huge strides made in the sounds of software-generated cymbals, to our ears nothing will ever truly capture them as well as a pair of well-placed overhead microphones. Playing actual cymbals along with the Roland drums would be a great addition to the drums here.

As for the vocals, sibilance and proximity effect simultaneously would seem to indicate a mic position issue. Singing too closely into a large capsule condenser mic would absolutely result in proximity issues. Trying to EQ them away could, in turn, lead to exaggerated high-frequency presence, causing the sibilence. Nasty bit of business, eh?

Mic technique is still a crucial part of our skill set, even in the world of Auto-Tune and sound replacement.. The old school engineers banked on it every day, and you should, too!

Summary: Strong effort, L.J.

Contact: L.J. David, lj@ljdavid.com, ljdavid.bandcamp.com

Tom Hammel

DAW: PC with Zoom R8 interface running Steinberg Cubase Elements 7 and iZotope Ozone 5. Mics: Audio-Technica AT2020 (vocals, kick) and AT2021 (snare, guitars). ART Pro MPA II preamp, M-Audio BX5 monitors, Primacoustic VoxGuard for vocal mic isolation.

Music: "Empty Chair" is a male vocal country song, Tom did it all in his "medium-sized basement rec room with hardwood floors and gypsum roc walls".

Recording: Tom tells us that he wrote and recorded "Empty Chair" as a demo for a country band that he was forming in Vancouver. His aim was to compose and present the track as "Classic Country".... which we assume does not mean the Auto-Tuned faux-'70s rock stuff that Nashville's cranking out these days. Given these parameters, let's see how Tom fared, shall we?

Our definition of "classic country" relates to the sounds and styles that emanated from Nashville (and to a lesser extent Bakersfield CA) from the mid-'50s to the mid-'70s, before Urban Cowboy ruined everything. Think Ray Price, George Jones, Lefty Frissell.

As with all genres, this one had its fingerprint sounds, and fortunately Tom has done his homework here. We hear subtle drums with excellent cymbal clarity, a muted "acoustic" bass sound, twangy electric guitars, and most importantly, pedal steel guitar and vocals with gobs of reverb. Oh, and a darn fine "period" composition to top things off.

Standouts here include the aforementioned cymbals (check out the beautiful sound of the stick tips on the ride cymbal) along with the rich sound on the pedal steel. We also really dug the super-tight harmony vocals. On the flip side, the mix seemed a tad bit left-centric, with the electric guitar solo, harmony vocal, and steel guitar all occupying the 11:00 slot in the stereo field at various times.

Suggestions: Tom did a great job overall here, creating a well-above-average demo that gets his ideas across via some fine performances and tones. As for the mix suggestion, it could be that Tom was striving for consistency and that is certainly his prerogative. It's also helpful to remember that many of the great recordings of yesteryear were delivered in glorious monophonic sound. Consider that, or just center those slightly left-leaning sources, Tom!

Summary: Old school is working for us.

Contact: Tom Hammel, tommyham99@hotmail.com

TAXI A&R INSIDER
OCTOBER 2015

TAXI Road Rally 2014

Making Hit Records With Rock Mafia, Part 2

Michael Laskow, Moderator

Tim James and Antonina Armato, (aka Rock Mafia) are two of the most in-demand songwriters and producers on the *planet*! Their songs and productions are on more than *100 Million* records sold. They've created Chart-Topping Hits for Vanessa Hudgens, Miley Cyrus, Hannah Montana, Selena Gomez and the Scene, Enrique Iglesias, Daughtry, Hoku, Patrice Rushen, Adam Lambert, Green Day, Mariah Carey, David Archuleta, Ellie Goulding, Flo Rida, Justin Bieber, Sick Puppies, Aly & AJ, The Cheetah Girls, Brenda K. Star, Demi Lovato, The Jonas Brothers, Aloe Blacc, Miranda Cosgrove, Barbra Streisand, and many, *many* more.

Michael Laskow: By the way, I want to mention that I reached out to your assistant, Jason, and asked, "Is there an audio montage or a song list that Tim and Antonina would like me to play before I bring them up on the stage?" And he responded, "Do you want a video sizzle reel?" I said, "Yeah, that would be great," thinking that he already had one. And then, three days before this weekend started, I emailed him and said, "I kinda need it now." And he said, "OK, I'm editing as fast as I can." I had no idea that he and your son were building a sizzle reel from *scratch*! Good job guys!
Antonina Armato: Yeah, it's incredible. Like I said, we all just pitch in.

Tim James: The sizzle reels have to be done about every 60 days, and then basically we hadn't done one since "Tokyo Hotel," and we debated whether we'd put the "The Heart Wants What It Wants" on it. We decided not to because it just came out Thursday.

A: Yeah, we're a team. There's no job too big or too small. I mean, I'll take the trash out, whatever. Well, maybe I don't do *that*, but we have this kind of group, and we... I love making video content too. I don't know if any of you also do that. Are most of the people in here writers, songwriters, producers?

[A show of hands.]

T: It's a good group. How many of you guys use video content as well to convey your ideas? Cool!

Antonina Armato (center) makes a point during the Rock Mafia interview, while her partner Tim James (right) looks on and smiles in agreement.

Do you have any technical skills, Antonina? If Tim went out on a golf outing and you had an inspiration, are you technologically challenged or capable of laying something down in ProTools or Logic?
A: The first one. To be honest with you, we have three amazing engineers; we have four studios now. No, I'm not very technical. I sing things into my phone; I play a little piano; I play guitar. I do stuff like that, but no, I'm not an engineer.

