

Exclusive Report: **NAMM 2000**

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PROJECT
RECORDING
& SOUND

MARCH • 2000

REVIEWS:

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Ashly MX-508
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Marshall
Electronics Mics

Blue The Mouse
Microphone

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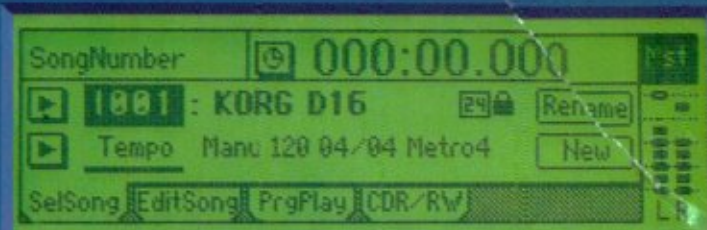
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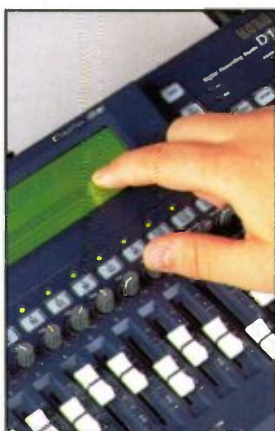
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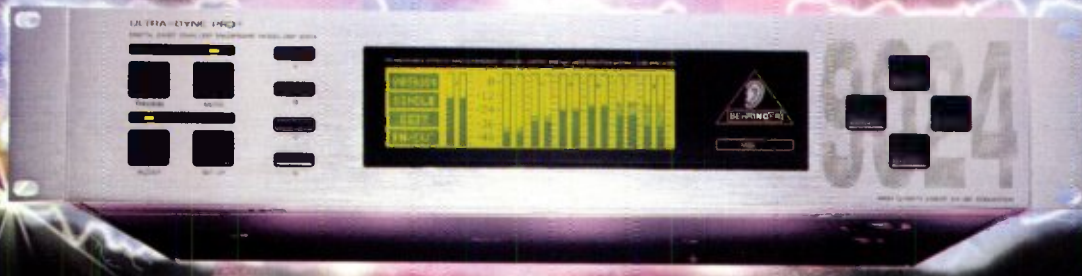
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CIRCLE 7 ON FREE INFO CARD

EQ

PROJECT RECORDING
& SOUND TECHNIQUES
VOLUME 11, ISSUE 3
MARCH 2000



ON THE COVER:

Jimmy Johnson and some of his Gold records. Photo by Jimmy Stratton.

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EQ (ISSN 1050-7868) is published monthly plus Product Guide in December by Miller Freeman PSN Inc., 460 Park Ave. south, 9th fl., New York, NY 10016-7315. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. \$29.95 for 1 yr. (13 issues); CANADA add \$10.00 per year for surface; other countries add \$15.00 per yr. for surface; All add \$30.00 per yr. for Airmail. All subscriptions outside the U.S. must be pre-paid in U.S. funds-by International Money Order, checks drawn from a bank located in the USA Visa, Master Card or American Express. Back-issues \$5. Printed in the U.S.A.

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CIRCLE 54 ON FREE INFO CARD

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CIRCLE 11 ON FREE INFO CARD



Vol. 11, No. 3 March 2000

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PUBLISHED BY MILLER FREEMAN PSN, INC.

Editorial Offices: 6 Manhasset Ave., Port Washington, NY 11050. Tel: 516-944-5940. Fax: 516-767-1745. Email: eqmagazine@aol.com

Subscriptions: EQ Magazine, P.O. Box 0532, Baldwin, NY 11510. Tel: 212-378-0449. Email: circulation@psn.com

Article Reprints: Tel: 212-378-0440. Email: reprints@psn.com

Administrative/Sales Offices: 460 Park Ave. South, 9th Floor, New York, NY 10016-7315. Tel: 212-378-0400. Fax: 212-378-2160

Web Sites: www.prosoundnews.com www.eqmag.com



EQ (ISSN 1050-7868) is published monthly plus Buyer's Guide in December by Miller Freeman PSN Inc., 460 Park Ave. S., 9th Fl., New York, NY 10016-7315. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. \$29.95 for 1 yr.; CANADA add \$10 per yr. for surface; other countries add \$15 per yr. for surface; All add \$30 per yr. for Airmail. All subscriptions outside the U.S. must be prepaid in U.S. funds by International Money Order, checks draw from a bank located in the USA Visa, MasterCard or American Express. Back issues \$5. All product information is subject to change; publisher assumes no responsibility for such changes. All listed model numbers and product names are manufacturers' registered trademarks.

