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CELEMONY MELODYNE

# CAN'T FORGET ABOUT DRE

HIP-HOP PIONEER DR. DRE REVEALS HIS  
GRAMMY-WINNING PRODUCTION TECHNIQUES

ISSUE SIX

UNITED ENTERTAINMENT  
MEDIA MAGAZINE

USA \$3.95 • CAN \$4.95 • U.K. £2.95 • ISSUE #6



TESTED: IZ TECHNOLOGY RADAR 24

World Radio History

## It does more than burn. It sizzles.

Introducing the new Korg D1600 Digital Recording Studio, the most complete and affordable solution for home and project recording. This 16-track digital recorder packs recording, mixing and final CD mastering into a professional quality all-in-one unit. With even more features and capabilities, the D1600 has everything for your music-making needs.

The D1600 comes with a massive 20 GB hard drive for more recording time and less worry about running out of time or space. And thanks to its unique user-swappable design you can easily change drives from session to session using standard IDE mechanisms. The D1600 supports the largest drives possible, so say goodbye to making backups and clearing your drive for the next project. Simply swap it!

When it comes time to master or backup a project to CD you'll appreciate the D1600's internal CD-RW drive bay. (The Korg model CDRW-2 and many ATAPI-compatible devices can be used.) No cables. No additional power supplies. You can even record audio directly from the internal CD-RW drive. Try doing that with an external unit!

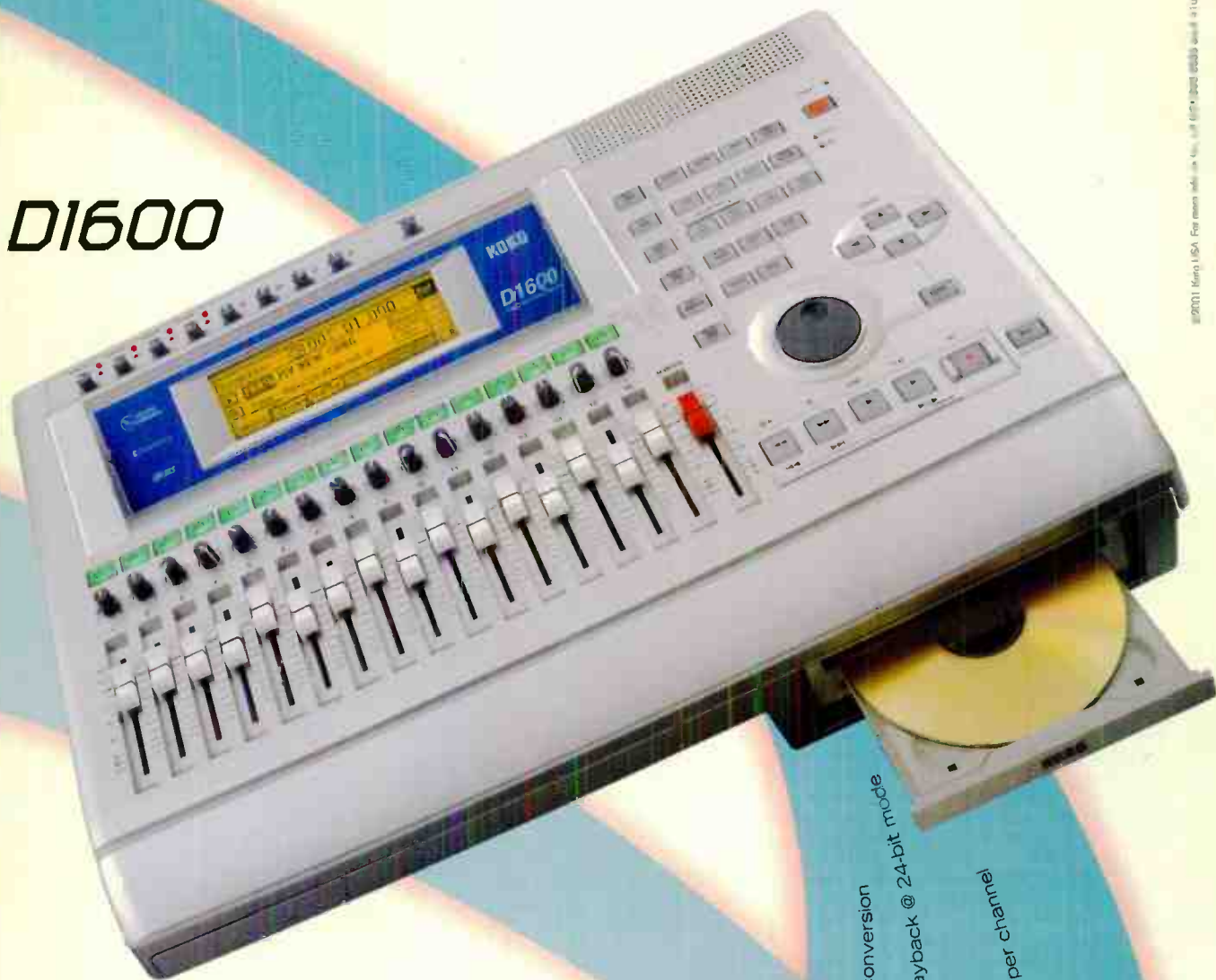
The effects power of the D1600 really shines when recording and mixing. Have up to eight Insert effects configured any way you like, plus two Master and one Final effect. It's like having a professional rack of high-quality effects processors with everything from reverbs and delays to compressors, limiters and EQs. Plus, our special REMS™ models of mics, guitar amps and speaker cabinets.

With its user-friendly TouchView graphic display and intuitive operating system, the D1600 is just begging to be touched. Lay your hands on it and let your creativity take over. Once you heat things up, there's no telling what you'll be able to burn.

**KORG**



# D1600



- Recording Format: 24-bit/16-bit uncompressed, 44.1 kHz
- 8 track recording/16 track playback @ 16-bit mode
- Total of 128 tracks (8 virtual tracks per track)
- 24 channel, 8 bus digital mixer with scene memory and MIDI automation
- Four XLR inputs w/phantom power
- 215 PCM drum rhythms
- 24-bit A/D, D/A conversion
- 4 track recording/8 track playback @ 24-bit mode
- 100 scenes/4 locate points per song
- 106 effects algorithms
- 24-bit optical SPDIF I/O
- 3-band EQ per channel
- Built-in tuner

CIRCLE 17 ON FREE INFO CARD

# Get the MX-2424 Advantage!

“ The ‘Golden Ears’ all found the TASCAM performed extremely well, nearly beating out a unit priced four times higher. The listening tests confirmed what I already knew: the MX-2424 is a solid performer at a great price. ”

- Glen O'Hara,  
*Pro Audio Review Magazine*

“ ...the MX-2424 puts high-resolution sound quality and professional recording features at your fingertips. ”

- *Electronic Musician Magazine,*  
2001 Editor's Choice Award

“ ...the TASCAM MX-2424 is a rock-solid, excellent studio recorder that performs well, sounds great and is priced right. ”

- George Petersen,  
*Mix Magazine*

“ The machine alone is impressive enough to warrant close attention, but the implications inherent in the control and networking capabilities make it potentially astounding. ”

- Rob James,  
*Studio Sound Magazine*

You probably  
machines in  
is the  
What you  
advantages  
multitracks,  
transition  
just getting  
understand



\* based on an average 3 1/2 minute song of 24 tracks at 24-bit/48kHz. Your mileage may vary.

† Offline CD-R backup is possible with an Ethernet-equipped computer. The \$749 (USD) reference is based on TASCAM's CDR-Pro Bundle.

MX-2424 24-TRACK 24-BIT HARD DISK RECORDER/EDITOR

World Radio History

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know that with thousands and thousands of use around the world, the **TASCAM MX-2424** most popular 24-track recorder ever made. What most people don't know is that the MX-2424 offers huge advantages that aren't available on other standalone hard disk recorders regardless of price. Whether you're making the transition from analog and tape-based digital recorders or jumping into recording, here's some info to help you truly appreciate the MX-2424 advantage.

### Ph.D. in Nuclear Physics Not Required

If you've ever recorded before, you'll find the MX-2424 as easy to use as any multitrack recorder. Flip the Power switch, arm a track and hit the Record and Play buttons. Voila...you're tracking to its internal hard disk. Since TASCAM has been the world leader in multitrack recording for over 25 years, we know how to create gear that's powerful and sophisticated without making the learning curve too steep.

### Edit How You Like: MX-View™ Waveform Graphic Interface and Extensive Front Panel Editing

One of the main reasons to get into hard disk recording is the incredible editing power versus tape. Running in native Mac and PC versions and connected via a fast 100Mb Ethernet interface to your computer, the upcoming MX-View is a powerful graphic editing interface that offers sophisticated, sample-level editing on par with full-featured digital audio workstations. You can drag and drop on the fly, get onscreen metering for up to six MX-2424s, set up custom configurable keyboard shortcuts, manage virtual tracks and much more. If you want to use the MX-2424 in the field, its



extensive built-in front panel editing tools let you edit without lugging around a keyboard, monitor and mouse.

### True Recording Power: Take the Punch-in Challenge

24-track, 24-bit digital audio requires a powerful hard disk recording engine. The MX-2424 is so strong that it allows for seamless, gapless punches across 24 tracks, with up to 72 tracks of throughput to accomplish this considerable task. If you're brave, try arming 24 tracks on any other standalone 24-track hard disk recorder and quickly punching in and out. It's just one example of the MX-2424's awesome dual-processor recording power and extremely fast SCSI bus. You can choose between TapeMode and Non Destructive recording, and access up to 999 virtual tracks per project with 100 locate points, 100 levels of Undo and much more.

### Sound Designer II, Broadcast Wave Files and SCSI Drives for Ultra Flexible Compatibility

TASCAM understands the reality that you may need to interface your audio with other pieces of equipment. Since the MX-2424 writes Sound Designer II™ audio files to Mac-formatted disks and

Broadcast Wave audio files to PC disks, it's easy to move sound back and forth between your computer and the MX-2424. With these standard time-stamped file types and professional SCSI drives, you're ensured sample-accurate compatibility with Pro Tools™, Nuendo™, Digital Performer™ and more. With compatibility being so important to MX-2424 owners, it's no surprise that its 24-channel interfaces are ready to connect to just about any console, digital or analog. Or that its analog, TDIF and AES/EBU interface modules are 96kHz ready.

### Back Up Your Tracks: As Low As A Buck Per Song

Media	Cost of Drive	Media/10 Projects	Total Cost
90 Minute IDE Drive	\$299	10 Drives	\$2990
Orb Drive	\$299	1 Drive + 86 Disks	\$2879
TASCAM DVD-RAM	\$599	1 Drive + 20 Disks	\$1739
Offline CD-R Backup	\$749	1 Drive + 290 Disks	\$959

*If you're forced to use cheap disk drives to backup, you'll pay in the long run. DVD-RAM drives may be connected to the MX-2424's front panel or rear SCSI port, and offline CD-R backup via Ethernet transfer to your computer is the most cost-effective backup method available on any HD recorder by far.*

Hard disks are great for recording...but not so great for archiving and transferring audio. That's why the MX-2424 gives you choices like 9.4GB DVD-RAM discs for your backup solution. Or simply transfer your audio to your computer and backup to CD-ROM for as low as one dollar for an average pop tune\*.

### Get the Advantage of the Most Powerful and Most Affordable 24-Track Hard Disk Recorder Available Today

There's much more to the MX-2424 than what fits on this page, like its award-winning sound quality, professional built-in synchronization tools and TASCAM's amazing online support forums. So if you're getting into the hard disk revolution, you might as well take advantage of the recorder with all the advantages. Just go to [www.mx2424.com](http://www.mx2424.com) for the complete MX-2424 story, or check out the MX-2424 for yourself at any TASCAM dealer.

Available soon, the new MX-View graphic editing software offers DAW-style waveform editing power, drag-and-drop editing on the fly, control of up to six MX-2424s with metering and much more.

[www.mx2424.com](http://www.mx2424.com)

**TASCAM**  
a whole world of recording

CIRCLE 44 ON INFO CARD



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ON THE COVER:  
DR. DRE PHOTO BY MR. BONZAI

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# I CAN DO IT ALL BY MYSELF.



The Yamaha AW4416 is all the studio you need to single-handedly record, mix and master a multi-platinum CD. This digital audio powerhouse comes fully equipped with every feature, specification and extra you could possibly want, including many crucial items our competition inexplicably left out. And it's all integrated with the signature style, performance and innovation that's put Yamaha digital gear in a class by itself. Once again, Yamaha gives you more for less.

**NO DATA COMPRESSION** – The AW4416 delivers full-fidelity 24-bit or 16-bit audio all the time on all 16 tracks

**WAV FILE FORMAT** – Files are stored in standard .wav format for ultimate compatibility and import/export ease

**SONIC FOUNDRY® SOFTWARE SUITE** – Acid®, Sound Forge® and Siren Xpress® are included for comprehensive editing

**32-BIT LEVEL DIGITAL MIXER** – Motorized fader automation accommodates an internal digital patchbay, providing infinite routing options

**STUDIO-GRADE EFFECTS** – Yamaha loaded the AW4416 with dedicated 4-band parametric EQ and dynamics on all channels, plus two patchable multi-effects processors

**INSERT I/O** – Patch your analog gear onto any track to augment the AW4416's capabilities

**EXPANDABILITY** – Dual card slots let you add analog and digital I/O options, Apogee® converters or the new WAVES® multi-effects processor card

**YAMAHA CD BURNER ON-BOARD** – CD mastering and backup are always available and easily accessible

**DEDICATED METER BRIDGE** – It's not a pricey option, it's included

**MAXIMUM PORTABILITY** – The AW4416 is small and light enough to carry on location in our new hardshell case\*

**AFFORDABILITY** – Get all this power for only \$3,299\*\*



WWW.AW4416.COM

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CIRCLE 33 ON INFO CARD

## Plugged Into The Outlet

For the past five or six months, I've been traveling on business a great deal — tradeshows, visits to manufacturers and studios, and so on. Being on the road and putting out a magazine — and still trying to put in time at my studio — takes its toll. Yeah, I've been teetering on the brink of burnout for awhile now. Interestingly, this topic, as well as how to balance a demanding and time-intensive career like recording engineering with family, friends, and, well, having a life, has come up several times on the EQ Expert Forums ([www.eqmag.com](http://www.eqmag.com)). Everyone seems to have their own way to deal with this problem, whether it's by scheduling time off, turning down an occasional job when you're already overbooked, just taking short breaks now and then, or whatever.

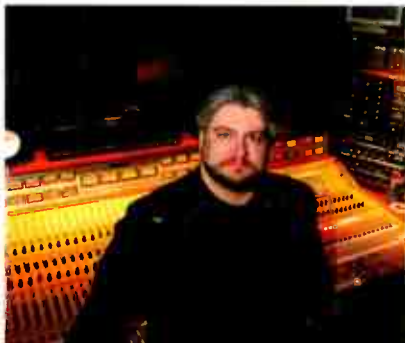
For me, the key is to get back to the basics (as sports coaches like to preach) and get out and make some music as a player. I rarely have time to practice anymore, so my chops aren't anywhere near what they used to be, but you know what? I have a great time playing, and I always come away feeling refreshed and energized. Plus, by keeping myself open to picking up my guitar and playing now and then, I find myself in a variety of new and (for me) thrilling musical situations. Just the other day, I ended up in a jam session with some musicians from Sudan — a long way from my musical roots growing up in the wilds of North Dakota!

The point is, we all love what we do so much that it's easy to get completely caught up and immersed in the rigors of recording, keeping up with the gear, and building a studio business. After all, we're not working, we're playing! But as much as you enjoy your job, be sure that you allow yourself some kind of outlet — whether it's music/audio-related or not — to keep yourself sane, and your life in balance and on track. As a bonus, when you come back to your studio, you'll be much more on top of your game.

### EVEN MORE WINNERS

A few months ago I mentioned in this space that there were new categories in the Grammy awards this year recognizing engineering accomplishments. According to postings up on the EQ Expert Forums, even more progress has been made in support of engineering and technical achievements. Nancy Matter, who was profiled in our April 2001 issue, helped spearhead an initiative that will include mastering engineers in the Grammy of the Year awards. According to a post by Ed Cherney, Nancy received a "big round of applause" at the Los Angeles Chapter Governors meeting for her efforts to push the initiative through. Congratulations, Nancy, and "pre-congratulations" to all the mastering engineers who will be honored with awards due to her efforts.

— Mitch Gallagher  
[mgallagher@uemedia.com](mailto:mgallagher@uemedia.com)



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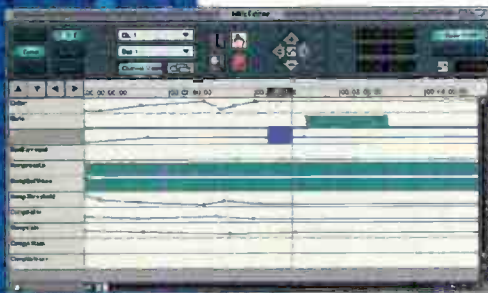
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# WE'VE ADDED SO MANY NEW FEATURES THAT WE SHOULD PROBABLY CALL IT THE DIGITAL 8•BUS MK. 3.0



*Mackie Real Time OS™ 3.0 Fat Channel Screen.*



*New 3.0 Mix Editor Window*



*New 3.0 24-Ch. Overview Screen*



*Massenberg Stereo Parametric Equalizer*

Other digital mixers get old. The Mackie Digital 8•Bus gets better and better.

We just added over 50 significant enhancements with our new, free Mackie Real Time OS™ 3.0 upgrade including...

- 3rd-party plug-ins
- Enhanced dynamics
- Pre-DSP inserts
- 200 levels of undo
- 48-channel overview screen
- 24-bit Alt I/O
- An advanced Mix Editor with auto-punch, view sizing arrows, auto-loop SMPTE time code boxes, Loop In/Loop Out, Punch In/Punch Out and Locate markers in the time bar
- Event Automation Track
- Enhanced Surround Sound mix environment with Depth of Center and LF Gain Control for each channel, surround-corrected bus and track assignment, front-to-rear pan via D8B control surface or MIDI and a 72-channel Overview window that instantly shows you where everything is
- Enhanced, flexible MIDI I/O mapping for all channel strip and Master parameters
- 24-bit plug-in inserts across the main L/R buses

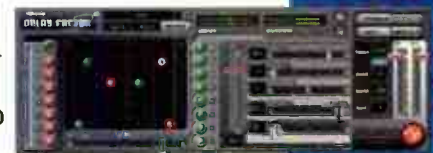
We could go on and on. But the main point is that if you buy a Mackie Digital 8•Bus now, you're not just getting a superb, productivity-boosting creative tool. You're buying the only digital console with an open architecture that provides for future enhancements, too. Mackie Real Time OS™ 3.0 is dramatic proof...and there's more to come.

Call for an excruciatingly detailed brochure or log onto our web site for more information on the remarkable Digital 8•Bus.

**MACKIE**  
Digital Systems



*Drawmer™ Expander Plug-in*



*Acuma Lab™ Filter Machine™ and more.*



*Antares™ Auto-Tune™*

Made by Mackoids in Woodinville WA, USA







**DRUM MIKING FIGURES**

Regarding the “Drum Miking for Live Recordings” in the April 2001 issue, the drum setup and mic placement in figs. 1 and 2 are incorrect. Presented with that type of strange drum setup, I would have placed the mics much differently. On the other hand, the drum setup in figs. 3 and 4 is correct, but the mic and speaker placement is not. For these diagrams, I believe a “bird’s eye view” would have been more effective.

Please run the correct diagrams that coincide with my miking technique.

Steve Remote  
President/Chief Engineer  
Aura Sonic Ltd., Flushing, NY

“I APPLAUD YOU FOR WRITING ABOUT MANSON’S MUSIC RATHER THAN THE CORPORATE POP THAT SEEMS TO SOUND MORE AND MORE ALIKE EVERY DAY.”

—GREG MOORE, LOS ANGELES, CA

**VOCAL PLANET AMENDMENT**

Thanks for your review of the Spectrasonics Vocal Planet sample library [April, 2001]. I would like to address one thing: the “weakness” about not enough stereo samples. I really don’t think this is a fair criticism, since every ensemble and group recording *is* in stereo, including the entire Gospel Choir disc, Children’s Choir, Urban Youth Choir, Jazz Ensembles, R&B Background phrases, etc. The mono samples are all recordings of soloists, and using one mic for a single vocalist is pretty standard practice — wouldn’t you agree? We could have used stereo samples of the mono recordings, but that would have taken up twice the amount of space on the CD-ROM, forcing us to cut down to about 5,000 samples (instead of 12,000).

From the review, it sounds more like the reviewer wished that there were more processed vocals, which is a perfectly valid subjective comment.

Eric Persing  
Spectrasonics

[This erroneous weakness should have been removed from the review when it was pointed out to us during the

factcheck process. Our sincere apologies for not making the required correction before the article was published.]

**MAIL ON MAIL**

I am amazed by the volume of negative mail about your Marilyn Manson issue. I would have imagined your readers to be much more open minded and slow to judge a book by its cover. I listen to everything from Brahms to Beatles to Brian Transeau, and I am not ashamed to admit that I like Marilyn Manson’s music. I simply disregard the ghoulish look and take the lyrics in jest or as a calculated marketing ploy for the demographic of their audience. However, the music is entertaining enough for me to play often.

In particular, the *Mechanical Animals* CD has some of the best production of heavy metal I’ve heard, and, in fact, is a model for me because of its balance, its creativity in that genre, and power. In fact, I’d like more details, and I applaud you for writing about Manson’s music rather than the corporate pop that seems to sound more and more alike every day.

Greg Moore  
Los Angeles, CA

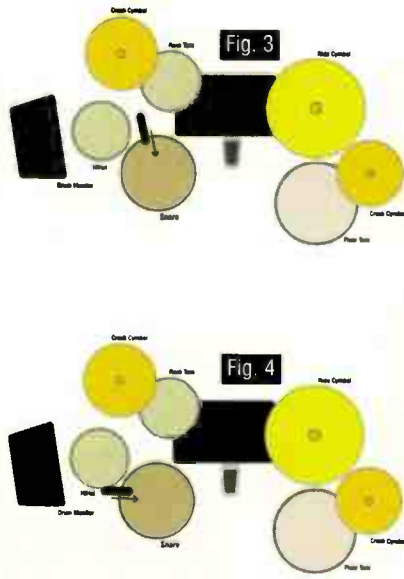
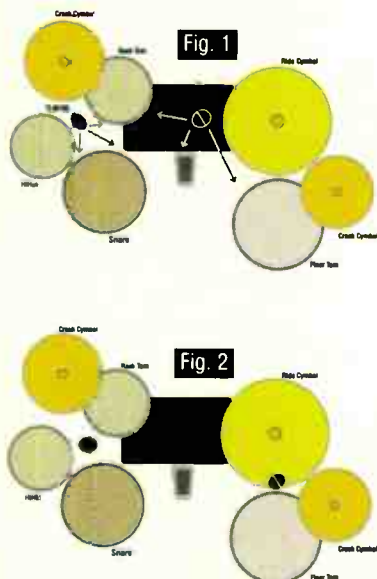
**EQ FOR EVERYONE**

I just wanted to thank you for writing about the kinds of things that both amateur and professional musicians love to read about. The tips I find in EQ are easy to understand and are extremely helpful.

Nathan Warden  
Tipp City, OH

**CORRECTION**

In EQ Guide to North American Recording Schools, which ran in the April 2001 issue, the number of course hours listed for the Ontario Institute of Audio Recording Technology was incorrect. The actual number of hours in the three semester course is 1,320, of which approximately half are lab hours. Our sincere apologies for this mistake and any confusion it might have caused.



Drum Miking Figures



SONY

"What a great machine!"

- ROGER NICHOLS, Grammy Award Winning Engineer/Producer, [www.eqmag.com](http://www.eqmag.com)

"The R100 packs more creative power per sample than most full size digital consoles." - BRUCE BOTNICK

# HOW DO YOU EVALUATE A DIGITAL MIXER? LISTEN.

"Sony clearly broke the mold with the DMX-R100. A dramatic improvement over other small digital consoles."

- JOHN NEWTON, Grammy-nominated engineer and owner of Soundmirror, Inc.

"We loved it... sonically beautiful and clean...the best small-format console ever... outstanding performance, execution and design."

- ROBERT MARGOULEFF and BRANT S. BILES, Proprietors of Mi Casa Multimedia Inc.

"This is the first digital console of this size that sounds this good. What goes in comes out. The R100 is right on the money."

- TOM LAZARUS, Engineer and owner of Classic Sound, NYC

"...pretty fantastic...rave reviews...incredible sonic integrity...and incredibly easy to learn and operate...a new generation of digital console."

- DENNY PURCELL, Award-winning mastering engineer, President - Georgetown Masters

"Sounds great, reliable and easy-to-use." - ALLEN SMITH, Chief Engineer, Soundtrack Boston



The DMX-R100 is changing even the experts' opinion of what to expect from a compact, affordable digital console. A full input module with a knob for every key function; selectable high sample rate operation; 5.1 surround mixing and

monitoring; and a high resolution touch screen that becomes an extension of your hands. The next thing to do is go out and hear one for yourself. In the meantime call today and we'll send you a brochure and tutorial CD-ROM.

## DMX-R100



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[www.sony.com/proaudio](http://www.sony.com/proaudio)

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World Radio History

**MONITORING FROM ANOTHER ROOM**

*This sounds crazy, but it seems like I get more big insights from hearing a mix played on a stereo/box in another room than just sitting in the sweet spot in front of speakers. I believe in this so much that, if I had my druthers, I would have a set of speakers in the room adjacent on a switch to check things. I suppose it's a combination of the room coloration combining with the distance/mono making the "perspective" more readily objective. Has anyone heard of anyone doing this?*

— Chip McDonald

I do it all the time. It really helps for setting vocal levels and solo levels. When you find yourself leaning your head toward the room that the sound is coming from to listen, then you know it's too low. Nothing mixes like good old air!

—d. gauss

This is absolutely standard procedure for me when I mix. I go so far as to open the outside doors in my basement and wander around outside, listening. In 5.1, I probably spend as much time away from the sweet spot as in it — I often correct panning/placement to help organize the perceived footprint *after* I listen away from the sweet spot.

—George Massenburg

Something I do all the time when mixing is to crank up the main monitors, exit the room, close the door, walk around my hallway and listen to the mix from outside the room. This can really help when attempting to balance levels in a mix. For some reason, I find I'm able to better discriminate whether a vocal is sitting comfortably, is buried, or is leaping out of a mix. I always "proof" my

mixes by listening on a ghetto blaster and on my small computer speakers. It all helps.

—lan

Judgment day for my mixes is always in the car. Personally, I think room acoustics and design, as well as monitors, are grossly overblown. If I'm ever faced with mediocre monitors, I play one of my reference/inspiration CDs and listen. Playing familiar music gives me a lot of cues on what's emphasized or missing in any listening environment.

—NYC Drew

**WHY USE HARDWARE EQ WHEN YOU CAN USE SOFTWARE PLUG-IN EQ?**

*Why all the fuss over outboard EQ on mic preamps or standalone EQs if one works with a DAW? This commits you to a specific tone that you have to work with, like it or not, in your digital workstation. If you don't use an external EQ, then using the software EQ on a track allows for a non-committed approach. You can "digest" the EQ settings for a few days and then go back and tweak or re-EQ if you're not happy with it.*

— Intense Jim S

That's a very good point. However, it's really a matter of taste. I tend to lean toward the old thought that the front end is that much more important when you're recording digitally. I do like the fact that I can go straight in from a pre-amp and create a tone as the track progresses, though. One reason that I try to get everything recorded with a tone that I'll be happy with is because it helps save on DSP during overdubs; I don't have to have a ton of plug-ins just to create a rough that is pleasant to listen to.

**WEBLINK**

Have a question you'd like answered? Visit Roger Nichols, George Massenburg, Ed Cherney, and David Frangioni online at [www.eqmag.com](http://www.eqmag.com).

—shawno

Many engineers like to fix stuff on the way to the recording medium so that it "plays back nicely," then they further fix stuff at the mixdown stage — it's down to preferred working methods. Other engineers like to record flat and have all the scope to alter the whole sound at a later stage.

I work the first way. I developed my own criteria for getting audio to analog tape; now I'm punching my way out of a sack and emerging with methods to get audio to a DAW.

I've done a couple of live concert albums. Remote trucks tend to just get the material down safe and flat. When first confronted with these tapes, I was shocked at how muddy and raw they were. It was quite a job to sculpt the basic sounds into anything good-sounding.

In a perfect world, you would EQ nothing — just use mic placement and a touch of compression!

—Jules

At some point, you have to start making decisions. That is, after all, what mixing and production are — decision commitments. The earlier in the process you can do that, the more efficient you end up being. It's all a matter of your comfort level with the monitoring/recording environment and the material.

I personally work both ways, and still find it useful, even in digital, to EQ to tape/hard drive. There will generally be another pass at the mix stage, and it's often useful to have done some of the "homework" beforehand to limit the number of bands you have to apply at the final stage. It depends on the situation/project.

—mudsmith

I never say never, but rarely do I EQ vocals on the way in. Usually drums. Not much else (most of the time).

—David Frangioni



ED CHERNEY  
BEHIND THE BIG BOARDS

ROGER NICHOLS  
DIGITAL RECORDING FORUM

GEORGE MASSENBURG  
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# 5.1

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BM6A

- The mountain climber constantly evaluates the situation while reaching for the top. Every little step is considered carefully while maintaining the big picture. He trusts his judgement 100%. So should we as audio professionals. Dynaudio Acoustics monitors provide the transparency and details we need to judge audio.

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**THE PRODUCT:** Roxio Toast 5 Titanium  
**THE BASICS:** CD and DVD mastering software

**THE DETAILS:** This easy-to-use and comprehensive package attempts to make mastering of CDs and DVDs effortless. Building on the merits of earlier versions of Toast are some improved or added features such as a new graphic interface, iMovie and iTunes integration, support for DVD-R, DVD-RW, DVD-RAM, and DLT drives, background burning, online help system, new MP3 disc format, and Mac OS X support. It offers a variety of CD formats, including HFS and HFS+, Joliet, and ISO 9660. The benefits aren't limited to audio capabilities — there's also a complete version of Magic Mouse Disc for creating and printing CD labels.

**CONTACT:** Roxio at 408-635-ROXI or visit [www.roxio.com](http://www.roxio.com). Circle EQ free lit. #110.

**THE PRODUCT:** SEK'D ProDif 88  
**THE BASICS:** 8-channel AES/EBU card

**THE DETAILS:** The new ProDif 88 includes additional stereo-balanced analog outputs and word clock In and Out drivers for Windows 95/98, NT, 2000, and ASIO. It's designed to play eight channels of digital audio simultaneously and supports 16-, 20-, and 24-bit rates. Sample rates include 44.1, 48, 88.2, and 96 kHz. The ProDif provides a multi-pin connector that features four transformer-balanced stereo AES/EBU digital inputs and four transformer-balanced stereo AES/EBU digital outputs. It's projected to ship in April for \$699.

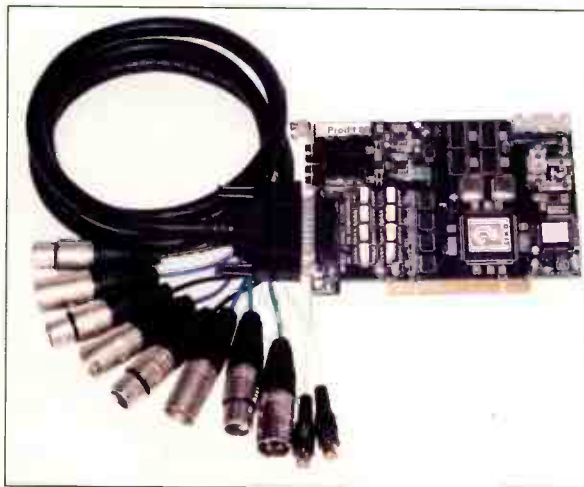
**CONTACT:** SEK'D America at 1-800-330-7753 or visit [www.sekd.com](http://www.sekd.com). Circle EQ free lit. #111.

**THE PRODUCT:** ARX 8 Pre Microphone Preamp

**THE BASICS:** Eight-channel microphone preamp

**THE DETAILS:** Offering an option for extending digital and analog mixing consoles, ARX's new microphone preamp solution features variable gain, 20 dB pad, phase reverse and switchable 48 V phantom power, comprehensive LED status indicators, balanced XLR inputs, and balanced 1/4-inch jack outputs.

**CONTACT:** ARX at 610-3-955-7859 or visit [www.arx.com.au](http://www.arx.com.au). Circle EQ free lit. #112.







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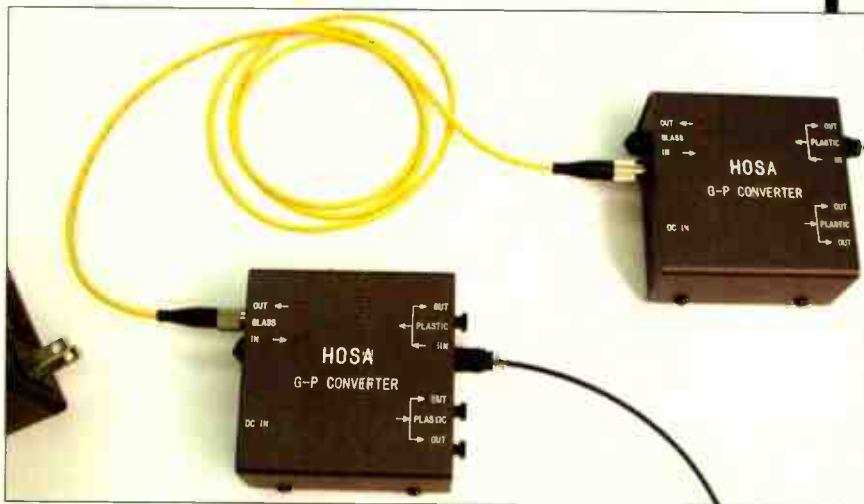
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**THE PRODUCT:** Brauner VM1 Klaus Heyne Edition Microphone  
**THE DETAILS:** Large diaphragm tube microphone  
**THE DETAILS:** These high-end, hand-made, German microphones are the work of respected designer Dirk Brauner. The good news is that they are now being distributed in the U.S. by Transamerica Audio Group. Once arriving stateside, they are personally given the final touch and thorough testing by A-list microphone modifier Klaus Heyne. The only bad news is that Transamerica reports that the high demand has created a waiting list of "six months."  
**CONTACT:** Transamerica Audio Group at 702-365-5155 or visit [transaudiogroup.com](http://transaudiogroup.com). Circle EQ free lit. #113.



**THE PRODUCT:** Universal Audio 1176SA  
**THE BASICS:** Stereo interconnect for 1176's  
**THE DETAILS:** With the high interest in stereo options for 1176's, Universal Audio is offering the 1176SA, a device that calibrates two mono 1176's for stereo use. Compatible with new and vintage model 1176's, it features a metal enclosure, gold-plated connectors, and a 2-year battery. It is available now and lists for \$99.  
**CONTACT:** Universal Audio at 831-454-0630 or visit [www.ualaudio.com](http://www.ualaudio.com). Circle EQ free lit. #114.



**THE PRODUCT:** Hosa Technology OGC-361  
**THE BASICS:** Long distance optical interface system  
**THE DETAILS:** The OGC-361 system is designed for extended lightpipe fiber optic signal runs. The lightpipe format is capable of transferring eight channels of digital audio data at a time, a maximum of 30 feet. This is a limitation inherent in the plastic optical media. The OGC-361 utilizes glass fiber cable and is capable of sustaining longer runs — the system up-converts the lightpipe signal at the source to the proper level for transmission through glass fiber cables. At the destination, it down-converts the signal for standard plastic-fiber transmission with TOSLINK connectors. The OGC-361 system ships with two identical units (uplinkable or downlinkable, as required). Glass fiber cables are not included but can be purchased from Hosa in 10 meter and 100 meter lengths. The OGC-361 is shipping now for \$499.  
**CONTACT:** Hosa Technology, Inc. at 714-736-9270. Circle EQ free lit. #115.

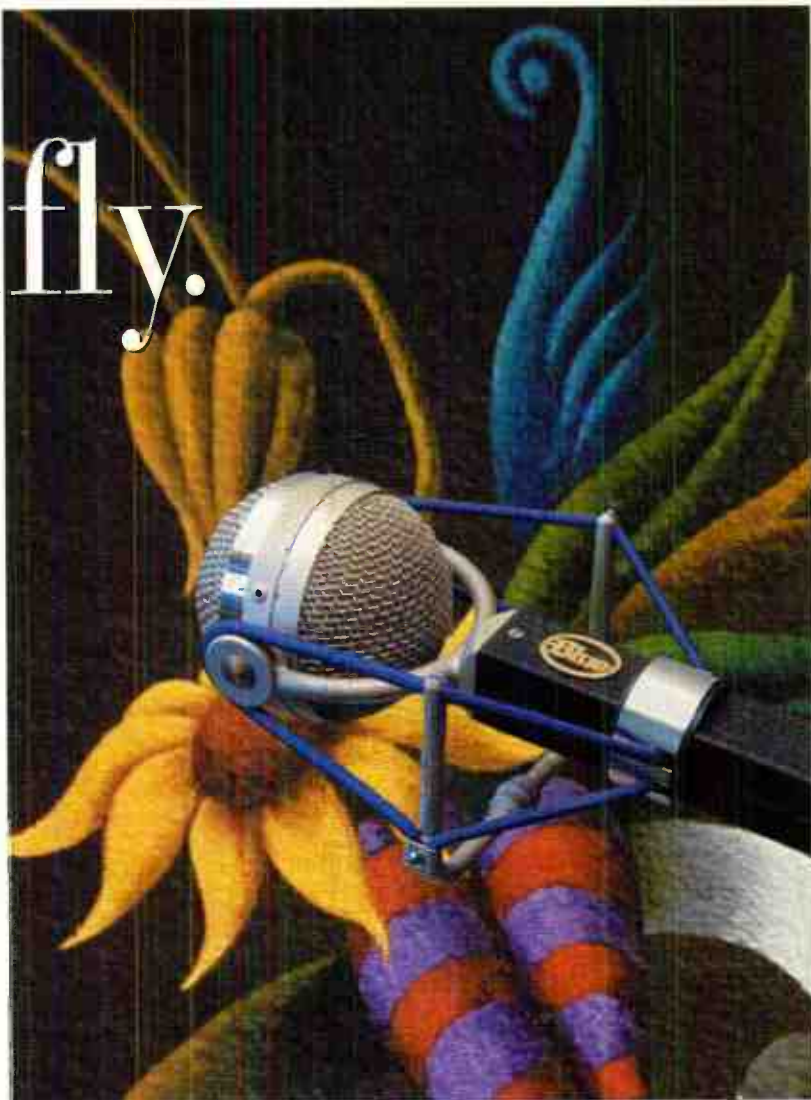


Dragonfly



# Year of the Dragonfly.

Fast, maneuverable and beautifully engineered, the BLUE Dragonfly employs an innovative design that offers fine tuning and precise placement to please the most discerning recordist, combined with an ease of use that is without equal among contemporary microphones—and at a price that's considerably less than anything in its class. The Dragonfly is a unique pressure-gradient cardioid condenser microphone, employing the BLUE hand-built single-membrane large diaphragm capsule coated with a 6-micron mylar film of pure gold and aluminum. Enclosed within a rotating spherical grille, the capsule can be positioned and adjusted in the smallest spaces. Complete with an integrated elastic shockmount, the microphone's electronics are based on a class A discrete circuit, with a transformerless output. Its neutral sonic character gives flight to everything from vocal to percussion, electric guitar and bass, as well as more "difficult" sources such as saxophones and stringed instruments. Oh, and did we mention that among its rave reviews, the Dragonfly is one of *Electronic Musician's* 2001 Editor's Choice award-winners?



Matched sets of Dragonflies can be purchased exclusively from BLUE. This limited edition set is uniquely colored in deep green lacquer with gold accent trim and housed in handmade cherrywood boxes. Contact BLUE for more information.



Winner of *Electronic Musician's* 2001 Editor's Choice Award and proud nominee for the 2001 TEC Award



Microphones



Dragonfly



Blueberry



Mouse



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Bottle

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CIRCLE 69 ON INFO CARD  
World Radio History



**THE PRODUCT:** iZ Technology RADAR II and RADAR 24 upgrades  
**THE BASICS:** RADAR II version 2.50 and RADAR 24 version 3.1

**THE DETAILS:** The latest version of RADAR II features enhanced graphics, accommodation of multiple SCSI back-up devices, Macro import and export, and improved RADAR Link protocol. Also, several operational and reliability issues of version 2.20 have been resolved. RADAR 24 version 3.1 now includes "Export to Broadcast Wave and WAV" functionality, allowing users to output projects and files to UDF formatted, DVD-RAM media in the time-stamped Broadcast Wave format or the non time-stamped .WAV format. Users have the option to drag and drop files and projects directly into digital audio workstation applications for mastering or mixing. Another useful function is the ability

to transfer files between RADAR 24 machines via ethernet.

