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REVIEWS:

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**ROYER R-121
AND SF-12 MICS**

**SENNHEISER
EVOLUTION
WIRELESS MICS**

AND MORE

SHOW REPORTS:

- SUMMER NAMM
- MACWORLD

**INTRODUCTION TO
DATA BACKUP
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**THE MIXING SECRETS
OF CHUCK AINLAY
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metal to the masses with the
imp Bizkit, and others.*

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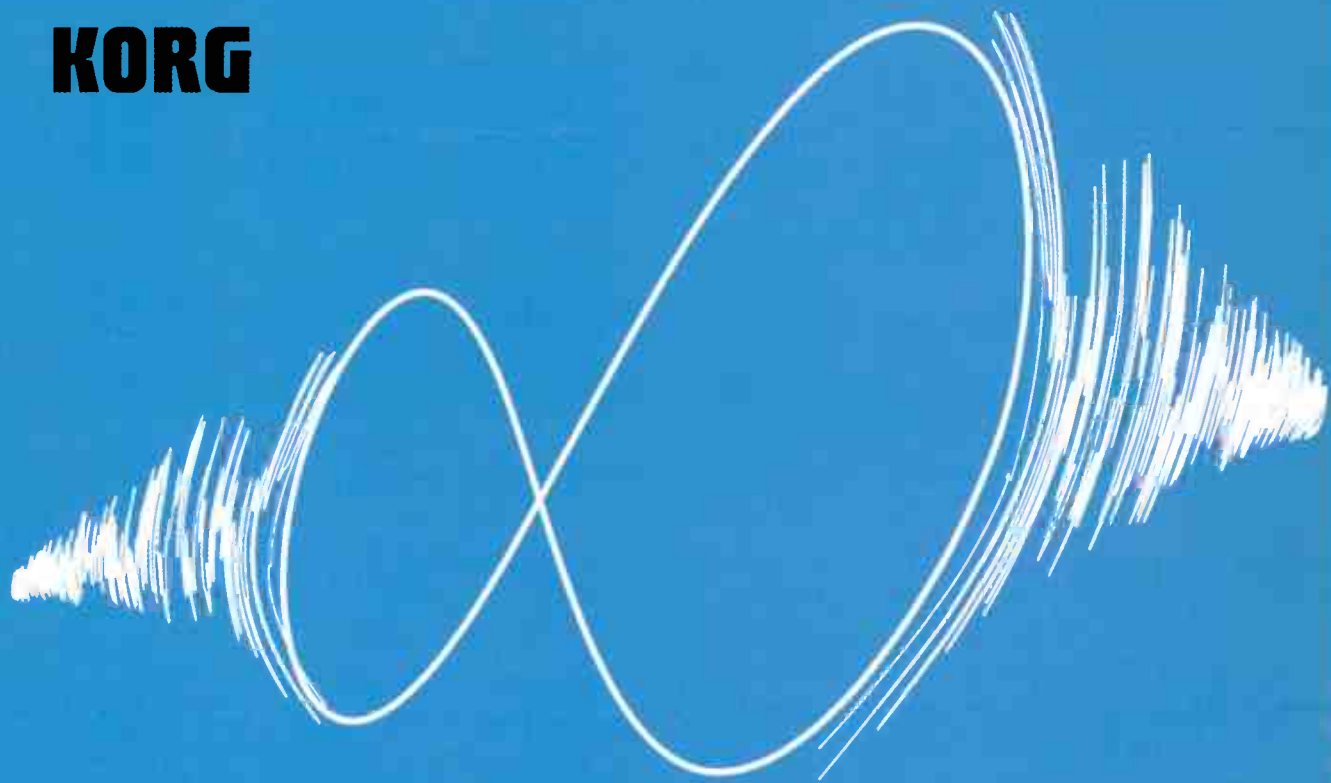
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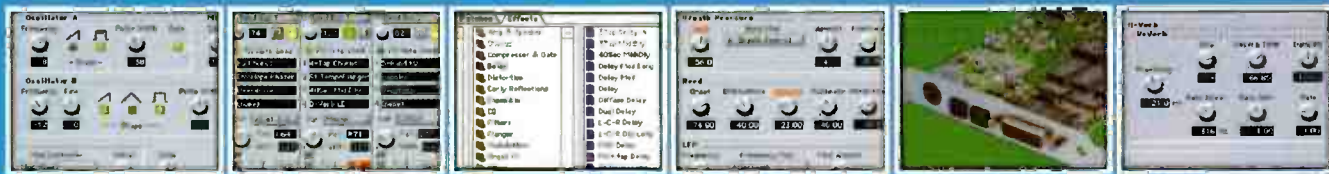
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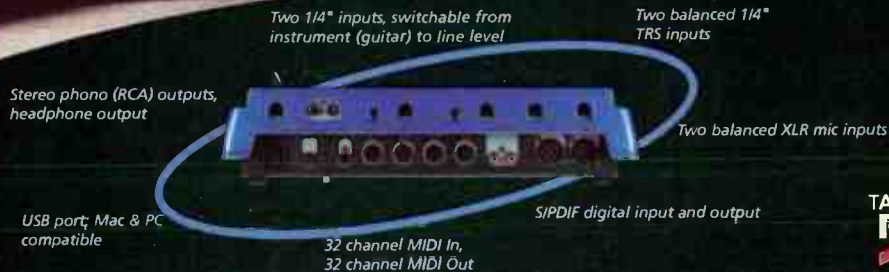
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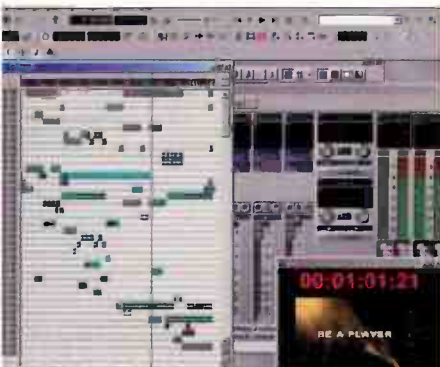
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World Radio History

CIRCLE 59 ON FREE INFO CARD

EQ

PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 11, ISSUE 9
SEPTEMBER 2000



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Terry Date sits in
Seattle's Studio X.
Photo by Tomiko Jones.

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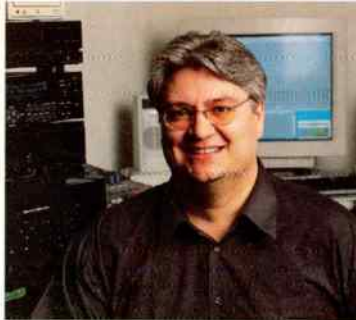
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Learn From the Worst

I'm fascinated by creativity in all its forms. Perhaps that's how I ended up in music; the whole idea of creating art through organized sound and the process of producing it with technology is very interesting to me. My interest in creativity leads me to read a great deal about it — the psychology and impetus behind it, how to increase it, and so on. Recently, for example, I've been reading *Zen in the Art of Writing*, by noted science fiction author Ray Bradbury. Rather than the expected treatise on writing *haiku* while sitting *zazen* on a *zafu*, the book is a collection of essays on creativity, inspiration, and feeding the muse. One topic Bradbury touches on flies in the face of conventional wisdom: We all try to learn from the best, but is that really the most effective way to improve skills? Perhaps there's value in examining something that's not done so well and learning from the mistakes that were made.

Think about it; often learning from the best is very difficult. The "best" may be so high above your current level that you can't discern what makes it good — and even if you can, you may not have the experience or knowledge to understand what it is that makes it the "best." And often, with the "best," the whole is done so well that it's hard to focus in and extract what's good about particular component elements.

Contrast this with learning from something you don't like or that's not done so well. Generally, it's very easy to pick out where the mistakes or wrong decisions were made, or where things were done poorly. Look at this in terms of a mixdown: For most of us, when listening to someone else's mix, it's easy to hear when a vocal is too loud, the EQ is wrong, or a reverb tail is clashing with other elements of the song. (It's the old back-seat driver syndrome; it's always easy to find someone else's mistakes.) Now focus in and try to come up with an equally specific list of what it is that makes a good mix "good." Not as easy, is it?

Am I suggesting that you ignore what the "best" have to offer? Absolutely not! For example, I've been getting into surround mixing lately, and, yes, I'm referencing the best: George Massenburg's 5.1 mix of Lyle Lovett's *Joshua Judges Ruth*, Elliot Scheiner's 5.1 mix of *Toy Matinee*, and a few others. These are great inspirations, as well as excellent models to work toward. But I'm finding I'm learning more about what *not* to do from the five or six poorly done (in my opinion) surround mixes I have in my collection than I am from the two stellar examples listed above.

Give it a try. Before dismissing something you don't like or that seems less than well done, shift your perspective and focus in to find specifically where the creator went wrong. You may find yourself learning a great deal.

More news from EQ-land to pass along: This month, our big announcement is the addition of Howard Massey to our masthead as associate editor. Howard's work in major U.K. and U.S. studios, credits as an author (such as *The Complete DX7* and *The MIDI Home Studio*) and journalist (*Musician* magazine and countless freelance articles), and extensive knowledge of the industry, technology, and music make him the perfect choice for the job. Plus, so many of his articles have been running in EQ that we figured he should have a more formal home here. Please join me in welcoming Howard onboard — and (free plug) look for his new book *Behind The Glass* (Miller Freeman Books).

—Mitch Gallagher
mgallagher@uemedia.com



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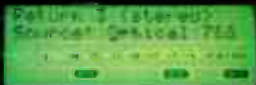
bus Because once upon a time we took a Greyhound to see our Aunt in Cleveland. She was pretty far ahead of her time, having predicted the breakup of the Beatles, the birth (and death) of disco, and hanging onto her vinyl collection because she had a feeling that "some day people will use records and turntables differently than the way we do today."

bus Because an audio path is a bus, and the EZbus has a ton of 'em. Fully programmable ones, at that.





A single button-push is all it takes to instantly transform the EZbus from an Audio Recording Interface into a Control Surface. Then operate your favorite MIDI and audio software using the EZbus's hardware controls—even scrub audio tracks with the data wheel! (Software dependent.) Customize the controls with your own command set, or use the convenient factory presets—support for major software programs is included. (Did we mention the ability to set and recall locate points?)



When is a Return more than a Return? When it's an EZbus Return, of course. In keeping with the EZbus design philosophy of ultra-flexible audio routing, the four Returns can accept audio from any EZbus analog or digital source. Those signals are then automatically routed to the Main Mix bus. So in addition to their traditional roles as effects Returns, the EZbus Returns provide you with four extra inputs to call on whenever you need them.



Want to create a separate control room mix? Need a stage monitor mix that's different from the one you're sending to the front-of-house console? Looking for a true four-bus setup for multitrack recording? The EZbus lets you route any signal from any source—analogue or digital—to the Main or Alternate (or both) Mix buses, with full control over level, bus assignment, and in the case of the Main Mix, EQ and dynamics processing.



Two independent S/PDIF outputs? Stop the madness! But of course there are two—you'll need one to handle signals routed to your new digital effects processor, and one for sending the full mix to your trusty old DAT recorder. (Hey, analogue diehards, don't worry—the Aux out jacks are perfectly fine for routing 24-bit/96kHz signals to your esoteric mastering gear. The Send jacks are as well. We're not about to tell you which ones to use.)



With four Sends, each configurable pre- or post-fader, you can easily create monitor and headphone mixes, patch into your outboard effects, and more. Sends can be routed to analog or digital outputs—even to USB—so interfacing with all your gear, old or new, is a snap.



You've just played your best gig ever. Thank goodness the performance was captured on your MDM by routing the individual EZbus channel outputs to it via a single optical cable. All you need to do now is mix the tracks to stereo (using the EZbus, naturally) and burn a CD to sell at your next show! (Yes, the optical outputs can also be used for Send and Mix signals. What, you think we'd limit you now?)



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REWRITING HISTORY

I'm rather mystified by some of the historical data propounded by Bruce Swedien and his interviewer (July 2000) regarding his recording session in Havana.

The article states that the EGREM studio is "where all the great Cuban recordings have been made," and that it has been the "number one recording studio in Havana since the 1940s." That cannot be possible. EGREM (*Empresa de Grabaciones y Ediciones Musicales*) was not formed by the Cuban government until 1965. The recording studio they built was renowned for rotten acoustics, namely an emphasis in the 3 kHz region that made the violins of the *charanga* bands too prominent.

Now, if Swedien fell in love with the acoustics of the room in which he worked, either the old acoustics problem has been solved or he worked in EGREM's new studio in the "fashionable" Mirimar district. Moreover, prior to the advent of EGREM's ill-fated studio, virtually all Cuban recordings were made in radio stations, particularly *Radio Progreso*, where recordings were mixed on old RCA radio broadcast consolettes and cut direct on RCA 73B disc cutters until Ampex tape recorders came along. All of the Cuban recording dates of RCA Victor's great artists were recorded thusly, unless they were done live onstage somewhere, or in Mexican recording studios.

How do I know all this? We are one of the world's leading publishers of Cuban music and represent hundreds of songs originally in the EGREM repertoire. I've been to Cuba innumerable times

both before and after the arrival of Fidel.

Oliver Berliner
Gramophone/Hall of Fame Music Co.
via fax

IT'S A MYSTERY

In the July 2000 issue of *EQ*, the Bruce Swedien article contains a picture of the "Wes Dooley recreation of the RCA 44BX," called the AEA 445C. However, it isn't mentioned what company makes this microphone, or what the letters "AEA" stand for; thus there's no way to contact this company. Can you enlighten me about this?

James Gruft
via e-mail

[Audio Engineering Associates, manufacturer of the AEA 445C microphone, can be reached at 1029 N. Allen Ave., Pasadena, CA 91104. Tel: 626-798-9128. Web: www.wesdooley.com.]

WE MISSED THAT CLASS

Regarding the Focusrite ISA430 [July 2000]: I enjoyed [Mitch Gallagher's] review and found it most informative. It's probably more information than I could absorb, but the box certainly goes to the top of my wish list.

In the sidebar "ISA430 Digital Option," you employ in sentence structure a mistake that I find more and more prevalent these days. You state, "A front-panel switch selects between internal clock, external clock, and external Super Clock..." Actually, you select "between" one thing or another, you select "among" three or more things. I mention it because the thought was initially confusing — before you accuse me of being some sort of techno-snot, let me just say that since your grasp of recording seems every bit as thorough as your writing, I thought maybe you'd like to know.

Walt Kraemer
via e-mail

[Mitch Gallagher replies: "Feel free to choose between (or is it among?) the following responses:

1. In every issue, I try to include at least one text-editing error for the benefit of readers who have too much time on their hands.

2. As editor of *EQ* magazine, I'm officially empowered to change the laws of sentence structure. You'll be seeing more of these 'corrections' in the future.

3. It was, uh, managing editor Tony Savona's fault.")

ON THE DELTA

I was pleasantly excited to read the article in the August 2000 issue reviewing the Delta 1010 by MidiMan (M Audio). Craig Anderton gave this audio interface card the visibility it deserves. I recently built up a PC using two of these interfaces for 16 channels [of I/O], and I have been more than pleased with the system's performance.

The reason Craig didn't see the peak indicators he expected was most likely because they belong on the console, not the recorder.

If you're looking for a digital recording solution, the Delta 1010 interface is definitely worth looking into. With a street price of \$700 (\$800 with a software bundle), it's the cheapest eight-channel card of its class on the market. Thanks, *EQ* and Craig, for giving it exposure.

James Lloyd
via e-mail

[Craig Anderton replies: "Thanks for the comments. The reason I mentioned the peak indicators is because the 1010 also seems a likely candidate for digital mixing, and under those circumstances, it would be helpful to know if signals coming into the interface are clipping. However, I'm sure the vast majority of 1010's end up as the "front end" for recording software, where, as you correctly observe, peak indicators would be redundant."]

CORRECTIONS

Sometimes, when things are slow here at *EQ*, we indulge in various casual hobbies, such as Bio-Topological Manipulation (BTM). In the August issue, we made public the miraculous results of one such manipulation, and no one even saw fit to compliment us on it. (Sometimes we wonder, why do we bother?) The miracle in question? We managed, through extreme efforts, to physically morph Craig Anderton into Roger Nichols — yes, it's true! Fortunately, a photographer was on hand and snapped a shot as proof, which we then ran with Craig's "Industry Insider" column.

Craig's relatives complained that the change made their family portraits obsolete, so we relented and morphed him back. Endless apologies to all concerned...

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Photo: R. Neilson/D. Young

Alan Meyerson shows off the AD-8000s at Media Ventures' facility in Santa Monica, CA.



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CIRCLE 03 ON FREE INFO CARD

ON THE BOARDS

GOOD BRASS MICS

Any suggestions for a good mic to record brass? I have to record trumpet and trombone. —ricoyeah

I just recorded a 13-piece brass section and used Sony C37A's on the trumpets, Coles mics on the 'bones, and an RCA 44 on the bass trombone. I ended up using one mic for each of the 13 players. At first I thought this was overkill, since the majority of my experience came from recording brass with a full orchestra where I would use one or two mics for each section. I found that using individual mics for each player allowed the arranger and I to make sure the blend was captured as written. I then decided to sum those mics down to only six tracks consisting of mono trumpets, mono 'bones, stereo saxes, and a stereo room.

Whenever possible, I try to commit to a sound and leave the regrets and abundance of choices behind me. I took an unconventional approach to the positioning of the players and a lot of the veterans looked at me as if I didn't know what the hell I was doing. I stood my ground and experimented using a setup that they weren't used to, and the results impressed everyone — including myself (rarely does this happen). —*Dave Reitzas*

Coles 4038 on trumpets, hands-down. U 67's or Coles on trombones.

Love Dave's use of C37's. I used to use them a lot. I remember in particular using them on the road with Earth Wind & Fire on the drum set that went up in the air. They were bolted down, of course. —*George Massenburg*

DAVE REITZAS ON MIXING MAGIC

Dave, you mixed Madonna's Ray of Light, right? The first song ["Drowned World"] sounds pretty amazing; the low end is incredible. Did you use something to "fix" the bass, or is it the pure sound from Mr. Orbit's synthesizer, or is it the mastering? Also the voice quality is coming from Mars...mic and preamp, please. —ricoyeah

I'm always willing and glad to contribute what I can to these forums, and I must say that I learn a lot from them myself. Re: "Drowned World" — thanks for your compliments. That's my favorite track for many reasons, and you might be surprised to know that it's a rough mix that was laid down to DAT at the completion of the last overdub. This was a track that we were playing for the "visitors" that came by the studio even before we started mixing. The response was so overwhelming that a "mix" seemed unnecessary. The final mix you hear on the record is as it was tracked. Hats off to William Orbit and Madonna for their genius. I have

learned so many things from them. The vocal was tracked through a [Neumann] U 47 to an N.T.I. PreQ3, to an N.T.I. EQ3, and then to a TubeTech CL1B. The vocal processing for the rough included a Spatializer to bring it more into your face. —*Dave Reitzas*

Dave, this is the second time I've heard that one of your rough mixes was used as a master. The other being Whitney's "I Will Always Love You." What gives with you getting out of doing three- and four-day mixes? How do I get to do that? (I know the answer already, dammit....) —*George Massenburg*

George, it's actually the third. The second was a song called "You'll See," which was also for Madonna. All I can say is that all three of those mixes were purely from the heart, with little brain involved. I was able to be in that position only because there was no pressure to deliver the "final" mix. I also felt that the rough mix that I delivered to my client should make them say, "Whoa, this sounds killer!" Every subsequent time that I've tried to make a rough become the master I have failed. I have only been successful when I was able to eliminate the external demand and just focus on the beauty of the music and the talent of the artist. I'm a believer that if you are in the position to record the tracks in the presence of the artist and producer, you are at an



Ed Cherney



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Roger Nichols



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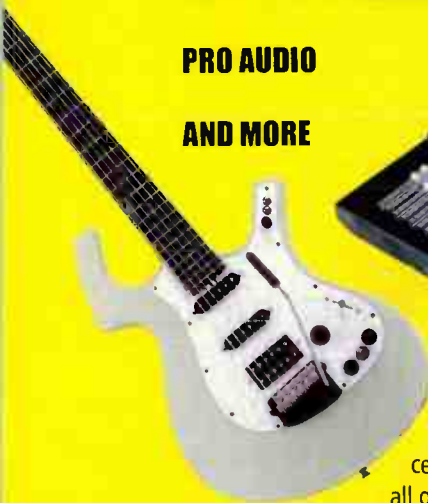
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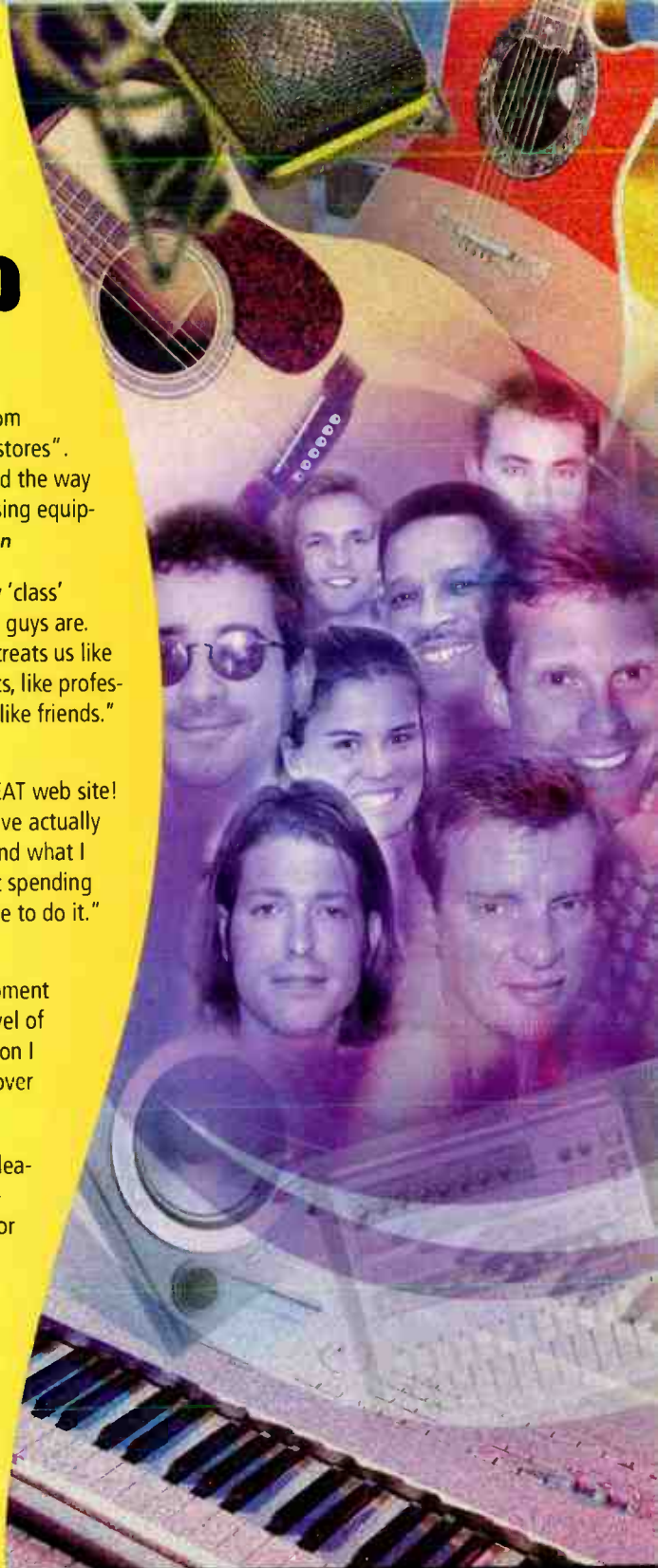
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CIRCLE 44 ON FREE INFO CARD

NEW ON THE BOARDS

EQ Studio Tech columnist and frequent contributor David Frangioni has joined the Boards. Log on to www.eqmag.com to pick his brain or just say hi.

advantage by being able to learn their likes and dislikes about a track. This makes a spontaneous rough mix shine much brighter than a polished final mix.

I might have had more rough mixes as final mixes except that the roughs were done prior to the crucial overdubs, rendering them useless. Of course, I often find myself in the "beat the rough" seat, and it's nearly impossible to duplicate that magic. Oh well, sometimes you get it and sometimes you don't. Lately I find my calls for work contain mix jobs in which I am taking another crack at a song that's already been mixed and, at the same time, I know there are mixers that are hired to remix a song that I had already mixed. This is very commonplace these days, and the best defense for me is to do the absolute best mix I am capable of doing and to leave my ego at rest. I do have confidence in my abilities and I'm very aware that we work in a subjective business. He (or she) who has the most power makes the rules. I would have never released "I Will Always Love You" if I had the power to say so, given its buzzes and the vocal being way too loud. But, in retrospect, I was wrong. People loved that record for Whitney and her performance. I happened to be the engineer pushing faders at the time of her brilliance.

In conclusion, I add that this is a job for me, to have fun making records — not waiting to see how a record does after it is released. Of course, I hope the records I make are the records you want to hear, but, if not, then I'm on to the next. I love what I do, I could do it forever, and I'm grateful that talented performers hire me to share my talents! —*Dave Reitzas*

DRUM PLACEMENT

Before I was in a band [Flying Burrito Brothers], I was guitarist for producer Jimmy Bowen in L.A. Bowen used to tell me he always mixed his drums as if the listener was sitting behind the set. Where do you place them? I mix it up quite a bit depending on the studio and assistant engineer, but I'm interested in how others might do it. —*John Beland*

I think this is a religious issue. I generally will pan drums from the drummer's perspective, I think it makes drummers happy and doesn't seem to cause any problems otherwise. —*mp*

For the first few years, I mixed drums from the drummer's perspective. I used to think I could play drums, and Stevie Wonder records were like that. But I got over it. Somewhere along the line, I took the philosophical approach that the record listener should have the best seat in the house, witnessing the record as if the band was performing in front of them. So I turned it around and have been mixing drums from audience perspective ever since. If the hi-hat's on the right (audience perspective), I'll put the shaker or other complementary percussive track opposite on the left side for some interplay, as it makes it more audible, etc. —*dc*

I usually go with audience perspective, unless my producer is a drummer (I just did that for a record that I mixed for James Stroud). It really doesn't matter; it's just personal preference. I keep trying to put all of the drums on one side or another, but it never works...at least not yet, but I'll keep trying. —*Ed Cherney*

How about panning the drums normal and putting the room mic on an autopan? Or the kick on the left and snare on the right? —*alphajerk*

I once put an autopan on a very compressed mic in front of the kit. Made the autopan move in sixteenth's...it was indeed a very funky effect, and gave the kit an amazing stereo spread while enhancing the groove. —*Oli P*

ASK US

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CIRCLE 43 ON FREE INFO CARD

Macworld NY 2000

BY MIKAIL GRAHAM

Not that long ago, many of us were wondering if Apple would even be around for another Macworld, but with the phenomenal success that the iMac, G4, and ultra-cool PowerBooks have brought, it's clear the Mac is back. Apple's commitment to music was loud and clear at the second annual Macworld Music & Audio Showcase part of Macworld. Music and audio-related companies exhibiting at the show included Adaptec, Beatnik, BitHeadz, Cakewalk, Digidesign, Magma, Marathon, MOTU, MusicMatch, SoftAcoustik, SRS Labs, Steinberg, Telex, and others. Product demos were in full swing while a wide range of performers jammed on stage *live* with their Macs to the delight of the grooving Macworld attendees.

THE CUBE

Hang on to your desktops and prepare to be assimilated — trust me, resistance is futile. At Macworld New York, Apple unveiled the Cube. A Borg-like eight-inch square about 10 inches high equipped with a 450 MHz G4 processor, FireWire and USB ports (two each), 64 MB of RAM (expandable to 1.5 gigs!), 16 MB of VRAM, 20 GB hard drive, DVD/CD, Airport card slot, cool new optical mouse, new keyboard, a single monitor cable/connector for both power and video, a pair of Harmon Kardon USB speakers, and no fan (making it virtually silent), all for just \$1,795. Perhaps the world's first true desktop computer, it's so darn cool that I want one and don't even need it! The only snag is the lack of analog I/O or PCI slots — you'll need a USB or FireWire audio interface.

MULTI-PROCESSOR G4

Apple also introduced MP (multi-processor) G4 computers with two 450 MHz or two 500 MHz CPU's at the same price as the original single-CPU G4. Aside from the multiple processors, the new machines are very similar to the "gray-and-white" G4's that Apple has been shipping for some time.

Software manufacturers were understandably very happy to see the power offered by the new computers, and many have already begun updating their programs to take advantage of the multiple processors. According to Jim Cooper of MOTU, "With Apple's [multi-processor] G4 Power Macs, native audio has truly arrived."

Apple G4 Multi-Processor Power Macintosh

What is it?	A personal computer sporting two 450 MHz or two 500 MHz CPUs.
Who needs it?	Once software has been updated to take advantage of it, anyone running native digital audio programs — especially those using large numbers of plug-in processors.
Why is it a big deal?	The most raw processing power ever offered in a personal computer.
Special notes:	Companies such as BitHeadz, Steinberg, MOTU, and others are promising multi-processor support soon.
Shipping:	Now
Suggested retail price:	Depends on configuration; prices for stock factory configurations start at \$2,499.
Contact:	For more information contact Apple Computers at 800-692-7753 or visit www.apple.com . Circle EQ free lit. #101.

OTHER HIGHLIGHTS

- BitHeadz announced their new Phrazier software (available Q3, 2000), which is being touted as Acid (Sonic Foundry) for the Mac. I, for one, can't wait to try it.

- Creative was showing their new Nomad series of MP3 players, including a Jukebox model that stores over 100 hours of compressed CD audio, or a phenomenal 2,600 hours of spoken word. It runs for 3–4 hours on four AA's, it has a cool rehearse mode that lets you speed audio up/down, it's software updateable, and it's about the size of a portable Discman (\$499).

- I-JAM Multimedia was showing their new series of MP3 players, one of which is a combo MP3/CD player that can hold up to 10 hours of MP3 audio.


- Harman Multimedia introduced their new SoundSticks/iSub combo — a \$199 set of USB speakers that look and sound great.

- Power On Software was showing *Rewind*, a new app said to keep track of all changes made to your Mac, so you can just *rewind* your hard drive(s) to when things were still working if you're having problems after installing the latest OS or a new program. (Shipping Q4, 2000.)

- Onadime was previewing their *Player/Composer* series of video art

sequencers that respond to mouse or audio/MIDI input. I saw it in action and actually played it live myself, interacting with one of the many music acts on stage at the Apple Music & Audio Showcase. Pretty cool! Check out the free demo at www.onadime.com.

- SeaSound had their new PCI-based Solo Expander 8x8 I/O on display for \$429.

- TC Works was giving demos of their new VST instrument, Mercury-1, a Mac/PC monophonic synth with four engines, each of which has dual oscillators and an additional sub-oscillator. 





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Kind Of Loud Technologies SmartCode Pro

BY STEVE LA CERRA

Along with the rising popularity of surround sound audio over the past several years, you may have noticed the increased availability of processors designed specifically for multichannel audio mixing. While some surround processors have been introduced in the traditional hardware format, Kind Of Loud Technologies has concentrated their efforts in surround sound software development — specifically in the form of plug-ins for Digidesign's Pro Tools. The company's RealVerb 5.1 surround reverb for Pro Tools was the first surround sound reverb on the market in any form — hardware or software. Additionally, Kind Of Loud Technologies has introduced a bass management plug-in called Woofie, a monitoring and calibration plug-in known as Tweetie, and a discrete 5.1 surround panning plug-in called SmartPan Pro. Therefore it was a natural progression for Kind Of Loud Technologies to develop their latest surround sound-related product, SmartCode Pro.

Combined with the previously mentioned surround audio plug-ins, SmartCode Pro completes a suite of surround audio production tools for Pro Tools users. SmartCode Pro is the first surround sound encoding plug-in for Pro Tools, available in versions for encoding for Dolby Digital and DTS formats (which are the two most popular surround formats). Both versions of SmartCode Pro run under AudioSuite, allowing users to preview their 5.1 surround mixes in real time, and then encode their mix to create a six-channel surround master.

Kind Of Loud Technologies is offering two versions of the DTS encoder. The first provides encoding for both DVD and CD bit rates, while the second version is for CD format only. In conjunction with a standard disc burner, the CD-only version will allow creation of CDs in the DTS format, providing an inexpensive way for people to print surround-mixed CDs for their own use — such as taking a mix home from the studio to hear what it sounds like in the living room (much like we already do with

stereo CDs after a mix session). Discs created in SmartCode Pro may be played back via a DVD player or via a standard "Red Book" CD player with a digital output (in either case, a DTS de-

single bit stream, and then writes the stream to a single file. After the encoding process is complete, SmartCode Pro offers an option for replacing the six selected audio tracks in Pro Tools with a

Kind Of Loud Technologies SmartCode Pro Plug-In	
What is it?	A plug-in for Digidesign Pro Tools that facilitates surround sound mixing and encoding for Dolby Digital and DTS surround formats.
Who needs it?	Anyone who wants to create a 5.1 mix in Pro Tools and burn a surround-encoded CD or DVD.
Why is it a big deal?	SmartCode Pro is the first surround encoding plug-in for Pro Tools.
Special notes:	SmartCode Pro/DTS CD-Only provides an alternative to those who wish to burn only DTS surround-encoded CDs.
Shipping:	Q4, 2000.
Suggested retail price:	SmartCode Pro/Dolby Digital: \$995; SmartCode Pro/DTS DVD/CD: \$1,995; SmartCode Pro/DTS CD-Only, TBA
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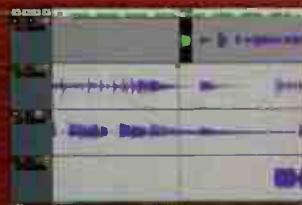
Both the Dolby Digital and the DTS SmartCode Pro AudioSuite plug-ins function within Pro Tools in a similar manner. Mixing of a surround sound project proceeds within Pro Tools on six tracks. SmartCode provides a track configuration editor that allows you to map each Pro Tools track to its corresponding surround channel. The track configuration editor defaults to left, right, center, low-frequency, and right-surround channels (this is currently the most prevalent channel ordering standard).

Once the mixing process is complete, the user selects the six tracks to be encoded, and hits the "process" button on the AudioSuite graphic interface. At this point, SmartCode encodes the six channels to a

decoded version of the bit stream file — so you can compare to ensure the encode/decode process didn't produce audible anomalies. Since the encoded bit stream masquerades as Red Book audio data, most popular CD-burning programs may be used to write surround-encoded CDs. **EQ**



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Apogee Electronics Trak2 Preamplifier/Conversion System

BY STEVE LA CERRA

At the summer NAMM show in Nashville, Apogee Electronics introduced the new Trak2, a two-channel microphone preamp and digital audio conversion system. Intended for use with digital multitrack tape recorders as well as computer-based workstations, the Trak2 lives in a single rackspace and features high-resolution analog-to-digital conversion, Apogee's new UV22HR bit-reduction technology, and a total of three expansion slots. The Trak2 can accept mic-, line-, or instrument-level signals, and can output digital audio in just about any format you might require.

The Trak2's front-panel LCD provides information about each channel's status, including input select, phantom power, low-pass filter, insert, and matrix routing. LED bar meters indicate signal level for each channel, with variable ballistics for average, fast-peak, two-second, or infinite-hold modes. Signal "over" indication may be adjusted between one and four consecutive full-scale words. Cursor controls and a data wheel are

included for front-panel data entry, while programmable "quick keys" allow instant access to four frequently used functions. I/O routing presets may be saved and recalled for quick setup.

At the front end of the Trak2 is a pair of discrete, solid-state microphone preamplifiers, each with three input jacks. Front-panel Neutrik Combo connectors accept and automatically configure for

mic-level or high-impedance instrument-level signals. One set of rear-panel XLR jacks accommodates mic-level signals, and a second set accepts balanced or unbalanced, +4 dBu or -10 dBv, line-level audio input. Each channel of the Trak2 has a fully balanced audio path with a maximum gain of 90 dB, user-definable gain steps, 20-dB pad, +48-volt phantom power, signal polarity reverse, and high-pass filter

Apogee Trak2	
What is it?	A two-channel mic/line preamp with integral analog-to-digital conversion.
Who needs it?	Any studio requiring high-quality mic preamplification and A/D conversion as a front end for a digital recorder.
Why is it a big deal?	Trak2 features Apogee's renowned conversion technology in addition to high-quality mic pres.
Special notes:	The Trak2 accommodates Apogee's AMBus expansion cards, making it able to interface with a variety of digital audio protocols.
Shipping:	September, 2000.
Suggested retail price:	\$3,995
Contact:	For more information contact Apogee at 310-915-1000 or visit www.apogeedigital.com . Circle EQ free lit. #103.




with 40 or 90 Hz corner frequency. Also found on the rear panel is a pair of balanced XLR "send" outputs, which can drive balanced or unbalanced inputs with up to +28 dBu of gain. Beside acting as a traditional analog output for the mic pre, the send — which is always active — may be used in conjunction with the line input as an insert point.

Since the line input is pre analog-to-digital converter, you could, for example, patch the send out to a compressor input, then the compressor output to the line input — allowing the line input to function as an insert return.

Directly following the analog input stage is Apogee's analog-to-digital conversion circuitry. Audio is sampled with 24-bit word length for a dynamic range exceeding 117 dB. Output sample rates of 44.1, 48, 88.2, and 96 kHz are supported. Included in the conversion are Apogee's proprietary Soft Limit (for maximizing recording level while eliminating "overs") and Soft Saturate (which simulates analog tape compression). These processes may be independently switched in or out for either channel.

Apogee has equipped the Trak2 with a variety of digital output possibilities. The unit outputs both AES and S/PDIF formats; these share a single jack and support operation at high sample rates. Two Apogee Multimedia Bus ("AMBus") slots are provided on the rear panel, enabling the Trak2 to interface with a variety of digital audio protocols, including Digidesign Pro Tools, ADAT, TDIF, SDIF-II, and SSL's HiWay. Some of the available AMBus cards support bit-splitting so you may use 44.1 (or 48) kHz/16-bit multitrack digital recorders to store up to 24-bit/96 kHz data. Since the AMBus cards accommodate eight-channel operation, the Trak2 may be used for multichannel digital format conversion. A third expansion slot accepts optional two- or eight-channel digital-to-analog conversion cards.

Other features include Apogee's Ultra-Low Jitter Clock, word clock I/O from 44.1 to 96 kHz, synchronization via AMBus card, synchronization via NTSC and PAL video sync, MIDI in/out/thru, digital oscillator, 96 kHz headphone digital-to-analog converter with 40-watt output amplifier, and an RS232 port for remote operation. Digital output may be processed through UV22HR for high-quality reduction of word length to 16 or 20 bits. 

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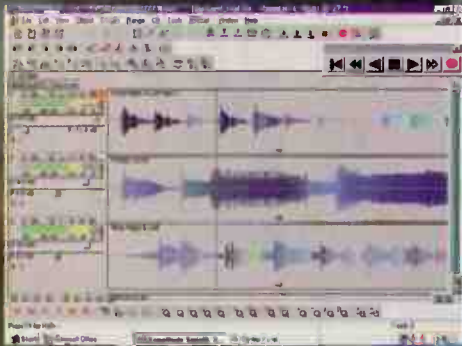
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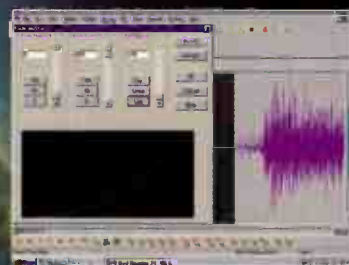
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Howling at the Moon

Word of mouth keeps guitarist Jeff Scheetz busy recording for music libraries, commercials, and CD releases

STUDIO NAME: Gray Wolf Studio

LOCATION: Kansas City, MO

KEY CREW: Jeff Scheetz (and occasionally Zack the wonder dog)

CREDITS: Guitarist Jeff Scheetz has produced and released five CDs, two of which were recorded at Gray Wolf. His latest is entitled *Pawn Shop* (available from Bam-Zoom! records in the U.S. and Bandai in Japan); tracks from *Pawn Shop* may be heard on the Web at www.jeffscheetz.com or www.mp3.com/jeffscheetz. Jeff has produced bands for Salt Inc. Records and Rowe Records (Australia), and has recorded tracks for music libraries such as DSM and DMPML. Scheetz has also produced commercials for Toyota and Chevrolet.

MIXING CONSOLE: Mackie 24x8

MONITORS: JBL 4412, Yamaha NS10M, AKG K240 and Sony 7506 headphones

AMPLIFIERS: Ashly CFT1800

RECORDERS: Alesis ADAT XT20 [3] and ADAT [3]; TASCAM 202 MK III cassette deck, CDRW 5000 (CD recorder), and DA30 MK II DAT recorder

OUTBOARD: Apogee Rosetta A/D converter, dbx DDP (Digital Dynamics Processor) and 166a; Aphex 105 logic gates [2], Alesis 3630

EFFECTS: TC Electronic M-One, Alesis Q2, Lexicon Alex, Yamaha SPX90, Antares ATR-1, BBE 462, ART Alpha SE, Zoom 9200 Studio Quad, Korg DT-1

MICROPHONES: AKG C414, Avlex AV S80, Shure SM57 [several], Sennheiser E604 [several], AKG D 112, Avlex drum mics, various "interesting" mics including a Turner that picks up anything within a three-mile radius, and an Ibanez mic with a nice funky midrange sound(!)

MIC PREAMPS: Aphex 107 Tubessence mic pre

SAMPLERS/KEYBOARDS/MIDI MODULES: Guitar synth with Roland GK-2A pickup into a Roland GI 10; Korg X5DR, Yamaha V50 and RY30; Alesis DM Pro

COMPUTERS: Micron Millennia 450 PII with 160 MB of RAM, 13 GB hard drive, MidiMan Midiport, and Soundblaster generic sound card

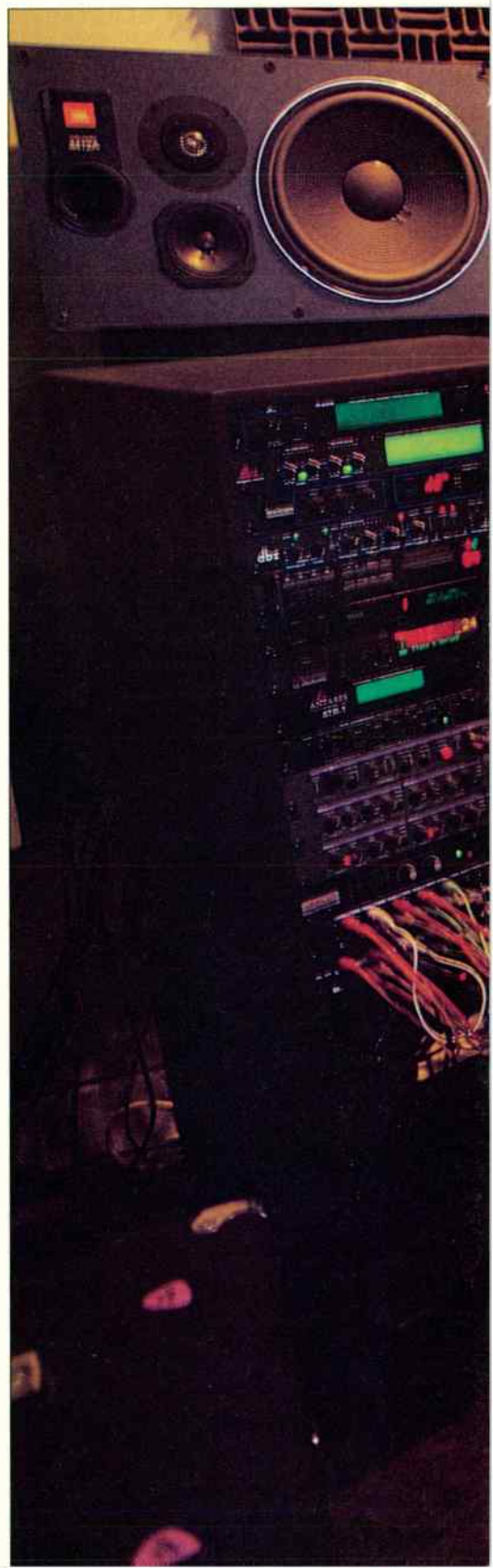
SOFTWARE: Red Roaster 24 v5.11, Sound Forge 4.5 (the computer is used for editing and mastering).

