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Talk Box

Vol. 18 No. 2
February 2007

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LET'S RE-INVENT THE OWNER'S MANUAL

Remember how technology was supposed to make our lives simpler? Well, in case you haven't noticed, in some ways it hasn't. When Apple or Microsoft sneezes, shudders run throughout the music industry as software companies scramble to update their products, others scramble to make sure their products work with other company's products, and we *all* scramble to get a stable system once more. And there are a variety of hidden problems — and hidden bonuses — that appear only after a program has been out for a while. Maybe that's why when a software product comes with a CD- or DVD-ROM, the first thing a savvy user does is visit the company website and download any updates.

In this brave new virtual world, the model of a printed owner's manual similar to that used for hardware seems increasingly quaint. The PDF manual was one step forward (or backward, depending on your viewpoint) as it could get slapped on to the distribution medium at the last moment — unlike print, which has a major lead time. Manuals are often printed before software is complete, leading to confusion and errata sheets.

These days, internet forums are helping to take up the slack as users (and company representatives) help other users to discover new problems and overcome incompatibilities. But maybe we need to take this concept further, and go for a Wikipedia-like, open-source-based documentation model. Imagine this: A company sets up a forum designed specifically for documenting tips, workarounds, and the like. Someone from the company then edits this into a separate online, downloadable document containing all this information in an organized, indexed way. As bugs are squelched, workarounds can be deleted; new sections can be added as new features appear. Thus, the manual would always be up to date, and in sync with the latest software version.

Would it cost the company something? Yes, but when you consider printing costs, and shipping for a heavy manual, the hit might not be that bad. Furthermore, having an up-to-date manual would encourage consumers to keep updated. Granted, many resist the idea of not having a printed manual, and that's understandable: Printed manuals are convenient, and printed "Quick Start" guides will likely survive. But even the strongest advocates of printed versions eventually realize that a searchable, findable document has its advantages. Besides, if you really want a printed document, you can print one out (probably in black and white, so you don't have to pay too much for color printer cartridges!).

In any event, it's time to re-think the role of a manual, and how to present it to users — just as software has forced us to re-think the role of the studio.

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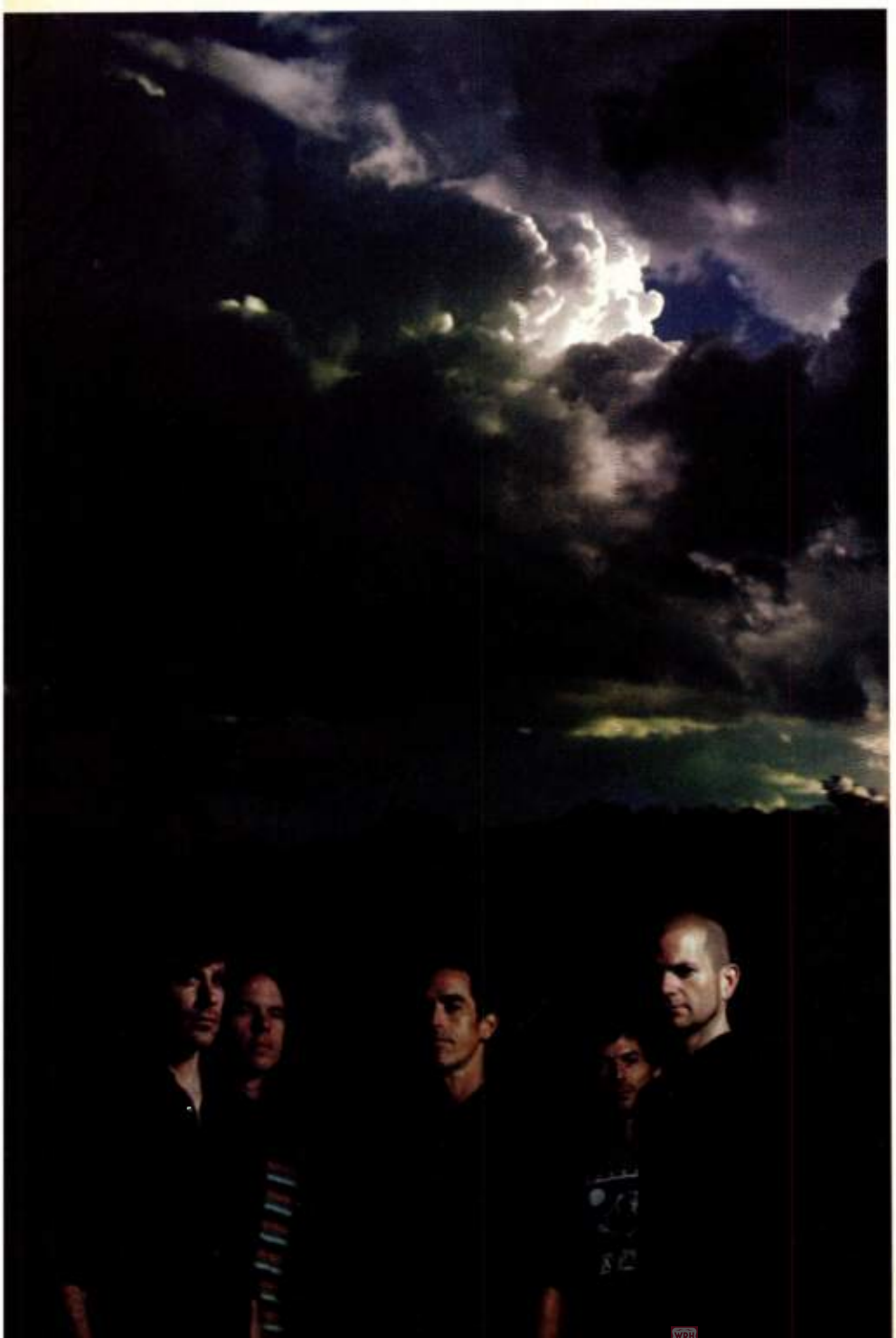
Punch In

TUNE IN, TURN ON, PUNCH OUT BY
MATT HARPER AND THE *EQ* STAFF

RED SPAROWES

Layered. Intricate. Epic. These are just some of the descriptive terms being tossed around more casually than handshakes in conversations regarding the instrumental post-rock phenomenon Red Sparowes' grandiose new release *Every Red Heart Shines Towards the Red Sun*.



Disappointed with the sound of their previous release, 2005's *At The Soundless Dawn*, the five-piece band tracked down veteran recording enthusiast Tim Green — a man known for his ability to faithfully capture a band's natural, live sounds on tape — to focus on recording an album full of nuance and dynamics. So, after hearing *Every Heart . . .* and falling madly in love with it, we decided to track Mr. Green down for a quick chat regarding the making of what is being touted as one of the past year's most multi-textural, interesting recordings.

EQ: Tim, in case you didn't notice, the drums sound huge.

Tim Green: I used the standby: [AKG] D112 for the kick, [Shure] SM57 on the top of the snare. I didn't even touch the bottom snare. If I have a lot of free tracks, I may use a two mic attack, top and bottom, for the snare; but if I know there's going to be a lot of overdubs, such as with this project, I'll usually just mic the top head. Then, when it comes time to mix, I'll run a feed off the snare through this late '70s Ibanez UE400 for it's distortion, bring it back and mix underneath the snare for some saturation.

Though I sometimes like to experiment by using various tube condensers on the toms, this record seemed to call for [Sennheiser] 421s and 441s. For the room, I ended up using two Neumann M582s. We did the basic tracking at Prairie Sun because they have a huge drum room. It's like a giant old barn! So we tried to take full advantage of the sound of the room. I didn't even end up using any overheads.

EQ: There are a lot of effects wandering in the peripheral of this album. With so much going on with the other instruments, how did you end up approaching the mix in terms of the drums, to really let them cut through where needed but also sit comfortably with the rest of the action?

TG: Well, when I'm setting up the mix, and I know it's going to be dense, my first inclination is to give the kick 2–4kHz more attack. Also, I took a sub mix of the kick, snare, and toms and

INCREDIBLE BONGO BAND by Lily Moayeri

Spending inordinate amounts of time in record stores, searching through bins in a quest for that one special piece of vinyl that will contain the sample your heart has been aching for — also known as "crate-digging"— has been a primary obsession for DJs since the first cut was ever performed. But while there are plenty of albums that have been sampled to death (one needs only look to any Parliament record or Herb Alpert & The Tijuana Brass' *Whipped Cream & Other Delights*), and readily available, one particular collection that has been scratched over and looped by some of the hip-hop era's biggest players has finally been given a proper re-mastering and re-release to the hungry hordes, to widespread celebration.

The Incredible Bongo Band's *Bongo Rock: The Story Of The Incredible Bongo Band* (a collection of tracks from *Bongo Rock* and *The Return Of The Incredible Bongo Band*) is the testament to former MGM staff producer Michael Viner's 1970's brainchildren: two relatively obscure releases that were adopted by genre forerunners such as Grandmaster Flash and Kool Herc and transformed into staples of hip-hop producers' vinyl collections.

Formed by Viner and Academy Award-winning arranger Perry Botkin Jr., and featuring some of the greatest percussionists of the time (specifically Jim Gordon and King Errison), The Incredible Bongo Band's small discography was recorded in various studios — from MGM to Vancouver's Goldstar — for the original purpose of creating soundtrack accompaniment. Sessions were exhausting, sometimes spanning multiple days for single tracks (the virtual entirety of the album was tracked live, with multiple performers being conducted to play together for hours on end for sometimes just seconds worth of music for the mix). "Oddly enough, as people got more tired, the takes got better," remembers Viner.

From those sessions, 17 tracks, plus two modern day remixes, have found their way to the newly released CD version of *Bongo Rock*. Re-mastered by Ben Mitchell (Jimi Hendrix, Beverly Knight, Chaka Khan) at Can Can Studios in Brighton, *Bongo Rock* has not lost the smallest bit of the power of the original recordings, despite its change in format.

Unable to obtain the original tapes, Mitchell was left to transfer from the vinyl masters onto compact disc. "There was a slight lack of detail in the originals," Mitchell points out. "But the vinyl format added a fantastic warm quality that most CDs lack. So I was very careful in my choice of analog EQs and compressors to help preserve that feel. A GML

continued on next page

by Shane Mehling

cut out some of the low end. Then ran it through a cheap compressor, like a [Alesis] 3630, which just smashes everything, and then brought that submix up underneath to give those pieces of the kit more punch.

EQ: What did you end using for the guitar tracks? They are incredibly warm. . . .

TG: I have a Neumann U67, modified by Klaus Heyne, that I used. I'm a practitioner of the whole "tube condenser straight to tape" philosophy, sometimes going through a compressor (in this case a Manley Variable Mu) for extra gain. But I found that, for some of the really loud guitar tracks, the signal was hot enough that Coles 4038s were really good at toning down the harshness in the 2–3kHz regions that the Marshalls were building up.

Though I didn't use it on this album, one of my favorites is the [Neumann] M147. It's a cheaper version of the 147, but it sounds pretty great. The midrange it brings out makes for some pretty aggressive guitar sounds.

EQ: You're a big fan of DIY equipment. Is there anything new you've put together that you got to put to the test on this album?

TG: No, but I did somewhat recently get to build this API-styled pre from a kit — it has a Millennia amp, a Lindahl input transformer, Solen caps, and a Jensen output transformer — which I had to track down myself. It sounds great, better than those lunchboxes that are out there, in my opinion. I also just finished building a Seventh Circle Audio N72 copy, which has Carnhill input and output transformers and a stepped attenuator.

EQ: Sometimes, building it yourself is definitely the way to go.

TG: It's certainly a lot cheaper of an alternative. But the resale value is low.

EQ: Alright, back on track. You record exclusively to tape. . . .

TG: Definitely. Not only do I stick with it for the sound, but using Pro Tools screws up my wrist [*laughs*].

EQ: Any challenges this time around recording to that format?

TG: I'd get a little spaced out since some of the music gets pretty hypnotic — I'd find myself starting to drift, but I just had to focus. The songs are long, but we only did one edit; we had a really nice four minutes, but we still had six to go. We did the edit, and it sounded fine. I don't know if there was a difference in tape tension or what, but when we got it back to my studio, Louder Studios, it was bordering on disaster. The edit was audible in a really crucial spot. To quickly remedy it, we recorded a guitar bend over another piece of tape, and in mastering we were, luckily, able to cover it up.

EQ: Did you have to rethink any of your standard approaches when working with such a dynamic band? You can hear a pin drop over some of these sections. . . .

TG: Not really, aside from using compression carefully to maintain the dynamic range. You have to be careful not to let it get too quiet. Stuff can get lost, especially in, say, a car stereo.

EQ: So you had to be especially conscious of those elements when listening back to your mixes. . . .

TG: I'm pretty used to my monitors, which are KRK 9000Bs. They're the same monitors John Galton uses, and since I do a lot of mastering at his place, I got a pair myself so I'd be prepared for what the mixes will sound like when they are first played at his mastering house. The KRKs are a little hyped in the high-mids, but I know how to compensate. But, for perspective, I also listen to playbacks through a pair of [Yamaha] NS 10s and a boombox. It doesn't really matter what kind of monitors you use as long as you know how they translate to the outside world.

EQ: Was the band heavily involved in the mixing stage?

TG: They were all involved. I always encourage bands to get on board because they know their parts, their overall balance, better than anyone. It's their record.

EQ: You're giving the band a lot more credit than some producers would.

TG: The band should always have the final say, because they really have to live with the album. I remember, the second or third time I went into the studio to record one of my projects, reaching for a fader and getting my hand slapped by the engineer. That was one of the first things that led me to start my own studio, and start doing things my way [*laughs*].

INCREDIBLE BONGO BAND continued

8200 Dual-Channel 5-Band Parametric EQ and a Manley Stereo Variable MU Limiter/Compressor was all I used. I haven't found anything I can't do with these two. I think the album has a fantastic sonic quality to it; it's very consistent."

And it shows. Unlike many digital re-masters that tend to be too sharp in the top end, Mitchell's work on the album sounds remarkably true to the original. As Mitchell explains: "Great mastering engineers have a motto: 'If it isn't broke, don't fix it.' It's very easy to pile on the top end, A & B your version with the original and think, 'This sounds better.' But if you do the same 30 minutes later, suddenly the original sounds fatter. Or add tons of bass, A & B the tracks, and your version sounds tougher. But then you go back to the original and find it has much more detail in the bottom end."

He continues, "On the analog side I used compression to give the album that vinyl compressed feel. I wanted this to be very transparent. I made a small tweak to the bottom end, and on the digital side, where I use Lexicon MPX1 with WaveBurner as my mastering software on a simple dual-processor Mac, a bit of balancing of all the tracks; a tweak on the highs to give it a bit of presence that may have been lost from old tapes, and a limiter over the mix to knock down the odd peak here and there was all that was needed. I wanted the album to sound as full as a contemporary album, while keeping that lovely old school texture."

Viner echoes the sentiment that absolutely nothing was lost during Mitchell's re-mastering, and for that he's incredibly thankful. "The reason people keep sampling these albums is because no one's getting that same sound; they keep getting further and further away from it."

Debate: What's The Role Of The Producer?

If you were to corner five professional house painters individually and ask them what their job entails, you would more or less get the same answer from each of them: They paint houses. But in the world of the record producer, the job description isn't always so clear. If you asked Steve Albini what he does when producing a record, you would be told that his duty is to "capture" the band's performance as honestly as possible. If you asked Dr. Dre, he would likely respond by writing you a beat and giving the "okay" on the font used in the liner notes for your debut album.

What a producer's exact role is defined as varies greatly not only from producer to producer, but also from producer to artist. Different artists demand different treatment and, moreover, different artists need different treatment. Fred Gaisberg, who ran the first recording studio in the 1890s, was responsible for guiding opera singers closer or further away from the gramophone's horn to match the dynamics of the score. The stereotypical Hollywood big-wig "fabulous, baby" producers from days of yore, when not chewing cigars on plush leather couches, oftentimes were responsible for everything from talent-scouting and band development to management of resources and mediating contract disputes.

Major hip-hop producers of today are key creative figures and vessels for product marketing. But, though the definitions of "producer" are constantly changing, there exists a huge semantic dispute within our industry as to what the definition of producer should be and, even, to what degree is it ethical to position yourself in the musical process.

Grammy-nominated producer Jeff Glixman (Kansas, Bob Marley, Ludacris) says, "A producer is like a movie director. The musicians are the actors." Cameron Webb (Social Distortion, Limp Bizkit, Monster Magnet) tells us, "My role as a producer is to take the artist's vision and expand on it, to make it bigger and better than they ever imagined' while Mike Plotnikoff (Aerosmith, Cranberries, My Chemical Romance) claims that his role as a producer is to "guide the artist with an unbiased opinion."

The Wizardz of Oz (Ricky Martin, Boris, Jason Mraz) claim their duty is to evolve along with the artist: "We hate hearing 'that sounds like the Wizardz'; we love hearing 'the Wizardz did that'?"

Sum41 member Greig Nori, who has become a sought-after producer in recent years, working with every one from Iggy Pop to No Warning, has adopted a traditional stance: "I feel the role of a producer today should be a throwback to the role a producer had in the '50s. Be a musician first. Then you will have the talent to find good bands that know how to write, develop, and record to world-class standards."

Multi-platinum producer Keith Clark (Snoop Dogg, The Eastsidaz, Master P) agrees with the orthodox approach. He tells us, "A producer should develop their artist even if it takes years. They have to teach them the business of music."

Thom Russo (Eric Clapton, Johnny Cash, Audioslave) sums his job up as "being the voice of perspective." Jeff Trott, known for writing some of Sheryl Crow's biggest songs, labels himself "a psychologist" and Ron Aniello (Barenaked Ladies, Guster) expounds on that view: "My job to inspire the artist to do his best work; to reflect back to the artist his strengths so they can hit their potential; to fill in the gaps, whatever those may be; to save him from himself . . . when necessary."

It's clear that, as the music industry rapidly changes, so does the producer's job description. Lately, it's not uncommon to see producer's assuming duties traditionally held as lying in the record label's hands. As one producer, who wished to go on the record anonymously, out of fear of negative career consequences while he finished work in his preparatory phase, says "I'm trying to get unsigned artists I know labels are pushing me to work with into my own production company, to sign development deals so I can distribute them myself. Now, labels are unnecessary, and we shouldn't have to work for them. I want to cut out the middle man, and give us both bigger slices of the pie."

Though they all may define their jobs differently, one aspect is crucial across the board to their success: They have to possess the skills to produce good-sounding music. This common thread notwithstanding, the current debate as to who is and is not a "producer," and is what that "producer" does really "producing" can ultimately be summed up in one "hilarious-because-it's-true" joke:

Q: How many producers does it take to change a light bulb?
A: I don't know, what do you think? —*Jeff Anderson*

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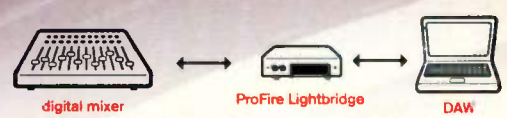

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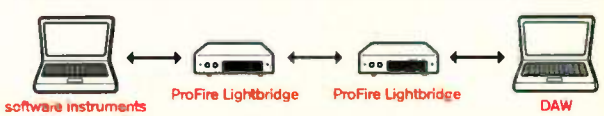

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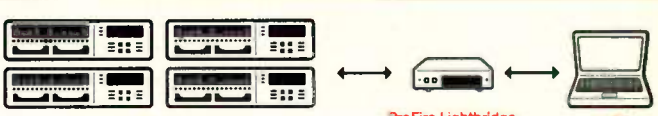

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RANT: What The F&*$% Happened To My Mix?

Based On A True Story

It's been six months since you've heard the final mixes, which the artist took off with afterwards, since he/she has been told that it's better to have someone — anyone — other that the mixing engineer handle the mastering. The budget has almost run out and, almost miraculously, the artist has been given a "recommendation" on a "mastering engineer" who can handle the project for super cheap. So here you sit, with someone else playing a sick, mis-aimed game of Russian Roulette with a reputation you've spent years building, but are lucky to have maintained given how many times the end of the chain has made decisions that should have already ruined your career.

Then the moment of truth arrives. The packaging is ugly, and your name misspelled, but at least you're in the credits. You tear off the wrapper, pop the disc in your player and. . . .

Congratulations! You're on the winning end of an unlucky chamber! The recording that sounded so good before mastering now has no high end, no dimension and no depth.

It sounds bad everywhere except on your laptop. Okay, it was a small label with questionable manufacturing practices, and the artist had to pay for mastering out of the recording budget (which never used to happen in the days of vinyl, but there's no use lamenting that).

There are mastering plug-ins that equalize, maximize, desensitize and straight flush your mixes right down the toilet. It's audio on the Internet, baby, who cares? Is it any wonder why the music industry is going down the tubes? I don't want to pay for this crap either and, by proxy, I'm responsible for some of it! This is the day and age that record companies, particularly indies, encourage artists to take the easy route, to save as much money as possible. So why not take the cheap way out in mastering as well?

Lesson learned. Per your experience, the next contract will explicitly state that you have final approval on to what "mastering house" handles your mix or, at the least, you get to be present for the mastering, even if it is sans pay. Because, face it, there comes a point when getting the money isn't as important as the passion that got you into this business in the first place. And you're never going too far in avoiding a tarnished reputation. And no money is compensation for the pain you will feel if, God unwilling, you have to hide your head for the next six months every time you pass a radio. In this day and age, you have to aspire, if not fight, for a great sound.

So what can you do to help avoid a repeat of this unfortunate situation? This is what I've learned in my years of being proactive in "sonic harm reduction." As a mixing engineer, you can take the following steps to avert disaster when working with less-than-seasoned mastering engineers:

1. Understand the intention of the recording, both yours and the artist's; and understand how the wrong move with the EQ or the compressor can destroy, or improve, your ability to convey that intent to the listener. Take the time to run the final mixes through some simple EQ, level adjustment, and compression to see how it affects this overall intention. Write down as much information as you can and bring it to the session. If you can be at the session, type the notes in a form the mastering engineer suggests, so that he/she can achieve the desired results.
2. Choose a group of your favorite recordings that you feel convey an intent similar to your own for comparison purposes. Listen to these recordings along with your final mixes on several different systems — from hi-fi stereo systems to your computer, from your car to your headphones. Bring those CDs to the mastering session, and request a quick listen to "tune" your ears to the room. These examples will make the mastering engineer's job much easier than simply saying, "I want it to sound good."
3. Understand that you probably won't be able to make sound sonic judgments in a facility you're not used to. If you've prepped for the session with steps one and two, then let the mastering engineer take over. But always make sure that in your contract that you are allowed to take the mastered version home and listen to it before giving any approval for sending it to manufacturing.
4. Repeat step two: Listen to the mastered version over several systems.
5. Make clear notes regarding changes that you would like. Contact the mastering engineer to make versions 2.0, 2.1, 3.9 . . . however many you need.
6. Request a CD ref of the approved PMCD that will be sent to manufacturing. Keep this copy on hand to compare with the manufactured product. Check that the CD ref plays well on several machines without glitches, and if the CD glitches on one machine, request a new CD ref. If that new one glitches, request a new PMCD be made as well.

That's all for now, gang. I have to go make sure a well-mixed record isn't destroyed in the mastering process. If you have any questions, please contact me at cookie@otrstudios.com.

Signing off,

Cookie Marenco: Producer/Engineer/Survivor

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SESSION FILE: WALTZ FOR VENUS

The East Meets West Test

by Jeff Anderson

"When we started pre-production, we all agreed that we didn't want to over-saturate our recordings," Scott Rottler — bassist, tracking engineer, and producer — tells when questioned about the genesis of Indianapolis' own Waltz for Venus' new four-song EP *Finally, The Beginnings End*. "Nowadays, it's all about using all 169 tracks, riddling the music with synth pads. We wanted to keep this recording as organic as possible, but still give a poppy impression."

Having originally served as both engineer and producer for Waltz's debut album *Devastation Celebration*, Rottler built a relationship with the band from the console up, deciding to fill the newly vacant slot as bass player just prior to the writing of *Finally, The Beginnings End* — an album defined as much by its production as its performance. As the band cites the production as a crucial aspect of the end product, Rottler specifically credits the convergence of what is commonly held in the rock production circle as two vastly different geographically characteristic approaches to making an album: The polished and heavily effected "West Coast sound" (*i.e.* heavily reverbed-out kicks, stacks upon stacks of vocal tracks) being married with the raw power, and affinity for all things tube and tape, of the more edgy "East Coast style."

"Being from the Midwest, we wanted to stand out by crossbreeding the two sounds," Rottler continues. "Since my approach to production is more in the West Coast vein, we were lucky in finding Mark Owen — a New York-based mixing engineer who is known for achieving that stereotypical 'New York Sound.' He got that in-your-face Tom Lord-Alge sound, but with enough space, depth, distortion, and rawness to sound like it came off the streets of NYC."