**CONTACT:** iZ Technology at 604-430-5818 or visit [www.izcorp.com](http://www.izcorp.com). Circle EQ free lit. #116.



**THE PRODUCT:** Nady TCM 1050 and 1100


**THE BASICS:** Vacuum tube condenser microphones

**THE DETAILS:** The TCM 1050 features gold-sputtered, 1-inch diameter mylar dual diaphragm and tube preamplifier circuitry with a 6072 vacuum tube. Power is provided by a dedicated AC power supply, offering remotely switchable pickup patterns. Polar patterns are selectable and come in nine flavors: omnidirectional, cardioid, figure 8, and six intermediate stages. The TCM 1050 is suited for vocals and all forms of instrument pickup. An aluminum flight case is included, along with TMPS-2 power supply (with switchable 115/230V operation and balanced output for connection to any mixing console with no phantom powering required), 30-foot/7-pin XLR cable, elastic spider shock-mount, and foam windscreen.

The TCM 1100 cardioid microphone features a hand-tooled brass capsule with a 3-micron gold-sputtered mylar diaphragm (1.1 inch). A gold-plated center element creates an extension of the top octaves and an enhanced transient response. The TCM 1050 also uses a 6072 vacuum tube and "special output" transformer.

**CONTACT:** Visit Nady Systems, Inc. at [www.nadywireless.com](http://www.nadywireless.com). Circle EQ free lit. #117.





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CIRCLE 42 ON INFO CARD  
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**THE PRODUCT:** Yamaha MV800  
**THE BASICS:** Two-space analog rack-mount mixer  
**THE DETAILS:** The MV800 features eight mic/line mono inputs and one stereo channel with A/B inputs that are selectable from the front panel. Each mono channel contains a balanced XLR-type input connector and balanced insert I/O with TRS-in. Other features include individual noise gates and a global compressor on all mono channels, two-band EQ, signal, and +48V phantom power on balanced mic inputs. Price is \$899.  
**CONTACT:** Yamaha at 714-522-9011 or visit [www.yamaha.com/proaudio](http://www.yamaha.com/proaudio). Circle EQ free lit. #118.

**THE PRODUCT:** Emtec Pro Media (MOD) disks  
**THE BASICS:** Magneto-optical disks  
**THE DETAILS:** Available in both 2.6 GB and 5.2 GB capacities, the disks are engineered specifically for real-time environments to eliminate "re-tries" in recording. They're designed with a real-time certification routine to retry data up to 30 times in cases of data-block.  
**CONTACT:** EMTEC Pro Media at 888-295-5551 or visit [www.emtec-usa.com](http://www.emtec-usa.com). Circle EQ free lit. #119.

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Photo by Mark Diamond

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# RECORD! EDIT! CREATE!

**P**lug in the HDR24/96 Recorder/Editor and start recording. No computer to boot up. No hardware and software configuration nightmares. No compromises like settling for 20-bit audio or just eight tracks at a time.

## Recording's easy with the HDR24/96.

Simultaneously record twenty-four tracks of 24-bit digital audio... without waiting for lock-up, tape shuttle or CPU lag. Drop up to 192 alternate tracks into "virtual tracks." Record onto affordable, removable media that you can swap in and out for each project.

And do it all with your hands on a familiar, analog-style machine (or choose from two sizes of wired remotes) instead of resorting to myriad mouse clicks. All basic functions are right on the HDR24/96 front panel including transport buttons and a Record Enable button for each track.

## Editing is easy with the HDR24/96.

Plug in an SVGA monitor, keyboard and mouse, choose from 2x, 4x, 8x, 12x or 24-track views and then watch them scroll smoothly past a centerline. Mark hundreds of cue points and four locate points for looping and auto-punch-in modes.

Use the mouse to "scrub" individual tracks, Cue, Punch and Loop points with continuously variable velocity. You can mark a segment (or multiple non-adjacent segments) as a *region* and then cut, copy and paste it anywhere — onto a blank track or right in the middle of an existing track

without erasing anything (the part of the track after the insert just "slides down").

You can audition regions or modify their start/end points instantly, capture them as "sound elements" for later use or quantize them to user-defined time grids.

Create fade-ins, fade-outs and cross-fades just by dragging and dropping them... and then set their length by dragging the mouse.

Add volume envelopes for simple level automation of regions or whole tracks.

Then use Render Track to combine all or selected regions of a track just as you hear it complete with cross-fades, volume envelopes, mutes, etc.

## Play with the HDR24/96.

Play back twenty-four tracks of pristine digital audio — instantly without any pause or lag time. It will be synched rock-solidly to everything in your studio — from MIDI-based sequencers to VTRs (via SMPTE or video sync).

Then let your partners, clients and friends "play" with your tracks anywhere in the world, thanks to the HDR24/96's Ethernet port and FTP server capability.

## The non-linear HDR24/96 vs. linear hard disk recorders.

Ever since the invention of magnetic tape, recording over something means it's

*If only life had 999 levels of undo. HDR24/96's History list lets you take loads of creative chances.*

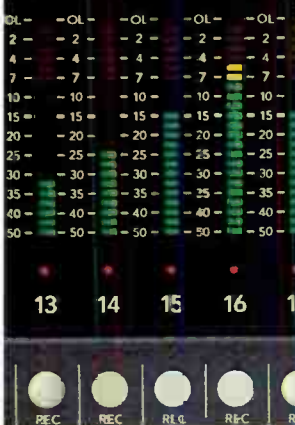


**"...the HDR24/96 is a stunning development with excellent sonic quality, an extensive feature set and versatile file management... it's easy to use and priced right. This one rocks!"**

**George Petersen  
Mix Magazine March 2001**

\*Based on average of length of current non-comp. using 24 tracks @ 44.1kHz/24-bits and a liberal number of extra regions and virtual tracks. This not apply to extended range remotes. ©2001 Mofette Design Inc. All rights reserved. Reproduction of this advertisement in whole or in part without the express written permission of Mofette Design Inc. is prohibited.





# SAVE YOUR COMPUTER FOR E-MAIL.



**Need to back up just one song? Plug a Mackie Media Project drive into the HDR24/96 external bay and transfer over 2GB to an ORB™ disk.**

gone... which makes doing "punch-ins" a dicey gamble. This is called linear (destructive) recording. Even some current hard disk recorders use this old-fashioned technology!

The HDR24/96 employs true, non-destructive, non-linear recording and editing. That means you can record as many versions of a track or track segment as you want without destroying the original. During playback, the recorder recombines the non-linear segments into a seamless soundstream.

And unlike linear-style recorders that treat disk space like digital tape, the HDR24/96 doesn't automatically eat up 24 tracks of disk space when you're just recording one or two tracks. Because it uses only the space needed for actual audio, you get far more recording time per gigabyte of hard disk space.

**Professional performance and affordable creativity with the HDR24/96.**

Non-linear hard disk recording is possible to do with a computer-based system. But to achieve what the HDR24/96 delivers – simultaneous, lag-free 24-track/24-bit recording and playback and waveform accurate

editing – requires major investment in a very expensive digital audio workstation system. Cheap "recorders-on-a-computer card" just don't have the horsepower for multi-track, twenty-four-bit 48kHz recording, much less twelve-channel 96kHz capability like the HDR24/96.

**Listen to somebody else instead of us.**

Here's what *Mix* magazine had to say about the HDR24/96:

*"...The HDR24/96 is a stunning development with excellent sonic quality... The unit offers an ease of use that should make disk-recording novices comfortable while including an impressive feature set that will appeal to seasoned pros.*

*"The recorder's faceplate holds few mysteries and most users can be up and recording just minutes after unpacking the HDR24/96."*

**Professional remote for a very professional hard disk recorder. Our new Remote 48 lets you run two HDR24/96s – 48 tracks of total control including a weighted jog/skittle wheel and full display!**

*According to Britain's Audio Media, "As a recorder (the HDR24/96) is transparent. As a tool, it's powerful. As a creative helper it's perfect. With focus on functional,*

*inexpensive, simple-to-use 24-track recording, Mackie has hit the mark."*

**Get a demo at a Mackie dealer.**

There are a bewildering array of digital recording options on the market right now. You've heard our two cents worth.

We honestly believe that we've created the best of two worlds: the best standalone non-linear digital recorder, and an extremely robust editing system with ultra-functional graphic user interface. And we've done it without making you enter the really cruel world of computer interface compatibility problems.

Call toll-free or visit our web site (using that computer you won't need to tie up) for more info.

Then get your hands on an HDR24/96 and track some hits.



**T**wenty-four track masters for under ten bucks each!! Divide the cost of a Mackie Media M90 into the 20+ pop tunes you can record on it and you're looking at under a ten-spot for each 24-track master\*. Remember, non-linear hard drives store audio data only, not silence. Tape (and linear hard disk recorders) just roll merrily along...eating oxide and costing money.



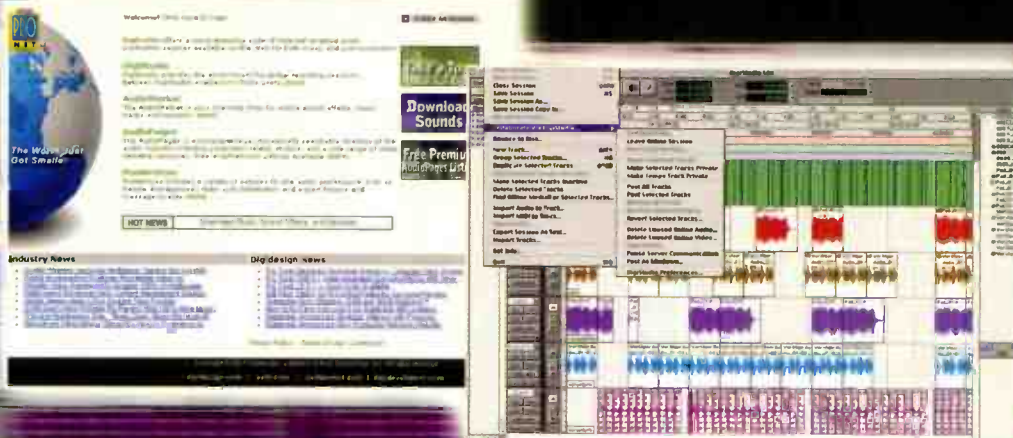
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# Digidesign DigiProNet

By Steve La Cerra

On May 25, 2001, Digidesign launched the Digidesign Production Network (or DigiProNet.com), a comprehensive set of Internet-enabled audio production services. Functioning as an online service center for the pro audio community, DigiProNet provides the ability to set up Web-based recording sessions, search online for talent, and download sound effects, samples, and music from online libraries.

The DigiStudio — a collaboration with Rocket Network — allows the exchange of stereo, multichannel surround, and mono audio tracks over the Internet. A DigiStudio can serve a Pro Tools session, and anyone working on the project can download the files for editing or overdubbing — facilitating the use of remote talent. With the release of Pro Tools 5.2 later this summer, Digidesign will add DigiStudio capability to Pro Tools 5.1. Along with the requisite software, users

will need a DigiStudio account, accessed from DigiProNet.com. DigiStudio Control software will allow a DigiStudio “owner” to employ password restriction of access to uploaded files.

DigiProNet services extend far beyond just the DigiStudio. AudioPages is an extensive listing of audio production-related contacts, including engineers, studios, producers, attorneys, and record labels. Within AudioPages, users can search for a specific type of contact or post their own business-related listing with Web address, text, photos, and sample audio and video files. Audio post houses and musicians with an insatiable need for samples or licensed music will be happy to hear about AudioMarket, an online “store” where files may be downloaded from a huge database of music, sound effects, and samples. The Hollywood Edge (a division of Soundelux) is the exclusive provider of all sound effects for DigiProNet; sound effects may be auditioned before purchase through a keyword search. Digidesign has also partnered with Sonomic to provide one-shots, loops, and SampleCell-formatted samples. DigiProNet users will have access to more than 50,000 pre-cleared music tracks for use in their broadcast and A/V productions through an arrangement with LicenseMusic.com.

DPN’s ProServices allows access to Avid’s AvidProNet Web-based Review and Approval, allowing you to post a project for download by people reviewing the project. “Reviewers” can write comments anywhere in the project’s timeline, down to a specific frame. ProServices also includes FastChannel’s SpotTaxi for efficient “trafficking” of radio spots between production facilities, ad agencies, and their clientele. Expert Forums within ProServices include message boards and live scheduled events with industry pros.

Tied to the launch of DigiStudio is DigiProNet Talent and Booking that matches up producers with talent. Musicians and audio pros seeking work can register with Talent and Booking to list their skills, exposing their abilities to prospective new clients. Talent and Booking also provides scheduling and payment services, standard contracts, and project review.

## DIGIDESIGN PRONET

**WHAT IS IT?** A suite of online audio services that facilitate production and exchange of audio via the Internet.

**WHO NEEDS IT?** Postproduction houses, ad agencies, recording studios, music producers.

**WHY IS IT A BIG DEAL?** DPN breaks down the “desktop” barrier to audio production and collaboration, extending it to anyone willing to participate.

**SHIPPING:** DigiProNetwork was launched online May 25, 2001; Pro Tools 5.2 will be released later this summer with the launch of DigiStudio.

**SUGGESTED RETAIL PRICE:** DigiStudio: prices vary depending upon configuration; Pro Tools 5.2: free download for 5.1.

**CONTACT:** For more information contact Digidesign at 800-333-2137 or 650-842-6602, or visit [www.digidesign.com](http://www.digidesign.com).

**EQ FREE LIT. #: 101**



make it happen.



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**30** | *s e r i e s* microphones

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Plus, the AT3035 includes a custom shock mount, something rare in its price class.

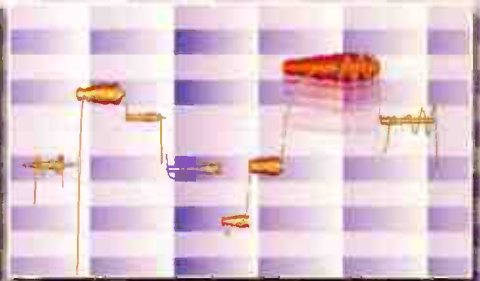
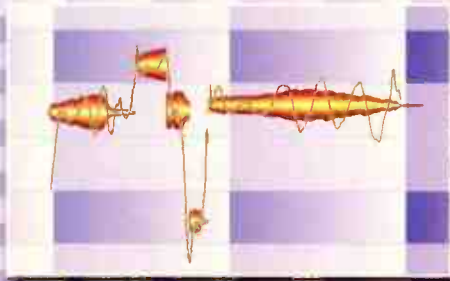
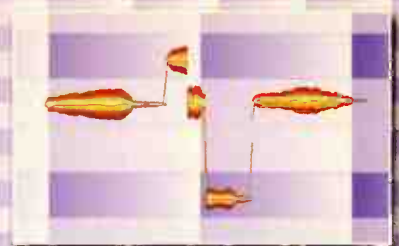
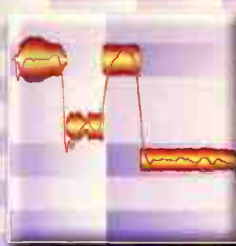
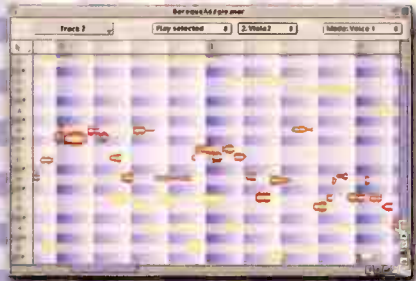
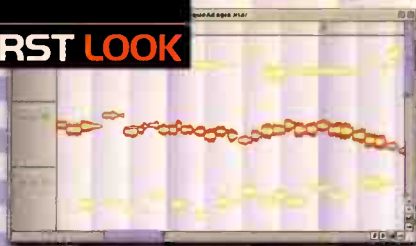
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## FIRST LOOK



# Celemony Melodyne

By Steve La Cerra

Melodyne — the first product from Celemony — is a software program that analyzes any monophonic audio signal, identifies the melody of that signal, and then provides easy editing of pitch, timing, formant, amplitude, and intonation for each note — *separately*. Unlike most pitch-correction plug-ins, Melodyne is a stand-alone application that operates in real time. Audio is recorded in Melodyne or imported as AIFF, WAV, SD2, or other file formats. Double-clicking on an audio file initiates a “detection” process, whereby the software analyzes and then displays time, pitch, amplitude, and phrasing of the melody line. Melodyne treats this audio similar to the manner in which we understand music — in other words, pitch, intonation, duration, and time are separate parameters that can be independently manipulated without affecting each other.

The cool thing about Melodyne is that you don't have to contemplate the manipulation. You simply grab a note and move it around in pitch or time. The results sound as you'd musically expect. All changes can be made on the fly while

the melody is playing, and changes are heard while the notes are moved. Through all changes, the phrasing within a note (vibrato for example) will be maintained — but the phrasing of the note may also be edited to add or remove vibrato, or change the transition curve between notes. Notes may be “snapped” to the nearest semitone or a

defined musical scale; the scale is displayed as the “y” axis in Melodyne's Edit window.

The position of a note in Melodyne is changed simply by grabbing that note and moving it to the desired place along the timeline. Depending upon which tool is chosen for the move, subsequent notes can be shortened (leaving overall time of the phrase unchanged), or they can maintain their original duration. Stretching a note doesn't result in a simple linear stretch. The start of the note will maintain its original character — so the consonant at the start of a syllable or the attack of a plucked string remains unchanged. Conversely, the character of a note's attack may be altered to make a melody sound more percussive without changing its overall duration. Stretching an entire melody yields similar results: the majority of stretching for each note or syllable is applied to the tonal phase of the note, while the starting portion is left unaltered.

Playback speed of a file in Melodyne is completely adjustable. A short snip of music may be played back at one-hundredth of its original speed while maintaining its original pitch. Individual notes of a melody line can be copied and pasted to create multi-part harmony, and formants can be adopted to simulate male or female voices, or, with more extreme changes, to convert a trumpet into a trombone.

Any melody detected by Melodyne can be saved as a Standard MIDI file for viewing in a notation program; the MIDI file can be exported, allowing any MIDI-capable synth to play the melody with vocal line phrasing.

Melodyne supports ASIO2 and will initially be released for Mac OS 8.6 through OS X. A Windows version is planned for next winter. Both versions require a 300 MHz processor with 128 MB RAM. VST2 and MAS plug-ins are expected to follow shortly. ■

### CELEMONY MELODYNE

**WHAT IS IT?** A stand-alone audio application that allows real-time pitch, time, amplitude, and formant manipulation of audio.

**WHO NEEDS IT?** Remixers, producers, and anyone who likes to alter time and pitch independently.

**WHY IS IT A BIG DEAL?** In addition to its real-time capabilities, Melodyne provides easy graphic manipulation of audio.

**SHIPPING:** June 2001

**SUGGESTED RETAIL PRICE:** \$995

**CONTACT:** For more information, visit [www.celemony.com](http://www.celemony.com).

**EQ FREE LIT. #:** 102



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World Radio History



# Jason Groucott

By Howard Massey

**EQ questions  
an up-and-  
coming  
engineer**

This month's Rising Star is Jason Groucott, who is rapidly becoming one of the most requested engineers in New York's R&B scene. Born in the Bahamas, Groucott spent his first twelve years "experiencing the world of beaches and music...and not much else" before moving with his family to Hong Kong. That's where he saw his first concert, Stevie Wonder, and, in his words, "was bitten by the 'rock star' bug."

Curious about the science behind the music, Groucott started experimenting with multitrack recording using two children's cassette recorders. "I would record my keyboard on one deck, then play back the recording and add a different part over it using the second deck," he tells us laughingly. "Then I'd repeat the process until you could barely hear the very first recording!"

At the age of seventeen, his family relocated to New York City, at last affording him an opportunity to study audio engineering seriously. Following graduation from the Institute Of Audio Research, he began interning at the famed Electric Lady Studios before landing a position at the equally fabled Hit Factory recording studios. He's already lined up an impressive discography that includes Queen Latifah, Mary J. Blige, Wyclef, Pras, Dante, and Billie Jean — proof positive that determination yields results.

**EQ: How did you land your current gig?**

**JASON GROUCCOTT:** Trying to decide what New York studio I wanted to apprentice in, I sat down with a bunch of my favorite albums and read through the credits. I saw that a lot of them — including some Stevie Wonder albums — were recorded at The Hit Factory, so I knew it had to be a cool place to work. I walked in cold, dropped off a resume, and applied for a job as assistant engineer. A few days later, [owner] Troy Germano called

me in for an interview, and I got the job.

**How did you get started in engineering?**

When I graduated from high school I immediately enrolled in The Institute of Audio Research (I didn't even take a summer break!), which landed me an internship at Electric Lady Studios.

**Where do you see yourself in five years time?**

I hope to be more involved in production, coordinating and overseeing projects where I'm given more responsibility toward the final creation.

**Who are your heroes in engineering and record production?**

Jim Steinman, William Orbit, and Mick Guzauski.

**What are your favorite current recordings, and why?**

Madonna's latest work is amazing (audio pioneering at its best!). Limp Bizkit's *Chocolate Starfish* is a true production of phatness. Anything ever done by Phish — they make it seem so easy.

**If you were stranded on a desert island and could only take five pieces of studio gear with you, what would it be?**

Lexicon 480L, Eventide Orville, TC Electronic M3000, Weiss Stereo EQ, and Neve 33609 stereo compressor.

**What's the coolest recording technique you've discovered?**

Every time I learn something new it's exciting to me. Then it seems like common practice and is not really that exciting at all.

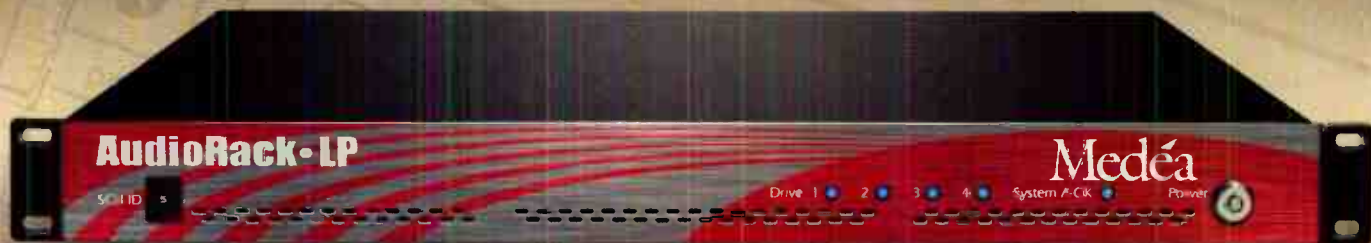
**What's the single best piece of advice anyone ever gave you?**

Don't program radio stations, use the seek button.

**WEBLINK**  
E-mail Jason at [Jacespace@aol.com](mailto:Jacespace@aol.com).



# Nice Rack...



## But our beauty isn't just skin deep



"I'd recommend the AudioRack to any Pro Tools user"

- John Karpowich, Grammy Award Winning Engineer - "Supernatural"

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## ROOM WITH A VU



By Steve La Cerra

# O(h)M Productions

Technology,  
determination,  
and a two-  
car garage

**STUDIO NAME:** O(h)M Productions  
**LOCATION:** Phoenix, AZ  
**KEY CREW:** Victor Palagano, Gretchen Palagano  
**CREDITS:** Victor Palagano — *Lucid Dreaming* (solo album), *The Trial of Major Reno* (PBS), *Revenant* (PC game), *Smoky Lies* (C. Everett Koop Institute), Milestones of the Heart (USC Hospital), Gamma-Knife (Good Samaritan Hospital), *Tom* and *Dark Redemption* (indie films). Gretchen Palagano — Voice-over and vocal artist, lyrical composer. Credits include MainstreetAuctions.com, Breakout Marketing, AIBT, and *Smoky Lies* (lyrics and vocals)  
**MIXER:** Mackie 1202  
**MONITORS:** Roland DS-90 monitors, Audio-Technica ATH-M40fs headphones  
**RECORDERS:** JVC TDW-205 dual cassette  
**OUTBOARD:** dbx 166XL, BBE 462 Sonic Maximizer  
**EFFECTS:** Line 6 Pod  
**MICROPHONES:** GT Electronics AM30, AM11, AM51; Shure Beta 58, SM57; Crown PZM  
**MIC PREAMPS:** ART Dual MP  
**SAMPLERS/KEYBOARDS/MIDI MODULES:** Emu E4XT w/128 MB RAM and 20 GB internal drive, Audity 2000; Roland JV-1080, XV-5080; Korg Triton, ES-1; Ensoniq ASR-10 w/16 MB RAM.  
**COMPUTERS:** Apple G3/266 MHz w/224 MB RAM, 6 GB hard disk, 4 GB optical, CD-ROM, CD-R, Jaz 1 GB and Zip 100 MB drives; Apple Power Mac 8600/250 MHz w/128 MB RAM, 4 GB internal and 2 GB external SCSI drives  
**SOFTWARE:** BIAS: Peak and SFX Machine; Opcode Studio Vision, Emagic Logic Audio Platinum, Sound Diver; Waves plug-ins, Rebirth 2.0, Adaptec Toast, Jam; Antares Auto-Tune  
**DAW:** Ensoniq PARIS with two 442 interfaces; Opcode Studio 128X MIDI interface  
**VIDEO:** Panasonic: AG-455 S-VHS camera/recorder, PV-7450 VHS recorder  
**STUDIO NOTES:** Victor Palagano explains, “The

studio is an efficient little workspace with everything in one room (there’s no separate iso booth). The house has a two-car garage that I split down the middle, running along the width. We insulated the ceiling and the wall we put in, and added some Auralex two-inch studio foam as treatment. It’s a fairly dead space that’s worked well for everything I’ve had to do here. Since I frequently record acoustic guitar and vocals here, noise from the computer could have been a problem. My solution was to use an Omnix C14 rack enclosure just for the computer. I lined the interior of that particular rack with acoustic foam so it cuts down the noise by about 80%.”

**EQUIPMENT NOTES:** Palagano continues, “I think my computer is my favorite piece of gear because it’s the heart of the system — without it I would be lost. I use it for all of my sequencing and with the Ensoniq Paris DAW system — so my multitracking and mixing is done in the computer. I back up the Paris sessions to CD-R and mix the session to two new tracks, so there’s not much of a need to mix to DAT. I also rely quite a bit upon my Emu E4XT Ultra, my sample library, and, last but not least, my guitars — my first love.”

**PRODUCTION NOTES:** Palagano concludes, “A recent project we worked on was a computer-animated short with a spy theme. It’s an anti-smoking campaign for the public school curriculum. I wrote and recorded music appropriate for five suspense and action scenes. One of the characters is also doing a campaign with a smoking ad. Gretchen did the lyrics and vocal for this ad within the short. It encompassed a lot of different elements, making it fun to work on — plus I think it’ll have a good impact on the children who see it.”

### WEBLINK

You can download MP3 files of some of the projects from O(h)M Productions at:  
[www.musicformotionpicture.com](http://www.musicformotionpicture.com).





# Take Control of Your Room!

## London-14 Studio



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- 2 Scandia Scatter Blocks
- 3 Orientique Washboard
- 4 Australis Bass Trap

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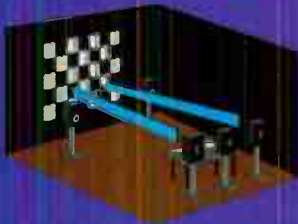
The London-14 is one of the more than dozen studio packages available. London combines all four acoustical systems into one affordable package. London Studios start at \$450\*. Other packages include the New York Voice Over Booths, Rio Video Suites and Montreal Studios. With complete rooms starting at \$200\* - no other acoustical treatment is as affordable or so effective! We even include the glue.

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**1 Europa Flutter Wall**  
Reduces "front to back" echo, standing waves and monitor fold back. Over 28 creative patterns to choose from. Prices start at \$150\*.



**2 Scandia Scatter Blocks**  
Affordable alternative to diffusion. Keeps room live and reduces standing waves. Over 12 creative patterns to choose from. Prices start at \$100\*.



**3 Orientique Washboard**  
Absorbs primary reflections and side-to-side flutter. Six creative patterns to choose from. Prices start at \$80\*.



**4 Australis Bass Trap**  
Effective down to 45Hz tightens up bass and reduces smear. Can be used in corners or on walls. Priced at \$100\* each.

\*Suggested US retail price.

## ROOM WITH A VU



By Steve La Cerra

# Lunatunes/OzWorld

Twin rooms  
with different  
VUs

**STUDIO NAME:** Lunatunes, Ashland, OR; OzWorld, Novato, CA

**KEY CREW:** Craig Chaquico (guitar, programming), Ozzie Ahlers (keyboards, programming), Jim Reitzel (bassist and computer tech)

**CREDITS:** **Craig Chaquico:** *Acoustic Planet, Acoustic Highway, Once In A Blue Universe, Four Corners, A Thousand Pictures, Panorama: The Best Of Craig Chaquico* (Higher Octave). Former lead guitarist for Jefferson Starship; songwriting credits include "Jane" and "Find Your Way Back." **Ozzie Ahlers:** *Fingerpainting* (Higher Octave); Ozzie has worked with Jesse Colin Young, Jerry Garcia, Jimmy Dillon, and 3rd Force, as well as working with Chaquico.

### BOTH STUDIOS

**MIXING CONSOLE:** Carvin SL40

**RECORDERS:** Alesis ADAT XT [2] with BRC, TASCAM DA30

**WIRING:** Monster Cable

**MIC PREAMPS:** George Massenburg

**COMPUTERS:** PowerMac G3/450 with 192 MB RAM (minimum), LaCie CD-R

**SOFTWARE:** MOTU Digital Performer V2.7.2, MAS plugins; Adaptec Toast 4.1.2

**DAW:** MOTU 2408 Mk II interface

### OZWORLD (OZZIE AHLERS)

**MONITORS:** Alesis Monitor One, Auratone, Sony 7506 headphones [6]

**AMPLIFIERS:** Carver PM 350, Behringer Powerplay

**RECORDERS:** Sony JE500 MiniDisc, Onkyo

dual cassette

**OUTBOARD:** Behringer Composer, API 550B EQ [2]

**EFFECTS:** Ensoniq DP2, Dynacord CLS222

**MICROPHONES:** Carvin CM87S, Shure SM81 [6]

**SAMPLERS/KEYBOARDS/MIDI MODULES:** Alesis QS8, QS7, SR16; Ensoniq TS10 [2], Roland D550, Voce V3 organ

**INSTRUMENTS:** Carvin CC Model Acoustic Prototype

### LUNATUNES (CRAIG CHAQUICO)

**MONITORS:** Yamaha NS-10M, Sony MDRV6 headphones

**AMPLIFIERS:** Carvin FET900

**RECORDERS:** Sony Walkman, Onkyo R1 cassette, Sony MDS JE510 MiniDisc

**OUTBOARD:** dbx 161 and 163x compressors; ART Dual Leveler, Rocktron HUSH II CX

**EFFECTS:** Yamaha SPX90, MXR Pitch Transposer, Jim Dunlop Uni-Vibe and Wah-Wah pedals, Scholz R&D XPR preamp/effects, API 550b EQ

**MICROPHONES:** Carvin CM98 ST, CM87, Shure Beta 91, Beta 98 [2], VP88, Beta 57, Beta 58, SM81

**INSTRUMENTS:** Carvin CL450 and AC375 acoustic guitars, Craig Chaquico Model (still under development), DC400 electric guitar; Washburn Craig Chaquico Signature Series EA-26, 1957 Gibson Les Paul, 1957 Fender Stratocaster, Martin D-18 acoustic guitar

**ACOUSTIC TREATMENT:** Auralex MAX-Wall

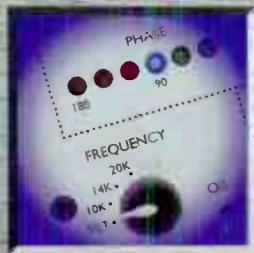
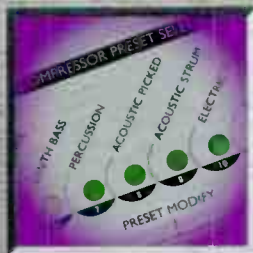


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for the Project Studio

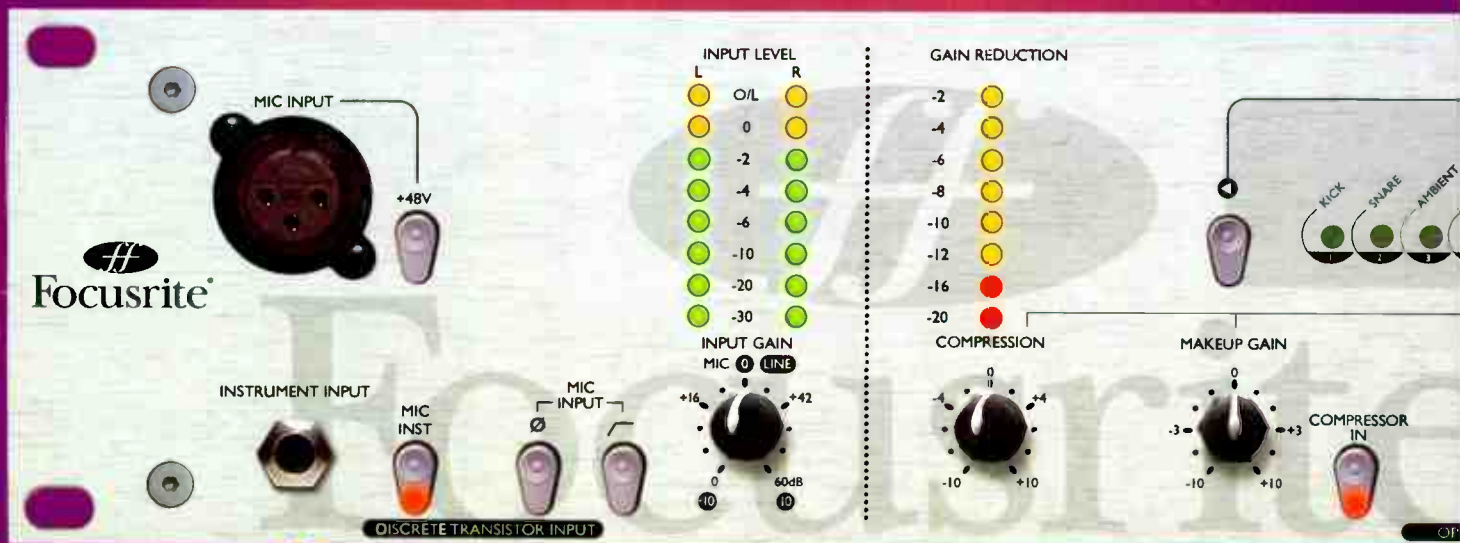


# Focusrite - The Industry Reference for Analogue Signal Processing

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The design expertise accumulated over the years in providing the best for the best has allowed us to bring the project studio owner one step closer to the professional studio sound they deserve. Thanks to high-grade Class A analogue circuitry and our no compromise design philosophy, the Platinum range puts this professional sound within your grasp.



## The Platinum Penta™ Stereo Analogue Preset Compressor

### Multiple Functions / Professional Sounds

Every dynamics processor you'll ever need, squeezed into one 2U rack-mountable unit, the Penta™ will go down in your recording history as one of the best investments you ever made.

16 presets, configured by a prestigious group of music industry professionals, set amongst a host of Class A analogue circuitry, the Penta™ offers that sought-after professional sound at the touch of a button. It can be used as a front end when tracking quality signals, as a mix-down processor, or as a final mastering processor.

The Penta™ is packed to the hilt with analogue processing power. It offers a huge number of recording benefits within a matter of seconds whilst still exhibiting the Focusrite signature sound.

The unit features a Focusrite Class A mic pre on the front end with both DI and mic inputs accessible directly from the fascia. Following this is a Stereo Preset Compressor, which is entirely editable and features Focusrite's exclusive TubeTran™ Technology.

As if this wasn't enough, the unit also features the spatial enhancer and optional A/D converter, along with a comprehensive visual meter to help you ensure optimum levels at all times.

### Discrete Transistor Mic Pre

The Penta™ boasts the Platinum mic pre featured in the *award winning* VoiceMaster™, ToneFactory™, and the industry transforming *Control | 24™* from Digidesign® and Focusrite®. The Penta™ ensures professional performance within the audible frequency range and beyond, producing cleaner recordings and delivering clarity without colouration.

### Direct Input

The Penta™ features a Direct Input on the fascia for quick and easy plug-in. Use the Penta™ as a front end for getting all your instruments down to track in seconds.



## Preset Stereo Compressor

The Penta™ offers you instant compression settings, as formulated by the Focusrite design team. Immediately available are 16 presets specifically designed to give you perfect compression at the touch of a button. But to make sure we don't limit your own potential, all these **presets are entirely editable**, giving you a quick, yet effective route to perfect compression.

<b>Kick</b>	Creates a full and deep effect. Use the attack to control the amount of punch desired for your track.
<b>Snare</b>	Set up for perfect control of stick (attack) and ringing overtones (release).
<b>Ambient</b>	Use with live drums or instruments and lift out natural room effects or get the best from digital reverb.
<b>Loop</b>	Tight and fast compression, especially suited to sampled loops and electronic sounds.
<b>Bass Guitar</b>	Plug straight into the front panel and call up deep and rounded sounds or punchy slap.
<b>Synth Bass</b>	Fat sounding especially when used with the warmth control to give a true vintage valve sound
<b>Percussion</b>	Acoustic or sampled drums
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<b>Electric Guitar</b>	Clean or distorted, plugged straight in or mic'd up, the opto compressor is perfect for guitar.
<b>Piano</b>	Achieve clarity and low distortion. Wide dynamic range and long sustaining mid range make the piano the most difficult of instruments to compress; well, ...until now.
<b>Keyboards</b>	Great for pads, this compressed and warm setting is especially suited for use with the image control to maximise stereo width
<b>Vocals</b>	Smooth, controlled and clean for male or female vocal recording.
<b>Crunch</b>	An essential setting for big beat or drum loops.
<b>Mix (pump)</b>	The classic loud and full on mastering compression setting.
<b>Vocals (limit)</b>	High threshold and plenty of warmth give a very dynamic upfront vocal performance.



## TubeTran™ Technology

Focusrite Exclusive TubeTran™ Technology gives you *controllable tube style warmth*. This unique effect is achieved using a dedicated discrete mosfet circuit, specifically designed to create this indistinguishable audio illusion. Instead of limiting your studio to one sound, now you can choose - *less tube, more tube, no tube, you decide*

## Analogue Spatial Enhancer

With the Image Width control you can widen the stereo image of your mix to create an ambient, spacious mix that extends beyond the normal stereo extremities, breathing new life into your projects. A tweak in the other direction produces a narrow, focussed image.

Also featured in the final section is a *comprehensive visual meter* to help you ensure optimum levels at all times.

## High Quality A/D converter

With Focusrite circuitry around premium semi-conductor converters (24 bit/56KHz, and 123 oversampled), set in a pristine electrical environment, the

digital interface option ensures total control of the final signal conversion. High Quality A/D conversion couldn't be any easier.

*Full A/D converter details on back page*

## Controls and Performance

### Inputs and outputs:

All inputs and outputs are TRS jacks and accept unbalanced (-10dBu) and balanced (+4dBu)

<b>Mic</b>	Gain 0dB to 60dB
<b>Line</b>	Gain -10dB to +10dB
<b>Instrument</b>	Gain 0dB to +20dB Impedance > 10kΩ

### Compressor:

Each individual preset is entirely editable

<b>Compression</b>	Gain -10dB to +10dB
<b>Make up</b>	Gain -10dB to +10dB
<b>Overload:</b>	-20dB

### Performance Spec

#### Frequency Response

Bypass in: -1dB down at 20Hz and 200KHz  
Compressor in: -2dB down at 20Hz and 200KHz

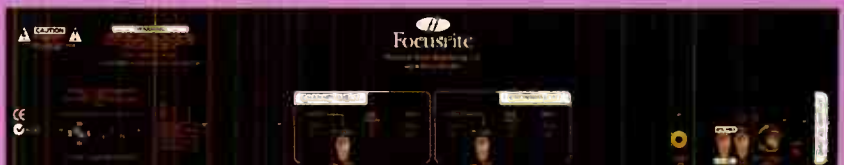
**TNO:** Measured with input signal frequency of 1KHz at 20dBu level and 20Hz/22KHz bandpass filter

Bypass in: 0.0008%

With compressor in, 6dB of compression and 6dB of makeup gain: 0.001%

**Noise:** Measured with 20Hz/22KHz bandpass filter.

Bypass in: -92dBu  
Compressor in: -91dBu



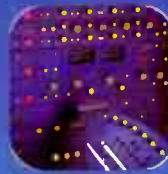
# The MixMaster™

Stereo Dynamics, EQ and Image Processor

How do I make my mix sound like a hit record?!