POWER CONDITIONING/BACKUP: Chandler CPI200

STUDIO NOTES: Jeff Scheetz states: "I primarily built my studio to record my own CDs, but I've ended up doing a lot of projects, mostly by word of mouth. I guess what makes my studio different is me. And that's true for *every* studio and their engineers/producers/owners. You can have all the gear in the world, but if the person running it isn't very good or just doesn't care, it won't matter even if you do run the vocals through that 'rare vintage 1952, radio actitron discombobulator.' Most of us have had the frustration of recording in a multimillion dollar studio only to end up with a product that wasn't very good. There has to be a certain level of gear at your disposal, but then it's up to the engineer to either make it sound good or not. I've had the good fortune of getting to do projects because someone likes the work I do. On the flipside of that, I'm sure I've missed the chance to do some things because someone *didn't* like the way I do things. But either way, if you try to be yourself, you get the best results. I usually just take on projects that I feel I can honestly put the heart and effort into making the best I can."


EQUIPMENT NOTES: Scheetz continues: "Right now — though it's not normally thought of as 'studio' gear — the thing I'm having the most fun with is the Line 6 Pod. Being a guitarist, it's amazing what you can do with the Pod. The ability to run direct without having to mic an amp all the time is very nice! It's perfect for laying down scratch parts (and on most occasions the scratch parts make it to the final mix). On the studio gear side, the Apogee Rosetta A/D converter seems to make everything sound better. I use it on the front end of everything I can."

PRODUCTION NOTES: "One of the main things I've learned about getting good



sounds is that there really *is* no main thing!" Scheetz concludes. "I look at getting sounds and mixing as a creative art, just like my playing. I like to use the 'whatever works' approach instead of the 'here is how you must mic a snare' approach. I love to try different things.

When we needed a skin drum for a tune on my last record, there was none available. But that's no worry when you have a 125-pound dog: We just put a mic by him while my drummer patted his belly! He loved it and we got a cool sound. Not your normal technique,

but it was effective and made the whole session fun — which is why we should be making music in the first place. So I guess my philosophy is to be creative and not get stuck in the rut of recording the same thing the same way every time." 



Frankie's Hideaway

A multi-room
hideaway in the wilds
of North Hollywood

BY STEVE LA CERRA

STUDIO NAME: Frankie's Hideaway

STUDIO LOCATION: North Hollywood, CA

KEY CREW: Mark Zonder (owner and studio manager), Phil Magnotti (engineer)

CREDITS: As a member of the band Fates Warning, drummer Mark Zonder has performed on records including *Perfect Symmetry*, *Pleasant Shade Of Grey*, *Parallels*, and their upcoming release entitled *Disconnected*. Phil Magnotti has worked with many artists, including Spyro Gyra, Mike Stern, Chuck Loeb, Larry Coryell, and Electric Light Orchestra. Upcoming projects at Frankie's Hideaway include the next Dave Weckl Band album.

MIXING CONSOLE: Amek Big 28 console with automation, 72-input with recall and virtual dynamics (gating, compression, etc.)

MONITORS: KRK V8 self-powered monitors, Yamaha NS10M, Alesis M1

RECORDERS: Alesis ADAT XT [5] with BRC, Studer A827 24-track two-inch available on request, HHB 850 CD Recorder, Panasonic 3700 DAT, Denon DTR2000 DAT, DN770R dual cassette, and DCD520

OUTBOARD: ART tube parametric equalizer [6] and Pro VLA tube compressor [2]; Orban 2-channel parametric; Amek 9098 stereo compressor limiter, DBX 165VU mono compressor with VU meter, 160VU stereo compressor, and 160 XT [2]; Behringer Intelligate [3]

EFFECTS: Dynacord DRP20 (true stereo multiple effects unit), Yamaha SPX 900 [2], Rev 7 [2], and SPX 9011 [3]; Roland SRV 2000 digital reverb, Lexicon PCM 91

MICROPHONES: Neumann U 47 Fet, AKG Solid Tube, C414 TLII, C3000 condenser [2], C451 [2], and D112 [2]; Shure KSM32 condenser [2], SM87, SM57 [6], and SM58 [4]; Electro-Voice RE27 [2], RE20, 408 [8], RE 200 condenser [2], and 757 [6]; Sennheiser MD421, Audio-Technica ATM25 [2]

MIC PREAMPS: Neve 33115 preamp and EQ [2], Avalon M5, Cal Rec PQ15 preamp/EQ [2], Manley Dual Mono preamp, Summit/Neve Element 78 MPE-200 mic pre/EQ, TL Audio

Dual Valve mic pre, ART Pro MPA tube mic pre [6]

SAMPLERS/SYNTHS/MIDI GEAR: AudioControl Industries PCA200 Low Frequency Synth, Akai CD3000 Sample Player, Alesis D4 Drum Module

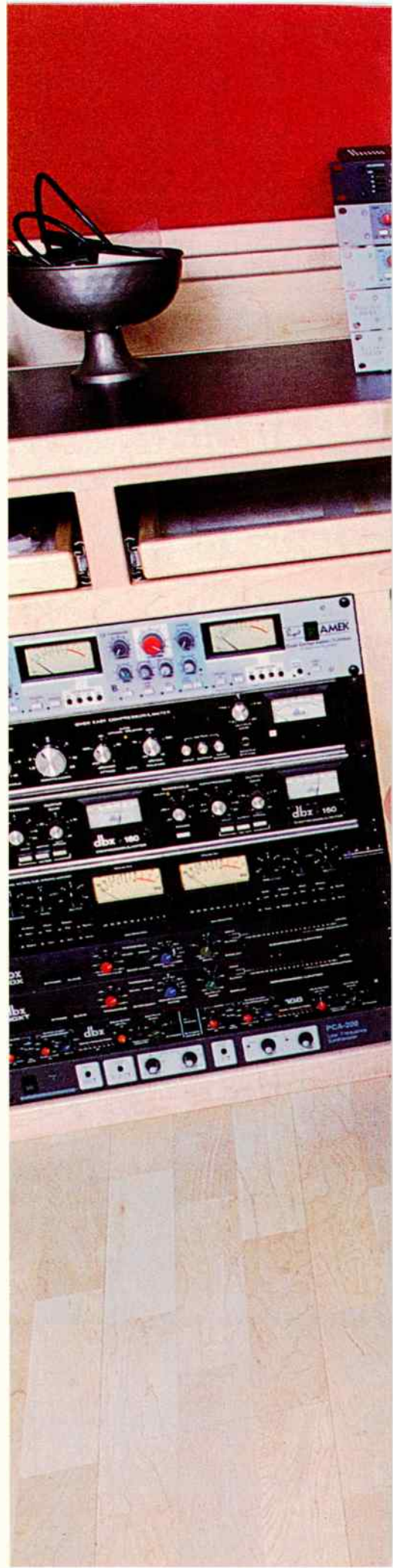
STUDIO NOTES: According to Mark Zonder, "Even though Frankie's Hideaway is located inside a 6,000-square-foot facility, the control room and iso both are about 450 square feet each. The room was built to industry standards, if not beyond. Sand-loaded floor, separate electrical panel, isolated grounds, three tons of central air on a completely different panel, all of the building tricks for the walls (nothing touching, etc.). There's a skylight so you don't get that closed-in, 'dark' feeling of a recording studio. Although it is comfortable and beautiful, the first and main concern was soundproofing and the tuning of the room (the most important part of a studio is tuning the mix area). I hired Steven Klein to tune the room.

"Another very important feature at the Hideaway is that the control room ties into three of the rehearsal rooms, the largest at 35x35 (feet) with a 17-foot ceiling. It's very valuable for drums and large group recordings. All three additional tracking rooms have audio snakes and video camera ties to the control room. The studio is always in the process of upgrading equipment, and we have a long-range plan to take the room next door to the recording studio (25x25 feet), make that the control room, and use the existing control and iso rooms for tracking."

FAVORITE GEAR: "Two pieces come to mind," reveals Zonder. "One is the Amek console. Since almost everything gets tracked through separate mic pres and EQs, the console is used primarily for listen-back and mixing. The automation and recall really put the studio one notch up compared to most studios at this level. The virtual dynamics and full automation and recall make it a pleasure to mix. Also, the flexibility of the console is incredible. The other piece is the Summit Audio MPE 200 mic pre/EQ (if you go to the Summit Audio Web page, you can view my comments on the 'experts' page). That piece really is great."

PRODUCTION NOTES: "Much has been stated above, but my big room (35x35) has an amazing live sound for drums — very reminiscent of the Led Zeppelin room sound for drums."

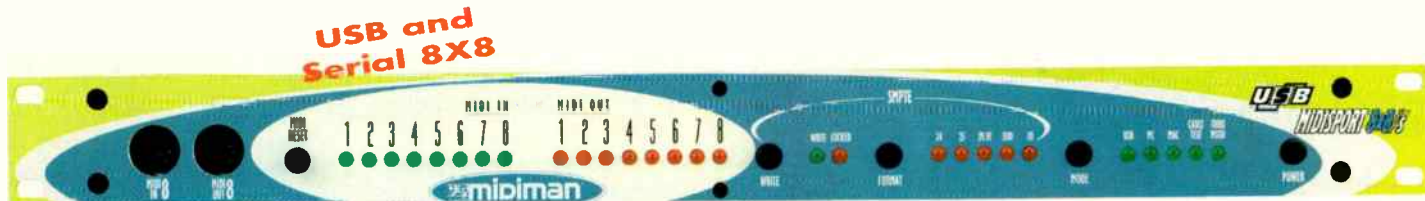
You can visit the Frankie's Hideaway Web site at www.frankieshideaway.com.





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RCA SK-45B

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MICROPHONE NAME: RCA SK-45B

FROM THE COLLECTION OF: Bill Meredith, Cine-sound Company, NY

PRICE WHEN NEW: \$49.85 (in 1961)

YEAR OF MANUFACTURE: circa late 1950s

TYPE OF MIC: Dynamic

FREQUENCY RESPONSE: 70 Hz to 12,000 Hz

DIRECTIONAL CHARACTERISTICS: Non-directional

EFFECTIVE OUTPUT LEVEL: -56 dBm, referenced to 1 milliwatt and a sound pressure of 10 dynes per square centimeter (see notes)

HUM PICKUP LEVEL: -109 dBm, referred to a hum field of 1×10^3

OUTPUT IMPEDANCE: 200 or 15,000 Ohms

EXTERIOR FINISH: "TV gray"

MIC NOTES: Designed to be visually less obtrusive than some of its contemporaries, RCA's SK-45B microphone was physically smaller and had simpler lines than mics such as the Type 77 or Type 44. It was intended essentially for talkback, cue, and public address purposes, where clean sight lines were becoming more of an issue with television broadcasts. Its sibling — the SK-45 — had a somewhat more limited frequency response of 80 to 8,000 Hz. The SK-45B's appearance is very similar to RCA's KN-1A and KN-1B microphones. The KN-models featured an integral desk stand with a compartment in the shank of the stand to hide the connecting cable's XLR connector, whereas the SK-45B could be mounted on any floor or desk stand with a standard 5/8-inch, 27-threaded fixture. The SK-45B was also identified by RCA as the MI-12045-B.

USER TIPS: The SK-45B is mounted on an adjustable swivel that may be moved through a range of 80 degrees (vertical). Impedance of the microphone could be set at either 200 Ohms for a balanced output of -56 dBm, or 15,000 Ohms for an unbalanced output level of -58 dBm. The SK-45B was originally supplied by RCA with an integral, unterminated 25-foot cable.

Technical data furnished through the courtesy of Clarence Kane at ENAK Microphone Repair, Pittman, NJ, and Stephen Sank at Champlain Valley Speaker Company, Albuquerque, NM.



PHOTO BY EDWARD COLVER

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The Dynamics of Mastering

Bob Ohlsson on mastering from Motown to Hearts of Space, and why dynamics are essential to selling records

BY BOBBY OWSINSKI

After cutting his first number one record (Stevie Wonder's "Uptight") at age 18, Bob Ohlsson worked on an amazing 80 top ten records while working for Motown in Detroit. Now located in San Francisco and mastering predominantly for New Age label Hearts of Space, Bob's unique view of the technology world and his insightful account of the history of the industry makes for a truly fascinating read.

EQ: How do you think mastering has changed from the vinyl days to the way it is now?

Bob Ohlsson: Well, I was thinking

about that. In the vinyl days, we were very concerned with mechanics, meaning the playability of a record and whether it could be manufactured. A mastering error in those areas would mean thousands of returned pressings. It was a big financial factor. Tapes, for the most part, came from larger studios with more experienced people, so you didn't really have that much to do in a lot of cases. A little EQ, a little level correction, filter some low frequency and de-ess some highs so you wouldn't run into skipping problems, but, other than that, you pretty much tried to go with the sound on the

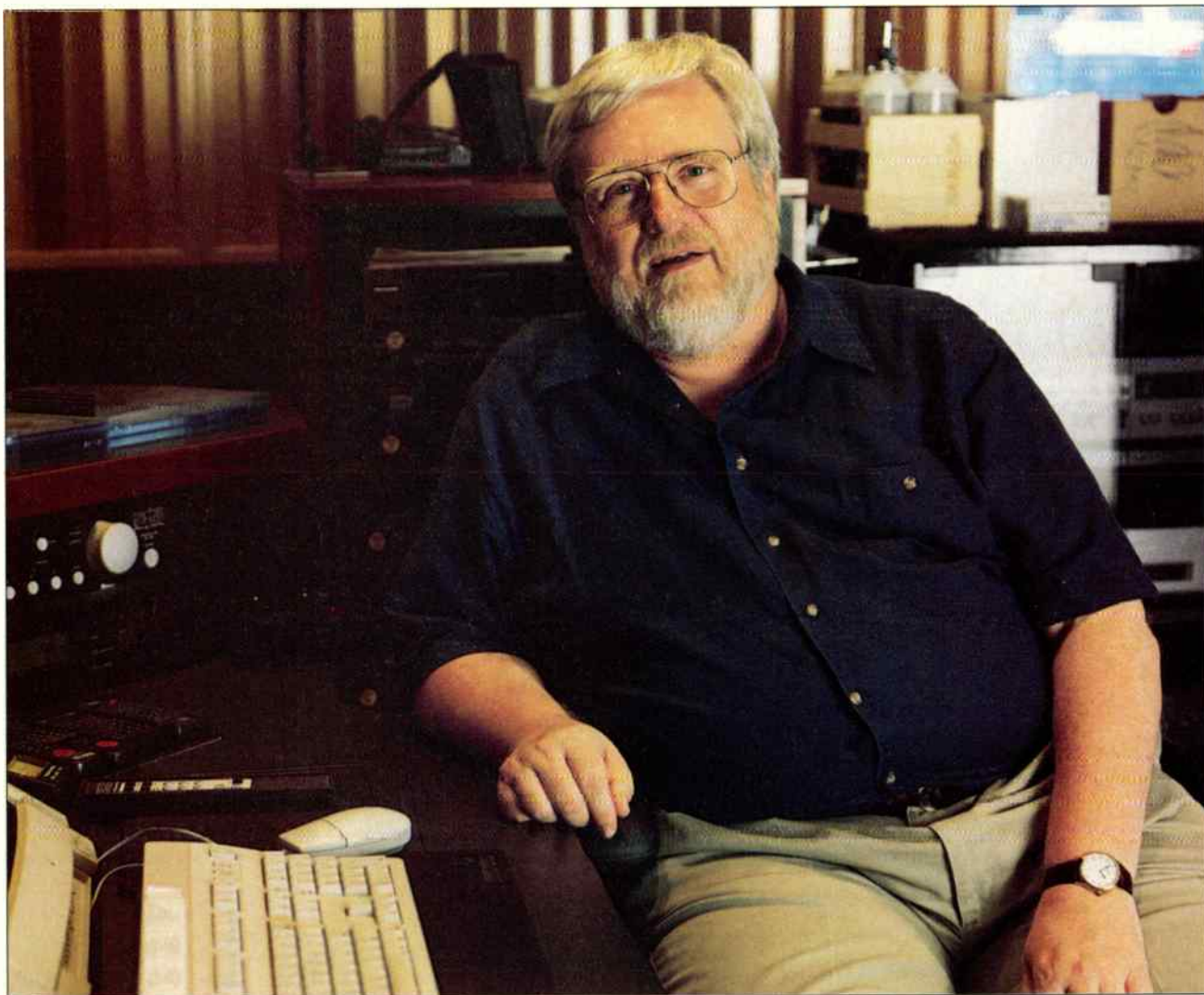


PHOTO BY ROSS PELTON

Bob Ohlsson has seen a lot in his years as a mastering engineer — from record company-owned facilities to the birth of the independent mastering studio.



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master tape. It was a lot more nuts and bolts. You'd always think, "How do I get it off from the tape onto the disk and still have something resembling the same thing come back?" So it started out very much as that kind of consideration.

Then, as the recording industry moved to the use of independent studios, we began to get a new generation of independent mastering studios. They got more involved with working on the audio itself, partly because the studios either had less experience, or had less feedback than, say, you would get in a record company studio. In a record company studio, you hear about it in a big hurry if something doesn't sound good, whereas in an independent studio you may or may not hear about it because, by the time the sales people are involved, the studio is completely out of the loop. So Sterling Sound and the Mastering Lab and so forth were kind of the first generation of mastering studios that were not part of record companies.

In 1948, the majors decided they were going to stop doing anything other than middle-of-the-road pop music, and so a whole bunch of people left the majors and started what we call the independent record companies; the Atlantic's, the VJ's, the Chess's, and so forth. Later on, Motown was actually part of the second generation of that evolution.

When you were at Motown, were you in Detroit or L.A.?

I was in Detroit, the real one.

You did the mastering?

Well, it was a complicated thing. Basically Berry Gordy is a man who tried to never make the same mistake

twice, so he had his own system that was integrated into RCA's manufacturing. If at all possible, he wanted the mixes to be able to be mastered flat. So, in many cases, if it didn't work well flat, it got sent back to mixing rather than attempting to fix it in mastering. He also had a policy that he wouldn't evaluate anything other than off a disk since

he didn't have a tape recorder in his office. He wanted to hear how it stacked up to other records on the market, and he wanted that perspective on everything he listened to. So we did an acetate of every mix that was done. We would occasionally suggest a change, but for the most part they wouldn't approve anything at all radical. Anything beyond a couple of dB at 4,000 [Hz] was sent back for another mix.

So what I was doing was cutting these acetates. We would cut a 33 1/3 of all the mixes and then they would pick which ones they wanted to go to the next step. If there was some marketing reason why it had to happen fast, we would do the mastering. But if there was time, we would then send the acetate and the master tape to RCA and tell them to match it. They were

willing to absolutely guarantee pressings and turn around any mistakes in 24 hours. We went that route because Berry's first business was a record store and he knew all about defective pressings. The way it was set up is we would hardly even know about a problem because they would deal with it all internally at RCA. So they were actually matching an acetate that we had sent, and we would check their acetate to make sure that it matched what we had done before letting it go.

I was doing mastering there until about 1968, and then I got moved into the studio because I had a background in music. So from that point on I was doing vocals, strings, horns, rhythm dates, the whole bit. I was one of two people that held every engineering job there.

You once told me that you didn't use much compression at Motown.

Berry Gordy hates compression, so we learned to not use any. We have far more transparent compressors today, but I've always found he was right in that if you can hold a great balance together without it, it'll sound a lot better.

How do you think we're going to get back to the use of dynamics, now that we're squeezing the life out of everything everywhere along the line?

The usual theory is that nobody will question it as long as it is selling, but I am starting to find signs that a lot of new recordings are not selling. I found out that the average new release is selling something like 800 copies. While you've got these spectacular gross figures and a few titles selling very well, the recordings that are selling millions and millions of copies are not paying for the ones that aren't. Apparently this came up in Soundscan, and *Billboard* printed the thing and a bunch of the majors tried to actually get them to pull that issue off the stands because they didn't want their stockholders seeing that statistic. So there is certainly something going on there.

I had an exchange with Bob Orban (designer of the Orban Optimod, a compressor/limiter found in virtually every radio station), and found out a couple of real interesting things: Apparently too much high frequency absolutely kills you with women, but a lot of bass is very important to women. Too much compression kills you with women because it becomes what he calls "intrusive." You want it to be able to be on and in the background all the time. You don't want it pulling your attention away. You still don't want it to be boring, and dynamics actually help with that, so it's a fine balance from a station's viewpoint. In order to appeal to women, they have to be less in your face, and the more in your face thing has to do with maybe the first ten seconds that somebody listens to a station before they adjust the volume control.

Apparently there are some major meetings going on in Nashville in an

I found out that the average new release is selling something like 800 copies. While you've got these spectacular gross figures and a few titles selling very well, the recordings that are selling millions and millions of copies are not paying for the ones that aren't.

attempt to more or less reel production back into the record companies. They are rethinking a lot of stuff because of the dropping percentage of titles that are paying for themselves. If people can come up with figures that indicate that over-compression can harm sales, that is definitely the message that can turn it around.

Returns would scare people away from going too far.

You had that same economic with vinyl. But, in this case, we can do things beyond anything we were ever able to do before, like turn the signal into a square wave even. The other thing is that people are commonly going so far with compression during mixing that an awful lot of mixes can't be helped [during mastering]. I average a couple of mastering jobs a year where I can't do anything to it. If you switch anything in at all, it just absolutely turns to dust. All you can do is hope that the stations that play it won't destroy it too much.

Do you have a philosophy about mastering?

Well, first, do no harm. To me, it's a matter of trying to figure out what people were trying to do, and then do what they would do if they had the listening situation and experience that I have. I sort of try to be them because I see the whole process as a matter of trying to clear the technology out of the way between the artist and the audience. You've got this person on this end who is doing a performance, and you have these people on the other end who are listening to it, so I think it's largely about keeping the technical aspects from distracting from the performance. That's the most basic thing. Then to a certain degree you can enhance things, of course. You can get it so that you can hear more of what they were doing on a wider range of playback systems or playback circumstances.

But the big thing is communication. It's about somebody working some magic in front of a microphone and people having the effect of that magic coming out of a loudspeaker. To me, that is the key to the whole thing. Do everything you can to get the music to happen in front of the mics and everything you can to protect it after it is an electrical signal.

This interview was excerpted from Bobby Owsinski's upcoming book, The Mastering Engineer's Handbook.

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Steve Churchyard

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BY HOWARD MASSEY

The Abbey Road lineage stretches a long ways, from Norman Smith to Geoff Emerick; from Ken Scott to Alan Parsons; from George Martin to Chris Thomas — all the way to Steve Churchyard. Churchyard's engineering career actually got its start in the early '70s at a dubious little demo studio called Orange Music, located near London's Tin Pan Alley, with the obligatory guitar shop overhead.

His ambition, though, was to work at George Martin's AIR studios, which was eventually realized, even though he had to take a step backwards from engineering to assisting in order to do so. As he recalls, after receiving their offer to start at the bottom and work his way up, he "thought about it for about five seconds and realized that doing Eurovision Song Contest demos was not the way I wanted to spend the rest of my career." This turned out to be a fortuitous decision, because within a short time he was assisting for Geoff Emerick on projects such as Paul McCartney's London Town album before ultimately returning to the rank of engineer and working with The Pretenders and INXS. In the '90s, Churchyard relocated to Los Angeles, where he continues a busy career behind the board, crafting hits for artists such as Natalie Imbruglia, Sophie B. Hawkins, Celine Dion, and Ricky Martin. Soft-spoken and meticulous, yet with a quiet air of confidence, Churchyard's genteel English accent somehow meshes seamlessly with the laid-back L.A. studio scene.

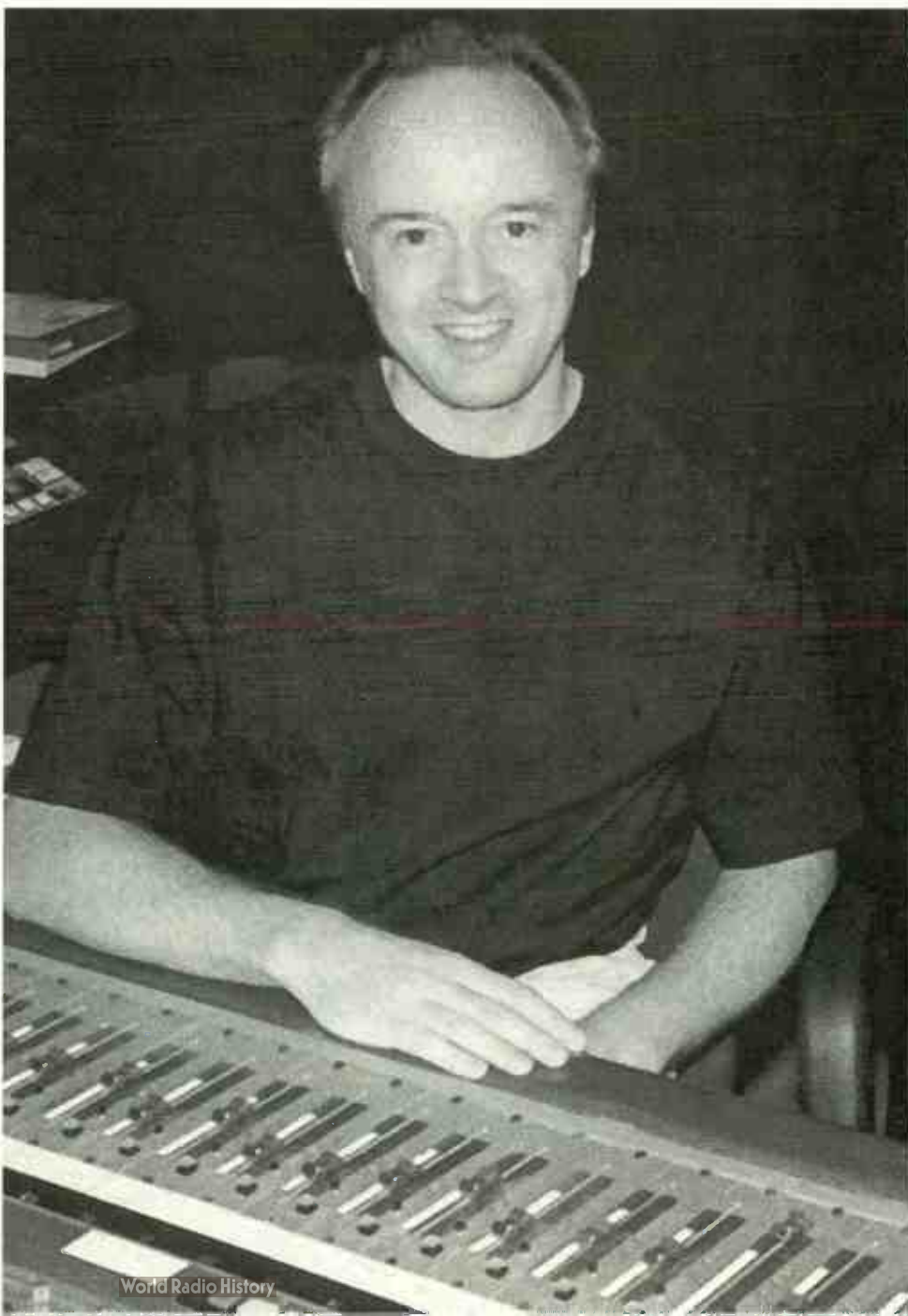
EQ: Geoff Emerick has said that he didn't get any kind of formal training from Norman Smith. Did he provide you with any kind of formal training, or did he just expect you to observe and pick it up?

Steve Churchyard: As you observed, you picked it up — you just assimilated anything and everything. Everything moves fast, and, with Geoff, you just did everything. We were there hours before the session, we were there hours afterwards, and we just made sure everything was right. It was a great experience, and Geoff was just brilliant. He's got such a unique gift to make sounds work. As an assistant, you

could put the drum mics *behind* the gobos and he'd make it work somehow.

Many producers maintain that moving a mic a fraction of an inch can make a world of difference, but Geoff doesn't really buy that.

Yeah. I'd sometimes ask him, "So what mic do you want on this, Geoff?" and he'd reply, "Put what you want on it." Which was great, because, rather than say, "Here's my drum mic list, do



this," he would just let you try things out, though he'd certainly change it if it wasn't right. You could bet it would be dynamic mics on the drums with a pair of [STC] 4038's overhead. His drum sound, a lot of the time, was the 4038's, and that was pretty much it. Maybe there'd be one mic in the kick, and you'd spot mic other drums for extra presence. He just makes things work — the way he fits them together, it's masterful mixing.

What are your favorite drum mics?

My standard arrangement would be a [AKG] D112 or a D12 inside the kick and a [Neumann] FET 47 just outside the kick. That FET 47 sitting outside the kick drum helps; it adds a lot more fullness and roundness

to the sound. For snare drum, a [Shure SM]57 on the top. I'll put something underneath, but invariably I won't use it — it's there just so I can make the choice later. A [Neumann] KM 84 on the hi-hat, Sennheiser 421's on the toms — I use them just on the top. For overheads I use AKG C452's, and I almost always put something on the ride cymbal, just for that extra presence — a KM 84, usually.

For room mics, I'll use almost anything: [Neumann] U 67's, M 50's, U 47's. I'll also usually put a '57 just in front of the whole kit — maybe about seven or eight feet away, at head height, maybe even pointing straight up — just to see what that does in the control room. That's the "fun" mic. I typically like to squash it

with a Fairchild [compressor] or gate it — I'll do something with it later, so I'll stick that on its own track.

Then I'll pan everything audience perspective and usually print everything discretely to separate tracks, including the two kick mics — put them on separate tracks, and then figure out a blend later.

I invariably start adding EQ to drums. Typically, I'm adding some low end — somewhere between 60 and 100 [Hz] — to the kick drum mics. Usually I put a Pultec [EQ] on the kick drum and sometimes on the snare, too. On the snare, I'll add some 10k or higher, just to get some crack in the sound. And then I usually brighten up the toms — usually some low top, some 3k, 5k, just to generally brighten everything up, because when you use dynamic mics you want to help them out a bit. I'll go crazy with my fun mic — my '57. I'll crank some high end into it, some low end, compress it, maybe with a Fairchild or a [Empirical Labs] Distressor, and just mix that back in with the kit.

Do you use compression while

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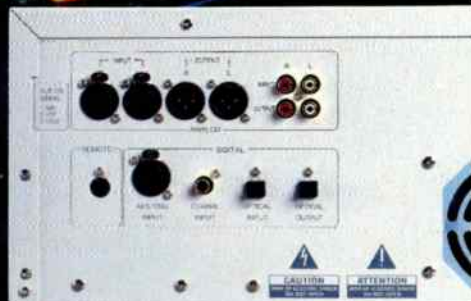
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you're recording drums?

Typically not, except on my fun mic, or perhaps on the room mics, depending on the song.

Do you filter low frequencies out of the hi-hat or overhead mics?

No. The mic placement is really important for those guys. I'll usually use a spaced pair for the overheads, get those so it looks real symmetrical with the kit and experiment with the hi-hat mic for the best separation, so I'm not getting loads and loads of snare drum leakage.

The most important thing of all is phase. You've used a lot of mics at this point — you could be up to somewhere like 12, 14 microphones — so I'll spend quite a bit of time making sure the phase is just right between them. I mix a lot of other people's stuff, and by far the most common problem with drum sounds — particularly when they're multi-miked — is phase. Typically, the overheads are out of phase with everything else because they're hearing things later than the closer mics. So, typically, I'll pop those out of phase with everything else, and usually all the sounds kind of come forward. When you've got things out of phase, it sounds like the snare's kind of sucked into the kit and the bottom end is gone; it's a strange thing.

That could be a problem between the two kick drum mics also, couldn't it?

Yes. But typically that distance is not quite as far as [the distance between] the snare drum and the overhead, so you can mess with the position of the '47 for the best phase. If you've got an assistant brave enough, give him a pair of headphones and let him move them around. It's amazing how much the sound changes if you're completely on-axis to the kick drum pedal beater rather than more off-axis and to the side of the kick drum.

Do you usually print to tape, or do you record digitally?

Usually tape, although recently I've begun going straight into Pro Tools.

So do you saturate the tape for the snare and the bass?

No, usually I'm not hitting it too hard. That's something I learned from Geoff. With Geoff, typically every VU meter is at -7 or -5, allowing the transient to show through rather than going to saturation. There are two schools of thought on that — some people will just pin it, and that's great, but my training and my background is not to do that.

Most of the AIR engineers never really subscribed to that "smash it on there" technique.

How do you typically record bass?

Bass is typically DI; that works well for me almost all of the time. If I use an amp at all, it will be an Ampeg B15. I'll use a FET '47 on the amp, but when I mix the DI and the amp together, sometimes the phasing really bugs me. It's almost like a foggy negative — you're not quite sure where the sound is; it lacks a real center. It's fine if you use just the amp or the DI on its own, but when you combine the two, sometimes the phase is a problem. So to get more focus on the bass sound I'll typically just use a DI.

What compressors do you favor for bass?

The [Universal Audio/Urei] 1176 works best for me; I tend to use a 4:1 ratio.

What kind of EQ curves will you typically use for bass?

Usually I'll add some mid, some highs, and maybe some low end. On the DI, maybe some 10k so I can hear some of the string a little better — 2.5k maybe. Maybe a little bit at 100 Hz. I rarely filter anything out at this point; maybe later in the mix when I'm a little bit more focused on what's going on. But, during recording, I always seem to be adding rather than subtracting.

What sort of recording techniques have you come up with for guitars?

I've recently been using this Royer ribbon microphone that I've had some good luck with. But, more usually, two SM57's. If I'm using a 4x12 cabinet, I find two of the best sounding speakers and I'll put a '57 right on-axis and right on the cone of both of those guys. Then I'll mix them in the control room, combine the two together. It seems a little different than just using one mic. It's not twice as good, but it's just mixing the character of two different speakers.

Sometimes I might put a '67 or an '87 a little bit off the cabinet and mix that with the '57's. Again, you're going to have a little phase thing, so that's definitely the biggest thing to watch for — and when recording any instrument with multiple mics.

What's your approach to recording acoustic guitar?

That can be really tricky. I usually try an AKG C451 somewhere about where the neck joins the body, not right by the sound hole — it's usually way too boomy there. Maybe 18 inches

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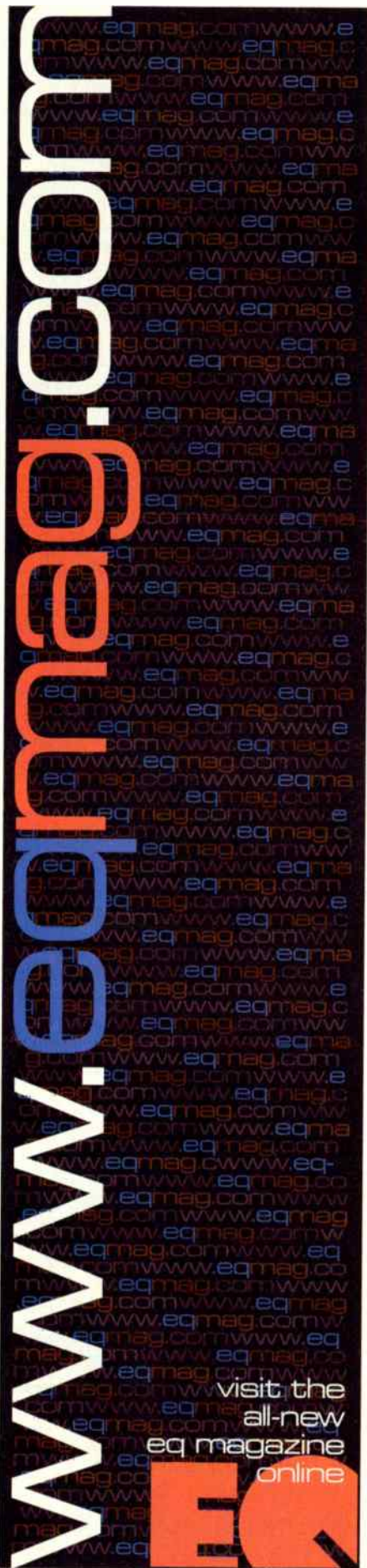
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away from the fretboard, where it joins the body. The C451 is very bright, but I find that it helps the acoustic guitar to cut in the track, because you really want to hear the strings and the pick and that nice presence. If it's going to be just a solo acoustic guitar, I might try something more like a tube '47 or a '67; it's a richer sound — something that would be lost if the bass and the drums and the guitars were blaring away.

Do you typically compress acoustic guitars when you are recording them?

Yeah. Again, I usually use an 1176 — my compressor of choice for most things.

How about electric guitar?

Usually not, because it tends to take off some of the highs.

Do you enhance those highs with EQ?

Usually I'll get the sound that I want from changing mic placement and amplifier tone; I'll work on that first. If it's still not right, I'll add EQ. EQ is almost always a last resort for me. I'll try everything else first: different guitars, different amplifier.

What's your approach to recording vocals?

I've worked with a lot of female singers in my career, and a FET '47 works very well for me, or a tube '47. My favorite mic is the U 67, but, again, in different studios, different environments, who knows what that particular mic's going to sound like? It's kind of like the '67 Mustang — was it taken good care of or was it thrashed? So typically, if I'm doing a vocal session, I'll see what the studio has, and I'll maybe put up six mics.

If I had to put my money down on any one particular mic working for me, though, a U 67 would be it, through something like a Neve 1073 module, flat, and an 1176. Sometimes I'll use two compressors — maybe a Fairchild — for the sound. So a little bit of compression before it gets to the Fairchild and then just a little bit of the Fairchild, more for the sound than for the compression.

I'll place the mic right on-axis, and typically I'll use a pop filter and put it six to eight inches in front of the singer.

Is flat EQ also the goal when recording vocals?

Yeah, though I might try different mic preamps. The Neve 1073 is usually my favorite. Usually it will be flat, but with maybe just a tiny bit of 10k, de-

pending on the singer. And I've been having some good results with Avalon preamps; they're very transparent sounding.

Are 1176's and Fairchilds also the vocal compressors of choice during mixing?

The dbx 160 seems a little faster than 1176's or the Fairchilds, so if I need something with a faster attack time, then I'll use that instead. But I kind of grew up with 1176's — they're great, great compressors.

It sounds like you use a fair mix of tube and solid-state gear.

Yeah, I love the sound of tube gear. When I started out at Orange, the board was all-tube, so I guess you get used to a certain sound, that analog sound. Digital is definitely an acquired taste, and the bad news is — it's not going away. It's here to stay, and you've got to embrace that technology. I love the facilities that Pro Tools offers — the flexibility and the editing capabilities — but at the same time, I still like the way analog tape sounds. And tape hiss doesn't bother me at all, never did. To me, tape hiss is like the air that you breathe; it's like the glue that holds the record together.

Although editing with a razor blade seems to have become a lost art.

I had to do that the other day, and it was really funny. We were in analog, and we had to do an edit. Pro Tools just wasn't around that day, and I said "Okay, I'll cut the tape." And the look of horror on everyone's face — it was hilarious.

Once, when I was recording The Stranglers with Tony Visconti, we had a click on tape, and we were using an old MCI machine that didn't have a spot erase facility. So I'd left it on there, because it was too close to the program and I couldn't erase it. But Tony said, "Oh, I'll get rid of that." He cut a window in the tape! It was a 24-track tape, so he said each track is 2.5 millimeters wide. He took a ruler and measured where the track was and he cut a little hole in the tape, put the tape back on, spun back, hit play, and it went through, no click. I was never so amazed — I just hoped it wouldn't rip, because of the hole in the middle of the tape. Now that's an *edit*.

This interview is excerpted from Howard Massey's new book Behind The Glass, now available from Miller-Freeman Books.

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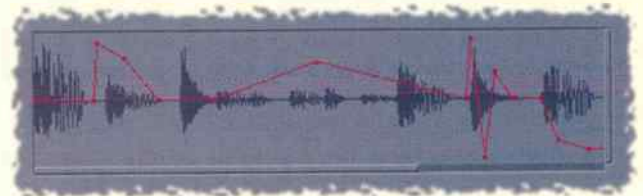
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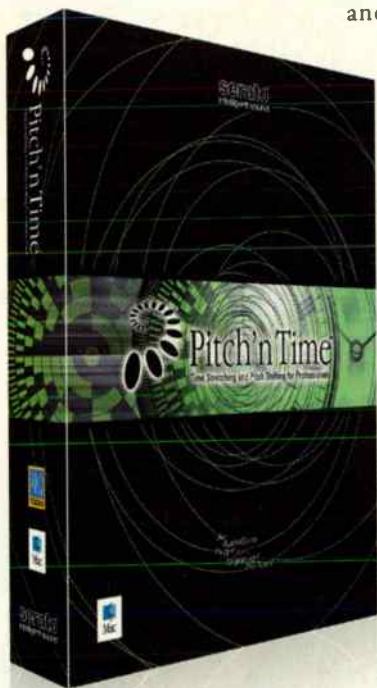
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Dexter Simmons's Vocal Magic

Want your vocal tracks to sound their best? Try working backwards....

BY BOBBY OWSINSKI

If you've been paying any attention to the radio lately, then you've heard the stellar work of master mixer Dexter Simmons. From multi-platinum records by Toni Braxton, Brandy, Destiny's Child, Mary J. Blige, and Monica, to upcoming releases by chart-toppers Britney Spears, Spice Girls, and Whitney Houston and George Michael, Dexter has taken the art of mixing to a new level. And while his method may not be as traditional as many of us are used to, it's interesting, provocative, and sure makes a lot of sense when you think about it.

EQ: I hear you have a unique approach to mixing.

Dexter Simmons: I guess, if you want to call it that. The vocal is what is most important to me. I listen to people and they sing melodies, so that's what I try to drive in my mix.

When I get a tape, the first thing I work on is the lead vocal because that's when my ears are the freshest. Since my ears aren't fatigued, I can get the best vocal sound that I can do and I can also dedicate the best pieces of outboard gear to it. When I know my vocal is sitting right and I've solved all the problems, I introduce the backgrounds and any ad-libs and treat those with the lead vocal. Then I go to stuff that needs to be panned around the vocals, which will be keyboards, guitars, strings, and any little samples. After that's done I'll introduce the drums and bass.

Most people say that I'm doing it backwards, but I think that it's the only way you can do it. If I start with drums, I'll mess it up. I've tried it, but I don't know how people can fit the vocal in when the drums are banging like that. I see guys that put up a kick drum first and EQ and compress it and I'll think, "How do you know how it will affect the vocal?" Don't get me wrong, I love drums to hit. But at the end of the day we're in the music business, and people connect to the melody, so that's what's most important to me.

How much time do you spend on the vocal then?

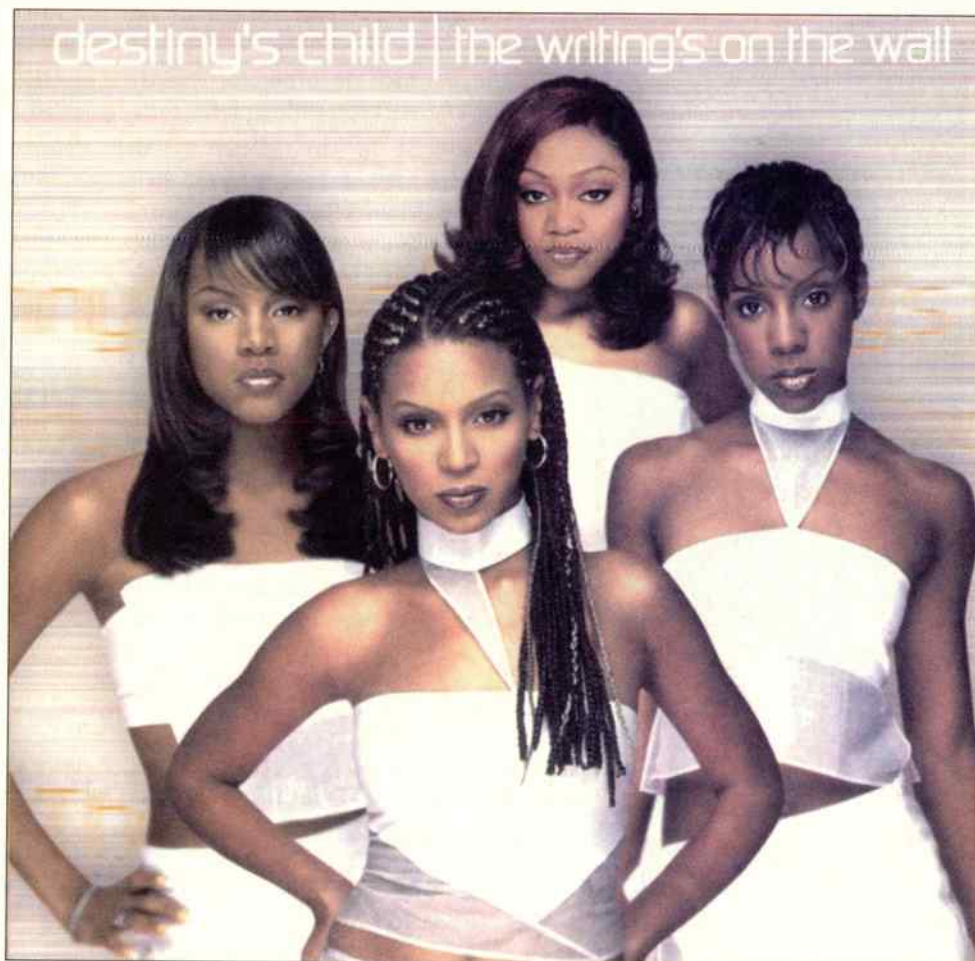
Maybe 45 minutes to an hour. Only when I know that it's right do I move on.