Do you have a rhythm between you? How often is it back-and-forth between the two of you? Like Antonina might write a top line, and then you go in and tweak the beats and produce the track. And then you bring it back to her and maybe she produces the vocal with somebody. It may just be a scratch vocal, or maybe you sing it yourself. Do you guys bounce back-and-forth between the two of you? Or do you tend to bounce it around all your folks at the compound?
T: I like to hold back the production as long as possible, because if it's not on the page, it won't be on the stage—stage being the recording. So, we are writing a lot and looking at making lyrics better, and looking at making melodies better. But we also have people we love to write with people like Desmond Child, who is an amazing writer. He'll come in and hang out with us and...

A: Sometimes people write to just kind of police us. Because, you know, when you're working together, and you're in love and stuff, you wear lots of hats. And I'm sure this would happen if there wasn't a romantic thing involved, because you're sort of competitive. It's like McCartney and Lennon were I'm sure competitive with each other. They wanted to write the songs; they thought their ideas were better. You're always "fighting" on *some* level, but if you take your ego out and you just let the best idea win, you're gonna get a lot more successful. You know, if you don't hold on and get too precious. I mean, I bring stuff to Tim; he brings stuff to me...

T: But then there is the line where you have to get precious actually. Because you can kind of get kicked around enough to where it's like you don't know where you're at. You have to have a vision. You have to be incredibly open to anything and everything to make something better. But at the same time, you have to know when you hit it. And

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in a couple of cases where she'll be on a lyric and me or the record company or whoever will kick back, "Can it be this way or can it be that way?" And I trust when she gets to the point where it's like, "No, this is it. This is the line." I trust her.

A: You know, I've had that a lot of times when I was just starting out when you should be super-intimidated by big record company people, where they said, "No, that's not grammatically correct. It should be 'Someday you and I.'" And I'm like, "Well, that doesn't sing right," and I wouldn't change it. Or, "I don't think people would do this," or "I don't think people would do that." And if you feel it in your heart 100%, you can't change it. There are times when you should be smart enough to know if it's quite right, and you can test it out when you play it with people and you see their reaction. The reaction of people just doesn't lie; you can tell.

How do you test it out on people?
T: We play our music for everybody, and we have a really amazing artist community. We have all these different writers and artists coming into the studio, and we have all different types of styles of music going, and we play everything for everybody. And, you know, it's a really interesting thing when you have musicians in a room, they gravitate to what's the best. You know, you start playing the music; they're walking from room to room; they're all hanging out, and it's like, "Oh, let's hear that one."

Sounds like the Brill Building.
T: Yeah! So in our building, the stuff starts to buzz. And when it starts buzzing, then our attention goes to that thing... It's a free-finding process.

A: Don't you notice that when you play a song for your friends even, or you put it up and you get a reaction. You know that there are certain songs that you get this super-strong reaction from, and you kind of go, "Maybe I *do* have something there." And then it'll also play the other way. It's like some song that you think is really great but nobody seems to respond to it.

It's got to breed a certain level of competitiveness, but a healthy type. Remember at lunch when we were talking about when I worked at Criteria, and you'd have Bill Szymczyk and the Eagles in one room, and Tommy Dowd and Clapton in the other room. There was an air of competition, but in the healthiest way, and I think it made better records. Do you see that with your "pods" of people?
T: Yeah, you're right. Everyone in those rooms is doing something, but collaboration is what really gets it going, right? So somebody walks in and just has a suggestion, or another person just does a chorus. It's just so wild, and it's kind of like stacking up better ideas on top of one another.

A: Even with "Love You Like a Love Song," I was driving and that came into my head: "I love you like a love song, baby." And I went, "Oh, that's cool, I think that could work." And then as soon as I sang that to Tim, he got out and...

T: Everything stopped and I said, "OK, no [studio] room is doing anything but this. Let's figure this out."

A: Sometimes things just hit you over the head, and then we're here to kinda help each other out. Because otherwise what would have happened was, "Oh, that's a good idea," and then... *That's* what makes it so great to have a partner, because you *start* something...

T: We call it *urgent*. If she has her tape recorder and I have mine—and everybody at Rock Mafia kinda does—and it if something goes off, we go, "That's *urgent*," and that becomes prioritized.

A: And then you have to deal with the music *business*, because we all...

T: Which is more of like a music *game*.

A: Yeah. No, it is a game, but that's why I want to be here to hopefully help people that are in the room with anything question-wise, or anything besides what we're doing. I just want to give information that's helpful to you, because it is hard. The music business is pretty tough out there.

T: So hard. I mean, think about it. You get a thousand *no's*, and it's the one or two *yes's* you live off of, right? So isn't that interesting? That's the game we're all in. No different. You'd be surprised how many no's we get. We just keep moving forward.

A: And we say, "no" to ourselves too! It's really frustrating when I think I have a great idea or something, and Tim's like, "That sucks." You know, I can't even get past *him*!

T: Well, yeah, but there have been times where that's... Again, that's why we have a great environment. If it's something that I'm just not feeling... You know, we all hear music and we're like, "Ah, I don't know about that," and then four months later the window's down and you're like, "I love this song." It happens, so that's why we have that process.

How much do you strategize for the future? Do you try and prognosticate? Because obviously if you're making stuff that sounds like radio sounds *today*, that stuff was written a year, year and a half ago. But yet if you come up with something so wacky and so fresh and so super-innovative, radio's not going to play it. So you have to find the sweet spot of...
T: That's OK if radio doesn't play it. I really don't care.