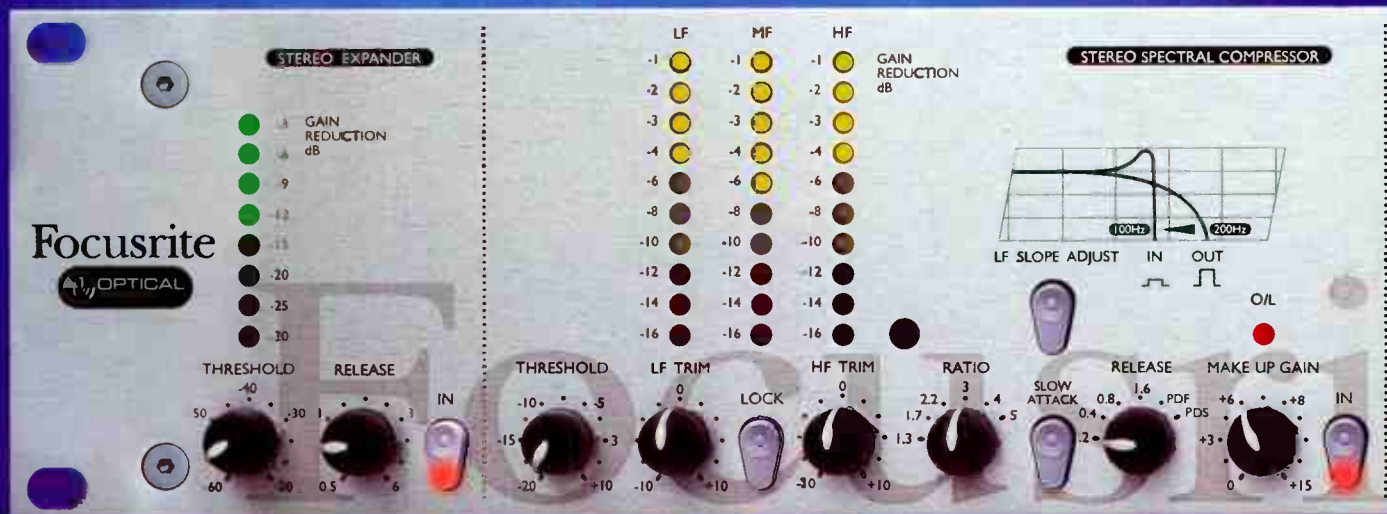
The Focusrite MixMaster™ is an analogue stereo audio processor designed primarily for project studio mastering. However, with so many useful features in one box, anyone involved in the business of making music will quickly find it indispensable at other stages of the recording process too.

Simple yet effective processing sections cover every aspect of the mix, giving you the *quickest route to that seemingly 'out of reach' sound that makes a hit record*. Within minutes you can give your mix punch, width and sheen with the signature transparency and sonic integrity that made Focusrite famous.



The MixMaster™ takes its inspiration from the processing circuitry of the legendary Focusrite Blue Mastering range, the preferred choice of many professional mastering engineers the world over. This piece of onboard genius refines the final balance and dynamic energy of the mix, introducing stereo enhancement whilst restoring essential elements which may have become overwhelmed in the mixing process.

Above: The legendary Focusrite Blue Mastering Range



## Stereo Expander

*Essentially a soft noise gate.* The stereo expander *decreases unwanted background noise* without sounding harsh or brutal. With only two controls and an LED monitoring display, controlling the noise floor becomes a breeze.

## Stereo Spectral Compressor

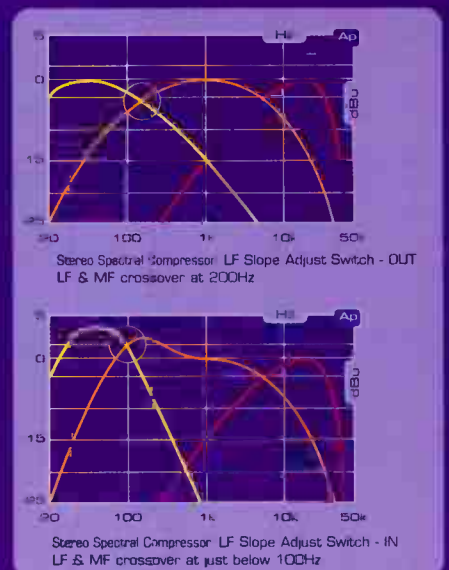
*A serious example of stereo processing power;* the Stereo Spectral Compressor is a multi-band compressor with three bands of compression, Low, Mid and High, each being visually displayed – vital when you need to *smooth out different frequency bands* and have true control over the mix.

When using a single band compressor, a loud kick drum can, for example, cause the compressor to pump on every kick. In dance music this effect might be desirable and

consequently you have the option to *lock the compressor across the bands*. The MixMaster™ also allows you to *individually compress each of these three bands*, so taming the kick alone is as easy as turning down the LF trim. Taming an overly loud vocal or hi-hat is just as easy; Using the MID band for vocals and the HF band for hi-hat and snare, you have complete control over these specific areas. The MixMaster™ simplifies this process to 5 knobs, and 2 buttons, all of which are easy to understand, and allow you not only to hear but also see what effect they are having on your mix.

A track put through this section will, when adjusted, sound tighter, bigger and smoother. Finally, a device that delivers that elusive finished, professional sound. The process is not difficult to employ. Use your ears and you will soon be grinning from one to the other as your mix comes to life! Also included in this section is the

“LF slope adjust” switch. Switching the circuit in gives a fuller bass sound, an instant enhancement for dance mixes at the flick of a switch.





## Controls & Performance

**Inputs** Electronically balanced, 20k $\Omega$ , nominal level +4dBu-10dBV

### Expander

**Threshold:** -60dB to -20dB (continuously variable)  
**Attack & Release:** Variable or auto (program dependent)  
 Attack: 100 $\mu$ s to 100ms  
 Release: 100ms to 4S

### Stereo Spectral Compressor

**Threshold:** -20dB to +15dB (cont. variable)  
**Ratios:** 1.3, 1.7, 2.2, 3, 4 & 5 (switched)  
**Slow Attack switch:** decreases attack time of compressor  
**Release (switched):** 0.2, 0.4, 0.8, 1.6 (Auto Fast, Auto Slow)  
**LF Trim (200kHz):** +10dB to -10dB  
**HF Trim (2kHz):** +10dB to -10dB  
**Makeup Gain:** 0dB to +15dB (cont. variable)

### Stereo EQ

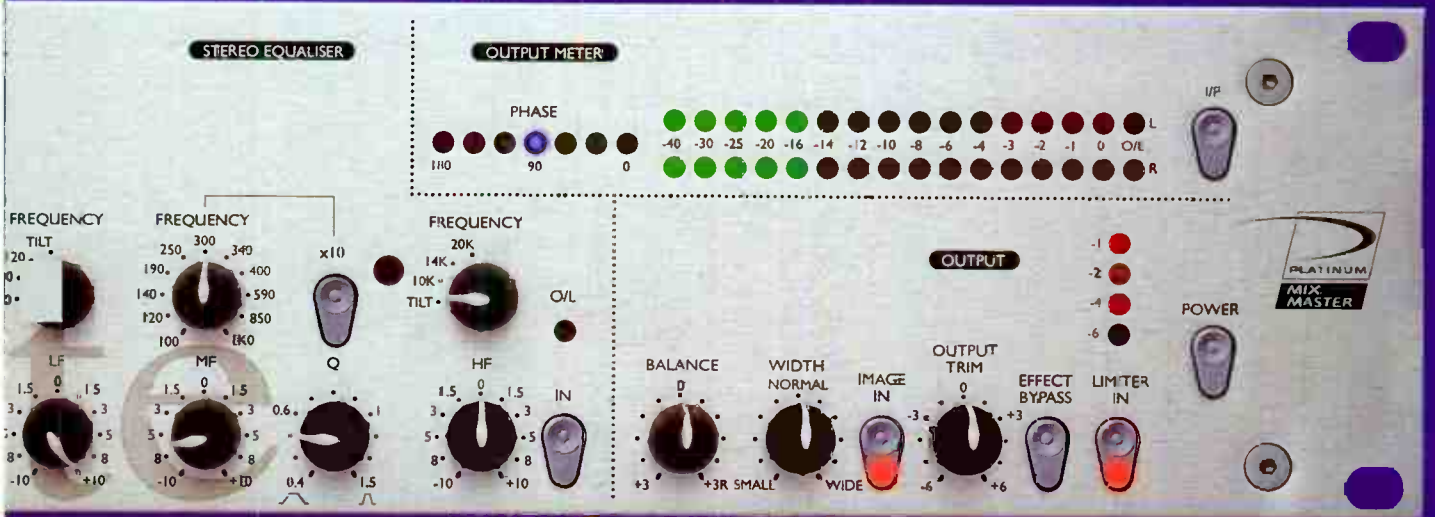
**LF:** Gain (+/- 10dB) & Frequency (40Hz, 70Hz, 120Hz + 'tilt')  
**Parametric** Gain (+/- 10dB); Frequency (switched)  
**Mid:** 100Hz to 1kHz or 1kHz to 10kHz  
 & Variable Q: 0.4 - 1.5  
**HF:** Gain (+/- 10dB) and Frequency (10kHz, 14kHz, 20kHz + 'tilt')  
 Very gradual tilt slopes, from 1kHz (-2dB/octave)

### Output Stage

Electronically balanced, 50 $\Omega$ , nominal level +4dBu  
 Unbalanced, ground compensated, 75 $\Omega$ , nominal level -10dBV  
 Output Trim: -6dB to +6dB (cont. variable)

### Performance Specifications

**Headroom:** 22dB  
**THD:** @ +4dBu, all sections in, no gain reduction: <0.005% (80kHz BW). Distortion during gain reduction is determined by the attack and release times set.  
**Noise:** (20Hz to 22kHz): < -96dBu (all sections out) < -86dBu (all sections in)  
**Frequency resp.:** (5Hz - 200kHz): +/- 2dB  
**Dimensions:** 480 mm (w) x 68 mm (H) x 265 (D)  
**Weight:** 5.2kg

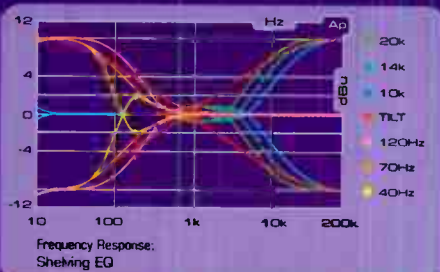


### Stereo EQ

The Stereo EQ on the MixMaster™ is *tri-band*, with *stepped frequency shelving* high (HF) and low (LF) bands and a *parametric mid band*. A serious Focusrite EQ with the ability to add musicality and subtlety to your mix.

The "tilt" feature allows *gentle emphasis or de-emphasis* at either end of the *audic spectrum* and is a vital mastering function.

The MixMaster EQ is a very powerful tool that can *gently enhance the tonal quality of the mix*, according to the user's objective.



### Analogue Spatial Enhancer

For *widening your stereo image*. A slight adjustment of the image controller allows you to create an *ambient, spacious mix* that extends beyond the normal stereo extremities, breathing new life into your projects. A tweak in the opposite direction produces a *narrowed, focussed image*. Many width enhancers can cause phase coherence problems for centrally-panned mix elements, but the MixMasters *additional direct inputs* allow *critical central elements* (like lead vocals or a kick drum) to be added to the mix after stereo enhancement. This means that you can enjoy the benefit of *wide, airy mixes*, but retain *critical tight focus* on, say, the lead vocal.

"What makes you think I'm impressed? I've used the unit to add extra polish to some of my home recordings transferred from analogue tapes. It now sits permanently bolted to my DSD output. If I can't keep this one then I'll certainly buy one to replace it - I can't do without it now."  
 Len Davies - Audio Media, November 2003.

### Output Control

The Output section gives *fine control of stereo balance* and trim is available before the A/D converter or analogue outputs. For output protection, switch in the *stereo frequency adaptive limiter*, with its own LED meter, to stop those critical digital 'overs'.

### High Quality A/D converter

With Focusrite circuitry around premium semi-conductor converters (24 bit/96kHz, and 123 oversampled), set in a pristine electrical environment, the digital interface option ensures total control of the final signal conversion. High Quality A/D conversion couldn't be any easier.

Full A/D converter details on back page



"Basically I use Focusrite on everything I do. I mix in the real world and like to keep my compressor and EQ where too. The MixMaster just keeps everything tight and smooth leaving a 'masculine' Focusrite shine over my mix."  
 Dave Clarke  
 - Leading Techno Producer

# The VoiceMaster™

## Dedicated Engineering for Vocals

The voice - the most fundamental instrument in the producer's repertoire. Focusrite believe that this instrument deserves a specifically designed channel strip. The VoiceMaster™ is designed to give you all the processing you need to create the perfect vocal. Incorporating

Class A circuitry and a signature sound and quality that has made Focusrite the industry reference for analogue signal processing throughout the world, the VoiceMaster™ has become a permanent and essential fixture wherever it has found a home.



### Discrete Transistor Mic Pre

Within the discrete transistor input section, the VoiceMaster™ features an audiophile quality Class A transistor mic pre design. The mic pre features the wide bandwidth design philosophy featured in the original Rupert Neve designs that gave birth to Focusrite. This design ensures low noise and distortion, delivering clarity without colouration, giving the signature transparency for which Focusrite have become famous. This section also features a high pass filter to remove proximity effect and wind noise.

### Noise Reducing Expander

The Noise Reducing Expander *is the perfect tool for removing ambient noise and headphone bleed.* With a gentle response, the expander section is ideal for processing vocals without running the risk of cutting into the vocal performance. With the **Gate mode** you have the further option to clean up noisier, less sensitive signals such as guitars and drums.

### Vocal Saturator

The Vocal Saturator will help you to enable your vocal to cut through the mix and *will add character to the sterile digital recording process.* This is achieved through a dedicated mosfet circuit which is designed to act in a valve-like state. This allows you to *create tape/valve style saturation* from the original signal and add compressed, harmonic-related, second order artefacts to the vocal. You can also emulate a valve mic sound without owning an expensive valve mic or outboard unit.

### The Focusrite sound - Welcome to one of the most prestigious clubs in pro audio.

Focusrite has, over the past decade, built a reputation as the market leader for high quality recording equipment, with its "Mic Pre" technology as the cornerstone of that enviable reputation.

The original Mic Pre was designed by Rupert Neve using rotary switched gain controls and high quality audio transformers. This Mic Pre has been used by many of the industries greatest producers and is the sound of countless hit records. Today, Focusrite design

equipment for a far greater audience, from professionals to amateur enthusiasts with high specification project studios.

As with the Red range, the Mic Pre technology found in the Platinum range is designed to the highest possible standards. What links all Focusrite products is the integrity of the design, testing and qualification process. All new designs are checked and tested to the same exacting standards as the

original Red and ISA ranges and can only make it to the 'final product' stage once they have passed the essential listening stage. Any design can measure well on the test bench but only a good design can be qualified in the studio. Rest assured, your Platinum Mic Pre encapsulates exactly this philosophy and is guaranteed to excel in any studio environment.

Rob Jenkins - Director of Product Strategy



## Features & Controls

**THD:** 0.002%  
**Noise:** -96dB at unity gain through the unit  
**Mic EIN:** -134dB  
**Frequency Resp.:** 1dB at 10Hz to 20000Hz

### Inputs

**Mic:** Gain 0dB to +60dB  
**Line:** Gain 10dB to +10dB

### Filters

20Hz to 3000Hz continuously variable 12dB per octave cut-off

### NR Expander

**Ratio variable:** 1:1 to 3:1  
**Gate attenuation:** >95dB

### Compressor

**Soft Ratio:** 2:1  
**Hard Ratio:** 6:1  
**Noise:** -94dB

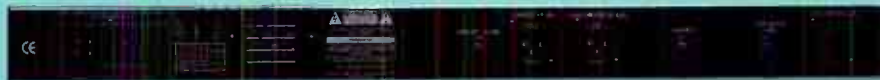
### EQ

**Warmth:** Frequency continuously variable  
 ~20Hz to 6000Hz  
**Level:** -12dB to +8dB  
**Shelf shape**  
**Presence:** Frequency fixed 1.5KHz  
**Level:** -12dB to +8dB  
**Shelf shape**

**Absence:** Frequency fixed 4.5KHz  
**Level:** fixed -8dB  
**Shelf shape**  
**Breath:** Frequency fixed 10KHz  
**Level:** -8dB to +8dB  
**Shelf shape**

### Opto De-esser

**Frequency:** Cut variable 2.2KHz to 9.2KHz  
**Level:** Threshold dependent  
**Noise:** -95dB  
**Overload:** +20dB



### Opto Compressor

The Opto Compressor on the VoiceMaster™ is, like all other features, designed specifically for the voice and offers easy-to-set-up dynamic control of performance changes.

The Compressor comprises servo-controlled optical attenuators giving better results than equivalent VCA designs, giving more punch and fat sounding compression, especially when driven hard. Two modes of operation offer soft (vocals) or hard (drums or electric guitars) compression. The additional *enhancer enables you to add brightening harmonics* to a vocal which lacks character.

### Voice Optimised EQ

The EQ is designed with controls tailored specifically to give immediate results to live or pre-recorded vocals. The controls include breath to add air, presence to give vocals bite in a busy mix, absence to remove harshness and warmth to add depth and volume. Variable frequency allows the warmth to function over the entire range of a voice from Baritone to Soprano.

### Opto De-esser

The Opto De-esser is featured to allow you to remove undesirable sibilance leaving the rest of the vocal sound unscathed. In addition, for perfecting your mix-down, you can choose whether the output of the unit is taken pre or post the De-esser. This gives you the choice of sending the vocal straight to the mix bus for a natural sound or, alternatively you can take the output post De-esser to the reverb or delay unit, preventing the "zing effect".

### Output Meter & Fader

The final section features output metering and control to ensure you have visual indication and instant control of your output. This helps to ensure that the operating level accurately matches the following piece of equipment.



Phil Dudderidge - Chairman of Focusrite and Sir George Martin, producer of the Beatles, with the ISA 110. Just one of the many Focusrite units to be found at AIR Studios, London.

*The VoiceMaster provides the tools to create a pure vocal or a creatively enhanced one. I think the only problem Focusrite are going to have is making enough of the things.*

Paul White, Sound on Sound

# The Compounder™

## Serious Compression

The Platinum Compounder™ is a **high performance stereo dynamics processor** designed for the quality conscious professional and project studio owner. This highly featured unit is an essential tool for any style

of music. The combination of high quality compression with the powerful Bass Expander, make this unit a must have for any dance music engineer or musician.



### Gate / Expander

The *unique opto circuit* featured in the Compounder's Gate/Expander section ensures quiet operation with no pops or clicks. With a complete set of controls you have accurate control over gating and the expander switch ensures professional noise reduction on difficult audio tracks such as vocals.

### High spec compressor

The compressor in the Compounder™ features *Class A amplification* and a *VCA circuit design* derived from the *legendary Red 3 Dual Compressor/Limiter*, resulting in superb sound and very low distortion. *Soft and Hard Knee compression curves* and a *wide ratio control* that takes you beyond infinity for that classic pumping sound means you have substantial control over compression. With the unique *Bass Expander* section you can make kick drums and bass riffs far more powerful and effective. The expander circuit generates extra bass harmonics to fatten up any low frequency signal. Add to this the *'Huge'* feature and, be afraid, be very afraid.

### High performance opto-limiter

A *matched pair of high quality Optos* offers improved performance over VCA limiter designs which tend to add high levels of distortion, even when they are not limiting. The Limiter features a *Class A low distortion design* and *accurate threshold control* to ensure quality precision limiting. The limiter enables you to prevent overload when recording to an A/D.





## Features & Controls

### Compressor

**Threshold Range:** -24dB to 12dB  
**Ratio:** 1.3:1 through  $\infty$  (infinity) to over compression  
**Slope:** select between hard and soft knee  
**Attack and Release:** Variable or auto (program dependent)  
 Attack: 100 $\mu$ S to 100mS  
 Release: 100mS to 4S

### Limiter

**Threshold Range:** 12dBu to 26dBu  
**Ratio:**  $\infty$  (infinity)  
**Attack:** Fast

### Gate

**Threshold Range:** -40dB to +10dB  
**Gate Range:** -20dB or -80dB(full)  
**Attack:** switched fast or slow  
**Release/Hold:** variable or fixed 100mS to 4S  
**Expander Ratio:** 2:1

### Performance Specification

**Inputs:** Electronically balanced, impedance 20K $\Omega$ , nominal level +4dBu/-10dBV switchable.  
**Outputs:** Electronically balanced, impedance 50K $\Omega$ , nominal level +4dBu. Unbalanced, ground compensated, impedance 75 $\Omega$ , nominal level -10dBV.

**Headroom:** 22dB

**THD:** @ +6dB, all sections IN, no gain reduction  
 <0.006% (80KHz BW)  
 Distortion during gain reduction is determined by the attack and release times set.

**Noise (22KHz):** -100dB (compressor OUT)  
 -87dB (compressor IN)

**Frequency Resp.:** 5Hz @ 200KHz +/-2dB



### True Stereo Linking

The link feature enables the Compounder to act as a *true stereo compressor*, enabling complete stereo control of every parameter. When switched to stereo the left channel becomes the master section and controls both left and right compressor and limiter sections simultaneously. You can also choose to operate the unit as a dual mono device allowing you to process two separate channels independently.

### Multiple recording applications

**Recording Chain** - Use with a high quality pre amp and EQ to create a high quality record path with compression for dynamic control and a limiter to protect the A/D of the record device.

**Mixing** - Insert into the console channel path to control individual or stereo tracks, giving real presence and punch to vocals and instruments.

**Mastering** - Place across the console two track bus or use on a finished mix or DAT tape to beef up the sound. Use the Bass Expander to get serious hard punching results for dance and techno tracks.

The Compounder draws inspiration from Focusrite's Tech Award winning Red 3 Dual Compressor/Limiter. Designed to handle studio workloads.



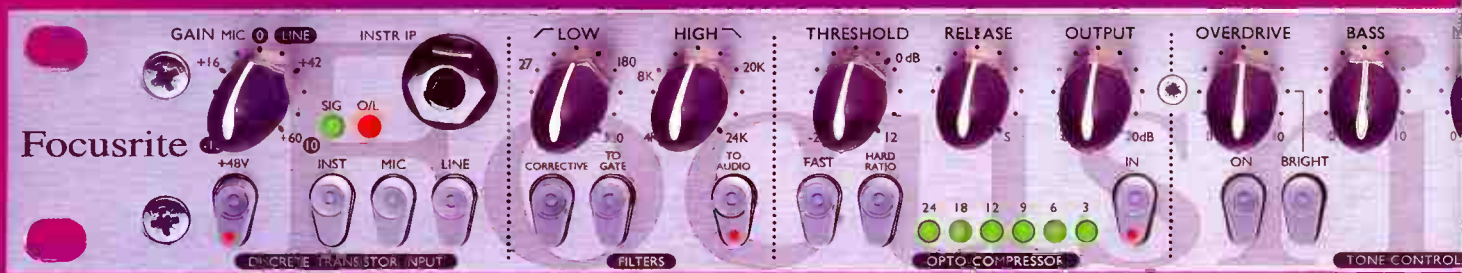
*Nothing in my rack comes close to the classy sounds which my Focusrite units produce. The bass channel is permanently routed through the Compounder - powerful compression and fantastic bass enhancement.*  
 M.J. Cole

# The ToneFactory™

Giving instruments impact, character and control

The ToneFactory™ is a high spec intuitive channel strip specifically designed to give you total control over instrumental recordings. It will enable you to achieve outstanding musical, or even radical results. Featured within this unit is the award winning Class A mic pre from the

VoiceMaster™, Focusrite EQs, both active and passive, powerful opto compression and limiting, sensitive control over noise levels and outrageously powerful yet adaptable filters. If you were searching for a sound, you've just found it.



## Discrete Transistor Mic Pre

Within the discrete transistor input section, the ToneFactory™ features an *audiophile quality Class A transistor mic pre design*. The mic pre features the wide bandwidth design philosophy featured in the original Rupert Neve designs that gave birth to Focusrite. This design ensures **low noise and distortion, delivering clarity without colouration and giving the signature transparency** for which Focusrite have become famous.

## Direct Input

The ToneFactory™ features a Direct Input on the fascia for **quick and easy plug-in**. Use the ToneFactory™ as a front end for getting all your instruments down to track in seconds.

## Creative Filters

The filters in the ToneFactory™ are changeable between two modes:

**Creative mode:** Reduces low frequency noise without affecting the bass; cut high frequency noise but retain presence in the sound.

**Corrective mode:** Low frequency filter removes proximity effect and rumble. The High frequency removes wideband noise from old synths and the like.

The Filter is switchable between the main audio path and the sidechain of the gate. When both switches are selected simultaneously the filtered gate side chain can be monitored.

Post filters and pre compressor you will find a further insert point for patching in external effects.

## Opto Compressor

The Opto Compressor on the ToneFactory™ offers **easy-to-set-up dynamic control of performance changes**. The Compressor comprises servo-controlled optical attenuators giving **better results than equivalent VCA designs, giving more punch and fat sounding compression**, especially when driven hard. *Two modes of operation offer soft (vocals) or hard (drums or electric guitars) compression.*



Impact



## Features & Controls

**TND** 0.002%

**Noise** -95dB at unity gain through the unit

**Mic EIN** -134dB

**Frequency Resp.:** -1dB at 10Hz to 20KHz

### Controls Spec

#### Input

**Mic** Gain 0dB to +60dB

**Line** Gain -10dB to +10dB

**Instrument** Gain 0dB to +20dB Impedance >1MΩhm  
Accepts all musical instrument signal levels from guitar pickups to synthesiser outputs

#### Filters

**Low Filter** 15Hz to 320Hz continuously variable, gentle roll off curve.

-12dB per octave in corrective mode

**High Filter** 4.7KHz to 24KHz continuously variable  
Steep cut off with resonant presence peak.

-12dB per octave in corrective mode.

**Gate** Gate attenuation -20dB

In deep mode Gate attenuation >55dB

**Compressor** Soft Ratio 2:1

Hard Ratio 6:1

Noise -94dB

#### EQ

**Band 1** Frequency continuously variable 40 to 1KHz  
Level -18dB to +18dB

Q fixed fine or wide  
Bell shape or Shelving

**Band 2** Frequency continuously variable 500Hz to 20KHz  
Level -18dB to +18dB

Q fixed fine or wide  
Bell shape or Shelving

**Overload** ±20dB



### Tone Control

The Tone Controller helps you to achieve immediate results – the control layout is similar to a guitar preamp so therefore instantly familiar to any musician. This section features a design based around a *classic 60's vintage circuit* and incorporates bass, middle and two treble modes to cover the entire audible frequency bandwidth. It also features an *overdrive control* to add character to any instrument.

### Focusrite Parametric EQ

This extra stage augments the effect of the Tone Controller and gives the *user fine detail control to add the finishing touches* to complete the desired sound. The two bands of EQ can be independently selected for three different modes

**Shelf mode** – Adds tilt to the frequency response to boost bass or ambient reverb information.

**Bell mode** – Select a specific frequency to boost or cut

**Fine mode** – Makes the filter more selective for fine detail work, without interacting with adjacent frequencies

### Noise Control

The Noise Gate on the ToneFactory™ allows control of noise levels by effectively removing noise build up, especially due to noisy guitar footpedals, etc.

### Output Meter & Fader

This final section features concise output metering and instant control to enable you to ensure that the operating level accurately matches the following piece of equipment.

### Character



### Control



*Everything it does it does well, and some things it does superbly well. This is the unit that's going to appeal to those musicians and studio engineers who are prepared to spend just that little bit more on quality equipment, but who previously couldn't justify the expense of a high end processor.*

Paul White - *Sound on Sound*

## Quick Reference Product Comparison

	VoiceMaster™	ToneFactory™	Compounder™	MixMaster™	Penta™
Height in Units	1U	1U	1U	2U	2U
Mono / stereo	Mono	Mono	Dual Mono/stereo	Stereo	Mono/stereo
Mic Pre	Yes	Yes	No	No	Yes
Inst In	No	Yes	No	No	Yes
Line +4db	Yes	Yes	Yes	Yes	Yes
Line -10db	Yes	Yes	Yes	Yes	Yes
Compressor Type	Opto	Opto	VCA	MultiBand Opto	Opto
Gate	Expander	Gate	Gate	Expander	None
Saturation	Voice Optimised	Distortion with speaker emulation	None	None	TubeTran Valve warmth
Optional Digital I/o	No	No	No	Yes	Yes
Filters	Hi-pass	Hi & Low Pass	No	No	Hi Pass
Parametric EQ	Voice Optimised 3 Band	2 Band	No	1x Full Range	No
Passive Eq	No	3 Band	No	No	No
Total Eq Bands	4 (inc Absence)	7	0	3	0
Bass Enhancement	No	No	Huge	Yes	No
Presets	No	No	No	No	Yes
Stereo Image Widening	No	No	No	Yes	Yes
De-esser	Yes	No	No	No	No
Gate Key Input	No	Yes	Yes	No	No
Comp SideChain Input	No	Yes	No	No	Yes
Limiter	No	No	Yes	Yes	No

### The Digital option

Available for both the MixMaster and the new Penta, the digital option allows high quality, super-clean A/D conversion of stereo signals before audio leaves the unit. No additional circuitry is required post-mastering, on the way to digital recording media.

With Focusrite circuitry around premium converters (24bit / 96kHz, and 128 times oversampled), in a pristine electrical environment, the Focusrite



digital option gives you total control of the final signal conversion – a key moment in signal processing.

The board can be retrofitted by the customer without any soldering etc. Just a few screws to undo, and one clip-connector to join the digital board to the main PCB.

*High quality A/D conversion couldn't be any easier!*

### Controls & Performance

Resolution:	16/24-bit
Sample Frequency:	44.1, 48, 88.2 or 96 kHz – switchable
THD (@+18dBu):	0.004% (+/- 0.001%)
Noise:	(16 bit resolution): < -95 dBFS (24 bit resolution): < -83 dBFS
Outputs:	MixMaster – AES/EBU & S/PDIF Penta – S/PDIF



MixMaster A/D card option

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OZZIE AHLERS

**POWER CONDITIONING:** Furman PL-Plus, AR-Pro Line Regulator; APC Smart UPS

**STUDIO NOTES:** It's no accident that these studios look suspiciously similar. Craig Chaquico and Ozzie Ahlers work together from separate locales. As Craig explains, "Ozzie and I have the same computers, processors, software, consoles, and ADATs so we can easily exchange files. In the rare event there's a problem, we can help each other trace it without wondering if it's because one of us has a different version of software."

Ozzie concurs: "Even our system software is the same. Sometimes we work with other people who have different versions of Digital Performer, so we save the file as an earlier version. Generally a lower-version file will work with a higher-version software, but a higher-version file may not work with a lower-version software."

**EQUIPMENT NOTES:** Through past experience, Craig "appreciates the need for computer power backup. I use an APC Smart UPS for the computer because I've had momentary blackouts that were enough to crash the computer and lose my work. The APC unit keeps power to the computer steady. In the event of a blackout, it gives me enough time to save

my work and do a proper shut-down. Having a good rack setup is important to the studio layout, and I really like the QuikLok gear. The bottom rack (RS 954) slants up, so when I sit at the desk, everything is at my fingertips. I can easily wheel the frame out slightly to reach the back of the gear if I have to pull a cable. Plus, all of the equipment stays very well ventilated."

**PRODUCTION NOTES:** As Ozzie explains, their recent #1 Smooth Jazz Radio track — "Café Carnival" — was "totally recorded in our studios on Digital Performer and then mixed by William Aura at Auravision (Ojai, CA). We wrote and recorded that song by exchanging Digital Performer files on CD-R, and that's how we're doing our new project. We can send a 'cassette tape' version of a song as an MPEG file over the 'Net to exchange ideas almost immediately. Then, when we start working in DP, Craig will record a part, save the entire DP file to CD-R and FedEx the disk to me. I open it in my system, and the entire DP session comes up, including the mix that he was listening to. I overdub my parts and send them back to Craig on CD-R. We can also import overdubs and fly them into our session. It's been a fun way to work, and having similar equipment makes us feel almost like we're working in the same studio together." ■



CRAIG CHAQUICO

## SESSION FILE



Al Schmitt photo By David Goggin

By Lisa Roy

# Diana Krall's "Dancing in the Dark"

## SIGNAL PATH

Ten-time Grammy winning engineer Al Schmitt began basic tracking at Avatar Studios (New York) in Studio A at the end of January. In preparation for his studio date in London, he had slaves made at Capitol Studios in L.A. on February 15th, then headed for Abbey Road to record the strings. Al Schmitt explains, "For the setup of the room, I used a couple of the new Neumann M 150's for the ambience and some vintage Neumann M 50's for the surround. The spot mics were a couple of Neumann U 67's on the viola, three KM 84's on the cello, U 47's on the bass, U 67's on the woodwinds, an M 49 on the French horns, and I believe I used a Cole ribbon mic on the tuba. We recorded it to the Studer A820 at 30 ips, +6 over 185 on BASF 900, non-Dolby through the Neve VR60 Legend. All together, there were a total of 53 pieces. Eight cello, twenty-four violins, eight violas, four French horns, four basses, one tuba, and four woodwinds. I ran it through the board preamps and then directly to the tape machine."

## MIC POSITION

Al Schmitt confides, "I had the studio set up symphonic style, which is normally the way I set things up when I'm doing this kind of an orchestra. Claus Ogerman, who is a brilliant arranger and conductor, wanted it set up so he could adjust the balance of the instruments in the room.

That way he could get all the information from where he was standing, which made my job a little easier. I had the two Neumann M 150's above him about twenty feet in the omni position, about three feet apart and angled down slightly towards the strings. Off to either side and behind him about ten to fifteen feet were the M 50's for my surround position. I always record now for surround because it's becoming so important.

"One of my special tips for miking violins and violas — I almost always have the microphones in the omni position. I just like the way the mics sound and I seem to pick up more of the room that way. I feel that I'm not trying to isolate things as much as I'm trying to pick up the leakage. The room ambience tends to make things sound richer and bigger, and the better the microphone you use, the better the leakage sounds, obviously.

"On the violins I had four U 67's, two of them in front about fifteen feet up and two of them about halfway down the line, fifteen feet up and positioned down at a 45° angle. The first two violin mics were placed up above so I picked up the first two lines of 6, and then the other two mics in the back picked up the second two lines of 6. On the cello, I used KM 84's about six to eight feet back and six feet up, and they were aimed at the F holes. With this setup, I could pick up the four on the left and the four on the right."

## PROCESSING

Al Schmitt shares, "I didn't use any equalization or any limiting or compression. Nothing. I rarely do. My theory on that is the microphones give me what I want, and I know what microphones sound good on what

**DATE:** March 9, 10, & 11, 2001

**STUDIO:** Abbey Road Studios, Studio 2

**LOCATION:** London, England

**ARTIST:** Diana Krall

**PROJECT:** Dancing In The Dark

**TRACK:** The London Symphony Orchestra strings for the song, "Dancing In The Dark"

**PRODUCER:** Tommy LiPuma

**ENGINEER:** Al Schmitt

**ASSISTANT ENGINEER:** Chris Clark



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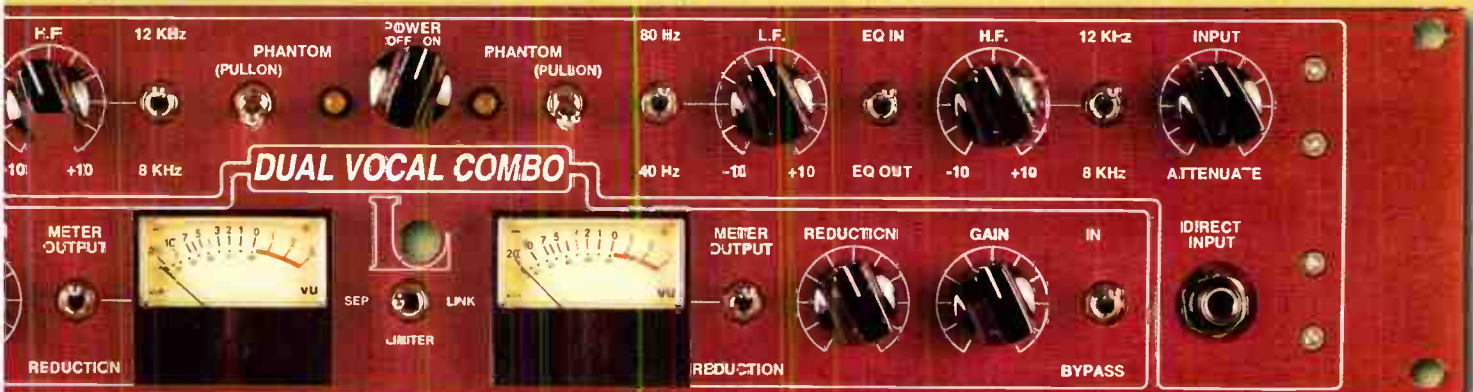
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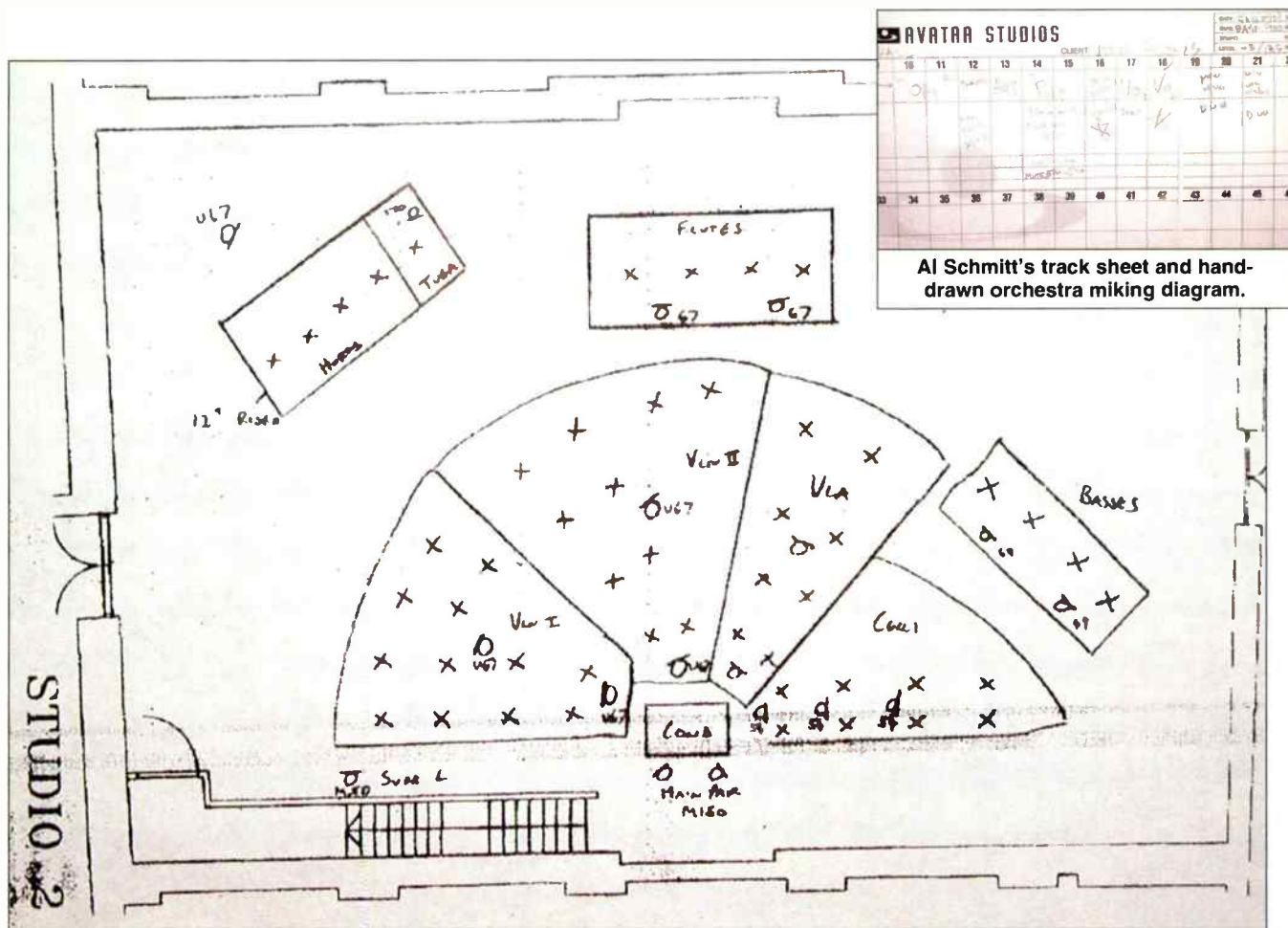
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Al Schmitt's track sheet and hand-drawn orchestra miking diagram.

instruments. I stay away from equalization and limiting as much as possible. If it doesn't sound right to me, I'd rather change the microphone than try to EQ it. The way I set it up on the board is the same way I set up the room — the ambience first, then the four violin mics, then the two viola mics, the two cello mics, the bass mics, then the flutes, the French horns, the tuba, and then the surround. I didn't use any EQ — not even in the mixing."