Printed in the U.S.A. Miller Freeman
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From the Editor

What a thrill! After ten years as a loyal reader of *EQ*, I find myself sitting down as the editor of the magazine and composing my first "From the Editor" letter. How did I come to this pass? Mainly by spending the majority of my life making music in front of and behind mixing consoles. But also by working in pro audio retail and as a MIDI/audio consultant; by teaching myriad lessons, classes, and seminars on music/audio topics; and by serving as the senior technical editor at *EQ*'s sister magazine, *Keyboard*. All of which brings me here, to Manhattan, unbelievably excited to take the helm at *EQ* as it launches into decade two of its life. (Forgive me if I look a bit thrashed. In addition to being excited, I'm currently crashing in an empty apartment on an air mattress — let's hope the moving company I chose eventually finds New York City. NYC is east of San Francisco, guys!)

So what kinds of cool things are you going to see headed your way from *EQ* under my direction? Sorry, can't give away everything right now — that would spoil the surprise — but stay tuned, there's going to be some great stuff coming down the pike in the near future. You can trust in one thing: I won't be fixing what's not broken. *EQ* will remain the premier source for project recording coverage.

And remember that *EQ* doesn't stop with the glossy pages you're holding in your hot little hands. The *EQ* Web site, www.eqmag.com, will be ramping up to new levels as well. Want an example? In last month's issue, *EQ* announced the launch of Roger Nichols's Digital Audio Online Forum. But it doesn't stop there; I'll be keeping him company with an online version of the magazine's EQ&A question-and-answer column, and we've secured the services of two gentlemen you might recognize from the zillion or so top-notch projects they've participated in: Ed Cherney and George Massenburg. Ed's forum will be covering topics related to producing, while George's forum will field questions on recording. Web sites are appearing almost daily claiming to be the source for recording information. I think you'll agree that with Roger, Ed, and George at the ready to answer your questions, *EQ*'s site has taken a huge leap into the online leadership position. So with three industry giants signed up, are we resting on our laurels? Nope — we're nowhere near tapped out. Visit the site often, more coolness is looming....

Speaking of the Web, the Music Players Network site is now online (www.musicplayersnetwork.com). As announced in these pages recently, MPN combines and provides access to the resources of *Gig*, *Bass Player*, *Guitar Player*, *Keyboard*, and *EQ* magazines. *EQ*'s own Craig Anderton is heading up the project. Definitely check it out.

Finally, remember that when it's all said and done, *EQ* belongs to you, the project recording community. I'm really just the caretaker. To that end, you'll find my direct e-mail address at the end of this and each future "From the Editor." Don't be shy about sending me your comments and suggestions — I want to know what you think. While I won't be able to reply to every message, trust that each one will be read and considered.

—Mitch Gallagher
gallagher@psn.com

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Richard Battaglia with AD-8000 Special Edition units at Béla Fleck's Nashville studio.



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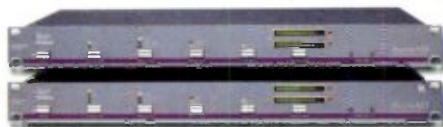
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CIRCLE 5 ON FREE INFO CARD

MAN WITH A PLAN

In response to Martin Polon and his article "Time to Add a Room" [February 2000]:

As someone who has built and managed my share of studios, I would suggest that your readers first consider the three P's: Power, Parking, and Plumbing. Martin addressed the power, but, here in L.A., parking can be a major hassle for even some of the finest facilities. Before you expand, make sure you have adequate parking for the additional automobiles. A studio can fill up with bodies even in a single-room facility; you add another room you might need another rest room. Also don't forget to budget for more air conditioning. It is all so glamorous...

Jeffrey Sherman
Santa Monica, CA

SUPPORT GROUPS

Thanks for the January 2000 editorial, "Who's Really Paying," which recognizes the plight of overworked, underpaid salespeople in the music equipment industry. I have been there and done that, and can attest to the struggle of working in a music store and dealing with customers who would grind away at my sales commission.