A: Oh *stop*!

T: But I really don't. I love radio.

A: You *totally* care.

T: No I don't.

***Tonight's* the night they're going to bed angry. [Audience laughter]**
A: OK, maybe *you* don't care. *I* care. But there's a whole thing with radio. That's also a game that the labels have the lock on in a way. Like with "The Big Bang." How many people know the song "The Big Bang"? [Show of hands] OK, great. Because we released that independently and we had a smattering of radio play, and others did it, and got more radio play. But we sold over a million copies of that worldwide.

T: The point is, why I say I don't care is, let's be creative as a community; let's push the envelope; do it for glory. You know what I mean? If we do it for glory, then...

A: I agree with *that*, for sure. By the way, a lot of times we're way ahead of the curve.

T: Which is just as bad as being *behind*, by the way. You want to be *on* time.

A: I know, that's true.

But how do you self-edit to be ahead *enough*, but not *too* far ahead. So you're working on something and you come up with this really fresh innovative thing, and you guys probably edit each other and edit yourselves and go, "You know, now that is just a little too far." How do you know when to pull it back?
T: Without naming titles, I mean, there have been songs that are seven years old that are happening now, or three years old or four years old. Generally it's not the case, but there *are* cases.

A: Let me give you an example of something more current. A lot of times there is a method to the madness. It's like a lot of producers—I'm not saying we don't do this, but we don't do it as often—we'll listen to what's going on underground or what's happening, and then they just twist it a little and make it more commercial. Like this whole sort of folk thing, like "Wake Me Up." Avicii kind of heard a sound that was happening somewhere else and sort of incorporated that and was the first one to push it out.

T: He did a brilliant job, by the way. It's an amazing record.

A: Yeah, and Pitbull felt the same way, and that's why he had the song with Ke$ha... All of a sudden they hear something that's sort of bubbling under, and then they make it a little bit more commercial, something that would have more mass appeal. And then suddenly they have a hit that other people like. So there *is* some kind of method to it, and sort of a

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Ryan Hewitt – Review in *Tape Op*, Issue #100

"It is a perfect microphone for critical vocals and female voices and compare very favorably to any U-67 I have heard. It also shines on acoustic guitars and anything that needs an open top end without over pronounced upper midrange. **I love the ADK Z-67!**"

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"I Got a $ix-Figure Indie Label Deal Because I Joined TAXI"

Jenna Drey – TAXI Member – www.jennadrey.com

My name is Jenna Drey. That's me sitting next to TAXI president, Michael Laskow.

For as long as I can remember, I've wanted to be a recording artist. I've studied music my whole life. I've read all the books. I've been to the seminars. In short, I've done all the same things you're probably doing.

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way that you could kind of figure out how to do that so you can be on time more.

Back in my day, there were one or two writers on a song, maybe three. But nowadays it seems like there are six writers on everything. So I'm constantly trying to wrap my head around that. Why does it take six people to write a frickin' song? But I think that the competition is so intensely fierce that you *need* that team. When you guys describe your studio complex, I can envision some sort of religious cult fortress, but without the FBI surrounding it with shoulder fire missiles and tear gas and stuff. But it's like a fortress of creativity…

A: It is! Look, you don't need five people to write a song, but there's sort of a political thing sometimes. OK, let's say you're writing... I'm not saying this artist for any particular reason, but let's say—hypothetically speaking—you've got Dr. Luke or Max Martin, or whomever. So he's super-busy making grips of money and he can't focus necessarily like he used to, so he needs to hire people that he'll give a little piece to. "OK, you're a really good lyricist, I need a few lines from you," or "You have good melody ideas, come here, come here," or "OK, I've got Katy Perry coming in. I'm gonna bring her in and she's gonna get a little piece." And then I'm gonna maybe use one of my producers, or they have a bunch of writers and they want to give everybody a little taste. So they all get in a room and they have fun and they order pizza and they write a song. And the great thing is if I'm the big guy [not Tim personally, he's speaking in the hypothetical], I've already carved out my niche. I get 50% no matter what y'all do, or I get 75% no matter what y'all do. So you five people go to town and give me, "Oh, I got a good line from you," "I got a good line from you," and I'm happy and I'm getting rich, and my name is the only name that anyone cares about anyway. So I don't care if there are 20 names on there. Do you know what I'm saying? So to answer your question, it doesn't take 15 people to write a song. I mean, if you came up with a great song and you're a newbie, and your song is amazing, then I'm gonna take your song; I'm gonna change a few things, because I've already bled for the last 10 years—and remember, I'm just talking about theoretically—and *that's* your foot in the door. Do you know what I mean? So there are lots of ways to skin the cat.

T: Yes, you're right, and that's true. But there's also creativity being democratized. There's duality to everything; there's definitely that going on; it always has been. But then there's also an interesting thing that happens with the competition being so stiff. It's not a competition on an objective level; it's a *subjective* competition, and you're playing for the public's attention and the public's desire, and sometimes it *does* take a lot of different minds to go through a filtering process where it starts to resonate with a lot of people. Again, I think a lot of times as writers we're thinking about our stories and our life; we're thinking about our *brand*. You know, we make all these decisions, but we're not thinking about the most important thing...