**TRACK NOTES**

Al Schmitt elaborates, "Claus Ogerman hadn't done anything but classical music in the last twenty years, so to get him out of retirement to do something different was a big feat. He's a great arranger/ conductor, and we were all just overwhelmed by him and his arrangements. At first he wasn't interested in doing something different, so Tommy LiPuma set up a dinner between Claus and Diana. They talked and he was so impressed with Diana and her musi-

cal knowledge and ability that she won him over.

"Claus lives in Munich and was very familiar with the London Symphony Orchestra, so he wanted to do it at Abbey Road in London. Studio 2 is a pretty large room, a little over 2,000 square feet. It's where the Beatles did all their recordings, and there's such a great vibe to the room. The control room is upstairs on the second floor, so you're looking down into the studio. The studio is an oblong shape, about 60 feet long by 28 feet wide with 24-foot high ceilings. As you're looking down into the studio to the wall on the right, about half way down, and out about eight to ten feet, was where I positioned Claus, and then everybody was set up around him. We had good communication from the control room. We used a phone system so we could talk to him. Claus is a very spry guy and he kept running up and down the stairs. I kept running down the stairs, too, so we all stayed in good shape. I set up the violins to the left of Claus,

the violas in the center. The French horns and the tuba were behind and to the right of the violins with the woodwinds behind the violas. I had the percussionist, who just played light bells, set up to right center of the room. I set it up this way because this is the way it's normally set up for a symphony orchestra and that's the way the conductor looks when he's conducting.

"The great thing about 'Dancing In The Dark' was Claus did an ending with kind of a tango feel after Diana finishes. It has this hypnotic thing in the arrangement that's just amazing. It's very unusual to have an ending of a song go on for 45 seconds after the vocal ends, and it's just fabulous. Also, listen closely for the way Claus wrote the tuba and the French horns on this track, and also the harmonics in the violins. I just finished doing the surround mixes at Capitol Studios in Studio C, and they came out great. I advise everybody to get their surround systems and set them up because surround is here to stay and it's a phenomenal way to listen to music." ■



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# Electro-Voice 636

by Steve La Cerra

**MICROPHONE NAME:** Electro-Voice 636

**FROM THE COLLECTION OF:** The Wood Shop, NY

**YEAR MANUFACTURED:** 1972 through 1986

**PRICE WHEN NEW:** \$180

**TYPE OF MIC:** Moving coil

**POLAR PATTERN:** Omnidirectional

**FREQUENCY RESPONSE:** 60 Hz to 13,000 Hz

**IMPEDANCE:** 150 ohms or high impedance (shipped for high impedance)

**OUTPUT LEVEL:** -58 dB, ref to 0 dB = 1 volt per dyne per square centimeter (high impedance); ref to 0 dB = 1 milliwatt per 10 dynes per square centimeter (150-ohm impedance)

**EIA SENSITIVITY RATING:** -154 dB (high or low impedance)

**DIAPHRAGM MATERIAL:** Electro-Voice Acoustalloy

**CASE MATERIAL:** Steel

**DIMENSIONS:** 10.25 long x 1.125 diameter (inches)

**WEIGHT:** 15 ounces

**MIC NOTES:** Designed for general public address use, the Electro-Voice 636 was built for immunity from physical bumps and bruises. According to the instruction sheet that accompanied the 636, "The mechanical nesting principle of design by which the internal parts of the microphone are closely fitted within one another results in a mechanical structure that almost completely eliminates damage from mechanical shock." In addition to an on/off switch located at its base, the 636 was supplied with a built-in blast filter to minimize wind noise.

**USER TIPS:** The Electro-Voice 636 was furnished with a cable that terminated on one end with a QC-4M Quick-Change Connector (the other end of the cable was unterminated). Use of this connector allowed the output impedance of the mic to be changed from low to high impedance without tools. After removing the connector from the microphone base, the QC-4M is opened simply by holding its shell and pushing the cable through the shell. The connector insert will open up, and since the contact pins just push into the insert, they can be removed and reconfigured. For low-impedance operation, insert the white conductor's pin into hole two; for high-impedance operation, insert this pin into hole three. The shield pin should be placed in hole one and the black conductor's pin in hole four; these should not be changed. If you're wiring the cable to an XLR connector, use shield to pin one, black to pin three, and white to pin two. ■





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# Ron Fair

**SUSPECT:**  
**OCCUPATION:**  
**BIRTHPLACE:**  
**NOTES:**

Ron Fair  
 Producer, arranger, engineer, keyboardist  
 Los Angeles  
 Fair's father is an opera singer and his mother is a classically trained pianist. Following studies as a musician, his career began as an arranger/producer of publishing demos, including work as a recording engineer.  
**1979:** Named house engineer for United Artist Music Publishing.  
**1981:** Named Talent Manager, A&R, West Coast for RCA.  
**1983:** Director, A&R, Chrysalis Records — signed Go West, Armored Saint. Mixed the hit metal album by Slayer, *Hell Awaits*.  
**1988:** Joined Island Records. Produced #1 Alternative track: "Charlotte Anne" by Julian Cope.  
**1990:** Named Senior VP and head of A&R at EMI Records — produced the 8-million selling soundtrack to *Pretty Woman*.  
**1993:** VP of A&R at RCA Records. Signed Grammy-winner Christina Aguilera and guided her multiplatinum career. Co-produced and co-wrote her #1 hit "Come On Over Baby" and produced her platinum Christmas album. Also signed the group Lit and executive-produced the *Reality Bites* soundtrack with #1 hits by Lisa Loeb and Big Mountain.  
**2001:** Joins A&M as president.

**EQ: What's your family background?**

**RON FAIR:** My father was born and raised in Shanghai, China. His father was American and his mother was Russian. On my mother's side, I come from a family of Jewish actors who were renowned in the Yiddish theater and went on to become pioneers in Yiddish broadcasting. They migrated from Poland, toured the world, and ended up in Los Angeles where my grandfather started a daily radio program that ran for 25 years called "The Jewish Hour" on KALI. He had a recording studio in the '50s, built into a garage and then converted into a broadcast studio that operated with the radio station through special FCC lines. I've been around recording, microphones, and broadcasting since I was two years old.

**How has that background affected you?**

Through all the years I spent as a starving

musician, my fallback and day job was as a recording engineer. I began recording at a really young age — a friend of mine, Joe Klein, had a recording studio mainly for commercial production, voiceovers, and backing tracks back in the early '70s. That studio went from full-track mono to three-track with a Scully deck, then four-track, 12, 16, and 24. I lived through all the changes as the studio evolved.

**What was your first success as an engineer?**

The original soundtrack to *Rocky*. I was one of two engineers, and I worked for Bill Conti, who was a mentor to me in those days. I had done a lot of engineering for him before he got his big break with *Rocky*.

**Do you and Sly still hang out together?**

Right. No, I really didn't know him, but Bill Conti and I still hang out together.

**How did you make the move to producer?**

I was always playing piano and arranging music, and then producing, pulling my friends in after hours at the studio, making tapes and demos, knocking on doors of publishers and record companies, trying to break in. I used every means available to me, and my engineering was always connected with my playing ability. Back in those days, technology was a lot simpler and the process of recording was much more related to making music than it is today.

**Yes, I was looking at your elaborate**



(l-r) Dave Pensado, Christina Aguilera, and Ron Fair

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**digital setup during the recording of "Lady Marmalade" for the film Moulin Rouge — can you explain what was going on?**

The vocal production was done by recording each of the artists singing their part. But at that time, we didn't know exactly who was going to be singing what and where, especially during the ad libs, which are a crucial part of the song. Each artist sang down the track, recording several different takes of the material, and just riffing. Then, I isolated the riffs and truncated them, put them into an Akai sampler, and triggered them off a keyboard. I had about 35 unique vocal samples for each singer: Lil Kim, Pink, Mya, and Christina.

**Now that you're the head of a record company, are you still on top of the technology?**

Definitely not. Back in the days of analog recording, I was completely on top of it. I could walk into any studio, anywhere in the world, and record and mix a record on my own with no help whatsoever. Now, with all the digital media, with hundreds of formats, and the way that music syncs to film, and 5.1, and all the issues — it's so far beyond me that I can't focus on it anymore. I have to delegate and focus on the major issues of the singer and the song.

**Who do you rely on?**

I worked on this project — and a lot of others — with a great mixer, Dave

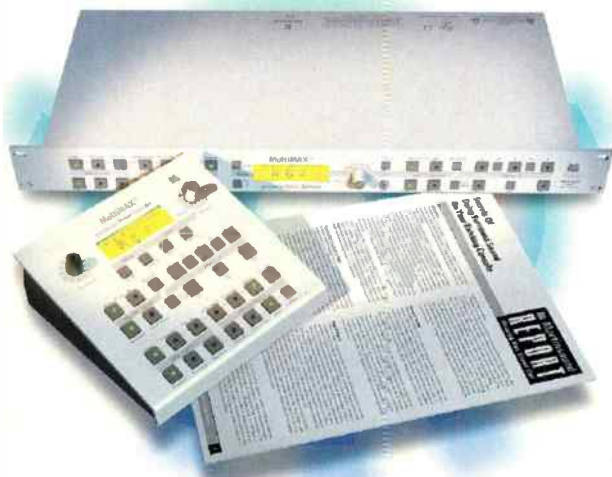
Pensado. Tal Herzberg is my number one guy for all the recording and editing of the music. He's a highly evolved musician and Pro Tools guy, way more than simply an operator of a system. He's an integral, artistic part of the way we record. Mike Ross is my engineer — he records all the great sounds.

**So, how does it feel, as the head of A&M, to be totally responsible for an artist's future?**

I've been responsible in the past, whether I had the president title or not. It didn't change anything for me. It comes with the turf. To me, it's a commitment when I sign an artist. I make their music my cause and become an advocate for them. It's so far reaching — much more



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than just delivering a great record and a great song. It's seeing it through the promotion and marketing, publicity, and distribution levels of bringing it to fruition. It's a gigantic leap from the heart for me whenever I get involved with any artist or group. The fundamental connection between me and the artist hasn't changed, regardless of job title. If anything, it's more difficult to have that single-minded dedication because my playing field is much bigger now.

**Could you take me back to that**

**moment when you signed Christina Aguilera?**

My former boss, RCA president/CEO Bob Jameson, knew Christina's original managers, the father and son team of Norman and Steve Kurtz. Bob listened to her music and told them that I understood that genre of music. He thought she was good and I listened to the tape. I thought there was about eight bars of exquisite tonality in her voice on one of the songs. Most of the songs were forgettable — first effort, pop demos. But

the last song was exquisite because of the tonality and the scope of her voice. I arranged a meeting — she was 16 years old, with no makeup, her hair in a ponytail. A petite, teenage girl. I asked her to sing for me, and she said, "Here?" I said yes. She did a song from *The Preacher's Wife*, a Whitney Houston song she'd been listening to. She stood there, her feet firmly planted on the ground; her eyes went into sort of an icy stare — a total sense of self-possession and perfect intonation. She had the complete command of a seasoned performer in Carnegie Hall. No inhibition, no sense of containment. In that moment, you know you're in the room with greatness. The combination of spectacular pitch and stupendous tone, and that fearlessness, they were automatic bell ringers for me. If it happens one or two more times in my life, I'll consider myself very lucky.

**So, how are you getting along with Jimmy [lovine]?**

Jimmy gave me the keys to the car and said I could drive anywhere I want to go.

**How will the music industry look in five years?**

The entire delivery end will be dramatically altered once we have good quality, simple, reliable, and fast downloading of music. Plus, the subscription model will make record consumption more like cable television. Great things are happening, and bringing hundreds of choices to people. It opens the business up to so many more people who are interested in music.

But, as the universe of choice expands, the attention span decreases, so I think it will be very difficult in the future for an artist to sustain a long career. It will be much more of a song-by-song business. ■

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(l-r) Tal Herzberg and Ron Fair



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**THE PRODUCTION SECRETS  
OF GRAMMY AWARD  
WINNER DR. DRE**





CAN'T FORGET ABOUT

# DRE



**R**ecently, the *Los Angeles Times* did a survey among 22 record company executives to name the artists they believe will sell the most records over the next seven years. Dr. Dre was at the top of that list. One executive said that Dre, who won a Grammy in February for Producer of the Year, might be the greatest talent in the music business right now. "Hip-hop is the most dynamic sound in pop, and he's the king of hip-hop."

It came as no surprise that catching up with Dr. Dre for this interview was a bit of a challenge. After all, he's been busy putting final touches on a mix for Eminem's side group, D12, making beats with Busta Rhymes, working on a new single with Eve

and Gwen Stefani, and producing a soundtrack for a major film, *The Wash*, which he also stars in with Snoop Dogg. He manages to accomplish this mind-boggling schedule with the aide of his production manager, Larry Chatman.

As I walk into Record One in Studio City, Chatman is in between juggling phone calls and greets me with a warm smile, informing me that Dre is on his way. He invites me into the control room where Dr. Dre's Dream Team is already warming up. Ensclosed in Studio B, engineer "Veto" (a.k.a. Mauricio Iragorri) is tinkering on the SSL 8000, while Mike Elizondo, bass player, and Scott Storch, the expert on keys, file into the studio. The activity seems normal, even mundane, until Dr. Dre walks



# CAN'T FORGET ABOUT DRE

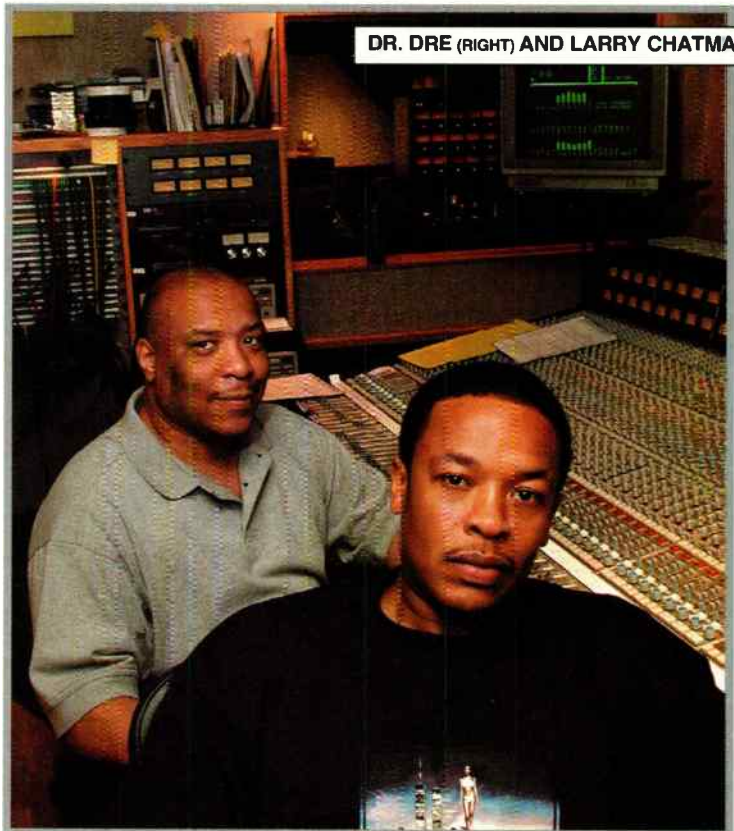
into the room. The vibe in the control room shifts up a level of energy. During a lunch break, the conversation turned to a VH-1 documentary on The Doors that Dre had seen the previous night, and, after commenting on how much he liked the keyboard sound, Scott Storch immediately launched into what was a near-perfect rendition of the classic Doors sound. Soon Mike Elizondo had joined in on bass, Dre added a beat at the turntable, and, before you knew it, a song was born!

Contrary to media reports that his recording sessions are filled with drugs, alcohol, and gang warfare, all I saw was positive energy, professional vibe, creativity, and solid business. After completing a call with his protégé Eminem (a.k.a. Marshall Mathers), where he was advising the young rapper on some crucial business decisions, Dre turned his attention to the interview at hand....

Dr. Dre can be described as many things — a catalyst, an astute businessman, an innovator — but perhaps the most interesting description of the man, born 35 years ago as Andre Young, is his description of himself as “a motivator.” “I’m a very good motivator,” he shares. “I direct well. I’m a person that will spend three or four hours working on one line of a song to get it correct. I have to be able to work with artists who are ready to go through that torture.” Some of the artists that have signed up for his unique brand of “torture” are Snoop Dogg, Eminem, and the hardcore rap group N.W.A., which Dre founded in the mid ‘80s with fellow rapper Ice Cube and signed to Eazy-E’s Ruthless Records.

Although Dr. Dre had been rapping and DJing since his early years growing up in one of L.A.’s rougher neighborhoods, Compton, he’s surprisingly realistic about where his truest talents lie, and that’s in production. In addition to being credited with inventing gangsta rap, he’s responsible for creating his own musical style — G-Funk. This patented, often imitated style of music immediately became the defining characteristic of the entire generation of music. There are few that would argue that from the introduction of G-Funk, Dre’s sounds and rhythms shaped the future of rap music, while impacting its history at every turn.

One of the key moments in Dr. Dre’s career came in 1992, when he founded Death Row Records with his friend Suge Knight. This became a platform for Dre’s obvious production talents. He released only one solo record for Death Row, the critically acclaimed *The Chronic*. While



DR. DRE (RIGHT) AND LARRY CHATMAN

the production values behind G-Funk dominated the hip-hop world for the next four years, collaborations with stepbrother Warren G and the immense success of Snoop Dogg’s 1993 debut *Doggystyle* cemented Dre’s name on the list of the most powerful and influential men in the music industry. Unfortunately, all of this success did not prevent the eventual collapse of the record label in 1996 amid financial difficulties and creative differences — not to mention a lengthy murder trial for the label’s star, Snoop Doggy Dog.

The businessman in Dr. Dre had matured through all the challenges and obstacles of the ‘80s and early ‘90s. His instincts served him well when he made the decision to bail from Death Row Records almost a year before its ultimate demise. Eventually, he formed Aftermath Records and turned his production, mixing, and writing energy toward a young rapper he found in Detroit called Eminem. This collaboration not only resulted in Eminem’s 1999 debut record, *The Slim Shady LP*, and the multi-platinum smash follow-up *The Marshall Mathers LP*, but also a Grammy for their collaboration on 2001’s “Forgot About Dre.”

Dre explains, “‘Forgot About Dre’ was actually Marshall’s idea. He said I have an idea for a song, I just need some music to it. So he sent the chorus to me and then we went to work on our music. We recorded it at Granny’s House Studio in Reno, and then we put



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**FIRST WE LISTEN**



# CAN FORGET ABOUT DRE

the song together in a couple of hours." The collaboration also garnered him a Grammy for Producer of the Year. "That was big," confides Dre. "I love the fact that I didn't have to go on stage and give a thank you speech. I didn't have anything written down. As it turned out, when they called my name for Producer of the Year, I just stood up. That's going to be the perfect ending to my life story."

Perhaps he should start preparing his acceptance speech for next year now because an Engineer of the Year Grammy is certainly not out of the question for the technically savvy Dre. He humbly admits that, although he defers to his engineer of choice, Veto, on certain things, he himself is the man behind the board for the majority of the projects he works on. His roots in recording began in a small studio in the back of a club in Compton where he used to DJ. "I would just come in there during the week and just try to create my songs, just messing around, seeing if I had it. I would play them in the clubs on the weekend and I would get good responses, so I just kept doing

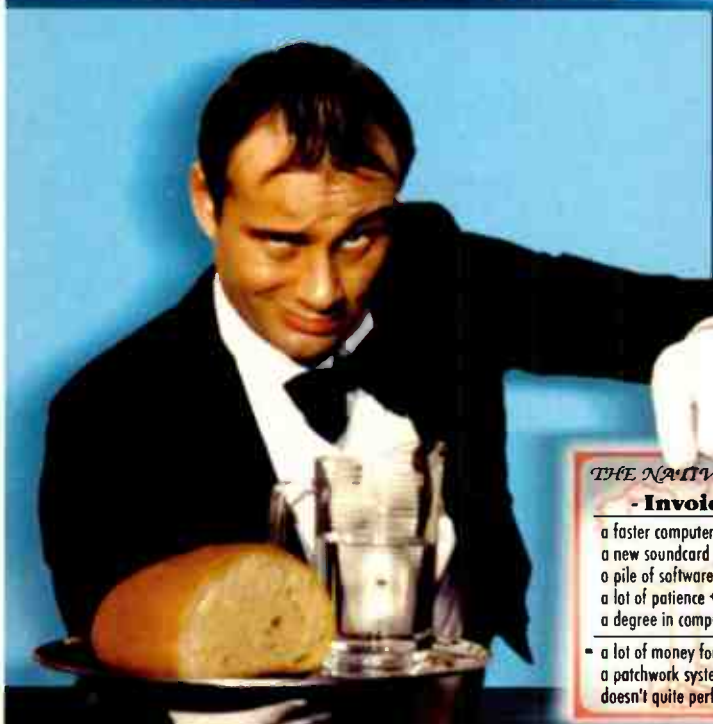
it and it became my profession." He continues, "I learned how to engineer basically from that club. I also learned a lot from this engineer, Donovan, at Audio Achievements in Torrance. We used to work together a lot, and I eventually started working by myself on mixes. I wanted it to sound a certain way and I felt nobody was going to be able to dig in my brain and get the sound out that I wanted except me. Everyday I would learn something new. I'm actually still learning with all the new technology."

Through the years, as any engineer would, Dre has defined his choices in audio gear. He's candid about his love for any and all Solid State Logic consoles, as well as the Studer A827. He always uses Quantegy 499 tape. His mic of choice is the Sony C800G, which is the only mic he ever uses on vocals. When recording vocals with the Sony mic, he runs it through a Neve 1073 mic pre, and then through the SSL compressor and a dbx 160, but he admits to very little EQ on the vocal. Dre explains, "I usually record vocals flat. The only time I put EQ on vocals when

◆◆ I TRIED DIGITAL A COUPLE OF TIMES AND I DON'T REALLY LIKE IT. THERE'S JUST SOMETHING ABOUT IT. FOR ME, IT'S NOT FAST ENOUGH JUST YET. ◆◆

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recording is if I know for a fact that I'm going to want it to sound like that during the mix." He continues, "When I want a little more crispness out of the mic, I use the 1073 EQ with just a little high end. I don't use too much compression; maybe 4:1 with the outputs set to zero. I usually do my compression afterwards. I like the compressors on the SSL. I usually have the ratio up to about eight or ten on a lot of things." Dre, a die-hard fan of analog recording, is one of the few producer/engineer's left in the world that have not jumped on the Pro Tools bandwagon and, true to form, he makes no apologies for that.

"I tried digital a couple of times and I don't really like it. There's just something about it. For me, it's not fast enough just yet. I tried to record into Pro Tools and got one of the best Pro Tools operators down to record the music, and it's just not me. Not yet," he concludes. "We had the Sony 3348 in the studio, and I tried a couple of songs on it and it didn't give me the sound I wanted. The kick drum started sounding transparent. It wasn't good." When it's time to mix down, Dre makes the unusual choice of mixing straight to DAT, so you can imagine that the DAT machine is a key element in any studio he chooses to work in. Dre's DAT machine preference is the Panasonic 3800.

The question on everyone's mind, though, is what gear does Dr. Dre turn to make his signature beats? Engineer "Veto" confides that there's a laundry list of toys that make a Dre session complete. "The brain of the whole thing is the MIDI sequencer, the Akai MPC3000. We use the Korg Triton keyboard. Usually that's the controller — the Nord Lead and Korg's MS2000. Lately we've been trying out the Alesis Andromeda A6. Someone recommended a Waldorf cue, and we seem to like that one as well. They let us try it for a day and we said,

"Yes, we'll keep it!" You might also find a nice array of vintage keyboards on hand, including those by Rhodes, Wurlitzer, Moog, and Roland. But Veto says what you won't find in use on a Dre session is a lot of outboard gear.

"We don't use a lot of outboard gear," Dre concurs. "I doctor the vocal as far as de-essing and maybe some low-end EQ for the kicks. We use a lot of EQ on the console and all the limiters. Most of it comes out of the SSL and into the quad compressor.



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# CAN I FORGET ABOUT DRE

I like the sound of it on the mix bus. That's the SSL quad compressor in the center of the console."

Dr. Dre certainly knows his way around the studio and in and out of a "tool box." This knowledge he credits to once having his own studio, complete with an SSL 4000E/G. "We did a lot of Eminem's first record at my home studio. Actually the first song we did together, 'My Name Is,' was done there," remembers Dre. Eventually he removed the studio from his home and is now vocal about his love and support of the professional, commercial facility. "I kind of got tired of having a home studio because you get to the point where you want to feel like you're going to work. Plus, sometimes you have to work with people and there's just some people you don't want in your house," he laughs.

This love for the commercial recording facility has Dr. Dre hanging out on a regular basis at L.A. recording hotspots like Larrabee West, Encore, and, of course, Record One. "We mix most everything at Larrabee West. I just like a studio that's comfortable, has a lot of space, and, very important, has a lounge with a kitchen," he shares. "The equipment is important, but, to be honest, I'm still working on the same board I've worked on since 1990. The important part is who's pushing the buttons."

Dr. Dre just finished "pushing the buttons" on a new project, D12, the first act on Eminem's label, Shady Records. "D12 is an incredible group," Dre praises. "All the guys in the group are great musicians.



## DR. DRE'S DREAM TEAM

Dr. Dre is quick to give his Dream Team credit. "I don't have a main instrument. I feel my brain is my instrument. In my opinion, I'm not really that good of a musician. That's why I hire the best musicians around. Like Camara Kambon, he's one of the keyboard players, and Mike and Scott. Everybody just adds their part to the soup and it comes together." Here are the vital statistics:

### LARRY CHATMAN

**Title:** Production Manager  
**Birthplace:** Chicago, IL  
**Nickname:** Uncle  
**Years on the Job:** 10

**Job Description:** In charge of organizing Dre's recording, movie, video, and tour activities. Chatman makes it happen! "Dre comes up with the ideas and I've got to put it all together. Basically, he makes one call to me and I do the rest."

### MAURICO IRAGORRI

**Title:** Engineer  
**Birthplace:** Los Angeles, CA  
**Nickname:** Veto  
**Time on the job:** 7 months

**Job Description:** "Dre wants me to make his stuff sound as clean and clear as possible. I always EQ the tape. We put a lot of bottom on kicks, even snares, and get it set so, when it comes back, it already sounds EQ'd. [Dre] expects me to make the session run smoothly — have everything set up and ready to go when he walks in.

"The other thing he depends on me for is to know everything we've done and where it's cataloged on DAT. If he plays a beat that we did for Mary J. Blige, I have to know which one he's talking about and play it for him right there. Of course, I know where it's at because I recorded it."

### MIKE EUZONDO

**Title:** Track Writer/Bass/Co-Producer  
**Birthplace:** Los Angeles, CA  
**Nickname:** Bomba  
**Years on the Job:** 5

**Job Description:** "Dre, Scott, and myself will show up at the studio and just start vibing. Dre will have some beats going and I'll start with a guitar riff or a bass line — we start jamming. Once an idea sounds good, the skeleton of it, Dre will ask Veto to start rolling the DAT. While Dre and the artist are writing the lyrics, we'll be laying the track down on two-inch. That's the beginning stage of it.

"On Snoop's *The Last Meal* record [2000, Priority], it was just Dre and I goofing around. I started off with the guitar riff and he'd have the drums and there would be something there that would spark an idea. Then we would start building on top of that. My big thing is — in any situation — to just try and latch on and find a role and do that. With Dre, it began with being his musician, then it led to doing co-writes on some things, then the Snoop record, with some co-production."

### SCOTT STORCH

**Title:** Keys/Songwriter/Co-Producer  
**Birthplace:** Long Island, NY  
**Years on the Job:** 2

**Job Description:** "There's no one particular formula. I get cracking on a couple of beats with Mike and Mel-Man — we try to come up with the best music collectively. But, typically, Dre will come in with a beat idea and then we all play around it."



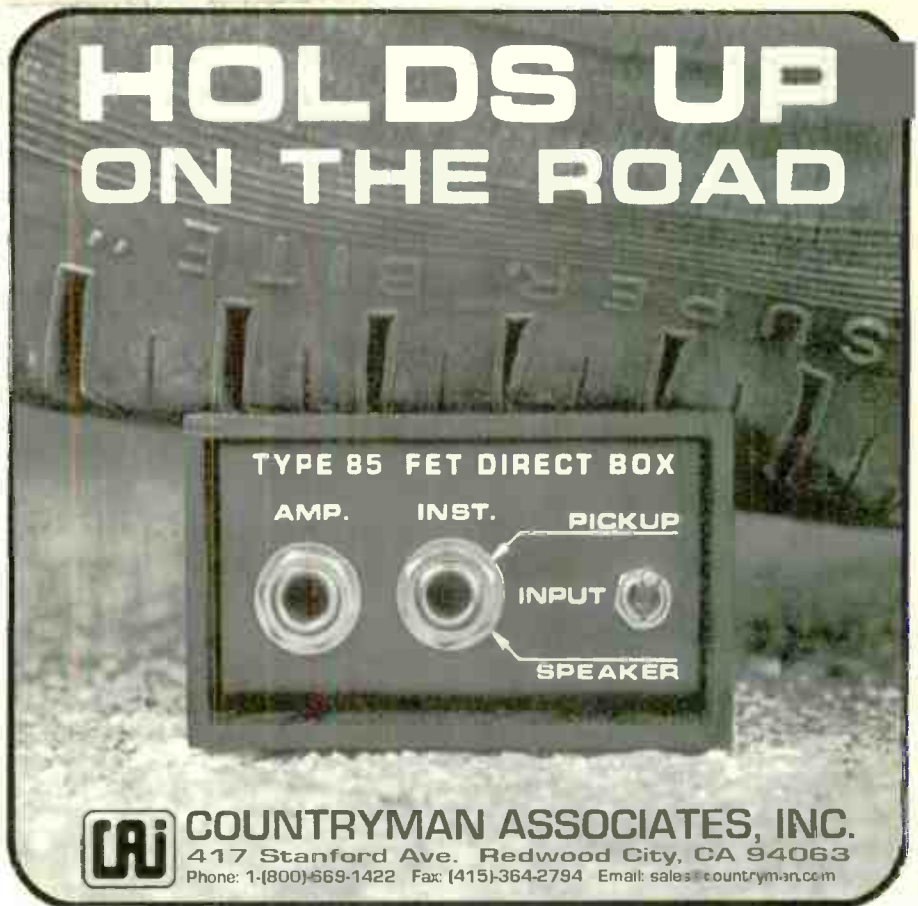
They all have really crazy personalities, you know, and I love working with them. I think they're going to be a big group. Eminem is the sixth member in the group." Also on the horizon for Dr. Dre is his first foray into surround sound mixing. "I'm going to record and mix my next record in 5.1, so it gives me a whole new world to work with. Hopefully, then people can just throw it in their DVD player and have a little blast of entertainment."

One thing that's evident about Dre is that he strives to keep his audience entertained regardless of what he's doing. He wants the records he makes to stand out and intrigue the fans long after they first listen. He ensures this, he says, by putting what he calls his "sprinkles" into the mix. He explains, "People come up to me on the street and say, 'I hear something different every time I listen to your record.' That's what I like to hear — that's the sprinkles." Even when he's self-producing, he challenges himself constantly. "I really take a lot of time on each song and make sure it's okay — I'm my worst critic. I want to make sure it's right."

The multi-faceted Dre has put plans in place to expand his empire by adding two more talents — acting and directing — to his already impressive resume. Dre fans can look forward to a Snoop/Dre reunion with the release of a movie they're currently filming together, *The Wash*. The power duo will also collaborate on the soundtrack of this "dramedy." Dre spills another interesting tidbit — he's going to direct a movie within the next year. "The first movie I'm doing is called *Raincoat*. It's all about...condoms," he muses with a grin. Acting is a true passion that he intends to explore fully in the future. "I want to do a really big movie and have it come across really good. I want it to have the same feeling that my records give people. This movie is going to be interesting."

We would expect nothing less from The Doctor. ■

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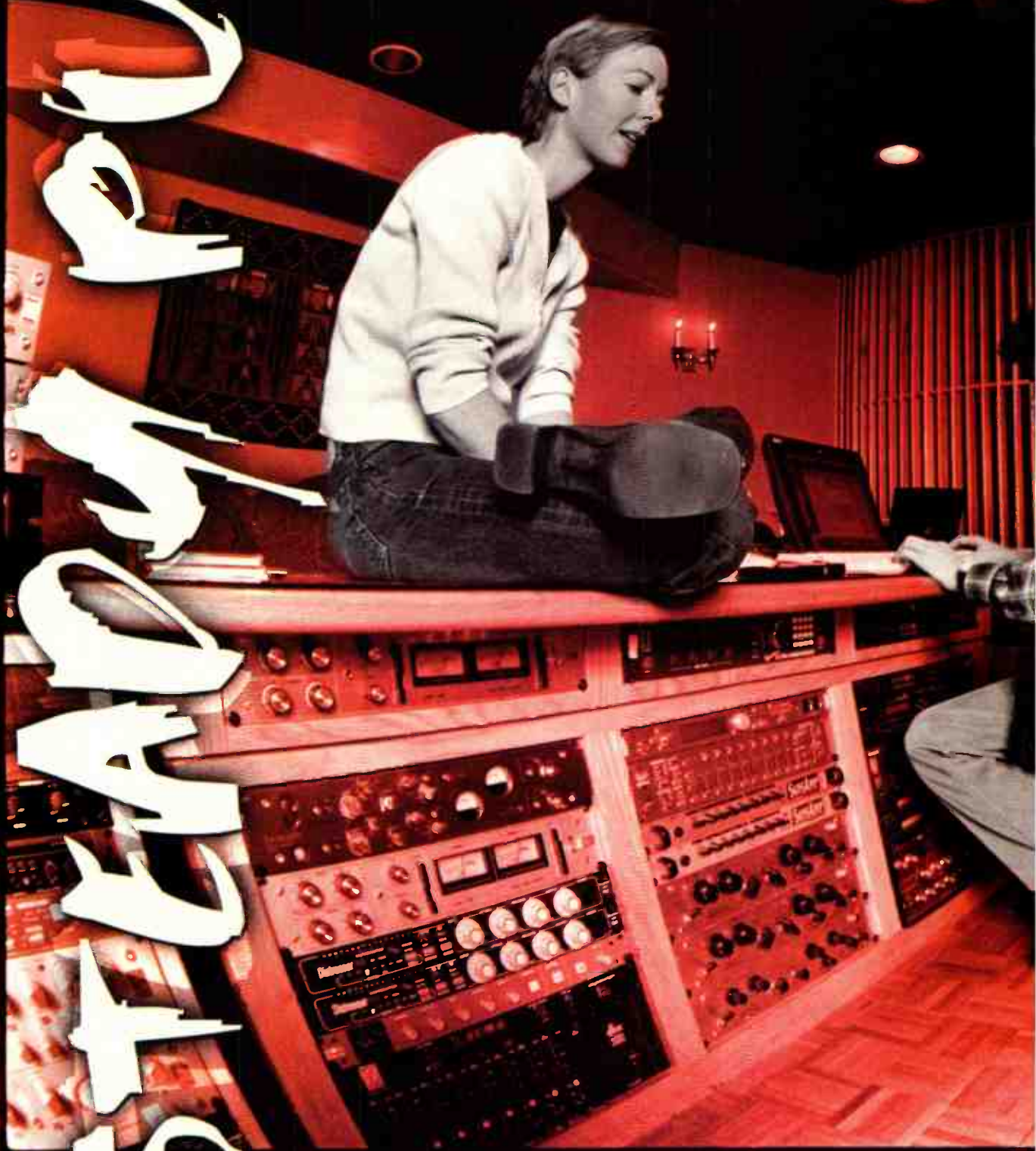
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# STUDIO CALL

Jonathan Brooke's latest project features mix





## master Bob Clearmountain's return to tracking and producing



By Steve La Cerra

There aren't many artists who have the privilege of working with a recording and production master like Bob Clearmountain, but Bad Dog Records artist Jonatha Brooke is one of those select few. Her most recent release, *Steady Pull*, was produced and engineered by Clearmountain at his home studio, Mix This! Clearmountain's workplace — which centers around an SSL 4000G+ console — was designed primarily as a mix room. However, Jonatha changed that with *Steady Pull*.

Clearmountain, who hasn't produced a record in almost ten years, recorded much of *Steady Pull* with Jonatha and drummer Larry Aberman playing live at Mix This! As Clearmountain reveals, "My studio has only two rooms. It was essentially built as a mix room, so I don't have 'proper' isolation booths. Jonatha was in the control room singing and playing acoustic guitar, while Larry was out in the lounge. This is the first time I tracked here."

Unlike Brooke's past recordings, *Steady Pull* didn't go through extensive preproduction. While recording her recent live CD, *Jonatha Brooke Live* (Bad Dog Records), Jonatha says she discovered "just how much I love the immediacy, intimacy, and spontaneity of the live sound. I wanted that in the studio, so a lot of tracks were laid down with just Larry and I. In some cases, Larry was hearing the songs for the first time. Having Bob and David [Boucher, Bob's assistant] in the control room made me feel more like I was performing. I kind of liked being in the control room at the center of things. Both 'Linger' and 'Red Dress' were scratch vocals that were kept, while 'Your House' is a live take of the whole band. So there are quite

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## STEADY PULL



Photos By Rick Gould

a few songs that are more like live performances. I'll take that vibe any day."

According to Clearmountain, "Jonatha sang through either a CAD Equitek E-300 microphone or one side of an AKG C24 [stereo] tube mic. The mic went to an Avalon M5 microphone pre-amp. I patched the M5 out to a line input on the SSL and then to an Apogee AD8000SE converter. The digital output of the AD8000SE fed my Sony PCM3348HR multitrack. At times I used an UREI LA3A compressor, which was modified to reduce the noise floor. I believe that there's a pad on the output, so you can turn the input level up and get a better signal-to-noise ratio for compression, while not overloading the output stage."

As you'd expect, recording live vocals and acoustic guitar in a control room presented challenges. "First off," Clearmountain notes, "we had to monitor on headphones, so I recorded the vocal and guitar flat. And of course we had to be quiet in the control room while we were recording, or the noise would be heard on Jonatha's vocal or guitar tracks (the '3348HR is in a machine room, so it's not a problem). For vocal overdubs, Jonatha was in the lounge, which has a big window. My house is in a quiet, residential neighborhood, but every now and then there'd be a dog barking or a gardener using a leaf blower nearby! We didn't have enough

isolation to keep that out. In fact, you can hear a truck go by at the beginning of the first verse of 'Lullaby!'"

Isolating acoustic guitar from a vocal (and vice versa) performed by the same person can be a difficult task. But Bob maintains that "a vocal mic doesn't have to be placed directly in front of the singer. I brought the vocal mic down lower, sort of pointing up Jonatha's nose (so to speak) at a 45-degree angle. That allows the rejection spot of the vocal microphone to face the guitar. Likewise, I placed the acoustic guitar mic pointing downward at about the same angle, with the rejection point facing Jonatha's mouth. That, plus using the Fishman pickup on her Olsen guitar (which sounds wonderful), gave me pretty good isolation — enough that, if we needed to fix a vocal line, we could do a punch without worrying about leakage on the guitar track."

### LOUNGING AROUND THE DRUMS

Although never intended for use as a recording space, the lounge at Mix This! does have an XLR mic panel, facilitating Clearmountain's efforts in using the space as a "drum booth." The drum sounds on *Steady Pull* belie Clearmountain's rather ordinary selection of mics for the kit: Sennheiser MD421's on bass drum and floor tom, Shure SM57 on snare and SM98 on high toms, and AKG C460s for hi-hat



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# STEADY PULL

and overheads. For ambience, Clearmountain used "a pair of Royer R-121 ribbons about 12 feet in front of the kit, and about as high as I could get them — the ceiling height is only eight feet here. There's a bathroom at the end of the room behind the lounge that has a really ambient tile shower stall. We left the door open and stuck an Octava MC012 mic in there while we were recording. In the bridge of the song 'Room In My Heart,' the drums get bigger. I just cranked that mic to make the drum

sound open up. I usually compress the room mics a bit depending upon the music, what the track calls for, and what kind of effect I want to get. Sometimes I compress them with the SSL compressors, or maybe an (UREI) 1178, which is just a stereo version of the 1176."