However, I found most of your editorial unrealistic given today's advanced technology market. If I had a piece of gear lock-up, the last person I would call is my salesperson. First, I would call the factory to get the answer to my question and to find out why this crucial information was not included in the manual. If they could not help me, I would go to where the real experts are — to the users groups on the Internet. These are people using the gear constantly with a real passion for knowing their equipment. Factory personnel build and service the gear, music stores sell the gear, but user groups actually use the gear!

Why would we expect a salesperson to know an obscure function in a reverb unit? There must be 50 reverbs on the market now, and new units are appearing each time the industry holds a tradeshow. If my car fails, I call the service center at the car dealership. If my VCR breaks, I take it to the customer help desk at the electronics store. Why do we expect salespeople in our industry to be any different? By definition, a salesperson's job is to sell gear. That is their area of expertise. Let us not burden them by adding tasks that are not part of their job description.

I think we should let go of the old model of salesperson as dealer, buddy, and gear guru. If you want to buy a piece of gear, talk to a salesperson. If you want personal access to a knowledgeable pro, there are people who can help you out, but do not confuse these two different occupations. Just think how long it takes you to learn a piece of equipment inside and out, then multiply that times the products on display at this year's NAMM show!

By the way, if you do find a store with a genuinely helpful, knowledgeable staff, then by all means patronize that store regularly. And take your favorite salesperson to lunch sometimes! They are a rare find and a dying breed in today's market.

Wayne Scott Jones
Culver City, CA

BARGAIN HUNTER I

Regarding the *EQ* editorial in the January issue: *What is this guy thinking?* He wants us to *not* negotiate the lowest price possible on equipment just in case we *might* need further help in the future from the clerk who sold it to us. Since he appears to not know musicians' economic status very well, here's a clue: *Players have not had a cost of living raise in 20 years!* Many live music venues are dying (or are already dead), draining our income further. If we *were* willing to pay extra, there's no guarantee the money would go in the salesman's pocket. If one needs answers not found in the product manual, there are helpful Web sites for most major companies that provide technical help. *Whose side is he on?*

Steven Beasley
Songsafe Studio
North Hills, CA

BARGAIN HUNTER II

Regarding Steve La Cerra's editorial, "Who's Really Paying" [January 2000]:

I am sorry, but after I pay my rent, bills, food, etc., I don't have the luxury of paying a "few bucks more" for gear. Recently, when shopping for a microphone, I found the difference in price to be \$75. If I can save \$75, I am going to do it! There are so many places to buy gear now that we have the option of getting that good deal, and I find nothing wrong with that.

Chuck Ryals
via Internet

PAY TO PLAY

I usually skip past the editorials and go right into the features and reviews. But the editorial "Who's Really Paying" in the January issue caught my attention. I work in music retail, and everything you said rings true. I can't speak for all salesmen, but, for me, this is quite literally my day gig. I'm in this line of work because it keeps me close to music when music alone won't pay the bills. When guys beat me up on price, it affects my income. The less income I have, the less gear I can buy! It's a vicious cycle.

Scott Harnish
Halifax, Nova Scotia, Canada

CABLE GUY

Since most of us have a lot of expensive equipment that can be easily and quickly moved. It is important to remember that there are plenty of unscrupulous individuals around who have sadly replaced the Godly words, "Thou shalt not steal," with the greedy words, "Thou shalt not *get caught* when stealing other peoples stuff."

With this in mind, I was pleased to learn that the Kensington Master Lock Security cable that I purchased for my Apple PowerBook (about \$40 at a computer store) can also be used to secure other portable gear without a built-in slot for the lock. The package included a security slot that can be bonded, using the included glue, to a piece of equipment and then locked to the included 6-foot cable.

This is a great way to reduce the theft of computers, peripherals, mixers, and other portable gear. For more information, the fax number is 415-572-9675 and the Web address is www.Kensington.com.

My response to crime: preach honesty and protect with locks.

John Howell
via Internet

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CIRCLE 29 ON FREE INFO CARD

MANLEY



MASTERING MISHAPS

Q I have a pretty nice home setup; my problem is that projects leave here sounding great, but when they go to a mastering house, even though they sound more "radio ready," it seems that the low-end punch is gone. They're using Sonic Solutions and Manley tube gear, so I don't want to blame equipment. Do you think the master engineer is getting compressor happy? What to do?