A: OK, I'm gonna say it again. I don't think it takes five people to write a song. I really don't. I don't want to say anything disparaging about anyone, because no matter what their method is of their madness, God bless 'em and more power to them. But, I think if you're a real songwriter—like it's bred in your bones—you can write a song by yourself. Or you could actually write it with someone else, and that's really all you need.

T: Neil Young doesn't need six writers, that's for sure.

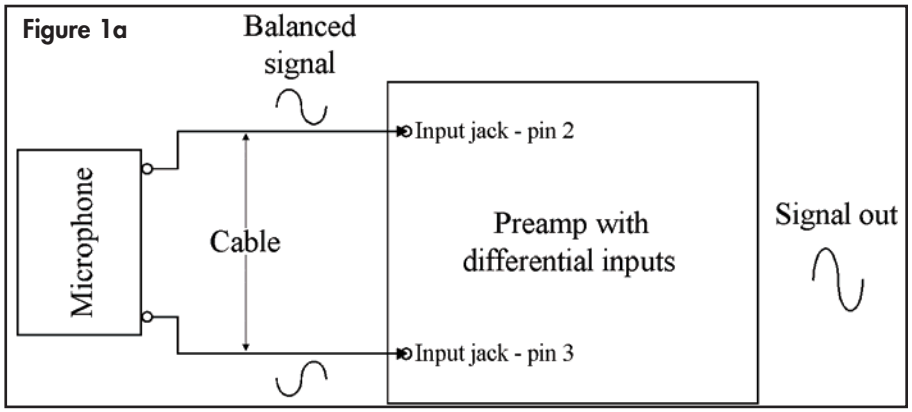
A: Yeah. I think that basically that's the truth. I mean, the other thing is more of a factory-feeling, or more of something because you've got so much else and you don't really have the time to focus on it anymore because you're too big. You know, you're a big corporation now as a producer or a writer. But for the most part, I think, you know, one, two, three writers maybe is good.

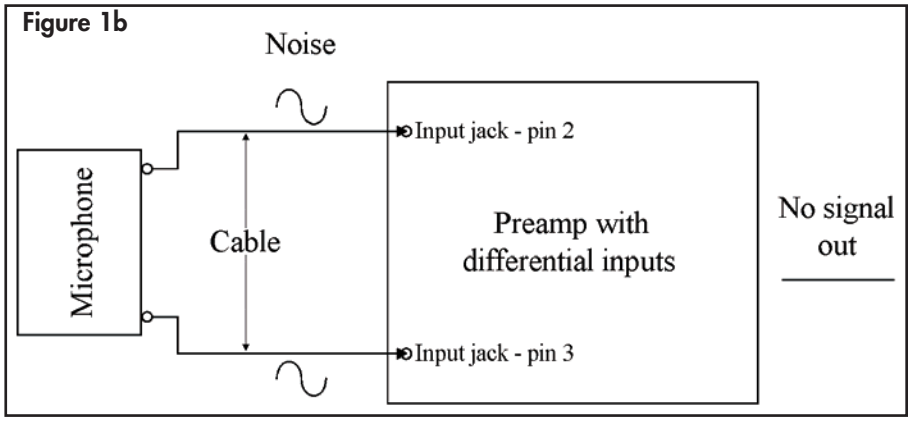
Read Part 3 of this interview in next month's TAXI Insider!

By Paul J. Stamler

FIRSTSTEPS

Part 10: Beyond The Boost—Mic Preamps II





Last time we talked about the physics of mic preamps: how they change signal levels, and what lurks in the shadows when we do (clipping and hiss). But there's more to preamps than just providing gain, and it's time to look at these handy extra features now.

Power games

What else do preamps do? Well, they provide *phantom power* to power condenser (and some ribbon) mics. They do that by including a source of +48V of DC *(direct current)* that connects to the Hot and Cold input terminals of the preamp (we talked about them last month) through a pair of well-matched resistors. The phantom power can be turned on and off; sometimes this can be done for each channel on a console. On cheaper consoles, and on channel strips and interfaces, all channels of phantom power get switched on and off at once.

I've mentioned this before, but I'll say it again: *never plug in or unplug either end of a cable with phantom power turned on!* Most of the time, nothing will happen (aside from a pop in the audio), but if you happen to have a defective cable, you can destroy an expensive microphone or console. So just don't do it.

A question of balance

Here's something else important to know about mic preamps: Their mic inputs are *balanced.* What does that mean?

Let's take a short detour. If you play electric guitar, you know that the cord connecting the guitar to the amp has two conductors: the Hot conductor, which is wired to the tips of the 1/4" plugs, and the Ground conductor, which is wired to the shafts (sleeves) on the plugs. The Hot wire carries the varying signal from the pickups, while the Ground is defined as maintaining a constant voltage of zero volts. When you plug the cord into an amp, the Hot signal goes to the amplifying circuit, while the Ground signal connects to the sleeve of the input jack and thence to the amp's chassis, which is grounded through the wall plug.

You also know that, if you lay your guitar cord near an AC power line, or something else which generates hum, the cable will pick up the hum and you'll hear it through the amp, which amplifies the hum just like it was a signal from the guitar.

Microphone inputs on mic preamps are different. They are *differential,* which means they will amplify the *difference* between the Hot connection (pin 2 on the XLR connector) and the Cold connection (pin 3). Some mic preamps do the differential amplifying thing by using a transformer at the input, while others do it with an electronic circuit that's transformerless, but they all do it—mic input circuits are always differential.