Is this with effects and everything?

No effects, just dry. I usually wait until I have some things to pan around the vocals before I put some effects on. I always go through a lot of changing of effects until about two hours before I'm done.

Do you have any mix tricks for the vocal?

Yeah, I'm really into sidechain compression. What I try to do is identify problems. Let's say there's a "P's" and "B's" problem at about 300 to 400 Hz. I'll split that off to a separate fader that will be dedicated to the "P's" and "B's." If the midrange is a bit harsh or sibilant, I'll split it off again and basically boost the frequencies that are bad and compress them. After the problems are solved, I spend a lot of time manually riding the lead in the mix. I prefer "manual" compression as opposed to just sticking a



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compressor on it. And I don't use [dbx] 902's or dedicated de-essers.

Does that mean that you don't use a lot of EQ?

I really don't use as much as you would think. I guess it's safe to say that on a vocal I really don't use a lot. I work a lot in the 1 to 3k range because a lot of the clarity is there. It's like a catch-22; the sibilance is down there and the clarity is down there, and you have to tread that fine line.

How do you know what to put on if you're not listening to the other instruments?

It's not what I put on because I rarely boost anything. What I'm doing is taking out the bad stuff. And when that's done and the track comes up, I might go, "Maybe we need a little air here or maybe some warmth down between 170 to 220."

Do you use Autotune on vocals at all?

I have in the past, but my preference is to leave it the way they sang it. If it's on and you can't hear it, then it might be okay, but if I hear it go into Cher-land, then I'll take it off. I prefer to stack different delays, from 125 to 250 ms with different pitches, so it's sort of disguised.

Do you have any special effects tricks that you like to use?

I have gazillions. I don't know where to begin. One of my things is that I really hate reverb, believe it or not. What's important to me is early reflections because I think that's the part of natural ambience that humans relate to. I came up with that because I'm usually listening in a medium-sized room and there's a natural effect here, but you don't hear a trail. So my approach is, "Why am I putting all these reverbs on the mix? Natural ambience doesn't sound like that." So that's what I try to recreate. I create a lot of small, tight spaces and, when you have a lot of those kinds of ambiences, it feels big without the trails running into one another. Then when you do need a reverb, it sounds special.

You mean under 100 ms or so?

Yeah, I'll probably start at eight [ms] and work my way up to about 100. The thing that sucks is that you'll have all this going on but you don't really hear it. Most people will say, "Man, your mix is dry but I know something's on it. What is it?"

So are you dedicating a different effect for each track then?

Yeah, that's why I have four racks of gear. One is dedicated to dynamics; it has Manleys, a couple of Amek 9098's, some Avalon units, [Empirical Labs] Distressors, and a special box by TC [Electronic] that was made for radio [the TC Max] that I'll use for problems. Another rack is for effects that has two Eventide 4500's, an Orville, two Lexicon PCM-91's, three Roland R-880's, two Sony V-77's, a Quantec QRS, and stuff like that. The other rack is [Digidesign] Pro Tools.

Can you hear the finished product in your head?

Yes, I know exactly where I'm going. The thing is though, I'll deliberately try different things, so halfway through a mix I may have a certain vibe going, but I'll squash it just to try something else. Sometimes it works out, sometimes it doesn't.

Do you have a different approach for different styles of music?

I approach everything pretty much the same way. But if I have a rap-driven track that's heavy on the kick drum, I might dedicate more time to that. At the end of the day, the vocal is what matters. I still always do the drums last.

I take it you don't have clients in the room when you start mixing.

You know what? They come into the room then they go crazy because all they hear is this vocal over and over, so they leave. They want to hear the track but they won't until maybe two or three hours into it.

If you could wave a magic wand and change anything that you wanted to, what would it be?

I would take compression out of

the recording chain. I get so much stuff that's been over-compressed that it's not funny. I just recorded something for Rodney Jerkins down in Florida and I didn't use a compressor at all and the assistants looked at me like I was crazy.

I think it's best that you capture all the dynamics when you record, then deal with it in the mix. In the right hands, it's fine. But I've gotten so much that's over-compressed, then there's nothing that you can do.

Do you use it on the stereo bus?

No, I stopped. I used to use the Manley, but I found that mastering was compressing so much, radio even more, and don't even talk about the music video channels. By the time the mix comes out it's like, "Whoa, did I do that?" So it's forced me to work harder in terms of controlling bottom end and transients, but how I achieve that is by sitting there and riding stuff. I'll ride the kick drum, then ride the bass. Then go back into trim and do it again.

You must do a lot of passes then?

I guess so. The assistants I work with will come in and see pass 75 and go, "He's not even close yet." But it ends up sounding better than just sticking in a bus compressor.

"Most people say that I'm doing it backwards, but I think that it's the only way you can do it. If I start with drums, I'll mess it up. I've tried it, but I don't know how people can fit the vocal in when the drums are banging like that."

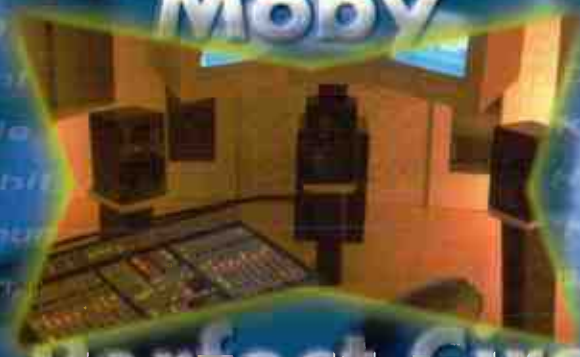
A 20-year veteran of the music business, Bobby Owsinski has worked in many creative facets of the music business including producer, guitar and keyboard player, recording engineer, songwriter, and arranger. Bobby has produced acts for Polygram, Mercury, Warner Bros., RCA, Chrysalis, and Manhattan/EMI and has produced, engineered, and performed the music for several movies.



Alan Moulder (A Perfect Circle, Smashing Pumpkins, Marilyn Manson, Depeche Mode, Nine Inch Nails, Curve, LP?) Butch Vig (Garbage, Korn, Nirvana, Smashing Pumpkins, The Offspring, Fun Lovin' Criminals, Limp Bizkit, Axl's Marisette) Trevor Horn (Sade, Art of Noise, Herbie Hancock, Rod Stewart, Tina Turner) Jerry Harrison (Livin' on a Prayer, Crash Test Dummies, Foo Fighters, No Doubt, Fine Young Cannibals) David Bottrill (Peter Dinklage, Kid Rock, Tool, King Crimson, David Sylvian/Robert Fripp) Charles Dye (Jon Bon Jovi, Frank Sinatra, Sammy Hagar, Gloria Estefan, Jon Secada, Ricky Martin, Allman Brothers) Simon Climbia (B.B. King & Eric Clapton, Tina Turner, Eternal, Louise) Walter Afanador (Mariah Carey, Ricky Martin, Whitney Houston, Lionel Richie) Michael Bradford (Kid Rock, Terence Trent D'Arby, New Radicals, Bun D.M.C., DJ Uncle Kracker) Ben Grosse (Filter, Republica, Orbital, Henry Rollins Band, The Romantics, Bone Thugs & Harmony) Marky & Jeff Bass (Eminem, Louis Childs, B-52's, Deborah Harry) Mark 'Spike' Stent (Oasis, Bjork, Madonna, Massive Attack, U2, Manic Street Preachers) Ian Stanley (Tears for Fears, The Pretenders, of Mercy, Archive) Gill Norton (Counting Crows, Blink 182, Fall, Smith, Long Pigs) Lars Fox (Everclear, Sheryl Crow, Hanson, Semisonic, Groove, Verve Pipe) Paul Falcone (Maxwell, Whitney Houston, R. Kelly, Queen Latifah, REM) Rob Chiaravelli (Will Smith, Christina Aguilera, The Coors, Coolio, Another Level) Paul Corkell (Catherine Wheel, The Cure, Suede, Bjork, Nick Cave & the Bad Seeds) Steve Osborne (R.E.M., Dinosaur Jr., The Smashing Pumpkins, The

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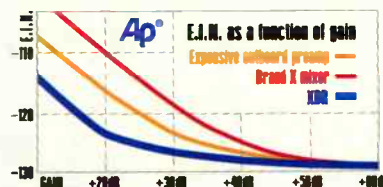
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"Love the XDR mic preamps... clean and sweet!" C.H., Tampa FL

"A quality replacement for a far more expensive mixer brand." J.C., Arlington TX

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J.K. Boise ID

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CIRCLE 31 ON FREE INFO CARD



Story and Photos By Mr. Bonzai

JOE BA



Engineer gear freak seeks project studio home

RRRSI: GEAR GOD

SUSPECT REPORT

Suspect:	Joe Breezy Barresi
Ancestry:	Italian
Occupation:	Producer, engineer, mixer
Birthplace:	Staten Island, NY
Residence:	Burbank, CA
Vehicle:	'93 Nissan Pathfinder
Diet:	Mike's Hard Lemonade and Devil Dogs
Identifying Marks:	Long fingernails on right hand
Pet Peeve:	"Drivers with one hand on the cell phone, one on the coffee, and one on..."
Credits:	Production: Buckcherry, "Alone" from the <i>Mission Impossible 2</i> soundtrack; Fu Manchu, <i>King Of The Road</i> ; American Pearl, "Automatic Pearl" from the <i>Scream 3</i> soundtrack; Queens of the Stone Age, self-titled debut (named one of the 10 most important hard and heavy bands by <i>Rolling Stone</i>); Loudmouth, self-titled debut; L7, <i>The Beauty Process</i> ; Melvins, <i>Stag</i> ; Melvins, <i>Honky</i> ; Catherine Wheel, "Spirit of Radio"; My Little Funhouse, <i>Blood</i>
Selected Mix Credits:	Monster Magnet, Veruca Salt, Anthrax, Bauhaus, The Jesus Lizard, Sting (VH1 Storytellers), Skunk Anansie, Downset, Sick of it All
Selected Engineering Credits:	Alanis Morissette, Loudermilk, Fastball, Powerman 5000, Hole, Weezer, Kyuss, Beth Hart, The Rentals
Notes:	Suspect is known for his humongous sound, especially with guitars. When I asked Barresi if he had a "project studio" we could conduct this interview in, he said, "No, but I've got this ridiculous collection of gear. All I need is a console and a tape machine. Do you have any ideas?" I respectfully replied, "No." So, Barresi arranged to get his "collection" out of storage and set it up in the big tracking room at Sound City in The Valley. He told me he needed to check his "inventory." Whew — 176 guitar pedals, 29 weird guitars, 46 amps, and 127 pieces of outboard gear in cases the size of refrigerators.

Mr. Bonzai: What are your main recording tools?

Joe Barresi: I really like to track on older Neve 80 series consoles and Studer tape machines — that, coupled with BASF 900 tape, is a dynamite combination. I prefer the Studer A 800 to the 827. To me, it has a thicker, punchier sound — especially the model with transformers, and I can even read the VU meters from across the room — what a concept! Sound City Studio "A" in Van Nuys is my all-time favorite tracking room. The console there is an old Neve 8028 and, although it's not very big, the sound of that board and that room is huge. Plus, the studio manager, Shivan, really goes out of her way to take care of noisy clients like me and make us feel comfortable.

For mixing, I generally like to stick with the older Neves as well, although

occasionally I'll get on an SSL if that's the sound I'm looking for. Recently I've been at Extasy South (formerly Brooklyn Recording). Their double-size Neve 8078 console sounds great. It's also a real pleasure to work with staff engineer Ronnie Rivera — he's like a psychic sidekick in the studio.

Did you ever lose a piece of gear?

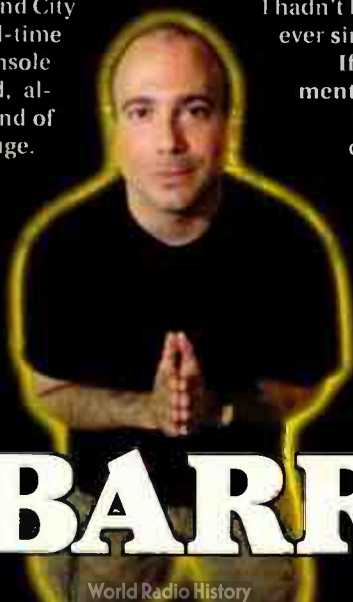
No, but I once sold a Fender amp that I hadn't been using and I've regretted it ever since.

If you were a musical instrument, which would you be?

I'd probably be a guitar. Some days I'm pretty mellow, and other times I'm running on "11."

What's wrong with the music industry?

Basically, you've got A&R/label people who change jobs more often than their underwear.



JOE BARRESI: GEAR GOD

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BARRESI'S TEN

1. Marshall Time Modulator — “I absolutely love this box! I think it’s from the mid-’70s or close to there, and it does some pretty crazy things. Whenever I’m dealing with a sound that needs that extra ‘push over the cliff,’ I reach for this box. You can get robotic sounds, ‘tunnel’-type effects, and it does some mean phasing, too. I love it so much, I had to buy two of them.”

2. Systematic Systems Guitar Splitter — “This is a guitar splitter made by Kirk Elliott up in Vancouver. It allows me to plug a guitar into one input and get six outputs, each with a phase switch and bypass. I’ve had several splitters in the past, but this is the only one I’ve heard that doesn’t screw with the sound of the guitar — it’s like you were plugged straight into the amp. I use this when tracking rhythm guitars because I sometimes like to blend various amps together to create one massive rhythm sound.”

3. “This is an old RCA BA-6A compressor. I’m not sure what year it was made, but I am sure it weighs a ton! It’s well worth lugging around, though, because it sounds

really, really good. I mostly use it on bass, but it has so much gain, I have also plugged a mic right into it and been able to drive a tape machine without a problem. I’ve recorded guitar solos and even a vocal or two this way.”

4. “This is a Mutator, made by Mutronics in England. It’s basically two channels of analog filtering, like in a synthesizer. I love the fact that you can invert one side into the other and that makes for some really crazy stereo panning/filtering effects. Just running through it gives a limp sound some bite and makes it stick out in a track.”

5. “These are my Lovetone guitar pedals. I use them for everything — not just on guitar. With names like ‘Meatball,’ ‘Ring Stinger,’ ‘Wobulator,’ ‘Big Cheese,’ etc., they’ve got to be good. They are especially good at mangling drum sounds and loops. I like to run stuff back through them in a mix, too. They’re very versatile, as they all have multiple functions, numerous control voltage inputs, and some even have a little jack that allows you to manipulate parameters by varying the amount of light allowed into it.”



6

7

9

8

10

FAVORITE TOYS

6. "This is a Rivera stack called the 'Bonehead' that has a 2x12 subwoofer system on the bottom. The sub can be used with any amp (not just Rivera heads), and it has really opened up a whole new world in recording drop-tuned and seven-string guitars. Most excellent."

7. "This is my favorite Marshall amplifier. It started out as a stock JCM-800, but over the years it's been modified several different times, and I think it's finally gotten to where I like it. It's the first amp I reach for when recording rhythm guitars because it distorts beautifully, and it's got tremendous punch and bottom without getting too mushy."

8. "The Sovtek Mig 50 was basically a Russian version of the Fender Bassman. When I'm mixing, I usually re-amp the direct bass — back through the Sovtek — and dial in a new amp sound using a Palmer speaker simulator for a cabinet. I'll overdrive it a little with an Ibanez Tube Screamer as well. This amp gets a pretty serious workout, sometimes staying on 12-plus hours a day for weeks

during a mix. It's pretty much stock except for a little tweak from amp guru Bob Dixon at Amphole. It sounds really amazing on guitar, too, and if you plug into both channels at once, you've got full-on AC/DC guitar tone!"

9. "This is a tube tape echo made by Watkins called 'The Copycat.' It doesn't sound like any tape echo, though — the three preset buttons allow for some interesting multitap effects, and when the "Swell" knob is turned up all the way, it creates a very beautiful runaway feedback. Just running through the tube front-end and using it to preamp a head is deadly."

10. "My newest acquisition — the Spatializer 'Retro.' It's a magical box that I got from the inventor, Steve Desper. It takes stereo information and can place it way outside the speakers depending on where you adjust the 'Space' knob. What I really like about it, though, is its ability to work on mono material as well. It can make a vocal sit way out front in a mix — or it can make you completely dizzy and disoriented."



METAL

FOR THE
MASSES,
PART II

World Radio History

MORE FROM *TERRY DATE* ON POUNDING DRUMS, SCREAMING



By Alan di Perna

VOCALS, AND THE HARDEST SOUNDING MIXES AROUND.

World Radio History

METAL FOR THE MASSES, PART II

all the other band instruments in the same room with the drummer. This way, the drummer's hearing all the frequencies and vibrations he's used to hearing on stage or in the rehearsal room. Also, having the bass guitar in the same room with the kick drum tends to tune the kick drum to the song. I don't know exactly why, but it does. And even when the band is in the room with the drummer, I'm still able to get some distant miking on the drums because the drums are so loud. I may not be able to get 30 feet of distance, but I can usually get some air around the drums — enough to make it work, I think.

With this style of music, guitars are so big a part of the canvas that you probably don't need really thunderous drum ambience.

No, you don't. And with Limp Bizkit and White Zombie's *Astro Creep 2000* album, we didn't use a lot of room ambience because there were so many loops going on in the background. A lot of those loops were drum rhythms. And the chaos of the loops sort of sounded like room ambience.

Was the White Zombie album less of a live-in-the-studio recording and more of a case of layering different guitar parts over all these loops?

No. The band played live to the loops, using them almost like a click track. Rob Zombie wanted to experiment with loops. So I found a programmer guy, Charlie Clouser, who works with Trent Reznor. Charlie was down in New Orleans. We would send him rehearsal DATs and he would

generate a loop based on those tempos and the drummer's feel. He would send us back a very basic, kick/snare loop with a minor fluctuation where the chorus is supposed to be. We would rehearse and record to that, with the band playing the guitar, bass, and drums live. Of course, we went back later on to fix mistakes and overdub guitars and things, the same way any band does. And, from there, the loop got developed to match the drummer. Charlie would take the basic tempo map and create some other sounds that were tuned to the song more. So instead of making the drummer correct his timing to match perfect computer timing, we actually corrected the computer to play along with the push and pull that the drummer has.

Were the loops triggered via MIDI or was it all done in a digital workstation kind of environment?

Charlie sent me everything on ADAT tape. I think he worked pretty much in Pro Tools, but he would send the loops to us on ADAT tapes, which we would lock to our machines and dump right over to 24-track analog. We ended up having one full 24-track machine just with loops, another one with the band, and a third one just with vocals. We were running a lot of machines on that record — for me anyway.

Do you always record on analog?

Yes. I always hit analog first. I have a Pro Tools rig, which was initially just an archiving unit for me, for backing up tapes. More recently I've been getting into some minor arrangement changes in the Pro Tools world. We'll record first

on analog. But if we decide we want to shorten or lengthen a chorus, we'll do that in Pro Tools and then spit it back to analog. I just feel that analog tape is important to what I do. I'm most commonly working on Studer A 827's and occasionally the A 800. I like the sound of the '800's quite a bit, but they're a little slower than the '827's, which is an important consideration for me. I don't like to make slave mixes. During tracking sessions, I'm constantly tinkering with the sound of the band tracks, building toward what the final mix would be. If I were to make a slave mix, so I can run only one machine when I'm tracking vocals, then I couldn't mess around with my sounds any more. So I run two machines. If you're doing vocal tracks, it's kind of a drag to wait for two machines to lock up. But if the machines are in pretty good shape, it works out all right.

What is your approach to recording vocals like?

Probably 80% of the vocals I've recorded over the last 10 years were done on a [Shure SM]58. Usually with the singer in front of either a pair of Lab 4 monitors or in the control room in front of the big monitors.



That's the mic most singers have in their hand when they're on stage. They're used to getting certain sounds when they hold it a certain way. I like to capture that. There's a comfort zone there. But for some singers, like [Limp Bizkit's] Fred Durst, I use a real nice tube [Neumann U] 47. Most of the songs I record are pretty aggressive, so a high-quality mic doesn't make that much of a difference. But on Fred's vocals for the last Limp Bizkit album [*Significant Other*], there was a lot more stuff where he was singing rather than screaming. So I wanted to use a mic that was a bit more clear, so you could hear what he's saying.

No matter what mic I use, I generally compress vocals fairly hard going down to tape. I'll usually run two [Universal Audio or Urei] 1176's back to back. I like to double-compress vocals, to the point where I can start to hear the singer taking a breath between words. To me, that sucking in sound gives the vocal a little more intensity.

I was wondering if you could even use a delicate tube mic like a '47 on some of the records you do. With all the screaming, doesn't the singer blow the mic out?

No, they hold up fine. It's the '58's that usually get trashed. Because they usually end up getting thrown on the ground or flung across the room when things aren't going so well. I wish I had a little plaque someplace, with all these bent up, banged up microphones, signed by the singers who destroyed them.

And, well, you don't like headphones, I guess.

I really don't. But I always give the singer a choice. I'll be ready for either one. When there are loud speakers going, I have to compress even harder. Because the compression will eliminate more of the background noise when the singer is actually singing. But, of course, when he stops singing, the background noise actually gets louder. Which means I have to go through and clean up the track between vocal lines. But sometimes there's feedback through the monitors that I definitely want to keep. On the first two Deftones records, you'll hear that feedback in a lot of songs. In fact, on a lot of the records I do, feedback in the vocal track ends up in the final mix. We tend to keep the feedback we like and get rid of the feedback we don't. Sometimes that lends itself to a nice live sound.

Do you gate to get rid of the stuff you don't want?

Sometimes. If there's nothing there that's really special, we'll throw a gate over the track. And that's usually enough. But if I want to take the time, or if the leakage is bad enough, I'll run it through Pro Tools and have it cleaned up in there. Or I'll just run the automation on the SSL and just hand mute it into the computer.

Do you always mix on SSL?

I would say yes. I've mixed on other consoles, but I prefer the SSL for mixing. And I prefer to record on either an old Neve or API.

Any particular favorite SSL series?

I like the older E series the best. And one in particular. There's one at Larrabee West in L.A. that I use all the time. It's an old E Series board with a G Series computer in it. A lot of people really like the sound of that. And I'm one of them.

Based on what you said earlier, it sounds like your approach to mixing is very organic — like you're building it even during the tracking.

Yeah. By the time I go to mix, I like to do as little as possible. That's why I love guitarists who want to print their own effects. I

continued on page 152

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- > Garbage
- > The Offspring
- > Limp Bizkit
- > Those Bastard Souls

- > Spacehog
- > Marah
- > J. Mascis
- > Cupcakes
- > Nelly Furtado

- > Tonic
- > Amanda Marshall
- > Ani DeFranco
- > Indigo Girls
- > Shawn Mullins

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A MIXING SEMINAR WITH CHUCK AINLAY — ONE OF NASHVILLE'S MOST IN-DEMAND MIX ENGINEERS

By HOWARD MASSEY

From his earliest childhood, Chuck Ainlay knew that he wanted to be a recording engineer. He had an uncle — a magician/banjo player/ventriloquist and audio enthusiast — who, in the late Fifties, built a modest studio near Ainlay's northern Indiana home town, equipped with a single RCA microphone, an old Ampex mono tape machine, and a homebuilt cutting lathe. Young Ainlay was a frequent visitor, and so, when college beckoned, he moved to Nashville to study recording at Belmont College. Before long, he was working in a "tourist studio" — one of those curiosities of Music City, where busloads of people would come in and do a handclap overdub to a prerecorded track, get a quick tour of the control room, and be herded out the door. After a spell assisting at Quad studios, he built a remote truck using equipment donated by a studio that had just gone out of business, recording notable bands that passed through town. Eventually, Ainlay became chief engineer at The Castle, where he came to the attention of famed producers Jimmy Bowen and Tony Brown. He hasn't looked back since.

Today, Ainlay is one of the most in-demand engineers and mixers in Nashville. He's worked with a veritable who's-who of modern country music, including Vince Gill, George Strait, Wynonna, The Dixie Chicks, Trisha Yearwood, Lyle Lovett, Nanci Griffith, and Mark Knopfler. He's also a singular force in 5.1 mixing, responsible for some of the freshest, most creative surround mixes available today. On the brutally hot July evening that Ainlay met with me, he had already completed a full day's mixing session, as well as, he proudly announced, having mowed his two-acre lawn! That he still had the energy to remain awake — much less do an in-depth two-hour interview in which he carefully and articulately shared the depths of his knowledge — was nothing short of astonishing.

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EQ: You're viewed primarily as a mixing expert. How do you approach a fresh mixing session? What tracks do you bring up first? What are you listening for?

Chuck Ainlay: I have certain things that I do straight off the bat. I'll patch in three general reverbs as a starting place. I like to use an EMT 250 for one of them, but that's not always available, so I've got a little Roland SRV-330 with a similar patch. I use it as an impact reverb with a fairly rapid decay — between 1.5 to 2.0 seconds. It's a pretty dark, dense sound, with a good bit of chorusing. Then I usually use a Lexicon 300 for a sound that shimmers more. That one's generally got a little longer predelay on it, anywhere from 40 to 180 milliseconds, depending on the song. It's a brighter 'verb with a bit more sheen to it, more like a plate. Finally, I'll use a Lexicon 224X in a rich chamber mode. Those are kind of beginning building blocks. Then I'll have a [Lexicon] PCM70 set to a gated program and a [Eventide] Harmonizer that I set left/right up/down. I'll have a mono delay, and then I'll use my Ensoniq DP2 and DP4 for when I want to really expand on some 'verbs and delays. If something else comes to mind, then I'll take the time to come up with it, but in Nashville we have to move fairly rapidly, so you have to have some of this stuff ready at the get-go.

Will you put multiple instruments into the same reverb, or do you use a different reverb for each instrument?

I'll put multiple instruments into the three core reverbs. They create the ambience of the record. One song may call for less of the shiny stuff and more of the impact stuff, while other songs may call for more airy sort of reverbs. So there are three or four reverbs that will work for the general mix. And then I'll have specific reverbs for specific instruments, like the gated things will be on percussion instruments; I may also use inverse reverbs and things like that, small room sounds.

Do you ever EQ the reverb sends or returns?

Actually, I don't much anymore. When we were using plates and real chambers and things like that years ago, yeah, you were always EQing and compressing and slapping some delay on in front of them and gating them. But, with the digital reverbs, I find that by changing their response — by tweaking the high-frequency decay and the low-frequency boost in them — you can create the 'verb that fits the track.

Why is it preferable to tweak the digital EQ in an outboard processor rather than using the mixing console's EQ, which is presumably higher quality?

Well, why turn on an EQ and add an extra circuit to something when you can do it without adding that extra circuit? In general, that's my philosophy about both recording and mixing. If I can do it with less in the signal path, that's the way I'll approach it. When I record tracks, I'll generally bypass the console unless I've got a nice old discrete Neve desk that I'm tracking on. I carry a good bit of outboard gear, and I'll go through those preamps and straight to tape, using the desk just for monitoring. When I mix, in many instances I'll avoid the desk EQ and use that outboard gear instead.

How long do you typically spend on a mix?

I always tell the producer or artist or whoever's booking me to book a day a song. Now, it doesn't always take me a day to do a song, but I don't like to work on more than one song in a day, because it's hard for me to shift modes from one song to another. The exact amount of time I spend largely depends on how problematic the track is.

If it's a reasonably recorded piece of music, then I can usually get through

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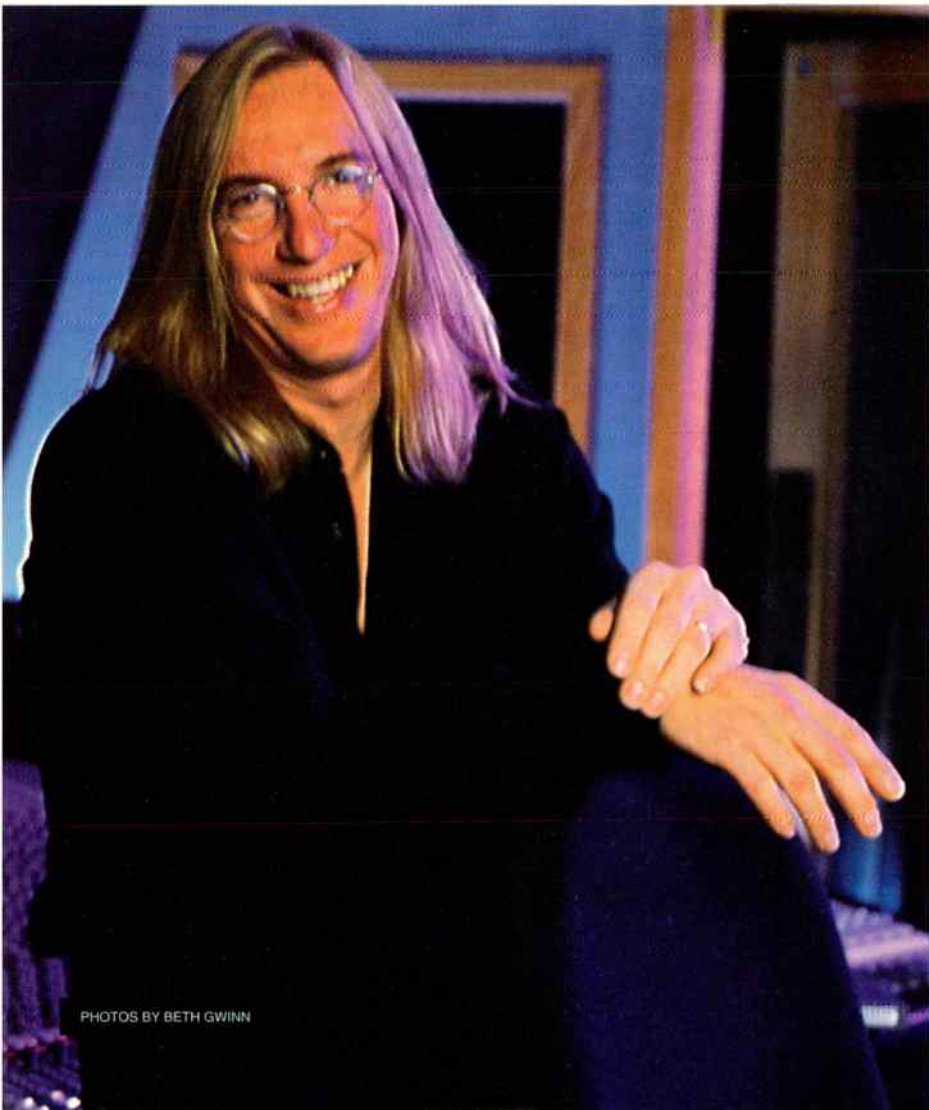
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it in six hours. Then I'll usually do a number of versions of the mix, so there'll be a vocal up, vocal and harmony vocals up, harmony vocals only up, the solo up. We'll always do a bass version of some sort, whether it just be a bass up or bass and bass drum up or just bass drum up. When you get to mastering, sometimes there's an element that EQ doesn't necessarily fix, so they might use a different version instead — like that bass drum up version — to add a little bit of punch.

How do you know when a mix is done?



PHOTOS BY BETH GWINN

Mixing is really something that is not an intellectual experience. It comes from your heart; there's a feeling of joy. Music ought to give you an emotional response and, depending on your mood, that emotional response may be triggered or it may not. I think this is why, when you listen to an entire album in a mastering room and you go from song to song, not every one of them stands up to your expectations. When you were doing it, you thought it was great, but when you go and listen to it in retrospect, you go, "What the hell was I thinking?"

So it's a very difficult thing to decide when you're done,

but what I go by is when I get a kick out of it; when I'm hearing all the elements of the record, the fills and so forth are coming out; when I can understand the lyrics; when the vocal is not blowing me away at times or too soft at other times. These are the things you work toward. You need to get through all that technical stuff to the point where the song actually gives you a kick. If it doesn't, I keep working and try and make it more exciting, make the guitars jump a bit more, maybe pan things wider — something to make it exciting to listen to. But when I'm enjoying it, I think it's done. Also, obviously, it's done when the producer thinks it's done! [Laughs.]

There always seems to be one track that somehow just doesn't seem to fit in the mix, though. What sort of steps do you take when you are faced with a track that just won't sit correctly?

Generally, if a track doesn't sit in the mix, it's either a performance problem or it's a dynamic or EQ problem. There's not a whole lot you can do from an engineering perspective with the performance problem other than replace it — and that's done. You can either sample a similar section from another part of the song or even fly it in from other takes if there's a chance that something like that exists.

If what you're facing is an equalization problem or a dynamic problem, the approach would be to decipher which you need to do, or whether you need to deal with both factors. The big thing there is to decide what kind of texturing it needs. Does it need to be warmed up, perhaps with a tube compressor or something to give it a little bit of harmonic distortion? Or do you need some sort of hard limiting in a compressor like an [Universal Audio/Urei] 1176 to put an edge to it? You have to pick your tool to do the dynamic control. Same with EQ — each equalizer has a different sonic signature.

How do you know which approach to take?

I think the tendency for the novice is to generally over-EQ and over-compress things to begin with. When I began my career, I felt the necessity to EQ everything, compress everything, and modify it. Just to put my fingerprint on it, so to speak. But I've learned that,

if you can let the music be, then you can get away from doing that so much. Do it where it's needed, and you'll probably find that you need to use less of it. If you don't start out by EQing the bass drum to death, then you're probably not going to have to EQ and compress the rest of the instruments as much. If you have a nice, round-sounding bass drum with a decent amount of attack and bottom, don't just start EQing until you have the perfect bass drum — let it be.

Just move through the music; move through all your tracks, and work on little bits here and there. That's my approach. Work on not just one instrument at a time in solo —

try and listen to the whole thing. And when you discover a problem, think about what it is that's wrong with it. Is it too muddy? Is it too thick, or is it not bright enough? Does it need a little compression to make it stand up? If you're missing some notes, then maybe you need to compress it to make a more solid sound out of it. You can solo things to hear what you're doing, but don't sit there and work on a sound for a long time — keep popping in and out of solo and see how it sits in the track after you've done a little bit to it. Maybe a balance change is all that's required. Mixing is more about listening overall than it is about making each element sound great.

Along with that, you have to understand the principle of masking. That's when an instrument is covered up by another instrument in the same frequency range. Say, for instance, the snare drum has a lot of 5 kHz on it, a lot of brightness to it. It's going to mask the acoustic guitar that's trying to get through in the midrange, too, and the tambourine and the enunciation in the vocals. So you need to find ways to cut a little bit in one instrument to allow another instrument to jump out, or EQ an instrument so it won't interfere with another instrument. If you're having a problem where you can't hear the acoustic guitar, maybe it's the snare drum's EQ that is a little too bright. It may be better to sacrifice the snare sound and not have the best sounding snare drum in the world, because the acoustic guitar element is more important to the song.

And then there's panning, which allows you to shift things away from each other. The way I go about panning is to separate things that are of equal spectral energies but are opposing rhythmically. Say, for instance, acoustic guitar and hi-hat: rather than having the acoustic guitar lay on top of the hi-hat, I'll separate them. It's basically identifying rhythmic elements and spectral elements and separating opposing rhythmic things so that you get movement within the stereo while separating the sonic elements.

Of course, there are some tracks that are traditionally not separated: for example, kick drum and bass guitar. Do you tend to place the bass guitar frequency lower than the kick drum or vice versa?

In general, if you listen to most records, the bass drum is usually accentuated quite low — like at around 60 Hz — and then it sort of reaches a point up above where the bass would be. So I'll boost it at around 4.8k and then maybe even 10k to add the extreme top, then I may dish it out a little bit in the 450 Hz region to kind of take out the "enormousness" of the sound. That's not a very good word, is it? It's *not* a word.

[Laughs.]

Anyway, it's dished out to give room for other instruments. Bass guitar generally lives in the 200 Hz region — the fundamentals are kind of happening from 100 Hz up, through that middle lower region of 200, 300, 400 Hz. So by dishing out the bass drum a little bit in the 450 Hz area and adding a little below and above where the bass really is, that kind of gives separation between the bass and bass drum.

Do you frequency-limit the bass guitar to get it to sit in that region?

The bass *is* a very frequency-limited instrument. You won't find much in a bass at 10k. You'll find a good bit of energy maybe up at 3k, but if you start adding too much upper-mid to a bass guitar in that region, you're going to start wiping out

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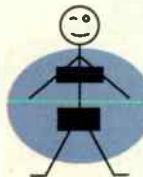
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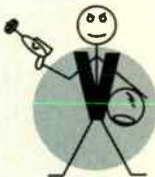
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to a bass guitar in that region, you're going to start wiping out everything in a snare drum and an acoustic guitar. All of a sudden, your mix will start sounding as though it's very middle-y and piercing. It depends on the genre of music, of course, but that element can make a mix sound bad.

That said, I may add a little bit of 2k, 2.8k, or 3k to the bass to give it some presence, and I may even add some air up on top in the 10k region. If I need to enunciate notes in the bass, it's more in the 800 Hz region, to get that sort of growl happening, or I may add a little 80 or 120 Hz to add warmth.

I generally use very wide Qs [bandwidth] on everything. I don't usually get into narrow bandwidth boosting or cutting, because it takes the music out of most instruments, unless there's some real problem element to an instrument that I need to get out. So I usually use very wide, broad EQs and a lot of shelving on the top and bottom.

On the bottom, you have to make sure that you're not adding subsonic stuff that's going to cause woofer excursions. If I see a lot of excursion on the woofer, then I'll start filtering something. A lot of times, it exists in a bass guitar, which can go quite low, but what you're seeing there is a subsonic harmonic. That can be filtered out without hindering the sound of the bass at all.

Do you typically compress bass?

I usually don't compress bass when I'm tracking, because most of the guys in town come in with their own racks that usually have an [Teletronix] LA2A or a Tube Tech com-

pressor, and they will do that themselves.

For mixing, I've got a JoeMeek compressor that I love — the original JoeMeek, which I think is an incredible compressor on bass. I actually have a few JoeMeeks — I've got the original one and I've got the SC3 and the SC4 — and I love them all for different things.

One thing that's very important about low end is absolute phase. Maintaining absolute phase makes the biggest difference in a recording. I would suggest that everybody go out and buy a phase clicker and reader. The one that I have is made by a company called SVC, but there are a number of companies that make them. The clicker is a little transducer that emits a positive phase pulse with a built-in speaker, and you can either put it up next to a microphone, or it's got a jack that you can plug into a direct input. The reader has a built-in mic or once again a jack, plus a couple of LEDs that read the pulse as either in or out of phase. It allows you to make sure that all your mics and all your DIs are in absolute phase polarity. In the home situation, it's probably even more of a problem, and I run into it all the time in professional studios — some microphones are pin 2 hot, some microphones are pin 3 hot, some mic panels may be wired pin 2 hot or pin 3 hot. If your mic panel is wired pin 3 hot, or the piece of gear that you are going into is pin 3 hot but the mic is pin 2 hot, you have a 180-degree phase reversal! And there is definitely a difference in the way things sound — especially in low-frequency sounds.

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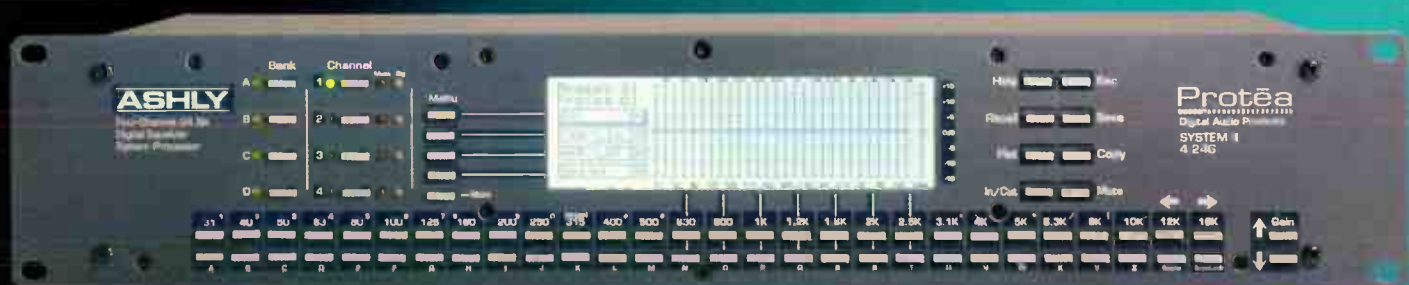
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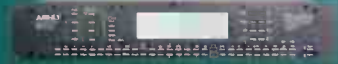
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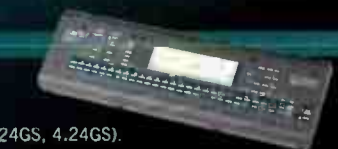
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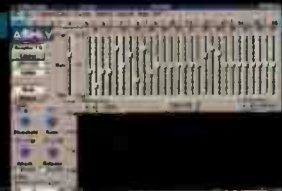
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Do you generally use the bass amp signal if one has been recorded?

I think in Nashville it's generally not used, but I prefer to have a bass amp. I think it makes the sound more natural — it just kind of fills out a bass in a real way. There are a few guys that are using these boxes that are basically a road case with a speaker and a microphone built in it, and they work pretty well, adding some sort of speaker element to the bass, but it's not the real thing.

Do you compress drums during mixing?

I compress them a good bit when I mix. The tom tracks are compressed; the overheads I may limit and squash pretty good. I'll compress the hi-hat to try and pull up the subtleties in the playing. Usually, besides having the bass drum come up on its own channel, I'll take the same tape output and go through an 1176 and way over-compress it — maybe using a 10:1 ratio so I'm actually limiting it — and return it on another channel. I'll use a real slow attack and a very fast release, so it's not grabbing the transients, but it's just smashing the sound. I'll mix that with the softer compressed signal of the original channel. Then I may actually create a drum submix and feed it to one of my other JoeMeek compressors for an overall drum squeeze.

On snare drum, I do a similar thing with another 1176. If there's a cross stick played, I may mult it off to another channel. That way I can gate it out to get more level, plus I can EQ it separately. Then I'll mute the snare channel and switch

on the cross-stick channel at the appropriate time in the song.

A basic starting point would be to bring up the bass drum and the compressed bass drum so that the VU meters are hitting about -10. Then I balance the snare drum to that, and then I start bringing up the whole kit. By the time I get the overheads and toms and room mics up, the overall kit will be averaging somewhere around -5 VU.

Do you set the kick drum and the snare at roughly the same level?

Well, that depends on the song. You generally want give-and-take from the snare drum and bass drum. You generally don't want the bass drum to be this soft little tap and the snare drum knocking you toackwall,so,yeah, there's some sort of element of even sound pressure level from the snare drum and bass drum. That's a good starting point.

This interview is excerpted from Howard Massey's new book Behind The Glass, now available from Miller-Freeman Books.

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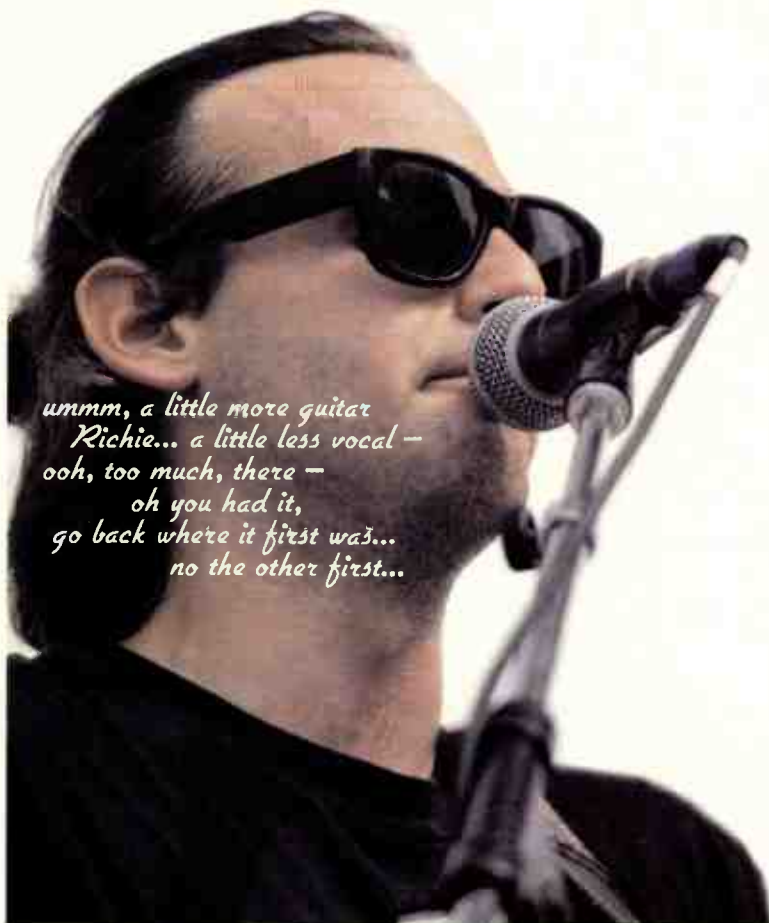
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Recording at home with XTC

"I suppose it's all kind of 'English country gent,'" Colin Moulding muses. "Jolly good thing to jump out of bed and go straight into the studio. And if an overdub is getting you down, you can hang your guitar up and just go for a walk in the garden."