DRUMMING UP

Recorded at Lafayette, IN-based Sound Logic LLC, Waltz approached the project in a manner best described as "calculated," if not overtly cautious. "We wanted to make sure that everything sounded right from the source. You can't really fix in the mix, so we would do no more than one song a day, starting with just drums and a click, spending hours just getting the right tones."

After miking up drummer Derek Llama's kit (kick inside: AKG D112; kick outside: Neumann U47 FET; snare top: Shure SM57; snare bottom: AKG 414; toms: Sennheiser 421s; hi-hat and ride: Shure SM81s at 45 degrees angled out from bell; overheads: Neumann U87s space paired and time-aligned; room: Shure SM57 in far corner, 20 ft. from source), Rottler says the band captured raw takes and then filled the drum performance up with a few choice overdubbing tactics. "For example, in 'War Without Faces,' Dave is doing a lot of tom action that you would have to be an octopus to pull it off. I read about Dave Grohl doing this: overdubbing drums with complete isolation so you can apply effects to specific tracks. It also allowed us to pan so our stereo image was wider than a house."

STRING SOLDIERS

"The bass was recorded in a fairly straightforward way," Rottler continues, "mostly a Fender Jazz bass through Ampeg SVT Pros and 410s. For the first DI track, I went through a SansAmp pedal into a Universal Audio 1176, set at a 4:1 ratio. For the second DI, I went into the Universal Audio 610, later re-amped into the live room, miked with a Neumann U47 and then ran into an Empirical Labs Distressor set at 3:1 — putting both the dry and effected signals to tape.

"Once we got to guitars, the process started flying by. We were recording song-by-song with both Bartek

Mark Owen mixing on the SSL 5000M in CloserLook's pristine Studio B.

Michael [guitarist] and Jay Brooks [guitarist/vocalist]. After the rhythm and lead parts were recorded (electric guitars: Neumann U47 to Universal Audio Solo 610 and Neumann U87i to Empirical Labs Distressor with HPF and Mid-Boost activated; acoustic guitars: Shure SM81s in XY position, straight into Neve 8108 console), we added in a lot of off the wall sounds — handclaps, stomps, CB radios, guitar-driven pads, and a lot of single note guitar overdubs. Bart has a custom Gretsch that has ridiculous sustain; I would use the Distressor with the HPF and the Mid-Boost, hit at 3:1 to where there's just a bit of harmonic distortion. It helps to hold the sustain thoughout the track. So, if the song was in A, we would hold an A throughout the entirety of the song to help fill out the sound."

MIXMASTER, COMP FASTER

The mixing of *Finally, The Beginnings End* was housed at Cleveland, Ohio's, CloserLook Recording Studios — a

facility chosen for its incredible 72-channel SSL 5000M — with Mark Owen presiding. Having been sent the rawest tracks available, *sans* even the most rudimentary editing, Owen got to work on the SSL, averaging the completion of one song per day. As Owen tells it, "I had the SSL set up so that everything comes up on my earmarked channels. I'll start by pushing up the faders and learning the mix, with automation coming into play almost instantly. I can usually have the mix up in around 40 minutes of so, spending the remaining time fine-tuning. We had 40–60 tracks per song to work with, but I condensed them all to only 32; there's really no need to have 40,000 background vocal tracks coming up on separate faders.

"The 19-foot long SSL was originally built for Disney. We had to modify it to be used for music; it has direct outputs, but no multi-track busing system. It's closer to a 4000 series, but has a bigger bottom end. Everything is balanced; the desk runs insanely quiet. The output section had been replaced by a Dangerous Music system, which gives it a ton more headroom. Changing the output section opened up the desk more, I think that's why I feel it has more bottom end."

Owen claims that there was absolutely no compression or EQ used on the guitar tracks; simply a lot of filters were employed, set at around 5kHz. Bass tracks were given the treatment of the dbx 165a, which Owen attributes to the massive low-end presence on the album. For vocals, Owen ran the signals into a Valley People Audio compressor and, finally, into his trusty Teletronix LA-2A.

"For the drums, I compressed and EQed each element individually (kick: SSL channel compressor; snare: UREI 1178, gated with the Drawmer DS 201; toms: SSL channel compressor, expanded by a modified Drawmer DS 201; overheads: SSL channel compressor; stereo drum compression: Studio Electronics C2). I made a sub mix that is uncompressed to group A, then a compressed group to bus group B. Afterwards, I combine them both to the grand master. It makes the drums sound larger than life.

"I use a Dangerous Music 2-Bus for all of our sub groups. I've started working in a hybrid way now that I've been turned onto the Dangerous gear; it's so much easier than having to eat up faders. No matter where I get the mastering done — Sterling or Sony or wherever — all of the gear that my mixes get run through is Chris Muth designed, so this way I really I know what my mixes are going to sound like in the mastering house."

According to Owen, *Finally, The Beginnings End* was mixed down to 1/2" on a Studer A80 deck, as well as back into the box. "Of course, hands down, the 1/2" sounded better, and that's what was ultimately sent to be mastered."

. . . AND IN THE END

Sony Music Studios' Dave Kutch handled the mastering duties for *Finally, The Beginnings End*, claiming to have spent most of his time in the mastering house working on the gain staging of the project. "I think the trend of smashing records for gain is finally going away," Kutch says. "We spent a lot of time really focusing on the dynamics." Kutch passed the signal through his API 2500 to soften the highs, then EQed with a Sony Oxford GML. "I then put the signal through the TC Electronic System 6000 and, finally, through the Dangerous Music master section."

Scott Rottler (left) and Bartek Michael (right) overdubbing guitar tracks at Sound Logic LLC.

It's undoubtedly a very exciting time for Waltz for Venus. Fresh from the mastering house, *Finally, The Beginnings End* was turned out to a major label bidding war of epic proportions, the end result of near constant self promotion and licensing deals that have found the band's music playing backdrop to a few choice MTV moments, and a few million ringtones. And it only continues to look up as the band approaches the next step with as die-hard of an attitude as ever, as Rottler summarizes the band's overall approach to both the performance and the production of their music: "From the start, we all agreed on the same basic principles, and we all agreed that we weren't going to settle on any aspect of this band, especially in the studio. And we didn't." EQ

SUCCESS STORY: MOBY

Everything Is Alright

by Jeff Anderson

For the past decade, Richard Melville Hall, better known as Moby, has been a constant fixture in modern music circles — turning out critically acclaimed release after critically acclaimed release of electronic-based music, over a plethora of genres; performing, producing, engineering, mixing, and remixing his way to the top of the charts time and time again.

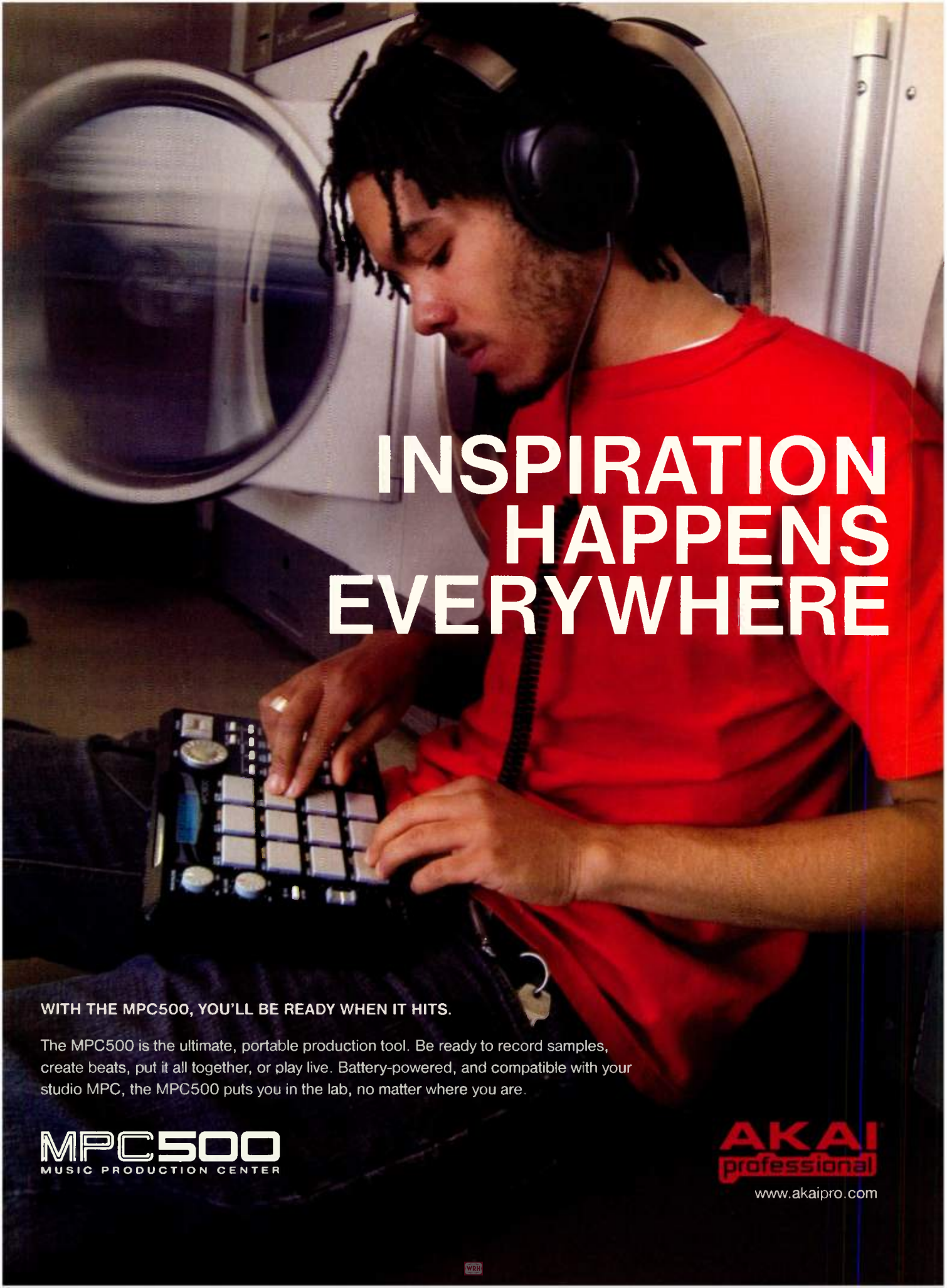
With an intimidating discography under his belt, Moby — nicknamed for his great-great grand uncle Herman Melville's classic novel *Moby Dick* — has sought to update his *résumé*, so to speak, since his breakthrough 1999 release *Play* (the only record in history to have all of its tracks commercially licensed) propelled him to the forefront of popular music. So the man himself, along with Mute records owner Daniel Miller, known for his production work with Depeche Mode and Nitzer Ebb, have hand-picked a batch of tracks to serve as a career retrospective, including the previously-unavailable hit collaborative effort with Debbie Harry "New York, New York." The result is *GO: The Very Best of Moby*, a monolithic task to undertake given the sheer volume of music Moby has produced, as he discloses one crisp fall afternoon via phone from his New York home base: "I probably come up with about 300 songs a year. Not necessarily 300 good songs, but 300 songs nonetheless."

THE SUDDEN RISE

"I hope this doesn't reek of hubris," Moby says, almost apologetically, "but I think I've had the strangest career in the history of music. The first time I played live I was 13 or 14 years old, playing in a punk rock band. We played in a field in Connecticut that was next door to where my friend lived, and our audience consisted of his sister and a friend. Then I was a hip-hop DJ with Big Daddy Kane, and some of the Run-D.M.C. guys. Then it was house music. I studied jazz and music theory growing up, have written classical music scores for movies and made noisy punk rock records that no one has bought, and no one wants to listen to. And then, in 1999, while I'm trying to get a record contract, when my career was basically over, this bald, has-been musician produces a lo-fi record in his bedroom that goes on to sell ten million records."

It's an undeniably enthralling anecdote, especially considering the somewhat harsh nature of *Play* — and, at first spin, highly unlikely hit album. But what makes the story all the more interesting are the non-traditional production techniques Moby applied when forging the album. "There's one song in particular, 'Bodyrock', that just wasn't coming together," he says, with a hint of sentimentality in his voice. "I had tried mixing it in different studios, and it just wasn't working. So, out of frustration, I

Photo: Danny Clinch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SUCCESS STORY: MOBY

took it home and just ran the vocal signal through a SansAmp pedal, and turned the line input up so the drum loop got really overdriven. Somehow, that made the song a hundred times more interesting. Y'know, sometimes fixing a recording really comes from not doing the right thing, but from doing the unconventional thing."

DOING HIS HOMEWORK

"Unconventional" is a fair term to describe Moby's approach to production, if not music as a whole — a general ethos cultivated from all the years he spent learning the ins and outs of the process with nominal outside resources. However, as success and the spoils of are nearly limitless nowadays, Moby still retreats to his home studio to write and produce a certain amount of his material. "What I've found to be one of the great joys of having a home studio is the ability afforded to work on music all the time, and if it's not good, you don't ever have to play it for anyone," he adds with a laugh. "And, since you haven't spent extra money being in the studio, you can really just concentrate on working on music you like."

Considering he records an estimated 60 per cent of his music at home ("90 per cent, if it's primarily MIDI), it's a safe assumption that a Moby home studio is a bit more posh than what many are used to, right? Right?

"Its funny; friends of mine will come over and they'll look at my studio and they'll see the racks and racks of vintage equipment, and be very impressed with it. Then I have to confess to them: I really don't use any of my rack anymore. I work a lot totally in the box, but I still won't use plug-ins for compression and, very rarely, for EQ, though I may do a quick low pass for reference. Nonetheless, most of this stuff just sits around and looks pretty."

MOBY VS. THE CALL-GUY

Perhaps this desire to work at home (even if the 1176 goes hungry most nights) is indicative of a sort of industry phobia? As he explains: "It's strange. The majority of people who work in the music business now, especially the record companies, don't know how to actually make records. So many A&R people and studio execs wouldn't know how to do the first thing in a recording studio. It's kind of like having a NASA higher-up who has no experience in aerospace engineering.

"There are so many different variables that can contribute to a good or bad recording, and I just don't know how record company people can tell if they have no experience with recording. Their criticisms usually are sort of without merit because, at the end of the day, there is no objective criterion for determining what makes a good or bad record. You go back and listen to a Billie Holiday record, and it's laden with emotion. And even though it's, by contemporary standards, incredibly poorly recorded, it still sounds fantastic."

THE GREAT PLATFORM WARS

As he has pointed out, a poor-sounding album has more to do with a poor performance than a poor production, but good tools are certainly an invaluable aid. Cubase and Pro Tools are his methods of choice in achieving those patented lush sounds that he manages, since the usual suspects have been forced into semi-retirement . . . though he's not safe from the same day-to-day platform frustrations we all deal with. Eliciting more than just a brief pang of empathy, he shares: "I have a dilemma: I'm using Pro Tools and Cubase in conjunction with each other and, as a result, I'm still on OS 9 in my studio, because you can't use Pro Tools and Cubase together in OS X. I think at some point I'm going to have to bite the bullet and figure out a new software platform because, five years from now, I don't want to be a complete relic. I might just get rid of both of them and try Logic. With Pro Tools, Cubase, Logic, and so on, a lot of it is just contingent on what you are familiar with. I had originally wanted to just use Pro Tools exclusively, but I found the MIDI to be so worthless, especially since I had been accustomed to Cubase MIDI, which, for sequencing, is really sophisticated. It works really well for me, as I like to leave everything in the realm of MIDI for as long as possible, so I can change specific notes with ease. It's funny, because once it leaves the realm of MIDI, in my perspective, it's cast in stone."

MOVING FORWARD

Dilemmas aside, Moby is still forging onward in a rather renaissance fashion, and *GO* is but one testament to his longevity and ability to improvise with these ever-trying technological times, though he is amused by how things are beginning to really come full circle, particularly in terms of recording enthusiasts fetishizing sounds that, for a time, were largely avoided.

"One of the things I love about a lot of the contemporary technology is the fantastic irony of people using very sophisticated, very expensive technology to try and make records sound old and bad," he says with a chuckle. "You got these Digidesign lo-fi filters, whose purpose is to make things sound old and rough. I love that."

Ironic as it all may be, technology plays a central role in Moby's creative process, and it's a subject that he approaches with an air of reverence, as it allows him to continue to indulge in his passion of art for art's sake.

"My goals are almost painfully simple," he says. "Honestly, all I want to do is just make music and make records. What the records might sound like, I have no idea; whether they'll be good or not, I have no idea; whether anyone would ever want to buy them, I have no idea. But my biggest hope is to hopefully make music that I love and, maybe inadvertently, somehow make music that other people will love as well." EQ

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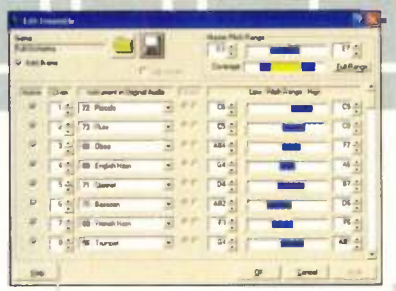

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www.digidesign.com

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www.nativeinstruments.com/afharmony01.info

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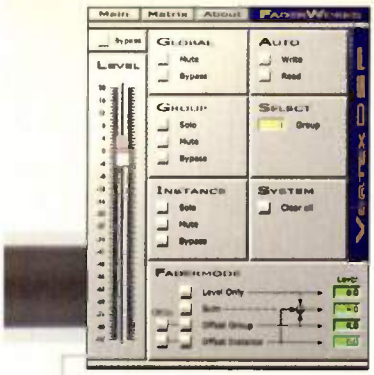

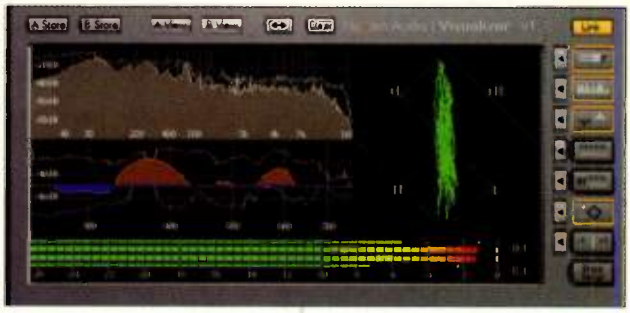

VertexDSP FaderWorks Gain Adjustment Plug-In

FaderWorks is a Windows VST/Mac OS X VST/AU audio plug-in for intelligent gain adjustment. At its simplest, FaderWorks controls the volume before or after other audio plug-ins. However, multiple instances can be opened and connected logically (including grouping and crossfading), making it possible to manage complex mix setups with one volume fader.
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In *Mixing With The Pros* ($55), a three-hour DVD video tutorial for Mac or PC, mixing veteran James Tuttle shows how EQs, compressors, limiters, reverbs, delays, amp simulators, automation, and mastering plug-ins are all used to construct a mix. Tuttle approaches each instrument or track individually and examines setup, adjustments, editing, and automation. Bonus material is also included.
www.askvideo.com

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Melodyne plug-in ($299, free to users of Melodyne Studio 3) offers Melodyne's unique pitch and time editing functions as a VST/AU/RTAS plug-in for Windows/Mac. It provides intelligent, context-sensitive tools for editing pitch, vibrato, drift, timing, volume, and formants of individual notes.
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Awave Studio ($129.95) lets you convert, edit, play, or process more than 260 audio and synthesizer file formats, including CD-ripping, MIDI SDS or SCSI SMDI transfers, reading of non-Windows compatible Akai, Kurzweil and Roland CD-ROMs, batch conversions, MIDI to WAV rendering, and more.
www.fmjsoft.com

Sony Oxford Pro Tools Plug-Ins: Now Universal Binary

Sony Oxford has released Universal Binary versions of its range of Pro Tools TDM/LE plug-ins. Upgrades are free of charge for a 3-month period from original registration, with a nominal cost thereafter.
www.sonyplugins.com

NuGen Audio Visualizer 1.1

The Visualizer FFT audio analyzer has been updated to version 1.1.
www.nugenaudio.com

VirSyn CANTOR 2 Vocal Machine

CANTOR 2 ($349), a VST/AU/RTAS plug-in for Mac/PC, creates and manipulates synthetic singing voices, from robotic to highly expressive vocals that almost sound "real." The new MIDI import feature makes it possible to use pitchbend and expression information.
www.virsyn.com

Outsim SynthMaker 1.0

SynthMaker 1.0 allows creating VST and standalone plug-ins without having to write any code.
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TC Electronic UnWrap HD Software Update For System 6000

UnWrap HD (free) provides existing System 6000 UnWrap owners new options for extracting dialog or enveloping sources from a stereo or LtRt mix, enabling better discrimination between a track's foreground and background elements.
www.tcelectronic.com

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Chris Athens' list of mastering credits is nothing if not impressive. In fact, it's downright intimidating — especially given the fact that he's only officially held the title of Mastering Engineer Extraordinaire for less than 15 years. But in those short 15 years he's managed to become responsible for some of the greatest-sounding releases spawned from a plethora of musical genres. From hip-hop to J-pop to reggae to rock, Chris Athens has truly mastered them all.

Originally starting as a tape librarian at the famed **Sony Music Studios** in New York, Chris quickly clawed his way to the top of the mastering game, learning his trade from the likes of **Mark Wilder** and **Vlado Mellor** before moving into his own as the Senior Mastering Engineer at the esteemed **Sterling Sound**. It's been a meteoric rise, but one that has benefited acts as diverse as **Ben Folds**, **Mos Def**, **Chris Whitley**, **Coldplay**, **Method Man**, **Peter Tosh**, **Johnny Cash**, **Erykah Badu**, **Juliana Theory**, **Beastie Boys**, and so many others — testaments to the notion that Chris Athens has really been doing something special in that scary little mastering lab of his. So we pulled up a few comfortable seats at Athen's home base of Sterling Sound in downtown NYC to pick his brain about the goods, the bads, and the uglies of the mastering business; and this is what he had to say. So we invite you to follow suit, loosen the tie, turn on the answering machine and turn off the TV, and join us in . . .

An Evening With Chris Athens

by Rich Tozzoli

EQ: Where is mastering, in general, heading?

Chris Athens: To Hell. In a hand basket. I'm kidding . . . sort of (*laughs*). There are those who are clued in on how to do, and do it right, but there are also a lot of folks coming into it who are just software jockeys that may, or very well may not, ever become great mastering engineers. Only time will tell. The history of software as a component in mastering is still pretty short, so it's hard to tell exactly where it's all heading.

EQ: So you feel people abuse the art by overusing these current generation tools — hardware and software limiters and "mastering programs?"

CA: Wow, do they ever — in ways that are hard to even imagine. There's some actual creativity that goes into that level of abuse. It's off the charts (*laughs*). But they can be perfectly viable tools, they just need the right hands . . . and ears.

EQ: How did you learn the "black art" of mastering? It seems to be a subject many mastering engineers can't, or don't want to, shed a lot of light on. . . .

CA: I don't believe in keeping "secrets." The guys who were my mentors were very open with their knowledge, and I benefited greatly from them. The way I came up was, in a sense, very "old school." I came up through the ranks at Sony, editing tape with a razorblade and cutting vinyl — arts that were on their way out when I decided to become a mastering engineer. I actually probably could have avoided ever going about things the traditional way and just sat down behind the computer, but I felt it was important to learn those skills.

Not everybody gets a chance to apprentice under a great mastering engineer or, in my case, several great mastering engineers — though I recommend attempting to if you are serious about pursuing the craft.

EQ: You're known to combine both digital and analog elements.

CA: Yes, I certainly do — whether they like it or not.

EQ: Is there a lot of high-resolution work coming in here?

CA: I do have some hi-res work coming in here. A lot of the people that go through the trouble of doing hi-res are also printing to analog as well — usually a combination of 1/2" analog and 88.2 or 96kHz digital. It's pretty common these days.

EQ: How do you downconvert?

CA: Nine times out of ten I'll run out through a D to A converter, and then record back into my system at the target sample rate and 24-bit.


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Nine times out of ten I'll run out through a D to A converter, and then record back into my system at the target sample rate and 24-bit.

EQ: What is the trustiest piece you own?

CA: My custom Muth analog transfer console and my Sontec MS430B EQ are the pieces that definitely get the most use, though I use the API 550Ms quite a bit as well — configured in 0.5dB steps, which is great for mastering. I also have the normal API 550Bs that have 2dB steps, but they aren't quite as useful for mastering.

EQ: What are your preferred means of monitoring?

CA: I have Dynaudio C4 speakers. I have a set there and a set at my personal studio in upstate New York — which is very similar to the room at Sterling, though it's rigged for surround. At Sterling I focus just on stereo mastering.

EQ: But you do a lot more than just stereo mastering there, correct?