Here's how that makes a difference (pardon the expression). Most microphones put out a balanced signal, meaning that the changing voltage on the Hot pin (2) is matched by a mirror-image signal on the Cold pin (3), with the polarity inverted. When Pin 2 goes up, Pin 3 goes down; the differential circuit in the preamp sees that they are different, and amplifies that difference (Figure 1a).

But what happens if you lay the mic cable in a hum field, like next to a power cable, or in front of a refrigerator motor? As we talked about last month, the Hot and Cold conductors in the cable are twisted tightly around each other (extra-tightly in a Star-Quad cable), and the same hum signal gets induced in the Hot and Cold wires. Figure 1b shows the

result: When the hum signal in the Hot wire goes up, the signal in the Cold wire goes up identically. The preamp's differential input sees no difference between the signals on the two input pins, and, because there's no difference, it ignores those signals; as a result, there's no hum at the preamp's output.

Like magic, the preamp amplifies the microphone signal (wanted) but ignores the noise signal (not wanted). The noise is called *common-mode* signal, because it's common to both wires. Ideally, the preamp will reject any common-mode signal, whether it's 60 Hz hum or garbage at radio frequencies (coming from taxi dispatchers, broadcast stations, cell phones and the like).

That's why I laid such emphasis in last month's mic cable discussion on the tight wrap of the inner conductors; the closer they are to one another, the more identical the noise signals induced in them, and the better the preamp's differential input will reject the noise. (In practice, transformerless circuits usually do a good job rejecting 60 Hz hum, but transformers are better at ignoring radio-frequency crud.) Balanced circuits are found in high-level connections too, with similarly useful rejection of noise.

Hot stuff

Mic preamps will often include an instrument input. This is usually a jack on the front panel, convenient for the self-recording musician. Electric guitars and basses like to see a high impedance, and the instrument inputs on preamps, channel strips and interfaces usually oblige them, with input impedances in the range of 1 megohm (1 million ohms).

Instrument inputs are also used for electric keyboards, synths and the like. Those don't require the same high impedances as electric guitars, but the high impedance doesn't hurt anything.

Manufacturers sometimes call these "DI" inputs, but I think "DI" should be reserved for boxes that convert high-level, high-impedance, unbalanced instrument signals into mic-level, low-impedance, balanced signals that can travel down long cables. I prefer to preserve the distinction by calling the jacks on mic preamps "instrument inputs", but maybe that's just me.

More bits and pieces

More bits often found on mic preamps are lowcut filters, polarity switches, and pads. A lowcut filter, when switched in, cuts the level of the signal's low frequencies; the filter usually begins to roll off around 80–100 Hz (see Figure 2), and it's normally used to compensate for the proximity effect found in directional microphones—see Article 5 in this series, May 2015. A filter that slopes down at 6 dB/octave is gentle, while 12 dB/octave and 18 dB/octave filters chop the low frequencies more drastically. Lowcut filters are also useful for minimizing room noise and rumble that comes into the mic through the stand.

The polarity switch inverts the polarity of the amplified mic signal. That can be useful if you mike the top and bottom of a snare drum with two different microphones; flipping the polarity of the bottom mic can make them blend better. The switch (or button) is sometimes called "Phase" or labeled with a Ø. Opinion time: I think this is a misnomer; the word "phase" should be reserved for information about when signals arrive at a mic, not for polarity.

Sometimes it's not possible to design a mic preamp with low enough gain to avoid clipping when it's used to amplify hot mics on loud instruments or voices. Those preamps often incorporate a *pad*, which is a network of resistors at the input that drops the mic's signal level (usually by 14–20 dB) when it's switched in.

One more thing: a mic preamp has an *input impedance,* into which the mic operates. This can sometimes affect the mic's performance—see the free articles "The Taming of the Shure" and "When Mikey Met Ohmy" on the *Recording* website to learn more.

Across the great divide

Mic preamps can be divided into two broad categories. No, I do *not* mean tube and solid state. One group includes preamps intended to add their own flavor of sound to signals that pass through them. My colleague Paul Vnuk Jr. often refers to these as "colored" or "vibey" preamps. The other is composed of preamps intended to be neutral, adding no particular color. The jargon name for these is "straight wire with gain"; I prefer to avoid the word "clean", because it implies that colored preamps are somehow "dirty" as in noisy.

These categories don't line up with tubes and transistors. Tube preamps can be very neutral—I've designed and built several preamps for my own use, and the most neutral one used tubes as the amplifying devices. Contrariwise, some of the most famous "color" preamps have been built from transistors.

A few examples of "colored" preamps are the Universal Audio 610 designs, the API preamps (whether in consoles or in the famed 500 Series modules), and the Little Labs LMNOPre. Pretty much anything with a Neve pedigree is also considered to have a particular color; Rupert Neve sold preamps and consoles under his own name, but also designed consoles for AMEK and Focusrite, and his 1073 preamp design has spawned dozens of third-party imitators.

In the "straight wire with gain" category you'll find preamps like those from Grace Design and Millennia Media, the Solid State Logic (SSL) preamps (whether

in consoles or standalone), and designs from Benchmark Media Systems, John Hardy, Gordon Instruments, and Earthworks. The now-discontinued MP-2 preamp from Great River was like this; the current designs have a Neve-esque flavor.

Many of the "vibey" preamps get their flavor from transformers at the input (or, more rarely, the output), but the presence of a transformer doesn't necessarily mean a colorful-sounding preamp; Great River's MP2 was one of the most neutral designs ever made—they used a very good (and expensive) Jensen transformer on the input. John Hardy preamps are also outstandingly neutral—and their transformers are even costlier.