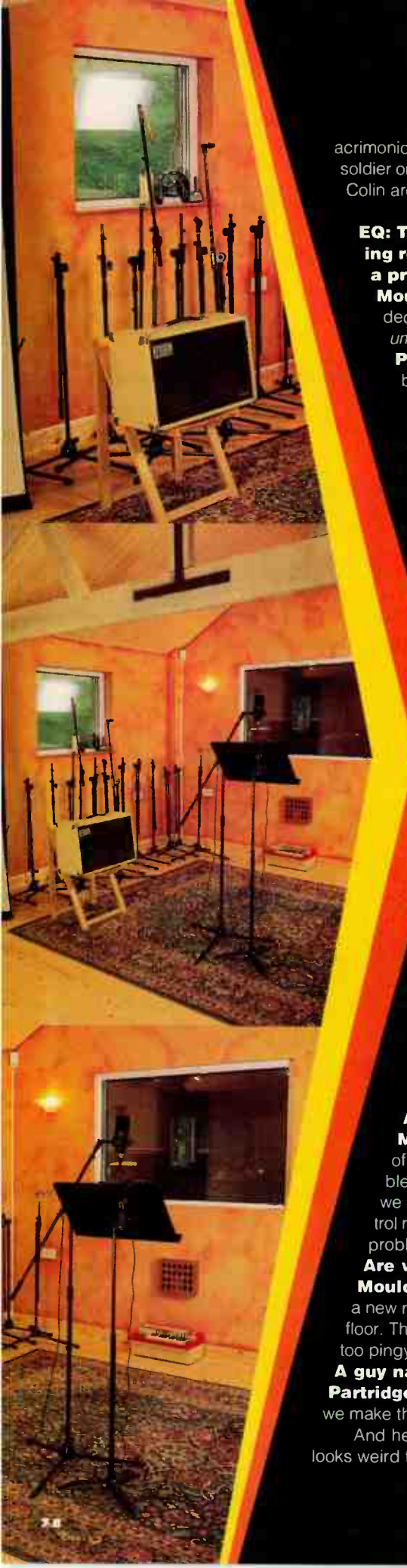
The idyllic spot Moulding is describing is Idea Studios, where he and his long-time musical partner Andy Partridge completed the new XTC album, *Wasp Star* (*Apple Venus Volume Two*). The studio is located in Moulding's backyard, just outside the English town of Swindon, about an hour west of London by train. Partridge and Moulding grew up in Swindon and have never really abandoned their hometown — not even during XTC's Eighties heyday, when albums such as *Black Sea*, *English Settlement*, *Skylarking*, and *Oranges and Lemons* cemented the band's reputation as prime British purveyors of literate, challenging, post-punk guitar pop.

Originally a five-piece rock band, XTC exists today as a recording entity composed of Partridge (vocals, guitar) and Moulding (vocals, bass).

Partridge is the author of XTC classics such as "Respectable Street," "Senses Working Overtime," "Dear God," and "The Mayor of Simpleton," while Moulding's portfolio of killer tunes includes "Life Begins at the Hop," "Making Plans for Nigel," and "Generals and Majors." So XTC have never been at a loss for songs to record. The band stopped performing live back in 1982, after Partridge suffered a nervous collapse while on tour. XTC focused their energies entirely on the recording studio and have never looked back since.

"We don't even think of playing live anymore," says Moulding. "We're record makers. That's what we do. We concentrate on chasing the magic of records."

The release of *Wasp Star* and its predecessor, last year's *Apple Venus Volume One*, marks a triumphant return for XTC. The group spent the better part of the Nineties "on strike" from Virgin records — XTC's label at the time. Longtime lead guitarist Dave Gregory also left XTC, somewhat



acrimoniously, during sessions for *Apple Venus Volume One*, leaving Partridge and Moulding to soldier on as a duo. But with a new record deal on TVT, and their own recording studio, Andy and Colin are back on top of their game.

EQ: The final stages of *Apple Venus Volume One* were recorded in Colin's living room, due to a lack of funds. Was that the genesis of the idea of building a proper home studio and doing all your records there?

Moulding: I suppose so. We had these two front rooms at my house, which had never been decorated. It was my suggestion to use them for recording, to complete *Apple Venus Volume One*.

Partridge: We had the mixing desk and a few bits of gear in one room, and a load of cables going across the hall to the other room where we had a mic stand and a mic, and an amp and a cab. That's where we made the noises. And at the end we said, "Hmm this home recording can be really good." And looking at Colin's unused double garage and his adjoining coal store building, it was a case of, "Don't you think we should turn this into a studio? Instead of blowing a £1,000 a day on someone else's studio and owning nothing at the end of it, why don't we throw the money at ourselves and convert this into a sensible, decent studio?"

Moulding: So we bought a modicum of gear: compressors, equalizers — some of the Tube Tech stuff and a 32-channel Mackie 8-bus desk, which was quite affordable. The most important thing, I think, is to make sure you've got decent external EQ if you haven't spent a lot of money on the desk.

Partridge: We wanted a really good quality vocal mic. So we went for the [AKG]

It makes you realize that your favorite records from less technically adept times probably had lots of different varieties of distortion on different instruments, which gave them that life, that animation.

C12. And we got a Focusrite Red EQ. Not too many toys. Just enough to get good quality tracks that we could then take somewhere else to mix.

Moulding: Our friend Nick Davis, who engineered *Apple Venus One* and *Two*, introduced us to the Otari RADAR hard-disk recording system. We rented Nick's to finish *Volume One*, then we bought a 24-track RADAR system of our own, secondhand, when we built the studio to record *Volume Two*.

Partridge: The editing freedom is fantastic on a digital hard-disk system like that. As for the sound, that's all down to those converters, isn't it? The RADAR sounds just like an Otari tape machine, to me. And then you can go and move stuff around, which you can't do with tape. We did a lot of editing on this album, which we'd never done before. This is the first time we had that luxury.

And what about the space where you installed the gear?

Moulding: It was just a large double garage in my yard. I never kept a car in there. Full of junk, of course, which most garages are. And at one end of it, there was kind of a stable block attached. We thought, "We can have the garage as the main recording room; and we can knock through into the stable block, put a new roof on that and make that the control room. The buildings were quite dilapidated really. They leaked water and had a few damp problems.

Are we talking about really old buildings?

Moulding: No. They were probably only put up 30 years ago — cheaply. So we had to put a new roof on. And added an extra inner wall for isolation. Then we wooded it out with a wood floor. There's a wood ceiling as well, and plaster walls. Wood's very good for acoustics — not too pingy and kind to the sound. And then we carpeted the control room.

A guy named John Hillier built it?

Partridge: Yeah. He's just a local builder. We had to persuade him to do certain things, like, "Can we make the ceiling slope in the control room?"

And he'd say [English country accent] "Oh aye...if you think that'll make it better. But that looks weird to me. Looks wrong." You know what local builders are like. But he was really helpful

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and he didn't charge too much. He's not a studio builder or anything. But, freakily enough, the room sounds really good — just by accident. Chuck Sabo, the drummer who played on a lot of the album, said it was the nicest, most flattering room that he'd ever drummed in, for the sound of his drums.

Moulding: It's not a tremendous room, of course. Maybe about 22 by 25 feet with a pitched ceiling that goes up to maybe 18 feet. You can put mics up in the pinnacle. It's nice to have a bit of height for the drums and stuff.

There's some curtains that can be drawn right across the center of the room, for damping down. We had some screens [gobos] made up. We've got a few quilts and sleeping bags...that sort of thing.

Following in the wake of the mainly acoustic-driven *Apple Venus Volume One*, *Wasp Star* marks XTC's return to full-on electric guitar. What was your approach to recording guitars in your studio?

Partridge: Our secret weapon on this was the Line 6 Pod. Not just for guitars, but for bass, vocals, drums, percussion, keyboards...everything. For electric guitar we'd usually combine that with a mic right on the guitar itself, which was usually Colin's Fender Squire Telecaster. Whether it was Colin or me playing the part, we'd put maybe a Gefell or an AKG right up against the strings, so you could hear the unamplified sound of the guitar itself — the very thin, super highs that will never go down the pickups. Then you take a DI from that and treat it through the Pod in the control room. So the sound is split across the stereo perspective. You have this extremely bright, obscenely personal sound on one side, and whatever fuzzy, gooped-up sound you've got from the Pod on the other side. And it's a sound that you can put your head inside — because it's stereo content.

Did you go direct to tape from the Pod, or did the Pod go through an amp?

Partridge: We went direct a lot. But sometimes the Pod would go through either my little Sessionette 70 amplifier or Colin's Gallien-Krueger bass setup. The Sessionette 70 is just some crappy little amp I bought years ago. I think it was the cheapest in the shop. It's MOSFET technology — kind of a cream-colored bumpy looking thing with two 12-inch speakers. It's horrible. But it does add a little low-end punch to the sound if you need that. Like in the song "Playground," which is a mixture of Pod and Pod sent out through the Sessionette.

The other thing about our guitar sounds is that we use quite a lot of compression on record. Even before we had the Pod, we used to compress the guitar signal before it went to the amplifier. Because that makes the amplifier work smoother. The amplifier tends not to punch itself out at higher volumes.

Miking the strings of an electric guitar is actually an old trick. Shel Talmy did it on early singles by the Who and Kinks in the mid-Sixties.

Moulding: Oh really. I'm a very big Kinks fan. It's funny you should say that, 'cause that's the bloody sound I was after, really, on "In Another Life." I tried acoustic guitar on it, and that didn't work. I wanted something more

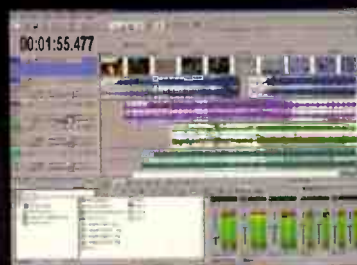
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electric. Sort of a very steely acoustic/electric sound like Ray Davies sometimes had. So maybe we were following in Shel's footsteps. We've been into miking the strings for a while now. We even did it on the bass on *Apple Venus Volume One*.

Partridge: Most of the guitars on *English Settlement* have that treatment as well.

What did you use to generate the guitar tremolo on "Wounded Horse" [from *Wasp Star*]?

Partridge: That's the Pod as well. There are a couple of guitars there. Two of them have different speeds of tremolo, so they collide. You get little blank spots and little crowded spots. I think it has slapback on it as well. And the treatment in the mix is constantly changing. Different echoes and reverbs are being buttoned in and out — to sound sort of disorientating and rather drunken.

"My Brown Guitar" is full of nice, chiming guitar embellishments.

Partridge: Well, there's kind of a sad story there. That song was actually completed during the sessions for *Apple Venus One*, at Chipping Norton Studios, with Dave Gregory on guitar, before he left the group.

Moulding: He kind of left under a cloud, really. Which was unfortunate. He's a very bitter chap, Dave. Lots of jealousy there.

Partridge: We'd asked his permission to use his playing on "My Brown Guitar." And he sent us a really nasty fax one day, claiming we were ripping him off for money and blah, blah, blah — which we aren't. We were very upset by this. And I said, "That's it. Just wipe his playing off. I'm gonna redo everything." So yeah, the guitars on there are kind of an attempt to orchestrate with different tones — muddy

On a lot of records we've also done what we call "the homogeneous XTC voice." If one of us is singing, we'll get the other one to sing the same line and mix the two together. So you don't double track yourself. The other one double tracks for you.

tones, bright tones, sinuous tones. But I have to say it's probably just as much a showcase for the Pod as anything else. This album couldn't have been made without that device. You put drums through it and it gives them great bite. Or you put keyboards through it and it gives them a real nice, fuzzy flaring edge.

The album is rich in little percussive sounds. Non-drum-kit sounds. Lots of little clicks and pops. Was the Pod used for any of those?

Partridge: A lot of them. On "Wounded Horse" there's a tottering kind of sound — like a bag of nails being rattled. It's actually just a whole drum kit being played on a counter rhythm and then Pod-ded up. So it fits between the clip-clop of the basic, cleaner beat. And there's a similar kind of thing on "You and the Clouds Will Still Be Beautiful." There's a snare drum playing a simple back-beat, which is placed against a more ornate, Arabic kind of beat. And that snare drum is going through one of the amp settings on the Pod. You can find specific, narrow bands of distortion. Which means you can sit sounds on very specific rungs of the sonic ladder.

Moulding: We used it to process the bass drum on "In Another Life." There's no bass guitar, just this huge bass drum. It seemed to suit the song.

Partridge: It makes you realize that your favorite records from less technically adept times probably had lots of different varieties of distortion on different instruments, which gave them that life, that animation. Your favorite Tamla records have got distorted drums, fuzzy bass, vocals that kick into the red and break up, distorted reverbs, shattering tambourines. But all the distortions go to make excitement and a beautiful, primitive kind of varnish that swills everything together. Nowadays, you can record everything scientifically clean. But you find that you have to put the distortion back in — mix the varnish back in. So the Pod was a Godsend — a Pod-send!

How do you work out those great XTC vocal arrangements — the contrapuntal stuff and all?

Partridge: There are several good rules for harmonies. We tend to place vocal harmonies lower in the register than the lead line, because your ears are always drawn to the high line. And if you place harmonies higher than that, your ear will be drawn to those. So we tend to place them lower. It's a bit of an old Beatles trick, that. More of a George Martin trick, actually.

Colin sings the high parts and Andy does the lower bits?

Moulding: Yes. Always have. I do the very high ones and falsettos most of the time. Andy tends to do the very low ones. On a lot of records we've also done what we call "the homogeneous XTC voice." If one of us is singing, we'll get the other one to sing the same line and mix the two together. So you don't double track yourself. The other one double tracks for you. And you get this homogeneous XTC voice, 'cause our voices can be very similar. If you come from the same place and have the same accent, something must grow out of it.

Partridge: In harmony vocals and contrapuntal vocals, be very aware of taking away all the frequencies you don't need. Otherwise they'll crowd in on the other instruments. You don't need lows on vocals. They just really ruin the tom toms, the bass drum, the deep end of the piano, etc. It's the same thing with acoustic guitars — all the lows gotta go. The common mistake is to say, "Oh let's make the acoustic guitar rich and boomy." And boomy just ends up being unworkable. So get rid of all those lows. You don't need them. Go for that narrow bandwidth, so you can slot each sound in, like a video-cassette going into that little slot.

Now that Wasp Star is completed, have we reached the end of the stockpile of songs you amassed during the strike from Virgin?

Partridge: Well, there are more, but I don't think we're going to record them. I think we've used the cream of those songs. So I just wanna clear the decks. Now that the whole project is finished, I have this glorious blank page in front of me.

Moulding: It's a relief that we got to realize everything we hoped we would two years ago.

I honestly don't know what we're going to do in the next few years. Which is exciting, but also kind of frightening.

Has owning your own recording studio given you more leverage from a business standpoint — the workers owning the means of production?

Partridge: It certainly saved us a hell of a lot of money. Reasonable studios in England work out to £1,000 pounds a day, with tape fees and stuff. So if you spend three months in a studio...well, you can do the math. We built and equipped our studio for about £60,000. Which is the cost of like two months in a [commercial] studio. And, at the end of that, you don't own that studio. So is it an advisable move to build your own studio? I think so.

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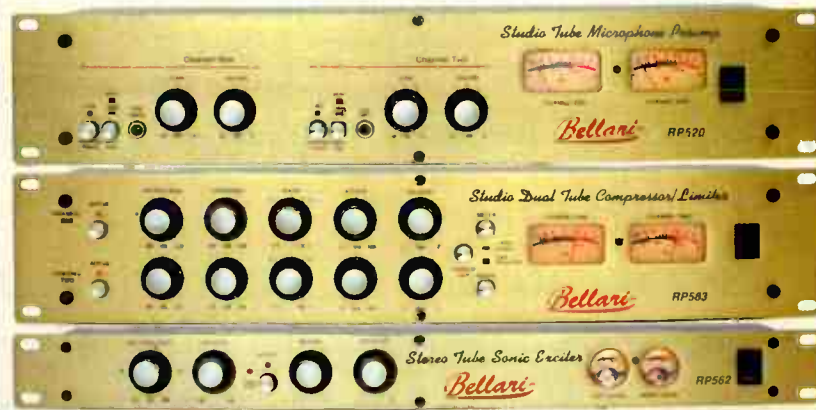
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SHOW REPORT

THIS YEAR'S SUMMER NAMM SHOW HELD FEW SURPRISES, OTHER THAN THE NASHVILLE WEATHER (USUALLY BRUTAL IN JULY) BEING RELATIVELY BENIGN FOR A CHANGE. NOT NEARLY AS BIG AS THE WINTER NAMM, THE SHOW APPEARS TO BE EVOLVING INTO A GUITAR-CENTRIC EVENT. ANOTHER FACTOR LIMITING THE NUMBER OF NEW AUDIO PRODUCT RELEASES IS SUMMER NAMM'S PROXIMITY TO THE AES SHOW — MANY MANUFACTURERS PREFER TO TAKE THE LUXURY OF THE EXTRA TWO MONTHS TO FURTHER DEVELOP THEIR IDEAS AND THEN MAKE THEIR OFFICIAL ANNOUNCEMENT AT THAT VENUE. BE THAT AS IT MAY, SUMMER NAMM 2000 STILL MANAGED TO SHAKE LOOSE SOME INTERESTING NEW GEAR.

AUDIO INTERFACES AND CDM/D RECORDERS

TASCAM entered the computer card market with the Mac/Windows-compatible PCI-822 computer interface card. Priced at \$369, it comes bundled with GigaSampler LE and incorporates an eight-channel TDIF multichannel connector, breakout cable supporting S/PDIF coax in/out, two MIDI in/out ports, and BNC word clock. And the rack-mount TASCAM CD-D4000MKII CD duplicator (\$1,299) creates audio or data CDs at 1/2/4/6 or 8X speed from the onboard CD-ROM drive to the built-in CD-R drive.

Not to be outdone, the new Sony CDR-W33 CD-R/RW recorder (\$799) includes their Super Bit Mapping process, as well as 32–48 kHz sample rate conversion, 24-bit A/Ds and D/As, and onboard parametric EQ and limiting. CD-Text



support allows disc/track names to be displayed and entered from the front-panel AMS controller, the supplied remote control, or even from an optional PC QWERTY keyboard. I/O includes coax and optical digital, as well as analog unbalanced phone jacks. Sony also showed two new portable MiniDisc recorders: the MZ-R70 (\$279.95) and MDS-JB940 (\$480), aimed toward casual and pro applications, respectively. The MZ-R70 plays back for 17 hours with a AA-size battery and includes two headphone jacks for listening with a friend; the MDS-JB940 offers coax and optical digital I/O, pitch control, wireless remote, and a function that can scale track levels after they've been recorded.

DIGITAL MULTITRACKERS

What can \$1,399 buy you these days? A lot. For example, it'll snag you a Fostex VF-16 16-track digital multitracker, which integrates 16 tracks/eight virtual tracks of recording (with no data compression) with a digital mixer that has both balanced and unbalanced ins. Other features include a waveform display, SCSI interface, three-band EQ with parametric mid (per-channel and master), two channel compressors, master compressors, two effects sends, 100 mix scenes per program, dual effects processors (reverbs, delays, pitch shift, chorus, etc.), ADAT I/O, WAV file import/export, and S/PDIF out.

In the "It Had to Happen Sometime" category, TASCAM unveiled the first-ever hard disk-based Portastudio. Costing little more than some original four-track analog cassette models — \$1,149, to be precise — the Portastudio 788 delivers six simultaneous tracks of 24-bit uncompressed recording and eight tracks of playback from its internal hard drive. There's also an eight-channel main mixer, six-channel submixer, and eight-channel cue mix. I/O includes four mono TRS phone jack balanced ins, one

stereo in via two TRS phone jacks, stereo out, monitor out, stereo aux out, and coax S/PDIF digital out. Each mixer channel has high and low sweepable shelving bands, parametric mid, and aux and effect sends. Other features include two internal effects processors (with three libraries of 128 presets), 250 virtual tracks per song, waveform display for editing, auto punch in/out, multi-take function, CD backup/mastering with optional CD-R drive, forward/reverse jog scrubbing, pitch control, MTC sync, SCSI port for external hard disk, 10-scene memory per song, and a built-in metronome.



Like the VS-880EX, Roland's new VS-890 digital audio workstation (\$1,995) is an eight-track/128 virtual track digital hard-disk recorder with integrated effects processing and automated digital mixing capabilities, but also features 24-bit A/D-D/A converters and an improved CD writing mode with mastering menu (CD writing requires the optional Roland CD Recording System).

The Zoom PS-02 palmtop studio (\$625) is an affordable studio-in-a-box/songwriter's companion that provides sequenced drum and bass backing tracks, along with the ability to record three audio tracks (or one stereo+one mono) onto a SmartMedia card. Other features include track bouncing, chromatic tuner, punch in/punch out, and a multieffects section based on Zoom's GM-200 Guitar Amp Modeler (which includes vocal effects useable with the PS-02's built-in dynamic mic). The GM-200 itself (\$309.99) emulates 11 different amp types, as well as offering chorus, tremolo, tape echo, spring reverb, and variable output character that controls ambience and mastering effects. A gain switch accommodates guitars with active pickups, and a stereo mix input allows adding in signals from CDs, recorders, etc. for play-along applications. Last but not least, the compact Zoom 505II (\$144.99) signal processor offers 33 effects, arranged as seven modules, with nine effects available simultaneously. It includes 36 programmable patches, noise reduction, a control pedal input, tuner, and line/headphone out; a similar device, the 506II (\$144.99), is designed for bass.



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PROCESSORS AND PREAMPS

Project studio-oriented signal processors continue to proliferate. The ART Tube MP Studio (\$149) offers an output brickwall limiter and VU metering of both output level and gain reduction. Other features include +48V phantom power and phase reverse switch, XLR and 1/4-inch ins and outs, and variable input and output gain controls. The ART HPFX is a headphone monitor system designed to solve the latency problems in computer-based systems. The Eventide DSP7000 Ultra-Harmonizer is a new high-end stereo processor that includes over 500 factory presets; 150 user presets that can be stored internally, and hundreds more that can be saved on removable PCMCIA cards. It provides both analog and digital I/O, converting at 96 kHz with 24-bit resolution. Retro fans will appreciate the JoeMeek Trident MT-A Series dual discrete channel (\$3,199). This preamp is based on Trident's original "A" series design from 1973. The input stages use a transformer for a "warm" sound, along with phase reverse, phantom power, three high-pass and three low-pass filters, and discrete class A amplifiers with true inductive four-band EQ (± 15 dB boost/cut with four switched frequencies per stage).

The Apogee Trak2 mic preamp/converter system (\$3,995) is a combination two-channel A/D converter and high-quality mic preamp. Features include 90 dB of gain, front-panel XLR/1/4-inch high-Z instrument inputs (making it an ultra-cool, if pricey, guitar DI box), and rear-panel XLR ins. There's also a switchable Soft Limit process to maximize recording levels without overs, switchable Soft Saturate process for analog tape emulation, and two Apogee Multimedia Bus slots to accommodate Pro Tools, ADAT, TDIF, etc. digital signals in addition to the onboard AES/EBU out. Resolution is 24 bits, with 44, 48, 88, or 96 kHz sampling rates. [See the First Look on page 22 for more information.]

Earthworks countered with their 1024 four-channel mic preamp (\$3,500). Not only does it have exceptional specs, but each channel also features a stepped gain switch (from 5 to 60 dB in five dB steps), 48V phantom power switch, standby switch, and polarity reverse. I/O consists of XLR balanced transformerless inputs and both XLR and 1/4-inch outs.

KEYBOARDS, SYNTHS, AND CONTROLLERS

On the keyboard front, Korg's re-issued 61-note CX-3 combo organ, housed in a very familiar-looking wood cabinet, uses modeling technology to emulate the original 1979 design. It features 128 programs that cover a wide range of organ sounds. Two different tone wheel sounds are provided (Vintage and Clean), and it can even add the mechanical noise generated by the tone wheels as well as control the tone wheel overtone levels. Control is also available for keyclick (both down and up) to simulate the dirty key contact sound of older instruments. There are two sets of nine drawbars; with a Split Mode setup, each set of drawbars is assignable to either upper or lower sounds. The CX-3 also includes dynamic overdrive, rotary speaker, classic tube amp sound, or preamp-only signal (for connecting to a genuine wood cabinet rotary speaker). Also new from Korg is the Triton-Rack (\$2,500), essentially a Triton in 2U rack format. New features include an increased number of program and combination locations (2,057 programs and 1,664 combinations of up to eight timbres each) along with significantly more expansion and digital I/O possibilities (up to eight PCM expansion boards, 96 MB of sample memory, S/PDIF I/O, optional six-channel ADAT optical output, and, perhaps most intriguing, future support for the mLAN audio/MIDI standard).



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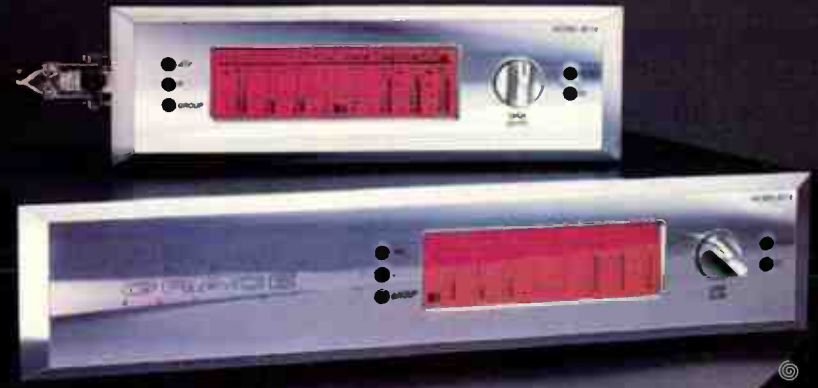
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New from Clavia is the Nord Lead 3. It's still red, but this 20-voice keyboard synthesizer offers several improvements over previous models: six waveforms for the two oscillators per voice, two-multi-mode filters in the filter section, and additional modulation options (three LFOs

and envelope generators). But the most obvious addition is the bright ring of red (of course!) LEDs around each rotary control to indicate parameter value. The E-mu Planet Earth sound module specializes in world music and ethnic sounds, particularly African, Brazilian, Japanese, and

GROOVING IN NASHVILLE

Many new products for the DJ/remixer/producer were either announced or released at Summer NAMM, with most companies having even greater aspirations for September's AES show in Los Angeles. A few distinct trends caught my eye as I walked the show floor in Nashville. First off, manufacturers are scrambling to find an adequate method of emulating the sound of a turntable scratch on their newest model CD players. Numark, TASCAM, and American DJ all showed digital scratching vehicles. Second, the loop is here to stay. In this age of computer-driven remix and production facilities, the creation and manipulation of sound loops has become a profitable game. Many of the new products aimed at our market are designed to make loops lighter, more eclectic, and more interchangeable. And it's becoming clear that not all of today's DJs use only records and CDs in their mix. More live elements are being included as the gap between DJs and musicians continues to shrink. Let's take a look at some of the key DJ/groove products at this year's show.

Yamaha led the way, showing several impressive new items. Their **SU200** Loop Factory allows for real-time manipulation of loops and WAV files, as well as providing a good variety of onboard effects. The company also demonstrated their **A4000** and **A5000** sampling units. These feature 64-note and 126-note polyphony, respectively.

Electrix, famous for its outboard effects processors, showed the beta version of a new loop-based controller, the **Repeater**. This impressive device will begin shipping shortly after AES.

TASCAM entered the DJ market in enviable fashion with its new **CD-302** dual-CD player. The unit features sample and

loop functions, and can be split into two separate portable units. The CD-302 even features automatic tempo sync and beat sync controls, which make mixing simple.

Roland debuted their **EF-303** groove effects, a highly functional table-top effects processor that gives DJs and electronic musicians an arsenal of powerful dance-music friendly effects — including a DSP synthesizer and step modulator. These effects can easily be integrated into either live performance or studio applications.

Stanton introduced their **DJ Pro 60** headphones, a lightweight, folding stereo headphone. The company also showed its **STR8-50** turntable, a remarkable belt driven unit that can easily handle the stress of scratching and back-cueing. Best of all, this straight tone armed unit retails for around \$150.

American DJ took a huge leap toward the digital emulation of the turntable scratch phenomenon with the release of its **Pro DJ** CD player. This unit makes scratch manipulation of CDs a snap!

E-mu showed their new **Xtreme Lead-1**, a powerful module that contains an incredibly diverse array of dance sounds, filters, and rhythmic capabilities. The unit has 64-voice polyphony on up to 16 MIDI channels.

The best is yet to come for the DJ community as more manufacturers enter this rapidly growing market. This will benefit us, the end users, as products become more specifically geared to our needs and increasing competition drives prices down. I'm glad to report that manufacturers are taking DJs seriously and devoting a considerable amount of research and development to products intended for our market.

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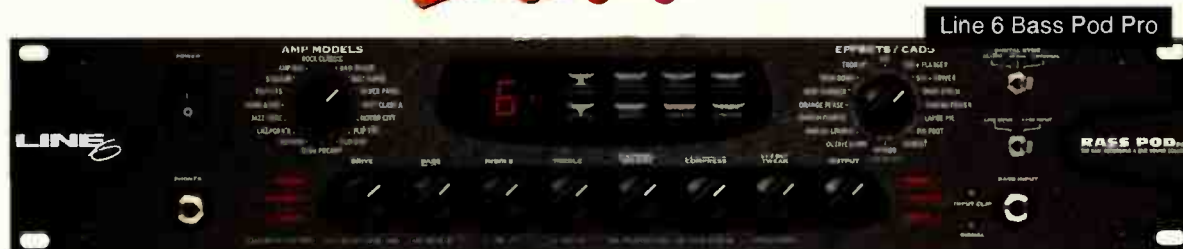


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Celtic instruments. Likewise, the E-mu Virtuoso 2000 virtual orchestra features a wide variety of orchestral sounds.

On the drum front, the **Roland Studio Set** (\$2,595) is an electronic percussion kit that combines the V-drums TD-8 percussion sound module (1,024 drum and percussion sounds and 262 backing instruments) with three PD-9 10-inch dual-trigger pads (for snare, floor tom, and ride cymbal), four PD-7 7.5-inch dual-trigger pads (for hi-hat, rack toms, and crash cymbal), a KD-7 kick trigger unit, FD-7 hi-hat control pedal, plus a custom studio stand including all necessary mounting hardware.

GUITAR PROCESSORS AND MODELING

The folks at Line 6 have obviously been working overtime. Hot on the heels of their Bass Pod (reviewed in our August issue) comes the Bass Pod Pro (\$799.99), a 2U rackmount that adds several new models, AES/EBU and S/PDIF digital outs, effects loops, and a line-level input and output (for re-amping or processing non-bass sources). Also new from Line 6 is the DM4

distortion modeler (\$349.99). Featuring 16 models of classic distortion effects (with 24-bit processing), four programmable presets, true bypass, and bass/middle/treble controls, the DM4 comes in an all-metal, gold-colored retro-style chassis that matches other Stomp Box Modeler series devices. Finally, the **Spider 212** combo amp (\$899.99) offers 100W stereo operation into 12-inch speakers, with sounds from the Line 6 collection of amp models. Other features include a headphone/direct out for practice or recording, four programmable channels (expands to 12 channels with the Floor Board accessory), and effects (delay, ping pong, tape echo with tap tempo, flange, chorus, tremolo, and reverb).

In a similar vein, Roland unveiled their **VGA-7** guitar amp (\$1,699), a 65-watt-per-channel stereo modeling combo amp with two 12-inch custom speakers and two high-frequency horn drivers, all powered by a V-Guitar technology processing engine. Requiring a "Roland-ready" guitar with a 13-pin divided pickup, the VGA-7 offers 20 amp models, three-band EQ, modeling of several guitar types

A GUEST ROOM WARRIOR AT SUMMER NAMM

I'd never attended a NAMM show, or even been to Nashville, so I was quite jazzed when *EQ*'s fearless leader, Mitch Gallagher, offered me the chance to attend the Summer 2000 NAMM. While Summer NAMM is traditionally a smaller show than the big Winter NAMM bash in California, there was still plenty to see and hear. Here's what I noticed.

There's suddenly a remarkable selection of good-quality microphones at affordable prices. A fresh wave of imported mid-to-large diaphragm condenser mics have shook up the industry, and major manufacturers are responding by giving us better quality at lower prices. **AKG's C2000B** is a good example: A medium-diaphragm mic based on their popular C3000 circuitry, assembled in Austria, held to AKG's standards for quality control, and at an MSRP of \$299. (There are, of course, other good examples from **Shure**, **Audio-Technica**, and a new mic from **CAD** that looked pretty slick, although I didn't get a chance to hear it.) Now the project pro can afford to own more good microphones, and have the luxury of choosing mics to fit a voice or instrument. I'm excited to see what else is coming.

If you thought you were having trouble choosing a multitrack recording format last year, it's only going to get worse. The number of choices is completely off the hook. Stand-alone multitrackers that do everything from front-end instrument processing to burning master CDs seem to be the hot item: I was particularly impressed with **Yamaha's AW4416**. Sixteen tracks of simultaneous 24-bit recording (with eight virtual tracks available on each track), 02R-style automation, card slots for

interfacing with ADAT, TASCAM, and AES/EBU, built-in sampling pads, and a Yamaha CD-R drive...far too many features to list, and at a suggested list of \$3,799. If you already own a computer, **TASCAM's US-428** (previewed in the August issue of *EQ*), looks to be a very cool unit, and the TASCAM guys tell me that most major digital audio software manufacturers are writing drivers that will let you use the unit as a control surface. Not to mention stuff from Roland and Mackie, and, well, you get the idea.

The object with the highest drool factor for me was the **Sony DMX-R100** digital mixer, shown in a near-completed fashion in Sony's perch overlooking the main floor. At \$20,000 list, it ain't cheap, but the automation features are dazzling (it works like the big boards do, with inductive touch-sensitive faders) and the physical design is wicked cool.

So much digital amp modeling, so much D.I gear bathed in smoke and lights, so many guitars...I remember being impressed by the new **Fender American Series**, but, finally, the cacophony generated by 100 guitarists, 73 bass players, and 42 drummers all playing every lick they knew at Mach 3 drove me out to check out Nashville. If you think you're a pretty good guitar player, you should stroll along Broadway some Friday or Saturday night. The street is lined on both sides with skinny little taverns, each one with a band crammed into a corner near the door. Each band features a country cat who can flat wail, and these guys are playing for *tips*.

All in all, a great time. Can't wait until next year.

—Jim Bordner

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(including electric, hollow-body, and "guitar-meets-synth" sounds), and four independent effects processors with 15 of Roland/Boss's most popular effects algorithms. There are 80 preset and 80 user patches, foot pedal and expression pedal inputs, and stereo line outs for recording.

Speaking of guitar amps, Peavey unveiled their Transformer 212 (\$949.99). Unlike digital modeling amps, the 212 alters circuit characteristics in the analog preamp and power amp to model 12 different amp types. There's also reverb, delay, five types of modulation effects, effects loop, 32 presets, and two 50-watt TransTube power amps for driving the stereo speakers. DigiTech were showing the RP100 modeling guitar processor (\$129.95). This little puppy concentrates on effects — 25 total, and 10 available simultaneously, with three adjustable parameters per effect. It also includes a Rhythm Trainer (drum pattern player), chromatic tuner, 40 factory/40 user presets, stereo outs, headphone out, and expression pedal input. The Koch Load Box (\$399) is a 50-watt power attenuator (available in 4-, 8-, and 16-ohm versions) that reduces your tube amp's output power to small club, rehearsal, or bedroom levels (it also allows you to monitor through headphones). It includes both line and balanced DI outputs; speaker simulation selects either a single guitar speaker or the added low-end boost of a 4x12 cabinet. Koch also debuted their Pedaltone, a four-channel tube guitar pre-amp cleverly disguised as a stomp box.



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LIVE SOUND

Mackie announced two new mixers: the SR244 VLZ Pro and the SR32.4 VLZ Pro. These updates of the SR24.4 and SR32.4 sound reinforcement consoles now include XDR

continued on page 152

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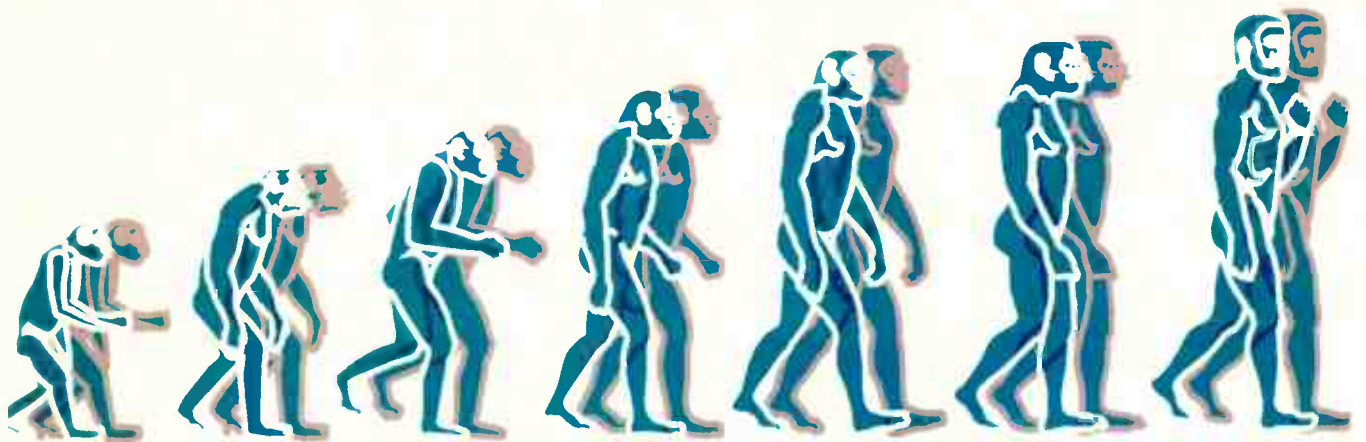
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IN TODAY'S DIGITAL
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IMPORTANCE OF
PROPERLY BACKING
UP AND ARCHIVING
DATA CAN'T BE
UNDERESTIMATED

"Eat your vegetables, brush your teeth, and backup your data!" These are reminders we've all heard too many times. Although many of us do the first two almost instinctively, it's a safe bet most of us *don't* back up our data as religiously! Be honest. How many times have you lost irreplaceable material because you didn't spend the time to properly back up your files? At worst, your laziness has cost you a gig or a studio project. At best, it's wasted hours of time and caused you and others a tremendous amount of frustration. This article isn't about whether or not you should backup your data — that's a given. It's about the different hardware systems available today for backing up, storing, arranging, and archiving data.

TAPE DRIVES

Tape was actually the first storage medium used by computers. Now tape has come full circle as a popular system for computer storage, albeit, in a much different form. There are a number of popular tape backup systems available today. Among these are QIC/Travan, data DAT/DDS, AIT, DLT, and Exabyte.

QIC (Quarter-Inch-Cartridge — Travan is Imation's version of QIC), is among the least expensive tape-based backup solutions. The newer versions, such as Travan-5, have capacities up to 10 GB uncompressed or 20 GB compressed on a single cartridge, with transfer speeds up to 1 MB/sec.

BY BOB BUONTEMPO

AN INTRODUCTION TO

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Get 2 GB of storage per disk with Iomega's Jaz.

DDS, which stands for "Digital Data Storage," uses 4mm Digital Audio Tape (DAT) for data storage. Several versions have been released; the current version, DDS-4, can store up to 20 GB (40 GB compressed) on a single tape at speeds up to 2.4 MB/sec. DDS uses hardware data compression, making it faster than software-based compression schemes. Depending on the DDS version, data DAT drives run in the \$600 to \$1,100 price range, making them a reasonably affordable backup option.

Sony's AIT uses ALDC technology, which typically yields a data compression ratio of 2:6:1. It uses 8mm tape cartridges and employs a helical scan recording head. AIT-2 can store a maximum of 50 GB of uncompressed data and 130 GB of compressed data. The data transfer rates are 6 MB/sec uncompressed and 15.6 MB/sec compressed. Typical list price for AIT is around \$2,200, while the AIT-2 runs in the \$4,300 neighborhood.

Quantum's DLT (Digital Linear Tape) drives utilize DLZ data compression, which typically yields a ratio of 2:1. The Quantum DLT 8000 can store a maximum of 40 GB of uncompressed data, and 80 GB of compressed data. Its data transfer rate is 6 MB/sec uncompressed and 12 MB/sec compressed. Quantum also makes several other DLT models: the 2000, 4000, 4500, 4700, and the 7000. The DLT 8000 offers the highest storage capacity of these. Typical list prices for DLT drives range from \$2,000 to \$6,000, depending on the model.

Another 8mm tape format, Exabyte Mammoth drives, use IDRC compression, which typically yields a data compression ratio of 2:1. These drives can store a maximum of 20 GB of uncompressed data and 40 GB of compressed data. The Exabyte Mammoth's data transfer rate is 3 MB/sec uncompressed and 6 MB/sec compressed. This drive weighs in with a street price of \$2,600.

DATA CARTRIDGES

Data cartridges are easily transportable and removable devices that can hold a relatively large amount of data rather inexpensively. The most common types are Zip and Jaz, but there have been a number of different types produced over the years, and new formats,

CASE STUDIO: PROJECT STUDIO

Here at Microsound, my project studio, I use multiple formats (Windows/Mac computers, MasterLink, DAT, and multitrack ADAT tape) that all need backing up, so I use different strategies.

Computer Files: Temporary and small files are saved on 100 MB Zip disks. These are good for the "backup *du jour*" while work is in progress, although they no longer have enough capacity for many projects. Larger files go to CD-RW, and archives go to CD-R. As I don't completely trust recordable CD media, I make at least two copies of each. I also make copies that I send to friends as a sort of "remote backup."

MasterLink Files: MasterLink is essentially self-archiving for projects recorded into its hard disk. It's also the obvious choice for 24-bit backups, although, so far, that's not a big part of what I do.

Audio Files: Some are saved as WAV or AIFF files on CD-RW or CD-R. But I also run the audio to two tracks of an ADAT tape. This gives me a total of four hours of stereo audio backup, or eight hours mono (useful for backing up samples) per tape. Because I have two ADATs, it's easy to clone the tapes for extra safety copies.

DAT: DATs get backed up to ADAT as well. Thanks to the ease with which you can clone ADAT tapes, I find their long-term reliability is superior to DAT.

Multitrack Tape: Since all multitrack tape work is done on ADAT, I simply clone tapes for backup. —Craig Anderton

Craig Anderton is *EQ's* technology editor and the creative director of MusicPlayer.com in addition to leading a busy project studio life.

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CASE STUDIO: COMPOSER STUDIO

At my composing studio, we have four or five Macs on an Ethernet network. There's about 60 to 75 GB of disk storage hooked up to the computers, of which 35 to 40 GB are filled with various kinds of files. We follow some basic data management rules:

1. Everything gets backed up several times. This includes system folders, application files, and preferences — everything. When we're finished with a project, we burn a stack of CD-Rs and then burn a second safety stack.
2. I make copies of all the samples that I'm using and dedicate them specifically to each project. It's safer to do this than to have one sample serve multiple projects. If you edit a sample that's shared between projects, when you go to reconstruct an earlier piece, you're lost because the sample's been changed!
3. With my Yamaha 02R, I use Project Manager Pro software to edit and memorize most (alas, not all) of the mixer settings. I do a complete data dump not only for each project, but, if it's a film score, for every cue.
4. Daily backups are handled by a Glyph DDS-3 data DAT. The computers are signed on to the network at the end of the day and backed up to the data DAT. In addition, projects in progress are backed up to a project data DAT. This happens during downtime, lunch, etc.
5. Offsite storage can be an important safety precaution, although I'm not religious about it. I should store a copy of everything offsite, but let's face it — if I followed every backup commandment, I wouldn't have time to compose anything worthwhile enough to back up! —*Richard Einhorn*

Formerly a record producer for artists such as Yo Yo Ma, Meredith Monk, and Isaac Stern, Richard Einhorn is now a noted film and classical music composer. His credits include the "opera with silent film" *Voices of Light*, orchestra pieces, numerous film scores, song cycles, chamber works, and a ballet (www.sonyclassical.com/artists/einhorn/ or www.richardeinhorn.com)

such as Castlewood's 2.2 GB Orb continue to show up.