In the song "Red Dress," the kick drum sound is massive. According to Clearmountain, "That's mostly Larry's drums, plus the ambience of my lounge. There's a program in the Lexicon 480 called '20W50,' which is a very dark, short

## WEBLINK

Email Jonatha Brooke at [pra@prarecords.com](mailto:pra@prarecords.com) and visit her Web site at [www.jonathabrooke.com](http://www.jonathabrooke.com). Bob Clearmountain's Web site is at [www.mixthis.com](http://www.mixthis.com).

verb. I sometimes add that to a kick and it makes for a very resonant sound. But there's no sample or any big trick."

## TRACKING AND TRANSFERRING

Some of the tracks for *Steady Pull* were recorded in Pro Tools. Brooke cites "How Deep Is Your Love" as an example: "That song started as a demo at my friend Ryan Freeland's apartment and it was a Pro Tools adventure. It has all sorts of weird backward parts and loops. There was a lot of experimentation on that song, and it became very complicated. Clearmountain concurs: "'How Deep...' probably went 70 or 80 tracks deep in Pro Tools. We eventually got it down to under 48 and bounced it to the 3348HR, because I'd rather have the tracks on tape when mixing as well as for archiving."

Clearmountain owns a total of seven Apogee AD8000SE's: six of them that are fitted with SDIF-2 cards and are dedicated to A/D and D/A conversion for the 3348HR, and one that serves as the front-end for his Pro Tools system. Clearmountain interfaced his Pro Tools rig with his 3348HR using Apogee's Multimedia Bus (a.k.a. "AMBus" — a feature on the AD8000 that has the ability to format-convert various digital audio protocols). With a Pro Tools TDM-compatible AMBus card (the Digi 8+ card) in the control room's AD8000, four AES pairs then travel to the 3348HR. A Digidesign Universal Slave Driver (USD) interprets the timecode for Pro Tools, providing the positional reference. Under normal circumstances (tracking to or mixing from the 3348HR), the 3348HR is clock master, taking advantage of the attached AD8000's low jitter clock. When transferring from Pro Tools, however, the control room AD8000 provides the word sync via the AES pairs, ensuring that signal path and word clock path are identical lengths for minimal jitter.

## MIX THIS!

Throughout *Steady Pull* there's a feeling of clarity and immediacy in Brooke's

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vocals. Though this gives the impression of a lot of compression, Clearmountain states that's not the case: "It's more riding the fader on Jonatha's vocal track during the mix. Plus she's a very consistent singer, so I don't ride gain during the recording process. There aren't a lot of effects on her vocal. There are some delays here and there, plus my live chambers. When I moved in, there was a wine cellar here, so I built a wall dividing it into two rooms. In each of these rooms I have a Mackie HR824 powered speaker and an AKG C460 microphone. The console sends to the speakers and then the C460's return to the console. Whenever you hear a tight, bright room sound, it's the live chamber. I bring them back in stereo, so if I pan a guitar to one side of the chamber, the reverb also comes back panned to the same position, or a different position if I so choose."

Clearmountain routes his stereo mix to an Apogee PSX100, using it as a bit-splitter to mix at 88.2 kHz/24-bit onto two TASCAM DA-88's for redundancy. In addition to Yamaha NS10M's, Audix N5's, and KRK E7's

(which he uses for surround mixing), Bob's preferences for mixing speakers also includes a pair of Apple Computer speakers. "Unfortunately they've been discontinued," Clearmountain laments, "which stinks because I really like mixing on them. They're simply called Apple Powered Speakers, and they're my portable mix reference. I switch between them and the Audix N5's, which are really wonderful for mixing. I don't have large monitors and haven't used them in years. The last time I used a set of large monitors on a project, they were so wrong that I had to remix the project. They weren't even close. I'd be mixing, and then go up to the big speakers and think, 'Oh, there's way too much bass. But these things can't be that wrong in the bottom end because they cost like, a trillion dollars!' [Laughs.] When I took those mixes home I thought, 'Oh my God, where's the bottom end?' There was none. I think the only real purpose for monitors like that is to feel the bottom end for an overdub or for certain types

► continued on page 118





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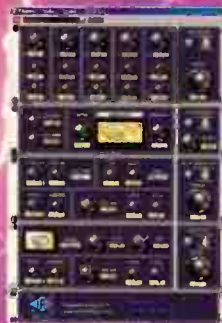
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EQ IN REVIEW



**EQ TAKES A CLOSE LOOK AT IZ TECHNOLOGY'S NEW MULTITRACK HARD DISK RECORDING AND EDITING SYSTEM**

RADAR 24 represents the third generation in IZ Technology's RADAR hard disk recording family. RADAR 24 is capable of simultaneously recording 24 tracks at 44.1 or 48 kHz with 16- or 24-bit resolution. High-resolution modes may be used to simultaneously record up to 12 tracks of 96 kHz or six tracks of 192 kHz, depending on the installed I/O. A standard RADAR 24 system ships with a four-space rackmount mainframe plus the KC-24 controller for transport control and record arming of 24 tracks. Available options include the Session Controller (which can arm up to 48 tracks) and the Meterbridge. All processing, audio I/O, and data I/O is contained within the RADAR 24 mainframe. Rear-panel features include word clock and SMPTE I/O, MIDI in/out/thru, a PC parallel port, two USB receptacles, RADARLink I/O for syncing multiple RADAR 24 machines, an Ethernet port, and an SVGA monitor output.

# IZ TECHNOLOGY

**RADAR 24 HARD DISK RECORDING SYSTEM**

# IZ TECHNOLOGY RADAR 24

On the front panel of the RADAR 24 is a power switch, a 3.5-inch floppy drive (for RADAR 24 software upgrades), a removable hard drive, and a third bay for a backup drive. Our review mainframe was shipped with the (24-channel) Nyquist Analog I/O Kit (supports up to 96 kHz sample rates), 24 channels of TDIF I/O, two channels of AES/EBU and S/PDIF I/O, a DVD-RAM backup drive, and a 9 GB hard drive. We also received the Session Controller and Meterbridge 24 for this review.

When I unpacked the RADAR 24, I was determined to find out if the system was easy enough to use without studying the manual — opting only for a quick read of iZ's printed quick-start guide the night before the first session (a comprehensive manual is supplied on CD-ROM). I racked the mainframe next to my TASCAM DA-98/88/38 system and decided to wing it. I substituted RADAR 24 for the TASCAM system, digitally connecting

the mainframe's TDIF I/O to my Yamaha 02R. The analog I/O hooked in just as easily because iZ configured it to conform with the TASCAM DB-25 protocol for analog I/O. (Smart move, iZ.) Moving a word clock connection from the DA-98 over to the mainframe completed the necessary connections. After powering up, I was literally ready to record. Elapsed time: approximately 25 minutes.

At this point, I wasn't using a video monitor — just the Session Controller

— and I treated the RADAR 24 like any multitrack recorder, without concern for CPU, OS, IRQ, PCI, blah, blah, blah. I patched my outboard mic pres to the RADAR 24's analog inputs, and used the 02R's digital tape returns for playback. This configuration worked perfectly. After 10 minutes I had cut my first tracks, still no manual needed. What a concept!

After the preliminary tests, it was time to get down to some serious mixing. Blue Oyster Cult had just

## RADAR 24 AT A GLANCE

**MANUFACTURER:** iZ Technology, 214-8988 Fraserton Court, Burnaby BC, Canada, V5J 5H8. Tel: 800-776-1356. Web: [www.recordingtheworld.com](http://www.recordingtheworld.com).

**SUMMARY:** Multitrack hard disk recording and editing system.

**STRENGTHS:** Excellent sound quality. Easy to use. Flexible I/O and sync interfacing. Supports high-resolution sample and bit rates. Static Timecode Output. 24/7 live tech support.

**WEAKNESSES:** No virtual tracks. Current software doesn't support use of a mouse for editing. Mainframe is mechanically noisy.

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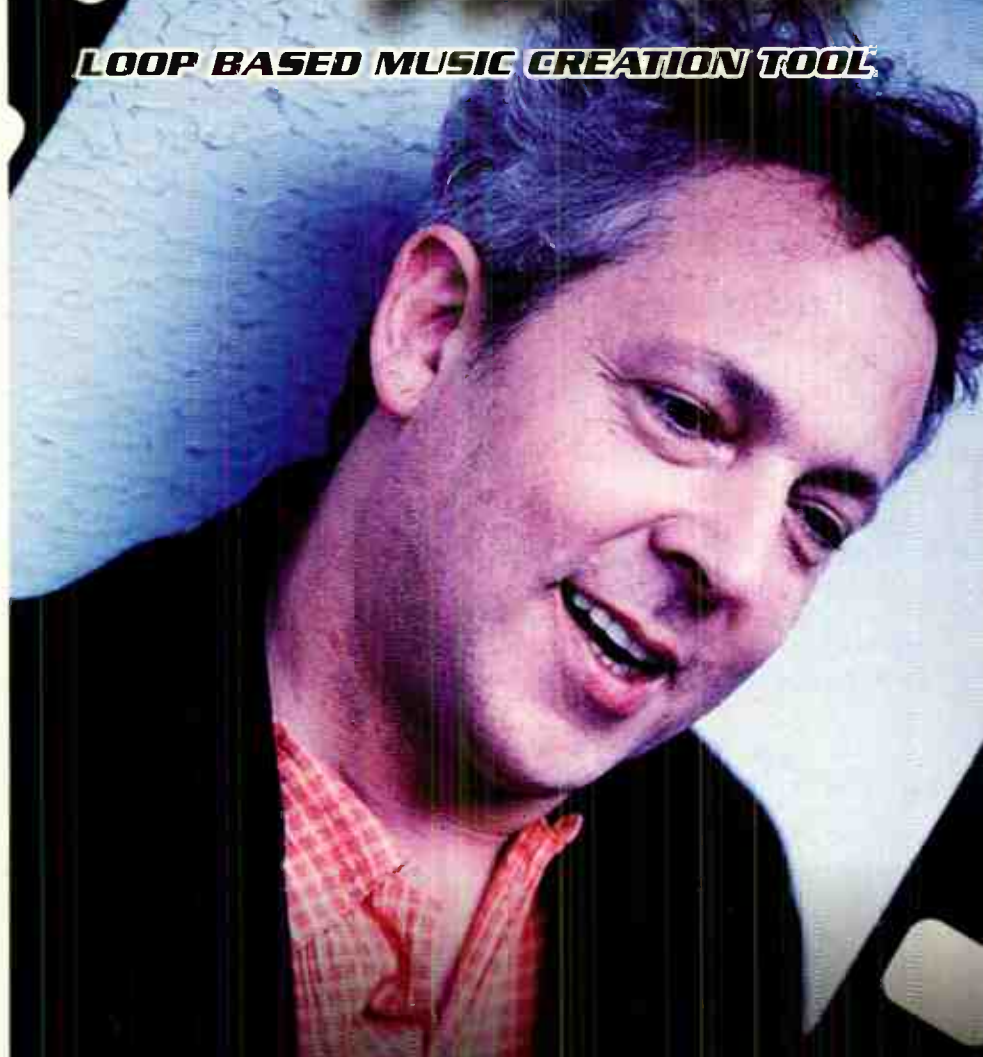


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**CIRCLE 13 ON INFO CARD**

## IZ TECHNOLOGY RADAR 24

finished cutting tracks for their new release *Curse Of The Hidden Mirror* at Millbrook Sound in New York with engineer Paul Orofino. Paul recorded *Curse* on a RADAR II system, and I was going to do some mixes for the band. Due to the fact that Paul's system has a different backup drive, I pulled the removable hard drive from my RADAR 24 and shipped it to him. He loaded three songs onto disk and shipped it back. I popped the drive back in the bay, mounted the disk simply by pressing "Mount Disk" on the Session Controller, and the three songs loaded into RADAR 24. Very smooth — and still no manual.

For the next week, I put RADAR 24 through its paces by mixing the three songs. The Session Controller has a feel reminiscent of Otari's transport controls — though the buttons are small, they have a solid feel. Locate points are marked simply by hitting the "Mark Loc" button. Trimming a locate point required a quick trip to the manual because, when you edit the locate point, you can add or subtract an amount of time to the

original locate number — or directly enter the desired time for the locate.

RADAR 24 essentially became transparent to the mix process, never glitching or hesitating. During the critical listening of these mix sessions, the mainframe's noisy fans became quite a distraction. I recommend either locating the mainframe in a remote machine room or mounting the mainframe in an acoustically isolated rack. iZ Technology has informed me that RADAR 24's are now shipping with a much quieter fan.

### IN THE SANDBOX

The next step was finding out if RADAR 24 could play happily with the other children in the studio, starting with an external monitor. I connected a ViewSonic VA800 LCD ViewPanel to the SVGA output on the rear of the RADAR 24 and powered up both units. After the RADAR 24 booted, the VA800 displayed a timeline of all 24 tracks, along with session data, locate points, and track level meters. They worked perfectly together — plug-n-play.

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## ENDLESS OPTIONS

A basic RADAR 24 recording system lists for \$5,690 and includes the following: 18 GB Fast-Wide Ultra SCSI Hard Drive (86 minutes of 24 track, 24-bit/48 kHz recording), 2x DVD-RAM backup device, two channels each of AES/EBU and S/PDIF I/O, KC-24 keyboard controller, 10/100 Mbps network card, SMPTE, MIDI, word clock, and video sync I/O.

iZ Technology offers a RADAR 24 package called the Analog Lover's Bundle for \$8,995 that includes the 24-channel Classic Analog I/O, 18 GB Fast-Wide Ultra SCSI Hard Drive, Kingston drive carrier, Professional Session Controller, Session Controller Remote Cable (10 meter), 24-channel Meterbridge, 9.4 GB DVD-RAM drive, and two 4.7 GB DVD blanks.

Accessories and options are priced as follows:

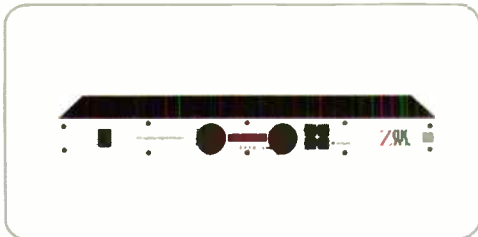
- 24-channel TDIF I/O Kit — \$495
- 24-channel ADAT I/O Kit — \$495
- 4-channel AES I/O Kit — \$995
- Session Controller — \$1,195 including 10-meter cable (20-meter extension is available for \$150)
- Meterbridge 24 — \$495
- Meterbridge 48 — \$795
- Classic Analog I/O (48 kHz sampling) — \$1,695
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CIRCLE 63 ON INFO CARD

I used the RADAR 24's XLR SMPTE output to drive the SMPTE input of an Opcode Studio 4 MIDI interface and to lock a sequence to hard disk. The Studio 4's SMPTE input is on an unbalanced TS connector, and the SMPTE out on the TASCAM DA-98 I usually use is pin-2-hot. But RADAR 24's SMPTE output is pin-3-hot. (Can't we all just get along?) Changing the cable to one that was wired pin-3-hot solved the problem.

Next I synchronized the RADAR 24 to the TASCAM DA-98 via SMPTE, using the RADAR as both slave and master. Synchronizing a tape machine to a hard disk recorder can be a finicky process. While a hard disk recorder has instant random access to any point in a track, the tape machine must wind forward or backward to a locate point. For example, to return to the beginning of a song on RADAR 24, you simply recall the locate point for the start.

That's fine, but if the hard disk machine isn't putting out code when it locates to the song start, then the tape machine thinks the hard drive has stopped. When the hard disk begins playing, the tape machine sees code, realizes that it's a few minutes out of sync, and takes off for the SMPTE start. By the time the tape machine chases down the hard disk, the first verse is over.

Lucky for us, RADAR 24 is smart enough to know this and has a solution: static timecode output. Enabled from the preferences menu, Static TC out sends timecode to RADAR 24's SMPTE output when the hard disk isn't playing — allowing the DA-98 (or any tape transport) to receive a SMPTE locate address even though RADAR 24's transport isn't in motion. This is invaluable when using the RADAR 24 as the master in multi-machine lock-ups.

Slaving the RADAR 24 to the DA-98 consisted of simply connecting the DA-98's SMPTE out to the RADAR 24's SMPTE in, and setting RADAR 24 for external sync. This worked without a hitch.

## EDITING

My first edit was the trimming of extraneous noise on a guitar track before the song start. The Session



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Controller's "Mark In" and "Mark Out" buttons looked like suspects for defining an edit region, so I hit Mark In before the guitar started, and Mark Out just before the songs started. The monitor now displayed a gray area indicating the defined region. I hit the "Cut" button, and the noise was gone.

Next, I comp'd a lead vocal take from four tracks by copying and pasting to an open track. Once again, the audio to be copied was defined by using Mark In and Mark Out. When

you press "Copy," RADAR 24 asks you whether to copy all tracks or only certain tracks. To choose a track for copying you press its track arm button, which will then blink as if it was record ready. Press "Enter" to copy the track into a buffer. You can audition the buffer by using "Listen" — a very handy feature. One annoyance is that all shift-related functions (including Listen) on the Session Controller are labeled in blue. Since the keys are black, this is very difficult to see.

## DIGITAL TRANSFERS

Doing a TDIF transfer into the RADAR 24 brought my first frustrations with the machine. After pulling on what's left of my hair for a bit, a call to iZ's tech support yielded the suggestion that I upgrade the operating system to version 3.0.6. As soon as the new version was loaded, my TDIF problems disappeared. (A note to 02R users: when connecting the RADAR 24 to the 02R's TDIF card, internal DIP switches should be set as for a DA-38, not a DA-88). It was now simple to switch between analog and digital input to the RADAR 24 during a project. Both analog and digital audio outputs are active at all times. Moral of the story: Even with a



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**AFTER 10 MINUTES I HAD CUT MY FIRST TRACKS, STILL NO MANUAL NEEDED. WHAT A CONCEPT!**

stand-alone, dedicated unit, make sure the OS is as current as possible. It's worth mentioning that iZ offers 24-hour, human-staffed tech support. I called at around 10 PM, and a real live person picked up the phone on the second ring.

There are two ways to receive upgrade software for a RADAR — download the files from iZ's Web site, or ask them to send the upgrade on floppy disks. I downloaded the upgrade via my PowerBook G3 without a problem, but the download is only the beginning of the process. The downloaded file must be expanded into two "IMZ" files, which I did using Aladdin Stuffit Expander. The "IMZ" files are then expanded, creating two "IMA" files. Aladdin's ShrinkWrap is then used to create bootable disks for the RADAR 24. It was a pain, since PowerBooks don't

► continued on page i24



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**EQ**

**INSIDE**

**FIRST LOOK:  
EAW SM Series Stage Monitors  
New Products**

**CONFESSIONS  
OF A MONITOR  
ENGINEER**

**How to Prevent Monitor Mayhem**

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# Crank It Up

Once upon a time, back in my wayward musician days, the country-rock band I was playing guitar with had just released its first CD. We managed to secure a very tiny bit of regional airplay around our home base, and we were featured as the opening act at a local showcase club when various Nashville artists toured their way through town.

Although I had played in a seemingly endless array of bands, locales, venues, and situations, this was the first opportunity I'd had to work with a professional monitor engineer running a serious monitor rig. I'd played gigs where there was a "monitor engineer" in the past, and I'd set up countless stage monitor systems myself, but this was an entirely different level. I remember being fascinated by how well the engineers worked — especially given the pressure they were under. How fast they could identify ringing frequencies by ear, how sure-fingered they were in adjusting the multiple monitor mixes, and so on. I learned a great deal at those gigs, and eventually was able to apply those lessons myself in subsequent live gigs.

One thing, however, never failed to amaze me — the volume at which the monitors were set. This wasn't a huge concert stage, or even necessarily a high-volume musical style, yet the monitors were, without exception, screaming. In fact, it was so loud that the band was forced to significantly increase its stage volume just to keep up — something that had to make the FOH engineer very happy. Now don't get me wrong, I liked it as loud as the next guy (especially in those days), but this was over the top. Even more surprising, the monitor engineers didn't seem open to lowering the level to accommodate our requests. And this brings me to the most important lesson I learned at those gigs: As the monitor engineer, you're there to serve the musicians onstage — the whole point is to allow them to hear themselves clearly so they can perform at their best. It's a lesson I also carried over to my studio engineering gigs, making sure to provide the very best headphone and cue mixes I could.

You'll find a ton of monitor setup tips on page 82. Dig in and enjoy!

—Mick Gallagher  
mgallagher@wemedia.com

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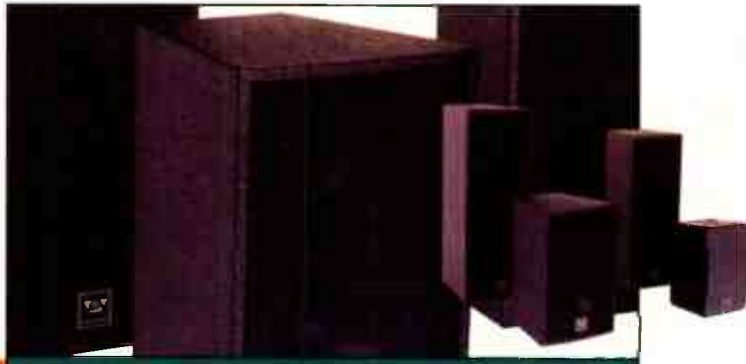


# EQ LIVE: NEW PRODUCTS



## BLACKHURST STAGEGEAR

**THE PRODUCT:** Blackhurst Stagegear RUM Series  
**THE BASICS:** A new line of utility racks and mixer tops  
**THE DETAILS:** Southern California's Blackhurst Stagegear continues their development of custom amplifier racks, utility workboxes, and lighting cases with the new RUM line series of utility racks and mixer tops. They come in a three-lid design for easy access to your gear. Each is composed of Baltic birch with gray carpet finish as standard; black carpet is available upon request. Other options include a rear rack rail.  
**CONTACT:** Blackhurst Stagegear at 714-632-7170. Circle EQ free lit. #120.



## STAGE ACCOMPANY

**THE PRODUCT:** Stage Accompany Friend Series  
**THE BASICS:** A new line of small speaker systems  
**THE DETAILS:** Geared toward the installation and smaller rental market, the line comes in four models: F1, F5, F7, and F9. Each sports double Speakon connectors, flush-mounted speakers to fight baffle-reflection, steel grille, and Protecture coating to lessen the wear and tear of transport. The line provides full-range speech and music reinforcement, and is well suited as "fill" speakers.  
**CONTACT:** Stage Accompany at [www.StageAccompany.com](http://www.StageAccompany.com). Circle EQ free lit. #121.



## SHURE

**THE PRODUCT:** Shure AuxPander  
**THE BASICS:** Auxiliary send expander for mixing consoles  
**THE DETAILS:** So you need more auxiliary sends? Designed for sound engineers and touring musicians, Shure's new auxiliary send expander provides the ability to increase a console's output capabilities. The ability to turn any mixer into an eight-bus console certainly could come in handy when that unexpected horn section shows up. It's vertically and horizontally expandable (e.g., two units create an 8x16 or 16x8 matrix).  
**CONTACT:** Visit Shure at [www.shure.com](http://www.shure.com). Circle EQ free lit. #122.



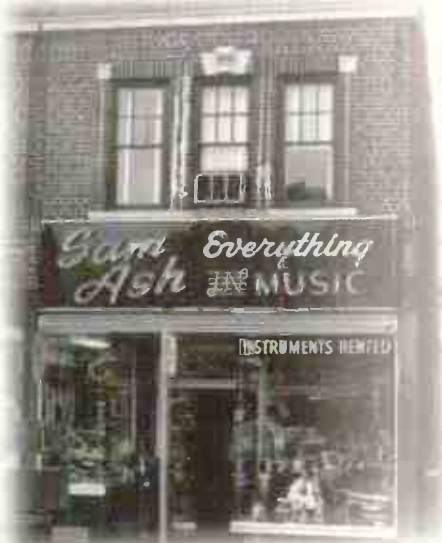
## JBL PROFESSIONAL

**THE PRODUCT:** JBL Professional EON Speakers  
**THE BASICS:** Second generation of EON powered speakers  
**THE DETAILS:** The EON10 G2 features a black co-polymer enclosure with a built-in mini-mixer with three inputs and added power. The EONSUB G2 comes with a 15-inch transducer, and 250 watts of power. The EON15 G2 System sports a MusicMix 16 mixer, two EON15 G2 speakers, two JBL M50S mics, and four cables. The EON10 G2 System features a MusicMix 14 mixer, two EON10 G2 speakers, and the same mic/cable package as the EON15 G2 System.  
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BY STEVE LA CERRA

## EAW SM SERIES STAGE MONITORS

Eastern Acoustic Works (EAW) recently added three products to their well-established line of Stage Monitor (SM) Series stage monitors. The SM84, SM12, and SM15 are all high-output wedge monitors intended for floor placement. Any of these models may be augmented using the SB412 drum fill subwoofer for increased low-frequency response as might be needed in a drum fill application.

The SM84 is the most unconventional of the new SM Series. Four 8-inch woofers are mounted in a vented enclosure on a split-design baffle. Two of the drivers are mounted facing upward, while the other two are facing forward toward the performer. The combination of the four drivers provides even coverage for the performer, with a minimal "hot spot." A 1.4-inch-exit compression driver with a neodymium diaphragm is mounted on a constant-directivity horn with a coverage pattern of 40° horizontal by 90° vertical. The horizontal coverage of the horn is narrower than that of traditional floor wedges, keeping stage spill and monitor mix "crosstalk" to a minimum. Frequency response of the SM84 ranges from 60 Hz to 17 kHz with the 10 dB down point stated as 45 Hz. As with the other members of the Stage Monitor Series, the SM84 is intended for biamped operation.

Sensitivity for a one watt input at one meter is 99 dB for the low-frequency section, and 110 dB for the high-frequency driver. Peak output for the SM84 is 139 dB SPL for the HF and 135 dB for the LF.

EAW's SM12 is a two-way stage monitor containing a 12-inch low-frequency driver and 1.4-inch-exit neodymium compression driver. The SM12's cabinet may be positioned on the floor for either a 37° or a 53° baffle angle. Its constant-directivity horn provides 60° vertical and 40° horizontal coverage. Peak SPL output is rated at 139 dB for the HF and 132 dB for the LF.

Similar in construction to the SM12, the SM15 is a two-way floor monitor system with the same high-frequency driver and constant-directivity horn. Unlike the SM12, the SM15 contains a 15-inch low-frequency driver for increased low-frequency output. The SM15 also includes variable positioning for choice of a 37° or 53° baffle angle. Peak SPL output is rated at 139 dB for the HF and 133 dB for the LF.

EAW's SB412 drum fill subwoofer was specially designed to enhance the new SM Series monitors. Four 12-inch woofers are used in the SB412, and the enclosure contains an integrated tilting system for easy mounting of the SM12, SM15, and SM84 cabinets. The SB412 is capable of a peak output of 141.1 dB SPL.

All three of the new SM Series of monitors are constructed from 15-millimeter-thick Baltic Birch plywood and are extensively braced internally. Drivers are protected from the elements with perforated-steel grilles backed with open-cell foam for protection against dust. Cabinetry is finished with black textured paint, and biamped input to all models is on Neutrik NL4 Speakon connectors. Available on EAW's Web site is a listing of specific processor settings that EAW has found to be successful for use with the SM Series.

### EAW SM SERIES

### FIRST LOOK

- **WHAT ARE THEY?** Three new wedge monitors designed for stage floor placement.
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- **WHY ARE THEY A BIG DEAL?** The SM Series monitors feature a tightly controlled horn coverage pattern for minimal monitor mix crosstalk.
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BY HERMAN LEIJTE

# PREVENTING MONITOR MAYHEM

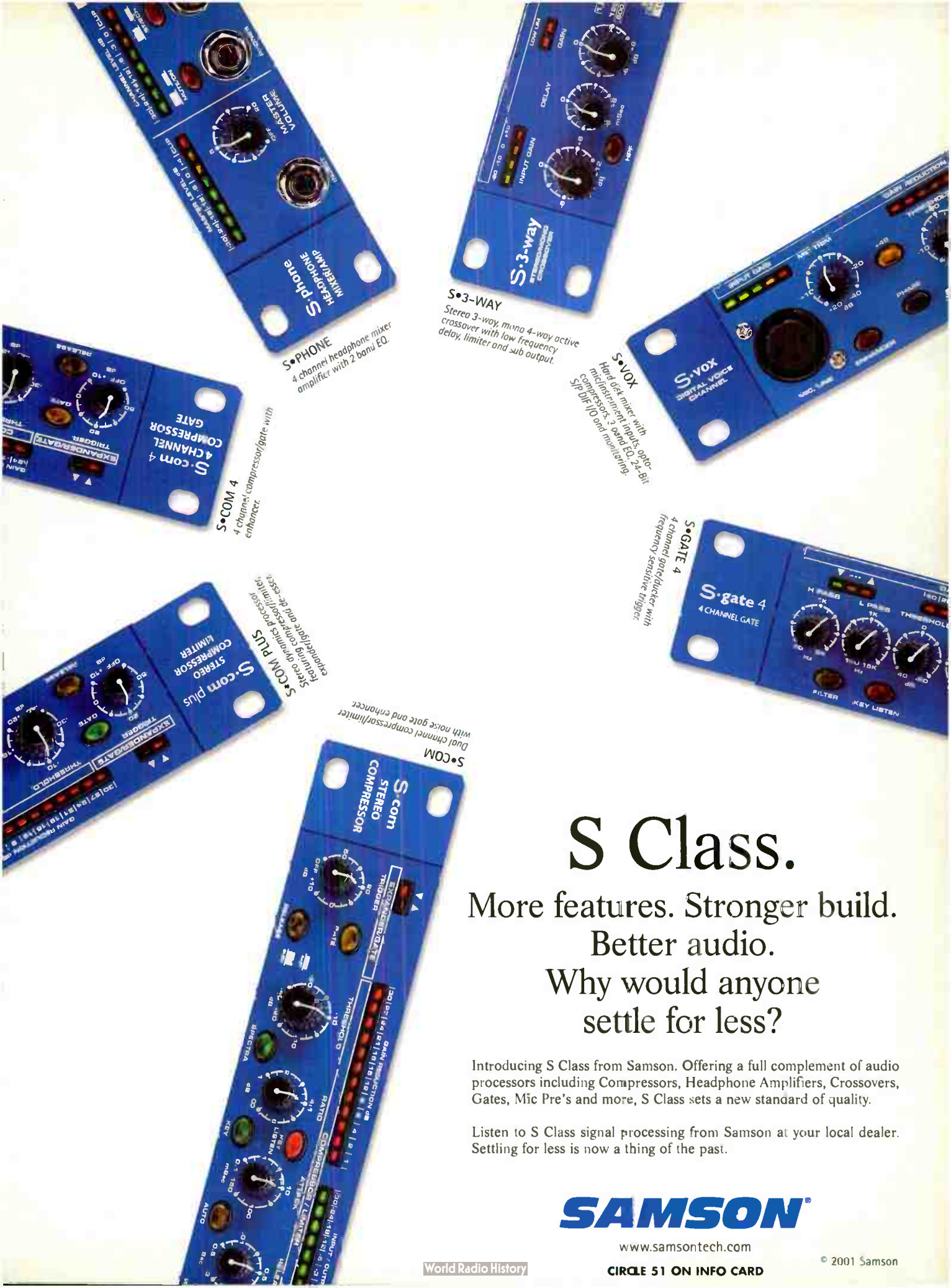
## HOW TO MAKE THE MOST OF YOUR MONITOR RIG

In addition to mixing front-of-house for artists such as Pat Benatar and Teena Marie, Herman Leijte has mixed monitors for KC and The Sunshine Band, Kool and The Gang, and Porno For Pyros. Currently, the production/house engineer at the Canyon Club (Agora Hills, CA), Herman also moonlights as a house and/or monitor engineer for LA Sound and Nelson Sound. Leijte knows that monitor mixing is a tricky business. In this article he puts forth some ideas on how to make the most of your monitor rig.

When I get to a gig, the first thing I do is check out the available gear. Then I'll fire up the first pair of wedges and listen to them. Usually I stand in-between the pair and speak into a microphone, preferably an Audix OM-5, OM-6, or OM-7. They don't have the nasty high-mid peak or abundance of 8 to 10 kHz like some other vocal mics. When I do this, I listen to the balance between the high and the low frequencies, making sure they're at the right levels. Over the years I've become very familiar with the sound of my voice (no wisecracks, please!), so I get a good idea of what the box is doing from the way my voice is reproduced through it; some people use music from a CD for this purpose. My goal is to make the box sound as good as possible before I do any EQ'ing.

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# PREVENTING MONITOR MAYHEM

Another basic thing I listen for is phase. If one monitor is out of phase, then — no matter what — you're battling uphill. Stand in the center of the two wedges and listen for a solid center image — just like you would in a control room. Recently, at the Canyon Club, there was an out-of-phase wedge. Perhaps someone changed a driver in it and then re-connected one of the EP-4 connectors in reverse. So you have the signal coming into the box and the polarity is reversed before the signal goes out to the next wedge. The result is that the two boxes are out of phase. This could also happen at the output of a power amp with a banana connector, so make sure you check those as well.

On some desks the mix output has a phase reverse switch. Pay attention to this when you're using two mix busses to create a stereo mix. Last week, The Tubes were in and the keyboard player wanted a stereo monitor mix. So I used two separate mix outputs from the desk to create a stereo monitor mix (one to each monitor); if one of the outputs was reversed, he'd hear some very strange things. If it's a mono mix and the phase is reversed on the mix out, it's really not a problem. When I was running 16 or 18 mixes for Kool and The Gang, sometimes it worked to my advantage to run sidefills or buttfills out of phase versus the front wedges (or even the FOH system).

Over the years I've learned to correspond crossover frequency with the sound of my voice. Typically, if there's a JBL 2445 or 2441 driver in the box, the crossover will be somewhere in the area between about 1.2 and 1.6 kHz. But if it doesn't sound right to me, then I'll bring the crossover point down as low as 800 Hz or as high as 2.5 kHz — providing I know the driver won't be damaged.

By making the box sound good without EQ, I get a more natural-sounding mix. Once the box is right, any signal you put into it will sound good regardless of the

source. Usually, if the acoustic instruments (such as the drums and voices) sound good, then everything else falls into place. EQ comes in when I need to remove an offensive frequency or to correct a problem here and there.

One of the things I like to do with EQ and high-pass filters is narrow the bandwidth of the signal being reproduced. There's no point in making the amp work to reproduce 40 Hz for a small wedge with a 12-

**“By making the box sound good without EQ, I get a more natural-sounding mix. Once the box is right, any signal you put into it will sound good regardless of the source.”**

inch woofer, so I'll whack the lowest two or three bands on the graphic completely out. I low-pass the crossover to make sure that the low stuff — the stuff that people aren't going to hear in a live situation — is pulled out. I do the same up at 20 kHz. No one is going to hear that in a live show, so I'll pull down the highest band on the graphic. It increases the efficiency of the amp and gives you more clarity in the mixes.

Drums require particular attention. To keep them tight, I cut the area between 250 and 350 Hz on the kick drum. Like the Beyer M38 or Shure Beta 52 for the kick. The sweet spot

on the kick is very important. I'll move the mic around and listen either in the cue wedge or the drum fill. Experience helps here. For example, Yamaha Recording Custom kick drums seem to have a sweet spot that's off to the right a bit, inside the drum (not in the middle of the drum). Recently, with Collin Hay, we used a Beta 52 in front of the drum (not inside). This gave more of an ambient sound that worked for this application, but it probably wouldn't be good for a very loud stage because of leakage from the bass amp or even the guitar amps.

I don't like using gates, and this is where high-pass filters and EQ really come in handy. By dialing up the region between 4 and 8 kHz on the toms and rolling the high-pass filter up to around 100, 160, or 200 Hz, a lot of the low-frequency slop is pulled out of the mix. If a tom is ringing in the monitor mix, I might flip the phase on that channel, which can help tighten up all the toms. Or maybe the drummer can alter the tuning a bit. For the hi-hat, I wind up the high-pass as high as it will go, plus I cut all the low frequencies and usually the low-mids as well. I don't want any rumble from the stage coming up the hi-hat stand. Ditto for overheads.

Seventy-five to eighty percent of the monitor gig is personality. The rest is packing up the bullshit! A monitor engineer really needs to pay attention to the artists throughout the whole show and not be distracted by whatever else happens to be going on. This goes a long way toward job security. Also, be strong with musicians. Don't let them step on you. Recently I did a gig where the whole band was on stage, all yelling about what they wanted in their mixes. I raised my voice a bit and told them all to be quiet so that I could hear what each person wanted. Then we went from mix to mix and dialed in the instruments. You have to be tough with musicians, but they'll respect you for it!

Herman Leijte can be reached online at [koalabum@earthlink.net](mailto:koalabum@earthlink.net)



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World Radio History  
CIRCLE 07 ON FREE INFO CARD

# A/D & D/A CONVERTER **GUIDE**

MANUFACTURER	PRODUCT	CHANNELS	INPUT CONNECTORS	OUTPUT TYPE (°CONNECTORS)	SAMPLING RATE	RESOLUTION	DITHERING	METERING (Y/N)	DISTORTION SPECS	CLOCK RESOLUTION	WORD CLOCK INPUT/OUT	MSRP	CONTACT INFORMATION
APOGEE	AP8AD	8-Ch.	IEEE25 analog in	YGDAl or Mini-Y to Yamaha host system	44.1-96 kHz	24-bit	N/A	N/A	THD+N -105 dB	Host system ref	N/A	\$1,495	www.apogeedigital.com
	AP8DA	8-Ch.	YGDAl or Mini-Y to Yamaha host system	IEEE25 analog out	44.1-96 kHz	24-bit	N/A	N/A	THD+N -103 dB	Host system ref	N/A	\$1,195	www.apogeedigital.com
	Rosetta 48K	2-Ch.	XLR analog in	ADAT, TDIF, AES/EBU, S/PDIF	44.1-48 kHz	24-bit	UV22HR (20 and 16-bit o/p)	Multi-segment LED bar metering plus over and other indicators	THD+N -112dB A, @ -0.1 dBFS	Jitter <<22 pS	Out	\$1,295	www.apogeedigital.com
	Rosetta 96K	2-Ch.	XLR analog in	ADAT, TDIF, AES/EBU, S/PDIF	44.1-96 kHz	24-bit	UV22HR (20 and 16-bit o/p)	Multi-segment LED bar metering plus over and other indicators	THD+N -112dB A, @ -0.1 dBFS	Jitter <<22 pS	Out	\$1,995	www.apogeedigital.com
	PSX 100	2-Ch. A/D & 2-Ch. D/A	XLR analog in, S/PDIF, ADAT, AES/EBU x 2, TDIF	XLR analog Out, S/PDIF, ADAT, AES/EBU x 3, TDIF	44.1-96 kHz	24-bit	UV22HR (20 and 16-bit o/p)	Multi-segment LED bar metering plus over and other indicators	A/D: THD+N -112dB A, @ -0.1 dBFS; D/A: THD+N -100 dB @ -0.5 dBFS	Jitter <<22 pS	In and out BNC	\$2,995	www.apogeedigital.com
BENCHMARK	AD2K+ A/D	2-Ch. -portable	Balanced XLR with variable input sensitivity	Dual XLR and Dual BNC digital out, AES and SPDIF; single and dual cable output for 88.1 & 96kHz operation	44.1, 48, 88.2, 96 kHz, and variable	24-bit	Yes: Benchmark NN (Near Nyquist) and NS Word Length Reduction; 28 curves for the 16-bit word length reduction and 16 more curves for 20-bit word length reduction	2 Ch. x 9-segment fully digital meters with a peak-hold selection	THD+N = -108 dBFS at -1 dBFS; (0.000398%) unweighted	Conversion jitter <9 pS jitter		\$1,795; AC adapter available: \$75	www.benchmarkmedia.com
	AD2404-96 A/D	4-Ch.	Balanced XLR	Dual XLR (110ohm) or dual BNC (75ohm) digital out, AES; single and dual cable output for 88.1 & 96kHz operation	44.1, 48, 88.2, 96 kHz, and variable	24-bit	Yes: Benchmark NN (Near Nyquist) and NS Word Length Reduction; 28 curves for the 16-bit word length reduction and 16 more curves for 20-bit word length reduction	4 Ch. x 9-segment fully digital meters with a peak-hold selection	THD+N = -108 dBFS at -1 dBFS; (0.000398%) unweighted	Conversion jitter <9 pS jitter		\$2,850	www.benchmarkmedia.com
	AD2408-96 A/D	8-Ch.	Balanced XLR	XLR (110ohm) or BNC (75ohm) digital out, AES	44.1, 48, 88.2, 96 kHz, and variable	24-bit	Yes: Benchmark NN (Near Nyquist) and NS Word Length Reduction; 28 curves for the 16-bit word length reduction and 16 more curves for 20-bit word length reduction	8-Ch. x 9-segment fully digital meters with a peak-hold selection	THD+N = -108 dBFS at -1 dBFS; (0.000398%) unweighted	Conversion jitter <9 pS jitter		\$5,095	www.benchmarkmedia.com
	DAC-104 D/A Converter Card	4-Ch.	110 ohm or 75 ohm (switchable); various connector options available on card frame	8 Balanced 60 ohm outputs with adjustable output level; various connector options available on card frame	28-108 kHz	24-bit; accepts any word length up to 24-bit	Accepts any word length up to 24-bit	10 LEDs: 4 power, 2 error, and 4 range indicating	THD+N = -102 dB at -3 dBFS; (0.00079%)	Total jitter immunity		\$1,295/card; \$1,070 for powered card frame; holds 10 cards (40 Ch.s)	www.benchmarkmedia.com



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Steve Kipner in his hillside studio with the AD-8000SE and Trak2.