You'll notice that I used the weasel-words "intended to be" in my descriptions. That's because, though most inexpensive mic preamps aspire to neutrality, some of them have a characteristic "cheap" sound that imposes itself—thin, bright, and one-dimensional.

I once reviewed a preamp, and said that my reference preamp made an acoustic guitar sound like a box with a definite size, living in a definite space, while the device being reviewed made it sound like a point source in no-space. That feeling of solid three-dimensionality, the sense that you can reach out and touch an instrument or voice, is characteristic of better preamp designs... either neutral or flavorful. And, unfortunately, most of the time you get what you pay for.

What flavors do you get with "flavorful" preamps? Mostly they depart from neutrality by having what's often described as a "big" sound; Neve-designed preamps, for example, are famous for making drums sound huge. Preamps made by Universal Audio (both tube and solid state) tend toward the mellow-sounding—not muddy or murky, but very slightly sweet. API preamps, on the other hand, have a sound often described as "aggressive", one that matches rock, punk and metal music well.

And sometimes it's hard to find words to describe a preamp's sound meaningfully. When I reviewed the Little Labs LMNOPre, for example, I couldn't find a better adjective to describe its sound on acoustic guitar than "beautiful". That doesn't help very much, I know; the business of trying to describe sounds with words is the hardest part of a reviewer's job.

There are a few urban legends in the mic preamp field; one of them is that the preamps of past years, used in studios like Bill Putnam's Universal Audio and EMI's Abbey Road, were really terrible, and the great recordings which came out of those studios were great precisely because the preamps (and consoles and recorders) were so awful.

Well, they weren't; real professional recording gear has, since about 1955, sounded excellent. The devices that build on this urban legend by including "toob" overload stages designed to imitate the supposed awfulness of earlier years are, in my opinion, barking up the wrong tree; all they do is make signals sound murky. You won't hear murk in the recordings of Frank Sinatra or the Beatles; their recordings sound rich and three-dimensional. Enough said.

Preamps at the example recording session

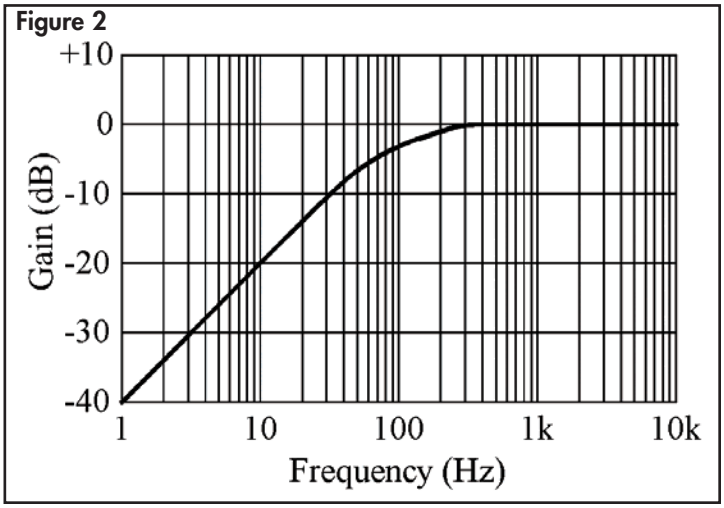
For the Ottoman Underground session which generated the clip that this series is dissecting (once again, you can find it at is.gd/RECFirstStepsClip1), I mostly used the preamps built into the studio's console, which was built by SSL. They're basically neutral, which is what I wanted for this recording which was intended to be "documentary" in style. Each channel of the console has a lowcut filter, and I used one on the channel carrying Will's voice to compensate for the mic's proximity effect.

For two channels, however, I used a pair of "color" preamps, the Little Labs LMNOPres. These went on the mic that recorded Shlomo's bass amp and the amp's direct feed.

I made this choice for two reasons. One was that Shlomo expected to switch to a dumbek (hand drum) later in the session, and it's been my experience that the LMNOPres have an affinity for drums of all sorts. I wanted to make the transition, when he switched instruments, as seamless as possible, without disturbing the flow of the session—because keeping the musicians' focus is just as important as using the right gear (or more so).

In the case of Shlomo's bass, though, there was another factor. A mic placed in front of an amp's speaker delivers its signal slightly later than the signal coming from the amp's output, because the sound takes time to propagate from the speaker to the microphone. If that were the only issue, then sliding the direct-feed track in the DAW to line up with the miked track would have solved it.

Figure 2



But there was more going on than a simple delay. An amplifier, because its frequency response doesn't extend to infinitely low frequencies, garbles the phase response on the bottom end; a speaker does the same thing. When I say "phase" here, I really mean "phase", not polarity; this is about when signals of different frequencies arrive at the recorder from the miked and direct feeds. If they combined without some correction, the sound of Shlomo's bass would be muddled rather than tight and tuneful.

Fortunately, these preamps include devices to compensate for precisely this problem, the In-Between Phase (IBP) circuits. I connected the line-level outputs of the preamps to line inputs on the console, and listened to the two channels, mixed together, while Shlomo ran through the pieces. I twisted the IBP dials until I found a position where the sound of his bass snapped into focus.

This was an example of matching a particular mic preamp, with a characteristic sound and particular controls, to a particular situation in the studio. If I'd had more time while setting up, I might have used some of the other "color" preamps the studio offers (a couple of Neve-family Focusrites, two channels of Universal Audio preamp, etc.). But I wanted neutral sounds, and the simplest way to achieve that was by using the preamps in the studio's console. So I did.