The Iomega Zip drive is available for practically any computer configuration. External Zip drives are available for USB-, parallel port-, and SCSI-equipped machines, or you can get internal drives with IDE/ATAPI support. Iomega also makes an internal drive for most popular laptops. All drives except the internal notebook units are available in both 100 and 250 MB versions. (The notebook model is available in a 100 MB version only.) Additionally, USB models give you the convenience of being able to "hot-swap" the drives, which simply means that you can hook and unhook the drive without having to power down first. Depending on the model, a Zip drive will cost between \$100 and \$180, with the 100 and 250 MB disks costing

\$10 and \$17, respectively. As far as compatibility, 250 MB drives can read 100 MB disks, but the reverse isn't true.

Also from Iomega is the Jaz drive. Available in 1 and 2 GB versions in internal and external configurations, these drives offer performance very close to some hard drives, with the convenience of portability. Jaz drives require a SCSI supported interface. With better performance and more storage space, the cost of these drives is still only between \$280 and \$350, depending on the model. Jaz disks cost \$100 to \$125 depending on their storage capacity, and, like Zip disks, can often be purchased in multi-packs at a discount price.

SWAPPABLE HARD DRIVES

In a survey on the EQmag.com forum boards asking about the popularity of various storage and backup devices, swappable hard drives came up as one of the most popular, especially with some of the new, external hard drives offered by companies such as Glyph. Many people who use Pro Tools or similar systems have to shuttle data from

CASE STUDIO: DAW-BASED PRODUCTION STUDIO

I have to admit: Given how long I've been working with DAWs, it took a little too long for me to realize the importance of backing things up. In 1988, when I bought my first computer-based audio recording/editing system, backup consisted primarily of either MO (Magneto Optical) drives or DDS-1 DAT tape. Neither was extremely reliable or affordable. At the time, the price was so high that I had to lease my first backup drive! What prompted my decision to buy an MO system was the fact that I had an external 675 MB hard drive go down with an entire album on it. Whoops! Forgot to back up....

More than 10 years later, I absolutely understand the importance of backing up computer data. I regularly backup every computer that I own (business, personal, or music-related). I use DDS-3 tape for my home and office backup because it's fairly robust, has an uncompressed capacity of 12 GB, and is pretty reasonably priced (although that's the least of my concerns — kind of like searching for the cheapest brain surgeon — no thanks!). As for my Pro Tools systems, I use both Retrospect and Mezzo software controlling a CD-R, 2 GB Jaz drive, and DDS-3 and AIT-2 tape drives. The reason for all of the software and hardware is that I get different formats from different clients and I need to be able to restore anything at any time. The great thing about both Retrospect and Mezzo software is that they support multiple backup drives being online at the same time. If I had to choose one format, it would definitely be AIT-2. This medium is robust, can store 50 GB of uncompressed data, and is very fast (its transfer rate is over 300 MB/min). —*David Frangioni*

David Frangioni is the author of EQ's Studio Tech column, as well as a noted studio consultant, recording engineer, and surround sound pioneer (www.audio-one.com).

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DATA BACKUP

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THE FUTURE OF STORAGE

In the future, the storage devices will be little crystals you put in a reader, like in a Superman or Star Trek movie, right?

Actually, that's not as far-fetched as it seems. Scientists are working on storage devices such as bubble memory, Carbon-14 memory, even biological DNA memory. Until those systems hit the streets, here are a few soon-to-be-available mediums.

C3D

The C3D is a CD-sized disc capable of holding up to 140 GB of information. C3D's system, FMD (Fluorescent Multi-layer Disc) ROM, uses a laser to stimulate fluorescent material. The company says this fluorescence (light emitting) property enables writing/reading of multi-layer structures with much greater storage capacity than offered by current optical memory products.

The disc is transparent. A single laser can pass through the disc, activating the fluorescent material in multiple layers almost simultaneously, allowing multiple tracks to be read at the same time. In the future, each disc may carry up to 100 layers, giving the medium *tremendous* storage capabilities. Check it out at www.c-3d.net.

SONY DOUBLE DENSITY CD FORMATS

The Sony Double Density CD stores up to 1.3 GB per disc, but inherits the basic specifications of current CDs. This allows manufacturers to utilize their current technologies and production facilities to manufacture Double Density discs.

The Double Density CD's high capacity is achieved by a modifying the standard CD format. Track pitch and pit lengths are miniaturized to increase data density. In order to accommodate higher physical bit density, the error-correction scheme has been changed, and the address format has been expanded. A copy control method will be included in the format to meet the increasing demand for secure content.

INCREASED CAPACITY DVD

Almost as soon as it came out, DVD is outdoing itself with increased storage capacity. Currently, it's possible to obtain a data density of up to 4.7 GB on each layer of a DVD. Since, theoretically, a DVD can have two layers on each side, that means there could be up to 17 GB of data stored on a single disc in just a few years.

one studio to another. Using a swappable hard drive that is dedicated to the data for the project being worked on seems to be one of the easiest and quickest ways to achieve this task. And, if the disk is "hot swappable," the switch can be done in just a few seconds.

CD-R AND CD-RW

Of all the currently available backup methods, CD-Rs are probably the most popular and cost-effective. CD-R drives are WORM (Write Once, Read Many) devices, thus they're excellent for storing and archiving information, whether it's music or data. Most workstation users have CD-R burners by now, and you can purchase blank discs for well

under a dollar. The typical CD-R holds 650 MB of data or 74 minutes of audio. There are now 700 MB versions available as well, which can hold 80 minutes of audio. One can write data to CD-Rs at speeds ranging from one-to-one (real-time) up to sixteen-to-one (16X).

The CD-RW format allows you to reuse the disc by erasing it and writing to it again. CD-RW discs can't be written by standard CD-R drives, but CD-RW drives can write to both types of blanks. Orange Book standards require CD-RW discs to be able to accommodate 1,000 successful writes, but most manufacturers claim that their products will write up to 100,000 times! One note: CD-RW discs can't be played in some older model CD players because the reflectivity of

CD-RW discs is far below that of CD and CD-R.

DVD-RAM AND DVD-RW

DVD is one of the newest technologies to come into

CASE STUDIO: PROJECT/MULTIMEDIA STUDIO

Here at MagMedia Productions, I work on various things, from music composition/recording/editing/mixing, to project mastering/restoration, to product reviews, to multimedia authoring. I use three Macs and a PIII Windows machine. In addition, I have data stored on ADAT tapes, DATs, samplers, and on Alesis MasterLink.

The computers all have Zip drives. I use these to make quick backups as I'm working, as well as for easy "sneaker net" transfers. With audio, the files are often too large to fit on Zip; in that case, I have a 2.2 GB Orb removable drive as well as old, slow hard drives that I use for quick "in-progress" backups. It's not a "permanent" backup, but at least the data exists in two places. For more permanent backups and archiving, I burn CD-Rs on a regular basis. I also have a Zip drive on my Kurzweil K2500 sampler; I save copies of the samples that live on the unit's internal hard drive off to Zip. Since the K2500 writes in DOS format, I can load those sample Zips into a computer and burn CD-R backups of them as well.

The ADAT and DAT material ultimately gets transferred into Pro Tools or another audio application, where it gets backed up to CD-R, so I don't bother cloning or backing up tapes. As Craig Anderton mentions in his sidebar, MasterLink tends to be self-backed by nature of its hard drive and built-in CD burner.

Larger files, surround sound, and higher resolutions have me re-thinking my approach a bit. At this point, I'm considering adding a very large FireWire hard drive for quick "in-progress" copies, and a DVD-RAM drive (particularly as capacities of these drives increase) for more permanent backup/archiving. —Mitch Gallagher

EQ editor Mitch Gallagher pretty much lives in his office/project studio. He's working on an album of his solo acoustic guitar music, and his first book will tentatively be released next spring.

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The Quantum DLT 8000 can store a maximum of 40 GB of uncompressed data, and 80 GB of compressed data.

the audio/data storage marketplace. Recently, recordable DVDs have emerged, changing the face of this technology. Software such as Adaptec's Toast enables the data on DVD-RAM and DVD-RW to be played or viewed as an audio-only file. At first, these units were extremely expensive, but they've recently come down in price — enough to compete with the other backup formats.

A drive from Lacie or Panasonic can be had for around \$600–\$900, and blanks holding 5.2 GB of data (using both sides of the disc) can be purchased for around \$40. These are increasingly popular with the DAW community, as they're convenient for transferring data from one studio to another, updating sessions, and archiving. The only real complaint users have is that the drives tend to be a bit on the slow side.

MAGNETO-OPTICAL DRIVES

The magneto-optical (MO) disc drive is another popular

way to back up data that writes as well as reads. As the moniker implies, an MO device employs both magnetic and optical technologies. A typical MO cartridge is slightly larger than a conventional 3.5-inch magnetic floppy disk, and looks similar. But, while a traditional floppy disk can store 1.44 MB of data, an MO disk can store many times that amount, from 100 MB up to several gigabytes.

An MO system achieves its high-data density by using a laser and a magnetic read/write head in combination. Both the laser and the magnet are used to write data onto the disc. The laser heats up the disc surface so it can be easily magnetized, and allows the region of magnetization to be precisely located and confined. A less intense laser is then used to read the data. This data can be erased and/or overwritten an unlimited number of times, just like a conventional 3.5-inch computer diskette.

The major advantages of MO drives include convenience, modest cost, and reliability. The chief limitation of MO drives is that, although they are faster than conventional 3.5-inch floppy disk drives, they're considerably slower than hard disks.



CASE STUDY: POSTPRODUCTION STUDIO

At Gizmo Post, our media management requirements are vast. We have over 500 GB of storage. Media files, internal drives, servers, and sound effects libraries all need to be archived regularly. Our four Pro Tools systems, two Avids, and graphics room work on projects ranging in size from a few hundred megs to 70 or 80 GB each. So, media management isn't just a job, it's an adventure.

Our current archiving regime is the result of years of experimentation and testing of software, gear, and workflow models. We use Mezzo software from Grey Matter Response. No other application does what it does. It can look at Pro Tools or Avid sessions and scan the drives involved, creating a relational database. It does the file management for you.

The tape format we use is AIT-2. It's lightning fast and reliable. Previously, we were using 8mm Exabyte drives. When we switched over to AIT, it gave new life to our Mezzo software. The tape drive can transfer up to 20 gigs an hour, not including verification. Tapes hold from 36 to 50 GB each.

We generally start an archive at the end of each workday. That way, the amount of data being processed is of a reasonable size, and if there is a fatal error, we're covered. If a project continues over multiple days, then only additions and changes will need to be archived. This is where Mezzo really shines. It looks at the database and knows if anything has changed.

A project that's on hold for a while gets deleted from the drives once the archive has been checked. When that project needs to continue, we restore it from the archive tape to the hard drives and the project opens up as it was last accessed. You have the option of restoring single files, whole sessions, or anything in between. —Brian Mackewich

Gizmo Post, located in New York City, is a multi-room postproduction facility whose clients include the Discovery Channel, Miramax Films, MTV Networks, National Geographic, and the Sundance Channel (www.gizmapost.com).

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TC Electronic Reverb (bundled with the D8B UFX card) provides Reverb 1 and Reverb 2 algorithms from the renowned TC Electronic M2000 Studio Effects Processor. TC FX upgrade package contains an expanded set of M2000 reverbs plus Delay, Chorus, and Pitch. TC 2000 adds the TC M2000's Reverb 3, de-essing, tremolo, phasing, and panning.

3 1999 TEC AWARD WINNER!



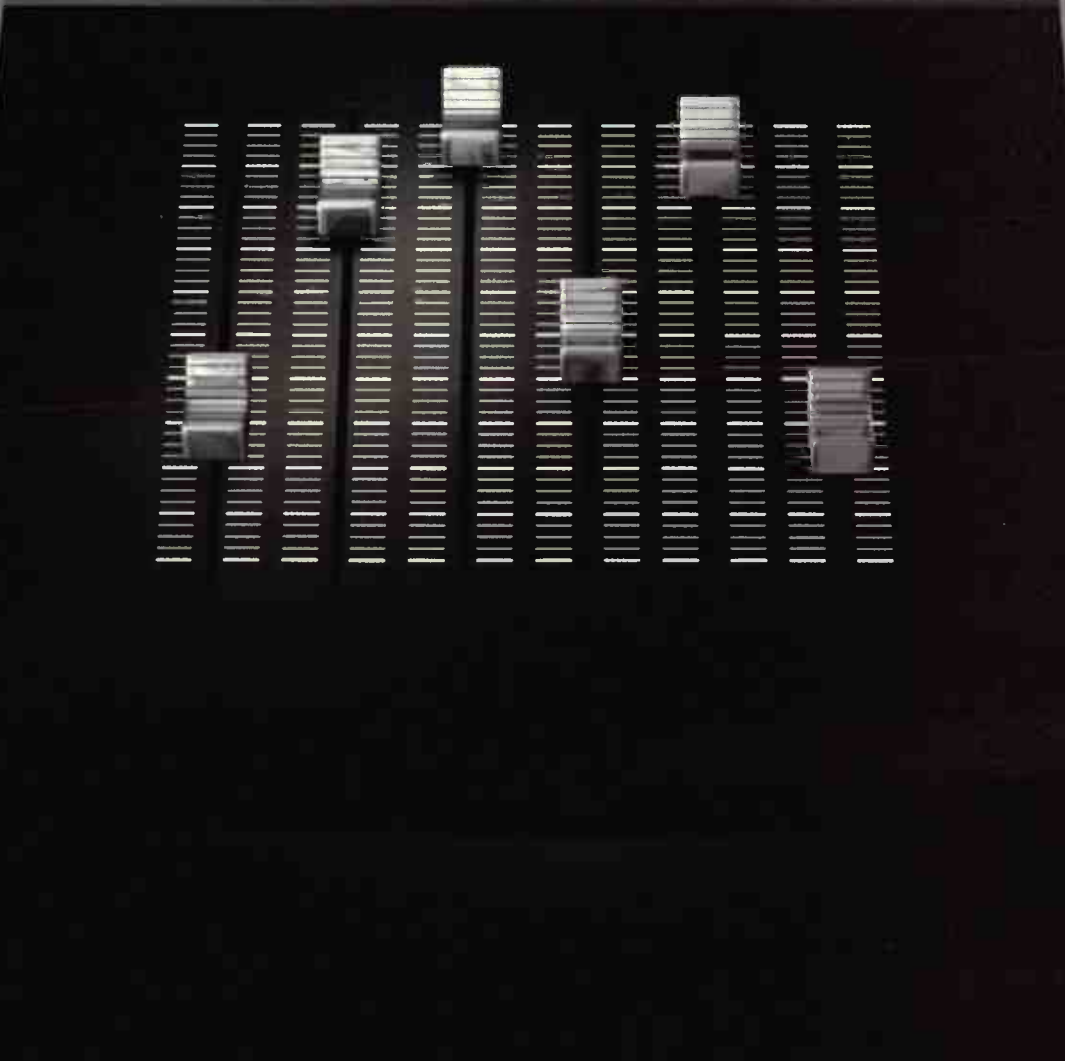
Normally we don't name competitors in our ads. But in this case, Mix Magazine published the other nominees for the 1999 TEC Award for Outstanding Technical Achievement in Small Format Consoles: Allen & Heath's GS-3000, Digidesign's ProControl, Panasonic's WR-DA7, Spirit's Digital 328 and Yamaha's O1V. Thanks to all who helped us win this prestigious award.

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t.c. electronic | TC ICON REMOTE SYSTEM 6000



TC ELECTRONIC SYSTEM 6000

Multichannel Digital Reverb and Effects Processor

BY DAVID FRANGIONI

Every so often, a piece of equipment is released that's as *revolutionary* as much as it is *evolutionary*. It's understood that in order to earn the banner of both titles, there's a lot of technology and innovation necessary. When I received a working TC Electronic System 6000 in February of this year, my expectations were quite high. My first impression was that its sound (and build) quality was outstanding. However, other than surround reverb and some miscellaneous effects, it worked primarily as a four-machine effects unit with great sound. Nice, but not revolutionary. At that point, I would have called it more an *evolution* of their M5000 (multi-engine, CORE reverb algorithms) and M3000 (VSS reverb technology).

But this review is being written in July, so let's set the record straight: The System 6000 has progressed by leaps and bounds since I first received the unit. Yes, TC has taken it that far in a very short period of time. As of this writing, I would say the System 6000 truly is *revolutionary*. This review is based on software version 1.01, which is the currently shipping rev.

TC chose a fairly unique release approach with the System 6000. They released the unit with the understanding that anyone purchasing the unit would be receiving regular software updates as they became available. (Is software ever really final?) The positive outcome of their choice was that they (TC) could get invaluable feedback (no pun intended) from a qualified group of professionals on what worked and what needed improvement as software development forged onward. The downside was that word travels fast in this industry, and it could have been perceived that the unit had software bugs or lacked features based on the early software releases (neither of which is the case now).

Personally, I applaud TC for their choice to handle the release in this fashion. In the future, I hope that more manufacturers will take such bold approaches to the update/release process. Enough



MANUFACTURER: TC Electronic, Inc., 742-A Hampshire Road, Westlake Village, CA 91361. Tel: 805-373-1828. Web: www.tcelectronic.com.

SUMMARY: World-class reverbs and processing in surround or multi-engine stereo formats.

STRENGTHS: Outstanding sound quality. Upgradeable. Networkable. Excellent metering. Very cool ICON remote. Unique six- and eight-channel surround processing capabilities. Inclusion of M5000 and M3000 algorithms and presets. Optional licenses provide essential surround sound processing capabilities.

WEAKNESSES: Some features (such as MIDI and SMPTE) not fully implemented as of version 1.01.

PRICE: \$8,595 **EQ FREE LT. #:** 104

TC's essential tool for surround mixing and processing

TC ELECTRONIC SYSTEM 6000

Multichannel Digital Reverb and Effects Processor

said. Let's talk about what the System 6000 does today and will do tomorrow.

I've been using this unit since day one of its release, featuring it on several DVD and album projects. I also reviewed the unit with an early software rev (as every other reviewer has had to do until now) for *EQ's* sister publication, *Surround Professional* (in the March 2000 issue), so I feel well qualified to now review the unit with its latest software release.

The ICON CPU contains a USB port that could theoretically be used to access a CD-ROM drive or other peripherals.

There are three open slots on the back of the Mainframe, each of which can house optional 24-bit/96 kHz analog inputs and outputs, bringing the total I/O capacity to 14 channels. What makes this so powerful is the manner in which the System 6000 software can route inputs and outputs. Virtually any input can go to any output and vice-versa. Analog. Digital. Either. Both. TC has included many Preset Routing configurations, any of which can be recalled, edited, and stored. Very powerful stuff.

The ICON CPU actually runs Windows NT 4. In fact, when the CPU boots, the NT "blue screen" shows, so there's no secret as to what engine is being used to control the System 6000. There's a 40-MB flash card inside of the CPU that houses the operating system and the ICON program. Both the ICON CPU and the Mainframe have independent IP addresses, which makes placing these units on a network easy. Adding more Mainframes is as simple as connecting an Ethernet hub and cable and assigning separate IP addresses per unit. Simple, fast, and exactly as a proper networkable device should work.

As for the ICON remote, it's absolutely wonderful. The touch screen looks great and responds fabulously. You can even change the background color as well as connect an external monitor (I used a 15-inch color screen with it — pretty cool). I've used quite a few touch screens over the years on various control systems (Crestron, AMX, etc.), and the ICON is one of the best. It's small enough to sit comfortably on a console while still being big enough to manage easily. The faders are responsive and the operating system runs very fast, making the System 6000 a real joy to use.

BASICS

The System 6000 consists of three physical hardware units, comprising an entire "System." The Mainframe houses all of the I/O, clock, and DSP. The ICON CPU controls the Mainframe via a touch screen—



The ICON interface's background colors and screen brightness can be customized (above). The Routing Page controls the inputs and outputs (right).



equipped remote control called the ICON. The ICON connects to the CPU via a custom (TC-supplied) multi-pin cable. The CPU connects to the Mainframe via Ethernet. All operations are managed through the user interface on the ICON remote. Straightforward and elegant.

The Mainframe comes "stock" with one DSP card capable of running four independent effects engines with eight channels of AES/EBU digital I/O. The AES I/O is on a DB-25 connector, and the required breakout cable is thoughtfully included with the unit at no additional charge. Word clock I/O is supported, as is Ethernet (which is how the Mainframe and ICON CPU communicate) as well as a floppy drive (used for software updates and program archiving). SMPTE and MIDI I/O are also provided.

INSIDE OUT

The System 6000 can clock to its own internal crystal, external word clock, or external digital input (via any of the four AES inputs), making it easy to integrate into an all-digital studio. MIDI and SMPTE support are planned for the future (the pages and physical connectors exist, they just don't do much right now). Navigating through the System 6000 is done with a series of buttons at the top of the ICON screen. There's one button per effects engine as well as a "Library" button (where you manage presets of all types) and, lastly, a "Frame" button (where the system settings, metering, and actual routing is done). I should mention that the metering on this unit is comprehensive, accurate, and visually pleasing. I'd rate it as some of the best metering that I've seen on a processor.

The truth is out there.



Surround yourself with it.

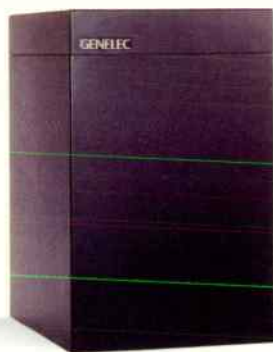


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TC ELECTRONIC SYSTEM 6000

Multichannel Digital Reverb and Effects Processor

In using the System 6000, the first thing that you'll do is load a Routing Preset, which configures the four effects engines. For example, if you wanted four independent stereo effects, each using digital I/O, you would load the "Engine 1-4 Digital I/O" routing preset. If you wanted to do surround sound effects (reverb, compression, etc.), you would configure the engines to run as one large engine ("E1-4 in Series, Digital I/O" preset). You get the idea. Once the routing configuration is loaded, it's time to have some fun.

Simply go to the "Library" page and choose which engine you want to load with a preset. (If you're using surround presets, then you'd load the preset into Engine 1, as the other engines are working in the back-

an actual M5000 sounds (I had an M5000 present to compare — the System 6000 versions are spot-on). The VSS algorithms from the M3000 are also present. Again, they sound as good as or better than an M3000 — not to mention the System 6000's additional surround sound capability with these algorithms. Couple this sonic palette of diverse algorithms with the multi-engine power of the System 6000 and you have an amazingly powerful reverb package. The multichannel reverbs, in particular, represent a giant step forward in the reproduction of sonic spaces. You can create many types of ambiances as well as pan the input source around the speakers.

Also part of the System 6000 package is the option of buying "licenses." The first license gets you a stereo Finalizer inside of the System 6000, called MD-3. No, you can't load Finalizer presets into this unit, but you can use MD-3 just as you would a Finalizer — for all intents and purposes, it's a Finalizer. As an upgrade from there, you can add the MD5.1, which is a six-channel Finalizer — the first of its kind. You have to hear this to believe it, but let's just say that if you're doing surround sound, you need this option. In addition, there's the optional Toolbox 5.1, which contains processes for fine-tuning six-channel balances, panning, level, EQ, etc. (Toolbox 5.1 doesn't contain multi-band compression, as this is included in the MD-3 and MD5.1.) TC promises an additional license called VP7.1, which offers eight-channel pitch shifting. Again, this has never before been available in an effects processor. I can't wait to hear what it sounds like!

CONCLUSIONS

It truly is a challenge to cover all of the features that the System 6000 offers. Although the unit is deceptively simple to use, there's so much power and flexibility in the box that, even after more than four months of using it, I was still finding new and exciting possibilities for both stereo and surround sound effects. The System 6000 is much more than "just" a reverb, both for stereo and for surround applications. Its surround sound offerings are especially powerful, useful, and innovative.

If you're looking for a high-end effects processor with multi-engine capability, then don't wait — check out the System 6000. You'll be amazed at what it does, how it sounds, and how easy it is to use. Effects processing has arrived in the year 2000 with the System 6000!

David Frangioni is a surround sound mixing engineer and technical consultant having recently done projects for Aerosmith, the Bee Gees, Steely Dan, and Chaka Khan. He can be reached at www.audio-one.com.



The System 6000 comes with a version of the popular Finalizer (above). All of the classic presets from the M5000 and M3000 have been ported over to the System 6000 (right).



ground to do the additional channels of DSP processing.) Presets are divided into groups according to stereo and surround sound reverbs (each of which are further divided into Music and Post types) and into both Stereo and Surround Mastering, as well as Pitch-Shift. Hundreds of presets are included, many of which are very useful right out of the box.

SO HOW DOES IT SOUND?

I'm sure it's obvious by now that my impression of this unit is that it's a powerful and easy-to-use monster. Its sound lives up to the billing of world-class effects processor. The fact that it comes with the M5000 algorithms and presets is a very significant bonus. The System 6000 sounds as good (or better), playing the M5000 presets as

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IN REVIEW

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The 1176 Reborn

Find out how two new versions of the classic 1176 hold up next to the real thing

BY DAVID MARTIN

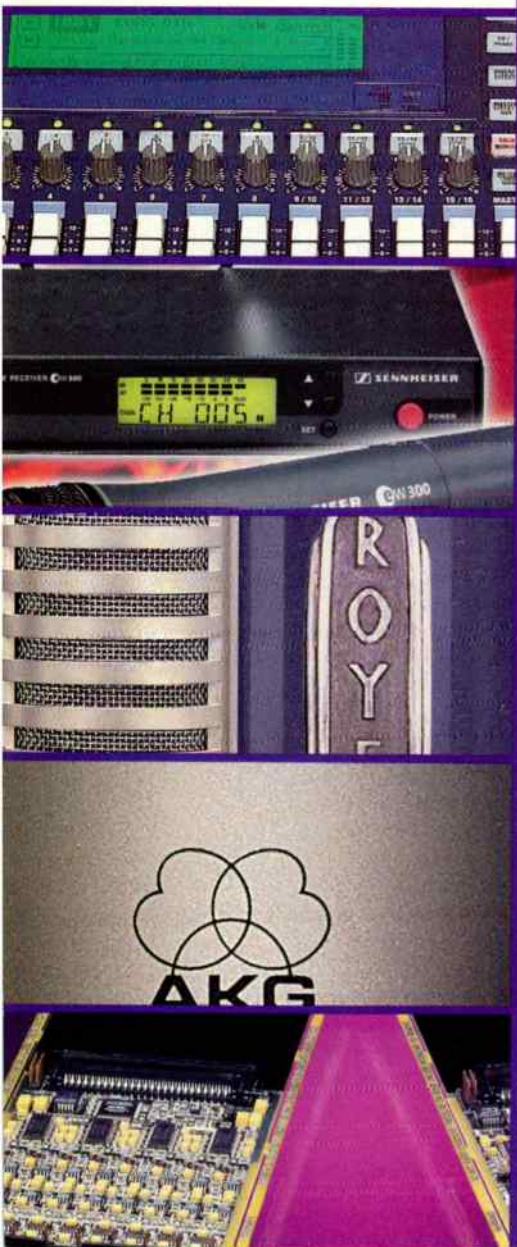
Those who use vintage UREI 1176's tend to find that each unit has its own character. This can result from several factors, such as the specific revision of the unit, components that have or haven't been replaced over the years, and drifting calibration. How noticeable the differences are and whether they're audible within the context of a multitrack mix is open to interpretation.

When the Purple Audio MC76 was introduced in 1997, I felt that it sounded *different* than the vintage

UREI units. The question was whether the difference was due to design or component changes, or simply because the vintage units had aged for 25 or 30 years. And, naturally, there was no way to find out, since there weren't any new 1176LN's.

But with the recent introduction of the Universal Audio 1176LN, a reproduction of the original, the time seemed ripe to attempt a meaningful comparison. The contestants in this experiment included a vintage "D" revision UREI 1176 owned by producer/engineer Richard Dodd. This unit has not been rebuilt, though its power supply has apparently been recapped. Also on test was a Purple Audio MC76 from the first production run of 50 units and a new Universal Audio 1176. Keep in mind that these tests can only compare the new units and one particular vintage UREI unit; the results shouldn't necessarily be thought of as universally applicable.

The UA appears to be built as a true reproduction of the UREI — the





circuit board is almost identical to the original, even sharing a part number. Most of the layout changes are cosmetic. The components appear to be as close to the originals as possible; the differences are mainly in the style and shape of the capacitors and transistors.

The Purple has a redesigned circuit-board layout, with some design modernization, such as an improved power supply. Improving the quality of the circuits might imply a change in the sound of the unit — possibly not the best course if the goal is to duplicate the sound of a vintage unit (though, in fairness, the design goals for the MC76 not only included duplicating the sound, but also making the units more consistent and reliable). Also, the sound of some circuits can be affected by layout, even when the components are identical.

To determine just how well the new models compare with the vintage unit, we put together two test scenarios. The

first, discussed here, consisted of a rigorous series of listening comparisons. The second, described in the accompanying sidebar, utilized laboratory-style tests in an attempt to quantify whatever differences the listening tests revealed.

Subjective listening tests aren't generally as amenable to rigorous procedure as bench tests. The protocol consisted of making a pot of coffee, putting up a multitrack master, soloing an instrument, and trying each limiter on that particular track. In general, the differences were fairly subtle. As a final caveat, these observations are colored by my personal preferences.

DRUMS

On a kick drum, I found the UA to be the most pleasing; it seemed to offer the most definition and low end. The Purple was close behind, seeming to lack some of the lows. The UREI didn't have the "thrust" of the other two units. On snare, however, the situation was reversed. I preferred the vintage unit, which seemed to enhance the brightness of the snare drum, then the Purple, and then the UA. On overhead mics, I first set the 1176's for an 8:1 ratio and a reasonably fast attack and release with a goal of maintaining a

sense of dynamics while controlling the volume of the snare in relation to the cymbals and hi-hat. For this, the UREI seemed to do the best job.

For fairly outrageous compression on the overheads (used as an effect), I tried the two-button trick (pressing the top and bottom ratio buttons simultaneously) with a fast attack and a slow release. For this, the UA was the most effective — the attack on this unit was fast enough to pull the snare hit out of the way while the slow release time emphasized the room sounds, cymbals, and the tom heads ringing. The slightly slower attack of the UREI and the Purple allowed the snare through, which de-emphasized the effect.

INSTRUMENTS AND VOCALS

For electric bass, I preferred the UREI, while on steel guitar, the Purple was my choice. On fiddle, I liked that both the UREI and the UA de-emphasized any tendency for high-end scratchiness, while on mandolin, acoustic guitar, and steel, I preferred the additional brightness of the Purple.

To confuse the issue even more, on three different vocalists, I picked a different one of the three compressors as my favorite

THE WRAP-UP

Spending a few days with the Universal Audio 1176, the UREI 1176, and the Purple Audio MC76 made me aware that none of the three should be considered the "best" or even necessarily better



EQ LAB REPORT

PURPLE AUDIO MC76

CONTACT: Purple Audio, 38-62 Eleventh St., Long Island City, NY 11101. Tel: 718-482-8494.
Web: www.purpleaudio.com

PRICE: \$2,000

EQ FREE LIT. #: 115

UNIVERSAL AUDIO 1176LN

CONTACT: Universal Audio, P.O. Box 3818, Santa Cruz, CA 95063-3818. Tel: 831-454-0630.
Web: www.uaudio.com

PRICE: \$2,295

EQ FREE LIT. #: 116

than the others. To my ears, the UA 1176 sounded more like the vintage UREI than did the Purple, but the Purple and the UA sounded more similar to each other than to the UREI. Overall, the Purple seemed to be a little

brighter than the other two units.

The UA sounds a little bit thicker than the Purple, with (to my ears) a bit more pleasing low end. The UREI seemed to be a little less aggressive overall, though it appears to enhance

the upper mids. I believe that I want a pair of each.

A version of this article originally ran in the August 2000 issue of Pro Sound News.

GETTING TWEAKY

As mentioned elsewhere in this article, the second part of our tests consisted of laboratory-style measurements. We calibrated the two newer compressors to match the vintage UREI, and ran extensive tests with an Audio Precision system. (To read a description of the test procedures and to view the test result plots online, visit www.prosoundnews.com). For consistency, the attack and release controls on each unit were set to their end stops.

The MC76 was the quietest of the three by a small margin, and had the least harmonic distortion at unity gain. It was the most different in the frequency response tests — though the plots were very close among all three units when no gain reduction was in effect. The harmonic content (which harmonics were present, and at what levels) at unity for the UA was close to the UREI.

The threshold in 1176-style units is dependent on input level and can't be independently tweaked. At a 20:1 compression ratio, the UA unit had the softest knee and the

lowest threshold. At 4:1, the UA still had the softest knee, but the higher threshold, with the UREI demonstrating a gentler ratio than the others. The UREI had the lowest THD+N and IMD distortion numbers across the board when swept with a varying amplitude tone (with gain reduction kicking in during the sweep).

It's hard to give a score to these results, and it's likely that other examples of these models would produce different data. In some ways, the two new units are closer to each other than they are to the original. In other ways, the UA 1176 responds most like the UREI. Undeniably, they're all from the same family.

In the end, it's all about getting the job done, and each of these tools will serve the individual wanting the sonic characteristics of an 1176, although either of the new units will do so more reliably than a vintage UREI.

—David Martin and Frank Wells

Thanks to Richard Dodd for the loan of his 1176.



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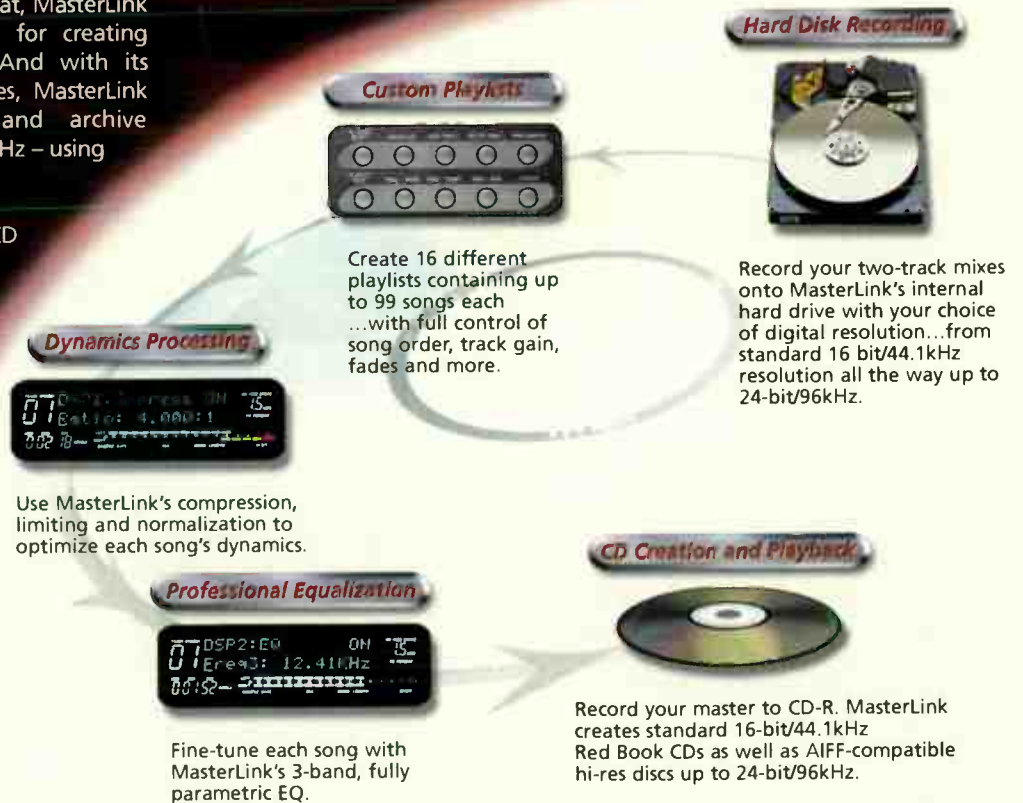


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Roland VG-88 Modeling Guitar Processing System

Does Roland's new modeling guitar processor raise the bar again?

BY MIKAIL GRAHAM

If you read my VG-8 tips and tricks article in last month's *EQ*, then you already know how I feel about that wonder box. If not, let me reiterate. The VG-8 is one of the most innovative pieces of technology for guitarists since the magnetic pickup; a true milestone in a world full of hype. Now that Roland's new VG-88, the successor to the VG-8 is available, is it really the next step? Let's take a closer look.

Like the original VG-8, the VG-88 is a floor-based system using Roland's COSM technology to model a wide

variety of guitar bodies, pickups, amplifiers, speaker configurations, mic placements, and effects all packed into a sturdy, almost bulletproof steel chassis. Unlike the VG-8, the VG-88's low price is hard to beat. The VG-88 updates the original VG-8's output to 20-bit/44.1 kHz resolution (the guitar input is 24-bit), adds new guitar and amp models, new onboard effects, onboard expression and control pedals, and has a much more intuitive icon-based user interface. Like the VG-8, the VG-88 can be played without the tracking delay often associated with guitar synthesis and works with any guitar equipped with a GK-2A or compatible pickup. New to the VG-88 is a 1/4-inch input so any guitar can take advantage of its COSM amps and internal effects (wah, compressor, chorus, delay, reverb, etc.). However, the COSM guitar types and effects, such as polyphonic pitch shifting, aren't available through this input.

The VG-88 contains 160 preset and 100 user patches, offering a good variety

of vintage guitar and amp tones using what Roland refers to as *natural tube amp* models for better sounding over-driven amp tones. When compared with the original VG-8, I'd have to agree that these new emulations do indeed sound much better, but they won't quite replace the blistering tone of, say, my Mesa Boogie Mark III.

A convenient new Output Select switch allows for easy connection to guitar amps, power amps, and line-level inputs for use with a mixer/multitrack recorder or with headphones. The new "EZ Edit" mode lets you create new sounds by adjusting only four parameters using the Value dial. A great way to get familiar with basic programming, but don't expect to be creating the next big virtual wonder-tone this way — it's more like wading in the shallow end of a pool than really swimming.

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Eddie Ciletti - Contributing Editor
EQ Magazine, March 2000

"The MXL 2003 strikes me as a mic that could very easily find a home in broadcast, ADR and Foley applications, in addition to a multitude of music chores"

Roger Maycock - Technical Consultant
Mix Magazine, March 2000

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EQ LAB REPORT

MANUFACTURER: Roland Corporation, 5100 S. Eastern Ave., Los Angeles, CA 90040. Tel: 323-890-3700.
Web: www.rolandus.com.

SUMMARY: A floor-based guitar processor using Roland's COSM technology to model a wide variety of guitar bodies, pickups, amplifiers, speaker configurations, mic placements, and effects.

STRENGTHS: Nothing like it on the market. More like an instrument than a guitar processor. Polyphonic pitch shifting and panning. Sound quality is superb. Can control up to 12 simultaneous parameters using onboard pedals, controllers on the pickup, or via MIDI. User-friendly operating system. Quarter-inch guitar input allows access to COSM amp models and internal effects with non-GK-2a-equipped guitars. New lower price.

WEAKNESSES: No compatibility with previous VG-8 sound libraries. No memory card slot. Nylon String guitar model could be better. No global override parameter for COSM/Direct guitar mix. Manual could be better.

PRICE: \$1,295

EQ FREE LIT. #: 112

simultaneous parameters, even via MIDI if you so desire. For my needs, this new functionality alone is worth buying the VG-88. It opens up some totally amazing possibilities and answers one of the big drawbacks in the original VG-8. Imagine being able to fade in a long delay, make the reverb size tighter, speed up the LFO rate of the chorus while adding more punch to the mid EQ, and adding a slight glissando — all with just one push of a pedal. Big fun indeed!

If you need more than one pedal, just plug more in via MIDI, or use the built-in sub-expression/control jack. The new assignment options for the guitar-mounted GK-2 S1/2 switches are also a real godsend: Imagine being able to turn on a chorus, wah, and delay for a solo with a simple flick of a switch.

The new Chain function lets you see at a glance how your entire signal chain is laid out, but also lets you easily rearrange the connection order of the COSM Guitar/Amp and internal FX via a simple iconic display. All effects have basic presets to get you started, and you can now instantly adjust global values for low/high EQ, noise suppressor, and reverb for all patches from one convenient screen. Nice work, Roland!

WISH LIST

The VG-88 is more like a new product based on the original VG-8 design than an update or upgrade. It adds many requested features, but at the price of being incompatible with older VG-8 sound libraries — a big loss for those of us who have spent years creating patches. There's also no memory card slot, which makes the VG-88 less versatile for those of us doing daily sessions and performing with multiple bands. (Roland suggests using a Palm Pilot with MIDI software for external storage.) Roland did include a nylon-string

guitar model that can almost do the job in a pinch (notice I said *almost*). It's good, but overall, it doesn't quite live up to expectations.

One thing that really stopped me cold was not being able to hear my direct guitar sound on any of the patches I tried. It turns out that Roland made the COSM and Direct guitar mix an assignable parameter per patch. If the current patch doesn't have a Direct Guitar level active when it's saved, you won't be able to hear any direct signal — which is how many of the VG-88's presets are stored. A great feature once you're aware of it, but a global override option and a bit more illumination in the manual would help.

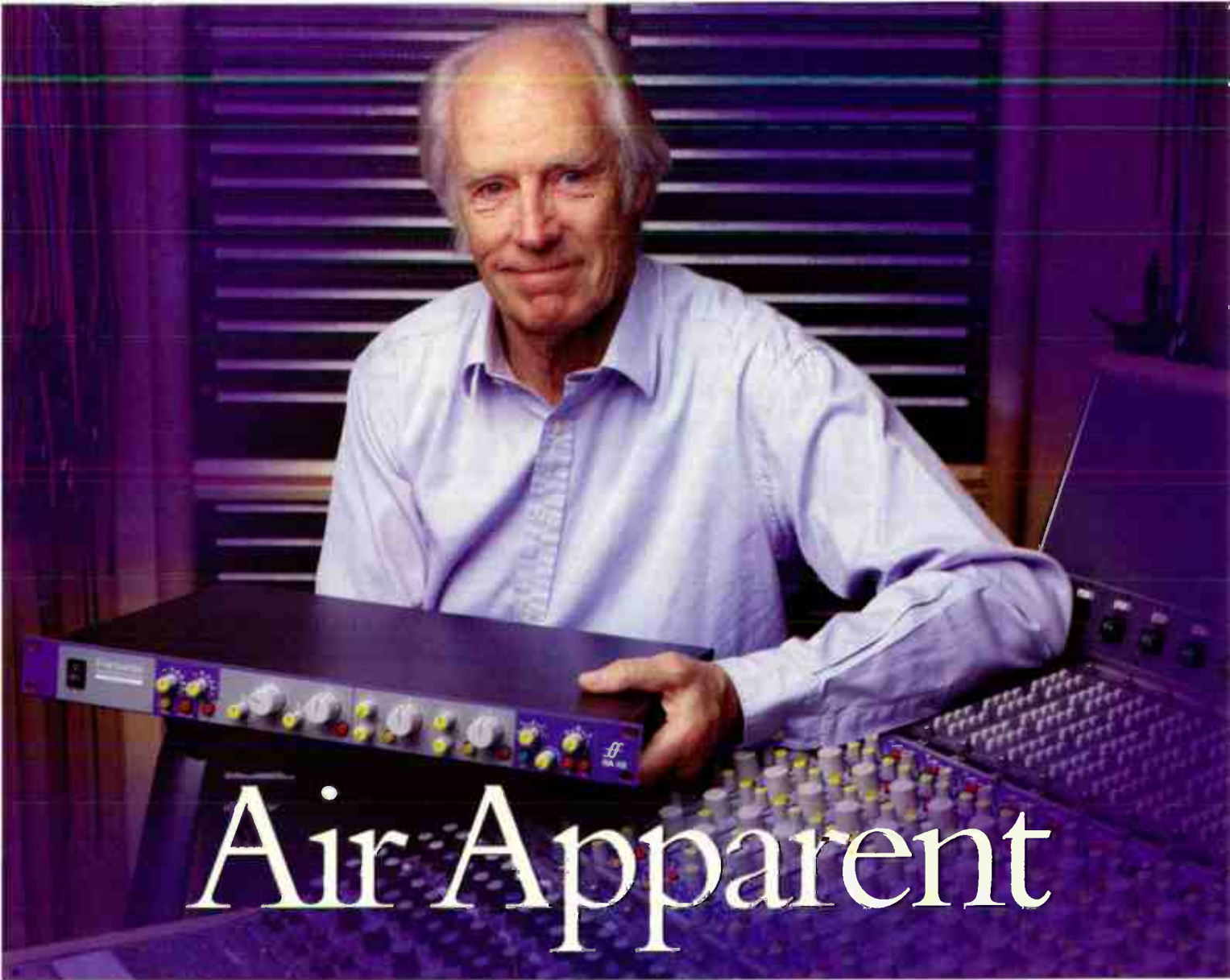
Last, but not least, like many VG-8 users I'd love a rackmount version so I could keep my floor space clear and have these cool controls at my fingertips.