**M**AYBE you haven't heard of Steve Kipner. But you've certainly heard his hit songs. For 30 years, he's penned hits for and co-produced some of the world's best-selling artists, from Olivia Newton-John to Christina Aguilera. And for many of those years, he's relied on Apogee.

Steve chose Apogee's Trak2 both for its mic preamps and for its superb quality 24/96 analog to digital conversion.

But first, he listened.

"We were in London working with Victoria Beckham – Posh Spice. We had the Trak2 and other well-known mic preamps, including some tube models, and held a shootout right there. The Trak2 won hands down," he says enthusiastically.

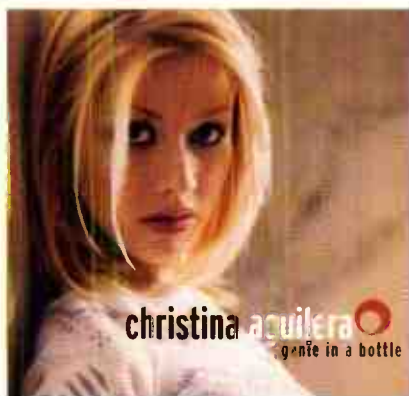
"It's so easy: I just plug a guitar into the front panel or use the rear panel mic inputs – hardly any EQ or anything – and it just sounds incredible. I don't need to do a lot of stuff, or use much outboard

gear."

Apogee's Trak2 simplifies Steve's life. "Before I had the Trak2, I was always trying hard to make things sound better. Now it sounds great straight away," he says. "I record straight into Logic, so the Trak2's built in mic pre, 8-channel routing and direct Pro Tools connection make it an ideal solution."

Today, Steve Kipner uses the Trak2 on virtually all his projects. You'll find it's the same for you.

**Hear Apogee's Trak2 for yourself – at your authorized Apogee dealer.**



**One for the record:** Steve Kipner produced, recorded and arranged, with David Frank, Christina Aguilera's 10-million-selling hit, Genie in a Bottle. And it was all done with Apogee.

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World Radio History  
CIRCLE 10 ON INFO CARD

# A/D & D/A CONVERTER GUIDE

MANUFACTURER	PRODUCT	CHANNELS	INPUT CONNECTORS	OUTPUT TYPE (=CONNECTORS)	SAMPLING RATE	RESOLUTION	DITHERING	METERING (Y/N)	DISTORTION SPECS	CLOCK RESOLUTION	WORD CLOCK INPUT/OUT	MSRP	CONTACT INFORMATION
DIGIDESIGN	888/24 I/O	8-Ch.	8 Ch.s digital I/O, XLR (4 in, 4 out)	4 x XLR	44.1, 48 kHz	24-bit			THD + N: <0.003% @ -0.01 dBFS, 1 kHz, 22 Hz -20 kHz bandwidth	256X		\$3,695	www.digidesign.com
	882/20 I/O	8-Ch.	8 analog balanced (TRS) 1/4 connections, 2 Ch.s S/PDIF (RCA)	4 x XLR	44.1, 48 kHz	20-bit			THD + N <0.003% @ 1 kHz, 20 Hz -20 kHz	256X		\$1,245	www.digidesign.com
EUPHONIX	AM713	28-Ch.	26 Ch XLR + 1x AES XLR	1x BNC (MADI)	44.1/48 kHz +/-12% 88.2/96 kHz +5%/-12%	24-bit	N/A	4-segment LED	THD 0.0005%	Host System Reference or Internal +/-10ppm	In, Out/Thru	\$6,195	www.euphonix.com
	MA703	28-Ch.	1x BNC (MADI)	26 Ch XLR + 1x AES XLR	44.1/48 kHz +/-12% 88.2/96 kHz +5%/-12%	24-bit	N/A	4-segment LED	THD 0.003%	Host System Reference	In, Out/Thru	\$5,795	www.euphonix.com
LUCID	ADA 8824 (Sonic)	8-Ch.	8 x XLR (+4 or -10), AES (XLR) x 4, S/PDIF (RCA), 68 pin mini D sub.	8 x XLR (+4 or -10), AES x 4, S/PDIF (RCA), 68 pin mini D sub	44.1, 48 kHz internal, ext sync through wordclock	24-bit	No dither	8-Ch. x 15-segment LED	< 0.01% (0 dBfs, 1k)	256x Fs crystal oscillator, at 25ppm	In, Out/Thru	\$3,299	www.lucidaudio.com
	ADA 8824 (ADAT)	8-Ch.	8 x XLR (+4 or -10), AES (XLR) x 4, S/PDIF (RCA), Lightpipe (8 Ch Optical), ADAT Sync In (DB9), MIDI	8 x XLR (+4 or -10), AES x 4, S/PDIF (RCA) x 1, Lightpipe (8 Ch Optical), ADAT Sync out (DB9), MIDI	44.1, 48 kHz internal, 30, 50 kHz through external sync.	24-bit	No dither	8-Ch. x 15-segment LED	< 0.05% (0 dBfs, 1k)	256x Fs crystal oscillator, at 25ppm	In, Out/Thru	\$2,499	www.lucidaudio.com
	ADA 1000	2-Ch.	2 x XLR, 2 x TRS, AES (XLR), S/PDIF (RCA)	2 x XLR, 2 x TRS, AES (XLR), S/PDIF (RCA)	32, 44.1, 48 kHz	20-bit	No dither	Input: 6-stage LED & clip. Output: signal present	< 0.05% A/D, < 0.01% D/A	256x Fs crystal oscillator, at 25ppm	No	\$599	www.lucidaudio.com
	AB 9624	2-Ch.	XLR x 2 +4 balanced	AES (XLR), S/PDIF (RCA), TOSLINK	32, 44.1, 48, 88.2, 96, ext. sync via word clock	24- or 16-bit	Flat Triangular Dithering	2-Ch., 20-segment LED	THD < 0.002% (-1 dBfs out, 1k)	512x Fs crystal oscillator, at 25ppm	Word Clock In	\$899	www.lucidaudio.com
	DA 9624	2-Ch.	AES (XLR), S/PDIF (RCA), TOSLINK	XLR x 2, TRS x 2, headphone (TRS)	32-100 kHz		No dither	2-Ch., 20-segment LED	THD < 0.002% (-1 dBfs, 1k)	256x Fs crystal oscillator, at 25ppm. DAC is clocked from derived sample rate	No	\$749	www.lucidaudio.com
MIDIMAN	Flying Cow	2-Ch.	2 x XLR, 2 x TRS 1/4, stereo coaxial S/PDIF, AES/EBU	2 x XLR, 2 x TRS 1/4, stereo coaxial S/PDIF, AES/EBU	internally clocks at 32 kHz, 44.1 kHz, 48 kHz, and locks to AES/EBU and S/PDIF inputs	24-, 20-, 18-, and 16-bit		2-Ch., 6-segment LED	A/D: THD .0015% @ 0dBFS D/A: THD 0.001% @ 0 dBFS		No	\$499	www.midiman.net www.m-audio.com
	Flying Calf A/D	2-Ch.	2 x TS 1/4	stereo coaxial S/PDIF	Internal clock 44.1 kHz 48 kHz	24-bit		2-Ch., 6-segment LED	THD 0.002% @ -1 dBFS		No	\$249	www.midiman.net www.m-audio.com
	Flying Calf D/A	2-Ch.	stereo coaxial S/PDIF	2 x unbalanced 1/4	locks to S/PDIF input	24-, 20-, 18-, and 16-bit		2-Ch., 6-segment LED	THD: 0.00093% @ 0 dBFS		No	\$199	www.midiman.net www.m-audio.com



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# A/D & D/A CONVERTER GUIDE

MANUFACTURER	PRODUCT	CHANNELS	INPUT CONNECTORS	OUTPUT TYPE (CONNECTORS)	SAMPLING RATE	RESOLUTION	DITHERING	METERING (Y/N)	DISTORTION SPECS	CLOCK RESOLUTION	WORD CLOCK INPUT/OUT	MSRP	CONTACT INFORMATION
MIDIMAN	SuperDAC D/A	2-Ch.	AES/EBU, Coaxial S/PDIF, Optical S/PDIF	2 x XLR, 2 x unbalanced 1/4	locks to S/PDIF or AES/EBU 11 kHz to over 100 kHz	24-, 20-, 18-, and 16-bit		none	THD: 0.00091% @ 0dBFS		No	\$299	www.midiman.net www.m-audio.com
PANASONIC/RAMSA	WZ-AD96/ WZ-AD96(M) (w/mic pres)	8-Ch.	XLR x 8	ADAT lightpipe and AES/EBU output	96 kHz	24-bit/ 96 kHz	Yes	10-segment high resolution WZ-AD96 only	0.003%	N/A	Yes	\$2195.00/ \$2,495.00 WZ-AD96(M)	www.panasonic.com/ proaudio
TROISI	DC224ADC	2-Ch.	2 XLR balanced analog line level inputs, 1 digital input - BNC transformer isolated digital input	1 XLR AES/EBU transformer isolated, 1 Coax S/PDIF transformer isolated, 1 TOSLINK optical	Internal, 44.1 kHz and 48 kHz. External 32 kHz to 50 kHz	24-bit	Yes, proprietary 16 and 20-bit shaped. Selectable for AES and S/PDIF outputs	Yes, multi-segment LED bar plus peak	THD+N -110 dB 20 Hz - 20 kHz, @ -5 dBFS	Internal <30pSec 25ppm	Yes, input Word Clock or AES/S/PDIF	\$1,915	www.troisi.com
	DC224-96 ABC	2-Ch.	2 XLR balanced analog line level inputs, 1 digital input - BNC transformer isolated digital input	2 XLR AES/EBU transformer isolated, operating as two single stream or one split stream output	Internal, 44.1 kHz, 48 kHz, 88.2 kHz and 96.0 kHz. External 32 kHz to 50 kHz	24-bit	Yes, proprietary 16 and 20-bit shaped. Selectable for AES1 and AES2 outputs	Yes, multi-segment LED bar plus pk meter	THD+N -110 dB 20 kHz @ -5 dBFS	Internal <30pSec 25ppm	Yes, input Word Clock or AES/S/PDIF	\$2,060	www.troisi.com
	DC8-224ADC	8-Ch.	8 XLR, balanced analog line level inputs	4 XLR AES/EBU transformer isolated.	Internal, 44.1 kHz, 48 kHz, 88.2 kHz and 96.0 kHz. Internal sample rate selectable for each pair of digital outputs. External 32 kHz to 100 kHz	24-bit	Yes, proprietary 16 and 20-bit shaped, selectable for each digital output	Yes, input sense and Pk indicator per Ch.	THD+N -110 dB 20 Hz - 20 kHz, @ -5 dBFS	Internal <30pSec 25ppm	Yes, input Word Clock	\$3,920	www.troisi.com
	DC224DAC	2-Ch.	2 XLR AES/EBU transformer isolated, 1 coax S/PDIF transformer isolated, 1 TOSLINK optical	2 Balanced XLR Analog outputs +24dBu	Locks to input source selected sample rate from 24 kHz to 100 kHz	24-bit	N/A	None	THD+N -104 dB 20 Hz - 20 kHz, @ -5 dBFS	Multi-stage PLL clock recovery	No	\$1,750	www.troisi.com
	DC8-224DAC	8-Ch.	4 XLR AES/EBU	8 XLR balanced analog outputs +26dBu	locks to AES input sample rates from 24 kHz to 100 kHz	24-bit	N/A	None	THD+N -107 dB 20 Hz - 20 kHz, @ -5 dBFS	multi-stage PLL clock recovery	no	\$3,890	www.troisi.com
	DC12-224DAC	12-Ch.	DB25 multi-pin - EAS format	2 x DB25 12 balanced analog outputs +26dBu	locks to AES input sample rates from 24 kHz to 100 kHz	24-bit	N/A	None	THD+N -107 dB 20 Hz - 20 kHz, @ -5 dBFS	Multi-stage PLL clock recovery	no	\$4,560	www.troisi.com

## OVERSAMPLING BASICS

With digital audio, you don't want any audio to exist in the same frequency range as the system clock frequency. So an A/D converter sampling at 44.1 kHz uses an input brickwall filter with an extremely sharp response (e.g., 96 dB/octave) to roll off the response starting at a little under half the clock frequency. For example, a 22 kHz brickwall filter with a 96 dB/octave slope will attenuate any harmonics in the 44.1 kHz range by 96 dB — enough to keep them out of the clock's way.

The output stage works similarly. You don't want any

of the output clock appearing in the audio out, so another brickwall filter removes those ultrasonic signals.

However, brickwall filters aren't perfect; extremely steep slopes can affect the sound at high frequencies. (Part of the reason why analog purists were so down on early CDs had more to do with the brickwall filter's quality than the sound's digital nature.)

Oversampling samples the input (or output) signal at some binary-friendly integer multiple of the sampling rate, like 4x, 8x, 16x, 64x, etc., thus raising the effective sampling rate to a much higher frequency. This doesn't magically give improved reso-

lution, because the final data stream still needs to be 44.1 kHz for a standard Red Book CD. However, it does allow using a much gentler filter slope. For example, with 2x oversampling, a 48 dB/octave slope will provide the same degree of signal rejection as a 96 dB/octave slope at a 1x sampling rate. With 16x oversampling, a comparatively gentle 6 dB/octave slope filter works just fine. These filters are easier to design, require less processing power, and (assuming good design) have less effect on the sound than steeper filters.

— Craig Anderton



# What Are You Looking for in a Reference Monitor?

Ask just about any music store salesperson what their customers tell them they want in a studio monitor, and nine times out of ten the answer is something like, "I want the speaker my friend has," or "I own a bunch of Brand X equipment, so I want a Brand X speaker," or "I want that one with the white woofer."

Oddly, few of them ask for a speaker that helps them do accurate mixes.

For five years now, our 20/20 Direct Field Monitors have been giving musicians the power to do just that. With custom designed components—and the legendary engineering team of Frank Kelly and Walter Dick behind them—the 20/20s deliver exceptionally pleasing, accurate, non-fatiguing sound, so the mixes you create on them translate flawlessly to other playback systems (which is, after all, the whole point).

Cool, you say. But surely speakers such as these must cost an arm and a leg. Fear not: With a street price of around \$299 a pair, the tools for making great mixes are well within reach.

So the next time you're in your friendly neighborhood music store, tell the salesperson that the speakers you want are the ones that professionals worldwide use to make records (hit records, that is). Tell them you want the ones that deliver mixes you can trust. Tell them you want the 20/20s.

And hey, if it makes you feel better to paint the woofers white, go for it.



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# Lexicon MPX 200

## 24-Bit Dual Channel Processor

Lexicon raises the bar and lowers the price

When it comes to delivering high-end digital effects, few manufacturers enjoy Lexicon's reputation, a name that's synonymous with reverb. But the Massachusetts-based company has also devoted ample resources to home and project studio owners, and over the years they've developed a long line of mid-priced processors that put their blue-blood sound in the hands of the masses.

The MPX 200, the latest of these budget-friendly units, offers better sound for the dollar than any previous Lexicon, plus some useful routing features that let it operate in a number of stereo and dual mono modes. For a small studio looking for a versatile processor, it's a sure-fire winner.

The 24-bit, two-channel, single rackspace unit provides the usual arsenal of digital effects, including reverb (plate, gate, hall, chamber, ambience, and room), tremolo, rotary (speaker), chorus, flange, detune, pitch, delay/echo, special F/X, and compression. In addition, you'll find a large array of Dual Program presets that mate flange, pitch or chorus with delay; flange, pitch, or chorus with reverb, and delay with reverb. Plus, you can use the compressor (which always comes first in the signal chain) on its own or in combination with any of the ambient effects.

### ROUTING

The MPX 200 lets you take advantage of this dual processing power by offering a number of routing schemes. Connections include unbalanced, high-impedance, quarter-inch inputs (because they're high-impedance, you can plug a guitar or bass directly into them); unbalanced quarter-inch outs (the right one doubles as a stereo headphones out); S/PDIF digital I/O; and MIDI in and out/thru. You can also connect a footswitch to bypass the effects and set tap tempo values.

While you could use the MPX 200 as a mono in/stereo out device, you'll take better advantage of its capabilities by connecting stereo inputs and stereo outputs. Routing is determined by the active preset, and includes Dual Stereo, where two stereo effects run in parallel; Cascade, where two stereo effects feed each other in series; Mono Split, where each input is routed independently to



### ▶ LEXICON MPX 200

**MANUFACTURER:** Lexicon, 3 Oak Park, Bedford, MA 01730-1441. Tel: 781-280-0300. Web: [www.lexicon.com](http://www.lexicon.com).

**SUMMARY:** Despite a sparse display and limited editing features, the MPX 200 is a winner. Flexible signal routing and excellent sound make this versatile unit a valuable role player in any home or project studio. You're simply not going to find more bang for so few bucks.

**STRENGTHS:** Great sound for the price. Flexible signal routing. Built-in compressor. 24-bit digital and analog I/O.

**WEAKNESSES:** Limited editing of individual presets. Unbalanced analog I/O.

**PRICE:** \$399

**EQ FREE LIT. #:** 104

a separate stereo processor, and Dual Mono, where each input is routed to a separate mono processor. This is one of those cases where an "advanced" feature has practical use. You can use a stereo reverb for a mix, or feed two separate sources (say, guitar and vocal) to two separate stereo effects, or split the signal into mono and feed the guitar to a flange and the vocal to a delay — all without repatching the MPX 200.

The front-panel matrix-style display shows you which effects are active and the current routing scheme, and the informative manual details the routing of each preset. A selection of "typical" combinations is available (such as dual mono delay, flange or chorus with delay, flange or chorus with reverb, etc.). Unfortunately, you can't change the routing of a given preset, nor can you create combinations of your own. But give Lexicon makeup points for including both input meters and gain reduction meters (to show you the compressor's effect on your signal).





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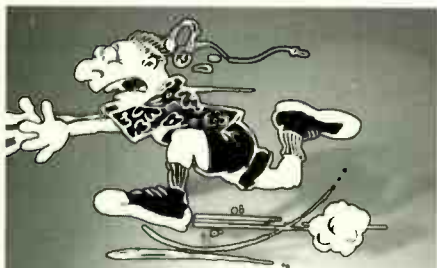
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### GETTING AROUND

The effects are grouped into 240 presets, and there are 64 additional slots for user programs, which you create by editing an existing factory preset. While there are no "banks" in the traditional sense, the presets themselves are arranged into categories (for example, a consecutive block might include Room sounds, followed by a block of Tremolo sounds, and so on). This makes it easier to find the presets you're looking for and to A/B the various programs of a given type. When you scroll to a new preset, the MPX 200 puts it into a buffer — you must push the Load button to make it active. This way, your current sound isn't disrupted while you trawl for the next one. Nice.

### EDITING

On the MPX 200, the main limitations are in the editing. Each preset lets you edit eight to nine basic parameters from the front panel, but four of these — Ratio, Threshold, Attack, and Release — are dedicated to the compressor.

For the ambient effects, you can edit wet/dry mix, EQ (a one-parameter edit whose function changes depending on the selected preset, though it's usually set to the cutoff of the HiCut filter), effect level (when a dual processor effect is active, this control sets the balance between the two effects), and Adjust, a wildcard that governs one parameter — or, in some cases, several parameters simultaneously — for each preset. Adjust's functionality varies from preset to preset (you'll need to consult the manual to see what it does for each one). For example, with some flange programs, it governs speed; with others, resonance. On the positive side, the MPX 200 provides easy access to each parameter — simply push the Edit button to select the one you want (each push scrolls to the next parameter), grab the adjust knob, and go.

Many of the presets also respond to the Tap key, which lets you set parameters such as delay time, tremolo rate, pre-delay, etc. You can use MIDI controllers and MIDI clocks to control any of these parameters from an external source, and the MPX 200's handy MIDI Learn function lets you set it to respond to the controller of your choice.

### SOUND

The MPX 200's presets sound very impressive. The reverbs are rich and full and not overly bright. The Plate and Chamber were especially smooth for a unit in this price range (plates can sound like broken spring reverbs on other low-cost devices). Some of the patches inspired creativity: One Ambience program gave so much life to a pitched electronic drum pattern — the tail added sustain and to the drum's decay and brought out its melodic potential — that it became an integral part of a song.

The mod effects, notably the chorus, shimmer without becoming muddy or over-modulated. Because they preserve the source sound's character, the MPX 200's mod effects work extremely well on guitar, vocals, and other staple sounds that need both color and clarity. The pitch shifter does a nice job with both straight interval shifting and simple detuning, but really comes to life on presets where it's combined with delay. Feed a little guitar in and use a volume pedal to create swells, and you'll feel like you're playing a highly expressive synth.

The compressor was also quite usable. It's especially handy for preventing overloads to the ambient effects from transient sounds such as percussion hits. You can use the compressor without other effects, but only as a stereo processor — it would have been nice to be able to apply it to two independent mono signals. Even if you don't plan on using the MPX 200 as a dedicated dynamics processor, you'll find the compressor useful as buffer between your source and your reverb.

### THE WRAP-UP

Overall, flexibility is the key to the MPX 200's appeal. It can cover a *lot* of territory in a home or small project studio. Better yet, because it sounds so good, it would also serve quite well as a secondary processor in a larger setup. Either way, the MPX 200's appeal is greater than the sum of its parts — and much greater than the sum of its price.

Emile Menasché's wife recently discovered him asleep at his keyboard with an Eb triad imprinted on his forehead.



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# Universal Audio 2-610 Tube Mic Pre

A two-channel tube mic pre that offers truly vintage sound in a brand new box

The 2-610 is the third release in Universal Audio's new Classics product line. It follows their revival of the 1176LN Limiting Amplifier and Teletronix LA-2A Leveling Amplifier, all of which were designed or manufactured by UA's founding father Bill Putnam. What's different about the 2-610 is that it's UA's first all-new product. It's based upon the original Universal Audio 610 console that was among the world's first modular recording mixers. UA points out that the 610 was used on countless classic recordings from Frank Sinatra to the Beach Boy's Pet Sounds. Engineers like Bruce Swedien started out on the original console, while my old friend Jack Joseph Puig still uses one daily on his records with Beck, Green Day, No Doubt, and others, even though less than ten 610 consoles were ever made. The UA design team spent more than two years researching and designing this little gem. After giving this preamp a listen, it's quite evident that this was time well spent.

Each channel uses one 12AX7 and one 6072 to give it that vintage UA tube sound. It's a very simple box to work with. The front panel has five knobs and three switches per channel, a Hi-Z input, and three center switches including power. The rear panel has three XLR inputs per channel, an IEC mains connector, and a voltage switch for 115 or 230 volts, making it easy to use anywhere you might be working.

We'll look at the features of just one channel since both are the same. Gain is selectable in 5 dB increments from -10, -5, 0, +5, to +10. Next up is the input selector, which is one of the simple things that I love about this box, as three different sources can be simultaneously connected. Using this switch, you can easily choose the one you need, making it a perfect tool for quick multi-tasking studio needs. The three inputs are: Mic, which selects the rear panel's balanced XLR input with impedance of 500 ohms and 2 kohms; Line, which selects the second rear panel XLR; and Hi-Z, which uses the front panel's 1/4-inch unbalanced input. The Hi-Z input offers impedance of either 47 kohms or 2.2 Mohms, the latter of which UA says is designed for



## ► UNIVERSAL AUDIO 2-610

**MANUFACTURER:** Universal Audio, 2125 Delaware Avenue, Suite A, Santa Cruz, CA 95060. Tel: 831-466-3737. Web: [www.uaudio.com](http://www.uaudio.com).

**SUMMARY:** The UA 2-610 is an aural delight. A tube-based mic pre, its sound quality is pristine and very transparent — with a minimum effort, it can also add a very effective vintage color to any mono or stereo source.

**STRENGTHS:** Vintage UA tube sound. Smooth-sounding shelving EQ. Three separate inputs per channel. Low noise floor. Variable input impedances.

**WEAKNESSES:** Limited EQ range.

**PRICE:** \$2,295

**EQ FREE LIT. #: 105**

a drum machine, keyboard, bass, or guitar. For my tastes, I found the 47-kohm setting to be just the ticket for my '64 Jazz bass and custom Epiphone Zephyr big-body electric guitar. In fact, I've never heard either of them sound this warm and big.

I like the look and feel of big knobs, and the 2-610 has two very large ones for controlling the master level with a range of zero to ten and a maximum overall gain of 61 dB. There's a polarity switch for inverting the phase by swapping pins two and three, and a set of EQ controls. Both low and high shelving EQ's are available. The low band lets you choose frequencies of 70, 100, and 200 Hz, and the high band includes 4.5k, 7.5k, and 10k. There is a boost/cut knob that is preset to dB values ranging from -9 to +9. A 48-volt phantom power switch for each channel is also conveniently included.

As the 2-610 is a mic pre, I put it through a variety of tests to see how it would perform. I





recorded several passes with each test into both Pro Tools and Steinberg's Nuendo at 24-bit/44.1 using no EQ and just the live sound of the room and mics. My first tests were with a pair of AKG 414's stereo miking an acoustic guitar. I then tested my 1943 Epiphone B5 upright bass, and also a late '70s Guild B-50 acoustic bass. Other than the obvious differences between instruments and each DAW adding its own special character, I found the recordings to have a wide and warm quality. Next, I recorded solo vocal takes using a Neumann U 87 that sounded quite lovely using a bit of EQ boost at 200 and 7.5K. Finally, I pulled out my trusty Røde NT-1 and NT-2 to see how they might fare, and though neither came near the overall vibe of the U 87 (obviously), there was a noticeable improvement to both with much more body and crispness to the sound using the same instruments and vocals — pretty sweet sound with headroom to spare and lots of gain if you need it.

Besides the vocals, guitar, and bass

## SPECS AT A GLANCE

INPUTS	Microphone Female XLR, Balanced Line Female XLR, Unbalanced Line/Instrument 1/4-inch jack, D
OUTPUTS	Balanced Line Male XLR
MICROPHONE INPUT IMPEDANCE	Selectable 500 ohms or 2 kohms
BALANCED LINE INPUT IMPEDANCE	3.8 kohms
HI-Z INPUT IMPEDANCE	Selectable, 2.2 Mohms or 47 kohms
MAXIMUM MICROPHONE INPUT LEVEL	+3.5 dBu
MAXIMUM OUTPUT LEVEL	+20 dBm
INTERNAL OUTPUT IMPEDANCE	60 ohms
RECOMMENDED MINIMUM LOAD	600 ohms
FREQUENCY RESPONSE	20 Hz to 20 kHz $\pm$ 1 dB
MAX GAIN	61 dB
SIGNAL TO NOISE RATIO	Greater than 32 dB
VACUUM TUBES	One 12AX7A and one 6072A per channel
POWER REQUIREMENTS	115V/230V
DIMENSIONS	3.5 inches vertical, for mounting in standard 19-inch rack
WEIGHT	11.75 lbs.

tests, I also did an A/B comparison between my basic Pro Tools Mix Plus stereo output and the same signal sent through a second master fader to the 2-610 with the EQ set flat. Listening to the Pro Tools output through the 2-610, I immediately noticed a warmer sound with a kind of roundness that made the mix much more enjoyable to listen to. After adding a bit of EQ, I found I could make that basic Pro Tools mix practically jump

out of the speakers. Are we having fun yet? You bet!

The 2-610 is an instant classic and a multi-functional mic pre that I predict will quickly become a staple in studios around the world. It can be very transparent, yet, with just a bit of extra gain or EQ, it can add a color that's about as warm and silky a sound as I've heard in quite some time. Speaking of gain, the 2-610

► continued on page 119

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Whether using it on your favorite large diaphragm condenser mic or plugging in an acoustic guitar, the model 101 will help you achieve results previously available only to big budget studios and Grammy winning engineers.

CIRCLE 64 ON INFO CARD

# Audio-Technica AT3035 Cardioid Condenser Microphone

Audio-Technica hits one out of the park with this affordable large-diaphragm cardioid condenser mic

Audio-Technica has established themselves as a manufacturer of quality mics at affordable prices, earning berths for several of their models in many a well-appointed mic locker. The AT4033, their first large-diaphragm side-address mic in the 40 series, is a bona fide classic, as is the higher-end AT4050, an equally venerable studio staple. The recent 4060 tube mic is also one of the company's highly respected success stories. But A-T may have outdone themselves in the quality-to-price arena with the AT3035, a handsome, well-engineered, versatile, and great-sounding large-diaphragm condenser mic. This affordable gem is a winner on three fronts: ergonomics, industrial engineering, and sound quality. Let's take a look at why the good folks at Audio-Technica will have to send their goon squad to pry the AT3035 from this reviewer's cold, dead fingers.

## OVERVIEW

The AT3035 is a large-diaphragm, cardioid condenser microphone designed to be versatile enough to handle a wide variety of project-studio miking applications. It has a fixed cardioid polar pattern, producing a flat frequency response from 20 Hz to 20 kHz. The diaphragm measures 26 mm (just a hair over one inch), and the high-SPL-handling capabilities weigh in at 148 dB (158 with the 10 dB pad switch engaged). The low-end roll-off (high-pass filter) switch attenuates low frequencies at 80 Hz to the tune of 12 dB/octave. The roll-off switch helps eliminate popping and the proximity effect from close-range vocals, as well as ambient rumbles such as footsteps across a stage, air conditioning systems, a passing truck, and



## ► AUDIO TECHNICA AT3035

**MANUFACTURER:** Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, OH 44224-1760. Tel: 330-686-2600. Web: [www.audio-technica.com](http://www.audio-technica.com).

**SUMMARY:** The AT3035 is a handsome and versatile mic, capable of recording a variety of material and enduring high SPLs like it ain't no thang.

**STRENGTHS:** Flat response. High-SPL handling. Warm character. Superior industrial design.

**WEAKNESSES:** Shockmount and mic won't fit together in supplied pouch.

**PRICE:** \$349

**EQ FREE LIT. #:** 106

other mechanically coupled vibrations. Though many engineers prefer to control low-end roll-off from the board, the 80 Hz switch is great to have for live situations or for a vocalist with poor mic technique.

The mic snips in a zippered vinyl pouch, like the kind in which you can stuff school supplies. The included shockmount doesn't fit into the pouch, so you'll probably do what I did and rescue the foam from the shipping box (which is form-cut to house the mic snugly) and create your own case. I used one of those soft, padded rectangular lunch boxes, which also held the mic cable (not included) and the shockmount. With the mic in its original molded foam, the pouch was superfluous. Maybe I can use it to hold my beat-up dynamic mic — or my Cap'n Crunch six-inch ruler.

The specs on this mic are quite impressive: as stated, it has a low-noise, high-SPL-handling element that can endure a maximum SPL of 148 dB without the pad switch engaged. The self noise is 12 dB, which is pretty quiet for a mic this size. If you subtract the noise from the maximum SPL, you get an impressive 136 dB of dynamic range — eminently usable for even the most exposed source material. The 10 dB pad is typical of





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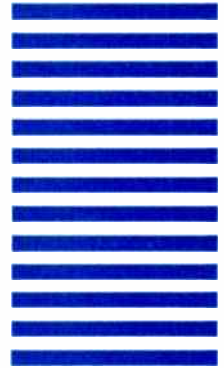
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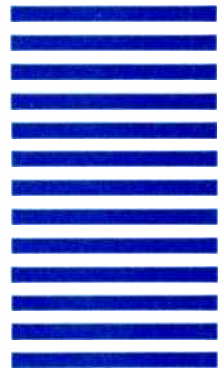
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				69	Z Systems	52	352-371-0990

Audio-Technica mics, as anything more tends to change the character of the mic (the noise floor comes up, for example), and takes the performances away from the published spec. With the 10 dB switch engaged, the mic is capable of handling 158 dB; if you're running signals hotter than that, you should be rethinking your miking strategy — or telling your guitar player to turn it down.

The sensitivity, or open-circuit level, is comparable with the 40 Series, so engineers used to setting levels for 4033's and 4050's will have no trouble with the 3035. The AT3035 produces a hotter signal level than other mics in the 30 Series.

**FIRST BLUSH**

Right out of the box, it's clear that the AT3035 is something special. It's the same size as the 4033 and 4047/SV, and well-proportioned, with the housing exhibiting a slight taper, so it doesn't have that "oil can" quality of many tube and other large-housing mics. Aside from the subtle arc in the body shape, its color is something new, too: slightly darker than most champagne-colored mics. This is a sort of dark silver color, and slightly muted looking, which projects an elegant, almost regal aura. Before even picking it out of the foam, you know you're in for a treat.

At first glance, the mount looks to be symmetrical, as if you could pass the mic through it either way. Upon closer inspection, however, the A-T logo is unobtrusively embossed on the front, and holding the logo upright (and facing you) allows the mic to be slipped in its proper direction, from the top. Here is where I got my second nice surprise and discovered that the mic is not only an aesthetic success, but an industrial-design triumph, too.

**INSERT THIS**

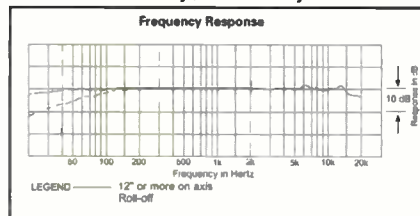
The mic slides effortlessly into the mount and then seats with a satisfying *shunk*, owing to a groove in the housing that runs around the circumference. You'd think a mic slipping successfully in and out of its mount would be one for the "like, duh" category, but you'd be surprised. I've experienced many shockmount insertions that are

**AT3035 SPECIFICATIONS**

Element.....	Fixed-charge back plate permanently polarized condenser
Polar Pattern.....	Cardioid
Frequency Response.....	20 Hz–20 kHz
Low Frequency Roll Off.....	80 Hz, 12 dB/octave
Open Circuit Sensitivity.....	–32 dB (25.1 mV) re 1V at 1 Pa
Impedance.....	250 ohms
Maximum Input Sound Level.....	148 dB SPL, 1 kHz at 1% THD; 158 dB SPL, with 10 dB pad (nominal)
Noise.....	12 dB SPL
Dynamic Range (Typical).....	136 dB, 1 kHz at max SPL
Signal-to-Noise Ratio.....	82 dB, 1 kHz at 1 Pa
Phantom Power Requirements.....	11–52V DC, 3 mA typical
Switches.....	Flat, roll-off; 10 dB pad (nominal)
Weight (Less Accessories).....	13.8 oz (390 g)
Dimensions.....	6.69 inches (170.0 mm) long, 2.05 inches (52.0 mm) maximum body diameter
Output Connector.....	Integral 3-pin XLRM-type
Accessories Furnished.....	Shockmount, soft protective pouch

either time-consuming, cumbersome, or worse, "insecure" — meaning you never know if it's *really* in or only part-way in (and therefore part-way out, which can become fully out — and on the floor — faster than you can catch it on the way down). Kudos to A-T for making the process simple and secure.

There's another nice design touch when the mic is in its mount: though securely nested in its ring, the mic will still swivel easily, in case you want to



**AT3035 Frequency Response**

rotate it toward a singer, but don't want to adjust the boom or move the stand off its tape marks. (And, of course, you've nailed the singer's shoes to the floor, so you can't ask *him* to move). The bass roll-off and 10 dB pad switches are visible (and accessible) when the mic is in the mount. You can experiment with the roll-off and pad settings without changing the position of the mic or the attitude of the diaphragm. Nice. The bands are made

of durable-grade elastic and are resistant enough to provide the necessary isolation from mechanical coupling (most typically manifested as mic stand vibrations), but springy enough to be pliant in your fingers for quick changes.

In short, installing the mic in its mount is about as smooth and quick an operation as you could imagine. Live sound technicians take note: This kind of facility is especially handy in the sometimes-rushed conditions of setups and strikes that a touring situation presents. I could see an engineer and his crew relying on the feel factor to quickly lock and load, say, 12 of these babies in about as many seconds.

**IN USE**

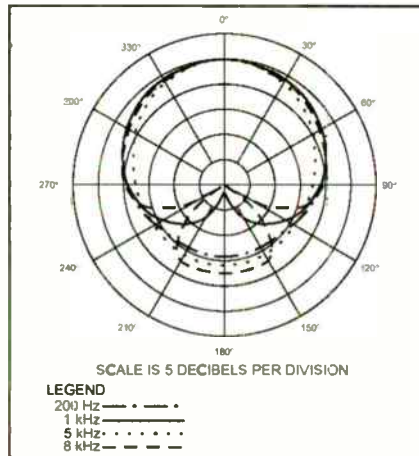
Encouraged by the high SPL-handling and flat response ratings, I decided to leave the 10 dB pad off and have a go with the AT3035 on two very raucous and different sources: the voice and guitar playing of my friend Larry, a songwriter and recording artist. Larry was working on a demo of new songs for his producer, and wanted just solo acoustic guitar and his voice, with an occasional overdubbed female harmony on selected songs. Larry's weapon (and in his hands, believe me, it's a weapon) of choice is a Martin J-40M,



which has the depth of a dreadnought and the surface area of a jumbo. It's the largest-bodied guitar Martin makes, or, as Larry says, "holds the most water." And it's strung with medium strings (.013's). It's not a guitar for sissies — either from a playing or recording perspective. Larry is a thumper and a basher, too, which meant plenty of low-frequency SPLs would be sallying forth.

I had good luck with the mic placed about ten inches off the lower bout. The sound was warm, yet crisp enough with transients that I decided to forego a pencil mic above the 12th fret. I didn't need the pad, despite the fact that sometimes the guitar body swung (dangerously) close to mic, which boosted the proximity effect. But still the mic didn't distort. I moved it around to various spots over the guitar's soundboard, and was struck by the warmth of the mic, as well as the level of detail it captured in the low end. In the dynamic passages, the mic held tough for high SPLs and was quiet (as in low noise floor) and responsive for low-level signals. Switching the mic to Larry's lead vocals did require the pad (as well as a pop screen), but once I compensated for the levels, the mic performed with the same sweetness it had on the guitar.

When we brought in the female vocalist for the harmonies, I noticed that the AT3035 tended to smooth out some of the strident character in the singer's high soprano region. Again, "warmth" was the quality that came to mind. Perhaps the AT3035 didn't achieve the ultra-transparent character that a \$1,500-or-above mic would, but it did produce a flat response, an even performance, and it successfully fielded the sibilant transients with aplomb while preserving the high-end detail. I wound up really liking this mic for what it did for vocals, both for the warmth it imbued as well as the versatility it showed in wrangling two very



AT3035 Polar Pattern

different vocal instruments (and mic techniques!). I especially like the warm presence in the high mids. This was perfect for my female singer, whose piercing soprano can benefit from a slight warming up and emphasis in her lower notes. In summary, I would characterize this mic as flat but warm, rather than, say, flat with crystalline transparency. In all fairness, if you want that kind of transparency, you have to spend five times the price. And the AT3035 provided plenty of low- and high-end detail.

## CONCLUSIONS

I see great things in the AT3035's future: Its strengths are its flat response, warm character, and versatile handling of not only widely varying SPLs, but also diverse program material — boomy guitars to crisp transients to warmth-seeking vocals. The fact that you can field-strip and set up this baby in a hurry will make it ubiquitous on the live set. To have a compact, well-engineered, and handsome mic that goes in and out of its shockmount — securely, with no ambiguity — in less than a second is a true engineering coup. Add to that its elegant color, versatile application, and great sound, and you have a professional-level microphone capable of serious recording work. At this price, you'd do well to acquire two in order to have a matched set for stereo work. Now I just have to figure how to snag me *another* AT3035.

Jon Chappell composes music for the daytime drama *All My Children*, but his evil twin won't let him watch it.

## WEBLINK

For an excellent primer on vocal mic selection, check out Lynn Fuston's "Choosing the Right Vocal Mic" at [www.eqmag.com/0201/techniques\\_rlg/htmic\\_103.html](http://www.eqmag.com/0201/techniques_rlg/htmic_103.html).

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In-depth advice on making  
the most out of your loops

## Tips for Better Loop-Based Music

Loop-based music is much more than the province of dancing and DJs. I've used loop music for three movie soundtracks, two industrial videos, a radio commercial, several remixes, and, of course, for my dance-oriented CDs. And for *EQ* readers, this type of music is very recording engineer friendly, because the process is more like collage — you don't need great technical music chops to put together a satisfying musical experience.