Next month, we begin to examine the signal processing I did on the recorded tracks, starting with *compression*—stay tuned!

Paul J. Stamler (stamler@recordingmag.com) is a recording musician, engineer, educator, and collector of bizarre vintage recordings, living in St. Louis.

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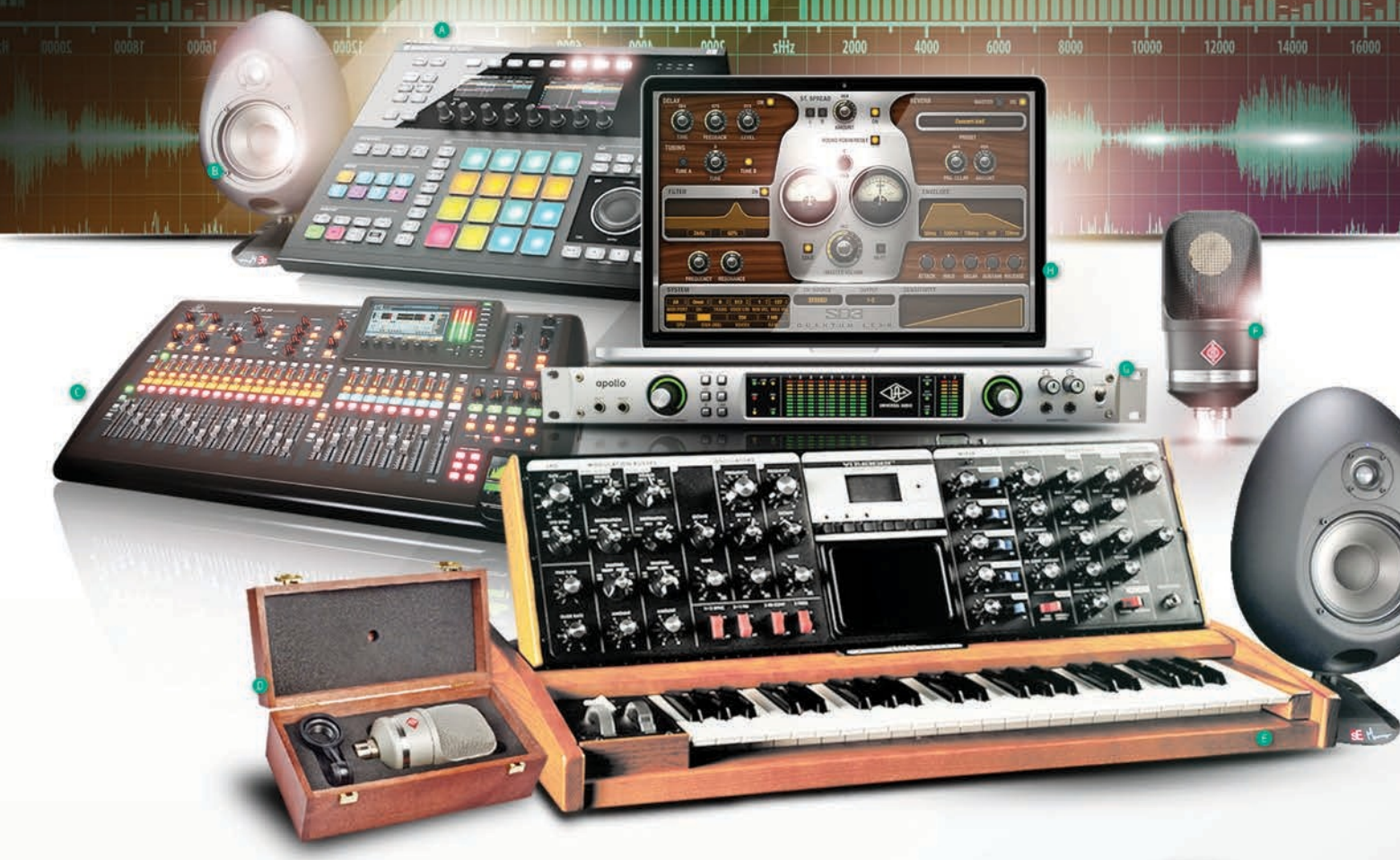

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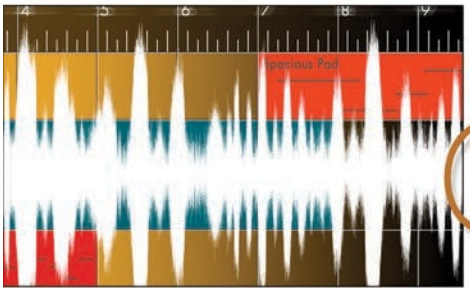

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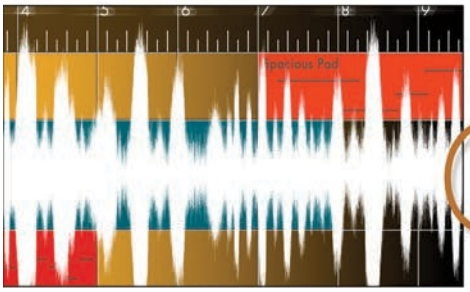

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The Making Of West Side Story

—an excellent documentary about the recording of a less-than-excellent record

Guest editorial by Scott Dorsey

Back in 1984 the audio world was changing. Record labels were starting to turn into CD labels, and the first direct digital recordings were beginning to show up here and there. There was a huge interest in back catalogue recordings; many record labels were working hard to get them out on CD.