CA: Yes, I also do a fair amount of mixing and general production. My main focus is mastering, but I don't sleep much. Mixing was my first love. I've always done it. In the last few years I've gotten more serious about incorporating it into what I do. On the production end, I may help a client during a mix — replace, replay, or remix certain parts of a track. I've cut vocals for Erykah Badu while she was sitting on my couch and done guitar overdubs with the Neptunes. I even put a microphone in front of Geoff Emerick once. That was a hoot. I mix a couple of albums a year, and just finished one for an artist named David Ryan Harris, which is really amazing. Check it out . . . or I'll kick your ass (*laughs*).

EQ: What's the greatest pooch screw you encounter from people that bring you tracks to master?

CA: It sounds insane, but some people will actually burn their mixes and then not listen to what they printed, assuming it's going to be okay. Then they get here and we find dropouts, distortion — some "magical" change. What a great way to bring a session to a screeching halt. . . .

Not properly organizing their sessions is another. It's very important at this stage to be well organized, so you're not second-guessing yourself, or rummaging through tape bins and hard drive folders looking for the right pass. A little bit of time spent organizing a session and properly marking tapes goes a long way in keeping the flow happening . . . and the budget in check.

Or when people leave zero headroom for their masters. I get mixes all the time that are so incredibly crushed. . . .

EQ: Then I would assume you prefer to be brought mixes that haven't been limited much?

CA: It really depends on who engineered the mix. If they understand how to use limiters, understand how they really affect what's going to be heard — if they are confident making that choice in their mixes — then whatever works. I don't even need to know if you limited it or not as long as it sounds good. But, if there is any question as to "should I do this," then you should not be limiting at all.

EQ: So what is a great mix, in your opinion?

CA: Well there are two different kinds of great mixes: The "technically" great mix where everything is in order, is tonally balanced, has great dynamics and just feels right for the song. Then there's the great "vibe" mix — it may not be "technically" perfect, but it has a tremendously great vibe that really enhances the song. There are a few people out there who can do both . . . and when I get mixes from those people it's a damn good day.

EQ: But how can people do better, particularly those at home?

CA: For me, the greatest way to ensure a great mix is to first model other great mixes. Take a mix that you really love, that has a sound that is appropriate for the genre you are working on, and really listen to it. But when you do this, as your goal is to first get a great mix and not worry so much about the master, lower the volume of the CD you are monitoring. This will help reduce the temptation to try to match the level, and will allow you to concentrate on matching the dynamics, the balance — the stuff that's important for a great mix.

EQ: CDs? With your background, I would assume you are always listening to vinyl!

CA: I do, but not as often as I would like. The main reason I have a turntable here is so I can listen to some of my collection, not to reference. It's a great depression lifter to listen to vinyl. I'm not the first person to say this, but an interesting thing has happened in the last couple of decades in this technological revolution. Releases in general have not gotten better sounding. It's never been easier to make a record, but it seems like technology has almost had an inverse effect on sound quality. And I don't think it's a coincidence. Sometimes I listen to vinyl just to remind myself what releases could sound like. EQ

Sometimes I listen to vinyl just to remind myself what releases could sound like.

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Mastering In the Digital Age

Can Technology Make You Master of Your Own Domain?

by Dan Daley

Mastering, in the days of vinyl records, was viewed as a critical process, requiring a deft touch to push the grooves to the limit, but never over the edge. And through the CD revolution, where major labels still ran the entirety of the music industry and paid the studio card rates, mastering continued to be a standard operating procedure, with the only question posed being: "Who of the handful of master meisters — the Bob Ludwigs, Bernie Grudmans, and Ted Jensens of the industry — will do the job?"

But, approximately a decade ago, everything quickly began to change. "Mastering isn't automatic anymore; in fact, for a lot of people, the idea is actually antiquated," comments Mark Greenwood, manager of Quad Studios in Nashville, a city experiencing a particular surge of independent recording artists. "If you want your recording to be competitive, like on the radio, then I recommend professional mastering. But if you're selling your own CDs at gigs, doing MP3s, then a lot of projects just don't need to make that investment."

DOING IT THEMSELVES

You don't need a license to be a recording artist, and the same goes for mastering engineers — a specialty whose practitioners once spent years as protégés to experienced mentors, but many of who now compete with black-box solutions and software. Bryan Bradley, director of pro audio/recording merchandise at Guitar Center, sums up the trend: "I was in one of our stores when I overheard a customer ask why his music sounded 'choppy' in his car stereo. A salesman discovered that he was burning mixes straight to CD. The customer left with a copy of [Sony] Sound Forge and a book. I'm guessing now he doesn't reach for the volume knob every time a track changes."

This DIY mastering trend follows the same vogue as personal recording, and it's had the same effect on professional mastering houses as home recording did on commercial studios. But while the art of mastering is still sufficiently mysterious and rarefied for it to remain a professional niche, even major houses have had to accommodate new economic realities. Some, like Sterling Sound in New York, have instituted "unattended mastering sessions" where projects are assigned to a pool of engineers and assistants for processing during off hours, at substantially lower rates. "We'd rather lower the rates than let projects wind up with

less-than-acceptable results by amateurs," says Murat Aktar, Sterling's president.

The advent of digital technology has spawned a cohort of second-tier facilities and engineers that cater to the indie recording market, many of whom hold as equally dim of a view on DIY mastering. "DIY mastering is the bane of my existence," says Erik Wolf of Nashville's Wolf Mastering. "You used to need a cutting lathe and lots of experience. Now, every bonehead with a plug-in thinks he can master a record properly."

IS IT A MASTERING ISSUE?

"If a producer is to a record what a director is to a film, then a mastering engineer is like a colorist on a movie," says Brent Lambert, owner of The Kitchen Mastering in North Carolina — a man who is as facile with the basics of DIY mastering as he is with analogies, listing the main missteps for auto-mastering being in level, compression, panning, and frequency allocations. "Ostensibly, people want mastering to make their records louder," he says. "But that's misleading. Especially with digital systems — when you hit the converters or summing buses too hard, it misshapes the signal and distorts.

"Misuse of compression is rampant; typically, amateurs use too fast an attack time and too long a release, especially on percussion. They will not put enough emphasis on de-essing. Most of the monitoring systems are set up improperly and the image is off — they think they're panning wider than they really are, which leads to crowding a lot of instruments in the same octave too far to the same side, causing similar frequencies to build up and blur. And that leads to a really disparate top end; cymbals, pianos, and other top-heavy sounds get brighter in the mix as they try to separate them. Then, when it's time to master, they brighten the entire song, over-emphasizing the highs on those instruments. The same scenario applies to the low end, too. What a lot of people look at as a mastering issue is really a matter of thinking the mix out better."

LIMITING PROBLEMS

Kevin Gray, who has mastered records for artists including Billy Joel and The Who and now owns AcousTech Mastering, says: "The tendency over the last few years with indie records has been towards over-compression and over-EQing. It might be driven by major labels that always look to make a record louder, but I think home recording has a lot to do with it."

When it comes to processing, Gary asserts the mentality is additive, not subtractive: "If you're within 6dB of zero, you're still using all 16 bits, and you can leave some headroom for the mastering engineer to apply EQ and other processing. And don't think doing this over eight-inch speakers is going to be accurate. You need a full-range monitoring system unless you like nasty surprises."

However, Gray agrees amateurs can achieve a decent sheen, if they're willing to take the time to reference mastered takes in a variety of monitoring environments, averaging outcomes. "That takes time going from one monitoring set up to another to compare, but time is something this type of client usually has more of than money," he says, citing one technique wherein you put your refs into a multi-CD changer with discs that were mastered correctly and used as references for your monitoring system.

You can use plug-ins, also — Gray uses Waves' L2 in Pro Tools regularly. "But not cranked up 15dB," he cautions. "When you push compression to the wall, you flatten the image and lose the presence of individual instruments. You can't tell one drum from another; the cymbals are a big mish-mash."

Gray points to vocal sibilance sneaking through the mastering process as a widely felt woe. "You need to be very conscious of what's going on in the 8-to-12kHz range on vocals," he explains. "It's really noticeable on vinyl, which is why I use super-fast-acting limiters for disk cutting."

THE TENDENCY OVER THE LAST FEW YEARS WITH INDIE RECORDS HAS BEEN TOWARDS OVER-COMPRESSION AND OVER-EQING.

MASTERING FILES FOR A MODERN WORLD

Long before iTunes undermined the music industry, the indie music universe was trading files online. What's taken longer to suss out, however, is what effect codec algorithms have on music. There's no argument that digital impacts how music sounds; in the mid-1990s a group of mastering engineers, led by the late Denny Purcell, compelled the major labels to acknowledge exactly that in a series of critical listening tests. However, there's been no such movement to address what codecs such as MP3 do to music.

Alan Douches, owner of West Side Music in upstate New York, encounters the issues often with his large base of independent music clients. "There are no real level and gain structure standards in online music distribution like there are in broadcast or CDs, so most of the problems center on level," he says. Douches has set up a 16-bit/44.1kHz side chain that runs parallel to his conventional 24-bit mastering signal path specifically to create MP3 masters. He sets the level at 0.4dB lower than that for CDs, sends the stereo signal to its own Lexicon 2020 comp/limiter, and he also introduces a hi-pass filter, set at between 38 and 40Hz, to limit the amount of low-frequency information that goes to the file-based master. "Limiting the level and the amount of low end helps avoid 'confusing' the algorithm," he explains. "If you give the file a little more headroom you have a better chance of developing a better sound at the extreme ends of the frequency spectrum and not inducing artifacts like 'pumping' on the low end or crackling on the high end by overloading the codec's [ability to process data]."

The high end is where the mastering minefield for files ultimately lies. "Ironically, it's the same place it is for SACD, the ultra-audio format," comments Allan Tucker of Foothill Digital in New York City. "Too much information at the top end translates horribly for sensitive formats, including SACD and especially lossy formats like MP3."

Such perils serve as testament to the fact that the onset of the digital age, and all the subsequent new means and ends at the recording artist's hands, has done little to truly simplify or demystify mastering — it's still a process shrouded in secrecy, a proclivity best suited for those that have moved out of the realm of the initiate. If anything, the advent of digital technology, particularly in the area of distribution, has made mastering all the more tricky . . . by the sheer plethora of codecs out there if nothing else. EQ

"YOU USED TO NEED A CUTTING LATHE AND LOTS OF EXPERIENCE. NOW, EVERY BONEHEAD WITH A PLUG-IN THINKS HE CAN MASTER A RECORD PROPERLY."

—Erik Wolf/Wolf Mastering

The 12-Step Mastering Program

My name is Dave, and I'm a Mastering Engineer. . . .

by Dave Kutch

They say mastering is a black art, a discipline that not everyone can learn. But if you are just now trying your hand at it, or even if you are a seasoned vet, there are a couple universal rules that, when abided by, will make all the difference in your end product. So, like Letterman, let's give a quick countdown.

#12 GIVE A WORD TO THE WISE MIXER

Perhaps the hallmark of a great mixing engineer, like a Serban Ghenea, Pat Vialla, or Chris Trevett, is the lack of squashed mixes they turn out. As a mastering engineer, it's important to get mixes that breathe, that have some headroom. We can take care of things better than any single compressor or plug-in any mixing engineer has in their studio, so tell them loudly — scream if you must — "Don't kill the dynamics!" They've worked hard on their mixes, so they shouldn't go ruining them; they should let someone *else* ruin them instead, so you can displace the blame later.

Tell them not to maximize; it can lead to nasty distortion. If they are unsure about whether distortion is imminent, they can always try bringing the mix up on two channels, flipping the phase on one channel, and mono their monitor section. They will now hear only the stereo information. If they hear crunch, and chorus vocals start breaking up, particularly on kick drum hits, then you're printing too hot. Also, tell them to look at their meters! Are they continuously in the red? Then they are printing too hot. Is their volume knob on five, but deep red fluid is pouring out of their ears? They are printing too hot! Stop printing too hot! Tell them to let you make it loud for them.

#11 REQUEST THE BEST FORMAT

A 24-bit DAT, when used with high quality converters in front of it, sounds great. The headroom is much greater in comparison to a print back into Pro Tools. I also prefer it to 1/2" most of the time, as there are just too many variables with 1/2" to trust putting final masters on it, unless you are really in a perfect environment. Because many recording studios' tape machines are not well maintained due to lack of use (many technicians don't understand bias well and much of the tape produced today is of questionable quality), I highly recommend not printing to 1/2", regardless of what many purists may say.

Digital file formats offer both consistency in sound and flexibility through the use of printed stems. A good mixing engineer working in Pro Tools will create a Pro Tools session for each song that contains both the final stereo passes and the mix stems — as well as organize the final masters, Pro Tools sessions, and mix passes so as to make the mastering process both easier and cost-effective.

#10 IF NECESSARY, DO NOTHING AT ALL

I know it sounds crazy, but sometimes the mixing engineer nails it. A mastering engineer's job is to make a song sound its best, not to recklessly step on a mixing engineer's toes just to par the course. As an example, "Do What it Do," on Jamie Foxx's album (a Serban Ghenea mix) and a couple of songs on Lyfe Jennings album (mixed by Rich Keller), only needed a simple gain increase and a tiny bit of top end shelving at 12kHz. Otherwise, it was best just left alone. It's a life lesson that applies to mastering as much as anything else: If it's not broken, don't break it.

#9 CONSOLE YOURSELF

A great console is key. My Dangerous Master analog console allows me to use one insert in sum and difference mode. This allows me to EQ the mono material independently from the stereo information. Therefore if a lead vocal needs to be louder I can boost some 2kHz to 5 kHz on the left channel of my Prism EQ and only affect my center/mono audio where the lead typically sits without affecting chorus vocals, which typically sit in the Left/Right stereo information. Conversely, I can make chorus vocals sparkle without over EQing the lead vocal. Working this way provides significant flexibility, but you must always be conscious not to disrupt the overall balance of the sound field.

#8 WORDCLOCKS: BUY THEM, USE THEM, LOVE THEM

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#7 DON'T FEAR THE PLUG-IN

My file playback device is Wavelab with a Lynx 2 soundcard that is externally word clocked. Why Wavelab? It's virtually an audio toolbox add kung fu grip; it recognizes almost every type of file and accepts Direct X and VST plug-ins. Plug-ins, you say, with a sneer? Yes. The plug-in can be your friend; there are some real excellent ones out there, whether you are looking to spend $300 or $3,000. The beauty of plug-ins is tied to the virtues of working in the box. Computers can read program material before it processes it, allowing compressors to "see ahead" and let kick drum transients to pass and not get squashed — something analog compressors have a hard time achieving. So the trick is to apply subtle compression via a plug-in *before* you hit your analog chain, with the keyword being "subtle."

#6 COMPRESS IN CHAIN

My compression approach is a little different than most engineers — I like to add little bits of compression three or four times in the signal path, and I suggest you try doing the same. I first apply compression via a plug-in for the reasons listed above, second that by going into the analog domain with an API 2500 or old NTP 179-120 to get that sought after character (this is when I recommend applying your EQ as well), and then touch –1dB with a Waves hardware L2 in the digital world, at the very end of the signal path, before going into my DAW. Any one of these used alone, excessively, destroys musical transients, in my opinion. The cumulative effect of a little bit of each is loud and clear — this is how you can achieve the volume many clients want today without losing musical transients, and it also reduces the amount of EQ work you have to do.

This is the best way to preserve headroom when mastering and, regardless of what trends arose in the Loudness Wars, that's precisely what a good mastering engineer should do. The soft spots are what allow the loud parts to have optimum impact. If you kill that, then you're killing a crucial part of the listener's experience.

#5 RAISE YOUR GAIN BEFORE YOU EQ

Before you EQ anything you should raise the overall gain to the point just *before* it distorts, and then compress. This can eliminate half of your EQ work. Doing the reverse will only change the EQ curve when you raise the gain, and you'll just be stuck having to re-adjust your EQ settings again and again.

#4 BEAT IT 'TIL IT HERTZ

Where to start? The approach changes from artist to artist and song to song, of course, but one technique I like to use when

EQing bass is to boost anywhere from 80Hz to 160Hz with a shelving EQ and then apply a 32Hz highpass filter to remove any excess sub build up. This will give you that hard hitting, kick-you-in-the-chest bass, a tight sub by removing unwanted frequencies that will not only make your sub-bass sound loose and sloppy, but will also eat up some of your valuable headroom. And I recommend using digital EQs, as they are tight, precise and great for filtering. The Roots "Game Theory," for instance, has this method applied throughout, with the addition of some aggressive 10k shelving for top, and air from an old Neumann PV76 EQ. Sometimes it takes more though — Outkast's song "BOB" required more than +9dB at 90Hz shelving to get some real bounce out of it.

#3 . . . OR, BABY, BE GENTLE

On the flip side, the recent Waltz for Venus and Acquiesce records I mastered for Mark Owen required very little EQ, and almost no compression at all. When I first asked what compressors he used, the reply was astonishing: "None!" It was all slammed to tape during tracking — total old school. In that case, I simply added some soft 10kHz shelving to the center and sides to sparkle up the guitars, and some 1.4kHz in the center to bring the lead vocals out in the mix.

#2 CHANGE IS GOOD

One EQ setting may not be appropriate for the entire song. To illustrate this, the Roots song "Take It There" takes a sharp left hand turn half way through. Jason Goldstein's mix of the song was dope the whole way through. My mastering settings, however, were not. Come the second half of the song those settings were downright unjust. I took the extra 15 minutes and equalized the second half separately, then spliced the two halves together in Sonic Solutions. Perfect. Doing otherwise would have just been lazy mastering, which is too much of a trend these days, something that's done by "seasoned" professionals who are . . . well . . . maybe a little too "seasoned." It's called "HMO Mastering": A client comes in to get better, and gets rushed out the back door sounding worse. So care enough to take the extra time to do it right. Your name is on the record too.

#1 ASK YOURSELF: "HOW DOES IT SOUND?"

Phil Ramone posed this question on a vocal session once. The engineer spent so much time obsessing over tape levels and the compressor's meters that Phil finally stopped the session and yelled, "I don't care about the meters! How does it sound? It sounds fine, so let's start recording!" I was 19 at the time and have never forgotten that moment. Don't worry about what the meters, waveforms or the oscilloscope looks like. Remember, we must master with our ears, not our eyes. Just because it's not a clear science doesn't mean that it's a black art. EQ

Dave Kutch is a mastering engineer at Song Music Studios. His credits include The Roots, DMX, Alicia Keys, and Outkast. Drop him a line at www.myspace.com/davekutch.

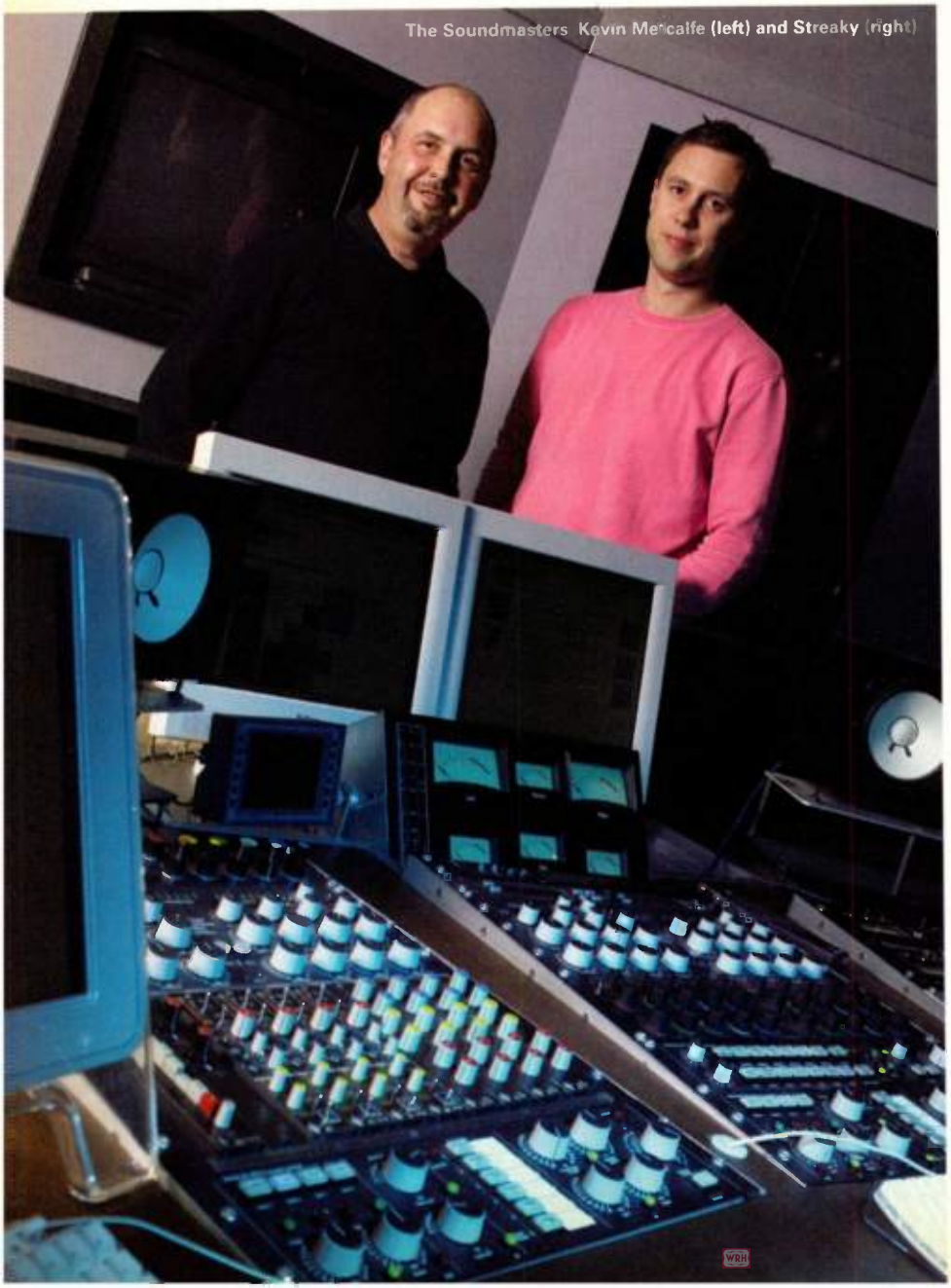
21st Century Mastering

In the Suite with the Soundmasters

by Matt Bell

The advent of new technology, in any sphere of human endeavor, has always created challenges to, and opportunities for, the established order. The Industrial Revolution in Victorian Great Britain made it the most technologically advanced country of its day and brought forth a new wealthy class of millionaire industrialists, but it also created a lot of very fed-up (and unemployed) weavers and spinners. Desktop publishing revolutionized the world of printing and graphic design, but much ink was spilt by disgruntled typesetters as the changes worked their way out. And in the world of music technology, virtually every new exciting breakthrough, from the invention of multitrack recording to the arrival of MP3s, has been greeted with predictions of impending doom and catastrophe.

Although these glum premonitions of disaster have usually gone unfulfilled, technology has of course been responsible for huge upheavals in the music business, certainly in regards to how music is created, recorded, and distributed. And while record companies and commercial recording studios talk endlessly of cutbacks and retrenchment, modern equipment allows the average musician access to recording facilities that were undreamt of just a couple of years ago.



The Soundmasters Kevin Metcalfe (left) and Streaky (right)

However, such changes have led to the elimination of many formerly secure careers for those involved in music production. As one industry stalwart moaned to me recently, "All these job titles are passing into history. Assistant Engineer, Balance Engineer, Mastering Engineer . . . they've all been replaced by a bloke on his own in a bedroom with a laptop."