However, you *do* need good source material, and, most importantly, the ability to move beyond the constraints associated with this method of making music. The tips presented in this article, coupled with a reasonable amount of time spent editing, will hopefully help you add a more creative, humanized element to your loop-based music.

The following examples (several are online at *EQ*'s Web site ([www.eqmag.com](http://www.eqmag.com))) are all based around Acid, currently the premier loop music program. However, Cakewalk's Sonar is also excellent for this type of application, and conventional digital audio-oriented programs (Cubase, Logic, Performer, etc.) also work if the loops you select are in the same key and tempo, or converted into a common key/tempo using time-stretch functions.

### PERSUASIVE PERCUSSION

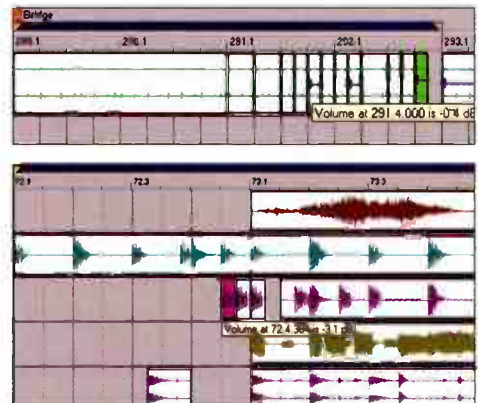
A lively conga or shaker loop can dress up a drum part, but the point of these instruments is to add variations. To keep the loops from getting too repetitive, cut them into pieces (see sidebar, "Slice and Dice Basics"). Rearrange the pieces in various orders, but do maintain some level of repetitiveness to "anchor" the part. For example, try always repeating the same quarter-note fragment at the beginning of every measure or two. Fig. 1 shows a conga loop before and after slicing and dicing [audio example 1 online].

### BREAK THAT BEAT

An important element in some dance-oriented music is the breakbeat, where the sound "thins out" dramatically just before a figure repeats. The breakbeat provides the element of tension/variation in the "tension/release" equation.

For example, suppose you have a two-measure, repeating drum loop. Let it go for seven measures, then cut the eighth measure. This throws the spotlight on whatever is playing in the background, such as a bass part. Conversely, you could cut out the last measure of bass and let the drums carry the piece by themselves; or cut both the bass and drums, and stick in a drum fill that's different from the main drum loop [audio example 2 online].

In a two-measure loop, there's a chance the downbeat might occur slightly ahead of the beat. If you cut exactly on the beat, this will leave a short click. Solo the track, zoom way in, turn off snap (the Acid snap on/off key command is F8), then drag the end of the track a bit to the left, just before the transient.



**FIGURE 1 (TOP):** The second repeat of this two-measure loop has been "sliced and diced" to create a different part compared to the original loop. Also, some of the slice's levels have been changed to add more dynamics. **FIGURE 2:** Two sixteenth-note kicks lead into measure 73. The first kick's level has been reduced by 3.1 dB.

Sometimes leaving the first downbeat of the breakbeat measure can be effective. Set snap to an eighth or sixteenth note, and drag right to retain the downbeat.

### EXITING THE BREAKBEAT

As you come out of the breakbeat, adding a few kick drum hits can be a really effective lead-in to the next measure. As many dance-oriented drum loops start with a kick, if you draw in just the first sixteenth note of the loop,

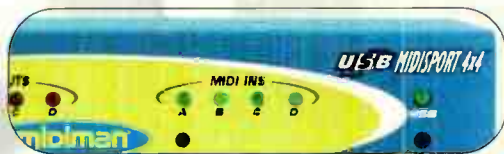
CRAIG ANDERTON



# The first name in MIDI is the last word in Digital Audio.



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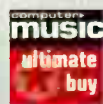
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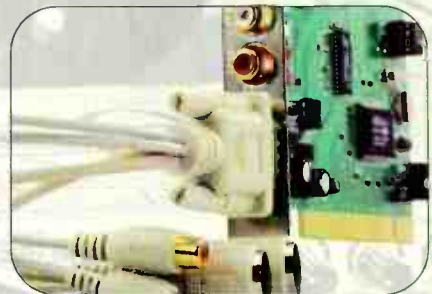


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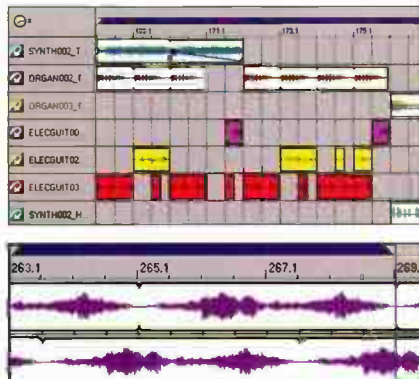
**SLICE AND DICE**

*You can operate on loops much faster in Acid if you use the S (split) key command. Select your snap value (usually eighth or sixteenth notes), then click the cursor on the loop where you want the split to occur. Hit S, and the loop will divide in two at the split point.*

you'll hear a short kick. To lead in, set snap to sixteenth notes, then draw two sixteenth notes just before the beginning of a measure (Fig. 2). Also, try lowering the first kick's volume a bit to provide some dynamics [audio example 3 online].

**PART SPLICING**

Sometimes a continuing part, like a rhythm guitar, can get really b-o-r-i-n-g as it loops and loops and.... It really helps to cut a small piece from a similar or related part and splice it in to break up the monotony and add a useful accent (Fig. 3). For example, if there's a funky guitar part doing most of the work, add a wah-wah flourish at the end of the measure [audio example 4 online].



**FIGURE 3 (TOP):** Three tracks of guitar have been edited to make one track with more interest. Note the wah-wah flourish (pink color) that hits during the last measure of an 8-bar figure. **FIGURE 4:** The top track has been copied, then shifted so that its peaks mask any volume drops in the original track.

**REPAIRING PAD LOOP SEAMS**

No, "pad loop" has nothing to do with Thai food. Rather, pads are sustaining sounds, like string beds or drones. Pads are difficult to loop, whether in samplers or digital audio programs. As a result, Acid by default adds a short fade to the beginning/end of the loop so that there aren't any clicks when the end transitions back to the beginning. Unfortunately, this causes the sound to drop out momentarily, thus negating the loop's continuous nature.

You can turn off the fade on a per-segment basis using the Properties tab. However, this will likely create the type of click that the fade was intended to solve, and you'll find it better to stay with the default.

The simplest way to fix a gap is to duplicate the looped pad, and offset the copy so its peak occurs during the original loop's volume drop, thus masking it (Fig. 4).

For the best masking effect, pan the two loops to the same point in the stereo image. But also try panning the loops to opposite channels, as this can produce some nifty panning effects [audio example 5 online].

**DETUNING**

Suppose a drum loop plays during the intro to a verse and during the verse itself. Detune the portion behind the verse by around a half-step or so; this adds a timbral difference that supports the change in the song from intro to verse.

Detuning is also great with cymbals, as you can use it to turn one cymbal into a family of cymbals. If you define the cymbal as a one-shot instead of a loop (specified under Properties), changing tuning will also change duration. In fact, you can get a gong-like effect by layering two cymbal sounds. Detune one by about a half-dozen semitones; detune the other by a much greater amount, like 20 or more semitones [audio example 6 online].

**CREATE YOUR OWN LOOPS...**

When you create loops, avoid one-measure loops and do at least two-measure loops. Have the second measure be a variation on the first measure. That way, if you want a loop to keep repeating and sound the same, just split the loop in half and copy the first measure over and over. When you want the variation to come in, drag the end of the first measure over to the right to reveal the second measure. Done! And we're done with this issue's column, as well. Just remember, a program like Acid allows a lot of creative latitude. Push its envelope — your music will thank you for it. ■



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A look back at a few of Dr. Al's  
more memorable musings

## The Best of Al Kooper

*Al Kooper's mother, Natalie Kooper, passed away on May 16, 2001, just as this issue was going to press. Natalie Kooper (b. 1/9/14) was a homemaker and travel agent, who, along with her late husband Sam, founded The Hollis Hills Jewish Center in Queens, NY, 50 years ago. She was the woman who constantly played pop music stations on the radio around the house. She is survived by her son Al, her sisters Rosalie and Pearl, her grandson Brian, and her great-grandson Benjamin.*

*Al's regular column will be back next month. In lieu of that, we hope you enjoy this page of Al's greatest hits.*

### ON TRUTHFULNESS IN LIVE PERFORMANCES

It's time for a new kind of RAP — the Real Audio Police. All connections have to be checked at concerts to see if they go directly to the mixing console or make a covert sidetrip to a black box. Penalties have to be enforced or confessions have to be made. "Ricky Martin's vocals will be performed through Antares pitch-correctors during tonight's show" would be a good one. Either that or a meter has to be put on the pitch-corrector and tally up how many times it kicks in and a dollar has to be sent to Amnesty International for each hit. Yeah, that's good. I like that.

### ON THE DEATH OF THE LOCAL MUSIC STORE

Russ Solomon, owner of Tower Records, created a nationwide nightmare for independent record stores. He built incredible-sized monolithic palaces of retail overflowing with customer choices. He merged video, music, and reading materials into the Coca-Cola of retail record shops. One of his most powerful stores, on the corner of Newbury Street and Massachusetts Avenue in the heart of Boston's Back Bay, was rumored at press time to have had its expiring lease incredibly outbid by the rival copycat Virgin Megastore. Word on the street is that Tower will have to vacate this plum location by the summer of 2001. This store is such a mainstay of the community, that a Grauman's-style display of famous musical footprints stands outside the

entrance in a Solomon-sponsored Walk-Of-Fame. What's to become of Aerosmith's cemented tootsies? To the victor go the cement spoils? The mind boggles.

Like Moses, I stand on the mountaintop and call out to you — we are breaking the Ten Commandments of the human-side of business. (*Is there even a human aspect of business left?*) We are surely headed toward a world where larger-than-life, impeccably groomed Fidel Castros stand at the helm of each industry, firmly in charge, until Steve Case (or the next Steve Case) comes roaring in on a tidal wave of assets and sweeps each natty Fidel into his ever-increasing-ocean-that-will-submerge-all-land-as-we-know-it-today.

### ON THE STATE OF SURROUND

The problem with 5.1 surround audio DVDs is simple: Unlike most of the formats before it, the existing catalog is largely unsuitable for this format. In a perfect world, if this bird is gonna fly, current projects need to be mixed in it. Mono Elvis albums ain't gonna cut it in surround sound; Benny Goodman will stall; Little Richard will be six or eight times shriller than usual. CDs worked because they disposed of the clicks and pops of vinyl. Therefore, it didn't matter if they were mono. Surround is a spatial media, not one of specific clarity. Mono is doomed in surround. However, if Eminem mixes his next project in surround, his demographic will most certainly increase.

### ON NAPSTER

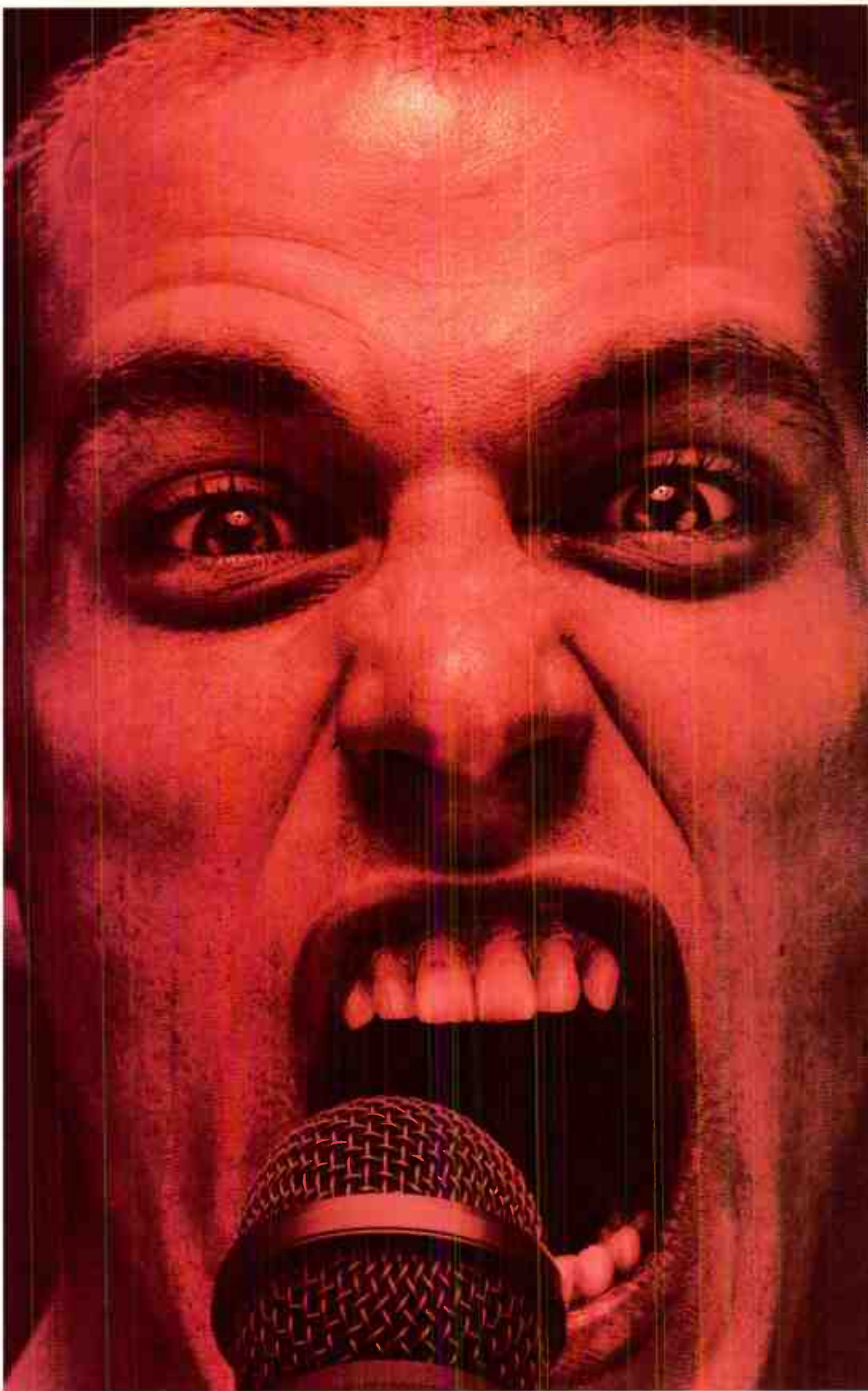
I've remained stoic and quiet on this subject for quite awhile, but now I must vent and rant or be crushed under a glass-encrusted tire of disrespect. I guess the thing that rankles me the most about Napster is that you have no say in whether they exploit your work or not. No contracts need to be signed. Somebody uploads your song and that's it. No one with a modem and a computer has to buy it ever again. Now if one were in their twenties and in an ambitious, nascent band, they would welcome Napster and their ilk — if only for the free distribution and publicity. I believe Brother Dylan said it best: "When ya ain't got nuthin', ya got nuthin' to lose...." ■

AL KOOPER





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*LISTEN TO THIS*

Audio customers do  
the darndest things

## Stupid Client Tricks

A couple of months ago, this column dealt with the uncomfortable subject of managing difficult clients. This month, I'm going a step beyond to tell a few stories of clients who wouldn't be managed. I know it's bad form to complain about 'em, but that's only to other clients. This is okay, because it's you guys, right?

It would be delicious to simply rant about the astonishingly dumb things some of my customers have done over the years and see it all in lovely mass-produced print. But my commission here as your humble Guest Room Warrior is to provide illumination, so I'm going to do my best to glean a business lesson — a moral, if you will — from these ghoulish tales.

Back when I started the enterprise that my wife and assistant (and world's most avid fan of HBO's *The Sopranos*) likes to call "this thing of ours," we were lucky enough to get a big jump-start gig. It was as a music director for the national sales conference of a gigantic multi-national financial company (name withheld for obvious reasons). I wrote original songs, booked all the bands for parties and receptions, recorded audio for presentation videos, and, essentially, became their slave for four months of preproduction and ten days surrounding the actual show. I got to live in a wonderful luxury resort hotel in a place where it's 72 degrees in January, drink a lot of rare single malt Scotch on their tab, and work with some of the best singers and musicians I've ever met (and if any of you are reading this, I still can't thank you enough for your hard work and understanding). I have a hundred stories from this gig, but one in particular stands out.

The CEO of this company, who had cast himself as the star of the show, was the kind of guy who got things done by scaring the bodily wastes out of his underlings. He rarely missed an opportunity to demonstrate his power, which was so complete that he had members of his team telling me he was "a brilliant musician," even though when his big moment came to conduct our

live orchestra on opening night he could barely wave a baton in straight time.

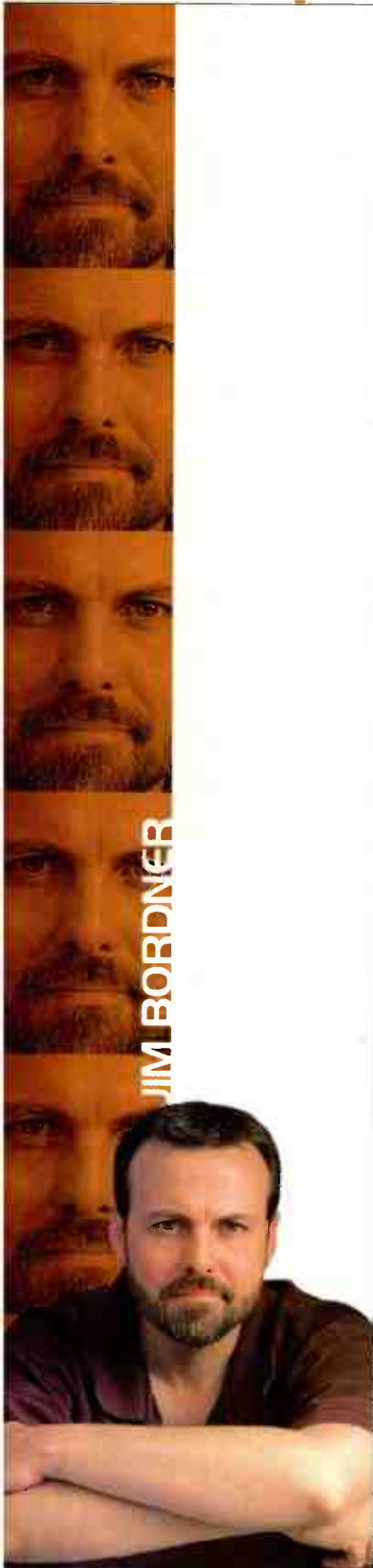
One of the things he liked to do during the annual conference was gather up a few of the company's top salesmen and invite them up to his suite for a drink and a heart-to-heart after each evening's staged hilarity had subsided. His suite was furnished with a nice grand piano, and, as the show approached, I was asked to hire a jazz player to provide

NO MATTER HOW  
OBVIOUS YOU THINK  
THE CLIENT'S REQUEST  
MAY BE, NAIL DOWN  
THE DETAILS.

background music for these after-hours gatherings.

I tracked down the area's finest jazzier, the head of the jazz studies department at a well-known university, a guy who had been ripping standards since before I was born. Booking agents and other musicians in town all told me this guy was *primo*, the bomb, as good as it gets. I booked him for four consecutive nights of the show and set him up so he would be playing when the CEO and his party arrived.

As the show was coming to a close, I asked how the guy had been doing, and expressed regret that I hadn't heard him play. A member of the CEO's entourage coolly informed me that he'd been fine, and that the CEO didn't want him banging away in the background all night. He just wanted him there when he and his guests arrived. All four nights, the CEO had come upstairs, poured drinks, and then sent the lowly piano player away after a few minutes. I'd spent many hours and a chunk of my budget securing a genius jazz player





## WFO LINK

Have a question or comment for Jim Bordner? Email him at [jim@gravitymusic.com](mailto:jim@gravitymusic.com).

to be used as a stylish prop. The moral: No matter how obvious you think the client's request may be, nail down the details. If I had known they wanted a guy to simply make a jazz noise for three minutes while the CEO set the stage, I would have just gone upstairs and played it myself. And, if I had asked, I would have known the details of the gig. This would have saved a few dollars as well as saving a great player, and me, some small humiliation (and if you're reading this, sorry man).

Here's another: A couple of years ago, a video producer I work with picked up a new client, a producer of training videos for the medical profession. On the first go-round, the budget was low and they used needle-drop music, which worked fine for the purpose — until the company president was checking into a hotel one day, switched on the TV, and heard the same music being used on the hotel's

information system. He wiggled out and immediately (from the hotel) called my friend, who patiently explained to him that library music belongs to everyone — it's like a beautiful butterfly, you can never hope to keep it as your own, etc. Well, that was completely unacceptable! He wanted his own music, dammit, and right now! She explained that he probably wouldn't want to pay for original scoring for each of the 50 or so videos they make in a year. She had another idea. So she called me and asked what it would cost to produce a mini-library of themes and variations that they could use on all their work. We worked out a price that was fair to both of us and she took the bid and my demo to the medical guys.

They loved the concept, loved the price, loved the demo, and couldn't wait to get started. And then something happened. The president's brother played drums in a band, and the band had just broken up. He had nothing to do so they decided to get a bid from him. I chewed my nails for a couple days until my friend called to say that the erstwhile rock star

had come back with a bid more than 50% higher than my own (he either needed to buy a studio or split the project with someone, was my guess). So, I'm an experienced professional producer, they love my work, and I'm way cheaper. It's in the bag right? Nope. A week later they called to say they were awarding the job to the unemployed drummer sibling.

The moral: Relationships are better than quality, better than price, better than anything. A family relationship is as close as they get, but the next best thing is a long working relationship. There is no gear you can buy, no technique you can learn, no high-visibility gig you can win — *nothing* that will grow your business like maintaining those relationships.

In fact, that reminds me — I have a long list of customers who have never done anything painfully stupid, and who have always been a pleasure to work for. Maybe I should call them up and thank them. If you'll excuse me, I have a little relationship marketing to do. Drop by next month and we'll talk about insurance. ■

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CIRCLE 65 ON INFO CARD

Shaking down the encoding process and explaining the ins and outs of converters

## 96k in a 48k World — Part 2

Last month we discussed the basics of the technology used in all of the major audio formats currently available. It's now clear that professionals need to work at several different bit depths, sample rates, and in different audio codecs in order to be compatible with these formats. Let's expound on that briefly, and then move on to which converters to use and why.

### ENCODE — YESTERDAY OR TOMORROW?

One of the most common misunderstandings when doing surround mixing is that of the encoding process. Specifically, many first-time surround clients (and studio owners, for that matter!) believe that once the material is mixed into six channels, it is then encoded. In reality, this is rarely the case. Most of the time, the music is mixed to a six-channel format such as TASCAM DA or Genex MO. The audio should be recorded (stored) at the proper bit depth and sample rate. However, it's PCM audio at this point. Once it's delivered to the DVD authoring house, then it's encoded into whatever format is being used on the disc. If it's stereo, it's typically encoded with Dolby Digital two-channel to save space on the disc while retaining sound quality (PCM is a digital copy of the original two-channel audio, so it's the best way to go. The downside is that it uses a lot of space, whereas Dolby Digital does not).

If the audio is archived as six-channel, then it's going to need to be encoded in either DTS or Dolby Digital. Each of these formats is known as a "codec." There is a Dolby Digital codec and a DTS codec. Although they both compress the six-channel data into a two-channel encoded file, they do it in very different ways with different sonic results. I'll leave those differences for another article. For now, just be sure that you're aware of which format is going to end up as the final master and

how many channels are included.

### 5, 4, 3, 2, 1 — BLAST OFF, OR, RATHER, BURN IN!

What if your mix is a three-channel mix or a five-channel mix (no center or sub)? How will the encode process handle these channels? Simple. Each codec is scalable from one to six channels. In the encoding process, the audio is formatted based on the number of original channels that it contains. For example, if you have a quad mix (LF, RF, LS, RS), then the Dolby Digital encoder would be set for this mode (the DD encoder has modes for virtually every combination of channel assignment). Upon encoding, the four channels would be encoded in

ONE OF THE MOST COMMON MISUNDERSTANDINGS WHEN DOING SURROUND MIXING IS THAT OF THE ENCODING PROCESS.

their exact positions (all LS information would be routed to the left surround speaker). The resulting file would be a AC3 file containing the entire multichannel mix.

### CONVERSION 101 — NOT!

Actually, let's start by examining in basic terms, what converters do and how. Simply stated, a digital audio converter comes in two flavors. One type is called an A/D, or analog-to-digital converter. The second type is called a D/A, or digital-to-analog converter. Any device that accepts "analog" audio and stores it digitally requires the use of an

DAVID ERANGIONI



## WEBLINK

For more "tech talk," visit the Studio Tech web Forum at [www.eqmag.com](http://www.eqmag.com). There's always tons of valuable information to gather, free giveaways contests, and lots of cool people.

A/D converter. So then, how does your tabletop CD-R work without these A/D-D/A converters? Simple. It doesn't. It's just that most every unit that records and stores digital audio has built-in converters. Once recorded (and thereby converted), the digital audio must now playback again in the form of analog audio. This process is where the D/A is used. An example of a digital device that uses a D/A is the CD player.

Let's make a list of some of the most important things to consider when choosing a converter:

- **How many channels do you need (or will you need in the future)?** Remember that most converters are now multichannel, so you'll probably go with eight channels.

- **Do you need A/D (analog-to-digital) conversion, D/A (digital-to-**

**analog) conversion, or both?** Many converters offer A/D only with an option to add D/A. Some converters (such as the new Genex) are two completely independent units — the GXA8 for A/D and the GXD8 for D/A. The new Prism ADA-8 will do both A/D and D/A in one unit, while the Apogee AD8000 can be configured all the way up to a Special Edition 8 I/O, A/D-D/A, AD8000DA-SE.

- **Do you need "base" sample rates (44.1 and 48) or high sample rates (88.2 and 96, or even 192)?** Many converters today will do 96 kHz, so be sure to consider that in your product comparisons.

- **Does your converter need to support audio recording formats other than PCM?** The bottom line here is, for now, do you need DSD or not? If not, then you'll save some money right off the top. In the future, MLP encoding might be an option, but that's not going happen anytime soon.

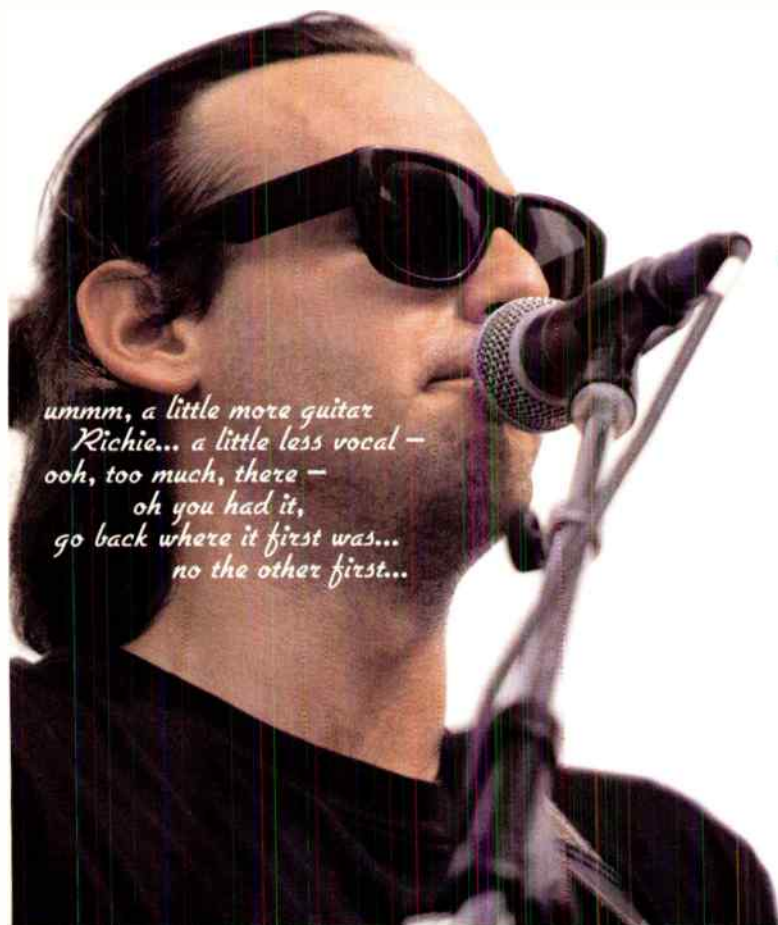
- **What digital I/O format does the converter need to support?** ADAT optical, TASCAM TDIF, Pro

Tools I/O, AES, S/PDIF, etc. Be sure that your choice of converter supports (or has an option to support) the requisite digital I/O that your system requires.

### WHERE TO GO FROM HERE...

The next step is to get out there with the aforementioned punch list and begin auditioning converters. Start by checking each item on the list that applies to you (the features that are important to you). When a converter has all of the features that you need, then you're ready to go hear it. At the very least, ask a friend, or, better yet, get on the Studio Tech Web forum and gather useful information from seasoned pros. The Studio Tech forum is chock full of people from all over the world that have used many different converters. You've heard it said a million times — the only dumb question is the one you don't ask! Always do your homework before making a purchase.

Good luck and happy converter hunting. See you on the forum! ■



*ummm, a little more guitar  
Richie... a little less vocal —  
ooh, too much, there —  
oh you had it,  
go back where it first was...  
no the other first...*

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Internet radio is alive  
and almost doing well...

## Running Around at the Top of Our Lungs

The hubbub about MP3 as a "platform" is a distant memory. Gone are Michael Robertson's ubiquitous rants, replaced by layoffs, bankruptcies, and a questionable future for Internet audio's poster child, Napster. In the U.S., Riffage.com is gone, Listen.com is dumping staff, Sonicnet is buried, MP3.com is keeping its head down, and EMusic.com is being picked up by Universal Music Group. Liquid Audio, for all intents and purposes, is an arm of the RIAA, and RealNetworks' ongoing fight with Microsoft over ownership of the streaming audio standard has become a bore even to the press. As usual, the casual user's preferences remain ignored.

Across the ocean, Besonic.com (Germany) and Vitaminic.com (Italy) are proving the old adage "slow cooking makes a creamy pudding." Both sites continue to gain ground, quietly collecting users and branching out beyond borders. Riffage.com's home page continues to refer people to Besonic. Vitaminic rescued IUMA from EMusic, resuscitating the gasping Godfather of Music Upload Web Sites. The signs are all there for a Next Phase. Internet audio is dead. Long live music on the Web.

### SOMAFM

Disgusted with what passes for music programming on terrestrial corporate broadcasting, [www.somafm.com](http://www.somafm.com) is charting the inspired course hashed out by FM rock radio in the late '60s and early '70s (when DJs loved music). We spoke to Rusty Hodge who, with his partner Zach Hoon (*a.k.a.* DJ Sordid), are the primary perpetrators of an intelligent, independent, and very musical streaming site.

Started in early 2000, Somafm was first streamed from a Windows/NT computer running Winamp with a Shoutcast plug-in, and served off a Linux box. Using bandwidth at Rusty's workplace and running a single 56 kbps stream, the site (through word of mouth) grew in popularity. "We filled up two T1 lines with 40 or 50 simultaneous streams," he says. Not willing to clog his employer's connections, Rusty bartered for bandwidth

within his circle, upgraded encoding/streaming to a "homebrew rack mount 600 MHz PIII Linux box," and moved the serving portion to a server co-location facility. With real-world common sense typically lacking in larger companies, he and his partner added streams and began offering them at multiple bitrates to facilitate both modem and broadband users. In January of 2001, Shoutcast set up a repeater service for the little streaming station, allowing 500 additional simultaneous listeners. Word was getting around about a cool streaming site with no advertising, high-quality audio, and good music.

Rusty (now 38) is no stranger to DIY startups. In college, he "took the lead" in re-animating the campus radio station, dead for 20 years. "My Dad was a computer mainframe guy," he admits. Though assisted by other students in obtaining funding and permits, he resurrected the technical side alone, handling the soldering and rewiring as well as organizing the programming when the station came on the air.

After college, Rusty worked as a software developer, creating electronic mail and bulletin board applications for Apple II computers hooked up to 1200-baud modems. He worked at KPIX-TV, and, in the early Internet era, ZDNET/ZDTV. He found the tech side interesting, but quickly grew tired of the "uncompelling content." Radio provided no relief either.

"I couldn't find anything I wanted to listen to," he remembers. After operating pirate radio stations at the annual Burning Man festival in northern Nevada, he turned to creating his own programming on the Web. Growing steadily, Somafm currently has ten channels. It's free, for now, but "the trick is to make it pay its own bills."

One idea is offering streams for free with "some" advertising, or providing the same streams without advertising as a subscription service. The ads could be "inoffensive and completely in tune with the programming," he offers. Another idea is a link to Amazon.com. If users clicked to the retail site from Somafm and actually made a purchase, a percentage of the price would feed back to Somafm. It

JON LUNN & ALLEN WHITMAN





## OTHER INDEPENDENT SITES TO CHECK OUT

- > [www.bluemars.org](http://www.bluemars.org) — Check out "Cryosleep — Zero Beats Guaranteed."
- > [www.monkeyradio.net](http://www.monkeyradio.net) — "Abstrakt Beats."
- > [www.woffm.com](http://www.woffm.com) — "Wolf FM."
- > [www.betalounge.com](http://www.betalounge.com) — "Dance fundamentals."
- > <http://hotwired.lucos.com/webmonkey/00/45/index3a.html> — A full FezGuys tutorial on how to set up a streaming site for yourself.

arguably wouldn't be much, but every little bit helps. A good citizen, Somafm complies with BMI and ASCAP music use strictures. Quarterly reports are filed and fees get paid.

For now, Rusty remains pleasantly surprised and heartened by the popularity of the site. Sure, it's not the lovely and notorious KPIG with over 50,000 worldwide users on the Web, and it certainly isn't standard terrestrial radio programming with a mind-boggling 95% of the U.S. listening at some time or other. But for an indie site offering coherent musical programming, and with a marketing department named "word of mouth," it's a sign.

### TOP REASONS NOT TO INVEST MONEY IN YOUR SITE

Your FezGuys are naturally optimistic — we often get caught up in thoughts of what an efficient tool the Internet is for musicians. But a recent conversation with a well-known (not-to-be-named) musician friend reminded us that sometimes a little reality check is in order. This particular artist has lived through ups and downs of the Internet's effect on his career. With that in mind, we offer some real reasons on why you don't want to go overboard online.

**1. Don't Go Hoarse Shouting Into Empty Space.** It's a waste of your time to put up a Web site if there's no one out there to appreciate it. If you aren't letting fans at your shows know you've got a Web site, e-mailing your friends about it (stick it in your e-mail signature), then you shouldn't bother with anything more than the absolute basics: a bio, song sample, and contact info.

**2. Return on Investment.** Your Web site has a monthly cost (whether it's \$19.95/month or \$500/month). Each time you pay that bill you should be thinking,

"Am I happy with what I'm getting for this?" If your Web site fees prevent you from pressing more CDs or going on the road, you should reconsider your priorities.

**3. Opportunity Costs.** Do yourself a favor and don't spend hours putting updates on your news section when you should be working on new material. We've said it before and we'll say it again — get yourself a geek. No thanks to the dotcom explosion, a lot are unemployed and may be looking to bolster their resumes.

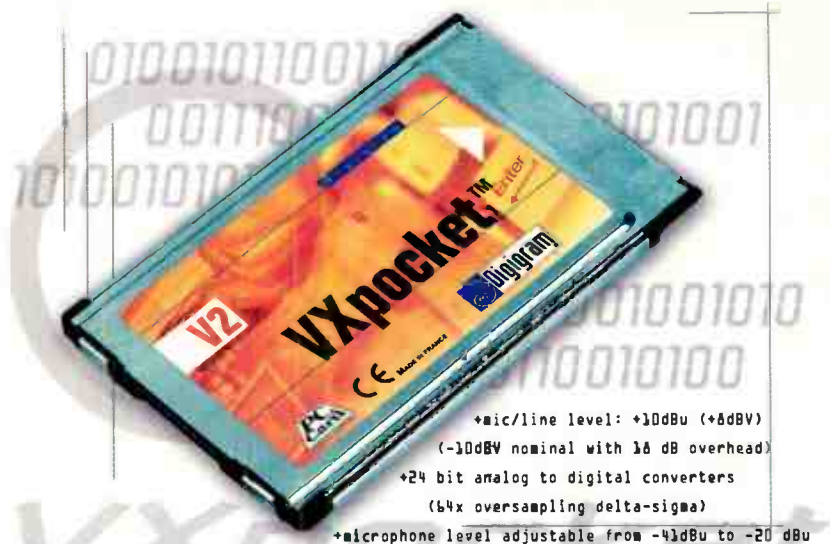
**4. Have a plan?** Like anything, jumping in before you've thought it out can often result in dissatisfaction later. Figure out realistic goals to achieve with your site before getting in too deep. Examples are: trade links with 10 other bands, expand your mailing list by 100 people, sell 50 CDs, or provide a comfortable place for your fans to hang out together.

**5. Go outside and smell some flowers, dammit!**

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**STEADY PULL**

► continued from page 62

of music. I can't speak for every large monitor, but the ones I have heard aren't accurate for the kick drum. I get a lot more bass out of the little Apple speakers than you'd believe. They're self-powered, so they connect directly to one of the SSL's monitor busses."

As far as studio toys, Clearmountain deems the SSL "an obvious favorite, as is the Pultec EQP1A3. I don't have [UREI] 1176's but I do have 1178's, which are virtually the same except for the fact that they're stereo units. I also like the LA3A very much, which is a completely different sound from the 1176. To me, the LA3A is a lot more transparent on a vocal, so you're not as aware of the compression. With the 1176 or 1178 you hear the compression. It's more of an effect, and I like that for drums. Another unit I like (which no one really knows about) is the Yamaha D5000 — the best digital delay ever made. It's just a dedicated delay. It's doesn't do a trillion different things, but what it does, it does very well."

Brooke describes Bob's studio as "an important part of the process in making *Steady Pull*. We were all a bit nervous the first day because he'd never tracked there before. We cut 'Linger,' played it back, and it sounded amazing! I asked Bob what he did, and he's like, 'Oh nothing special....' I think Bob was excited to be part of the production, being that it had been such a long time since he's produced. The best part of it was that he was willing to experiment and try anything. Like on 'How Deep Is Your Love' — we needed a percussion part, but we were tired of the same old egg-shaker sound. Bob and I looked around his house for something we could use as a variation. We found this cat hair removal roller. Bob miked it very close and I rolled it against my hand. That's the percussion sound for that song. We had some amazing days, like when Mitchell Froom came in to play B3 on 'Walking' or when Neil Finn came in to do background vocals on 'New Dress.' And I almost died when I heard [bassist] Marcus Miller play the chorus of 'Room In My Heart.' I even got Bob to play bass on 'Linger!' It really was Christmas everyday. How lucky could a girl get?" ■

**UNIVERSAL AUDIO**

► continued from page 101

has more output than I'll ever use, yet the background noise level is barely noticeable — even at very high gain settings. I'm lucky enough to also own an 1176N, and, when coupled with the 2-610, it's a very big round sound that makes both me and my clients smile. I do wish the EQs were available simultaneously for all three frequency bands instead of just one at a time. Also, a digital I/O would be useful for those of us with DAWs. But hey, then it wouldn't be the same vintage box now would it? The UA folks told me that I'm among the very first to get his hands on a 2-610, and I'm here to tell you now that they're going to have a very hard time getting me to part with it.

Mikhail Graham is a selective media consultant who long ago decided that being independent was much more fun than being owned by just one company. He has a weekly radio show called "The Other Side" on KVMR ([www.kvmr.org](http://www.kvmr.org)) that is now going into its 23rd year, and he still manages to compose new music and produce regional records and shows on a regular basis.