It's in that context that Leonard Bernstein went into the studio with a pickup orchestra, the engineering team from Deutsche Grammophon, and his choice of some of the finest opera performers in the world, to conduct and record a brand-new version of his famed opera *West Side Story*.

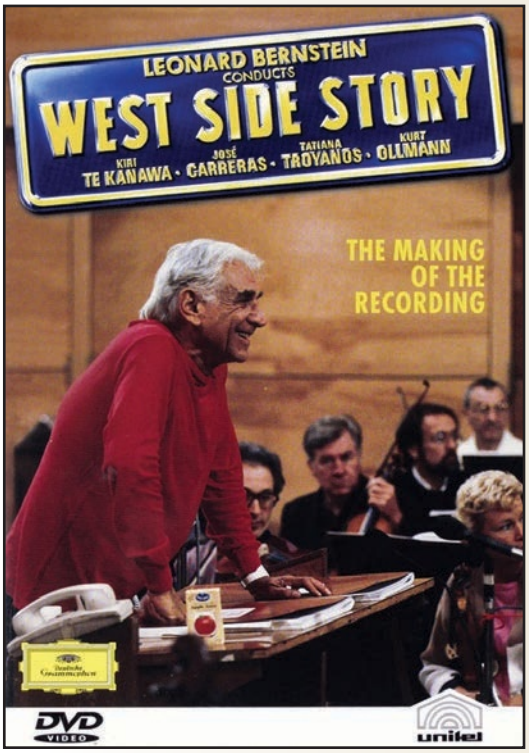
This is the first time Bernstein had actually conducted the piece himself, and he made some very different choices in emphasis and tempo than previous interpreters of the work. It was coming out on CD, and that alone made it exciting in 1984. To put the icing on the technological cake, it was being recorded entirely digitally, using the 3M 32-track digital recorder.

I am going to say up front that I didn't like this recording when it came out. Upon relistening, I find that I *still* don't. A lot of things don't work for me, beginning with the rather more formal and operatic performances, and ending with José Carreras' supposedly all-American Tony sounding more Spanish-inflected than Kiri Te Kanawa's supposedly Puerto Rican Maria. It just doesn't feel right.

On top of that are the technological artifacts of the era. The opera soundtrack suffers heavily from its aggressive multitrack production and from the 3M recorder's somewhat harsh early digital sound. The result is that all the instruments and performers sound very close and in your face. The performances and recording both just grate on my nerves.

So what makes this take on *West Side Story* interesting, and why am I writing about it rather than just relegating this recording to the vast dustbin of poor releases? Because the recording sessions were filmed by the BBC, and an edit of that film was released in the US on PBS' Great Performances series. That film is available today as the DVD *The Making of West Side Story,* Universal Classics B0004666-09. Ironically enough, in contrast to the less-than-thrilling record that it documents, the film itself is brilliant—a very well-done look into some of the decisions that went into the recording, and of some of the practices and procedures of the day.

There wasn't a lot in the film about the equipment itself; you can only briefly see glimpses of the 3M digital recorder and the custom console Deutsche Grammophon used. But you can see a lot of the behind-the-scenes setup, the choices that transcended the gear.



For example, the film shows how all of the vocal soloists were close-miked with U87s. Some of the mics are shown above the performer's mouth, some below, some with foam balls and some without. It's interesting to note how they picked very different setups for the different vocalists. It's also very interesting to note the degree to which they tried to reduce leakage. Not to anything like the degree that was common in rock or pop recordings, but a degree of separation that is quite unusual for classical recordings. Soloists and sections were miked with very little contribution from overall room pickups. That's why, among other things, we hear a discussion with Bernstein being unhappy about how the baritone saxes are not being picked up well; all the balances are coming from the console and not the room, so Bernstein gets a surprise every time he hears a playback!

As I watched the DVD, I came to a realization of what went into the recording, how it got that way, and I developed an appreciation for the things I disliked about the recording. I didn't like the recording any more after watching the film than I did before, but now I understood a bit more about *why* I didn't like it.

The 1980s were sort of the height of excess for classical recording in general. Technology had advanced to the point where close-miking of orchestras was possible... and people hadn't yet quite realized how bad an idea this really was. There were also large budgets available to hire topnotch performers and give them time to practice and concentrate on the pieces. As you might expect, this had a combination of good and bad consequences.

At about the same time, von Karajan re-recorded the complete Beethoven symphonies for Deutsche Grammophon, going over the work he had recorded for them in 1977 and 1963. Comparing the 1963 and 1985 recordings is very enlightening. The 1985 recording sounds like fifty top-grade musicians all playing the same piece in different rooms at the same time; the 1963 recording, however, sounds (insert gasps of shock here) like an *orchestra*.

You will never hear recordings made in this way again. Mostly that's to our benefit, but there are a few areas where we see techniques we probably shouldn't lose—and that, in short, is why you should watch this DVD. It is very much a view into a technique, a procedure, and a sort of session that no longer exists, and I think we can learn things from watching this sort of work—good things, bad things, and things like not having an operatic tenor playing a hoodlum on Broadway. It's a fascinating bit of education... and besides, you're going to love the cool microphone stands.

Scott Dorsey (dorsey@recordingmag.com) is an audio engineer, electrical engineer, software engineer, and probably several other kinds of engineer as well. We wouldn't be too surprised if he knew how to drive a train.

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