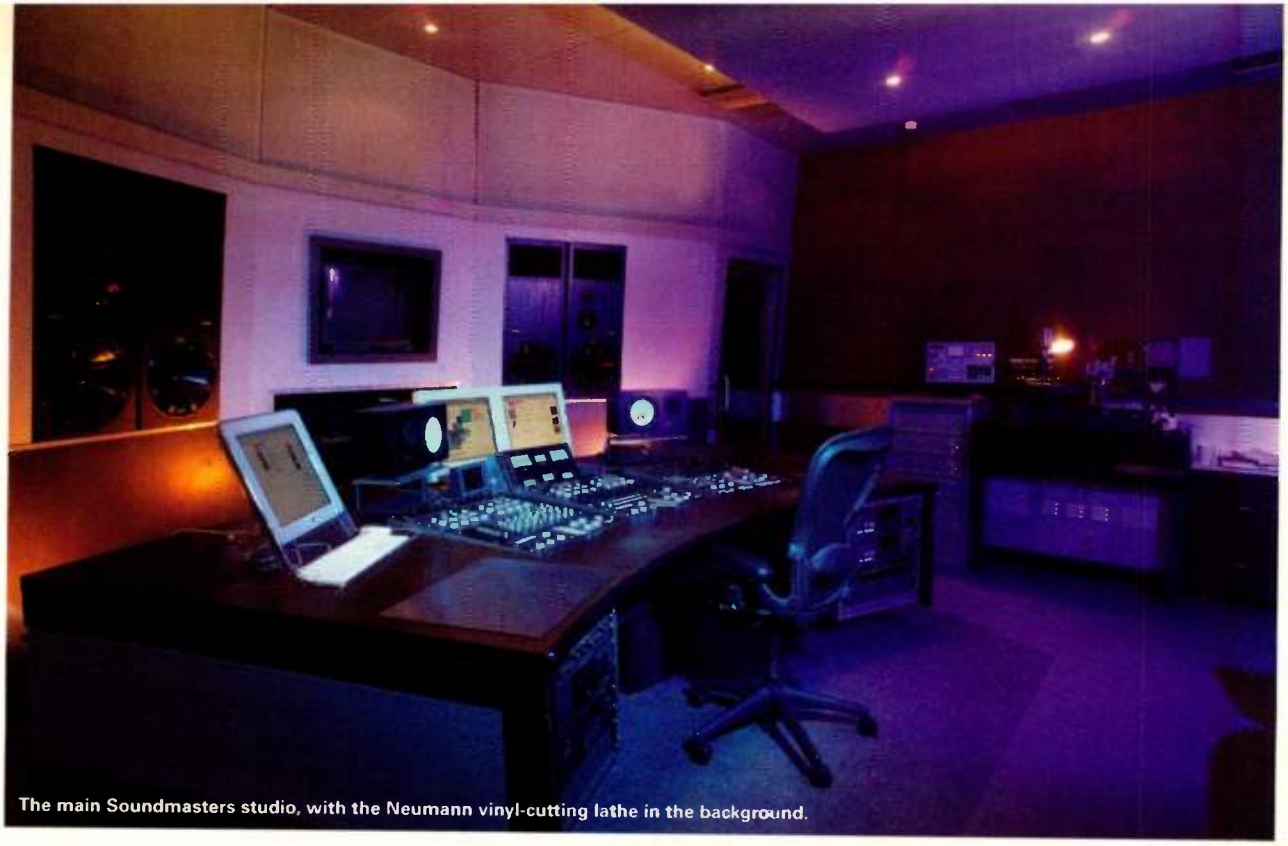
Of course, this is an exaggeration: It's not hard to find people in these established occupations who manage to ensure that their experience remains relevant in changing times — often by harnessing the power of the Internet to make their expertise relevant to a wider market.

Enter the Soundmasters mastering house in West London. It's run by Kevin Metcalfe, a mastering engineer for over 30 years, who has trained at a variety of major record labels such as RCA and Virgin (including a spell as Chief Mastering Engineer at London's renowned Town House) and partner Streaky, an energetic former DJ and studio engineer who came to Kevin in 2000 to learn the business of mastering for vinyl. Soundmasters has faced the challenges of the modern music industry by making their services much more accessible via their eMasters venture, which allows potential mastering clients to send their music to them from all over the world via the Internet, while also staying true to the belief that, where mastering is concerned, it's hard to improve on the sound of well-designed high-end analog equipment in the hands of experienced users.

ANALOG ETHOS

For those used to modern recording studios, the contents of the Soundmasters' mastering studio can come as a surprise: "All our processing is analog, with good A/Ds and D/As on either side," Kevin comments. In keeping with this philosophy, the studio's Pro Tools system

Photos: Pete Cronin



The main Soundmasters studio, with the Neumann vinyl-cutting lathe in the background.

is used only to get digital audio for mastering into the high-end Prism and DCS D/A units, which handle the conversions into analog at the beginning of the process.

Soundmasters' main processing comes from Fairman and Maselec compressor/limiters, and very accurate Massenburg, Summit, Neumann, and Maselec mastering EQs, which allow the boosting or cutting of very precise frequencies in a mix. These processors are located in the main Soundmasters console, and can be inserted into the control room's stereo signal path by the Maselec MTC2 Master Control — a two-channel analog mastering mixer and router that lies at the heart of the Soundmasters studio (multitrack mixing capabilities are not necessary in a mastering studio, although the Soundmasters do have three MTC2s in their desk to enable them to handle 5.1 surround mastering jobs when required).

In addition to its own EQ and level controls, the MTC2 also offers control over overall stereo width and an "elliptical filter," which allows precise control over the stereo spread of bass frequencies in particular by progressively removing out of phase bass frequencies as it is applied. These last two facilities are particularly important in vinyl mastering, where a well-centered mix and bass is essential if the playback needle is to accurately track the vinyl groove. However, Kevin and Streaky find the MTC2's elliptical filter useful for tightening up bass even on non-vinyl projects.

In order to get an accurate idea of how playback will sound on a variety of systems, accurate, neutral monitoring is critical in a mastering suite. Kevin chose PMC BB5s after becoming accustomed to them at the Town House mastering studios, where he worked until the mid-'90s. For similar reasons, the studio also features industry-standard Yamaha NS10s — because as Kevin explains, he and Streaky have developed an innate sense of what consistent, well-mastered audio should sound like on them.

Once Kevin and Streaky are happy with the sound of the audio they're mastering, it's converted back into digital audio via Prism and DCS A/Ds if it's for a non-vinyl release, where it can be assembled, ordered, and crossfaded if necessary in Sonic Studio HD, the duo's digital editor of choice. Material for vinyl release is left in the analog domain and sent to the modified Neumann VMS82 vinyl lathe for disc cutting.

THE VOYAGE FROM VINYL

Most of the music mastered by the Soundmasters duo is now released on CD or as digital files, but vinyl remains an important part of their business, and more importantly, they still tackle all of their work as though they're cutting it for reproduction on vinyl, even if the music is being released as an MP3. Streaky explains: "With digital recordings, you can do what you want, but if you're still thinking as though you're mastering on vinyl, then you can get a really nice, tight sound. The frequencies are so much more important with vinyl, because of its physical limitations; just making sure that you're able to play it without the needle skipping the groove is an art in itself. You can actually get quite a wide range of frequencies on vinyl, but only with certain disciplines, and they're good to know for all mastering. That's why I wanted to learn to work with vinyl, because well-mastered vinyl records have a sound I like: with warm, controlled, tight bass, and everything nice and clear. Certainly the sound I was getting on CD before I came here was a lot thinner than the one I can get now, having learned the principles of cutting vinyl."

Kevin elaborates on what the sonic limitations of the vinyl format can teach a good cutting engineer in the digital age. "The first key to understanding vinyl mastering is understanding bass, because it determines the spacing of the groove on a record, and the groove shape," he explains. "The higher the level and the amount of bass, the wider the groove in the record is, and the more space on the vinyl you need to accommodate it. So it's a balancing act between the volume you want on the record, the length of the track, and the fact that a vinyl disc only has so big a radius — if you have a six-minute track to put on a 12-inch disc, you can cut it hot. If you have 10 or 12 minutes to get on there, you need to rethink. And if you reduce bass and level, you can fit more music on the disc. But people don't like that," Streaky nods. "Nobody wants a quiet disc."

21st Century Mastering

Kevin continues to clarify the key issues for successful mastering on vinyl. "The other big concern is high-frequency transients: cymbals, clicks, and sibilance. Sibilance is the worst for a cutting engineer; it starts at about 4kHz and has upper harmonics forever. Of course, on CD, that doesn't matter, except that it takes your head off if you turn it up — but it's clean, whereas on vinyl, it distorts and sounds horrible. So knowing that, you tend to try to minimize sibilance at the cut. And that's what you want for most records: You want to be able to turn it up nice and loud without it hurting, and for it to have a nice-sounding bass. And if you put that onto CD, it'll sound great," concludes Streaky, bringing us full circle.

THE MASTER'S CRAFT

After communicating with the artist and establishing a rough idea of how the track is supposed to sound and listening to it just a couple of times — Kevin says no more than three times at most, because he then starts to lose perspective on it — the pair get going. Watching them at work is fascinating; within seconds of hearing a track over their monitors, they're reaching for limiter controls, boosting EQ here, or more frequently cutting it somewhere else.

A commonly asked question about mastering is what faults can possibly be left for the mastering engineer to correct after a painstaking mix session. After all, isn't the mix supposed to take care of the major sonic problems? But according to the Soundmasters, there can be an awful lot left for them to do. Kevin says: "The old techniques for recording and mixing are being forgotten, and that shows. Like using good mics and preamps, and not EQing too much at source. So you get things like sibilance on vocals or drum sounds . . . cymbals, say. And often we just hear over-production — too much in the mix. Often it's what you take out that's more important than what you put in, because that can leave the rest more room to be heard. Sometimes, you get intermodulation between different instruments, producing a spike at one frequency. We can identify that and correct it, because we can be quite precise with our EQs."

"Over-use of limiting is the worst," says Streaky, "when people crush a track to death to make it sound loud. It means we don't have any headroom left to do anything useful to their tracks. And if I lower the level so that I can recreate some sense of dynamics, then people say, 'but it's not as loud as my version!' That's not the point — it's better that a track is mixed to leave some headroom, because then we can give it the sound of some nice equipment pushing it a bit, rather than your one mastering box or plug-in going mad at full scale.

"Bass end is also often a problem for people in their bedroom studios, because they usually can't reliably hear what they're doing down there through their monitors. If they try to do something with it, they usually mess it up; it'll either be too compressed or there'll be too much of it. And if you have bass interfering with what's trying to play at the top end, that's awful. You don't have to put loads of sub-bass in to get it sounding big, either. A lot of people do that now, too, especially in dance tracks." It's not about boosting bass — as Kevin says, "you can even make bass sound better by removing bass frequencies, because then you're left with more room in the mix and higher-end bass, which can sound better sometimes."

"Another common mistake" says Streaky, "is when people are playing tracks too loud during the mix. You can really hear problems in a mix when you play it quietly. The louder you have it, the more top you tend to take off it. I know why people turn things up, because it's exciting, and you get better performances out of people when you're recording. But when you're trying to mix or master, you need to concentrate on the fine details. Also, if you've got a badly treated room, as soon as you turn up the music, you start to excite all your room modes, and then you can't really hear what's going on in your music any more. The bottom line is that if you can hear the bass and all the important parts when the level is low — down at whispering level — that's a good mix." EQ

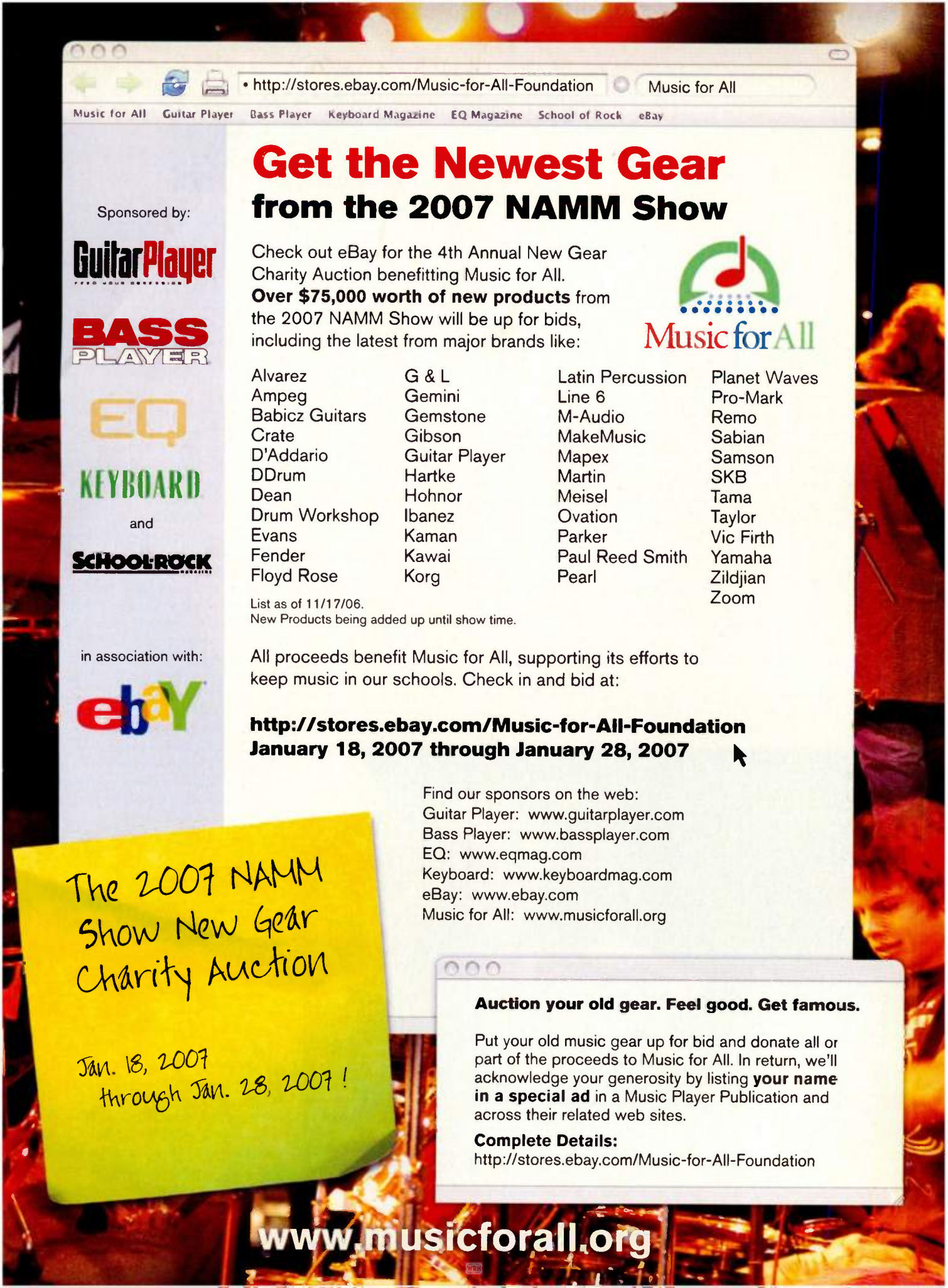
MASTERS COMPETITION FOR *EQ* READERS!

Since 2004, the Soundmasters team has been dealing with much more material recorded in project studios, thanks to their Internet-based mastering service, eMasters. This came about when Streaky realized that the spread of broadband Internet connections was finally making it feasible to send uncompressed audio to and from almost anywhere in the world.

The service is easy to use; potential eMasters customers register via the website at www.emasters.co.uk, and immediately receive access to 1GB of secure space on the eMasters server, free of charge. Tracks can then be uploaded to the artist's dedicated server area, where Kevin and Streaky can access them and master them, placing the completed files back in the user area afterwards for download. Users can append notes to uploaded files to point out particular aspects of a mix Kevin or Streaky should focus on, and the engineers attach mastering notes to the completed tracks when they've finished their work, to explain what they've done and why. "We value that contact between client and engineer, and want to keep it in our eMasters work — as much as we can when people are on the other side of the world," says Kevin.

This month, ten lucky *EQ* readers can take advantage of this novel approach to mastering, and win themselves the chance to get a track professionally mastered for free! If you'd like to have engineers Streaky and Kevin Metcalfe master one of your tracks to CD or vinyl via their eMasters online service, simply register for free at www.emasters.co.uk/eqregister.php. Then, head to www.eqmag.com to answer three simple questions you'll find there, and complete the tiebreaker in less than 30 words.

Note: Entries must be submitted on the *EQ* website by March 1st, 2007.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An Angry Letter from a Mastering Engineer

Yes, we still matter. Here's why.

by Garrett Haines

I'm shocked when I read the credits from many self, and independently, released albums. In the "Who's Who" of "Who Did What," oftentimes the mastering engineer's credit is either a.) missing or b.) bears a striking resemblance to the name(s) listed under engineer, mixing engineer, or producer. We're either chopped liver, or something downright foul is afoot.

In an age where every young Turk engineer is surprisingly well-acquainted with the most minute design details of every vintage mic under the sun, the age where even those with average skills can manage a fine recording at home, I have to wonder how a fundamental part of the record-making process has, in many cases, been neglected...and who is to blame for this commonplace travesty.

BIRDS OF A FEATHER

Over the years I've determined there are four types of bird-brains . . . err . . . artists who forego the hiring of a dedicated mastering engineer. They are:

- The Ostrich: Those who just don't know what mastering really is.
- The Parrot: Those who have been told that the sonic quality a real mastering job adds to an album isn't commensurate with the expenses incurred, and believes it.
- The Cuckoo: Those who are convinced that a mixing engineer should just go ahead and master the project while they are at it.
- The Peacock: Those who believe they can master their own recordings.

Every musician starts out as an Ostrich. Unless one of their parents was a mastering engineer, there's little chance that this person is going to have any understanding of mastering on the first day they step into a studio. But the ignorance excuse only passes once, and they are going to qualify for sympathy only after their debut album comes out a total mess. It's a sad situation, but forgivable . . . the first time around.

Then there's the Parrot who simply repeats what he/she has heard somewhere. Their favorite band ran up a mastering tab of twenty grand at a major New York establishment, so how could his or her band afford mastering on a meager budget? Never mind that said favorite band locked down the suite for weeks on end, prohibiting the mastering engineer from handling other projects, forcing the bill to rise exponentially. Nevermind that there are scores of experienced mastering houses that will accommodate a full-length release for hundreds of dollars. The Parrot is convinced that they can skip the mastering process altogether.

The Cuckoo tends to think that all recording engineers are the same. They've been working with their tracking and mixing person for a while, and see no reason to involve someone who is completely new to the project. This is the same person that's lilely to visit their dentist while in the midst of an appendicitis.

The Cuckoo is crazy, no doubt about it, but you do have to feel a little sorry for them — especially if they've been coerced into this insanity by their mixing engineer. And you have to feel sorry for that mixing engineer, mistaken as they may be, especially if they've lived a life tormented by mastering engineers that like to use stems to remix an entire album, just because they can. Or if they are dealing with Ostriches that turn their noses up when they hear their reference discs, notice they aren't as loud as commercial CDs and, from the look in their eyes, are about to make the decision to never, ever let that engineer touch another one of their albums again unless they juice the mix up haphazardly by crushing it to death with some plug-in. After all, it's hard to cover overhead in this day and age, and they are lucky

Garrett Haines, taking a break from yelling at you, prepares yet another master.

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An Angry Letter

that the artist was smart enough not to record the album in their shed in the first place.

But there are also recording engineers who like to insist that there is no need to hire a mastering engineer. Whether they do this out of stupidity or spite we may never know, but they need to get off the road. They are a danger to themselves and others.

Then, finally, there's the Peacock. From a certain standpoint, they could master themselves — hell, the box says so. They could also drive with their feet or conduct their own root canals. But that doesn't mean it's going to turn out well. Maybe they are just confused because they are focusing too much on the gear and not the craft. Sure, mastering labs rely on specialized equipment, but there are a lot of easily attainable tools available to home studio dwellers that are mastering cornerstones. And in the right hands, these tools can help someone help do a damn good job. So the Peacock whips out the credit card and begins flirting with disaster, seemingly oblivious to the important factors that go into real mastering. And the results, ubiquitously, are far from pretty.

SO WHAT CAN A MASTERING ENGINEER REALLY OFFER?

1. Perspective

After spending hundreds of hours listening to tracks over and over, a fresh pair of ears can provide crucial insight. Problems that may have been missed until now are not going to suddenly reveal themselves, especially on the same speakers in the same room. The mastering engineer is a clean slate, and a good one will immediately spot problems with frequency, balance, and even editing.

2. Relevant Experience

Mastering is a different discipline than tracking and mixing, and if it's not a skill that's been honed, there is no just "winging it." As the last step in the professional recording chain, a mastering engineer serves as the final opportunity to have a recording reviewed, and tweaked, before being sent to press. To even be labeled a mastering engineer takes loads of experience and, taking that into account, chances are that he/she will have numerous reference points and fixes for whatever problems may plague a particular recording — and will do so in the most transparent manner possible. So, if the mix is in top shape, the mastering engineer will polish the finals and send them on their way. Or, if the recording requires some added color, tone, or sweetening, then a mastering engineer has plenty of more active approaches available to better an album. Long story short: Employing a capable mastering engineer to handle the last phase of a recording is the only way to ensure that the final product sounds professional.

3. Proper Facilities

Real mastering studios are specialized environments that offer the benefit of differently tailored acoustic designs where

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one can hear everything in a more true sense before a recording is sent to duplication. Typically designed by acoustic designers and audio savvy architects, mastering suites have dimensions and treatments that allow both high and low frequencies to be reproduced clearly and accurately. In these mythological places, mastering is performed in a dedicated room with quiet, calibrated acoustics, and a single set of specialized monitors — which are much different than the close and mid monitors found in recording studios (*i.e.* a single pair of wide range speakers will bring out many more critical details of a recording). Sit in front of a pair of Dunlavy SC-Vs instead of a pair of standard studio monitors and hear the difference for yourself if you don't believe me — any potentially fatal flaws are made evident.

I had a pair of Superman underoos as a young child, but I couldn't fly. And just because someone bought a product that has "mastering" silk-screened somewhere on the box doesn't mean they can master an album. Though rapidly improving by the second, and being responsible for some passable results here and there, most plug-ins are just not capable of the transparency, clarity, depth, and impact provided by dedicated analog and digital hardware. Trust me, as a mastering engineer, if I could just drop a couple hundred bucks into my rig and have a quick fix, I would've done it a long time ago. Instead, I've mastered tons of albums just to make enough money to pay for single pieces of mastering-grade gear. I've never seen an iLok included in anyone's will, but if you look at mine, you'll find plenty of mastering equalizers.

THE SUM OF THE PARTS

So someone has the jack to rent a bunch of vintage tube gear to run his or her mixes through, or they may even have time booked at a world-class mastering suite in off-hours. Great. They could also have bought Tiger Woods' golf clubs off of eBay . . . but their swing isn't going to improve. If I waved a magic wand and magically conjured up Jeff Lipton's room at Peerless, Sara Register's perspective, Bob Ludwig's gear or Dave Collin's experience, it still wouldn't guarantee a better end product than what would have come from the lender. The combination of perspective, experience, and tools is greater than the individual elements, and the sum of these parts is likely to exist only in the form of a real mastering engineer.

As Jackson B. Jackson once wrote, "Unless you're a mastering engineer, you're not a mastering engineer." Truer words have never been spoken. But if you don't want to listen, go ahead and try your hand at it. I'm off to get some pie. EQ

Garrett Haines is a mastering engineer at Treelady Studios. He would like to acknowledge the following individuals for influencing this rant: Roger Nichols, Craig (Hutch) Hutchison, Dave Davis, Brad Blackwood, and Jackson B. Jackson.

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Practical Mastering

Ready to take the plunge? Read this first.

by Craig Anderton

If you're ready to try your hand at DIY mastering (as in, "This sounds better than the mix did"), let's sidestep the controversies about the artistic issues, and just deal with some practical matters.

EQUALIZATION: THE CRUCIAL PROCESS

Many novices now associate mastering with dynamics control, but it wasn't always this way. Mastering was all about EQ, with dynamics control added as a last step to accommodate the distribution medium (vinyl, cassette).

The excessive squashing of today's mastering appears to make EQ less important, but this is only because everything is brought up so much that indeed, differences in frequency response are flattened as well.

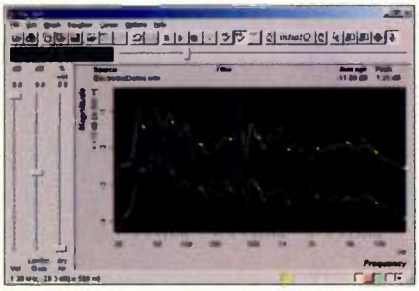


Fig. 1: Har-Bal is being used to tweak frequency response. The gray lines show the original spectral response; the yellow line shows the modified spectrum peaks, while the green line shows the modified average response.

So, the first step in mastering (after removing any DC offset) should be to tweak the EQ to perfection. My favorite tool for this is Har-Bal (Figure 1), which makes it easy to see where there are peaks/dips/holes/etc. in the frequency response. You then correct these by drawing in a new curve with a pencil-type tool.

You need to have some experience when using this; the object is not to have a *flat* frequency response but a *balanced* one, which are not necessarily the same thing. Lacking that, a quality EQ with at least six bands (and maybe more) is the way to go, as you may need to do some "microtweaks" in very narrow regions of the audio spectrum. Once the EQ is golden, do any required dynamics processing.

MASTER IN YOUR DAW

Although most people use dedicated audio editors like Adobe Audition, DSP Quattro, Peak, Sequoia, Sound Forge, Wavelab, and others, today's DAWs often have enough capabilities to do decent mastering: They include basic DSP (gain, normalize, remove DC offset, and the like) and the ability to insert plug-ins.

Although you can use individual mastering-oriented plug-ins, for a one-stop solution, consider iZotope's Ozone 3 (Figure 2; Windows only). This is a "mastering suite plug-in" with parametric EQ, various analysis tools, multiband compression, loudness maximization, stereo imaging processors, and the like.