THE BOTTOM LINE

Roland's dedication to improving the potential of the modern guitarist is laudable, and the VG-88 is a great example of their dedication to the cause. I'm hopeful that the few minor drawbacks in the VG-88 can be addressed in a software update. But taken as it stands, the sound quality of the VG-88 makes it a solid winner. For me, the effects alone are worth the price, let alone the improved distortion, amp, and guitar modeling, and controller capabilities.

With a few tweaks, the VG-88 could arguably become the best guitar processor ever made. Time (and the next software version) will tell...

Mikail Graham works very hard at virtual practicing on his virtual guitar, which he plays through his virtual amp at virtual gigs in Northern California, which is fast becoming the world's first virtual state.



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Korg D16

Portable Digital Recording Studio

Take your music from raw tracks to finished CD — all with one box!

BY ROB MCGAUGHEY

Over the past few years, there's been a proliferation of self-contained portable DAWs released; Roland's VS series, the Akai DPS series, offerings from TASCAM and Yamaha, and so on. Korg joined the fray with their D8, and have now added a new big brother, the D16, to the line.

Providing loads of real and virtual tracks, a full-featured mixer, built-in effects, a built-in rhythm machine, and the ability to create audio CDs with an optional CD burner, the D16 definitely fits the studio-in-a-box profile. I had a chance to take the D16 for a spin both in my project studio and as a travelling companion while I did some road work.

GETTING INTO IT

The mixer on the D16 has eight inputs. The first two utilize balanced XLR/1/4-inch TRS "combi" connectors and the remaining six are unbalanced 1/4-inch TS. Each of the inputs has a trim pot that allows you to set the input sensitivity anywhere between -60 dB and $+4$ dB. Input 1 also has a separate 1/4-inch connector specifically designed for guitar-level signals. Any of the eight inputs can be assigned to one of 16 mixer channels. The

first eight channels are mono with pan control, while inputs 9–16 are stereo inputs with a balance control. The D16 has a pair of unbalanced RCA connectors for master out, a second pair for monitor out, and a single unbalanced 1/4-inch connector for auxiliary send. Each input and playback track has a three-band equalizer that contains a high shelving filter, a low shelving filter, and a sweepable midrange.

There's also a microphone built into the D16 that can be assigned to either input

EQ LAB REPORT

MANUFACTURER: Korg USA, 316 South Service Road, Melville, NY 11747-3201. Tel: 516-333-9100. Web: www.korg.com.

SUMMARY: The D16 provides excellent sound quality in a small portable box, allows you to record up to 128 tracks (8 simultaneously), playback 16 simultaneous tracks, build drum tracks from numerous onboard drum patterns, mix down to stereo with a wide array of digital effects, and burn your own audio CDs (with optional SCSI CD-R burner).

STRENGTHS: Good sound quality. Compact yet all-inclusive design. Easy to record lots of takes and sketch ideas out. Built-in effects processor handles standard repertoire (reverbs, chorus, delays, etc.) admirably and has some cool additional features such as guitar amp and microphone simulation, as well as ring modulation. CD burning capability.

WEAKNESSES: Slight initial learning curve. No phantom power. Puts out a lot of heat from the line lump power supply.

PRICE: \$1,999

EQ FREE LIT. #: 105



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KORG D16 SPECS

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# of Tracks @ 24 bits	64 tracks (including virtual tracks), 8 tracks simultaneous playback, 4 tracks simultaneous record
# of Tracks @ 16 bits	128 tracks (including virtual tracks), 16 tracks simultaneous playback, 8 tracks simultaneous record
Internal Hard Drive	2.1 GB internal IDE hard drive provides up to 6.5 hours of record time
Data Format	24- or 16-bit uncompressed @ 44.1 kHz
Metronome Patterns	96
Rhythms	215
MIDI	transmits MIDI timecode and MIDI Clock, receives MIDI Machine Control

PHYSICAL I/O

Input 1 & 2	XLR/1/4-inch TRS combi jack (balanced), adjustable trim from -60 to +4 dBu
Input 3-8	1/4-inch phone jack (unbalanced), adjustable trim from -60 to +4 dBu
Guitar Input	1/4-inch phone jack (unbalanced), adjustable trim from -60 to +4 dBu
Master Outputs	2 RCA connectors (unbalanced) @ -10 dBV
Monitor Outputs	2 RCA connectors (unbalanced) @ -10 dBV
Aux Output	1/4-inch phone jack (unbalanced) @ -10 dBV
Headphone Out	1/4-inch stereo phone jack
Digital I/O	Optical connector, 24-bit S/PDIF format
SCSI	D-sub 25-pin female, SCSI-2 compatible

MIXER

Structure	24 input channels, 8 busses, 1 aux send, 1 stereo master output
Signal Processing	32-bit @ 44.1 kHz
EQ	high — shelving filter fixed at 10 kHz, ±15 dB of gain; mid — sweepable from 100 Hz to 20 kHz, ±15 dB of gain; low — shelving filter fixed at 100 Hz, ±15 dB of gain
Scene Memory	100 scenes per song

EFFECTS

Max Simul Effects	8 insert, 2 master, 1 final
Signal Processing	44-bit @ 44.1 kHz
Programs	insert (128 preset, 128 user), master (32 preset, 32 user) final (32 preset, 32 final)
Algorithms	98
Effects Types	106

GENERAL

Frequency Response	10 Hz-20 kHz ±1 dB
S/N	100 dB
Dynamic Range	100 dB
THD+N	0.02% 20 Hz-20 kHz
A/D Conversion	24-bit, 64x oversampling
D/A Conversion	24-bit, 128x oversampling
Sampling Frequency	44.1 kHz
Display	240x64 pixel touchscreen LCD with backlight

1 or 2. This allows you to plug a guitar into input 1 and assign the built-in microphone to input 2 and start laying down tracks. Because of this, the D16 makes an excellent self-contained sketchpad for laying down ideas and for working out arrangements in a tour bus or hotel.

RECORDING AND EDITING TRACKS

It's very easy to record on the D16. You simply plug an instrument or microphone into one of the inputs, set your levels, route the input to one of the 128 tracks, arm the track, and then hit record. You can go further, of course: The D16 also adds a number of useful features such as auto punch in/out, loop recording, rehearsal mode, and trigger recording. The auto punch in/out works much as you would expect it to, and gives you adjustable pre and post roll times. When you combine loop recording with auto punch, you can play a section repeatedly and record up to 99 different takes. Using the undo/redo feature of the D16, you can select the best take afterward. (The D16 allows up to 99 levels of undo.) Trigger recording lets you start recording when a note is played. The D16 even allows you to define up to 700 ms of pre-trigger time where you can capture audio in a buffer before the recorder is started — very cool.

The D16 has the ability to copy a track or even several tracks simultaneously and then paste them to a predefined time on the same track(s), other tracks, or other songs. With the insert feature you can add blank measures into a song.

As you fill up the playback tracks, you can bounce them to virtual tracks and free up space for more stuff. This is a pretty cool feature because you don't have to worry about saving tracks for bouncing or losing information in a bounce. When I first started playing with the D16 in 24-bit mode, I was recording guitar tracks. I quickly filled up all eight playback tracks. So I bounced all eight tracks with insert effects, level, and pan information to two virtual tracks. I then turned off the eight original tracks, turned on the two virtual tracks, and had six more tracks to play with. Plus, this was all non-destructive; I still had the original tracks if I needed them.

TEMPO/RHYTHM TRACKS

The D16 has a great built-in metronome/rhythm box that lets you set the tempo, the time signature, the volume, and the pattern — consider it a built-in drum machine. There are 215 patterns to choose from that encompass a wide range of styles — 188 of the patterns are in 4/4 time, but there are 13 patterns in 3/4 and 14 patterns in 6/8. In addition to these patterns, there are 16 different

standard metronome patterns that can be used for the 48 different time signatures available in the D16. The drum rhythms consist of one- to eight-bar patterns, plus there are intros, fills, and endings. There's enough selection that you can build a nice customized drum track for use as a metronome, or that you might even choose to make a final track.

The tempo/rhythm section of the D16 allows you to build a tempo map. A tempo track is created by either recording clocks from a MIDI sequencer or by using the tap tempo function. With tap tempo, you push a button either on the beginning of every measure or the beginning of every beat and the D16 will figure out the tempo map for you. This is pretty cool, especially if you want to add a metronome or beat to an audio track that's already been recorded. The quality of the built-in rhythm tracks and sounds is pretty good, and they're ideal for using the D16 as a sketchpad to work out song arrangements.

MIXDOWN

There are lots of options available at mixdown. Each of the playback tracks has a three-band equalizer and can access two types of effects: Insert and Master. Insert effects are "inline" (in series) with the signal path, whereas Master effects are of the aux send/return variety. There are a total of 106 different effect types (98 different algorithms) available in the effects processor. There are 128 Insert effect ROM presets provided, plus 128 user Insert presets, which you can edit and use however you like. The D16 provides a maximum of eight simultaneous Insert effects, which should be adequate for most applications. If you need more, you can always bounce a track with effects to free up Insert effects for other tracks. Common Insert effects applications would include compression and amp/mic simulation.

You also have two Master effects at your disposal. The Master effects are fed by aux sends from each playback track. Typically you'd use reverbs, delays, and other effects that you might apply to more than one track at a time as Master effects.

The D16 also provides a Final effect, which shows up at the last stage of the master stereo bus. In a typical scenario you might use Final effects for limiting, EQing, or compressing the entire mix.

The D16 is also capable of performing time-compression and -expansion. With this feature you can select audio from one or more tracks, copy it to another location, and either speed it up or slow it down to fill a user-specified length of time. This can be done at three different quality levels (processing time is predictably faster on lower quality settings) at either fixed or variable pitch. I found this feature to be functional, but the audio quality began to degrade noticeably with a 10% change — it's fine for small adjustments or emergency repairs, but I wouldn't rely on it for master-quality work.

AUTOMATION AND MIDI

The D16 offers scene automation that allows the user to take a snapshot of the mixer settings and then be able to switch between scenes automatically when playing back the song. Scene automation can capture mixer channel level, EQ, pan/balance, aux sends, and channel pairing status. The D16 allows up to 100 scenes per song. The new Version 2 software also adds the ability to automate faders and pan using MIDI messages.

Another item of note is that the D16 has MIDI in and out connectors and is capable of outputting MIDI timecode (MTC) as well as sending or receiving MIDI machine control messages. This lets you sync an external sequencer to the D16 as well as remotely control the basic transport features (record, play, fast-forward, rewind,

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D16 VERSION 2

Version 2 of the D16 operating system was recently released as a free upgrade. The new version provides the addition of many frequently requested features, such as MIDI automation of mixer faders and pan, support for data backup to CD-R/RW, slaving the D16 to MIDI sync, WAV file import and export, track fade-in/-out and normalize, and much more. Visit www.korg.com for information on how to update your machine.

stop, and locate), or, with Version 2 software, you can slave the D16 to external MIDI sync.

BURNING CDS AND BACKING UP

The D16 has a standard 25-pin SCSI connector that supports up to seven external

SCSI devices. You will definitely want some type of removable media backup device such as an Omega Jaz or Castlewood Orb drive, and you may want a second hard drive for more storage space. The D16 comes with an internal 2.1-GB hard drive that provides up to 6.5 hours of record time. Of course, if you're recording a lot of tracks, you could use that drive up in just a few songs.

With an optional SCSI CD-R drive you can record your mixed songs onto a Red Book audio CD that can be played back on any CD player. With Version 2 software, you can also use a CD-R or CD-RW drive for backup purposes — a much-requested feature. You can burn your songs onto a CD-R one at a time, but remember that you won't be able to play the CD back in a standard CD player until you "finalize" the disc. After a disc is finalized, you can no longer record onto that CD. When recording songs to CD-R, the system places approximately two seconds (not user-definable) of silence between each track.

IN USE

It took me a little while to get comfortable with how the D16 worked, but it became much easier as I read through the manual and played around. The interface of the D16 is based around a touchscreen LCD and a host of feature-specific buttons. The touchscreen worked well and made the unit easier to use. Tracking, in particular, is a breeze. I found it easy to lay down tracks, record multiple takes, and quickly sketch out song ideas on the D16. The built-in guitar amp simulator and microphone simulator allowed me to get some decent-sounding tracks on tape with just my Tele and a Shure SM57 microphone. The D16 is capable of recording up to eight simultaneous tracks and playing back up to 16 tracks. That isn't the limit though, as each track has eight virtual tracks associated with it, allowing you to easily record multiple takes, edit them, and then bounce down to a composite track.

CONCLUSIONS

The Korg D16 is a recording studio in a box, a rather small box at that. I was impressed with how easy it was to use, the capability it had for covering all the bases in recording and mixing a song, and the flexibility it offered. All in all, the D16 is a powerful machine that has the tools to produce great-sounding tracks with a minimal overall investment. We've come a long way since the old four-track tape days....

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Sennheiser EW 335 Evolution Wireless Microphone System

The latest evolution
in wireless mics

BY STEVE LA CERRA

The Sennheiser EW 300 Evolution wireless microphone system is a UHF-band RF system designed primarily for live sound applications. Several variations of the EW 300 system are available, including the EW 312 omni and EW322 cardioid lavalier, EW 372 guitar/bass, EW 352 headset, and EW 335 handheld vocal microphone. All of these systems use the same EM 300 receiver; the difference is in the transmission device. Therefore, it's possible to change the transmitter for differing applications while still using the same receiver.

For this road test, I used the EW 335 system, which includes the EM 300 and the SKM 300 handheld transmitter fitted with the MD 835 cardioid dynamic microphone element.

EM 300 RECEIVER

The EM 300 is a half-rackspace unit with a generous LCD and a minimum of controls on the front panel. The display shows RF level, audio level, mute status, and diversity status, as well as frequency, channel, or name (more on those later). Accompanying the LCD are four push-button switches: power on/off, up, down, and set. The rear panel has XLR balanced and 1/4-inch balanced/unbalanced audio outputs, a pair of BNC antenna jacks, a pot for adjustment of audio output level, and a DC socket for connecting a wall wart power supply (included). Unlike some of the less expensive wireless receivers I've been seeing lately, the chassis of the EM 300 is made of metal, providing not only structural strength, but increased RF shielding — making it more attractive to pros with serious touring in mind. An optional kit is available for rack mounting.

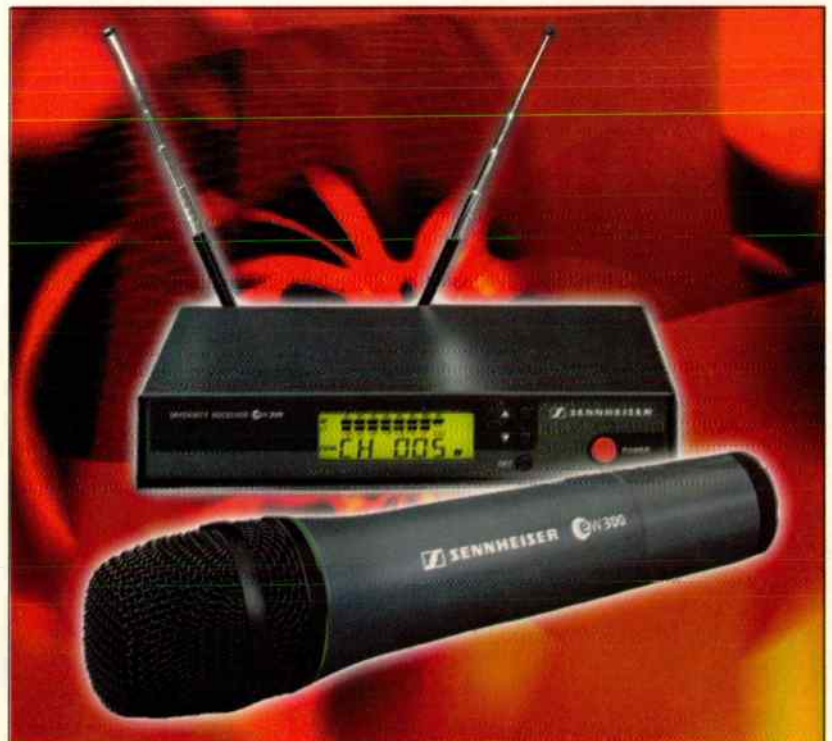
THE SKM 300

The SKM 300 wireless transmitter is a handheld transmitter slightly larger than

a "typical" wired vocal mic. As mentioned, our SKM 300 came outfitted with the MD 835 capsule; it may also be purchased with the MD 845 supercardioid dynamic or the MD 865 supercardioid condenser microphone elements. The bottom portion of the SKM 300 unscrews to reveal a compartment for the requisite nine-volt battery. A hinged locking lever holds the battery in place. Interestingly, the locking tab will not close if the battery is inserted backwards, ensuring that the battery is inserted with correct polarity. Once the battery is installed, you simply screw the case closed and the system is ready to use. At the base of the mic is a small LCD screen that shows frequency and battery status on an eight-segment bar meter. A "low bat" message appears if battery capacity is insufficient. On the bottom of the base is a round protective cap that rotates to expose several small push-button controls for the transmitter. There's an on/off switch, a mute switch, and up, down, and set buttons. A red LED indicates that the mic is operating; if the LED is flashing, the battery should be replaced at once.

ON THE ROAD AGAIN

I'll get to the various capabilities of the EW 335 in a moment, but the most striking thing about this system is that, in spite of its sophistication, it's a breeze to use: all you need to do is attach the antenna, plug it in, and turn it on. The receiver's LCD lights, indicating power is present. If the transmitter isn't turned on, the receiver automatically enters mute mode. This comes in handy when dealing with inexperienced people who turn the mic off at inopportune moments (usually when the PA is cranked up and the vocal fader is open), so you won't have to worry about hearing a rude hash sound from the receiver when transmission isn't present. Turning the mic on automatically unmutes the receiver. Simple and effective. Turning the mic off without first muting it will result in a low-level "tick" at the audio output, immediately after which the receiver will mute. I found this much more friendly to deal with than the typical rude "ssssshhhhhh" most receivers produce after losing transmission. The LCD's "I" and "II" indicators show which of the two diversity receivers is online at



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Bromley, England, 1899**



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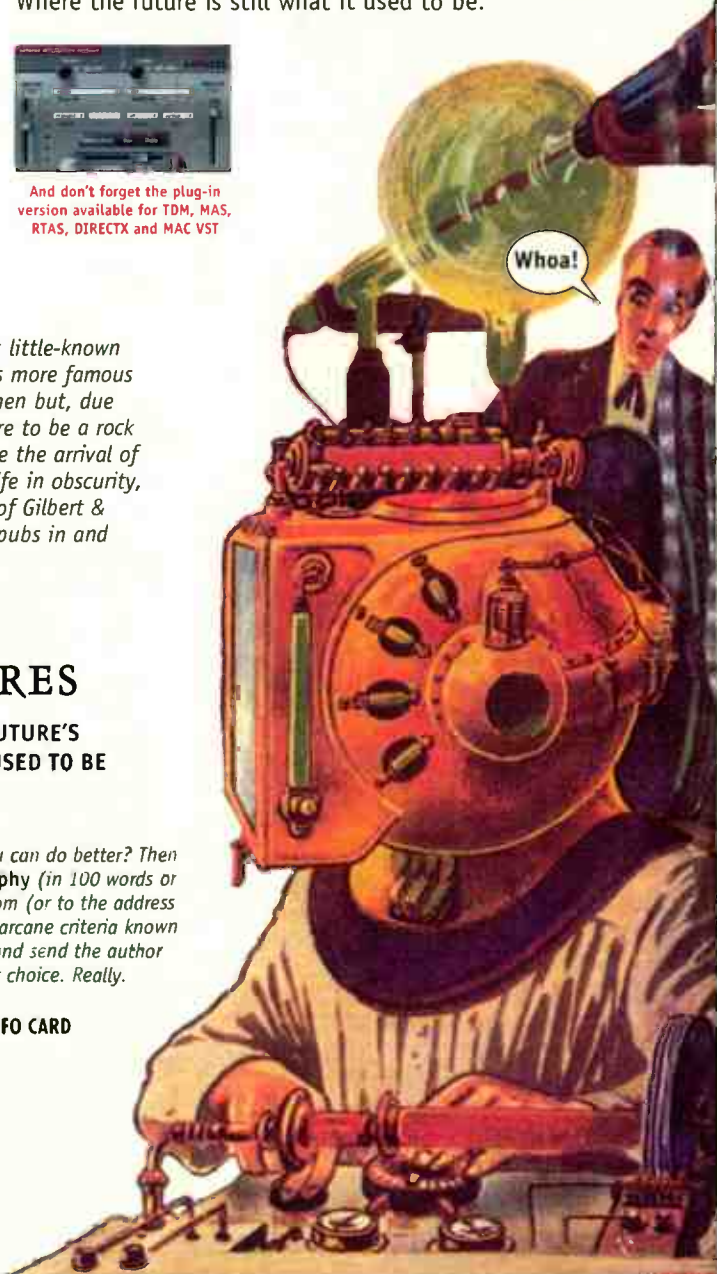


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EQ LAB REPORT	
MANUFACTURER:	Sennheiser Electronic Corporation, One Enterprise Drive, Old Lyme, CT 06371. Tel: 860-434-9190. Web: www.sennheiserusa.com .
SUMMARY:	Handheld UHF wireless microphone system for live performance applications.
STRENGTHS:	Great RF performance. High-quality sound. Very easy to use.
WEAKNESSES:	Wall wart power supply. Some buttons on the transmitter may be difficult to access with large fingers.
PRICE: \$1,235	EQ FREE LIT. #: 106

any moment. During performances, I never heard artifacts as the receiver switching between I and II.

WHAT'S ON THE MENU

Both the transmitter and receiver of the EW 335 have several menus for parameter adjustment. On either unit, the menu is accessed by pressing the "Set" button. Transmitter menus include frequency, sensitivity, display, tune, and lock. Simply press "Set" until you reach the menu you wish to access. The buttons on the SKM 300 transmitter are rather small, so those with large fingers will probably fumble a bit until they get the hang of it. During operation, this characteristic is actually a strength, because you won't have to worry about someone inadvertently changing a critical setting. After scrolling to the desired menu, the up and down buttons change the value. Selecting a new value causes the LCD to flash; pressing "Set" again enters the value, which will be remembered the next time the power is turned on (this is also true of the receiver). The Frequency menu allows the transmitter to be set to one of eight broadcast frequencies. Depending on geographic location, Sennheiser supplies the system set to operate within one of five UHF-band frequency ranges. Within this range, eight preset channels are provided; each channel is tunable in 25 kHz steps, providing 1,280 possible frequencies.

The SKM 300's "Sensitivity" parameter is adjustable from 0 to -30 dB in 10 dB steps to accommodate vocalists of various strengths. "Display" toggles the LCD between showing the actual broadcast frequency or the channel number (1 through 8). "Tune" accesses the fine-tune function for tweaking out interference in problem areas. The "Lock" function denies access to all menus, and prevents the transmitter from being powered off — even if the power switch is pressed. Many engineers will find this useful for dealing with *[sigh]* absent-minded performers who mistakenly turn their mic off during a show and then wonder why their mic isn't working. Once

you've set the parameters, rotating the protective cap conceals the switches, yet still allows the power LED to show through (very clever). "Mute" does exactly what you'd expect, and it created no audible noise from the receiver when switched on or off.

The EM 300 receiver offers the same basic menus as the SKM 300, with a couple of changes. For obvious reasons, the receiver omits the sensitivity adjustment. "Squelch" is adjustable from 5 dB to 40 dB in 5 dB steps. (I used the 5 dB factory setting.) The "Display" menu works similar to that of the transmitter, plus adds the

SPECIFICATIONS

RF Band	UHF
Audio Response	60 Hz to 18,000 Hz
THD	Less than 0.9% at 1 kHz
Signal-to-Noise Ratio	Greater than 110 dBA with Sennheiser HDX
Transmitter Output	30 mW
Receiver Principle	True diversity
Battery Life	8 hours (minimum)
Maximum SPL	150 dB SPL for the MD 835 capsule

option of entering a six-character name. This is very cool for venues with multiple systems, but I wish the "Name" option was available on the transmitter as well — this would prevent one performer from mistakenly using another performer's mic. A very cool aspect of the EW 335 system is that the moment you alter either the transmitter or receiver frequency, the receiver mutes its audio output. Once the transmission and reception frequencies are matched, the receiver automatically unmutes. When powered up, both the transmitter and receiver LCDs show frequency or channel of operation (or, in the case of the receiver, the name given to that particular system).

OUT HERE IN THE FIELD

I used the EW 300 system over a period of about three months on a tour that ran across the country (and briefly in Canada).

Most of these shows were fly-ins where set-up time was minimal and tweaking was often impossible. Even under such adverse circumstances, RF performance of the EW 300 was excellent. I rarely heard any RF "fffffftttt" or experienced any dropouts. In a few cases where I heard a bit of interference, moving the antenna or the receiver a few inches usually cured the problem. There was one notable exception: the Wisconsin State Fairgrounds in Milwaukee.

At this venue I was unable to use the system because RF was completely horrendous (our other wireless systems were equally ineffective). Due to time constraints, I was unable to try varying the broadcast channel or fine-tuning the channel(s) — it was definitely a grab-it-and-growl situation. However, I never experienced cross-channel problems, even when using the EW 300 with five wireless systems running concurrently.

In terms of audio performance, the EW 335 system sounded great — virtually indistinguishable from a high-quality wired handheld mic. Vocals were loud, clear, and actually maintained dynamic range, unlike many lesser wireless systems that compand

the life out of the audio in an effort to increase broadcast strength. The MD 835 capsule has a gentle presence peak at around 5,000 Hz that I found to be "just right" — audible enough to help vocals cut through the mix, yet subtle enough not to be harsh-sounding.

Sennheiser's HDX noise reduction circuitry is employed in the system, and, whatever it might be doing electronically, it does well and inaudibly, resulting in very quiet performance. On several occasions, the mic was used for a cowbell without any modification of the sensitivity parameter. The MD 835 capsule had absolutely no problems with the additional signal level.

ON THE AIR

Sennheiser has created a great wireless system in the EW 300. It's a bit pricey for the casual gigging musician, but well within reach of vocalists who are serious about their performance tools. **EQ**

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World Radio History

Royer Labs R-121 & SF-12 Ribbon Mics

Royer Labs updates the ribbon mic concept with natural, smooth-sounding results

BY ROB MCGAUGHEY

On their Web site, Royer Labs refers to the R-121 as the "world's first radically redesigned ribbon microphone." While I can't comment on how radical the redesign is, I can say the result is one fantastic-sounding, highly versatile microphone. I must admit right up front that both the R-121 and SF-12 microphones blew me away. I used these microphones to record just about everything I could think of, and the results consistently ranged from good to outstanding.

So what's so radical about these ribbon microphones? According to the manual, they use advanced materials and innovative construction techniques for their ribbons and take advantage of modern neodymium magnets to produce strong magnetic fields in a much smaller package than vintage ribbon microphones.

The R-121 is Royer Lab's flagship product. It's a bidirectional (figure-8) ribbon microphone capable of withstanding sound pressure levels of greater than 135 dB. It should be noted

that the R-121 is a side-address microphone, which is somewhat unusual for a microphone of this size. The stock finish of the R-121 is a good-looking bur-nished satin nickel with a green logo. The microphone looks great and feels like it is built like a tank. There's an optional matte black chrome finish available for the R-121, but I much prefer the stock finish. The R-121 comes in a beautiful wooden jewel case lined with a soft, red, velvet-like material. For what it's worth, the R-121 microphone and case are among the most aesthetically pleasing that I've come across.

The SF-12 is a stereo coincident ribbon microphone that utilizes two bidirectional (figure-8) elements positioned one on top of the other and forming a 90° angle. The SF-12 utilizes a thinner (as opposed to the R-121) 1.8-micron aluminum ribbon that still claims to handle sound pressure levels in excess of 130 dB. With the SF-12 you can record stereo tracks using either the classic Blumlein or Mid-Side (MS) technique. The SF-12 comes stock in a matte black chrome finish but is also offered in a dull satin nickel finish. The matte black chrome is less noticeable if you're recording live events and don't want to draw attention to the microphone, but, in my opinion, the dull satin looks cooler.

THE R-121 IN USE

I was provided with a pair of R-121's for review. For my first tests, I pulled out my trusty Guild JF-30 jumbo for a heavy strumming part that I needed to add to a song. For starters, I plugged one of the R-121's in and placed it about 12-14



EQ LAB REPORT	
MANUFACTURER:	Royer Labs, 821 North Ford Street, Burbank, CA 91505. Tel: 818-760-8472. Web: www.royerlabs.com .
SUMMARY:	The R-121 is a versatile ribbon microphone that can be used to record just about anything and is ideally suited for either live or studio recording. The SF-12 is a versatile stereo ribbon microphone that is ideally suited for recording orchestras, choirs, string sections, brass sections, woodwinds, drum set, piano, acoustic guitars, harp, etc.
STRENGTHS:	Smooth. Warm. Detailed. Minimal coloration. Low self-noise. Wide dynamic range. Can withstand high SPLs. Versatile. Lifetime warranty to original owner takes risk out of purchasing a ribbon microphone.
WEAKNESSES:	Proximity effect on R-121 can be overwhelming.
PRICE:	R-121, \$995; SF-12, \$2,150.

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- Professional 100mm 'long throw' faders
- Built-in programmable Lexicon effects unit
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- 4-bus structure
- 26 inputs to mix
- 19" Rackmount option

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inches in front of the guitar near where the neck meets the sound hole and angled slightly back toward the bridge. The sound was big, full, and very natural sounding. The timbral balance of the guitar was very good, and I was quite pleased with the sound. For the sake of comparison, I grabbed a couple of the "standard" condenser microphones normally used on acoustic guitar. The R-121 was definitely the most natural sounding, and also smoother on the top end. The other mics were somewhat harsh in comparison.

The next day I was recording euphonium tracks and decided to try the R-121. I placed the mic about a foot above the bell. Again, I was impressed by the warm, smooth, natural sound. Based on my experiences, the R-121 should work great on all brass instruments; it can even take the high-decibel punishment of screaming trumpets. The beauty of the R-121 is the way it captures the louder dynamics without getting harsh. It seems no matter how hard you push it, you get the same smooth and natural response.

I'd heard of the R-121's reputation as a great choice for miking electric guitar amps, so I decided to give it a try. The first test was to wind up my old black-face Fender Deluxe Reverb and get a good singing tone. I placed the R-121 about a foot in front of the amp; the resulting recording sounded just like the amp. Very natural, very smooth. In fact, when recording digitally, the R-121 seemed to warm up the recording and give it a more analog sound. I tried a variety of different types of electric guitar sounds and the result was the same — the recordings sounded just like the tone in the room.

Next, I tried the R-121 on miscellaneous percussion instruments. I used it on hand drums, earth drums (frame drums

played with a mallet), shakers, maracas, and a tambourine. In all cases they sounded fantastic. You could really hear the detail of the hand striking the drum, the beans in the maracas, etc. I was impressed by the level of sonic detail and, once again, the sound was very natural. With some trepidation, I put an R-121 about six inches above a snare drum — not something you'd normally do with a ribbon microphone! Even on loud snare hits the response was smooth and unstrained.

I also used the R-121 for vocal tracks. On one particular female vocalist, the R-121 was absolutely perfect — it truly captured the essence of her voice. You do have to be a bit careful in this application, as the R-121 exhibits a very strong proximity effect.

Overall, this is an excellent vocal microphone. I found that on female vocalists the best placement was about 16 inches away, whereas on male vocalists it sounded better to bring the mic in closer and use the proximity effect to make the sound bigger. A pop filter is an absolute necessity when using the R-121 to record vocals, and the optional shockmount is highly recommended. Because the mic is so sensitive, you may want to gate or automate down between phrases because the R-121 will definitely capture (potentially) un-

ROYER LABS R-121 SPECIFICATIONS

Generating Element	2.5-micron aluminum ribbon
Polar Pattern	figure-8
Frequency Range	30 Hz -15 kHz @ 3 dB
Sensitivity	-54 dBV Ref 1 V/Pascal @ 1 dB
Output Impedance	300 Ohms (nominal) balanced
Rated Load Impedance	>1000 Ohms
Maximum SPL	>135 dB
Output Connector	XLR 3-pin (pin 2 hot)

ROYER LABS SF-12 SPECIFICATIONS

Generating Element	1.8-micron aluminum ribbon
Polar Pattern	symmetrical figure-8
Frequency Range	30 Hz-15 kHz @ 3 dB
Sensitivity	-54 dBV Ref 1 V/Pascal @ 1 dB
Output Impedance	300 Ohms @ 1 kHz (nominal) balanced
Rated Load Impedance	>1500 Ohms @ 300 (nominal impedance)
Maximum SPL	>130 dB
Output Connector	XLR 5-pin

wanted sounds such as breathing, throat noise, etc.

THE SF-12 IN USE

The folks at Royer recommended that I try the stereo SF-12 on a drum kit, so I went to another studio where some drum tracking sessions were taking place. They already had nine close mics on a rather large drum kit, so I just put the SF-12 on a large boom stand about 10 feet in the air, centered directly above the drum kit. On listening back to the resulting tracks, we decided that the SF-12 sounded best by itself — no close mics at all. The only thing we added was just a little of the RE-20 in the kick drum for presence on the bottom end. The sound of the drums was natural and meshed with the other tracks nicely. We used a little EQ to bring out the snare drum in the bridge of the song, but, other than that, the stereo SF-12 drum tracks worked well as recorded.

I also used the SF-12 to record a grand piano. I placed the microphone about three feet from the curve of the piano, with the lid at full stick. I played with the positioning of the SF-12 a bit, but, once I found the sweet spot, it really sounded great. It was very natural, and captured the sound of that piano in that room — including the performer's wide dynamic range. I'd rate this as one of the best piano recordings I've ever done, in large part due to the SF-12.

CONCLUSIONS

The R-121 is a fabulous microphone. It's versatile enough to use on just about anything. I found that its sweet spot tended to be about a foot from the sound source for most close miking applications. It picks up every detail; so much so that you have to be a bit careful — you'll

continued on page 154

WHAT'S A RIBBON MICROPHONE?

Ribbon microphones came into prominence in the 1930s and were originally designed and used for radio broadcasts. Companies such as Western Electric and RCA pioneered this technology and it provided a significant improvement over other microphones available at the time. Ribbon microphones are based around a thin corrugated "ribbon" of aluminum foil suspended between the poles of a magnet. When sound waves strike the ribbon, it begins to move, and a small current is generated.

Early ribbon microphones were often quite large due to the physical size of the magnet required to generate an appropriate magnetic field, as well as the size of the transformer required for the output signal. They were also fragile due to the delicate nature of the aluminum ribbon, which was often thinner than the thickness of a human hair. Ribbon microphones were popular in the '30s, '40s, and '50s, but began to lose ground with the advent of modern condenser microphones that were more durable, consistent, and smaller in size. But, today, the old ribbon microphones made by Western Electric, RCA, and others are still revered in many circles.



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studio applications

BY STEVE LA CERRA

The AKG C 2000 B is a fixed-pattern, cardioid condenser microphone designed for use in studio and stage applications. The C 2000 B uses a 1/2-inch diameter gold-sputtered diaphragm. A neutral barrier is placed between the back plate and the mylar, preventing the diaphragm from touching the back plate under high-SPL conditions. AKG has designed the C 2000 B for use in miking a variety of instruments, including vocals, horns, acoustic guitars, strings, piano, cymbals, toms, and snare drums.

The C 2000 B is housed in a die-cast body with two switches for modifying the response of the mic: a 10 dB pad and a 500 Hz low-frequency rolloff with a 6 dB slope. Since the C 2000 B is internally shock-mounted, AKG ships the mic with a pivot-type stand adapter; users requiring critical isolation from mechanically transmitted noise can use AKG's H 100 suspension mount (optional). A flange on the end of the C 2000 B's connector shaft prevents the mic from slipping out of the H 100, as well as the stand adapter — even when the mic is mounted upside-down (very clever).

IN THE STUDIO

Our first use of the C 2000 B was on a studio drum kit as an overhead, placed approximately five and a half feet high, directly over the snare drum. In this application the mic emphasized the cymbals and produced a beautiful, meaty tone from the snare drum. Transient response from the toms was good, but the mic was too far away to really emphasize the low-frequency resonance of the toms. When we moved the mic down to about a foot above the toms, the bottom end of the C 2000 B blossomed, capturing a round resonance from the toms but still clearly maintaining the transient of the stick hitting the head. Using just one additional mic for the kick drum, we were able to create an excellent (mono) drum sound with the immediacy of close-miking and a frequency response that was extended at both extremes.

When we used the C 2000 B to close-mic a Noble & Cooley Alloy Classic snare drum, the mic really captured the "guts" in the low-300 Hz region, keeping the drum from sounding wimpy against a big kick sound. We noticed in this situation that the C 2000 B's cardioid pattern is not particularly tight, so care must be taken in positioning it to avoid undesired leakage. The C 2000 B

has a slight peak (about 3.5 dB) around 10,000 Hz; in most instances this peak lent "air" and space to sounds, but when used to close mic a pair of Zildjian New Beat hi-hat cymbals, the



EQ LAB REPORT

MANUFACTURER: AKG Acoustic, 1449 Donelson Pike, Nashville, TN 37217. Tel: 615-360-0499.
Web: www.akg-acoustics.com.

SUMMARY: Condenser microphone for studio and stage applications.

STRENGTHS: Extended frequency response. Useful for a large variety of instruments and applications.

WEAKNESSES: Fixed cardioid pattern is rather wide. Low-frequency rolloff is set at 500 Hz.

PRICE: \$299

EQ FREE LIT. #: 108

AKG C 2000 B SPECIFICATIONS

Type:	Pressure Gradient Condenser
Polar Pattern:	Cardioid
Maximum SPL:	140 dB, or 150 dB with pad switched on (for 0.5% THD)
Power Requirement:	9 to 52 volts DC phantom power
Signal-to-Noise Ratio:	74 dB, A-weighted for 48-volt phantom powering
Current Consumption:	Less than 2 milliamps

tone was a bit edgy for our taste.

We also used the C 2000 B in the studio for acoustic guitar and for lead and background vocals. On male lead vocal, the mic doesn't add a lot of personality. Whether you like this or not will depend upon the vocalist, the application, and how well the vocalist can work the mic's proximity effect — which increases subtly as distance from the mic goes from about six inches to one inch from the capsule. Closer than this, and the bottom gets bloated, making popping "P's" an issue. The relatively wide cardioid pattern is a plus when recording vocals because a singer can move as far as $\pm 35^\circ$ off-axis of the C 2000 B without noticeably changing the timbre of the sound. We did a bit of stacked harmony and noticed that tracks recorded with the C 2000 B maintained clarity when added together (not always the case when stacking vocals). Noise transmitted from the mic stand was well-damped by the internal shock mount. Switching in the low-frequency rolloff all but eliminated rumble, but also thinned out the timbre considerably. It might have been nice if AKG gave us the option of another position on the rolloff, say at 250 Hz. On acoustic guitar, the C 2000 B performed wonderfully, capturing the shimmering top end of the pick attacking the strings, and maintaining the full tone of the instrument without getting muddy in the lower mids.

ON THE ROAD

We also dragged the C 2000 B on the road with Blue Öyster Cult for a few weeks. The mic took a bit of punishment, including a drop to the floor from about three feet, and a whack on the grille from Bobby Rondinelli's drum stick. (And believe me, if you saw the size of those sticks, you wouldn't wanna be hit with one!) In any case, the mic survived unscathed. On Bobby's early-1960s, brass shell Ludwig Super Sensitive snare drum, the mic totally rocked — to the point where he commented that the snare

sounded awesome in his monitors. Frequency response was wide open with a lot of "air" and plenty of crack, helping the drum cut easily through the dense mix of the band. Again, careful placement was required to minimize leakage from the hi-hat.

We also tried the C 2000 B on Blue Öyster Cult guitarist Allen Lanier's electric guitar rig. Allen plays very percussively and, under certain circumstances, such as through a PA with aggressive-sounding horns or through mics having peaky high-mids, his guitar can sound harsh and unpleasant. With the C 2000 B, his guitar sounded smooth but still clear and articulate, with no hint of harshness. Ditto for using the mic on Firehouse guitarist Bill Leverty's guitar rig, where the C 2000 B's wide frequency range helped Bill's guitar fill out the mix of the trio-plurals instrumentation. We particularly liked the way his solos sounded through the C 2000 B.




THE BOTTOM LINE

AKG has done a lot of things right with the C 2000 B. It works well on a wide variety of instruments and it can be powered with 9 to 52 volts phantom — making it useful for low-voltage portable supplies in location situations. Taking the mic apart for a look inside, we noticed that the entire capsule is mounted on a multipin connector. In the unlikely event of a failure, it should be easy to service. You do need to pay attention to your mic placement, but generally the mic is appropriate for just about anything. It's a no-brainer for studios on a tight budget as well as those who need to round out their mic locker.

EQ senior editor Steve La Cerra is currently handling FOH duties for Blue Öyster Cult's live shows. When not on the road, he is busy producing and recording in his project studio. Steve's latest CD, Flight, is now available through Amazon.com.

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IN REVIEW

Shorts



STEINBERG/PROSONIQ TIME FACTORY

STAND-ALONE TIME/PITCH STRETCHING PROGRAM

BY CRAIG ANDERTON

BASICS: This Mac/PC stand-alone application ups the ante for pitch/time shifting with WAV, AIFF, and (Mac only) SDII files. It supports 8-, 16-, and 24-bit word resolution and 22, 44, 48, and 96 kHz sample rates, but also offers a “transcribe” mode that plays songs at half-speed for transcription, learning, or analysis. Other features include a choice of four algorithms (solo instrument, polyphonic music with fast encoding, polyphonic music with slower but more accurate encoding, and classical music), choice of formant preservation, and batch processing.

Minimum system requirements are (PC) 266 MHz PII and 32 MB RAM, (Mac) 120 MHz PPC, 16 MB RAM, Mac OS 8.0, and Apple Sound Manager 3.2. Unlocking copy protection requires authorizing the hard disk with a key floppy disk, or the “challenge/response” method for machines with no floppy.

PROS & CONS: The interface is simple (see above) — you process files by entering a target length, percentage change, or BPM (if the latter, you’re prompted for the file’s original tempo), and can have multiple files open simultaneously for comparison. Prosoniq claims to use a new type of stretch technology; whatever they’re doing is indeed above average, as there’s little echoing/flutter, and no phasing with mono material spread across two channels. The greater the stretch, the lower the sound quality; but small changes are virtually undetectable. In fact, if you need a really major stretch, processing a file several times with small stretches seems to work best.

But the price of this power isn’t just the higher software cost, but also the processing time (it took 87 seconds for an 850 MHz Celeron A to time-expand a 2.74 MB WAV file from 117.5 to 100 BPM at the “best” setting; time-compressing seems to work faster). Also, you need to specify the “Best” rather than “Fast” algorithm to get accurate timings — important if you’re using the program to change duration to hit an exact loop tempo.

BOTTOM LINE: I’ve yet to meet the perfect time-stretcher, but Time Factory definitely does a better job than the “generic” time-stretchers included with digital audio editing programs. As expected, it also does better than Acid’s algorithm, which is constrained by having to operate in real time. If you do lots of stretching, Time Factory is a well worth adding to your collection of processors.

STEINBERG/PROSONIQ TIME FACTORY INFO

PRICE: \$599

CONTACT: Steinberg, 21354 Nordhoff St. #110, Chatsworth, CA 91311. Tel: 818-678-5100. Web: www.cubase.net Circle EQ free lit. #109.