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**MOTU 828**  
**FireWire Audio Interface**



- Total of 18 simultaneous ins and outs: 8 channels of 24-bit analog I/O with 40.5 dB of gain; 2 x LP channels; 16 channels of 24-bit digital I/O with 6 balanced 1/4" TRS ins and 8 balanced 1/4" outs; 8 channels of ADAT optical (with 1/4" TRS SPDIF optical); 2 RCA SPDIF digital I/O
- 48-bit digital signal processing
- Connects to any FireWire-equipped Macintosh PC or Apple Macintosh computer via standard 1394 FireWire
- Includes an Analog-to-Digital converter for Macintosh 1394 FireWire
- Available for both computer platforms • Also includes AudioDesk audio workstation software package for the Mac

**MOTU Digital Performer 3**  
**Digital Audio - MIDI Sequencer For Mac**



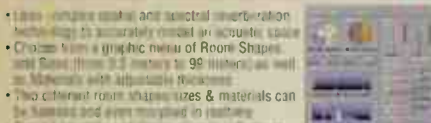
- Looks like virtual recording studio with fully assignable tracks, effects and EQ • Unlimited digital tracks • Sample-accurate waveform editing
- 100+ realtime effects • 64 of Masterworks software and hardware compression • PC/LAR software • Professional audio file recording
- Mac OS 9 •
- Designed user interface based on Apple's OS X
- Runs on Mac OS 9.x and OS X • Pro Tools support expert via Pro Transfer and OMF • All tracks, regions, crossfades and time-stretching • Over architecture support • Supports all currently available digital audio formats • Supports 10.2, 11.2, 12.2, 13.2, 14.2, 15.2, 16.2, 17.2, 18.2, 19.2, 20.2, 21.2, 22.2, 23.2, 24.2, 25.2, 26.2, 27.2, 28.2, 29.2, 30.2, 31.2, 32.2, 33.2, 34.2, 35.2, 36.2, 37.2, 38.2, 39.2, 40.2, 41.2, 42.2, 43.2, 44.2, 45.2, 46.2, 47.2, 48.2, 49.2, 50.2, 51.2, 52.2, 53.2, 54.2, 55.2, 56.2, 57.2, 58.2, 59.2, 60.2, 61.2, 62.2, 63.2, 64.2, 65.2, 66.2, 67.2, 68.2, 69.2, 70.2, 71.2, 72.2, 73.2, 74.2, 75.2, 76.2, 77.2, 78.2, 79.2, 80.2, 81.2, 82.2, 83.2, 84.2, 85.2, 86.2, 87.2, 88.2, 89.2, 90.2, 91.2, 92.2, 93.2, 94.2, 95.2, 96.2, 97.2, 98.2, 99.2, 100.2
- Also includes RealTime AudioSuite (RTAS) and AutoTune 3

**emagic Logic Audio Platinum 4.7**  
**Music Production Software For Mac & PC**



- Over 100 MIDI tracks • Up to 64 audio tracks • 128 effects and processors • Support for up to 24 external audio interfaces • Supports all native audio formats • 32 effects buses • Up to 8 effects chains per track or bus • Plug-in support for RTAS and VST1 • MIDI and Audio •
- Change and edit MIDI and audio tracks with a comprehensive set of tools • Data controller data transfer with the management software from Emagic
- Includes an audio interface for Macintosh and Windows • Real-time Stereo Sample Editor • Supports all currently available digital audio formats • Hardware support for ASIO, 10.2, 11.2, 12.2, 13.2, 14.2, 15.2, 16.2, 17.2, 18.2, 19.2, 20.2, 21.2, 22.2, 23.2, 24.2, 25.2, 26.2, 27.2, 28.2, 29.2, 30.2, 31.2, 32.2, 33.2, 34.2, 35.2, 36.2, 37.2, 38.2, 39.2, 40.2, 41.2, 42.2, 43.2, 44.2, 45.2, 46.2, 47.2, 48.2, 49.2, 50.2, 51.2, 52.2, 53.2, 54.2, 55.2, 56.2, 57.2, 58.2, 59.2, 60.2, 61.2, 62.2, 63.2, 64.2, 65.2, 66.2, 67.2, 68.2, 69.2, 70.2, 71.2, 72.2, 73.2, 74.2, 75.2, 76.2, 77.2, 78.2, 79.2, 80.2, 81.2, 82.2, 83.2, 84.2, 85.2, 86.2, 87.2, 88.2, 89.2, 90.2, 91.2, 92.2, 93.2, 94.2, 95.2, 96.2, 97.2, 98.2, 99.2, 100.2

**RealVerb**  
**Reverb Plug-In For TDM & MAS**



- Real-time reverb and digital reverbation technology to accurately model an acoustic space
- Choose from a graphic menu of Room Shapes and Room Types • 99 different reverb shapes and 99 different reverb types
- Two different room shapes and materials can be loaded and even mixed in real-time
- Control reverb and timing of early reflections • Low level reverbation
- Real-time reverbation for Realtime EQ, mixing and 100+ patterns
- Direct Stereo Delay Mixing uses two digital reverb paths to allow direct and control of the signal between stereo speakers creating an irreducible 3D ambience

**M-AUDIO USB Audiosport Quattro**  
**4 in./4-out Audio Interface w/ USB and MIDI**



- 24-bit/192kHz compatible • Multitrack recording and mixing without PCI card installation • Continuous direct monitoring
- Standard 1/4" TRS connectors
- Selectable input and output levels provide compatibility with both pro and consumer equipment • 1x1 USB MIDI interface
- Works with MIDI drivers for Mac & PC - more drivers are on the way
- Also has more professional connectivity with the optional Omni I/O which provides 2 mic inputs with phantom power and 2 balanced XLR and 2 balanced 1/4" TRS inputs • 2 head phones outputs • 1x1 stereo and stereo balanced input and output, and more

**Steinberg Cubase VST 5.0**  
**Complete Pro Music Recording System**



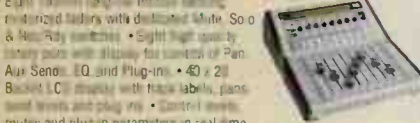
- Collaborates with real-time MIDI recording with audio recording in either 16 or 32-bit formats
- Up to 72 audio tracks • Includes lots of VST Plug-Ins • Also includes a complete range of 31-on real-time audio effects and sample-accurate multiplugs • True Time-stretching accurate word-level editing • Supports ADX (audio data exchange) for the absolute latest audio cards • Includes the Universal Sound Module (USM) instrument with over 70 MHz of sound data
- Also includes Cubase 5.0 LE
- Up to 128 Channels of Audio • 32-, 24-, 20- and 16-bit recording
- 16 Channels • Apple's Universal Audio

**cake walk Sonar**  
**Digital Multitrack Recording System**



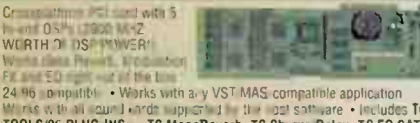
- Unlimited digital audio and MIDI tracks
- 4000+ audio effects • 32-bit • 64-bit effects
- Multi-processor and dual monitor support
- Audio loop construction and editing tools with automatic beat matching and full support for importing AC3 loops • DXI (Direct Instruments) software synthesizer plug-ins
- Full-featured Direct X 8 audio effects Plug-ins from Power Technology • Includes DX-compatible software from Realtime Apple Link, 3rd Party Live Update, and Audio Services • Designed for Windows 98/ME/98 SE systems
- Compatible with Microsoft's WDM low latency audio driver technology

**Automation MotorMix**  
**Desktop Motorized Fader Worksurface**



- Eight 120mm long motorized faders
- Real-time faders with digital motor • Solo • Mute • Pan controls • Eight high quality rotary pots with digital feedback • Pan • Aux Send • EQ and Plug-ins • 40 x 20" Backlit LCD display with track labels, pan send and plug-in controls • Control levels, mixes and plug-in parameters in real-time
- Automatic fader automation and motor speed control • Bank select buttons and the LCD display will allow you to control a number of channels and many plug-ins in each channel • Create a custom console tailored to the way you work • 20 faders expand up to 4 Motor Mixes for 32 channel mixes • Plus Stop, Fast Forward, Rewind transport keys

**TC | WORKS PowerCore**  
**The DSP Turbo For Your Native Audio Workstation**



- Cross-platform PCI card with 5 1/2" and DSP 12800 MHz
- WORTH OF DSP POWER
- Wave Data Preview, Production FX and EQ right out of the box
- 24/96 compatible • Works with any VST/MAS compatible application
- Works with all sound cards supported by the host software • Includes TC TOOLS/96 PLUG INS - TC MegaReverb, TC Chorus/Delay, TC EQ SAT
- Also includes SPARK LE Mastering Software • One complete set of TC TOOLS Plus the 3rd Party Realtime, ChromaVox and EQ only requires one DSP chip • Includes TC MAS EN 4-3-3 multi-band mastering processor
- Open processing platform allows future Plug-in compatibility by 3rd party developers

**Serato Pitch 'N Time**  
**Intelligent Sound Algorithm (AudioSuite)**



- Performs a sophisticated auditory scene analysis based on the human auditory system and uses a patented mathematical algorithm to speed up or slow down music without artifacts
- Used on solo instruments, voice and complete mixes
- Completely cross-platform compatible with both Macintosh and Intel architectures
- Preserves sample accurate timing
- Works with all bit depths and sampling rates
- Multi-channel phase accurate processing works with 5.1 and 7.1 surround items without loss of the 5.1 and 7.1 surround items

**digidesign DIGI001**  
**Digital Audio Workstation For Mac & PC**



- Complete digital audio recording, editing, sequencing, mixing and editing environment for the Macintosh and Windows
- Simple, accurate, simultaneous editing of audio & MIDI
- 18 simultaneous tracks and outputs with support for 48 and 96 kHz sample rates
- 2 x 1/4" 1/8" line inputs with up to 18 post-48 channels stereo gain, phase, and HPF for 48 kHz
- 6 1/4" TRS balanced unbalanced line ins • variable control gain
- 4x2 balanced 1/4" line ins • 1/4" balanced and 1/4" mono ins with line phase gain knob
- 1 touch-activated emergency channel mute
- Headphone output with independent gain control knob
- 2 channel SPDIF (S/PDIF) and 2 channel ADAT optical I/O (expandable to 4 channel S/PDIF)
- Includes Pro Tools LE software, based on Digidesign's world renowned Pro Tools software, supports 24 tracks of 16 or 24-bit audio and 128 MIDI tracks
- Supports both RealTime AudioSuite (RTAS) and AutoTune 3
- Includes RTAS plug-in modules, 1 and 4 band EQ, Dynamics 3 compression, limiter, gate and expander, Mid Side - Stereo, Stereo - Mid Side and Ring Mod with reverbation capabilities for stereo or Mono effects and other AutoTune plug-ins include Time Compression, Expansion, Pitch Shift, Harmonic Reverb
- All mixing parameters including effects processing can be fully automated

**EMTECH X-Project Firewire**  
**30GB Firewire Hard Drive**



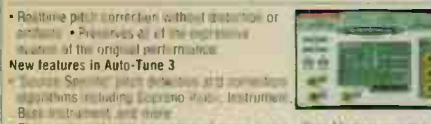
- 30GB non-30GB drive optimized for digital AV
- IEEE 1394 (FireWire) interface • drive automatically mounts drives on your desktop
- Removes and adds 166 minutes of 24 tracks audio at 24-bit, 192kHz
- Random access track reconfigurable configuration
- Hot-pluggable 3-pin serial reconfiguration allows re-cabling peripheral devices without re-formatting
- Includes Rack ears, hot-swapping cables, power cord

**WAVES Version 3.0**  
**Native & TDM Plug-In Bundles**



Waves Bundle features the finest software processing algorithms for reverb, mixing, timing, mastering and loudness. Choose from the professional mixers and spatial processing capabilities of the Native Power Pack TDM Bundle for Pro Tools, the unique processing characteristics of the Renaissance Collector, or the extreme analog tracking capabilities of the Pro-FX Plus Bundle. Also available in the C4 Multiband Parametric Processor software bundle 4 separate banks of processors for EQ, the Waves Gold Bundle features all of Waves processors in one affordable package.

**ANTARES Auto-Tune 3**  
**Pitch Correction Plug-In**



- Real-time pitch correction without distortion or artifacts
- Preserves all of the original performance
- Includes all of the original performance
- New features in Auto-Tune 3
- Supports 32-bit processing and 24-bit processing algorithms including Expando, Flex, Instrument, Beat, Pitch Bend, and more
- Pitch correction with correction of stereo tracks • Auto-Match compatible
- Supports the latest Pro Tools 5.0.1 • 100% bit-accurate in real-time via MIDI (now a requirement for Pro Tools 5.0.1) • Auto-Match from MIDI (now a requirement for Pro Tools 5.0.1) • Auto-Match from MIDI (now a requirement for Pro Tools 5.0.1)
- Supports rates of 48 kHz and 96 kHz and 24-bit and 32-bit processing
- Available for TDM, RTAS, MAS VST and Direct compatible digital audio applications



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## COMPUTER-BASED AUDIO

### TASCAM 788 12-Track Hard Disk Recording System

- 6-track simultaneous record • 250 virtual tracks • 24-bit A/D converters
- 14-channel mixer • 2-band EQ
- Dual effects processor • 10-track memory editing • 4-POL digital filter • 141-TRC TRS microphone ins. • RCA main and monitor outs
- 2 1/4 inch heads and 15 min
- 4 1/2 inch floppy disk output • MIDI input • Optional CD burning kit
- **Non-destructive editing** with 999 levels of undo
- Song, solo, and stereo mix real time • Dedicated locate and editing buttons • Wave form display • Title edit functions
- 40 pin SCSI connector • Built-in MIDI



### KORG D-12 12-Track Hard Disk Recording System

- 12-tracks of uncompressed 16-bit digital tracks • 24-bit A/D converters
- 16-track mixer with 3 bands of EQ per channel
- Comprehensive editing and DSP functions
- 25-TRC memory editing • 20-bit A/D converters • 40-bit digital filter • 141-TRC TRS microphone ins. • 4-bit optical S/PDIF I/O • 108-PINS SCSI connector
- 11 simultaneous real-time effects — 4 insert, 2 master and 1 master bus effects • Phasor, solo, stereo and real-time automation capabilities
- Internal 20-MHz hard disk drive up to 1GB capacity of 16-bit recording
- Optional internal CD-RW drive • 50-pin SCSI connector
- 8 1/2 inch floppy disk output and MIDI



### KORG D 1600 16-Track Hard Disk Recording System

- 16-track simultaneous recording • 24-bit A/D converters
- 16-track mixer with 3 bands of EQ per channel
- Comprehensive editing and DSP functions
- 25-TRC memory editing • 20-bit A/D converters • 40-bit digital filter • 141-TRC TRS microphone ins. • 4-bit optical S/PDIF I/O • 108-PINS SCSI connector
- 11 simultaneous real-time effects — 4 insert, 2 master and 1 master bus effects • Phasor, solo, stereo and real-time automation capabilities
- Internal 20-MHz hard disk drive up to 1GB capacity of 16-bit recording
- Optional internal CD-RW drive • 50-pin SCSI connector
- 8 1/2 inch floppy disk output and MIDI



### AKAI DPS 16 16-Track Hard Disk Music Production System

- True 24-bit stereo recording capabilities
- Record up to 10 tracks simultaneously
- 24-bit A/D converters • 24-bit digital filter
- 16-track simultaneous recording
- 8 mixing busses including 2 XLR mic inputs with phantom power • 108-PINS IDE internal hard drive • 16-track stereo main bus • 2-band EQ • 4-band stereo and master eq channels • Optional EFM & 5-bit EFM hard disk available for any of the 2 mix busses at no extra charge • Large 11-inch graphic display and easy-to-use interface makes editing and navigation a breeze • Built-in song memory as well as dynamic allocation built into the MIDI



### YAMAHA AW4416HDC 16-Track Digital Audio Workstation

- Record, edit, mix and master to CD-R in one machine • 16 tracks of 24-bit recording with 3 bands of EQ
- 24-bit internal digital processing
- 24 input mixer with 35 real-time 16-bit processors and full mix automation • 4-20-bit digital processing
- 2 built-in effects processors • Optional I/O interface cards provide serial I/O with a host of digital and analog I/O • 8 sampling rates provide real-time playback of samples • Internal 10GB IDE hard drive • Built-in CD-RW drive for creating audio CD-R and audio • MIDI I/O



### EE-MU XL7 Command Station Tabletop Groove Station

- Combines the fourth engine of E-MU's ProTools 2000 and XL-1 sound modeling with a new multi-track sequencer • Designed for Electronic Music, Dance, House, Trance • 16 tracks • 16 input channels • 16 output channels • 16 input channels • 16 output channels • 16 input channels • 16 output channels



### SONY CD-RW66 Standalone CD Recorder

- Supports Standard CD-R, CD-RW & audio mini-discs • Built-in 32kHz - 96kHz sample rate converter • 0-band DSP functions
- Pre-amplifier EQ, Limiter & Super Bit Mapping which provides near 20-20kHz dynamics • 24-bit A/D converters • CD-TEXT support up to 25 characters per name • AES/EBU input, optical & coaxial digital I/O and RCA analog I/O • Word Clock input
- 2x 40min • 2x 60min with 7 CD-RW66s
- Full-featured fluorescent display • Includes wireless remote



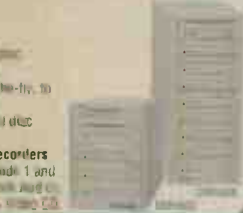
### marantz CDR-500 Standalone CD Recorder / Duplicator

- CD-Clon duplicator from the internal CD player • Pro and consumer CD-R and CD-RW compatible • CD-TEXT editing • Memory buffer
- Menu navigation • CD-R copy protection • Digital and analog record level control • XLR balanced and RCA unbalanced analog ins.
- Coaxial and Optical digital ins. • Unbalanced (RCA) analog and Coaxial digital outs including Coaxial loop-out for unprocessed connection to other digital equipment • R remote control included



### MICROBOARDS DSR-1600 Series CD Duplicators

- Fast record speed
- Compact design
- One touch operation
- One touch record, duplicate and copy
- One touch operation
- One touch record, duplicate and copy
- One touch operation
- One touch record, duplicate and copy



## Panasonic

Streamlined Version 2.5 operating system with more than 70 new or improved features including new shortcut control features, advanced MIDI ladders, new panels for LCD and LED areas, and enhanced software features, such as improved visuals and navigational controls.

- FEATURES:**
- 12 fully featured tracks and 6 auxiliary send returns
  - 16 tracks (16 channels) can be digitally recorded using a built-in 16-bit ADC for a total of 24 digital and analog I/O's
  - 32-bit internal processing and 24-bit A/D converters yield a dynamic range of 110 db
  - 25-MHz Motorola PowerPC 601 Digital Cursor with an 18-key keyboard
  - Mixing fader, digital and linear automation with independent level
  - Multi-Track fader layout for controlling several channels, Aux sends and returns and inputs at once, as if you were that old user-ask-another MIDI ladder
  - Built-in 16-bit processing for 24 outputs
- Connectivity**
- 16 balanced XLR and 14 TRS microphone inputs with 16 pin A/C analog inputs
  - AES/SPDF I/O, 24-bit digital I/O, Word Clock input, MIDI In, Out, MIDI Thru, MIDI Control (MIDI) RS-422/485 standard
  - Expansion with up to 24 S/PDIF I/O cards
  - Optional SMPTE video sync card
  - Optional Talk Box card allows dual-console operation providing total of 16 I/O cards
- EQ & Dynamics**
- Four track parameter bands of EQ on every channel and 2 bands of parametric EQ on the Aux returns
  - 12 full function Compressor/Limiter or Expanders
  - Select up to 300 ms to every channel
- Automation and Control**
- 50 independent I/O parameter and channel memories plus 50 snapshots of the entire console can be stored in real-time
  - Real-time color light barrier key take control of D-Matrix Control commands to MIDI sequencers and DAWs
  - Dedicated transport button and built-in Talk Backing
  - Large 11-inch LCD screen displays all channel parameters
- Optional High Resolution Mixer Bridge and Automation software for Mac and PC**
- Built-in Surround Mixing**
- Expanded to 5.1 surround through its Stereo/5.1 Surround Amps with full dynamic control of spacing

### WR-DA7 MKII Digital Mixer



- OPTIONS:**
- WR-ADAT 3-channel ADAT digital I/O card
  - WR-TDIF 8-channel TDIF digital I/O card
  - WR-AESS 8-channel AES/EBU and SPDIF digital I/O card
  - WR-ADDA 8-channel A-to-D, D-to-A card
  - WR-TNDM 7-channel dual-console connection card
  - WR-SMPT SMPTE and Video card
  - WR-MTRB Mixer Bridge (optional)
  - WR-WRRC Remote Control software

### TASCAM MX-2424 24-Track Hard Disk Recorder

- Records 24 tracks of 24-bit audio at 44.1 or 48 kHz in 12 tracks at 18 or 24 min • Up to 24 tracks with 16-bit digital processing using the combination of a 24-bit and analog I/O • 16 virtual tracks per project
  - Includes optional 96kHz sampling rate • 16-bit A/D converters • SCSI port via the back panel • Front 5 1/4 inch floppy disk ports in edit, record, or an Approved DMC-RAM drive for editing • Record to SCSI or PC (VxD) formatted drives • 24-bit A/D converters • 40-bit digital filter • 141-TRC TRS microphone ins. • 4-bit optical S/PDIF I/O • 108-PINS SCSI connector
  - 11 simultaneous real-time effects — 4 insert, 2 master and 1 master bus effects • Phasor, solo, stereo and real-time automation capabilities
  - Internal 20-MHz hard disk drive up to 1GB capacity of 16-bit recording
  - Optional internal CD-RW drive • 50-pin SCSI connector
  - 8 1/2 inch floppy disk output and MIDI
- I/O Options:**
- Optional analog and digital cards provide 24 channels of I/O each. There is one analog and one digital.
  - F-TD24 - T/DIF module
  - IF-AD24 - ADAT Lightpipe module
  - IF-AE24 - AES/EBU module
  - F-A124 - A-D-D-A I/O module with 08-25 connector





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COMPUTER-BASED AUDIO

**PreSonus DIGIMAX**

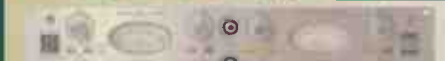
**8-Channel Mic Preamp with Digital Outs**



- 8 Dual Servo Mic Preamps with UltraWide dynamic range and very low noise operating levels
- Dual Dema limiter on every channel
- EQ, mtr, Pad and Phasr in every channel
- mtr inputs on channels 1 & 2 • Phase reverse on channels 1 & 2
- 24-bit 24 kHz ADC converters • 24-bit Light Preamplifier S/PDIF digital outputs • AES/EBU digital outputs are available as an option
- External clock sync input and Master clock output
- 16-bit dual-coded aluminum panel with sleek smoothed knobs

**AD2022**

**Dual Mono Pure Class A Preamplifier**



- 4th generation fully discrete, symmetrical Pure Class A mic preamp
- Mic and line 2-in/2-out inputs • Selectable mic source loading for optimized cable run, matching • Line switched in ADP mode with a 20dB line output gain
- Frequency +42dB phantom power supply • Phase reverse and variable HF • 60dB gain • Light illuminated analog VU meters and true peak LED • High bandwidth XLR input before overheat
- Fully balanced Class A regulated audio power supplies • Redundant wiring and double shielded signal sources for superior low level signal transfer

**Focusrite ISA 110**

**Channel Strip**



- Release of a single channel 1-strip from the legendary Focusrite Studio Series recording package
- Ultra high and precision 1-pole Class A mic preamplifier and EQ circuitry design inspired by Rupert Neve, provides a warm, yet transparent sound
- Line input includes 87-impedance section with 4-18dB gain control
- High and Low shelving and two separate bands of parametric EQ
- High and Low pass filters, frequency extended high or low frequency control

**exicon MPX-200**

**24-Bit True Stereo Dual Effects Processor**



- Powered by exicon's proprietary 24-bit 24-bit A/D converters
- 54 analog I/O • S/PDIF digital input and outputs • A newly designed digital compressor is best in its class with 117 dB of dynamic range
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more

**ANTARES ATR-1a**

**Auto-Tune Intonation Processor**



- Automatically corrects pitch in real-time while preserving the integrity of the original performance
- Includes factory programmed chromatic and standard diatonic scales and has the ability to create custom scales
- Bypass Mode detects pitch down to 25Hz
- Scale Scale From MIDI function allows you to construct a custom scale using a MIDI keyboard or sequencer
- 70-bit data path, 56-bit internal processing and balanced I/O

**TCHHELICON Voice Prism**

**Vocal Formant Pitch Processor**



- Built in the world with 48V analog power • 24-bit digital converters
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more
- 24-bit processing and 64 user locations with 24-bit resolution • 24-bit processing including reverb, delay, chorus, phaser, flanger, tremolo, and more

**audio technica AT3035**

**Cardioid Condenser Microphone**

- Large diaphragm provides excellent detail
- 150dB dynamic range
- 20Hz - 20kHz frequency response
- 15dB pad
- Includes 11-52 phantom power
- Includes shock mount and protective pop filter



**RØDE NT1000**

**Cardioid Condenser Microphone**

- Extremely balanced 1-preamp balanced circuitry
- Ultra low noise transformerless circuitry
- 120dB dynamic range
- 150dB SPL, Max SPL
- Frequency 20 - 20kHz
- Includes 11-52 phantom power
- Includes shock mount and protective pop filter
- 20Hz - 20kHz frequency response ±6dB
- Includes 2-pinned power M2 Stand Mount
- 11 - 52 Phantom Adapter
- Custom OAD shockmount



**SHURE KSM-44SL**

**Multi-Pattern Condenser Mic**

- Premium Vocal And Instrument Microphone Built Without Compromise
- Dual 1-inch capsule with 48V phantom power
- Class A discrete transformerless preamplifier
- Custom 11-52 and 11-52 power supply
- Includes shock mount and protective pop filter
- Includes 2-pinned power M2 Stand Mount
- 20 Hz - 20 kHz frequency response



**Hafner TRM-6 & TRM-10**

**Complete 5.1 Surround Monitoring Solution**

**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 Hafner's legendary amplifier technology, providing a more accurate sound field in width, height and also depth.

- 1" Tweeter, 6" Woofer
- Amplified 30 W LF, 33 W HF w/ Crestline
- 50 Hz - 20kHz frequency response
- Electrically and Acoustically Matched
- Magnetically shielded



**TRM-10s Active Subwoofer**

Combining Hafner's legendary amplifier technology with a proprietary woofer design, the TRM-10s active subwoofer provides significant bass definition required in today's studio and recording environments.

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- 1000 Watt RMS Power



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- 50 Hz - 20 kHz frequency response



- LSR25P Near-Field Monitors
- Bi-amplified design—100 watts for the low frequency and 50 watts for high frequency
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- XLR balanced and RCA unbalanced inputs
- Front Panel Volume and Power Controls
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- 70 Hz - 20 kHz frequency response



- LSR12P Powered Subwoofer
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- "Round" sound field
- 1/4" and balanced XLR inputs





## IZ TECHNOLOGY

► continued from page 72

come with floppy drives any more, and I had to search the Net for a demo of ShrinkWrap and download that as well. The actual process of loading the upgrade from floppy into RADAR 24 is very clear, taking only a few button pushes and no more than about ten minutes.

### UNDER THE HOOD

You'll probably never have to deal with RADAR 24's operating system.

RADAR 24's Adrenaline recording engine runs on the Be Operating System (a.k.a., BeOS — in this case, BeOS 5). For the RADAR 24, BeOS is the "man behind the curtain" and it performs this job exceptionally well. BeOS is an extremely efficient operating system that requires minimal RAM, and is designed specifically for the needs of high-horsepower applications such as those used in computer-based audio, video, and graphics. It's BeOS that allows you to ignore the fact that RADAR 24 is really a computer and not a "tape"

machine. In my ongoing experience with the RADAR 24, the machine has been completely stable — the system hasn't crashed even once. Having had my share of computer-based, hard disk recording aggravation, I find this astonishing. It's a welcome strength for engineers who are intimidated with the prospect of de-bugging a computer-based recording system.

### THE SOUND

All of RADAR 24's intelligent design and smooth operation would be a complete waste if the system didn't sound good. Fortunately, it sounds excellent, regardless of what mode you record in. The Nyquist converters have a smooth top end that won't make your ears fatigued through long sessions, and the bottom end is solid, tight, and extended. Used in 16-bit/48 kHz, RADAR 24 sounds as good as (if not better than) any recording system with a similar resolution. In 24-bit mode with a 48 kHz sample rate, RADAR 24 clearly raises the bar a notch. I was surprised at how dynamic a recording of a drum kit sounded — the kit seemed to have a lot more slam and visceral impact than in 16-bit recordings. I really liked the fact that you could hear cymbals slowly and smoothly decay without any volume "steps" or weird artifacts. For critical sessions requiring maximum fidelity, the 24-bit/96 kHz is a blessing, and, if you need more than 12 tracks in the enhanced mode, you can always get another RADAR 24 and link it to the first. Bit depth and sample rate must remain consistent for a project (i.e., a song), but you can have projects with different resolution residing in RADAR 24 simultaneously.

### THE VERDICT

With the RADAR 24, iZ Technology may have broken the last barrier for hard disk recording holdouts. They've made it stable and reliable — and they've made it work in a transparent fashion very similar to the tried-and-true analog multitracks we all know and love. Combine these qualities with excellent sound and intelligent design, and you've got a multitrack workhorse suitable to serve as the foundation for any professional recording studio. ■

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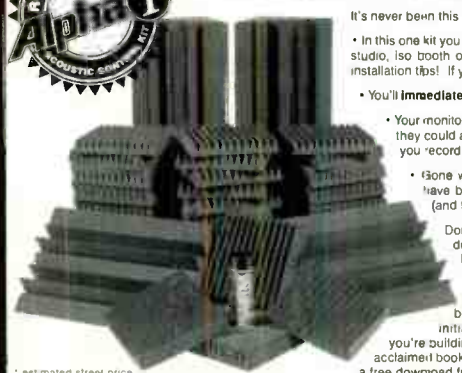
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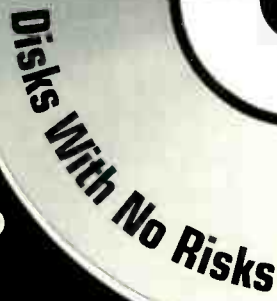
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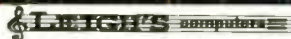


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way of knowing which disk was used to authorize which copy of the exact same software. For more than half the software, I brought the wrong key disk. There was also some software that I forgot was copy protected. I found out after the hard disk was replaced and the software started asking for the key disk to be inserted. It was a depressing, expensive trip to the music store to buy third copies of the software with the wrong key disks.

If you want to move the software from one computer to another, you can remove the authorization from one computer and authorize another computer. You can run the software temporarily on another computer by inserting the key disk when the software requests it.

### CHALLENGE/RESPONSE

When floppy disk drives started disappearing, challenge/response strings appeared. The first time you try to use a piece of software, the protection mechanism looks at your hard disk and generates a string of words based on the hard disk being authorized. You email this string to the software vendor who generates a response string and emails it to you. When the matching response is entered, your software turns on. If you reformat your hard disk, you just re-enter the same response and the software comes back on.

If you want to move the software to a new computer, you must email the vendor with the challenge string from the new computer along with a convincing explanation of why you have a new challenge string.

There are variations to this method that aren't based on hardware, but on a date and/or the name of the owner. The software will work on any hard disk, but must be supplied with a new response string every year.

### DONGLE

The dongle is a hardware device that can be read by the software. The dongle contains the serial number of the authorized software. If the dongle isn't plugged into the computer, the software won't operate. If you buy additional software, the serial numbers can be added to the dongle. If you change computers or

change hard disks, the software can be re-installed and the same dongle will activate the software.

Every piece of dongle-protected software used its own dongle. You could have multiple dongles hanging from the back of your computer. A new dongle called iLok is a universal dongle that can be authorized by many different software vendors. This will allow one dongle to authorize all of your software, no matter who the vendor is. Many companies are switching over to iLok authorization.

If you need to work on a different computer, just take the dongle with you and install the software on the computer you need to use.

### COPY, COPY, COPY

I'm not going to argue about whether or not you should be able to copy your own software, there are plenty of forums where the flaming rages on late into the night. I know we're always going to have copy protection on expensive software. I do think that there can be some changes that will better serve everyone involved.

One problem with Pro Tools and other DAW systems with copy-protected plug-ins is that, if you send a Pro Tools file to someone else, they have to own the same plug-ins that you own, or the session won't play back the same way. The graphics industry has solved this problem with expensive fonts by embedding them in the document so that the recipient can open the file and see it the same way you do, without having to purchase the same fonts you have. You can't use the fonts anywhere except in that document.

I'd like to see the same type of embedded plug-ins in Pro Tools session documents. If you send a session to someone else, the plug-ins would be included with the session file, but would only work in that session. You could add more of them in that session by option-dragging them around, but they wouldn't open in any other document. Besides making it easy to send a mix to someone else to touch up a little, it would be good advertising for the plug-in. If the guy on the receiving end liked the plug-in, he would have to buy it to use in other sessions. Also, if someone sends you a session document with some esoteric plug-in that you would never buy in 100 years, you won't have to buy it just to play back his session.

I prefer dongle copy protection, mainly because it lets me move between computers easily. If I buy a new computer two weeks after installing new software, I just move it to the new computer and plug in the dongle. Of all the last three major copy-protection schemes, the dongle seems the least objectionable.

### KEEPING PACE

The main player in the copy-protection field is Pace Anti-Piracy. They have software called Interlock that's used to produce key disks for software authorization. Pace makes the iLock dongle that will contain all of the software keys for copy protected software. So far Antares Audio, Bomb Factory, Digidesign, Serato Audio, and Steinberg have signed up for iLok protection and are starting to ship product.

To make the transition easier, I'd like to see Pace provide a software package to end users (copy protected, of course) that would gather up all of the key disk authorizations on a computer and store them in the iLok. A small init would be placed on the system so that, when protected software looks for the hidden key file, the init would query the iLok and then respond correctly to the protected software. The same type of utility could be used to gather challenge/response protections and store them on the iLok.

I would also like to see a "Backup iLok." For some fee you could own a second iLok that duplicated the authorizations of the first iLok. This could be administered by Pace, and they could keep track of who is authorized to have what. Also, I'd like to see temporary authorizations of software on the iLok, kind of like Pay-Per-View. You purchase the use of one or more pieces of software over the Internet for some number of days. You pay by credit card and the authorization is downloaded to your iLok.

This column is actually copy protected. If the back page of the magazine is blank, then it means that this isn't your legal copy of this month's *EQ*. You may in fact be reading someone else's copy or just browsing at a newsstand. I have found a crack for the magazine copy protection. Just go into a dark room, pour lemon juice on the last page, and hold a cigarette lighter under the page until it starts to turn brown.

Now try to explain why you are exiting a bathroom with a flaming, lemon-scented copy of my column. You guys are sick. ■



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# MOTU Dream Studio 2



- **MOTU 2408mkII™** — 24-channel expandable PCI audio interface
- **Digital Performer™ 3.0** — award-winning workstation software with MIDI sequencing
- **SAC-2K™** — expandable, touch-sensitive, 8-fader automated control surface for Digital Performer
- **DigiMax™** — 8-channel mic pre-amplifier with 24-bit optical connection to the 2408mkII/computer
- **Bias Peak 2.5 VST™** — award-winning waveform editing software

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# MOTU Dream Studio 3

- MOTU 1296™** — 12-channel expandable 24-bit / 96KHz PCI audio interface
- Digital Performer™ 3.0** — award-winning workstation software with MIDI sequencing
- HUI™** — automated, touch-sensitive control surface for Digital Performer
- PowerCore™** — DSP accelerator for TC Works MAS plug-ins (and other advanced 3rd-party MAS plug-ins)
- MAS STOR™** — reliable, high-performance SCSI storage and backup for MOTU Audio System based studios

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call up plug-ins on-screen directly from HUI. Keypad and transport controls let you locate Digital Performer's main counter instantly, just like the familiar keypad on your computer keyboard. HUI is an advanced hardware workstation console, complete with built-in monitoring and the user-friendly ergonomics that Mackie mixers are known for. Boost your productivity through direct hands-on control.

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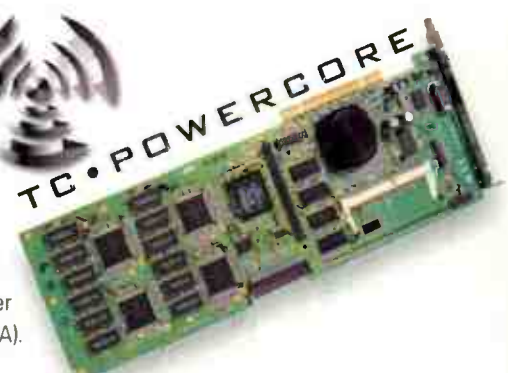


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The search for a kinder, gentler means of safe-guarding software

## Copy Protection

The first topic today will be copy protection. When I use protection, it always produces a sore spot, usually near my wallet. I know that software manufacturers need to protect their intellectual property because of piracy, but some of the restrictions due to copy protection issues can quickly get out of hand. Comparisons are drawn to music piracy issues, but a \$900 plug-in provides a much greater incentive for piracy than a \$16 music CD. I'm basically for copy protection of software, but I think there must be a way to produce a kinder, gentler copy-protection scheme. Most users of copy-protected software agree, but the software producers and the company that provides the vast majority of the protection schemes don't listen to outside suggestions on how to improve the usability of protected software.

The six major copy protection schemes are serial number/authorization code, hidden file placement during installation, original CD insertion during launch, authorization floppy disk, challenge/response strings, and dongles.

### SERIAL NUMBER

Serial number/authorization code entry is the easiest to deal with, but also the easiest to crack. There are tons of Web sites that provide serial numbers that can be plugged into a pirated program to get it to work. Microsoft and FileMaker are among those who use this type of protection. Some programs run in demo mode until the proper codes are entered, and then turn into a full working program. More and more software vendors now provide demo-only versions that can't become full working versions. You (or someone) must pay before downloading a fully functional version. The software can be moved to a different computer easily. The software can run on more than one computer at a time (although the license agreement may prohibit this).

### HIDDEN FILE

Hidden file placement during installation works much better. You still have to enter codes to unlock the program, but if the hard disk is reformatted or the program is moved to another disk, the program will ask for re-installation of

the original CD. This makes it less appealing to pirates because you have to circulate an original CD to install the program. If the program asks for the CD and you don't have it, you're out of luck. Apple's Final Cut Pro 2 software works this way. You can install the software on more than one computer and run multiple copies if installed from the original disk. (If the license agreement allows it.)

### ORIGINAL CD

Inserting the original CD during each launch works very well, but imagine if you had to insert a CD for each plug-in and program during a large Pro Tools launch. I have one program that will revert to demo mode if the CD isn't present, but it will still work for emergency work.

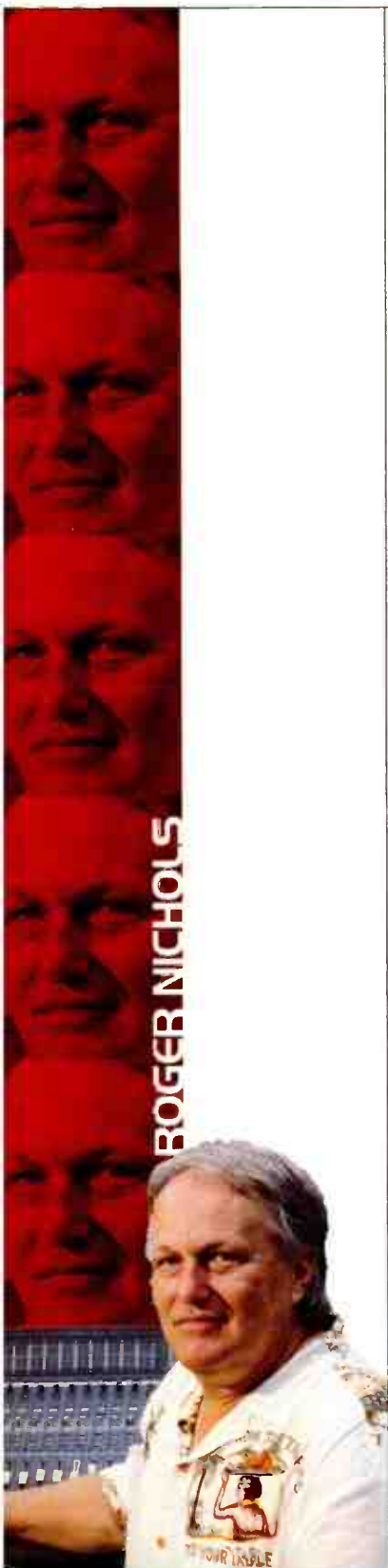
### KEY DISK

We all know about authorization floppy disks. These floppies are physically damaged so that some sectors can't be written to. You could make copies of key disks, but you'd have to damage the exact same sector, and then write a copy program that would make an exact image of the original, but not fail the copy when encountering the bad sector. Oh, yeah, I almost forgot — Macs don't have floppy drives any more. If the authorization is on the hard disk, the program will run. If the software is installed on a different computer, it will run if you insert the key disk when prompted by the software. Without a key disk, the program will quit.

This copy-protection scheme has caused me the most grief. I have been good about buying multiple copies of software that I want to run on more than one computer. I went to New York to work and took a key disk for each piece of software. My hard disk started acting up, so I had to replace it. I was grinning from ear to ear because I remembered to bring my key disks. I was going to un-install all of the software, replace the hard disk, and then re-install the software. I inserted the first key disk to de-authorize a software package. The program refused to un-install the authorization because it wasn't the exact same install disk used during the installation. The key disks have no serial numbers on them, so I had no

► continued on page 130

ROGER NICHOLS





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