Many times, you don't need even need to leave the DAW environment: You can bounce a mix of your tracks down to a stereo track, insert Ozone 3, mute all other tracks, and get to work. Once you're done, export the stereo mastered version with dithering, and you're good to go. When you save and archive the project, not only will you be saving the source tracks and project file, but the mastered version as well.

LOUDER, BUT WITH DYNAMICS!

In any given mix, occasionally transients will "pile on" each other and produce a peak that limits the maximum headroom you can use. Although limiting or compression will squash these, a better (albeit more tedious) approach is to isolate each one of these transients, and use a digital audio editor's gain function to lower the level.

This is easy to do with various programs; for example, Wavelab includes a "find peaks" function (go *Analysis > Global Analysis > Peaks* tab). If there are, for example, 12 peaks that exceed –3dB, you can simply reduce the gain of those peaks (select just the one or two cycles that exceed –3dB) by 3dB. Now you can bring up the entire file by 3dB, making it louder, but without disturbing any of the dynamics except those of the 12 peaks.

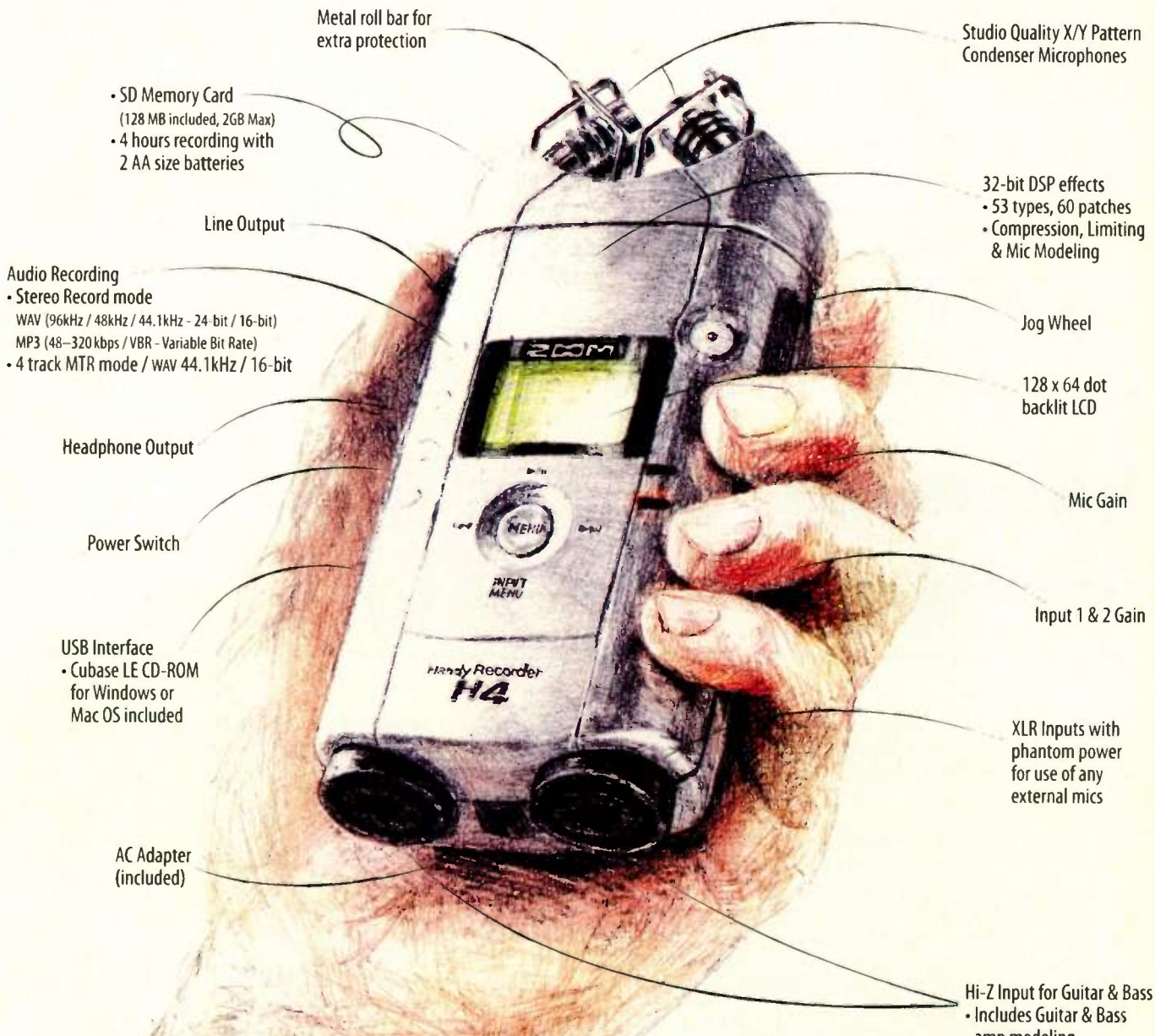
PLUG-IN PRESETS ARE INVALUABLE

When I do mastering, I try to get the final version sounding as good as I possibly can, but don't sign off until the client is happy. This is where plug-in presets are invaluable, because if the client says "I love it, but how about bringing up the voice just a little more," instead of having to explain they should have thought of that when mixing, I can call up the preset I used for mastering, and adjust the midrange EQ a bit to make the vocals more prominent. Some programs, like Wavelab and Sound Forge (Figure 3), let you save an entire chain of presets; with others, you'll need to save a preset for each processor you use, and load them into each plug-in individually.

Fig. 2: iZotope's Ozone 3 is a plug-in suite suitable for use with Windows hosts.

Fig. 3: Sound Forge's plug-in chainer allows creating chains of effects, and saving them (with settings) as presets.

The Swiss Army had nothing to do with its development.



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The Case Against Brickwall Limiting

Up against the wall, audio

by J.J. Blair

Back in the day, broadcasters used limiting so they could get the RMS signal as loud as possible without going over their allotted signal strength. While the program material was oftentimes highly compressed, there was no mentality of making a record as loud as possible because, unlike radio, the loudness was limited by the media's physical attributes. For example, if vinyl was mastered too loud, the grooves would have too wide an excursion and reduce the overall playing time. With cassettes, printing too "hot" caused distortion. It was a balancing act; the signal level compared to the inherent noise of the medium had to be balanced with the ill effects of pushing too hard on these formats.

Fast forward to the digital age: New digital processing options allow for true, realtime peak limiting, where the attack time can be zero. No more overages! This lets people close the gap between their peak signal and their RMS signal, meaning that while the unlimited version and the limited version will peak at 0dB, the limited version will give the impression of being much louder. With CDs as the prevalent medium, the singular concern was simply in having no peaks over 0dB, as jumping needles and tape compression weren't an issue; limiters became ubiquitous in mix buses, and mastering studios adopted "brickwall" limiting as the new protocol.

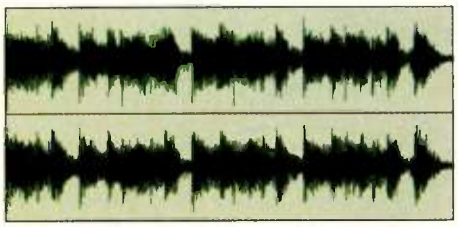

Fig. 1. An eight-second clip of audio, not limited. Look at those dynamics!

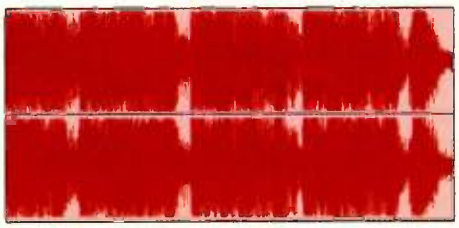

Fig. 2. The same figure, post-brickwall limiting. So samey. . . .

BUT WHY?

One anonymous mastering engineer with well over 500 credits explains: "The labels would send a track to three different mastering engineers, and they wouldn't pick the best-sounding one, but the *loudest* one." This spawned what became known as the "Loudness Wars," fueled by labels and artists noticing the relative loudness of certain CDs that were brickwall limited, and requesting the same treatment from mastering engineers.

WHAT'S WRONG WITH HAVING THINGS AS LOUD AS POSSIBLE?

Nothing . . . if you don't mind sacrificing dynamics, which brickwall limiting does. For example, in one very popular song, the verse is sparsely populated with sound, while the chorus is the band in full throttle. But, when that chorus comes, the music suddenly sounds smaller, and the drums practically disappear. This is because the recording was brickwall limited. The verse was already as loud as could be, and when the chorus was supposed to get louder, more limiting kicked in. You have to wonder if that's congruent with the original intent of the band — after all, they added extra instrumentation and velocity to the chorus probably to make it "bigger" than the verse, but the brickwall limiting sure neutered that idea.

Brickwall limiting also messes with the mix's balance. Note the waveform peaks in Figure 1, which are kick and snare. Brickwall limiting makes those transients quieter, so that everything else can be louder; in Figure 2, these transient peaks no longer exist. So all that time spent mixing, getting the drums just right, can be for naught once brickwall limiting comes into play. And if you make the mistake of limiting your mix, there's no room for dynamic tweaking in the mastering process. Compression and limiting are completely different processes; limiting the mix really impedes the ability to touch the master with compression — which can "glue" everything together nicely, and let the end product "breathe." It just doesn't work as well after the fact.

There's also the distortion artifact factor. After comparing 1/4" masters to the finished product, I (and many others) have noticed that certain limiters add distortion when brickwalled.

THE DOWNSTREAM CONSEQUENCES

Also consider what's going on beyond the master. As the preamps in many consumer CD players cannot tolerate the "hotness" of brickwall-limited signal levels without running out of headroom, while you may not have any digital distortion from your actual product, you will encounter distortion to some extent from many "civilian" players. Furthermore, when the music is converted to MP3, WMA, or AAC format, any prior distortion becomes amplified, and distortion that didn't exist before may miraculously appear. The more dynamics a track has, and the quieter it is overall, the easier it is to convert to these formats; less limiting and loudness means less information, which means more opportunity to conceal the negative effects of this conversion compression.

But to come full circle to the genesis of limiting, if the music ends up being played via radio stations, brickwall limiting is even more damaging, as the radio station has to limit *again* to pump a track out over the airwaves, resulting in some pretty bad-sounding songs emanating from your car. A program director of one popular L.A. radio station told me that tracks given the loudness treatment pre-broadcast have treble that is "very scratchy." And another big station in L.A. says that they received complaints from listeners that "couldn't understand the lyrics," which the station attributed to a byproduct of pile-on limiting.

WHY DO PEOPLE INSIST ON BRICKWALL LIMITING?

I don't know, and most mastering engineers admit privately that they want it to stop. I like to imagine a world where mixers and mastering engineers weren't forced to acquiesce to the requests out of fear of losing their business; a world where artists realized that making their albums as loud as possible doesn't equate with better sound; a world where listeners were made to tackle their level requests by reaching over to the knob on their playback system labeled "volume" — and just turning the damn thing up.

"V" FOR Windows Vista

A new Microsoft OS is a big deal. But this time, it's a big deal for pro audio

by Gary Garritan

The wraps are finally coming off Vista. While there's been a lot of buzz about the look, the graphics, and the seemingly never-ending product introduction delays, a quiet audio revolution has been happening behind the scenes in Redmond. And as we get closer to the day when Vista actually hits the shelves, it's becoming transparently clear — like the "Aero" look itself — that Vista, the next-generation Windows operating system, takes pro audio *very* seriously.

Windows is installed in about 95% of all client computers, and it's been awhile since Microsoft introduced a new operating system. Part of that is because, frankly, Windows XP really got it right. It seemed light years ahead of Windows 98, and thanks to widespread support and excellent stability, there was no great clamor to change it. Yet Windows Vista represents the most important element in Microsoft's upcoming product roster; it's expected to sell upwards of 100 million copies in 2007. With those kinds of expectations, Vista couldn't just be an incremental upgrade — it had to set phasers on stun, and wow the target audience. Luckily for us, Microsoft considers pro audio a vital part of that target audience.

OVERHAULING THE WINDOWS AUDIO INFRASTRUCTURE

The audio in earlier versions of Windows has never quite worked the way pro audio software developers wanted, and was getting unwieldy and difficult to modify. So, Microsoft rebuilt Vista's underlying audio architecture to provide greater performance, stability, and audio fidelity; the company is even hopeful Vista will spark a new round of evolution in music technology.

Microsoft has now made it easier for developers to write programs by simplifying the way software interfaces with the underlying hardware. There's a lot more going on under the hood, like revised driver structures, enhanced API sets that provide application isolation (one badly behaving audio app can't bring down the system), incorporation of reusable components to reduce the need for custom components, and optimization to prevent memory fragmentation and manage large memory requests.

There's also an emphasis on improved audio quality. In rewriting the audio stack, an entire new audio subsystem evolved called User Mode Audio (UMA), with developers using a new set of interfaces known as WASAPI (Windows Audio Session API). Windows Vista uses 32-bit floating point calculations by default in the core of the audio system to provide higher-quality digital signal processing, bit-for-bit sample level accuracy, and up to 144dB of dynamic range. And the new audio WaveRT (Wave Real Time) architecture allows for much lower hardware latency in audio apps. Developers will certainly have a much better underlying audio system as a foundation.

But will your current apps work? Most likely. Although completely overhauled, Microsoft wanted to make sure there was backward compatibility in Windows Vista. Current music apps and drivers should work fine, except some may not when you venture into 64-bit systems — we'll cover more on this later.

Like the audio infrastructure, the MIDI engine has also been rebuilt to minimize system wide impact, but you won't see any new MIDI features just yet. Nonetheless the underlying work has primed the platform for changes, and presumably, Windows Vista follow-up releases will take advantage of this.

Fig. 1: The Volume control allows adjusting the level of any currently open applications that use sound. To the left is the Main Volume slider, which controls a specific output, and to the right are individual sliders for open applications; positioning the mouse over the icon provides more detailed information.

"VISTA"

Fig. 2: It sure beats Alt-Tab — Vista's unique "rolodex" view makes it easy to see which applications are open.

GLITCH RESISTANCE

The entire OS has a priority structure, where a new operating system feature (Multimedia Class Scheduler Service) can prioritize audio apps over other processes to provide glitch-resilient operation. Under current versions of Windows, a wi-fi alert, instant message, antivirus program or some other process could steal processing power from the application and cause an audio glitch; so it was necessary to disable various programs to make sure they did not interrupt. But despite best efforts to disable potential threats, Windows is a busy system and there are processes always going on — networking, drive scanning, caching, etc. Sometimes priority gets confused and if every process has the same priority there can be a bottleneck or, even worse, a crash.

Microsoft endeavored to make the audio in Windows Vista as glitch-resilient as possible by allowing apps to prioritize audio over all other application processes using MMCSS. Once applications start to utilize this new feature, you will be able to run your audio in Windows Vista without having to go in and disable various processes.

At the Microsoft Audio Summit held last year, Arif Gursel (Program Manager on the Microsoft WAVE team) ran a massive stress test demonstration — the equivalent of running dozens of apps simultaneously to try to break the system. The audio processing and playback was prioritized over other apps, video, mouse movements, screen redraws, etc. and no matter how hard he tried to stress the system, the audio kept playing seamlessly. I was pretty impressed.

PER APP VOLUME CONTROL

In the previous versions of Windows, volume was universal across all apps so some sounds might blast you while others were barely audible. Not only that, but each new app might change the settings on the system and alter the sound. This got so confusing that some audio devices shipped with their own control panels, and disabled the system device controls.

With Vista, the Per App Volume control feature provides separate volume slider controls for each application that plays audio, thus giving the option to differentiate and control what's piped through the audio engine (Figure 1). The user interface is easy for the average person to understand; the apps as well as the Window System sounds are on their own volume slider.

In many cases Per App Volume Control may not apply to DAWs, which will utilize

HARDWARE ISSUES

A good DAW requires a set of well-defined components. Microsoft's "open system" allows users to pick precisely which hardware, as well as some software, components they want in their system. Making the right choices will be critical to maximize performance.

A number of manufacturers (such as MusicXPC, Carillon, Sweetwater, ADK, Rain Recording, etc.) are creating PCs specifically for audio users. These companies do the research to get the right combination of components for DAW applications, and provide excellent support. But if you prefer to build your own system, you can have a powerful and stable rig without breaking the bank by following these recommendations:

- **Make sure your core, non-DAW components are high quality. The Windows logo program requires hardware manufacturers to meet specific quality standards. Having an approved component means you can be certain the component has met these standards, and allows manufacturers to distribute their drivers on the Windows Update site.**
- **Identify the audio system components you are most concerned about and check their websites for compatibility with Windows Vista. Driver updates will be more important than ever.**
- **Check out forums (like www.northernsounds.com), blogs, etc. to identify which hardware works best with your software. A good source of Vista information is the Microsoft site, their user forums, and blogs (such as Larry Osterman's blog).**

"V" FOR "VISTA"

INTERVIEW WITH JIM ALLCHIN

As co-president of Microsoft's Platforms & Services Division, James (Jim) Allchin shares overall responsibility with Kevin Johnson for the Microsoft division that includes Windows and the various Windows development groups. And as a member of the Senior Leadership Team at Microsoft, Jim has the task, along with Steve Ballmer and Bill Gates, of developing Microsoft's core direction. We asked Jim about his thoughts on music and Vista.

Gary Garritan: *The music community is both thrilled — and relieved — that Microsoft will be focusing more on audio in Vista. Why do you feel audio and music production is important for Vista?*

Jim Allchin: Audio and music production has always been important for Windows, though in the past we didn't do as much for professionals as I would have liked. Windows Vista has given us the opportunity to make the underlying architecture and services more powerful and also easier for developers to harness. As a musician myself, I'm very happy to see the overall improvements and I've always pushed the Windows Audio team to do more. The spirit behind Windows Vista is to help connect people with their passions through a set of well-defined experiences, and music is one of them.

GG: *Could you tell us about your musical background? And how does your music background help you to focus on the audio and music aspects of Vista?*

JA: I'm an avid musician. In high school I started on the trumpet and played in the stage band. Later I got immersed in the guitar. For a while I was a professional musician, until I decided that technology was a more stable way to make a living. I have a music studio in my house and I use a lot of the tools that audio developers create. Some of these music scenarios are quite complex to manage, and to a degree that is our fault. Up to now it's been too complicated to figure out how to use things in the system, and applications have been too hard to write. We've worked to simplify both the end user experience and developer experience in Windows Vista. I think the progress is significant, and we hope that the results will save people both time and money. Since I have firsthand experience composing, recording, re-mixing, and listening, I've been able to give our development team some pretty detailed feedback.

GG: *Does music help you in your job and your life?*

JA: Music is a huge part of my life. In fact a lot of technical people at Microsoft are quite accomplished musicians. I think music attracts engineers because it's a unique combination of creativity and math. It's in a sense geeky while being immensely cool.

GG: *What role do you see software musical instruments playing in the future?*

JA: [Think how] electronic text complements printed material; software musical instruments complement physical instruments in a similar fashion. Printed books will never go away, but computing provides methods for searching, organizing, sharing, and visualizing information that books can't. For example, Princeton University has a laptop orchestra. One of the pieces they perform simulates the sounds of a casino. Each laptop is virtual slot machine whose sounds change based on whether the musician is "winning" or "losing." The conductor, who is a computer science professor, leads the orchestra from a server attached to all the laptops via a local area network. His job is to make sure that no musician is winning or losing too much. The piece is unique every time it's performed — the conductor doesn't use a baton to control sound, or even tempo. Also, think about the way computing can be used to automate the synchronization of sounds with sights. A simple example is a laser light show. Computing is broadening the tools we can use to create and manage artistic performance.

GG: *Do you see Windows Vista becoming the primary platform for the musician?*

JA: That's certainly our hope, as we've done a lot of work to simplify the audio architecture. One thing we did was to move some logic into the system plumbing, making it easier for an entry-level user to produce music on a PC with an on-board audio card solution. Having a self-contained audio engine means we can update it as we go. We've improved latency as well as the speed of disk I/O, and allow applications to have exclusive access to the hardware. The more developers take advantage of the new capabilities in the system, the better the experience will be for musicians. It's important for your audience to let the software and hardware community know what they want from their tools.

Fig. 3: Vista's search function is a major improvement over previous Windows, and is integrated into more aspects of the operating system.

exclusive mode (for performance) and are exempt from the Volume Control. Otherwise, it's a great feature for the customer trying to play multiple apps with sound.

OTHER VISTA FEATURES

One of the most talked-about features in Microsoft Windows Vista is a new glass-like interface called Aero Glass: The various windows, icons, toolbars, and other elements sport a translucent 3D design that you can see through, with animations, glassy reflections, drop shadows, scaling and vector-based graphics (the downside: you'll need a powerful graphics card). This also means other possibilities, like making semi-transparent virtual instrument GUIs so you can see the controls, yet also see what's happening on the tracks related to the instrument.

Microsoft has made some real leaps forward in navigating your PC with a 3D "rolodex"-style flipbook of your active windows (Figure 2). Users will appreciate the way the new search feature works, especially the way it navigates (Figure 3). But while the user interface seems more intuitive on the whole, it may take a little getting used to; if you want to go with what you already know, it's possible to go back to the classic (2000/XP) look.

There's also a new Windows Media Player with a cleaner, more modern user interface. It allows playlists to span multiple devices, and offers greater sync compatibility with various devices. I was able to auto-sync music, videos, and photos with no problem (currently there are over 130 devices on Microsoft's PlaysForSure compatibility list). Also, Speech Recognition is built into Windows Vista so you may want to try to control your sequencer transport with your voice.

Clicking on the Start menu no longer opens a long list of programs, as the Vista Start Menu integrates a desktop search feature (Quick Search) that helps you find and launch just about anything on your PC. Type in a word, name, or phrase, and Quick Search can find the right file. The new Start Menu also makes it very easy to navigate installed applications on your PC.

The audio DSP built into Vista is interesting, but will be more relevant to consumers than to the pro audio world. New audio and communication features include room correction (to find a "sweet spot" for the listener), bass management, loudness equalization DSP, acoustic cancellation (for communications), virtual surround (5.1 and 7.1), microphone array solutions, speaker phantoming, and various other audio features. Although designed primarily for media centers and home theater, it is interesting that Microsoft is focusing on these features, which could eventually make their way into music apps and plug-ins.

CALL SECURITY

Windows Vista eliminates the need for separate antispyware and firewall programs, as these security measures are built into the OS. There's also a new User Account Control policy that changes the experience in a number of ways, most noticeably by preventing applications from auto-installing themselves without your approval — although unfortunately,

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you will be prompted for approval when installing legitimate applications as well.

Driver signing, while controversial, is designed to help increase Windows security by letting users identify the source of the software they are installing, thus avoiding malware (spyware, viruses, etc.). A "signed" driver (or any signed component) simply allows Windows Vista to verify the author of the software and assure it is from a trusted source. Without this signature, Windows Vista cannot tell whether the code is legitimate or a virus. In Vista, Windows validates that 64-bit drivers are signed before they are allowed to run. 32-bit versions of Windows Vista do not require signing to load a driver, but there are certain features that may not work (such as playing some protected content) if unsigned drivers are running.

Microsoft has not been too forthcoming over the new Digital Rights Management protection Vista will incorporate, but it seems there will be protection at the OS and driver level, and the ability to disable output depending on the digital rights incorporated in the media. DRM is important to musicians who want to protect content distributed to end users/consumers, but how it's accepted — and whether it's intrusive — remains to be seen.

DECISIONS, DECISIONS

Windows Vista comes in an array of packages: Windows Vista Starter, Home Basic, Home Premium, Ultimate, Business, and Enterprise. Windows Vista Starter is primarily a bare-bones version for developing countries that is not upgradeable; it is not available to the public, and can be purchased only preloaded on a computer. Home Basic supports only single processors, whereas the Business and Enterprise flavors are targeted at businesses that require additional networking and management capabilities.

Although Microsoft is testing audio on each Vista edition, most musicians and audio pros will want Windows Vista Home Premium as it supports multiprocessing system and incorporates features needed for pro audio. Choose Windows Vista Ultimate Edition if you need to connect to a server-based network, administer users, or host remote desktop sessions. If you don't know which to get, start with Home Premium and upgrade to Windows Vista Ultimate later (the Control Panel's Windows Anytime Update makes it easy to purchase and download a Window Vista upgrade). At press time, expected prices for Windows XP Home Edition are $200 new/$100 upgrade and for Windows Vista Home Premium, about $240 new/$160 upgrade. Windows Vista Ultimate will run about $400 new/$360 upgrade.

32/64: TWO REAL CHOICES FOR MUSICIANS

64-bit computing is the future; not only will it eventually replace 32-bit computing, it offers significant advantages in audio production. Except for the Starter version, all Vista versions support 32-bit and 64-bit installations. Most audio apps are reported to run more efficiently in 64-bit systems; audio apps are highly processor and memory dependent, and 32-bit operation, being limited to accessing 4GB of memory, creates a major limitation. 64-bit supports 128GB right now, with theoretical limits being much higher.