WEB LINK: To compare a file that has been time-stretched (from 92.8 to 120 BPM) with Wavelab, Acid, Sound Forge, and Time Factory, as well as another set of files that was pitch-stretched up three semitones using the same programs, go to www.eqmag.com.

HNB RADIUS 3 FATMAN STEREO TUBE COMPRESSOR

BEEF UP YOUR TRACKS AND MIXES WITH
HNB'S ROTUND TUBE COMPRESSOR

BY MITCH GALLAGHER

BASICS: For many project studio owners and engineers, the quest for recording fat, warm sounds onto digital media has led to vacuum tubes — tube preamps, compressors, and EQs are all the rage. The Radius 3 stereo tube compressor (the “Fatman”) is HNB’s latest entry into the tube gear battlefield. The unit sports stereo unbalanced instrument level inputs on the front panel, and stereo balanced 1/4-inch line ins and outs on the back (switchable from -10 dBu to +4 dBu). You’re given the option of using one of 15 preset control setups (Keyboard, Vocal 1, Electric Guitar 2, Snare, and so on). If the presets don’t do it for you, switch to Manual, in which case you’re given access to threshold and ratio controls, as well as switches for slow or fast attack and release times, and hard or soft knee operation. A cool backlit VU meter displays either output or gain reduction. The unit works in linked stereo mode at all times; the controls adjust both channels simultaneously.

PROS & CONS: The Fatman seems aimed pretty squarely at the entry-level user; the box is easy to use thanks to the presets and its straightforward controls. The manual is clear, and provides explanations of compression and descriptions of the Fatman’s controls. The manual also details the Manual control settings required to duplicate the various presets; these serve as excellent starting points for your own settings.

Advanced users will also find things to like about the



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World Radio History



Fatman. For example, the Fatman can serve as a tube DI box for guitars, basses, and keyboards. However, if you're an inveterate tweaker, you may find yourself missing complete control over attack and release times. There's also no sidechain input provided for frequency-dependent compression. Be aware that the unit is a hefty tabletop box — in my crowded studio I had trouble finding a convenient place to put it.

In use, the Fatman lives up to its name. I tried it on a variety of signals, such as direct electric guitars, various synths, drums, basses, and vocals; in each case the output sound was rounder and fatter than the input sound. I wouldn't call it the least-colored compressor I've used (although it is clean, with a reasonable noise floor), but then, it's not supposed to be.

BOTTOM LINE: I really liked the Fatman as a front-end for direct-recording various instruments, such as basses, and big, punchy synths. I was also happy with it for rounding out and punching up snares, kicks, and drum kits, and as a tube warmth stage for electric guitar running through a Line 6 Pod Pro. It's not the first compressor I'd reach for if I was going to process an entire mix or more delicate sounds, but for added girth and presence, it's great.

If you're looking to pick up your first compressor, the Fatman provides an easy, fat-sounding introduction. The presets make good starting points, and the manual is very helpful. If you already have a compressor or two in your rig, the Fatman offers an alternative color that you may find useful. Beef it up!

HHB RADIUS 3 FATMAN STEREO TUBE COMPRESSOR INFO

PRICE: \$469
CONTACT: HHB Communications, 1410 Centinela Ave, Los Angeles, CA 90025. Tel: 310-319-1111. Web: www.hhbusa.com. Circle EQ free lit. #110.

STEINBERG/TLAUDIO EQ-1

POPULAR TUBE EQUALIZER TURNS INTO A PLUG-IN

BY CRAIG ANDERTON

BASICS: Designed for DirectX and VST host applications, this Mac/PC plug-in models the TLAudio EQ-1 tube equalizer. Neither parametric nor graphic, the EQ-1 is a gentle, wide-bandwidth EQ with ± 30 dB input and output gain controls and four bands, each with a four-position frequency switch. The Low band (60, 120, 250,

500 Hz) and High band (2.2, 5, 8, and 12 kHz) each have ± 20 dB boost/cut controls; the Low Mid (0.25, 0.5, 1, 2.2 kHz) and High Mid (1.5, 2.2, 3.6, 5 kHz) bands have ± 12 dB boost/cut controls. A three-position switch selects right, left, or both channels of a stereo pair.

Minimum system requirements are (PC) 133 MHz Pentium, 32 MB RAM, Windows 9X/NT 4.0; (Mac) 604e/132 MHz processor, 24 MB RAM, and Mac OS 7.5. Unlocking copy protection requires entering a code for Windows; for Mac, a key floppy disk authorizes the hard disk. For floppy-less Macs, quickly send in a "challenge" code to get the appropriate "response" — the demo mode expires in 15 days.



PROS & CONS: Unlike the hardware version, you can see an EQ curve (see above). However, when mastering I rarely use boosts and cuts of more than a couple dB, which don't show up well on the ± 12 dB scale. Being able to select ± 3 and ± 6 dB full-scale calibrations would be welcome. Each band has individual bypass, and the interface is virtually moron-proof.

As to sound quality, I don't have the equivalent hardware, so I can't judge the emulation's accuracy. Judged on its own merits, though, the EQ-1 does have a gentle, warm sound due to the wide-bandwidth curves — for a truly "old school" frame of reference, think of the old fixed-position Pultec EQs.

BOTTOM LINE: I wouldn't choose this as my only equalizer; a good parametric would come first. But the EQ-1 augments your EQ toolbox with a very useful tool, and offers a unique personality. Having only four frequencies per band is not a cause for concern, as the curves are gentle enough that any more precision wouldn't make a significant difference.

If you want to explore more esoteric EQ than conventional offerings, the EQ-1 does a great job not only for mastering, but also for general sound-shaping of individual tracks.

STEINBERG/TLAUDIO EQ-1 INFO

PRICE: \$199
CONTACT: Steinberg, 21354 Nordhoff St. #110, Chatsworth, CA 91311. Tel: 818-678-5100. Web: www.cubase.net. Circle EQ free lit. #111.

WEB LINK: To hear a file before and after using the EQ-1 for mastering, go to www.eqmag.com. The file uses the same curve shown above. Although subtle, you can definitely hear a lift in the upper mids that allows the track to "speak" more instead of sounding more muffled.

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Going Industrial



Scoring an industrial video in less than two days? No problem with modern technology.

BY CRAIG ANDERTON

No, I'm not talking about doing a Skinny Puppy — this is industrial as in "industrial video." That means coming up with music that is subservient to, and synchronized with, a video presentation.

When I last did this type of work, it was in the dark ages of using two S-VHS videotape machines and a switcher, doing A-B rolls (don't ask!), and syncing an ADAT to SMPTE. It was a slow, less-than-reliable pain in the butt. This time around, I was going to do the whole project within a computer, using hard disk editing.

THE SETUP

Like most gigs, this one began with a phone call: "Know anybody who can do exactly 1.5 minutes of soundtrack for a video?" The client was the Music Player Network, who were doing a video for continuous play at their NAMM show booth. Someone else had previously taken a stab at doing the music, but the video producer didn't find it suitable. What a lot of

musicians don't know is that video producers generally want music with lots of hit points and "Zap!" "Pow!" moments to support visual images as they enter and exit. I had learned this lesson the hard way, by doing two themes for a motion picture that were roundly rejected before I finally figured out what was needed, and got it right on the third try.

The video, by Lien-Chin Lin, was fast-paced, introducing key concepts via text over a constant carousel of images coming in and out of the background. (To see a low-res version of the video with its soundtrack, go to www.eqmag.com.) The mission was clear: Come up with a groove that would work behind the entire tune, so that the end could loop back to the beginning (remember, continuous play). Furthermore, as the video progressed, various Music Player Network magazines (including *Guitar Player*, *Keyboard*, *EQ*, etc.) flashed by, requiring variations on a theme.

Oh yes, and the whole project had to be done in two days. If it didn't work, there was no way to try again.

THE STRUCTURE

For a 90-second video, 120 BPM was an ideal tempo; it allowed 180 beats, or 45

measures (one measure of intro, followed by 44 measures of music). It also allowed for an easy correlation of musical time (bars, beats, measures) to absolute time (minutes and seconds).

THE TOOLS

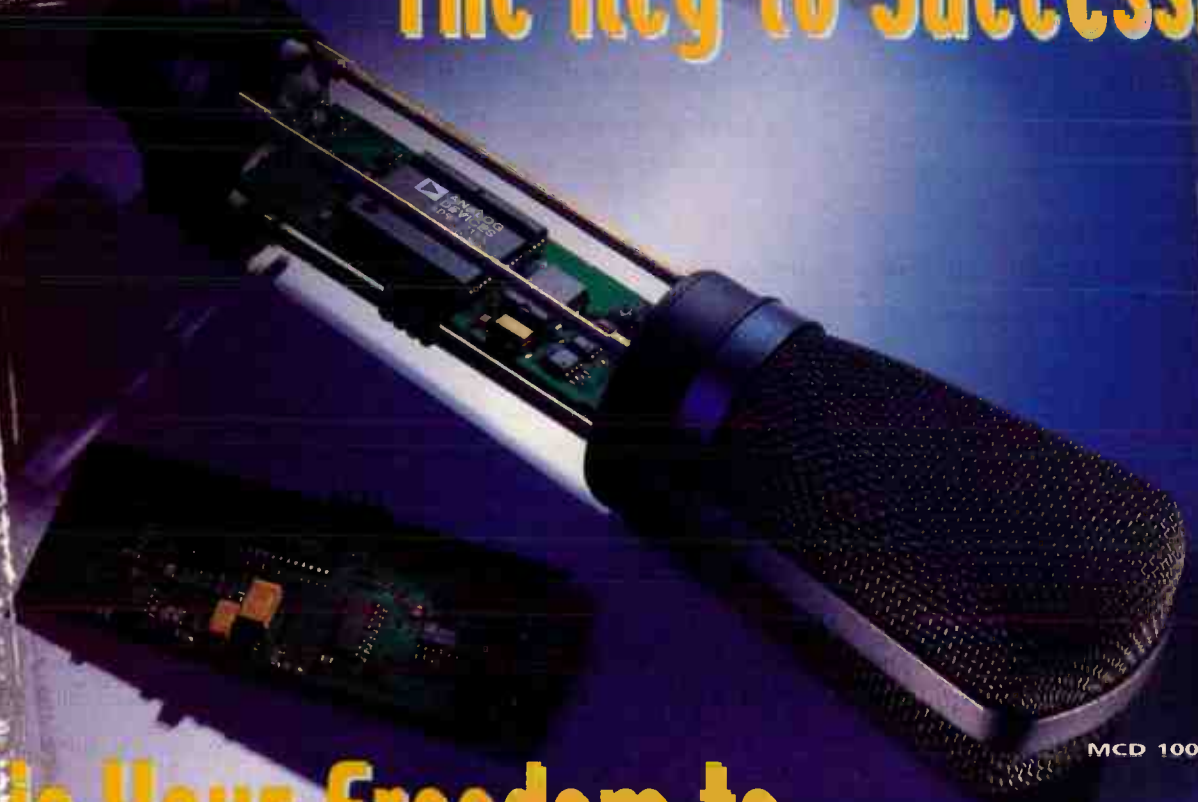
Due to time constraints, loop-oriented sample CDs were the main sound source. While I normally use Sonic Foundry's Acid for this type of project, the program doesn't provide a video window. As I didn't want to figure out timings by watching the video while holding a stopwatch, I decided to use Cakewalk Pro Audio 9. It has very tight integration between AVI files and audio, allows MIDI as well as digital audio (even though I wasn't expecting to use MIDI, I didn't want to exclude the possibility), and its re-worked audio engine is a delight. Also, I could use the StudioMix automated faders for mixing if necessary.

Regarding sample CDs, I first reached for Guitar Center's *SynchroLoops*, as all of its samples are in the same key (C) and tempo (120 BPM). To avoid time-compression, I wanted to use as many 120 BPM loops as possible. Other loops came from my *Sexy World* sample CD, the eJay series of CDs from



FIGURE 1: Cakewalk Pro Audio 9's ability to slide the tracks let me "fudge" the placement just a bit to line up perfectly with the video.

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Germany, and Wizoo's *Cologne Cyclez*. Having two CD drives (one CD-ROM, one CD-RW) sped up the loop selection process.

THE MAGIC OF "SEND TO"

When working with any loop-oriented project, I first create a temporary folder on the Windows Desktop called "!AA Sounds" (the !AA guarantees shooting it to the top of any alphabetized hierarchy list). The next step is creating an alias of the folder, and dropping it into the Send To folder (Windows > System > [ignore Microsoft's overly paranoid warning] > Send To folder). Thus prepared, I booted up Sound Forge to audition sounds from the CDs (in the Open dialog box, clicking on a sound plays it). When I heard a sound I liked, I'd right-click on it while still in the Open box, and send it to the !AASounds folder. Thus, all sounds for the project ended up in one convenient, easy-to-back up place.

POPULATING THE TRACKS

The drum part came first, not just for the traditional "rhythm track goes first" reason, but also to ensure that most of the hit points landed on a beat. There seemed to be some logical divisions in the video (intro, section on MusicPlayer.com, section on magazines), so I started placing loops, trying to remain in the same genre for some multiple of two measures.

Rhythm guitar and bass parts came after stringing the drum loops together. Like the drums, these shifted to match changes in the video.

Then came the hard part: adding the sonic effects to complement the on-screen images. For example, when the cover of *Bass Player* magazine appeared, I wanted a poppin' funk bass overlay. *Gig* had a female vocalist on the cover, so it begged to have a female vocal come in at the appropriate time. I was stumped coming up with sonic tag for EQ until I remembered having a tape rewind sample on the *Sexy World* CD.

By this time, I'd pretty much mined the *SynchroLoops* CD for all that was pertinent to the project, and started dipping into libraries with samples using different tempos or pitches. Although I missed Acid's on-the-fly time-stretching capabilities, relief came with Prosoniq's Time Factory application, which does high-quality time stretching.

For the MusicPlayer.com section, I recorded the sound of a touch-tone phone dialing when the name first appeared; as it dissolved into the home page screen, the sound of a connecting modem materialized

in the background (thank you, Creative Labs, for making a modem with a patchable audio output!). *MC2* magazine had DJ Skribble on the cover, so it was a no-brainer: throw in some scratching samples. *Extreme Groove* got some scratching, too, but I also blended in a remix by DJ Russ Reign that gave it some real power just before the climax at the end of the clip.

Being able to slide these around on the tracks (fig. 1) let me "fudge" the placement just a bit to line up perfectly with the video. This was particularly important when adding some "bloops and bleeps" to go behind lines of text with marketing-oriented bullet points such as "branding," "viral marketing," "affiliate programs," "community," etc. As clicking on the sequencer's timeline caused the video to jump to the same point, matching audio to video was simple.

Then came a few final touches — a flanged drum part here, a slow rising background tone to lead to the climax — and it was time to mix. All I needed to add were a few strategic level and pan changes; there was no need for automated faders.

The final track count was 38 digital audio tracks (no MIDI). With my 850 MHz Q Performance Systems computer, the disk activity indicator hit 11% from time to time on peaks, while the CPU was loafing along at about 2% of capacity, even with a couple plug-ins (Steinberg's TLAudio EQ-1 and Sonic Foundry's Simple Delay) thrown in.

FINISHING UP

Now all that remained was mixing down to stereo, and, as Cakewalk can premix all the digital audio tracks down to a WAV file, it was a piece of...err...cake. However, Lien-Chen was doing everything on a Mac, so a quick trip to Steinberg's WaveLab did the necessary WAV-to-AIF conversion. I burned a couple of CDs, created a demo that melded the original AVI file with the soundtrack so those in charge could check it out prior to seeing Lien-Chen's finished version, and it was wrap time for yet another project.

Would I ever want to do audio-for-video again with tape? No way!

Craig Anderton, creative director for MusicPlayer.com, is the author of Home Recording for Musicians as well as a popular lecturer in the U.S., Canada, and Europe. He recently mastered Smart Dust, the debut CD from the German electronic/hip-hop group Rei\$\$dorf Force.



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NAMM Spam



PHOTO BY JONATHAN POSTAL

Walking the Nashville Summer NAMM tradeshow floor with Dr. Al

BY AL KOOPER

Well, I'm back from the human steam bath of the Nashville Summer NAMM. It was a pretty quiet show this year.

Sony had some interesting hardware to show. They have a new CD burner listing at \$799 that has built-in EQ and compression with wide parameters. However, you can't store the settings or flip 'em from song to song. Hence the \$799. So you would get your settings for Song One, key them in, and then have to stop when Song One ends and set up the parameters for Song Two. It would slow things down, but there are times I wish I had EQ and a volume boost to make my mix CDs a little more even. It also has a plug for an IBM keyboard so you can input song titles in text format. They won't show up on every CD player, especially on car stereos, but how cool to have the song title instead of it saying *track 7* in the

read-out. This particular model only has the aforementioned DSP features in the analog realm, but Sony promises a higher-end model that will do the same stuff in the digital-to-digital realm. It purportedly will be shown at the AES show in late September. So much for that.

Sony was also showing their upcoming digital audio console, the DMX-R100, which starts at \$20K and comes fully loaded at \$24K (list). There's an 800-x600-pixel color touchscreen and 56 channels for mixdown, including 25 motorized faders. Optional accessories include eight return/send patchbay strips and eight-channel ADAT and TDIF interface boards. Looked pretty tasty. Kind of super top-of-the-line project studio or entry-level pro studio.

The most-welcome additions to the show for me were the three chi-ro-massage stations strategically placed throughout the Convention Center. For \$17 I was able to buy a two-hour second wind. After twenty minutes of rubbing, jabbing, and pounding, I was able to up my endurance another 120 minutes. Well worth it.


So now the outgoing president of NAMM says Nashville's shows are packed to capacity exhibitor-wise, and they must look for another city. They did this a couple of years ago and everybody jumped down their throats about leaving Nashville and it was dropped. Now it looks a little more ominous. I can remember Summer NAMMs in Chicago and Atlanta — not as much fun. Comparatively neither of these are

music-business cities, and that makes a big difference. The only alternative is really New York, and all these people have myriad excuses to get to NYC during the fiscal year, so that won't be a popular decision, either. Nashville, weather aside, is a fun place to visit for a few days. There's the interactive adventure of trying to find [a] edible food, [b] bars that stay open past midnight, and [c] clubs

that are situated in places you never dreamed clubs would be situated. But I'd be lying if I said I wanted the show moved from Nashville. It *really* is a fun place for Summer NAMM (tornadoes aside).

The other thing that struck me were the booths with no business going on. There are inevitably some booths at a NAMM show that claim to be distributors of lines I've never heard of. Guitars that look like the only customer they'd have in bulk would be wrestler Jeff Jarrett, who ends all his matches by smashing his opponent over the head with a silvery-painted gee-tar. They also show cabasas and, sometimes, dulcimers. How do these people afford to put up booths? And who

do they think will trade with them? Maybe there'd be more room for exhibitors at Summer NAMM if the screening committee nixed the applications of booth-holders like these and let some wacky inventors show their first-time brilliant ideas.

But, jeez, don't ask me. I'm just a guy that walks the floor interminably. Every summer. Like a male Patsy Cline.... 

There are inevitably some booths that claim to be distributors of lines I've never heard of. Guitars that look like the only customer they'd have in bulk would be wrestler Jeff Jarrett, who ends all his matches by smashing his opponent over the head with a silvery-painted gee-tar.

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each entry must consist of:

- Completed and signed entry form (or photocopy). All signatures must be original.
- CD(s) or audio cassette(s) containing ONE song only, five (5) minutes or less in length.
- Lyric sheet typed or printed legibly (please include English translation if applicable). Sheets not required for instrumental compositions.
- Check or money order for \$30.00 per song (U.S. currency only) payable to John Lennon Songwriting Contest. If paying by credit card, \$30.00 per song will be charged to your account.

Entries must be postmarked no later than September 29, 2000

Please read all rules carefully, and then sign your name in the space provided. If entrant is under 18 years old, the signature of a parent or guardian is required.

2. Prizes: Twelve (12) Grand Prize Winners will receive \$2,000 in cash, \$5,000 in Yamaha project studio equipment, and a \$5,000 advance from EMI Music Publishing. One (1) Grand Prize Winner will receive \$20,000 for the "Song of the Year" courtesy of Maxell. Thirty-six (36) Finalists will receive \$1,000. Seventy-two (72) Runners-up will receive \$100 gift certificates from Guitar Center Stores.
3. Contest is open to amateur and professional songwriters. Employees of JLSC, their families, subsidiaries, and affiliates are not eligible.
4. Winners will be chosen by a select panel of judges comprised of noted songwriters, producers, and music industry professionals. Songs will be judged based upon melody, composition and lyrics (when applicable). The quality of performance and production will not be considered. Prizes will be awarded jointly to all authors of any song; division of prizes is responsibility of winners. Void where prohibited. All federal, state, and local laws and regulations apply.
5. Winners will be notified by mail and must sign and return an affidavit of eligibility/recording rights/publicity release within 14 days of notification date. The affidavit will state that winner's song is original work and he/she holds all rights to song. Failure to sign and return such affidavit within 14 days or provision of false/inaccurate information therein will result in immediate disqualification and an alternate winner will be selected. Affidavits of winners under 18 years of age at time of award must be countersigned by parent or legal guardian. Affidavits subject to verification by JLSC and its agents. Entry constitutes permission to use winners names, likenesses, and voices for future advertising and publicity purposes without additional compensation.
6. Winners will be determined by January 15, 2001, after which each entrant will receive a list of winners in the mail. CDs, cassettes and lyrics will not be returned.

I have read and understand the rules of the John Lennon Songwriting Contest and I accept the terms and conditions of participation. (If entrant is under 18 years old, the signature of a parent or guardian is required.)

Make your check or money order for \$30.00 per song payable to:
John Lennon Songwriting Contest

check one category only

- rock world gospel/inspirational children's
- electronic pop folk r&b
- jazz country latin hip-hop

www.jlsc.com

1. Each song submitted must be contestant's original work. Songs may not exceed five (5) minutes in length. No song previously recorded and released through national distribution in any country will be eligible. Songs may have multiple co-writers, but please designate one name only on the application. Contestant may submit as many songs in as many categories as he/she wishes, but each entry requires a separate cassette or CD, entry form, lyric sheet, and entrance fee. One check or money order for multiple entries/categories is permitted. (Entrance fee is non-refundable. JLSC is not responsible for late, lost, damaged, misdirected, postage due, stolen, or misappropriated entries.)

SIGNATURE

DATE

Cover Me



Personal insurance for the small studio owner

BY JIM BORDNER

Everybody hates insurance until they need it. And for obvious reasons: Nobody likes sending a check once a month or once a quarter to some faceless entity that doesn't give anything back but a promise to help *if* disaster strikes. The annual insurance payment on even a modest pro studio could be a couple of mics or a fistful of sample CDs, both of which (in the short term) seem like better investments than a policy.

But we all pony up and pay to insure our gear. (You *do* insure your gear, don't you? Because if you don't, we need to have a long talk one of these days). But in most small studios, the most important piece of equipment is barely covered, if at all.

That piece of equipment, Dear Reader, is you. You're the one indispensable thing in your studio, and the least likely to be properly insured. Check and make sure you're covered in three major areas.

LIFE INSURANCE

If you have anyone depending on you — spouse and kids, elderly parents, a significant other — and you don't have a whopping nest egg stashed, then you need life insurance. If you're not insured, it's probably because:

1. You're too young to imagine dying.
2. You're so sick no company will insure you.

3. You hate listening to life insurance agents map out 257 different options for your coverage and talk about annuities and cash value until your head splits.

I'm betting it's most likely number three.

Life insurance salespeople show up with a black bag full of graphs, a computer full of arcane formulas, and a pretty good idea you need their new Annual Variable Controlled Buy-Down Life policy. Three hours later, you have no idea what you've purchased. But you have a vague sense that it was, somehow, "a smart investment."

At the risk of offending any insurance-industry readers (as if I haven't already done that pretty effectively), here's what my accountant says. Life insurance products with a cash value at maturity (whole life, variable-annuity life, and so on) are only fair-to-poor investments. On the other hand, a straight term policy has no investment value: It only pays if you die. Because there's no cash value at the end of the term, a term policy has much lower premiums than whole life and other investment-style products. If you want an investment, buy a term policy and put the money you save in a mutual fund, or better yet, in your business.

It's not difficult to determine how much policy to buy. Just figure out your obligations to the aforementioned dependent people. Add up your mortgage, your business debt, a couple year's salary, throw in some college money, and there you have it. Or use another formula I've heard: take the Total Liabilities number from your personal financial statement and double it. (I just ran my own numbers both ways, and they came out pretty close to the same.) Now all you have to do is call insurance agents and say, "I want a quote on a 20-year term life policy... \$250,000...I'm a 40-year-old male, no current health problems, and I smoke." (Or whatever your deal is.) They'll give you a price. Pick the lowest one and buy it.

HEALTH INSURANCE

Okay, now you've got insurance in case you die. But what if you live? It's a much scarier prospect, believe me. When I went into business for myself, I was younger and

healthier than I am now, and figured I could skate without the protective covering of health insurance. My wife disagreed. So, we got health insurance. Six months later, I was in the hospital for surgery and a five-day stay. The bill was stratospheric, a number I thought must represent pesos instead of dollars. Without the insurance, I would have been wiped out.

It's a little tougher shopping for health insurance than life. The market and the laws surrounding it are extremely complicated. Your needs are going to be very specific, and you may be covering a spouse or kids on your policy. Maybe you have some health concerns or a pre-existing condition that will narrow your choices. Whatever your circumstances, the secret to getting the best coverage for the least amount of money is finding a broker who will really work for you. (See "Choosing a Health Insurance Agent.")

SHORT-TERM DISABILITY

In the course of your insurance investigations, someone will probably ask you about disability insurance, which replaces your income if you can't work due to illness or injury. Most policies will replace between 50% to 70% of your lost monthly income...enough to keep you from losing everything. You have to be disabled for awhile before you can collect payments, usually 45 to 60 days.

Do you need it? Well, on the one hand, if your business can't create income without you, than a major illness could spell ruin. On the other hand, we work in a fairly low-risk business...you're much less likely to become disabled sitting behind a mixing console than you are walking steel, working in an auto plant, or sticking your hands inside farm machinery. A lot of it depends on your age, your general health, and your extracurricular activities. The best solution is to talk with someone who specializes in brokering disability coverage, usually a financial planner. I personally don't carry short-term disability insurance, but that doesn't mean you shouldn't look into it.

There you have it. Three ways to make sure that your business and your loved ones can survive a personal tragedy. I should also point out that if you have the ready cash necessary, you can create "self-insurance" accounts where you stash a set

QUESTIONS TO ASK A HEALTH INSURANCE AGENT

I got lucky when it came time to shop for health insurance. My Property and Casualty agent suggested a friend named Everett Schurg, and he turned out to be great. But since I never had to go searching, I didn't really know where to begin. So I called Everett and talked with him about how to select an insurance broker. We decided it really comes down to three questions.

Do you specialize in health insurance? The correct answer is "yes." You want someone who spends all of his or her time working in this field, because it's complicated in the extreme, and the legal climate and the players are changing every day. (There are 1,700 new laws on the books affecting your health insurance, and you can expect more coming.) A generalist can sell you a policy, but they can't possibly keep up with the market the way a specialist can.

How long have you been a specialist? Five years is enough. Maybe a larger company with a bunch of HR

people combing through the health plan can afford to work with a newbie, but you can't. Get someone with experience.

If the company declines a claim, what should I do? There's only one right answer to this question: "Call me." An insurance company makes its claims decisions based on an arcane set of diagnostic and procedural codes that doctors use to fill in your paperwork. They can't really tell from those number codes whether you need this procedure or not, and your doctor sure isn't going to track your claims for you. But a good agent or broker can make a huge difference by working as your advocate in the system and communicating your medical needs to the insurance company. Everett spends 80% of his time turning declined claims into accepted claims for his customers. If you ask this question, and the broker says, "Well, the insurance company has an 800 number you can call," take a pass and talk to someone else.

amount of money each month against That Rainy Day. Most of us don't have the bucks to replace life insurance, but talk with your financial planner or accountant about the possibility of self-insuring for

health and disability.

Whatever you decide, get yourself covered. The steady drip of a fixed cost like insurance beats the sudden flood of obligation you can get caught in without it.

Jim Bordner makes music, records audio, and studies the twisted anthropology of studio customers at Gravity Music. You can reach him at jim@gravitymusic.com.

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SEPTEMBER 2000
World Radio History

File Sharing Is Fun, Part II



PHOTO BY STEVE JENNINGS

More on sharing your music with the world...

BY JON LUINI AND ALLEN WHITMAN

Last month you witnessed this space helpfully demystify Napster, the wildly popular and temporarily banned file sharing application that's heralding the end of the music business as we know (and loathe) it. This month we'll explain Napster's Macintosh cousin, Macster, and another more powerful file sharing app: Gnutella. If that's not enough, in the near future we'll be clueing you into the next generation of file sharing: Freenet.

To review: File sharing is the act of swapping files (in this case: music) between users (listeners like you and us) across a network (the Internet).

MACSTER ([WWW.MACSTER.COM](http://www.macster.com))

"Be Part Of The Music Revolution" the site crows as we get right to the meat of the matter and download the app. The 523k Stuffit file blasts over our DSL connection in under twenty seconds. We're using an older Mac (8600 running OS 8.6). A file is dumped on our desktop and now it's time to install. Whoops! It doesn't need to be

installed, it either installed itself or is ready to go right out of the pipe.

The interface is tiny and text in the message bar reads "Not Connected." We rush to the menu and hit "Connect." Almost instantly the message bar changes to "864,106 songs in 7985 libraries (3511 gigs)." Holy moly! All free? Anytime, anywhere? Of course, that figure changes all the time. We click "Search." For "Artist" we enter "Genesis" (progrockhags, okay, we admit it). For "Song" we enter "Carpet Crawlers," knowing full well there's a new version recorded only recently by the original bandmembers, including Peter Gabriel. We search....

And there it is! About 17 different files of the same song, weighing in at 7.4 MB apiece. The Result window tells the file size, bitrate (that the file was encoded at), length of song, user (the person who made the file available on the network), line speed (the user's connection), and something called ping (in this case 235 ms or milliseconds). What is this ping, besides your uncle's new name? The Web site Help FAQ file has this to say: "We do have a 'ping' column in search results, the lower the ping, the faster/closer the user is to you, which usually means a faster download." It would be swell to get a sense of what 235 ms ping time means in seconds or minutes. Maybe a little table would help. But it's only a matter of time 'til we find out. Let's download the damn song and see what happens!

Double-clicking on the icon for the song in the Search Results window opens a Transfer window. Under "Progress," a little line crawls sideways. Download speeds tend to vary, and this does: dumping down to less than 1.5 K/sec and then ramping back up to 17.2 K/sec. Clearly the best time to download is when others are asleep. In five minutes we're done. The song now resides on our desktop (where we instructed Macster to save our files). We're officially criminals.

This particular file has been encoded at the relatively high bitrate of 192 kbps and it sounds almost indistinguishable from CD audio, with none of the artifacts typically found in MP3-encoded files. One hundred and ninety-two kbps encoding is the quality where we'd consider becoming a paying customer, though we always prefer true 44.1 kHz/16-bit CD audio quality when it comes to shelling out cash.

Remember that sometimes people don't do a very good job of encoding their

audio. Files encoded at 128 kbps sound way better than files encoded at 64 kbps. Also, the speed of your connection, the speed of their connection, and the overall amount of traffic on the network will radically affect download times. Sometimes all the servers on the network are busy (this thing is popular!) and your connection attempt is rebuffed. Keep trying, you'll eventually get in. Think of it like auto-dialing a terrestrial radio station to win tickets. Of course, you can be kicked off the volatile network at a moment's notice, and we were, many times.

Macster offers more than just the ability to acquire MP3 files across the Internet. There are chat rooms with user profiles. Users can invent personas and communicate with other alter egos. Though Macster's search engine delivers only 100 results, it's more than enough. Did we mention it's free?

GNUTELLA

The primary difference between Gnutella and the Napster/Macster family is Gnutella's lack of a central server: clients connect directly with each other. Gnutella also can share any kind of file type (as opposed to only MP3). There are no unnecessary bells or whistles like chat rooms.

We go to www.gnutella.wego.com to download Gnutella for Windows. There are links on the site for Mac, Linux, Perl, Java, etc. clones as well. Gnutella "allows a user running a Gnutella client to search for and download files from other Gnutella users."

Gnutella source code is freely available. Anyone can participate in GnutellaNet for the creation of "Next Generation Gnutella Protocol." Because the protocol is public and people are encouraged to write their own or participate with others, the application is practically guaranteed a long and healthy life. Long live Open Source!

Download is quick and painless. We click the (not so obvious) picture of a floppy disk in the "D/L" column to download. It's very small and arrives quickly. Installation requires merely running the downloaded file and clicking "Install." No multi-page licenses, no queries about our age, gender, or telephone number. In fact, no username either. Though that's nice, it's immediately apparent that Gnutella's current form is more for hackers than mom-and-pop users. Help is



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A talented musician, successful composer and recognized producer, Lenny White is considered one of music's real innovators. He's played with such greats as Miles Davis, Chick Corea and Stanley Clark, and has also collaborated on some of the most recognized and influential music of the past three decades, including the new CD *On the One*, with Sammy Peralta.

and indisputable fact: the LSR25P consistently outperforms any other monitor in its class. As a result, it's gaining popularity in all critical monitoring applications, from digital workstations and near field stereo to 5.1 mixing. In fact, the LSR25P is as comfortable on the road as it is on the meter bridge.

Every LSR25P incorporates JBL's revolutionary Linear Spatial Reference (LSR) performance characteristics, assuring a mix that sounds consistent from room to room. What's more, the two-way 5.25", bi-amplified LSR25P



Sammy Peralta loves music. That pure and simple fact comes through strikingly clear as he sits at his keyboard tinkering with half-written tunes. Sammy's background includes work with talents including Tito Puente and Willie Bermudez. "I have to be careful because I can get so lost in the music, I sometimes forget I have a family that would like a little of my attention too".

also features 150 watts of linear power as well as purpose-built transducers with JBL's most current thinking and designs. This last point has earned the entire LSR family of monitors continual critical acclaim for more than three years.

One last point: Sammy Peralta's new CD *On the One* featuring Lenny White was mixed entirely with LSR monitors.

LSR.



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CIRCLE 23 ON FREE INFO CARD

within the application and isn't configured to connect to anything, or to find any files to share. There are clear instructions on the Web site, however, so anyone with a little patience shouldn't have problems (unless you're easily put-off by some mild profanity in the instructions).

Let's share some files. We click on "Config" in the list of options. This brings up several choices, allowing us to select "Add directory" to enter in the directory(s) where file types we wish to share reside in our computer. We use C:Files to keep things in one place. We click the "Rescan"

button and make sure the "Files Scanned" displays the correct number of files in the directory we want to share. Next, we enter correct connection speed. Because this is a bare-bones application, we need to tell Gnutella what our connection speed is. The app comes defaulted to 28.8k (a slow modem), so if you have a 256k DSL connection, enter "256."

Next, we enter a host to connect to for hooking into the network. Some host choices are listed on the home page under "Need a host?" Click on "GnutellaNet" in the top left and enter (or copy and paste)

one of those hosts into the space next to the "Remove" and "Add" buttons. We used <gnet.ath.cx> which works fine. Click "Add" and it connects to the server and loads up a few others. The information under "GnutellaNet stats" begins updating, showing how many hosts and files are available. For fun, we click on "Monitor" and then click the checkbox labeled "Search Monitor Enabled" and see what other people are searching for.

After listing our three files, we do a test search for them from another machine (connected to the same <gnet.ath.cx> primary server), and there they are. Gnutella has a nice feature allowing for streaming files instead of downloading. This is useful if you're working with audio files and want to sample a few before deciding to download an entire song.

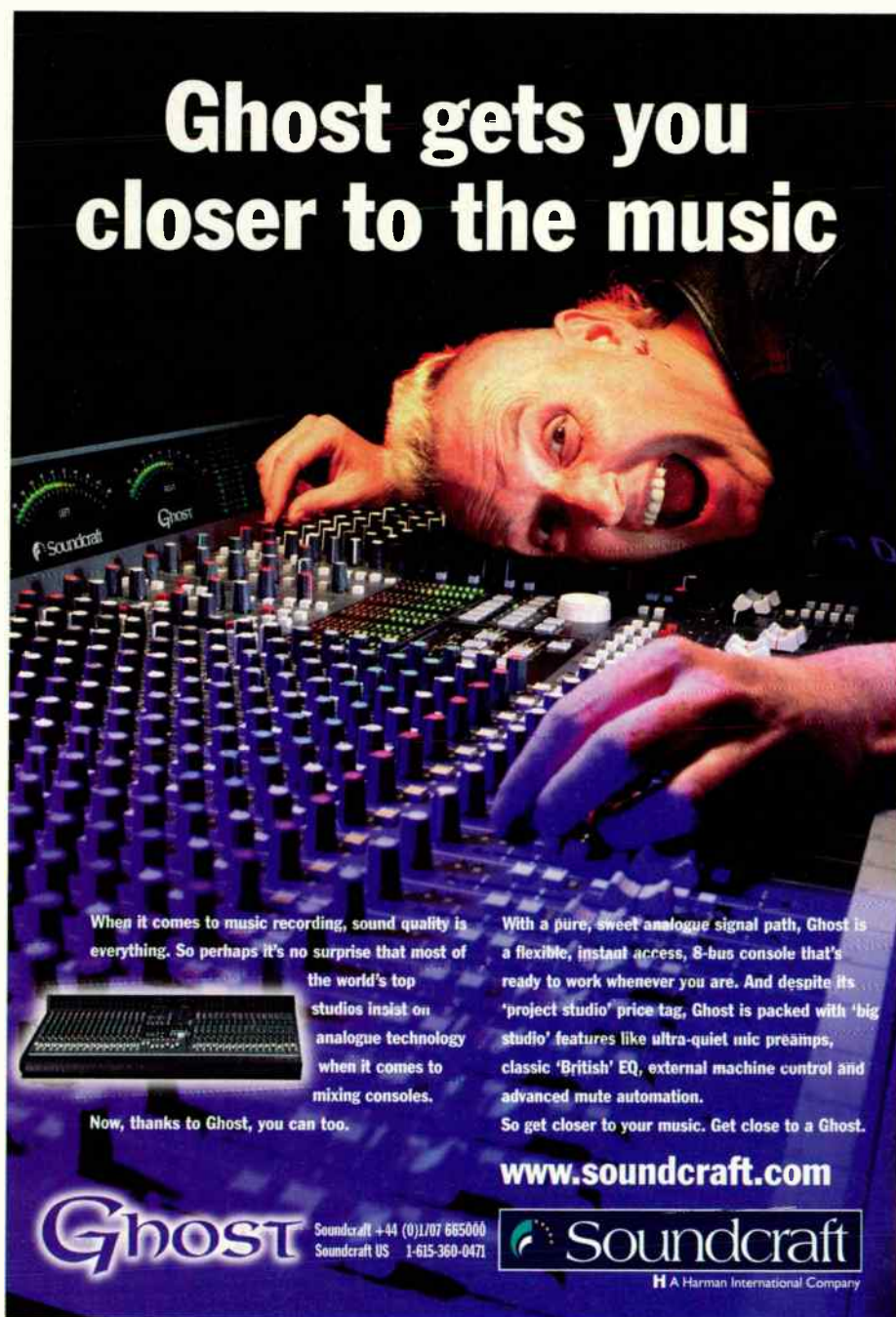
Curiously, it appears that a porn site has figured out a way to try and grab visitors. The porn-peddlers apparently have a special client that will match any search request and respond with a <searchkey>.html file that, if you download and open, takes you to the porno site. This is a known problem and the Gnutella folks are currently discussing solutions. Your ever-watchful FezGuys advise scanning for viruses on all downloads. Most virus apps (many of which come with new computer purchases) can be run on individual files, so it won't hurt to scan downloaded files before running them.

Based on our random sampling in the very early morning hours, Gnutella had 2,500 active users compared to Napster's 3,500. Although Napster's unconnected multiple servers make it impossible to accurately count the active users, Gnutella is fast becoming just as popular.

SCOUR EXCHANGE BETA 3 (WINDOWS ONLY, UNIX COMING)

Scour.net's (www.scour.net) "Scour Exchange" (SX) client is modeled after Napster, but has a few differences. SX includes some other media types (images, for example) and has released the specifics of their protocol and encouraged people to write their own clients (like Gnutella). Scour also plans on releasing a UNIX version with an "open source license." That means people can download the code and make modifications and/or port SX to other types of computers. Mac plans are unknown but, since a Perl version has already been posted, it may not be long until a Mac programmer decides to make one. There is no chat function, but a note on

continued on page 154



Ghost gets you closer to the music

When it comes to music recording, sound quality is everything. So perhaps it's no surprise that most of the world's top studios insist on analogue technology when it comes to mixing consoles.

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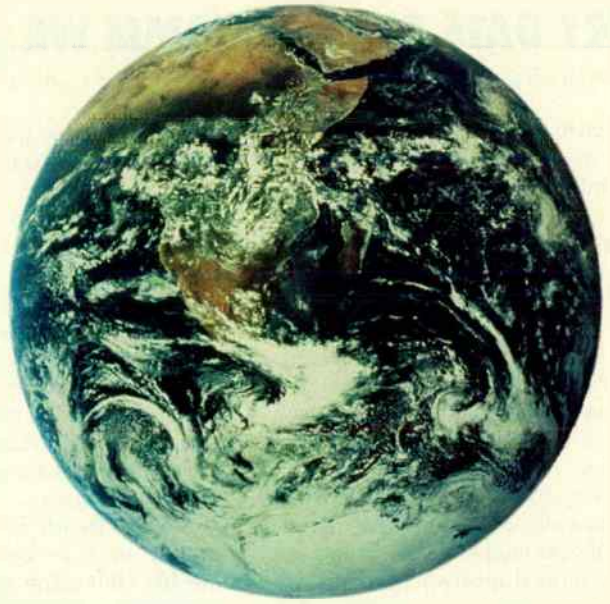
With a pure, sweet analogue signal path, Ghost is a flexible, instant access, 8-bus console that's ready to work whenever you are. And despite its 'project studio' price tag, Ghost is packed with 'big studio' features like ultra-quiet mic preamps, classic 'British' EQ, external machine control and advanced mute automation. So get closer to your music. Get close to a Ghost.

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TERRY DATE PART 2

continued from page 65


don't have to shock them with something later on. Also, I don't like to use reverb. I don't think I've used a reverb in 10 years, probably. I like to create the ambience from the rooms we're working in. As far as outboard gear, it's usually pretty simple. Just a couple of delays. Usually an old [Lexicon PCM] 42 or something. I use an [Eventide] H3000 for some vocal effects, like doubling. I have a Zoom 9050 that I also use for vocal effects. And I do like to process the bass through a SansAmp when I'm mixing sometimes.

I will say that I tend to support kick and snare drums with samples — far enough underneath the real drums to fill in whatever frequencies I messed up on when I recorded it. On kick drums, for instance, you'll tend to have better low end on slow passages than fast ones, just because of the way the drummer is using the pedal. So a sample will help give you a more consistent low end without losing the variations in attack that help make the performance. And on snares, I can support the two and four with samples and make a strong backbeat. But I'll still have the real snare up loud enough that you can hear the ghost notes and little finesse things. The idea is to strengthen the big picture while still maintaining all the little details.

Quite a few of the bands you work with have dark, dangerous images. Which ones, if any, are actually like that in the studio?

I don't think any of them really are. The reason they do that kind of music comes from someplace — some malfunction in their lives at some point. But I think everybody has that. These people wouldn't be where they are if they were all that impossible, dark, and dangerous. Things can get a bit hectic when you're in the heat of the creative process and something isn't working. But, in general, these are fun people to be around. I feel fortunate. I'd hang out with them even if I weren't working with them.

How do you feel about the current mainstream success of the really hard-sounding bands? Is this going to stick around for awhile?

Yeah. It'll stick around for about seven years. Then something else will take over. Then the heavy stuff will come back around seven years later. I've been doing this since the late Seventies, and I think this is the third time I've seen the heavy stuff come back around. It's really designed for 15 to 25 year old males. And as long as there are 15 to 25 year old males, they're always going to want aggressive music. I know that's what I wanted to listen to at that age. And I still like listening to it. 

NAMM WRAP-UP

continued from page 92

Extended Dynamic Range mic preamps (60 dB gain range, 0.0007% THD, 130 dB dynamic range, and +22 dB line signal handling capability), bifilar-wound/DC-pulse transformers to minimize RF interference, active three-band swept-midrange EQ per mic channel, four-band fixed EQ on the stereo channels, and sealed, dust-proof rotary controls. The SR24.4 VLZ Pro features 20 mono mic/line channels, two stereo channels, and four busses. The SR32.4 VLZ Pro has 28 mono mic/line channels, two stereo line channels, and four busses.

Allen & Heath were showing their new line of Xone Series mixers. The Xone:464 club mixer has 16 inputs, including four mic/line ins with inserts, four-band EQ with two sweepable ranges, six pre/post aux sends, VCA crossfade, and two stereo mix outs. The smaller Xone:62 for pro DJs offers six dual stereo ins (four with RIAA/line ins and two with mic/line ins) and four-band EQ. And Peavey unveiled the RQ 2300 series of live sound mixers — RQ 2310 (\$449.99), RQ 2314 (\$599.99), and RQ 2316 (\$699.99). All are non-powered mixers with high-quality mic pres, inserts, switchable +48 phantom power, pad and polarity switches, stereo RCA tape in/out jacks, and two stereo effects returns. Each input channel provides XLR and 1/4-inch ins, three-band EQ with sweepable mids, mute and PFL, two effects sends (each with stereo returns), and two monitor sends.

Those of you looking for a lightweight yet mondo power amplifier would do well to keep your eyes on Behringer, who announced that they have licensed proprietary technology called CoolAudio. This digital amplification technology, invented by semiconductor manufacturer Intersil, claims over 90% efficiency as well as small size and light weight. There are no CoolAudio products just yet, but they're sure to follow shortly.

The big news from JBL was the announcement of the second generation of the EON line of affordable powered stage monitors: the EON G2. The flagship of the new series is the EON15 G2, which delivers 300 watts of power to a 15-inch low-frequency driver and 100 watts of power to a 1.75-inch titanium diaphragm compression driver. The EON15 G2 also includes a built-in three-input mixer with one balanced mic/line input, two 1/4-inch line-level inputs, and two-band EQ, plus a Mix Out feature that allows the mixed output to be sent to an external mixing console.


And the Sennheiser Kick-Pack (\$415.95) bundle for drummers includes an E 602 pressure-gradient mic, weighted bass stand, cable, and mic pouch. The E 602 is a cardioid mic that can withstand sound levels up to 160 dB, and is enclosed in an all-metal enclosure. Other microphone news included the announcement of the second-generation Emotion II series of dynamic mics from AKG.

SOFTWARE

There were also several new software products on display. TC Works Mercury-1 (\$199) is a VST 2.0-compatible plug-in for Mac (G3/G4) or Windows (Pentium II) that adds a multitimbral monophonic synth (up to four layers) with dual oscillators and sub-oscillator, pulse-width modulation, oscillator sync and ring modulation, 24 dB/octave low-pass filter section, LFO with sample+hold and MIDI sync, dual envelope generators, and "saturation" processor for analog sounding distortion.

BitHeadz Phrazer (\$399) is designed for layering loops in real-time. Running under MacOS, it automatically pitch-shifts and time-stretches audio material. Different tracks can be gated on and off from the computer QWERTY keyboard, or from a MIDI keyboard, for tight rhythmic synchronization. A sample editor fine-tunes audio files, which can be standard digital audio files, Phrazer native files, or Acid files from Sonic Foundry's Windows-based looping program. Phrazer supports MAS 2.0, ReWire, DirectConnect, ASIO, Sound Manager, OMS, and FreeMIDI.

Cakewalk were showing Guitar Tracks 2 (\$69), which features a re-designed interface that emulates typical portable studio products. This eight-track recording program for Windows also integrates a simplified multitrack digital audio editing view for quick cut/copy/paste operations, volume and pan envelopes, real-time mixing console, track bounce, drum pattern library, several internal effects (including the AmpSim Lite vintage amp simulator), DirectX support, and export to RealSystem G2 and Windows Media formats. Also new from Cakewalk is Pyro (\$57), which burns CDs, converts them into MP3/WAV/Windows Media formats, supports DirectX plug-ins, creates song playlists via a digital jukebox function, and exports MP3 files to Nomad, Rio, and other portable players.

Finally, the latest addition to the E-mu/Ensoniq PARIS hard-disk recording system (now up to version 2.1) is PARIS Post, which adds video playback capabilities for audio-for-video applications. 

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World Radio History

FEZGUYS

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the Web site mentions its inclusion in a future release.

Downloading (like Napster) is very fast. Typical lengthy legalese (two whole sections of it!) pop up, but are easily clicked through. SX is kind enough to ask if you want it placed in the startup folder upon installation (unlike Napster, which doesn't ask and assumes you do), meaning each time you turn your computer on, you have the choice of automatically sharing files.

SX takes us through several steps to set up a member account, requiring a first and last name, e-mail address, zip code, gender, and age. We thought about posing as a five-year-old female (people who require unnecessary information deserve what they get!) but instead opt for a common existing nickname (bobdobbs).

SX offers to scan our drives for media folders that we can choose to share or not share on a case-by-case basis. For variety, we let it search (quickly deselected) all but our C:Files folder. Thank goodness they include a "Clear All" button! SX doesn't

include subdirectories in its libraries. For this reason, let SX scan your drive if you have more than one directory of media to share.

SX is divided into separate sections that behave similarly to Napster: "Find Media" (a.k.a. search), "Media Library," "File Transfer," and "Hotlist." Scour's greeting page, "SX Now!" provides news and also profiles downloads emphasizing not only the audio available but video, animations, and imagery.

While waiting for an MP3 download to finish, we used an SX feature that allows us to see all the files available by any one user. Here's a sampling of one modern music listener's diverse offerings: Cat Stevens, Eminem, Disney movie songs, John Fogerty, the theme from *The Jeffersons* TV show, and songs from *South Park*. Another clear example of the essential paradox of attempting to "genre-fy" personal taste.

At our time of testing, there were 5,232 users connected sharing 525,000 files for about two terabytes of total data. In the wake of recent court decisions involving the company, those numbers have doubled.

The FezGuys know a good thing when they see one: www.fezguys.com.

ROYER MICS

continued from page 132

want a good-sounding and quiet room to record in. I found that the tracks I put down with the R-121 tended to blend well making the mixdown process easier. At its price (or even at a much higher price, for that matter), the R-121 is incredibly hard to beat.

The SF-12 is also a fabulous microphone — but don't make the mistake of thinking of it as a stereo version of the R-121. The SF-12 has a more linear frequency response and provides an even more natural sound. It's ideally suited to applications where you want to record in stereo or capture multiple instruments or an ensemble with one coincident mic. Its sweet spot is a little further out than the R-121's; I liked it placed a number of feet from the source in most applications.

If you haven't experienced what a great ribbon microphone has to offer, don't delay — check out the Royers as soon as you can. Whether as a principle microphone for day-to-day recording tasks, or to expand the palette offered by your mic locker, the R-121 and SF-12 absolutely shine. **EQ**

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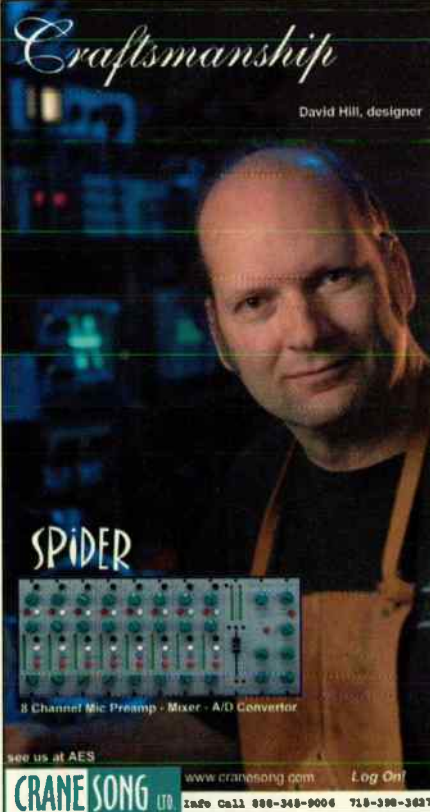
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HARD DISK RECORDING



DIGI001 Digital Audio Workstation For Mac And PC

A completely integrated digital recording, mixing and editing environment for the Mac and PC, the DIGI-001 offers a 24-bit multi I/O breakout interface along with Pro Tools LE software—based on Digidesign's world renowned ProTools software. The DIGI-001 interface features 18 simultaneous I/Os made up of 8 analog inputs and outputs—two of the inputs are full featured mic preamps with phantom power, and digital I/O including standard S/PDIF as well as an ADAT optical interface that can also be used as a S/PDIF I/O. ProTools LE supports 24 tracks of 16 or 24-bit audio and 128 MIDI tracks and also features RealTime AudioSuite (RTAS) effects plug-ins. For ease of use, MIDI and audio are editable within the same environment and all mixing parameters including effects processing can be fully automated.

FEATURES—

- 18 simultaneous, 24-bit ins and outs with support for 44.1 and 48 kHz sample rates
- 20Hz - 22kHz freq. response ± 0.5 dB
- 2 channel, XLR mic/1/4" line inputs with -26 dB pad, 48v phantom power, gain knob, and HP Filter at 60Hz
- 6 ch. line inputs (1/4") TRS balanced/unbalanced w/ software controlled gain
- +4dB balanced 1/4-inch Main outputs
- Balanced 1/4" monitor outs with front panel gain knob
- 1/4-inch unbalanced line outputs channels 3-8
- Headphone output with independent gain control knob
- 2 channel S/PDIF coaxial digital I/O
- 8 channel ADAT optical I/O can also be used as 2 channel optical S/PDIF

Pro Tools LE

- Supports 24 tracks of 16 or 24-bit audio and 128 sequenced MIDI tracks
- Sample-accurate simultaneous editing of audio & MIDI
- Real-time digital mixing capabilities include recall of all mixing parameters, support for edit and mix groups and complete automation of all volume, panning, mutes and plug-ins.
- Route and mix outboard gear in realtime
- MP3 and RealAudio G2 file support (Mac)

- Two plug-in platforms offer multiple options for effects processing—Real-Time AudioSuite (RTAS) is a host-based architecture that allows an effect to change and be dynamically automated in realtime as the audio plays back. —AudioSuite is a file-based format, that renders a new file with the processed sound.
- Bounce RTAS plug-ins include: 1 and 4-band EQ, Dynamics II- compressor, limiter, gate and expander/gate, Mod Delay - short, slap, medium, and long delays with modulation capabilities for chorus or flange effects and dither. AudioSuite plug-ins include Time Compression/Expansion, Pitch Shift, Normalize, Reverse

MIDI Functions

- MIDI functions include graphic controller editing, piano roll display, up to 128 MIDI tracks and editing options like quantization, transpose, split notes, change velocity and change duration.
- MIDI data can be edited on the fly



MOTU AUDIO Hard Disk Recording Systems

The MOTU Audio System is a PCI based hard recording solution for the Mac and PC platforms. At the heart of the system is the PCI-324 PCI card that can connect up to three audio interfaces and allows up to 72 channels of simultaneous I/O. Audio interfaces are available with a wide range of I/O configurations including multiple analog I/O with the latest 24-bit A/D/A converters and/or multi channel digital I/O such as ADAT optical and TDIF I/O as well as standard S/PDIF and AES/EBU I/O. Each interface can be purchased separately or with a PCI-324 card allowing you to build a system to suit your needs. Includes drivers for all of today's hottest audio software and AudioDesk, multitrack recording and editing software for the Mac.

THEY ALL FEATURE—

- Mac OS and Windows compatible
- Includes software drivers for compatibility with all of today's popular audio software plus AudioDesk, MOTU's sample-accurate audio workstation software for Mac OS
- Host computer determines the number of tracks that the software can record and play simultaneously, as well as the amount of real-time effects processing it can support
- Front panels display metering for all inputs and outputs
- AudioDesk Audio Workstation Software for Mac OS features 24-bit recording, multi-channel waveform editing, automated virtual mixing, graphic editing of ramp automation, real-time effects plug-ins with 32-bit floating point processing, crossfades, support for third-party audio plug-ins (in the MOTU Audio System and Adobe Premiere formats), background processing of file-based operations, sample-accurate editing and placement of audio, and more



1296 24-bit/96kHz Interface Features—

- 24-bit enhanced multi-bit 128x oversampling 96kHz converters
- A-weighted signal-to-noise ratio of 117 dB
- 12 Balanced XLR inputs and outputs can support two simultaneous 5.1 mixes
- AES/EBU I/O with sample rate

conversion both in and out • Compatible with existing PCI-324 cards (requires new PCI-324 driver) • Connect up to 3 1296 interfaces to one PCI-324 card for a total of 36 inputs and outputs or mix and match the 1296 interface with up to three of the other MOTU audio interfaces



2408 mkII FEATURES—

- 7 banks of 8 channel I/O: 1 bank of analog, 3 banks of ADAT optical, 3 banks of Tascam TDIF, plus stereo S/PDIF.
- Custom VLSI chip for amazing I/O capabilities
- Format conversion between ADAT and DA-88

• 8x 24-bit 1/4" balanced analog I/Os • 24-bit internal data bus for full 24-bit recording via digital inputs • Standard S/PDIF I/O for digital plus an additional S/PDIF I/O for the main mix • Sample-accurate synchronization with AOATS and DA88s via an ADAT SYNC IN and RS422



1224 FEATURES—

- 24-bit analog audio interface
- State-of-the-art 24-bit A/D/A
- Simultaneously record and play back 8 channels of balanced (TRS), +4 dB audio
- 24-bit balanced +4 XLR

main outputs • Stereo AES/EBU digital I/O • Word clock input • Dynamic range of 116 dB (A-weighted) • Front panel displays six-segment metering for all inputs and outputs • Headphone jack with volume knob

CD RECORDING/MASTERING

ALESIS Masterlink ML-9600

High-Resolution Master Disk Recorder

The Alesis MasterLink ML-9600 is a 2-track 24-bit recorder that combines hard disk recording, CD burning, digital signal processing, and mastering functions to create compact discs in the standard "Red Book" 16-bit/44.1kHz format, or high resolution CDs that utilize Alesis' revolutionary CD24 AIFF-compatible technology. MasterLink is capable of recording and playing up to 24-bit/96kHz resolution CDs using the inexpensive, readily available CD-R media. The amazing sonic quality, powerful built-in tools and CD24 technology offers a uniquely versatile and affordable solution for everyone from large commercial audio facilities to project studios and recording musicians.



FEATURES—

- 24-bit 128x oversampling analog to digital and digital to analog converters
- Supports 44.1, 48, 88.2, 96 kHz sample rates and word lengths of 16-, 20- and 24-bit
- 20Hz-20kHz frequency response at 44 1/48 kHz sample rates
- 20Hz-40kHz, frequency response at 88.2/96 kHz sample rates
- 113dB signal-to-noise ratio (A-weighted)
- Matsushita ATAPI CD-ROM drive allows up to 4x CD burning using standard CD-R discs.
- Built-in sample rate conversion & noise shaping to change sample rates & bit resolution as needed
- Reads and Writes 16-bit 44.1kHz Red Book Audio CDs
- Alesis' exclusive CD24 is a high-

resolution mastering format that reads/writes files up to 24-bit 96kHz in the ISD 9660 disc format. AIFF compatible file format that can be read by MacOS, Windows and Unix computer platforms.

- Built-in 3.2GB IDE hard drive
- Hard disk max recording times 95 min. @ 24-bit/96kHz 3'10 min. @ 16-bit/44.1kHz
- Create and store up to 16 playlists containing as many as 99 tracks

Analog Inputs and Outputs

- Balanced XLR connectors (+4dBu input and +19dBu max. output)
- Unbalanced phono (RCA) connectors (-10dBV input and +5dBV max. output)
- 1/4-inch TRS headphone output with level control

Digital Inputs and Outputs

- AES/EBU balanced XLR inputs and outputs
- S/PDIF unbalanced phono (RCA) inputs and outputs

Editing

- Gain control
- Cropping allows adjusting start and end points.
- Join and Split features allow combining and separating song sections.

DSP Finishing Tools

- Equalization, Compression, Normalizing and Peak Limiting

Includes

- Infra red remote control and rackmount brackets

marantz

CDR-631 Professional CD Recorder

The CDR631 offer all the features and functions of the CDR630, its popular predecessor, but adds many features and functions that were previously unavailable. Its full complement of digital and analog connections lets you record your own CDs from audio sources such as CDs, LFs, cassettes, DAT, or even a computer.



Features—

- Pro and consumer CD-R and CD-RW compatible
- Track titles can be saved and edited in CD-TEXT format that can be read on CD-TEXT compatible CD players
- Memory buffer that prevents the beginning of tracks from getting cut off
- Menu selectable SCMS copy protection
- Digital and analog record level and balance control
- XLR-Balanced and RCA unbalanced analog inputs
- AES/EBU (XLR), Coaxial, and Optical digital inputs
- Unbalanced (RCA) analog and Coaxial digital outputs including Coaxial loop-out for unprocessed connection to other digital equipment
- IR remote control included

MICROBOARDS

StartREC Digital Audio Editing/ CD Duplication System

The Microboards StartREC is the first digital audio editing system combined with a multitrack CD recordable duplication system for professionals. Audio is recorded to the internal 6.2 GB IDE hard drive using analog or digital inputs. Sample rate conversion is automatic. Tracks can be edited and sequenced using the StartREC's user friendly interface and up to 4 CDs can be recorded simultaneously. StartREC is the ideal solution for studio recording, mastering, post production or any pro audio environment requiring digital audio editing and short run CD-R duplication.



Features—

- 2X, 4X, or 8X recording speeds
- 6.2GB IDE hard drive
- Editing functions include move, divide, combine or delete audio tracks, add or drop any index or sub index, and create track fade in or fade out
- Coaxial S/PDIF or AES/EBU digital input plus optical S/PDIF I/O
- XLR balanced and RCA Line inputs and outputs
- Automatic sample rate conversion from 32 and 48kHz
- Automatic CD Format Detection feature and user friendly interface provide one touch button operation
- Front panel trim and LCD display provide accurate input signal and time lapse metering
- SCMS (Serial Copy Management System) is supported, regardless of the source disc copy protection status
- StartREC Models Include: ST2000 (2) 8x writers, ST3000 (3) 8x writers and ST4000 (4) 8x writers



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DIGITAL MULTI-TRACK RECORDERS

TASCAM

MX-2424 24-Bit 24-Track Hard Disk Recorder

Co-designed by TASCAM and TimeLine Inc., the MX-2424 is an affordable 24-bit, 24-track hard disk recorder that also has the editing power of a digital audio workstation. A 9GB internal hard drive comes standard as well as a SCSI Wide port that supports external LVD (Low Voltage Drives) hard drives from up to 40 feet away. An optional analog and several digital I/O cards are available so the MX-2424 can be configured to suit your work environment. SMPTE synchronization, Word Clock, MIDI Time Code and MIDI Machine Control are all built in for seamless integration into any studio.



- Records 24 tracks of 24-bit audio at 44.1 or 48 kHz, or 12 tracks at 88.2 or 96 kHz. Up to 24 tracks can be recorded simultaneously using any combination of digital and analog I/O.
- Supplied 9GB internal drive allows 45 minutes of audio across all 24 tracks
- Wide SCSI port on the back panel allows you to add multiple drives. A front 5-1/2" bay available for installing an additional drive, or an approved DVD-RAM drive for back-up.
- ViewNet MX, a Java-based software suite for Mac and PC offers DAW style editing of audio regions, dedicated system set-up screens that make set-up quicker and easier and track load screens that make virtual track management a snap. Connects to a computer via a standard Ethernet line.
- Can record to Mac (SDI) or PC (.WAV) formatted drives, allowing later export to the computer. The Open TL format allows compatible software to recognize virtual tracks without have to load, reposition and trim each digital file.

Transport Controls-

- Jog/scrub wheel
- MIDI In, Out, and Thru ports are built-in for MIDI Machine Control.

Editing-

- Built-in editing capabilities include cut, copy, paste, split and ripple or overwrite
- 100 levels of undo
- Supports destructive loop recording and non-destructive loop recording which continuously records new takes without erasing the previous version.

Built-in Synchronization-

- TBUS protocol can sample accurately lock 32 machines together for 384 tracks at 96kHz, or 768 tracks at 48kHz.
- Can generate or chase SMPTE timecode or MIDI Time Code
- Word Clock In, Out, and Thru ports

I/O Options-

- Optional analog and digital cards all provide 24 channels of I/O. There is one slot for analog and one for digital.
- IF-TD24 - T/DIF module
- IF-AD24 - ADAT Lightpipe module
- IF-AE24 - AES/EBU module
- IF-AN24 - A-D, D-A I/O module with DB-25 connectors

Software Updates-

- System updates are made available through a front panel Smart Card slot or via computer directly from the TASCAM web site.

DA-78HR Modular Digital Multitrack

The DA-78HR is the first true 24-bit lane-based 8-track modular digital multitrack recorder. Based on the DTRS (Digital Tape Recording System) it provides up to 108 minutes of pristine 24-bit or 16-bit digital audio on a single 120 Hi-8 video tape. Designed for project and commercial recording studios as well as video post and field production, the DA-78HR offers a host of standard features including built-in SMPTE Time Code Reader/Generator, MIDI Time Code synchronization and a digital mixer with pan and level controls. A coaxial S/PDIF digital I/O allows pre-mixed digital bouncing within a single unit, or externally to another recorder or even a DAT or CD recorder. Up to 16 DTRS machines can be synchronized together for simultaneous, sample accurate control of 128 tracks of digital audio.



Features-

- Selectable 16 bit or 24 bit High Resolution audio
- 24 bit A/D and D/A converters
- >104dB Dynamic range
- 20Hz - 20kHz frequency response \pm 5dB
- 1 hr., 48 min. recording time on a single 120 tape
- On-Board SMPTE synchronizer - chase or generate timecode
- On-Board support for MIDI Machine Control

- Internal digital mixer with level and pan for internal bouncing, or for quick mixes
- Track slip from -200 to +7200 samples
- Expandable up to 128 tracks (16 machines)
- Word Sync In/Out/Thru
- Analog output on DB25 balanced or RCA unbalanced
- Digital output on TDI/F or 2 channels of S/PDIF

A TO D CONVERTERS

APOGEE Rosetta 24-bit A to D Converter

The high-end quality analog to digital solution for the project studio. With support for both professional and consumer digital formats you can now record your audio at a higher resolution and with greater detail than standard converters found on MDM's, DAT's and DAW's. Ideal for mastering or tracking.



FEATURES--

- 24-bit, 44.1-48, 88.2-96 kHz Sample Rate (\pm 10%)
 - 116dB dynamic range (unweighted)
 - Improved UV22HR for 16 and 20-bit A/D conversion
- FRONT PANEL:**
- Power switch • Sample Rate (44.1, 48, 88.2, 96kHz) selector • 16-bit (UV22), 20-bit (UV22) and

- 24-bit resolution selector • S/PDIF-ADAT optical selector • Soft Limit on or off • 12-segment metering w/ over indicator & Meter Clear switch • Level trim
- REAR PANEL:**
- XLR balanced inputs • 2 x AES/EBU for 88.2/96kHz 2 channel path. Coaxial S/PDIF, switchable S/PDIF or ADAT optical outputs • Wordclock out

LUCID AD 9624 24-bit A to D Converter

Transparent analog to digital conversion designed to bring your music to the next level. XLR balanced inputs feed true 24-bit converters for revealing all the detail of the analog source. 16-bit masters can take advantage of the AD9624's noise shaping function which enhances clarity of low level signals.



FEATURES--

- 24-bit precision A/D conversion • Support for 32, 44.1, 48, 88.2 & 96kHz sample rates • Wordclock sync input • Selectable 16-bit noise shaping •

- Simultaneous AES/EBU, coaxial and optical S/PDIF outputs • 20-segment LED meters w/ peak hold & clip indicators • **ALSO AVAILABLE:** DA9624 24-bit D/A converter

DIGITAL MIXERS

Roland

VM Basic 72 Digital Mixing System

The all digital Roland V-Mixing System, when fully expanded, is capable of mixing up to 94 channels with 16 stereo (32 mono) onboard multi-effects including COSM Speaker Modeling. Utilizing a separate component design, comprised of the VM-C7200 console and VM-7200 rackmount processor, allows the V-Mixing System to be configured to suit your needs. Navigation is made easy via a friendly user interface, FlexBus and EZ routing capabilities as well as a large informative LCD and ultra-fast short cut keys.



- 94 channels of digital automated mixing (fully expanded)
- Up to 48 channels of ADAT/Tascam T-DIF digital audio I/O with optional expansion boards and interfaces
- Separate console/processor design
- Quiet motorized faders, transport controls, total recall of all parameters including input gain, onboard mixer dynamic automation and scene memory
- 24 fader groups, dual-channel delays, 4-band parametric channel EQ + channel HPF
- FlexBus and "virtual patchbay" for unparalleled routing flexibility

- VS8F-2 Effects Expansion Board** -- Provides 2 stereo effects processors including COSM Speaker Modeling. Up to 3 additional boards can be user-installed into the VM-7200 processor, for 8 stereo or 16 mono effects per processor.

- VM-24E I/O Expansion Board** -- Offers 3 R-Bus I/Os on a single board. Each R-Bus I/O provides 8-in/8-out 24-bit digital I/O, totalling 24 I/O per expansion board.

- Up to 16 stereo (or 32 mono) multi-effects processors using optional VS8F-2 Effects Expansion Boards (2 stereo effects processors standard)
- COSM Speaker Modeling and Mic Simulation technology
- 5.1 Surround mixing capabilities
- EZ Routing allows mixer settings to be saved as templates
- Realtime Spectrum Analyzer checks room acoustics in conjunction with noise generator and oscillator
- Digital cables between processor and mixer can be up to 100 meters long - ideal for live sound reinforcement.

- DIF-AT Interface Box for ADAT/Tascam** -- Converts signals between R-Bus (VM-24E expansion board required) and ADAT/Tascam T-DIF. Handles 8-in/8-out digital audio. 1/3 rackmount size.

- VM-24C Cascade Kit** -- Connects two VM-Series processor units. Using two VM-7200 processors cascaded and fully expanded with R-Bus I/O, 94 channels of audio processing are available.

EFFECTS & PROCESSING

Lexicon

MPX-500 24-Bit Dual Channel Effects Processor



The MPX 500 is a true stereo 24-bit dual-channel processor and like the MPX100 is powered by Lexicon's proprietary Lexichip and offers dual-channel processing. However, the MPX 500 offers even greater control over effects parameters, has digital inputs and outputs as well as a large graphics display.

- 240 presets with classic, true stereo reverb programs as well as Tremolo, Rotary, Chorus, Flange, Pitch, Detune, 5.5 second Delay and Echo
- Balanced analog and S/PDIF digital I/O

- 4 dedicated front panel knobs allow adjustment of effect parameters. Easy Learn mode allows MIDI patching of front panel controls.
- Tempo-controlled delays lock to Tap or MIDI clock

t.c. electronic

M-One Dual Effects Processor



The M-One allows two reverbs or other effects to be run simultaneously, without compromising sound quality. The intuitive yet sophisticated interface gives you instant control of all vital parameters and allows you to create awesome effects programs quickly and easily.

- 20 incredible TC effects including, Reverb, Chorus, Tremolo, Pitch, Delay and Dynamics
- Analog-style user interface
- 100 Factory/100 User presets

- Dual-Engine design
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing

D-Two Multitap Rhythm Delay



Based on the Classic TC2290 Delay, the D-Two is the first unit that allows rhythm patterns to be tapped in directly or quantized to a specific tempo and subdivision.

- Multitap Rhythm Delay
- Absolute Repeat Control
- Up to 10 seconds of Delay
- 50 Factory/100 User presets

- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing



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MICROPHONES



C414 TLII "Vintage TL"

Combines the best of old and new: legendary C12 acoustics and the latest generation of C414 transformerless FET electronics. Although similar in design and shape to the C414BULS, the TLII features a capsule that is a faithful sonic recreation of the one used in the classic C12 tube mic combined with computer-aided manufacturing techniques that assure greater uniformity in response from microphone to microphone.

FEATURES-

- Cardioid, hypercardioid, omnidirectional and figure 8 polar patterns
- Warm, smooth microphone that is suitable for high-quality digital recording.
- Frequency response 10Hz to 20kHz



C4000B ELECTRET CONDENSER

This new mic from AKG is a multi polar pattern condenser microphone using a unique electret dual large diaphragm transducer. It is based on the AKG SolidTube design, except that the tube has been replaced by a transistorized impedance converter/preamp. The transformerless output stage offers the C4000B exceptional low frequency

FEATURES-

- Electret Dual Large Diaphragm Transducer (1st of its kind) • Cardioid, hypercardioid & omnidirectional polar patterns • High Sensitivity
- Extremely low self-noise • Bass cut filter & Pad switches • Requires 12, 24 or 48 V phantom power
- Includes H-100 shockmount and wind/pop screen
- Frequency response 20Hz to 20kHz



RØDE NT-2 Condenser Mic

The RØDE NT-2 is a large diaphragm true condenser studio mic that features both cardioid and omnidirectional polar patterns. The NT-2 offers superb sonic detail with a vintage flavor for vocal and instrument miking. Like all RØDE mics the NT-2 is hand-assembled in Australia and is available at a breakthrough price.

FEATURES-

- Dual pressure gradient transducer
- 1 capsule with gold-sputtered membranes • Low noise transformerless circuitry • Omni and cardioid polar patterns • 135dB Max SPL • High pass filter switch and -10dB pad switch • Gold plated output connector and internal head pins
- Shockmount, Flight Case, and Pop Filter included
- 20Hz-20kHz frequency response



audio-technica AT4047 Cardioid Condenser

The AT4047 is the latest 40 Series large diaphragm condenser mic from Audio Technica. It has the low self noise, wide dynamic range and high sound pressure level capacity demanded by recording studios and sound reinforcement professionals.

FEATURES-

- Side address cardioid condenser microphone for professional recording and critical applications in broadcast and live sound
- Low self noise, wide dynamic range and high SPL
- Switchable 80Hz Hi Pass Filter and 10dB pad
- Includes AT8449/SV shockmount



MICROPHONE PREAMPS

AVALON DESIGN

VT-737SP Mono Class A, Vacuum Tube-Discrete Preamp-Opto-Compressor-Equalizer



The VT-737SP is a vacuum tube, Class A processor that combines a mic preamp, instrument DI, compressor and sweepable 4-band equalizer in a 2U rack space. Like all Avalon Design products the VT-737SP utilizes a minimum signal path design with 100% discrete, high-bias pure Class A audio amplifiers and the best active and passive components available. Used by renowned artists and studios world wide and the winner of the Electronic Musician 1999 Editors' Choice Award for Product Of The Year.

FEATURES-

- Combination of TUBE preamplifiers, opto-compressor, sweep equalizer, output level and VU metering in a 2U space
- Four dual triode vacuum tubes, high-voltage discrete Class A with a 10 Hz to 120kHz frequency response ± 0.5 dB
- The Preamp has three input selections- The first is a high performance XLR balanced mic input transformer with +48v phantom power, the second is a high impedance instrument DI with a 1/4" jack located on the front panel and the third is a discrete high-level Class A balanced line input.
- High gain switch boosts overall preamp gain and a passive variable high pass filter, hardwire relay bypass and phase reverse relay is available for all three inputs
- The Opto-Compressor uses a minimum signal path design and features twin Class A vacuum tube triodes for gain matching. A passive optical attenuator serves as a simple level controller. Variable threshold, compression ratio and attack and release offer dynamics control from soft compression to hard knee limiting.
- The dual sweep mid-EQ can be side chained to the compressor allowing a broad range of spectral

- control including de-essing. The EQ can be assigned pre and post compressor from the front panel to add even greater sonic possibilities.
- Two VT-737 SPs can be linked together via a rear panel link cable for stereo tracking
- The Equalizer utilizes 100% discrete, Class A-high-voltage transistors for optimum sonic performance.
- The low frequency passive shelving EQ is selectable between 15, 30 60 and 150Hz with a boost and cut of ± 24 dB
- The high frequency passive shelving EQ is selectable between 10, 15, 20 and 32 kHz with a boost and cut of ± 20 dB
- The low-mid frequency is variable between 35 to 450 Hz while the high-mid frequency is variable from 220Hz to 2.8 kHz. Both mid-band frequencies offer a boost and cut of ± 16 dB and a hi-D/Q switch.
- When the EQ to side chain is used, the low and high EQ is still available for tonal adjustment
- The Output level is continuously variable and utilizes an another dual triode vacuum tube driving a 100% Class A high-current balanced and DC coupled low noise output amplifier.
- Sealed silver relay bypass switches are used for the most direct signal path

POWERED STUDIO MONITORS



VERGENCE A-20 Studio Reference Monitor System



Incorporating a pair of 2-way, acoustic suspension monitors and external, system-specific 250 watt per side control amplifier, the A-20 provides a precise, neutral studio reference monitoring system for project, commercial and post production studios. The A-20's control amplifier adapts to any production environment by offering control over monitoring depth (from near to far field), wall proximity and even input sensitivity while the speakers' magnetic shielding allows seamless integration into today's computer based studios.

- Type Modular, self-powered near/mid/far-field monitor.
- 48Hz - 20kHz frequency response @ 1M
- Peak Acoustic Output 117dB SPL (100ms pink noise at 1M)
- XLR outputs from power amp to speakers
- Matched impedance output cables included.

- 6dB LF Cutoff 40Hz
- 5 position wall proximity control
- 5 position listening proximity control between near, mid and far-field monitoring
- Power, Overload; SPL Output, Line VAC and Output device temperature display.

Amplifier

- Amplifier Power 250W (continuous rms/ch), 400W (100ms peak)
- XLR, TRS input connectors
- Headphone output
- 5-position input sensitivity switch with settings

Speakers

- 2-way acoustic suspension with a 6.5-inch treated paper woofer and a 1-inch aluminum dome tweeter
- Fully magnetically shielded with an 18-inch recommended working distance

PS-5 Bi-Amplified Project Studio Monitors



The PS-5s are small format, full-range, non-fatiguing project studio monitors that give you the same precise, accurate sound as the highly acclaimed 20/20 series studio monitors. The use of custom driver components, complimentary crossover and bi-amplified power design provides a wide dynamic range with excellent transient response and low intermodulation distortion.



FEATURES-

- 5-1/4-inch magnetically shielded mineral-filled polypropylene cone with 1-inch diameter high-temperature voice coil and damped rubber surround LF Driver
- Magnetically shielded 25mm diameter ferrofluid-cooled natural silk dome neodymium HF Driver
- 70 watt continuous LF and 30 watt continuous HF amplification per side
- XLR-balanced and 1/4-inch (balanced or unbalanced) inputs

- 52Hz-19kHz frequency response ± 3 dB
- 2.6kHz, active second order crossover
- Built-in RF interference, output current limiting, over temperature, turn-on transient, subsonic filter, internal fuse protection
- Combination Power On/Clip LED indicator
- 5/8" vinyl-laminated MDF cabinet

Hafler

TRM-6 Bi-Amplified Studio Monitors

Offering honest, consistent sound from top to bottom, the TRM-6 bi-amplified studio monitors are the ideal reference monitors for any recording environment whether tracking, mixing and mastering. Supported by Hafler's legendary amplifier technology providing a more accurate sound field, in width, height and also depth.



FEATURES-

- 33 Watt HF & 50 Watt LF amplification
- 1-inch soft dome tweeter and 6.5-inch polypropylene woofer
- 55Hz - 21kHz Response
- Magnetically Shielded
- Electronically and Acoustically Matched

Also Available- TRM-8

- 1-inch soft dome tweeter and 8-inch polypropylene woofer
- 45Hz - 21kHz frequency response ± 2 dB
- 75 Watt HF, 150 Watt LF amplification

TRM-10s And TRM-12s Active Subwoofers

Combining Hafler's legendary amplifier technology with a proprietary woofer design, the TRM10s and TRM12s active subwoofers provide superb bass definition required in today's studio and surround sound environments.



TRM-10s

- 10-inch cellulose fibre cone down firing woofer.
- 200 watt low frequency amplifier
- 30Hz to 110Hz frequency response ± 2 dB
- 24dB/octave Linkwitz-Riley crossover variable (40Hz to 110Hz)

TRM-12s

- 12-inch cellulose fibre cone down firing woofer.
- 200 watt low frequency amplifier
- 25Hz to 110Hz frequency response ± 2 dB
- 24dB/octave Linkwitz-Riley crossover variable (40Hz to 110Hz)

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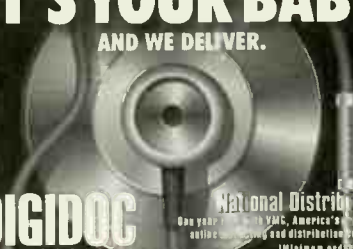
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ACROSS THE BOARD

continued from page 170

figure something out. I moved all of the software and audio files over to the G4/500 at the show, thinking that maybe it had something to do with the Powerbook. The tour manager was aware of the time crunch for delivery of the master CD and kept coming by and asking, "How we doin'?" My blank stare and bleeding fingers were enough of a reply.

Okay! Last chance. Go into Spark, change all of the crossfade points just a hair, make an image file, check the transitions in Jam, and burn the CD. Now, pop the CD into a player and listen. Exactly the same glitches in exactly the same spot. Walk to the edge of the stage. Not high enough to hurt myself. I should have thought of this back at the hotel.

PLAN B

After the show we flew to West Palm Beach. We got there at 1:30 AM. I had a car waiting to drive me 100 miles to Miami. I arrived at 3:00 AM and fired up my studio. I was ready to start over with the

whole process. Re-enter the songs, re-do the edits, and burn the CDs on a system I knew worked. It is now Monday morning. I am in Miami. SFX was expecting the master in L.A. at 10:00 AM *today* and I have nothing to send them. Will there be 74:34 of silence broadcast for the Steely Dan radio show? How will they know where to insert the commercials?

Before I start completely over, let me just try one thing: I transfer the software and audio files, including the already generated Jam image file, over to my Mac 9600 with SCSI CD burner. I start Jam, load the image file, and listen to the same transitions. Everything is still perfect in preview mode. I insert a blank CD and click on "Burn." The finished CD ejects; I pop it in the same CD player and...yippee! Perfect. All of the transitions are perfect. Everything is fine.

I listened to the whole CD once more to make sure. Still perfect. I called FedEx and sent the master via Same Day FedEx to L.A. By 1:00 PM SFX had the master, made the copies, and sent them to the radio stations. Saved by the bill. The FedEx bill — \$193 for same-day service to L.A. Ouchie!

The problem had to be either the

QPS drive or the FireWire driver for Toast and Jam (they both use the same extension). I e-mailed Adaptec about the problem. They responded a couple of days later:

"Although QPS supports it, we know that disc-at-once does not currently work with the QPS drivers in our software. We are working on an update to fix this issue."

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The new Steely Dan DVD is jam-packed with video, PCM, AC-3, and DTS. There have been some complaints about the audio not being in sync with the video. It turns out that most players can't keep up with the 10 MB/sec data rates and the video is delayed slightly because of processing time. This makes the audio sound early. It is different with every player, and depends on which audio track you're listening to. I guess if you really want to hear it right you are going to have to buy a Denon DVD player and a Lexicon MC-1 preamp for decoding the audio. About \$8,000 for both.

Oh well. It usually feels good to be on the bleeding edge of technology. This time I think I am going to need a transfusion. Maybe two transfusions. **EQ**

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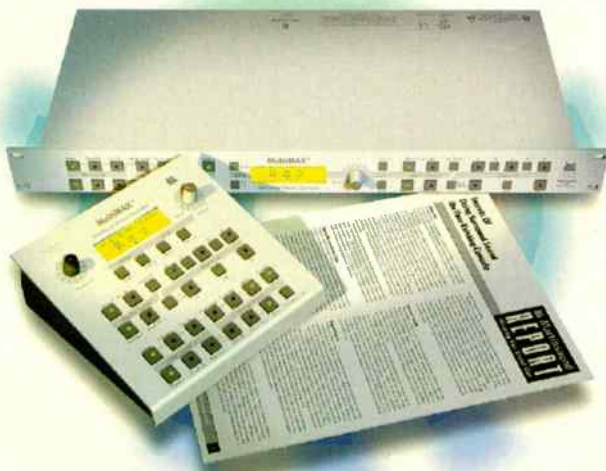
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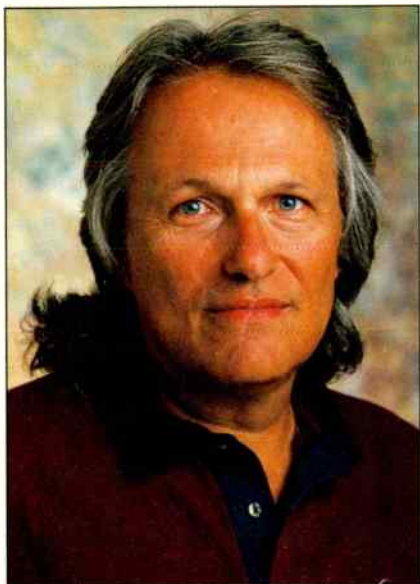
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BY ROGER NICHOLS

Remember last month I talked about my portable audio editing system for the road? Spark XL, Toast 4.1 Deluxe, Jam 2.6, and a Vxpocket PCM card for digital in and out of a Powerbook G3/500. Well, it almost worked.

Four days before a syndicated radio broadcast of the Steely Dan PBS TV show, I got a call asking for an edited version with just the music portion of the show with the audience reaction put back in. All of my copies were in Miami on DLT-7000 tapes, while I was in a hotel room in Washington, DC. Nobody was at my studio to make me a copy from the DLT tape (hey, I gave them two weeks off), so I called River Sound, which was where we mixed the show. We had printed the final mix to two tracks of the 48-track digital machine, so they just copied those tracks off to a CD from the digital outputs.

I was gloating when they asked me if I needed to find a studio to edit the show. "What, are you kidding? I can do

stuff like this in my hotel room. Just give me a direct line to room service and I'll be done by tomorrow."

I fired up the Powerbook, launched Spark, and ripped the audio tracks off of the CDs. I imported all of the cuts into Spark and proceeded to edit all 14 songs together with brilliant crossfades and superb level control.

Altogether the radio show was 74:34 with no blank space between cuts.

This would require cutting the CD in disc-at-once mode. Not possible with Toast 4.1, but possible with Toast 4.1 Deluxe or Jam 2.6. Jam was my choice because you can audition the transitions between tracks before you cut the CD. Version 2.6 also supports FireWire and USB CD burners.

From Spark, you click on the CD icon and Spark builds an image file for Jam, loads Jam, and opens the newly created image file. There it was. The completed CD image just waiting for the "Burn" command. I previewed all of the transitions to make sure that there were no glitches added by Spark when it made the Jam disc image. Everything was perfect. I inserted a blank CD in the QPS 8X FireWire CD recorder and clicked on "Burn."

Life in a hotel digital editing suite was good. Or so I thought.

After the finished CD was ejected, I popped it into my portable CD player to listen to the whole thing. All 74:34 of it. Everything was perfect until I got to the transition between cut 10 and cut 11. As the audience was fading out, there was a loud half-second chunk of audience, a very short space of nothing, and the first attack of cut 11 was distorted. It sounded like a recording (a pretty good recording actually) of the Mormon Tabernacle Choir during a train wreck inserted between my two CD cuts.

I went back and listened to the image file in Jam. The transition was fine. No glitches. My first thought was that Spark had placed some illegal pointers in the image file that corrupted the CD-R, but sounded fine in preview mode. I went back to Spark and made a different crossfade between tracks 10 and 11, produced a new image file, and previewed it in Jam. The preview was fine. I burned another CD and listened. The same Gawd-

Awful glitch in the same spot. Who can I kill? I can't kick my dogs; they're safe in Miami.

Maybe it was some very weird hardware-based error in the CD burner? I cut out one of the earlier tracks so that the transition between cuts 10 and 11 would happen in a different physical spot on the disc. New image file, new CD burn, then a listen. The same glitch in the same musical spot. Not hardware.

Maybe it was a Jam software error. I reconfigured Spark to use Toast 4.1 Deluxe instead of Jam. I put the missing cut back in, made a new image file, selected disc-at-once mode in Toast and burned another CD. Same glitch in the same place. With nobody else in my hotel room I was soon to become the target of my own rage.

It was now two days before the air-date of the radio show and I had nothing to send. I was supposed to send my CD master to SFX Radio for them to duplicate and send on to the radio stations. This is all made worse by the fact that each afternoon I have to leave the hotel and go to the venue for that night's Steely Dan show. After this show, we were going to fly to West Palm Beach, have a day off, and then more shows.

I took all of my hardware to the show venue. Maybe in the two hours between soundcheck and the show I could

continued on page 167

The first attack of cut 11 was distorted. It sounded like a recording (a pretty good recording actually) of the Mormon Tabernacle Choir during a train wreck inserted between my two CD cuts.



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