Running 64-bit Vista requires having 64-bit drivers regardless of whether the applications that use them are native 64-bit, and all 64-bit drivers and kernel mode code must be signed. Software vendors will also have to build specific 64-bit versions to take advantage of 64-bit computing. Although you can run your 32-bit music apps on 64-bit machines, you'll also need 64-bit plug-ins (or an adapter like Cakewalk's) to use your 32-bit plug-ins on a 64-bit system running a 64-bit app.

I tested several music apps and they seemed to work well with the Windows Vista beta. Almost every hardware and software manufacturer will supposedly work with 32-bit Vista without any major change. There are some features in 64-bit Vista that will require changes by the manufacturers to enhance your experience (especially with regards to signed drivers); before you upgrade, check that your software and hardware are Vista-ready.

HASTA LA VISTA, BABY!

Will you want to upgrade to Windows Vista? If you are into audio on a PC, the answer is yes — but make sure all your audio apps and hardware are supported so they can take advantage of the significant audio improvements.

Overall, it's clear that Microsoft is taking a big leap forward in providing a better music and pro audio platform. And this is just a peek of what's to come, as Microsoft has mentioned that it plans to continue improving audio. Windows Vista represents a significant leap over Windows XP — and I think many musicians will be pleased with what's coming. EQ

Gary Garritan *is an award-winning soundware developer. His sample libraries have won accolades from celebrity musicians and music press alike, and been used in a variety of applications: from popular TV shows, film and attractions to video games, live concerts and ballets. Many schools and universities have chosen Garritan Libraries for use with their music programs.*

The John Lennon

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UNIVERSAL AUDIO UAD-1E EXPRESS PAK PCIE DSP CARD AND PRECISION MASTERING BUNDLE

We're talking bundles of joy

by Garrett Haines

It just wouldn't be the computer industry if standards were not constantly changing. While most of us rely on PCI-format expansion cards, brand-new computers have motherboards with the latest slot format: PCI Express (PCIe). Universal Audio, one of the leading digital audio hardware/software vendors, has filled the need for a PCIe solution with the UAD-1e Express PAK (card + 100 UAD$ voucher for additional plug-ins) and Expert PAK (card + 750 UAD$ voucher). Each offers the same horsepower and reliability associated with the UAD-1 line, but in a 1x PCIe format.

OVERVIEW

Welcome to the paragraph where we indulge in the obligatory PCIe definition, review the merits of this format, and ponder the performance impact it will have on our digital audio workstations. Don't worry, we'll keep it brief.

Basically, the existing PCI standard specifies that all cards share a communications line that goes to a bridge chip. In turn, the bridge maintains contact with the CPU (this is akin to everyone in an office sharing a single telephone line). For day-to-day computing this is fine, but shuttling lots of audio and video data can cause traffic jams.

PCIe technology allows each card to have a direct communications link to the PCIe switch: There's no more sharing of the communications channel (*i.e.*, everyone gets their own phone line). By centralizing data and resource flow functions, the PCIe switch can prioritize data packets so realtime activities such as audio recording can take priority. While this doesn't mean your UAD card will magically acquire more DSP power per se, PCIe can reduce latency and, through better resource management, make better use of the newer, faster CPUs.

APPLYING THE CARD AND PRECISION MASTERING BUNDLE

I installed the UAD-1e in a Dell workstation with an available PCIe slot. The UAD-1e card is rated at 1x PCIe bus speed, yet my slot is rated at 4x; however, UA confirmed their cards will work in any speed PCI Express slot (1x, 4x, 8x, 16x, etc.). Plug-ins were tested using Magix Sequoia, with a variety of sources (plug-ins are VST or AU, with RTAS support available through a free VST-to-RTAS wrapper that's part of the installer). As the bundle included with the UAD-1e card is fairly enormous, we'll focus on the Precision Mastering Bundle (PMB for short), which includes an equalizer, multi-band compressor, and limiter. (For details on the various plug-in options, go to www.uaudio.com.)

The Precision Equalizer is a stereo (or dual mono) four-band EQ. It also includes a high-pass filter that lets highs, mids, and everything in between pass through unimpeded. The Precision Equalizer has a clean, neo-vintage interface that reminds me of a Fairchild Compressor crossed with a Manley Massive Passive. And, like many mastering compressors, the gain controls are stepped, making for easily repeatable settings. UA chose 0.5dB increments for the ±0 to 3dB range, and 1dB increments for the ±4 to 8dB range, which works well in most situations. One of the cooler features is how some bands can overlap; this allows many experimental boosts and cuts that other EQs could not perform.

Of the three PMB members, the EQ was my favorite in a mastering setting. I found the sound to be an intriguing blend of both transparency and musicality. It's not as clean as an MDW EQ or an Algorithmix LP Red, but it's not particularly colored either. In the right context, I would have absolutely no reservation adding this to my chain. Given the flexibility to bypass bands that are not in use, I was pleased that I could use the Precision EQ tactically, as needed. In a straight-ahead rock mix, I was able to tame low-mid mud very well.

Furthermore, the 0.5dB gain controls and preset Q widths made finding settings quick and painless: I was also able to bring out a vocalist by using a narrow curve and 1.5dB boost in the right area. Though I tend to rant about the inferiority of "mastering" plug-ins, the Precision EQ is a damn good complement to my outboard gear. I really liked the results I got with it.

Turning from mastering to mixing, the Precision MultiBand, with five bands and an intuitive interface, is quite possibly my new favorite multi-band. Adding to the Multi's flexibility, you can choose linear phase (which works brilliantly for de-essing) or minimum phase processing, which has a more "rack gear"-like behavior; this was great as a drum bus compressor. Everything I tried it on, from bass guitar to backing synth beds, benefited from the treatment. If you typically call upon a multi-band compression plug-in for mixing, try this multi-band monster. Don't let the mastering moniker put you off, this is the new multi-band plug-in to beat.

The Precision Limiter also offers more than meets the eye, serving as a high-resolution metering system. Four modes are

available: Peak-RMS, K12, K14, and K20 (taken from Bob Katz's 'K' System). And, if you feel like it, you can bypass the limiter and just use it as a meter.

As a limiter, the Precision worked very well, and being digital, it can "look ahead" to stop any potential overs. It pumped much less than most other limiter plug-ins, especially using the Auto Release settings. However, the key to the Precision is the Release and Contour modes, which can affect the sound's overall "punchiness," as well as give a source more or less "presence." Consequently, the Precision can be a total chameleon depending on the source. As with the Multi, I suggest UAD owners try the Precision on individual tracks and buses in mixdown situations. I had good success making a guitar solo sit in a mix in that glassy, '70s AM radio way (and I mean this as a huge compliment). And, using the Contour function, I was able to pull backing vocals up in a guitar-dense mix. Try doing that with your ordinary limiter!

CONCLUSIONS

Although they are labeled as mastering plug-ins, the Multi and Limiter are some of the best mixing tools I've heard in a while. Don't believe me? UA offers a 14-day demo, so if you're an existing card owner, give it a try in your own studio . . . but heed these words of warning: Those two weeks can fly by fast, so have some test material lined up. And if you're a mastering engineer who's blessed with a UAD card in your machine, you should definitely put the Precision EQ through its paces. As either a main or utility device, the EQ goes a long way. (Note: If you already know you want the PMB, the UAD-1e Expert PAK provides a 750 UAD$ voucher you can use to buy it.)

If you thought the UAD cards were a "fad" that would fade when faster CPUs hit the market, I have some advice: Wake up and smell the throughput! The UAD line is rock-stable, scalable, and complemented by some of the best sounding plug-ins available. I have no doubt systems featuring multiple UAD cards will be as ubiquitous as Pro Tools HD systems in the years to come. If you use any kind of digital audio workstation, the UA line delivers. EQ

Product type: PCI Express Card with various plug-in bundles.
Target Market: Those needing a PCIe-based DSP solution who also want to add some great plug-ins to their DAW.
Strengths: Great value. Some of the best-sounding plugs on the market. Plug-in license works on up to four cards at a time.
Limitations: Multi-mono mode not supported in Pro Tools. Plug-ins are DSP-hungry; one card might not be enough.
Price: UAD-1e cards are available as UAD-1e Express PAK ($750 list) and UAD-1e Expert PAK ($1,299 list). The Precision Mastering Bundle is $500; separately, the Precision EQ is $199, Precision Multi-Band $249, and Precision Limiter $199.
Contact: www.uaudio.com

BIAS PEAK PRO 5.2 XT

The premiere Mac editing program climbs another peak

by Craig Anderton

At one point, Peak was the only option for Mac-based digital audio editing. Alchemy had vanished, Digidesign abandoned Sound Designer II to pursue Pro Tools, TC's ill-fated Spark hadn't yet appeared, and i3's DSP Quattro was still a few years off. Peak 1.0 was initially a bit rough around the edges, but at least made it possible to do serious audio editing on a Mac.

Over the years, though, Peak (now at V5.2, with Universal support) has matured into a stable, serious, and creativity-friendly program (Figure 1). It "turned the corner" with version 4, which embraced Mac OS X to the fullest, remedied some annoying omissions, and cleaned up the workflow. Although its roster of plug-ins was limited, the new Peak Pro 5.2 XT package (which lists for twice as much as Peak 5.2) makes up for lost time with a solid, and sometimes inspired, suite of plug-ins called Master Perfection Suite.

While Peak 5.2 includes the Freq-4 (4-band parametric) and Sqweez compressor/limiter, the XT version adds GateEx (gate/downward expander), PitchCraft (pitch correction/transposition), Repli-Q (linear phase EQ/spectral matching), Reveal (suite of analysis tools), SoundSoap 2 ("one-click" noise reduction and restoration), SoundSoap Pro (more flexible version of SoundSoap 2), Sqweez-3 and Sqweez-5 (linear phase 3-band and 5-band compressor/limiter respectively), and SuperFreq-4, SuperFreq-6, SuperFreq-8, and SuperFreq-10 (4, 6, 8, and 10-band parametric EQs, respectively). Note that these plug-ins (except both SoundSoaps) cannot be used with sequencing hosts as of this writing, but a free update is planned that allows AU, VST, and RTAS compatibility.

GETTING STARTED

Peak works in trial mode for 14 days; you then need to authorize (online or phone, and it's painless — BIAS has made the dongle optional). The Master Perfection Suite of plug-ins do require a dongle (included) for the time being; the SoundSoaps get registered online.

As there's a demo you can check out for yourself, instead of covering the basics, we'll look at some of the areas where Peak stands apart from the crowd.

Fig. 1: The upper left shows the SuperFreq-10 equalizer; to the right is the Reveal suite of analysis tools. The generous DSP options are shown in the menu toward the middle of the screen, while SoundSoap Pro is behind it and to the left. The loooong meter is at the bottom, and just above it, one channel of the waveform view.

MANAGING PLUG-INS

Although Peak has only five insert slots, you can insert the outstanding Vbox plug-in into one of these slots and gain an essentially unlimited number of effects. Vbox is basically an effects matrix plug-in that hosts VST/AU/BIAS plugs and lets you create series, parallel, and series/parallel effects chains. Within Vbox, it's easy to mute and solo effects, as well as move ("hot swap") effects around, save/load presets, adjust input and output levels for each slot (with full metering to aid in level-setting), and set up A/B comparisons with different effects setups.

THE DSP

Much of this menu remains unchanged, but it's a strong point. While the DSP includes the usual suspects, there's also an impulse-based reverb and "sound designer's delights" like Envelope from Audio (an envelope follower), Harmonic Rotate, Phase Vocoder, Rappify, Reverse Boomerang, and Convolve (some of these take a while to crunch all those numbers, but the results can be worth it). Rather than try to describe these, just download the demo and listen for yourself. You'll be impressed.

THE MASTER PERFECTION SUITE

If you're into mastering, this plug-in suite transforms Peak 5.2 into a serious mastering machine. For starters, I like that the meter along the bottom extends the region between –8dB and 0dB, as you can really see what the peaks are doing. However, I would also like the option to choose different scales; sometimes you're more interested in what's happening at the bottom of the range than the top.

The Reveal plug-in offers an oscilloscope, peak and RMS power history, spectrograph, pan power, spectrum analyzer, phase scope, and peak/RMS level meters. One view shows these as "thumbnails," or you can click on tabs to make one function (with additional controls) fill the Reveal window.

The EQs sound good, but the SuperFreq-10 is built with mastering in mind — the 10 stages can each be set for lowpass, highpass, high shelf, low shelf, or peak; there are individual bypass controls for each band, and an intuitive graphic interface. I like that you can store four settings, and A/B/C/D among them. What I don't like: The graphic interface isn't very tall, yet covers a range of ±24dB. I'd like to see the scale adjustable to at least ±6, ±12, and ±24dB.

The multiband compression interface (Figure 2) is outstanding. It's easy to see how the bands are EQ'ed, as well as the thresholds and other parameters. I particularly appreciate the ability to set a maximum amount of gain reduction.

PitchCraft corrects vocals and such, but also does a surprisingly good job on program material if you match the pitch change with its corresponding formant change. Finally, Repli-Q is also cool, as it lets you superimpose the response curve of one piece of audio on to another. This has more uses than the obvious ones (see "Curves of Steal" in the Aug. '05 issue of *EQ*), and is also useful for analysis as it can show "holes" or peaks in audio that would be difficult to see with a spectrum analyzer.

OTHER FEATURES OF NOTE

Some features aren't new, but deserve the

spotlight too. The Pow-r dithering is an essential mastering tool for going from higher to lower bit resolutions, and Peak's handling of loop-oriented functions is superb. For example, the Loop Surfer function lets you specify a particular tempo and number of beats; Peak then automatically sets up a loop based on the loop start. (It can also calculate tempo, as well as "guess" the tempo.) After initiating Loop Surfer you can still adjust the start/end points, but more interestingly, you can move them in tandem. This allows trying out different loop placements, while retaining the same number of beats. If you're into extracting loops from files, this can save a lot of time.

Peak also excels at batch processing and scripting; and it still supports several hardware samplers, although your Mac will need a SCSI interface adapter to take advantage of this.

CONCLUSIONS

Version 5.2 is not only the best Peak yet, but with this version, it's joined my other editors in "heavy rotation" for editing-related tasks. For mastering, there's a precise, well-oiled, reassuring vibe: It *feels* like a mastering suite. For sound design and sample creation, it's flat out wonderful. As I was testing out various features, more than once I made sure to hit "Save As" because I'd stumbled on something genuinely cool.

Peak has never been a pretentious program; it's always been about getting the job done. But Peak Pro 5.2 XT earns its keep as a hard-working, reliable, pro piece of software that's inspiring as well as utilitarian. EQ

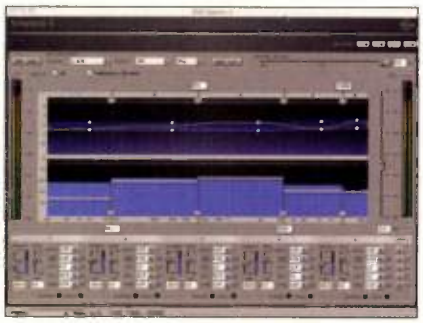
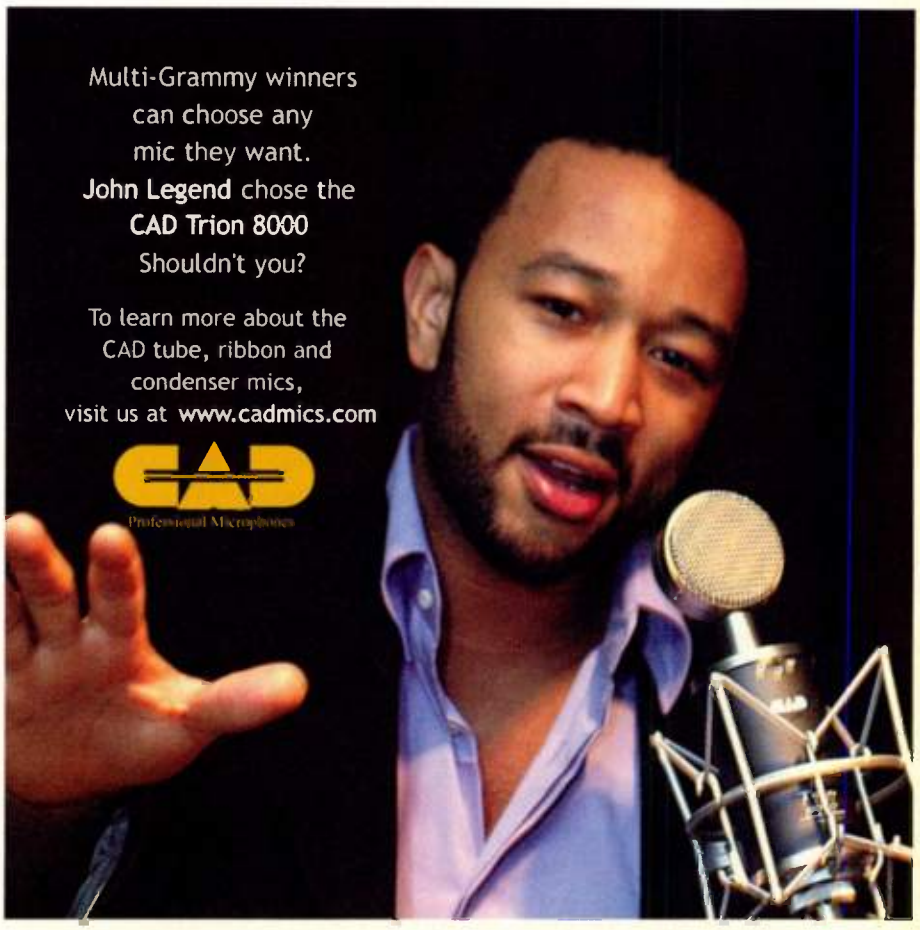


Fig. 2: The multiband compressor has an exceptionally well-designed, and informative, interface.

Product Type: Editing, mastering, restoration, and CD-burning software for Mac OS X 10.3.9 and up.
Target Market: Mastering, sound design, post-production, sample editing, CD creation.
Strengths: Significant DSP functions and restoration tools. Supports VST and AU instruments. SoundSoap provides effective noise reduction. Clean sample rate conversion. Excellent printed manual. Sophisticated CD burning options *(e.g.,* CD Text). Strong looping and analysis tools. Vbox plug-in matrix. Great multiband compression, solid pitch correction. Aesthetic interface. DDP export optional ($399).
Limitations: No surround editing. Some interface labels hard to read. Fee-based phone support after three incidents in 90 days (free online support). Can't re-record the output.
Price: $1,199 list (Peak 5.2, $599)
Contact: www.bias-inc.com



TC ELECTRONIC KONNEKT 24D AUDIO INTERFACE

An interface with the TC pedigree? Yes, but what exactly does that mean. . . .

by Craig Anderton

Do we *really* need another FireWire audio interface? TC thought so, and they have indeed come up with a novel twist on the audio interface concept.

BASICS

I/O means two front panel, XLR+1/4" mic/instrument pres (switchable to rear line level 1/4" ins), two additional line ins, and four line outs; in digital-land, there's MIDI, optical (S/PDIF or ADAT — standard 44.1/48kHz, and SMUX for four channels at 88.2/96kHz), as well as S/PDIF coax I/O. A phantom power switch turns on a real +48V for both ins. Of the two headphone jacks, one works as usual, while the other mutes outputs 3/4 when you plug in the phones.

Fig. 1: The mixer applet and processor interfaces are as clean as the sound.

The K24D can be bus- or AC adapter-powered. There are two FireWire ports, which let you chain up to four K24Ds. It's worth noting that I took the thing apart (the construction is top-notch), and there's shielding within shielding — this box won't dirty up your electrical environment.

The cosmetics are very northern Euro: Shiny metal casing, white front panel with a shiny clear plastic overlay, oval knobs so they're easy to grasp without disturbing other knobs, and a visually appealing LED "light ring" around a multipurpose control whose function depends on what you select with a front panel pushbutton.

APPLYING THE KONNEKT 24D

Here's where it gets interesting. The mixer applet (Figure 1) provides the usual direct monitoring and routing options, but also has edit pages for two very hip processors that run on the K24D's internal DSP: the Fabrik C channel strip (EQ and dynamics) and Fabrik R (algorithm-based reverb). These sound *wonderful* — the reverb (fed by send controls) runs circles around just about any plug-in that comes with your host of choice, and the dynamics control and EQ are both crisp and tight.

They also have "outside the box" interfaces that involve dragging around what seems like pieces on a game board; these each tend to control multiple parameters , so you just drag around until things sound good (or look at the numericals if you want old school).

But it's bonus time: The K24D can serve as a stand-alone processor (yes, stick the reverb in your mixer's aux bus, or use the dynamics in a channel insert). You can also use either effect as a send/receive effect in software hosts (or with Cubase SX3 and 4, as a pseudo-VST plug-in); this involves sending signal out of the host, into the K24D, then bringing it back in again as if monitoring a live input. And registered owners can download Assimilator (curve-matching software), which is an actual VST plug-in.

However, when the DSP-based processors are used with a host, you can't instantiate multiple instances like a "real" plug-in, and because you're leaving the host and returning, any system latency matters. At 96kHz, you have to choose between the Fabrik C or R; furthermore, the two Fabrik C processors are wedded to channels 1 and 2, so you can't insert them on inputs 3/4, or any of the digital inputs.

Given how much the processors bring to the party, I won't complain but be aware there are some limitations.

As to latency and stability, TC is to be commended for issuing a couple driver updates in quick succession that solved some vexing problems. With driver 1.03 installed, the K24D has been a reliable performer at 128 samples, and in some cases, goes down to 64 samples without a hiccup. That's good stuff, especially if you're going to use the effects as send/receive effects with your host.

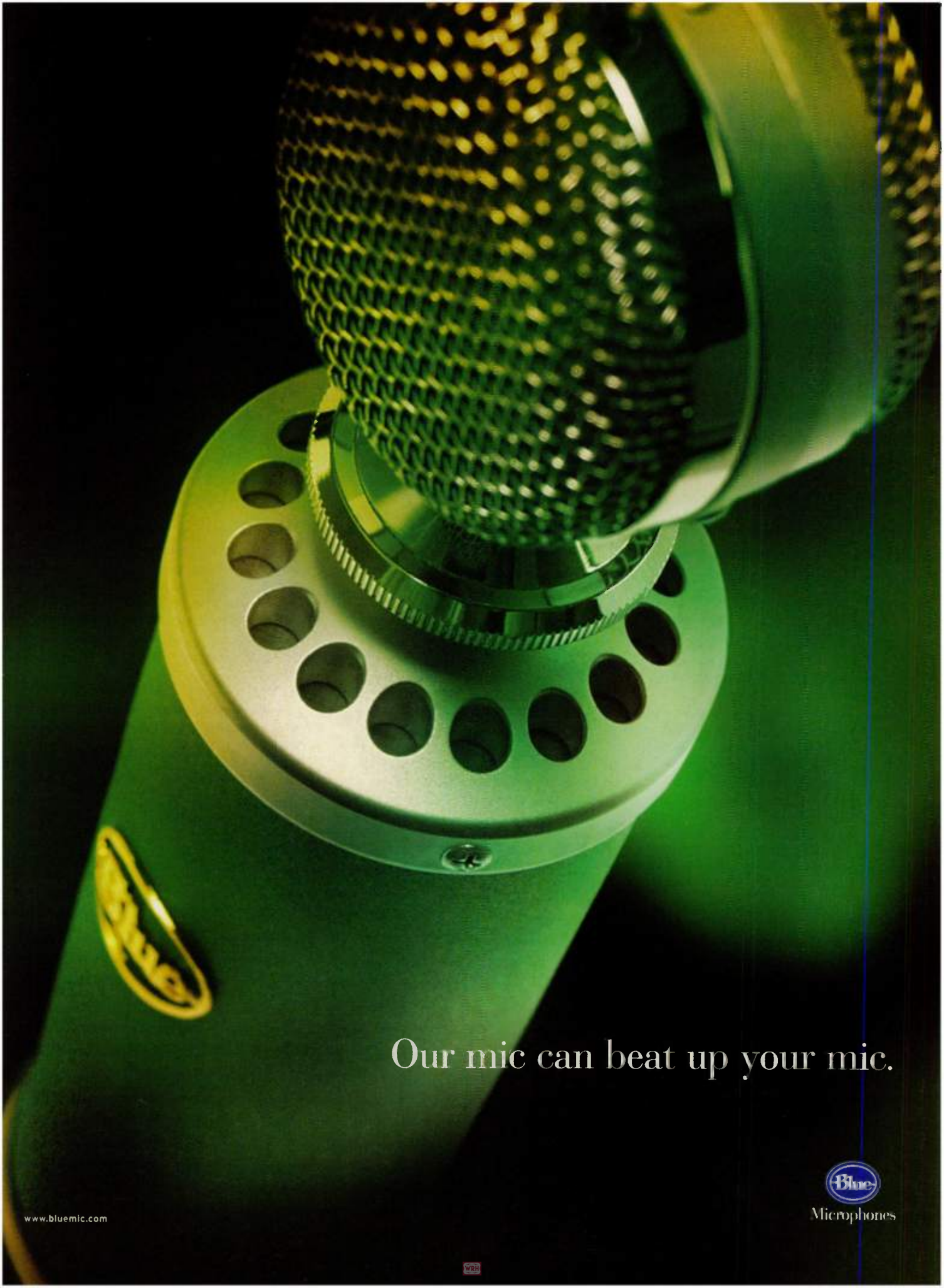
CONCLUSIONS

I expected a competent, well-engineered product, but this one threw me a curve. The sound quality is exceptionally good, even in a world where the bar for audio quality keeps getting raised. The character is clean and defined; from mic pre to headphone outs, sonic detail is the name of the game.

The DSP is exceptional, it's nice to have real MIDI I/O (no breakout cable), and the ADAT in is a great "trap door": I patched in a PreSonus DigiMAX FS and *voilà*, eight extra mic pres (a cheaper route than chaining three more K24Ds if all you want is more mics).

I've worked extensively with the K24D over the past several weeks, and it's passed every test I could throw at it. Thumbs way up. EQ

Product Type: FireWire audio interface and stand-alone signal processor.
Target Market: Project studios who are willing to pay a bit more for superior fidelity and onboard DSP processing.
Strengths: Sounds great, including the processors. Plenty of I/O. Well built. Solid drivers. More flexible than the average interface. Can stack up to four units. Innovative thinking.
Limitations: DSP usage is limited in various ways. Assimilator plug-in not yet Mac Intel compatible.
Price: $625 list
Contact: www.tcelectronic.com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JOE MEEK MC2

Maybe "MC" actually means "More than Compression"

by Jeff Anderson

I don't think there's a single piece of outboard gear in my rack that costs less than a mortgage payment. So it can be difficult, when you are used to SSL everything, to approach a unit that is barely above the price of your monthly studio coffee bill in an objective manner. But hey, I review things . . . and here's what I found.

OVERVIEW

The half-rack MC2 is a workhorse — effectively pulling triple duty as a line-level stereo pre, stereo optical compressor, and stereo width processor, making it a smart (and incredibly cost-effective) addition to your rig. The back panel has two input and two output 1/4" TRS jacks (for balanced or unbalanced operation), with an associated button to select +4dBu or –10dBV operation. There's also a compressor sidechain insert jack (unbalanced, 1/4" send and return) labeled "s/c insert."

Accurate metering is offered for every relevant aspect of the unit: A peak indicator for monitoring the input level, an eight-segment LED VU meter that displays the unit's output from –24dB to +12dB, and an eight-segment gain reduction meter (2dB to 16dB). Furthermore, there are on/off indicator lights for the compressor, stereo width section, and GR Hold section (more on this later), so you can be sure which components of the piece are active.

APPLYING THE MC2

As a line level stereo pre, the MC2's gain range is –6dB to 15dB and offers a fairly transparent sound. It focuses solely on boosting line input signals without adding any special (potentially unwanted) character. Bottom line: It sounds fine, but it's hardly the most impressive element.

The stereo optical compressor is essentially the same compressor as the Twin Q, yet stereo, and boasts more controls. The MC2 features gain, compress (threshold), attack, release and even slope controls, thus offering the same functionality as many more expensive products. This makes the unit perfect for just about any scenario that calls for compression — from single track applications, to stereo bus insertion, to overload protection from blasts that occur either onstage or in the studio.

The MC2's Stereo Width function came as a nice surprise; it modifies the stereo image range from mono to stereo to "extra-wide" stereo — the latter of which adds a greater sense of depth to your mix, or more "beef" and "punch" in a live application. Activating this feature on sources such as drum overheads, dual guitars, horn sections — any tracks with two or more sources — really spreads the image out, and helps breathe life into the mix. For example, I was running out of channels in a Pro Tools mix and forced to subgroup six horns down to two tracks in order to open up some faders. I generally hate doing this, as it doesn't seem to allow me the same feel of control over the "width" of the two-channel out. But, by using the MC2's Stereo Width feature, I was able to compensate and spread the image as wide as I wanted. Two thumbs up.

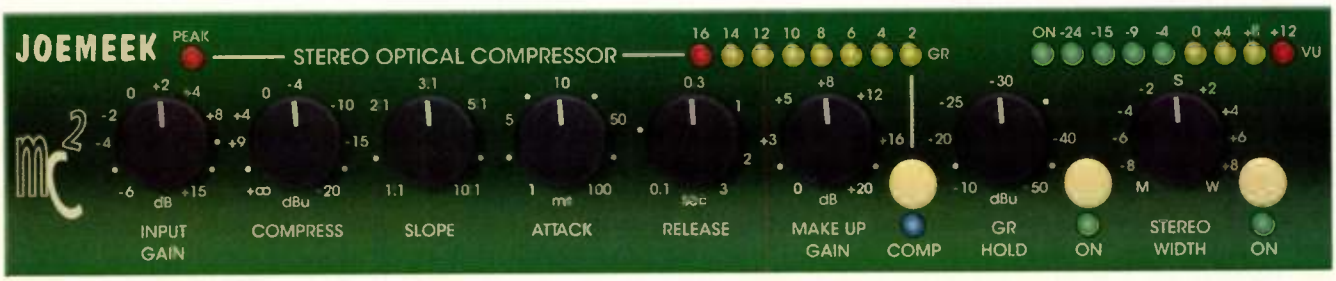
Likewise, the GR Hold (an automatic way of "freezing" the gain reduction level at the same spot as it was just before it dropped below the threshold setting) was very useful in helping preserve a solid, stable sound devoid of dropouts and level dips . . . and is a great tool to prevent raising the volume of background noise, and some transients, that can be downright annoying.

But perhaps my favorite MC2 feature is the side chain insert. The s/c insert offers a direct link into the compressor, allowing you to, say, insert an EQ into the compressor control path, resulting in frequency selective compression for applications like sibilance control. Translation: greater control options than the average compressor.

CONCLUSION

Having used the MC2 on three separate mixing sessions over the past few months, I've come to the conclusion that with a price point of under $300, this is not only a bargain but one of the better buys on the market. Perhaps most importantly, whereas most pieces in this range sound "prosumer," the MC2 offers high enough quality sounds that I'm not ashamed to throw it into my bank-breaking outboard rack. In fact, I'll probably end up using it just as much as some of those ten-fold priced competitor's models we all swear by. EQ

Product type: Stereo line level preamp, stereo optical compressor, and stereo width processor.
Target market: Project studios, especially those on a budget, and home studios.
Strengths: Affordability/value. Chock full of features such as stereo width processor, s/c insert and GR Hold function.
Limitations: S/c jack requires Y cable. Half-rack size crowds controls somewhat.
Price: $299.99 list.
Contact: www.joemeek.com



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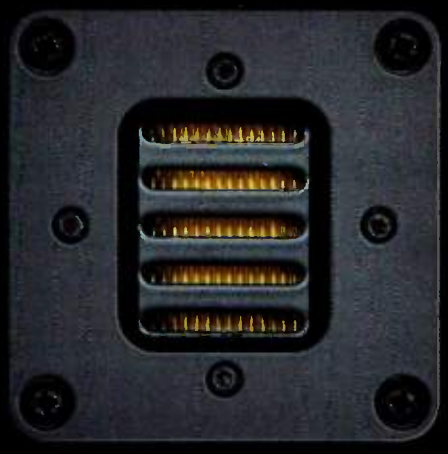

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LACHAPELL AUDIO 992EG

Traversing monolithic tone

by Jay Matheson

Depending on my most recent bank statement, getting handed a mic pre to evaluate (a debilitating addiction of mine) is either a dream, or a nightmare, come true: The best case scenario is that I'm going to find another to-die-for piece, and thus eat ramen noodles for the rest of my natural life, or a good majority of it. So, when I was asked to demo the new LaChapell 992 Extended Gain, I experienced that sinking feeling, knowing that this would probably eventually cost me my ass.

OVERVIEW

The three-space rackmount 992EG was impressive right out of the box, and I was more than just a little excited to work with such an esoteric pre. Its heavy 1/4" milled aluminum front panel, flawless powder coated finish, and top quality knobs and switches made it one sharp-looking piece, and its heavy-duty design gave the impression that it just rolled off of a tank assembly line. Peeking inside, one finds four ECC803/12AX7 and four 12AU7/6189 tubes — two for each channel — and fully balanced circuitry. So, picking my jaw up off the floor, I racked this baby up, and mentally prepared myself for what I had already assumed were going to be spectacular results.

APPLYING THE 992EG

Steve Slavich, our house engineer, first used the 992EG during a tracking session and reported, at default, a very warm, rich sound that turned brighter and punchier as the input gain was cranked. Later on, as I finally got to give it a go, I paired two Neumann KM100s up as overheads for a session with a heavy rock band and was blown away by the results — this was the best sounding pre for overheads I had ever heard. Recently, I had been using the PreSonus ADL 600 or Pacifica MP-1 in this context and had been more than pleased with the results, but the 992EG simply took the overhead's sounds to a new level of size, seeming smooth, crisp and open simultaneously. The overall sound of the kit sounded more "analog" during mixing; the hi-hats and cymbals were transparent and detailed, with no hint of harshness.

The next big discovery was with putting the 992EG to the test when I brought in a session guitarist to help rectify a rather anemic-sounding recording. We decided to track acoustic guitar parts with his favorite Martin, in stereo, with a pair of ADK SCTs running into the 992EG. The result was impressively rich. The instrument seemed to sit perfectly in the mix, working well alongside a wall of distorted guitars, without adjusting EQ or applying heavy compression.

However, when I tried the 992EG on heavy electric guitars, it almost sounded too big, and didn't add the grit that I tend to prefer for "in-your-face" distorted guitar tracks. It sounded great on clean electric, but for metallic guitar tracks I would tend toward a dirtier pre.

Next up was a rap project where we used the 992EG on vocals. With a Neumann U87 the vocals sounded massive, though we did need a bit more compression than usual to get this performer's vocal tracks to sit well in the mix. But, as we were already in the session and were feeling froggy, our house engineer routed a Yamaha Motif into the 1/4" input for the key tracks and, lo and behold, colossal tone. Score one more.

CONCLUSION

While, in my opinion, everyone should be hyped up and ready to buy the 992EG, the fact of the matter is that a preamp that sounds this great is just not an easy financial acquisition. At $3,895 list, the 992EG is simply too far out of many people's budgetary possibilities.

In addition there is another 992 unit (minus the extended gain, but designed for totally different purposes) that retails for $3,495. Both units have identical power supplies and push/pull output topologies utilizing the nickel-plated Jensen JT-11-BM transformer. The main design difference between these two units lies in their respective input topology types: The standard unit features a >50dB transformer-less input stage, with 21dB of gain assigned to the input pot while the EG variant uses the Jensen JT-115k transformer helping provide the >74dB of gain, with 41dB assigned to the input pot.

With this much gain available on the 992EG inputs alone, I often found myself using the input pad in order to prevent distortion, though the distortion was very smooth and sometimes hard to notice. According to LaChapell Audio, this input/output gain ratio is primarily meant to attract those using ribbon mics, so take that into consideration if you are in the market and trying to decide which version will best suit your needs.

All in all, I just can't say enough good things about this pre. It's clear that years of careful research and development went into creating this unique piece. This is a true work of art. EQ

Product Type: Two-channel, all-tube microphone preamp.
Target Market: Primarily professional level recordists or project studios that don't mind spending the extra dollars for a flagship pre.
Strengths: Huge sound. Solidly constructed and loaded with premium components. Shines on acoustic instruments.
Limitations: No line input, no low cut filters.
Price: $3,895 list.
Contact: www.lachapellaudio.com

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M-AUDIO MIDAIR 25 REMOTE CONTROL

They say it's a keyboard . . . little do they know!

by Craig Anderton

Wireless is the word *du jour,* whether we're talking cell phones, TV remote controls (remember when they had wires?), mice/keyboards for your computer, cool little devices like the Frontier Design Group Tranzport, or the Lynx Aurora converters you can control via infrared from a PDA.

Why wireless? Aside from the smiles wireless devices put on the faces of battery manufacturers, there's something cool about not having any wires, and being able to do stuff while roaming around with impunity. Now, into this arena steps the M-Audio MidAir 25. Many have tried wireless MIDI keyboards before, but few have succeeded. Can the MidAir 25 break the jinx?

BASICS

The MidAir 25 is a variation on M-Audio's Oxygen V2 series of controllers, with 25 velocity-sensitive keys (no aftertouch, though), pitch bend and mod wheels, eight controller knobs, and the usual interface (navigation buttons and 3-digit LED display). It can talk to your world via a hardware MIDI out jack, but the Big Deal here is wireless USB connectivity. There's a little USB-powered, palm-size receiver box that connects to your computer via USB, and receives MIDI messages wirelessly from the keyboard itself (the receiver also has MIDI in and out jacks, so it's a basic interface). It seems you can get about 10 yards away from the receiver before reception starts to get iffy.

Setting it up is easy: You just hook up the receiver to your computer, insert the batteries in the keyboard (or use an AC adapter), turn it on, and start playing. The drivers are class-compliant so the keyboard just shows up in your Windows or Mac machine, although you can download drivers that allow using the MidAir 25 with more than one application at a time, as well as send long sysex commands.

Note that the keyboard has no physical USB connector, which is kind of shortsighted — if you lose (or break) the receiver and don't have a physical MIDI in port on your computer, you're out of luck.

The wireless connection works at 2.4GHz, which is the same frequency as some cordless phones and wireless internet boxes. Although I couldn't do a full Underwriter's Lab testing scenario, my wireless internet kept working while I used the keyboard and I could still dial out, so I guess it's not an issue.

APPLYING THE MIDAIR 25

Well duh, it's a keyboard. And of course, for on-stage use it's kind of cool to be able to set up the keyboard anywhere and control a bunch of synths set up in a rack somewhere else. But what's also of interest to *EQ* readers is that this is a very capable remote control in disguise.

For example, most host sequencing programs allow parameter control via MIDI commands. So suppose you're in the vocal booth, and listening on headphones. You can assign the eight controller knobs in the MidAir 25 to the levels of the channels you'll be monitoring in the headphones. Need a little more drums? A little less overall volume? Bring the MidAir 25 into your vocal booth, and tweak away. Even better, you may be able to assign the keyboard keys to your host's transport controls, and if your host allows it, use the sustain pedal (there's a jack on the back of the MidAir 25) to punch in and out while recording — useful for guitarists doing overdubs.

And I can really see this as a great addition for my live remixing act. It's based around Ableton Live, and a lot of the act depends on being able to control levels (eight controller knobs — check) and solo tracks with buttons (25 keys — check). The idea of being able to step out from behind the laptop and do my thing is very appealing. Maybe I can even get some lighter fluid and . . . uh, never mind.

CONCLUSIONS

Mini-keyboard controllers are useful in their own right. But if you're willing to pay the extra for this wireless version, then you have a pretty cool remote control as well. It's not as ergonomic when serving as a remote as something designed specifically for that purpose (*e.g.*, the aforementioned Tranzport), but when you need something that does double-duty as a wireless keyboard and remote controller, the MidAir series is the only game in town — and it plays that game well. EQ

Product type: 25-key keyboard controller with wireless capabilities.
Target market: Those who need a multi-purpose remote controller for studio and stage.
Strengths: Wireless functionality actually works. Can serve as a remote controller for many programs. Good for custom headphone monitor mixes. Good keyboard feel. Reasonable battery life.
Limitations: No aftertouch. No physical USB connector.
Price: $249.95 list.
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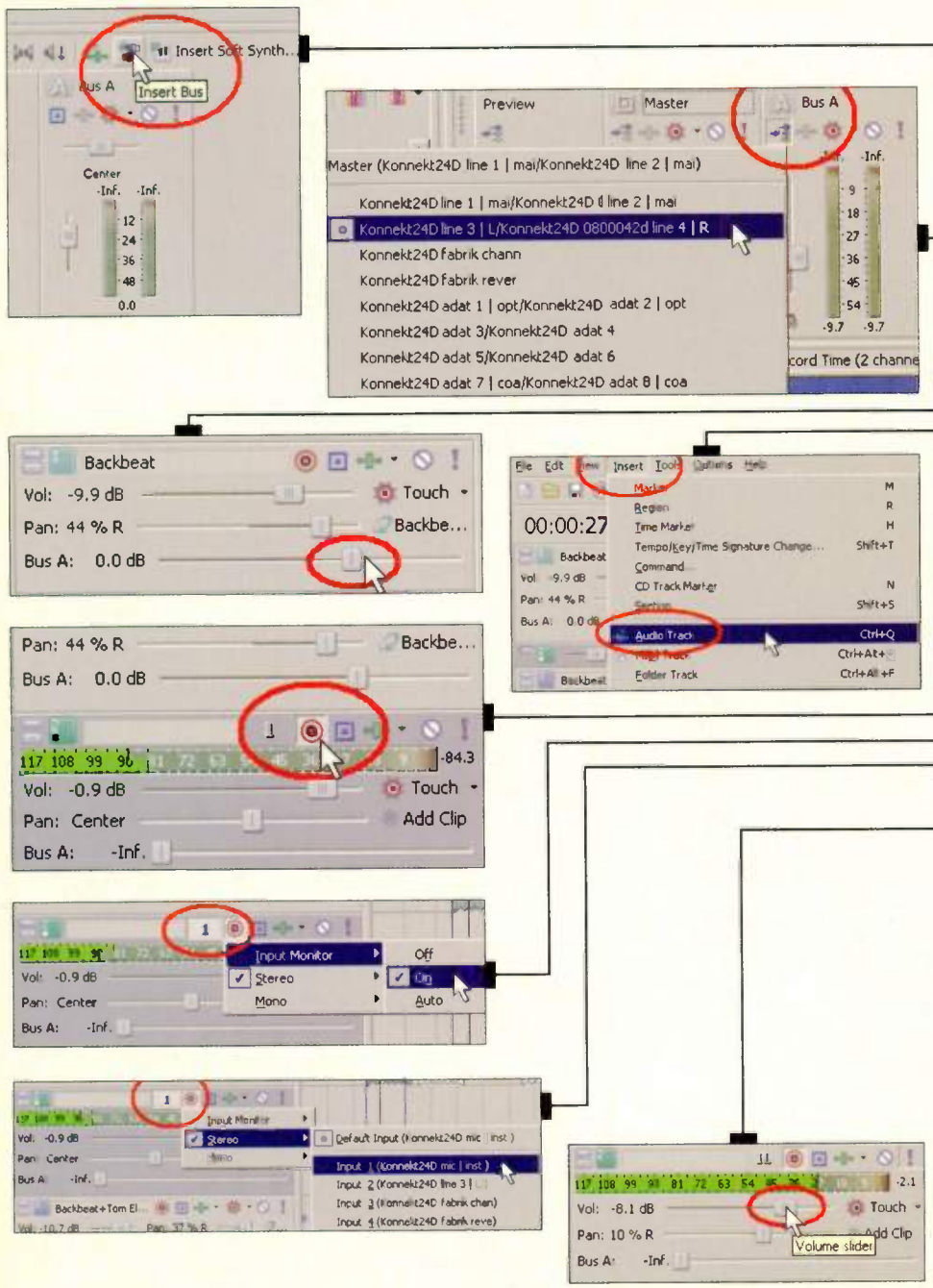
Power App Alley
by Craig Anderton

SONY ACID PRO 6

Combine analog effects with Acid 6's digital world

OBJECTIVE: Process tracks in Acid Pro 6 with external analog effects.

BACKGROUND: There's more to life than plug-ins, like groovacious guitar stomp boxes, Things With Tubes, and classic hardware reverbs. If you have an audio interface with some spare analog ins and outs, it's easy to patch these effects into Acid Pro. We'll assume track 1 (the source track) has a drum loop and you want some of its signal to go to an external effect, then bring the effect output back into Acid.



steps

1. Insert a bus in Acid; we'll call it Bus A.
2. Assign the bus output to an interface audio output that patches to the effect's input. In this case, the bus is assigned to outputs 3/4 of TC Electronic's Konnekt 24D.
3. Turn up the Bus A level control in Track 1 to send some signal to the bus.
4. Go Insert > Audio Track; we'll call this Track 2.
5. Arm Track 2 for recording.
6. Click on the monitor indicator to the immediate left of the Arm Record button, and select Input Monitor > On.
7. Patch the external effect's output to an interface audio input, then click again on the monitor indicator to the immediate left of the Arm Record button. Select the input to which the external effect's output connects.
8. Turn up Track 2's volume for the desired amount of processed signal.

tips

- If you want only processed sound, right-click on the name of the bus sending out signal to the effect (*e.g.*, Bus A), and select Pre-Volume. Then, you can turn down the volume on the source track so it doesn't contribute anything to the overall mix.
- If there's latency through your interface, you may need to record the signal coming into Track 2 so you can slip it forward in time a bit to compensate.
- In step 6, choose stereo or mono monitoring, as appropriate.

Power App Alley
by John Krogh

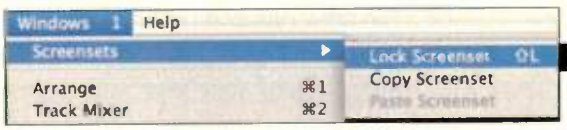
APPLE LOGIC

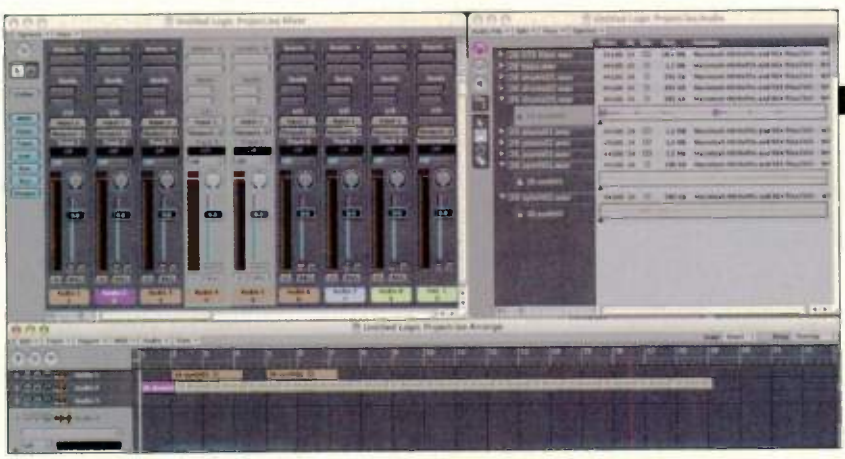
Maximize efficiency by customizing your workspace

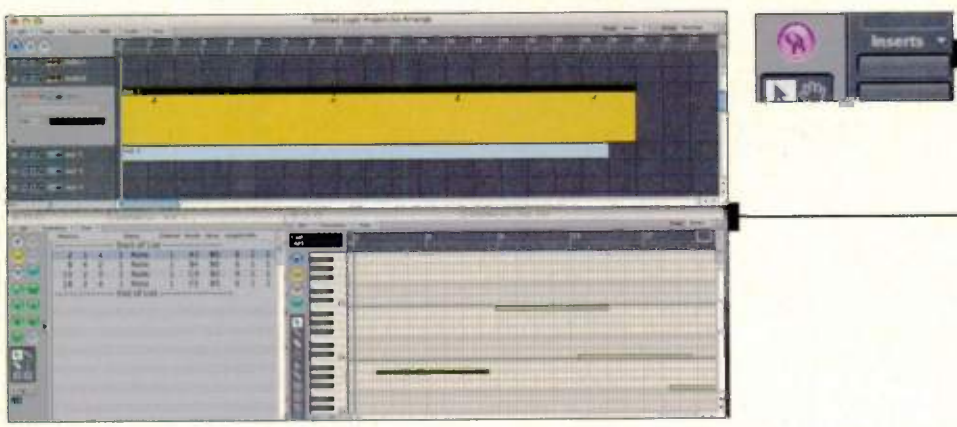
OBJECTIVE: Improve workflow and "window management" using Logic's screensets.

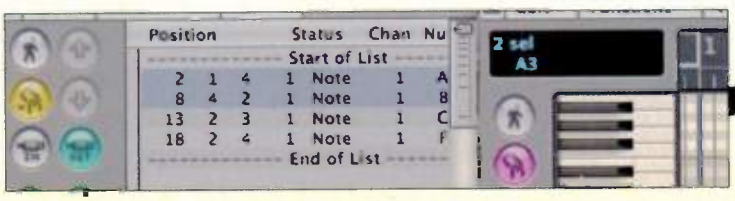
BACKGROUND: One of Logic's more time-saving aspects is that you can create *screensets* — groups of windows and toolsets arranged to fit the way you prefer to work. This allows you to configure, say, a MIDI editor, track mixer, and arrange window in a way that makes each one more ergonomic and "in tune" with your workflow.

Let's configure a set of windows geared toward basic composing/editing of both MIDI and audio material. By default, Logic boots up with a familiar tracks-plus-transport configuration. To free up more screen real estate, close the Transport, drag the lower right corner to maximize the Arrange window, and show the Transport buttons within the Arrange window by going *View > Transport Buttons*. Now we have a large "overview" to work from.









steps

1. Lock this screenset by choosing Lock Screenset from the Window menu. Now, if you move, close, or resize the windows, you can always return to this configuration by pressing the number 1 on your keyboard.

2. Press the number 2. You should see a mixer window on the top of the screen, and an Arrange window on the bottom. This is fine for mixing, but if you work with audio clips and loops, it's handy to have the Audio window available, so let's open it and position all three windows as shown. Go ahead and lock this screenset, then press the number 3.

3. Notice the small Link button in each window. When this button is enabled (pink or yellow) in a given window, this window always displays the same contents selected in the foreground (active) window. Single-click the Link buttons to make them pink in both the Audio and Mixer windows. Now, when you select an audio track or region in the Arrange window, the Audio window and Mixer will automatically update their display to show the selected track/region.

4. Let's create a third screenset designed for detailed MIDI editing. Start by pressing the number 3, then closing whatever windows appear. Next, open the Arrange window, an Event List, and a Matrix Editor. Position the Arrange window at the top of your screen and the two editors next to each other along the bottom half, as shown in the screenshot.

5. Note that the Link button is Yellow. This indicates "Content Link mode," which means that the window always shows the contents of the region or object selected in the active window. You can switch between normal Link and Contents Link mode by single- and double-clicking the Link icon.

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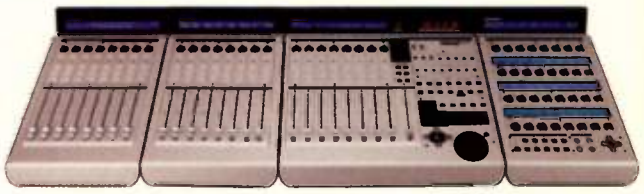

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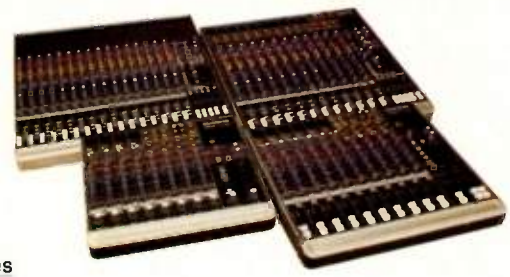

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by Phil O'Keefe

WELCOME TO HELL!

So that's why they're called "dead" lines . . .

You know the deal: There's a lot of work that still needs to be done as deadlines hang over you like a Sword of Damocles, and you draw ever-closer to impending doom (or a ticked-off client — basically the same thing). *What do you do?* First, don't panic: That only makes things worse. Instead, plan your course of action.

SET PRIORITIES

It's been said that the shortest note is better than the longest memory — write down *everything* you need to do, and organize the items in order of importance. (If nothing else, you'll realize that the list is, thankfully, finite.) As you create your list, carry around a small notepad and pen; that way if something enters your head, you can write it down immediately so you don't forget it.

Once you've finished a task, cross it off. That not only puts the remaining items in perspective, but provides a sense of accomplishment as you see more and more items bite the dust.

SKIRTING DEADLINES

If it seems unlikely that you'll be able to accomplish everything in the available time, see if you can get some deadlines changed. This is sometimes easier if the client contributed to the problem; for example, if they rescheduled a tracking date, you might find that the deadline is a "soft" one instead of a "hard" one. And, no one will tell you that the graphics person is running late so you can slip a few days, but if you ask, you might get lucky.

You also might get lucky if a project requires approvals along the way. When a client is late signing off on something, you have every right to expect an extended deadline.

SAVE TIME: PLAY, DON'T EDIT

If a ton of edits are needed on a particular track or set of tracks, cutting the parts over (if the musicians are available) can often be more efficient — and more musical — than spending hours moving notes around.

If you don't think re-tracking is going to provide a substantially better recording, it's time to pull out the virtual razor blade. But before you start, prioritize: Take care of the big issues that *must* be done first, and if any time remains, attend to the details. Do this in consultation with the client — remember, what is important to them is what should be important to you, because at the end of the day, it's their project and they pay the bills. (Of course, they're also hiring you for your expertise and knowledge, so don't hesitate to share it with them.)

BUILD IN BUFFERS

As they say, "Murphy was an optimist" — so allow yourself additional time for the unexpected when setting up a schedule. Take a tip from the airlines: They add extra minutes to the estimated landing time, so that the odds are better of having an on-time arrival. And if everything goes as planned, the plane will appear to have gotten in early.

In the middle of my current deadline crunches, an old friend passed away (we miss you Robbie), my internet computer had a hard disk failure, and one of my dogs decided to lift his leg on my wife's computer, shorting out the power switch. (I guess I now know where he stands on the Mac vs. PC debate.) There's no way you can anticipate these problems, so just assume some yet-to-be-determined problems will occur. They will.

AVOID CHRONOPHAGIA

Avoid all distractions during crunch time. When you have deadlines bearing down on you, reconsider the importance of watching the new episode of the *Simpsons* — it will be re-run anyway. The internet can be another great time-waster, but also note that distractions don't always come from outside of the studio: Sometimes they come directly from the band or client. This is not the time for the band's entourage to be hanging out, and even the band's access to the control room should be controlled. Explain that you're not trying to close anyone out, but you do need quiet in the control room as you focus on completing your work for them. Call them back in as needed to seek their opinions on the work as it progresses.

Two things that *aren't* a waste of time are rest and nutrition. You can't concentrate on the work at hand if you're stomach is growling louder than the fretless bass, and you won't make good decisions if you've sat in front of the speakers non-stop for the last 37 hours. Send out a runner or have food delivered. A 20-minute catnap on the couch every few hours can do wonders for your focus and concentration, and keep you going for longer than you might think.

LEARN TO DELEGATE

If you're really swamped, consider paying for extra studio help from outside engineers or other studios. Tasks such as editing and pitch correction, or compiling tracks and doing backups, can possibly be farmed out to allow you to focus on mixing. The phone can be a problem too, so have someone screen your calls. Urgent calls should be put through, so provide your assistant with a list of "important" names; put off everything else until you complete your project.

DON'T AGONIZE!

In an ideal world, we'd all make perfect albums with no flaws, and nowadays the trend is to try to make everything perfect in every detail. But as Michael Molenda pointed out in his Dec. '06 column, many of the records we all revere were made on tight deadlines, and decisions were made in minutes, not hours or days — and the music didn't suffer for it. So don't obsess too much; try to listen to the overall sound, like the average listener will, and quit worrying about the drum hit that's 3ms late. Remember, a producer's first job is to get the album finished: So get organized, get focused, and get busy. EQ

Phil O'Keefe is a producer/engineer, and the owner of Sound Sanctuary Recording in Riverside, California. He can be contacted at www.philokeefe.com, or via the Studio Trenches forum at www.harmony-central.com.

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by Michael Molenda

BUTCHERING THE BEATLES

Bob Kulick's Fab Metal Opus

Grammy-winning producer and guitarist Bob Kulick is pretty damn fearless, and that's an advantage when you invite a critical ass-kicking by launching a heavy-metal tribute to the Fab Four entitled *Butchering the Beatles* (Restless/Rykodisc). Not one to sidestep a challenge, Kulick and equally courageous co-producer/engineer Brett Chassen reinvented 12 classic Beatles hits by inviting icons such as Alice Cooper, Steve Vai, John 5, Steve Stevens and Billy Idol, Lemmy, Yngwie Malmsteen, Billy Gibbons, Stephen Carpenter, C.C. DeVille, Steve Lukather, and George Lynch to brutalize the Mop Tops. Typically building the songs track-by-track (due to artist availability), it took one-and-a-half years to complete the mammoth project.

Timid types and conformists may be revolted by *Butchering the Beatles,* but guitar lovers will likely freak over Kulick's vision, as the project is a fabulous hybrid of timeless songwriting and ferocious, shredderific 6-string assaults. Here, Kulick and Chassen provide *EQ* readers with some session details.

PRODUCTION STRATEGY

"How bad can Billy Gibbons play?" asks Kulick. "He and the others are awesome guitarists, so the recording process wasn't a concern. Picking the songs to match the lineups was the hard part. After that, it was just a matter of inspiring the players to deliver their best performances, and to do that, you have to sell them on the fact that what they did is raging beyond belief. You have to be authoritative. You can't let the tail wag the dog. A producer's job is to cajole and encourage, but, at the end of the day, you also have to be able to say, 'Dude, you're done!' And forget about the technical aspects. Ask yourself, 'Is this blowing me away? Am I getting goosebumps?' If the answer is no, then it's not right yet. If it's 'yes' — mission accomplished!"

Beatle butchers (left to right) — Brett Chassen, Bob Kulick, and ZZ Tops' Billy Gibbons.

TRACKING

"We went through a lot of different mic preamps before we got the sound we were after," remembers Chassen. "Thank God for Chandler Limited! The company's EMI/Abbey Road TG series preamps, EQs, and compressors were used everywhere — which seemed fitting for a Beatles tribute! For mics, we used Royer R-121 and R-122 ribbons on most of the electric guitar tracks — although we occasionally added a Shure SM57 alongside the Royers to capture a slightly different texture. We also used a Telefunken USA ELAM251 to record the acoustic guitars on 'Hey Jude.'

"The Royers and TG preamps were a great combo that delivered a 'modern-retro' guitar sound with a great growl in the midrange frequencies and thick, meaty lows and low mids. We also tracked with a bit of compression from either an Empirical Labs Distressor or a Urei 1176 to put a bit more 'hair' on the guitar tone."

SWEETENING

"One of the things we did when all the artists were done recording was to add some ear candy — or, more specifically, some Beatles-like textures," says Kulick. "For example, I used a Coral Sitar to simulate George Harrison's vibe on 'Lucy in the Sky with Diamonds,' EBows to enhance the texture of some guitar layers, and a 7-string to add some 'thwap' to big, bombastic whole-note accents.

"In addition, the good people at Engl Amps sent us a high-gain monster called the Powerball, which provided the heaviosity we were looking for on most of the songs. Brett dialed in the sounds so that they wouldn't compete with whatever the guest stars had laid down, but would add impact or vibe to the overall mix."

THE MIX

"As we tracked and mixed on Pro Tools HD, we spent a lot of time trying different plug-ins to come up with the vintage tones we wanted," states Chassen. "For example, the McDSP Analog Channel helped the guitars sound as if they were recorded on an old, 3M analog tape machine. Sound Toys' Echo Boy was the effect of choice on solos due to its thick tone and analog nature, and IK Multimedia's Classic Studio Reverb gave us that slightly dirty Lexicon 224 vibe."

THE FINAL WORD

"I don't think anyone on this record would be here were it not for the Beatles," says Kulick. "They put the train on the track, and George Harrison wrote the book on rock guitar playing. This is why this album had to be the greatest thing we've ever worked on."

Michael Molenda is a seminal San Francisco punk, multimedia artist, and producer who has recorded tracks for everyone from NASA to Paramount Pictures to various major and minor labels to hundreds of bands you've never heard. He currently co-owns Tiki Town Studios with producer Scott Mathews, and is signed to MI5 Recordings.

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by Lee Flier

DAWS: THERE *MUST* BE AN EASIER WAY!

Actually there is, and it may even be ideal for how you work

Most of us record on computer-based DAWs these days, and why not? There's a huge range of choices in software platforms, recording interfaces, control surfaces, and plug-ins. With everything that's available, and given the constant rate of improvement, they seem like the obvious choice.

But there's been a concurrent development of standalone, hardware-based, all-in-one digital workstations that are the preferred tool of many, and are used in conjunction with — or even instead of — a computer-based system. Standalone multitrack offerings from Korg, Yamaha, Roland, TASCAM, Fostex, Akai, and more continue to be released and updated each year. But can these be considered "legitimate" recording tools? And what are the advantages and disadvantages of working with an all-in-one box?

We'll start with the obvious disadvantages compared to a computer-based DAW.

- **You're limited to one company's hardware, software and effects.** You can't use your favorite plug-ins, or take advantage of the huge pool of companies and independent developers who create them. You might get lucky and happen to like the built-in effects, but the chances are remote that you'll like all of them better than the best computer plug-ins available.
- **It's tough to upgrade the core hardware without buying a whole new box.** Although the manufacturer may provide software updates (as well as hardware expansion options), advances in preamps and converters may leave you in the dust in a hurry (although it's debatable whether standalone boxes become obsolete any faster than computer hardware and software).
- **Most all-in-one workstations have small LCD screens that make editing and scrolling through menus tedious.** While you can hook up an external monitor to many of them, the display usually doesn't equal that of computer-based graphics.
- **All-in-one boxes generally have few user-serviceable parts.** If something goes wrong, your whole "studio" goes in the shop.

However, in addition to these downsides there are a number of advantages to using a standalone workstation. In fact, a few of the "curses" can actually be blessings in disguise.

- **An all-in-one box has its own specialized operating system.** Because these boxes aren't designed for general-purpose computing, they make very efficient use of processor power, have very low latency, and tend to be extremely stable.
- **Standalone workstations are ideal for live and remote recording.** Sure, you can get a laptop interface, but do you really want to leave a fragile laptop, your interface, and a Firewire cable sitting on top of the console at a club full of drunk patrons? I don't! A standalone multitracker is much more rugged, portable, and sets up in a jiffy. And this ease of use can inspire musicians and engineers to take their rigs to record in places they otherwise wouldn't have considered, such as a church, warehouse, or other acoustically interesting space that isn't a permanent studio.
- **I actually *like* the tiny video displays on all-in-one boxes.** They minimize the visual distractions during recording and mixing, and force you to focus on the sound and feel. I might hook up a monitor during editing, but that's about it.
- **Most standalone DAWs offer ways to shuttle data back and forth with computers.** If you want to track on your standalone box and edit and mix in a computer with all your favorite plug-ins, you can. Sometimes you can even use the mixer section of your standalone box as a control surface for your computer-based DAW. As I'm partial to certain specific computer-based plug-ins and editing features but I like mixing with real faders, I like this option.
- **Perhaps most importantly, a standalone box offers simplified workflow for a musician or composer who is doubling as engineer.** It's a real buzzkill if you're inspired to write a song or record a great performance, but have to go through a million steps to power up all the pieces of your rig and get the tracks armed and ready. With a standalone box you can often be ready to press "record" in a couple of minutes, including adding a few effects in the monitor mix for added inspiration. Many of them even have built-in amp simulators, drum machines, and other composition aids too. There's a lot to be said for this kind of simplicity, and for many it can make the difference between accomplishing something on a regular basis or not.

Of course, all of these advantages are moot if the thing doesn't sound good, and the lower range of all-in-one units can't be expected to sound as good as top-of-the-line DAWs. But certainly, great results can be had from these little machines. They're a no-brainer for composition and demos, field recordings, and jingles. Some are optimized for specific purposes (such as post production), where the all-in-one might actually make more sense than using a DAW. My own band recorded and mixed its first two independent CD releases entirely on the now ancient (circa 2000) Yamaha AW4416. To enumerate the specific features of each machine is beyond the scope of this article — but is this age of computer mania, be careful not to overlook the advantages that all-in-one machines bring to the process of recording. EQ

Lee Flier is a guitarist, songwriter, engineer and producer based in Atlanta, Georgia. Her band, What The...?, is a fixture in the Atlanta area, has released two independent CDs, and of late has been performing in other states and countries. She can be contacted via the band's website at www.what-the.com, and also moderates the "Backstage With the Band" forum at www.harmony-central.com.

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Planning Your Resources

Want some extra muscle from your system? Plan, baby, plan!

The CD's 16-bit/44.1kHz, "perfect sound forever" glory days are fading. Today, we all assume today that our systems can record at 24 bits of resolution. Even very affordable units offer resolutions of 24/96, and we just take for granted that it sounds better than a CD. But are we aware of exactly how this extra resolution impacts every part of the recording process? Let's take a look, and consider what we could achieve with better project planning.

JUSTIFY MY BITS

As analog circuitry is the weakest link in the recording chain, without good equipment such as quality preamps, mics, and even clean sources of power, the benefits of a 24-bit recording will be compromised. Unbalanced analog connections are susceptible to inducing noise from the environment, and can also promote the creation of ground loops. Also, running a signal with an unbalanced stage in it will likely negate the benefits of 24-bit recording by lowering the signal-to-noise ratio of the total analog stage; devices with unbalanced outputs, that can't provide levels above +12dBu, typically do not offer great enough dynamic range to justify 24-bit A/D conversion.

Bit Depth	Sample Rate	Memory for 1 minute of stereo
16	44.100kHz	10.1MB
16	48,000kHz	11MB
24	44,100kHz	15.2MB
24	48,000kHz	16.5MB
24	96,000kHz	33MB
MP3	128kbps	0.94MB

Fig. 1: Higher bit depths and sample rates will also mean higher disk space per minute of recording. How much? 24/96 requires three times more space than 16/44.1.

It's kind of ironic that sometimes, using good gear at 24 bits will actually sound "cheaper," as your recordings will reproduce unwanted noise and crud from the environment far more faithfully. So be it. Just don't take your best mics to all of your gigs; if there are noisy environments, leave the U-47s at home.

Of all the reasons we may have to record at 24 bits, headroom is one of the greatest justifications. As every bit offers approximately 6dB of dynamic range, with 16 bits we achieve 96dB and with 24 bits, we go all the way up to 144dB. A recording with peaks hitting –12dB maximum will still take advantage of a theoretical 22 bits' worth of dynamic range and resolution. The result: greater quality for lower level signals, without any clipping.

Once you realize that there are some technical considerations involved in taking full advantage of those extra 8 bits, and that a 24-bit recording takes more space on your hard disk (see Figure 1), I still believe it's well worth recording with 24-bit resolution. You can record at lower levels, quiet passages won't be struggling to stay above your system's noise floor, and you'll give your converters some breathing room. Not a bad deal . . . now let's move on to selecting a sample rate.

WHAT ABOUT SAMPLING RATES?

It makes no sense to record a politician's three-hour speech, or an interview with a wasted rock star for the local newspaper, at 24/96 just to transcribe it to print later on. Built-in microphones on your portable solid-state recorder will do the trick, and recording at 128mbps MP3 will save tons of space on your memory card.

Some instruments with delicate high frequency content may benefit from being recorded at 88.2 or 96kHz instead of 48kHz, but the differences will be subtle. It's often better to use a higher-quality mic/preamp combination and record at 44.1 or 48kHz than record at 96kHz with your interface's onboard preamps.

Without getting sucked in to those endless discussions about whether an average human can really hear — or even care about — the difference between a 44.1 or 96kHz sampling rate, we can probably all agree that our choice of sampling rate will depend on the delivery media of our recorded material. If it is audio for commercial CDs or data-compressed formats (*e.g.*, MP3, WMA, AAC, ATRAC), go for 24/44.1 or 24/48 (what I use). Some audio for video editors require 48kHz audio, and DVD-Audio (as an example) demands 24-bit/96kHz audio files, so that may also help you to decide.

I believe that the difference between 16 bits and 24 bits is more significant than the difference between 48 and 96kHz recordings, and given the required extra space and computer resources, sometimes it just does not justify going to a higher sample rate.

Lower sample rates also require fewer computer resources and less recording space per minute, although one tradeoff is higher latencies. Storage media is getting dirt cheap nowadays, and we can get portable disks with over 250GB for peanuts. However, saving some computing resources could mean being able to record/edit more simultaneous channels in your computer and add a couple more of CPU-intensive plug-ins; even better, if you're using an audio interface with ADAT ports, you could get twice the channels at 44.1/48kHz if you do not give in to the temptation to go all the way up to 24/96 just because you *can*.

By knowing in advance what you are going to do, you could save some time on setup, bring less equipment for live recordings, save some computer resources, and get higher track counts — yet still achieve professional results. EQ

When not touring as the frontman of the band WoM (www.wom.com.mx), Gus Lozada hosts conferences and clinics in Latin America about music production. He also moderates two forums at Harmony Central, "Nuestro Foro" (Spanish language) and KSS - Keys, Samplers and Synths. His e-mail is gus@guslozada.com.

Room with a VU

by Matt Harper

STUDIO NAME: Catamount Recording
LOCATION: Cedar Falls, IA
CONTACT: www.catamountrecording.com
KEY CREW: Rick Bisbey (Tech/Owner); Travis Huisman (Engineer); Tom Tatman (Producer/Engineer/Owner); Kitty Tatman (Studio Manager); Henry (Beagle)
CONSOLE: SSL 4048E/G+ w/ Total Recall
DAW: Digidesign Pro Tools|HD3
COMPUTERS: Mac G4 733MHz, G4 Dual 1.25GHz, G5 Dual 2.0GHz
RECORDERS: Alesis ADAT XT-20 (2); Otari MTR-10 1/4" 2-track, MTR-12 1/2" 2-track, MX-80 2" 24-track; Tascam 80-8 1/2" 8-track, 103 cassette machines (6)
MONITORS: Auratone 5C; Dynaudio BM15A; Event 20/20bas; JBL 4311WX; Tannoy DMT-215 II, SRM-15X
MONITOR AMPS: Alesis RA300 (3); BGW 500; Hafler P-3000 (2), P-4000, P-7000 (2)
MIC PRES/EQ: Aphex 107; API 3124; Chandler LTD-1 (2), TG-2; Focusrite Octopre; Manley Dual Mono; Neve 3118 (2)
MICS: AKG 414EB (2), C-12, D-112 (3), D-1000 (2); Langevin CR-3A (2); Neumann KM-84 (2), M-49C (2), U-87 (2); Sennheiser MD-421U (4), MD-441U (2); Shure SM-7B, SM-57 (6), SM-59 (2), KSM 109 (2); Studio Projects C-1 (2)
OUTBOARD: dbx 160X (2); Drawmer DS-404 quad gates; Manley Tube D.I., Variable-mu (2); Orban 516EC de-esser; Summit TLA-100A (2); UREI 1176LN (2)
EFFECTS: Alesis Quadraverb (3); Delta Lab DL-1; Eventide H-3000S; Lexicon 300L, PCM-70, PCM-60, LXP-5, LXP-1; Roland R-880 (3), SDE-1000; TC Electronic 2290; Yamaha SPX90 II (2), SPX900; custom 6' plate
BACKLINE: Ampeg '72 V-4B; Danelectro U2; Fender American Std. Stratocaster, American Std. Telecaster, '59 Fender Bassman, Champ, '59 Deluxe, '63 Reverb Unit, '64 Twin Reverb, '66 Deluxe Reverb, '67 and '68 Leslie Vibratone speaker, '73 Vibro Champ, '82 Precision Bass, Strat XII; Gibson ES-335, ES-135, '59 Les Paul Jr., Les Paul Studio, SG Classic; Hammond C3 Organ w/Leslie 122; Marshall JCM-800; Rickenbacker 360/12 V64; '66 Silvertone 1481; '55 Supro "Chicago 51"; Taylor 410; Vox AC-30TB; Yamaha Recording Custom drumset, Yamaha C7 grand piano

It was 2002 when Tom Tatman and Rick Bisbey decided to take their 21 years served in the business of all things studio-centric and focus their collective efforts towards birthing what would become known as Catamount Recording. Enlisting the talents of famed designer Carl Yanchar — he of Wave Space who masterminded the building of some of the greatest studios of all time, from CBS to The Plant onwards — Tatman and Bisbey had Catamount, a 4000 sq. ft. facility, built from the ground up to provide uncompromised acoustics, great sight lines, and highly efficient traffic patterns. With each room constructed upon separate concrete slabs, with all-oak walls and floors and 16' sloped ceilings boasting bass traps best described as gargantuan, Catamount offers a bright, clear acoustic environ rich with ambience: a studio where musicians lucky enough to frequent it can be assured that truly great tones will be achieved with relative ease.

Created for the sole purpose of producing albums from beginning to end (Tatman handles engineering and mixing duties for virtually 100% of Catamount's client base, and their Studio B often houses mastering engineer Travis Huisman — therefore offering comprehensive sonic service), Catamount has been booked solid since its opening date. And it's to no great surprise; between the talents of the crew and the staggering array of top-of-the-line equipment — from the SSL 4048E/G+ console to the drool-inducing mic locker — Catamount is clearly all class.

So pop your head in if you're ever in the area. Just beware Henry the canine assistant engineer; we hear he's a little heavy on the humping. EQ

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