Also, I'm thinking of getting a program for my computer so I can do basic mastering on my own. I have a PC 300 MHz, so I could use this, or I have an old Mac with Opcode Vision. I was thinking of getting a new Mac and updating Vision, which has basic mastering in it. Please advise me as to what would be the most cost-effective solution.

Mark Maier
via Internet

A Bass takes up a lot of spectral energy. It could be that the mastering engineer is trading off less bass in order to get more level onto the CD. Or, it could be that by boosting the highs, the bass seems less prominent. Sometimes I'll narrowly boost one "magic" bass frequency (the exact frequency depends on the song, try between 50 and 130 Hz) to give more bass presence without boosting the entire bass range. Another option is to use multiband compression and compress just the bass so it has a higher apparent level. Bass is very tricky to get right; talk with your mastering engineer and see if

any of the above solutions make sense in your particular application.

As to mastering at home, the PC has some excellent mastering-oriented programs available such as Steinberg WaveLab, Sonic Foundry Sound Forge, or even the extremely cost-effective Syntrillium Systems Cool Edit. For the Mac, try BIAS Peak and/or TC Works Spark (Sound Designer and Alchemy, two mainstays for Mac mastering for many years, are no longer really current). Also, a program called T-RackS (available for Mac or PC) provides more of a vintage/tube mastering vibe. A 300 MHz PC with suitable RAM should be enough to run your mastering software and a couple plug-ins. Speaking of which, check out Steinberg's Mastering Edition set of plug-ins, which are optimized for mastering, and Sonic Foundry's XFX series. Both have become workhorses in my Windows-oriented mastering suite.

Craig Anderton
Technology Editor
EQ Magazine

MOVING ON UP

Q I am recording classical guitar in a quiet basement room. I have an AKG 3000 and a Shure SM81 connected to a Yamaha ProMix 01V connected via Lightpipe to a blackface ADAT. I find it difficult to get enough gain before hearing the noise floor monitoring the 01V's headphone output. I can close-mic the guitar, but I'd like to move the mics back to arm's length. At that distance, I find I have to do everything I can

to get the ADAT LEDs close to -18 dB on average. That includes slamming the channel levels and even using the 01V's compressors just to get some extra "makeup" gain.

Should my next investment be:

1. More sensitive mics (Neumann KM 184's)
2. Quieter mics (Neumann TLM 103's)
3. Outboard preamp (Great River)
4. Balanced power (Equi=Tech)

My goal is clean and quiet. Can you recommend an upgrade plan?

Kip
via Internet

A I think the AKG 3000 is pretty quiet to begin with, so you would probably get the most noise improvement from going to an outboard preamp. But it does seem a little strange that you can't get enough gain out of the pres in the 01V, so make sure you don't have any pads engaged in the mics. Going to KM 184's would help with the overall gain of your signal path, since they are a little more sensitive than the 3000's, and it's hard to argue with the sound of a Neumann mic. As far as outboard preamps are concerned, I've never reviewed the Great River product line, but I understand that they're quite good. If you have the bucks and want to up the social status of your studio a notch, check out the Millennium Media HV-3 preamp. I think it could be the greatest-sounding mic pre on earth, and it's not really that much money.

Mike Sokol
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COMMUNICATION BREAKDOWN

Q I am a professional musician in the Latin Field. I use mainly a laptop for most of my stuff, and I recently purchased a PowerBook G3, 400 MHz with a USB port. My MIDI interface is an Opcode Studio 4 with exclusively serial connectors, which, of course, the PowerBook doesn't have. Is there a commercially available solution to get these two to talk to each other?

Jose Cancela
via Internet

A If you have an iMac or desktop G3/G4, go to www.geethree.com for info on their Stealth port. It inserts in the modem card slot (you'll have to take out any existing modem), and provides a suitable serial connection known to work with the Opcode interfaces. However, laptops are a different issue; although USB-to-serial adapters are available, they reportedly do not work well for MIDI. You'll probably need to bite the bullet and get a USB MIDI interface such as those available from Emagic, Mark of the Unicorn, and MIDIMAN.

Craig Anderton
Technology Editor
EQ Magazine

FOR A FEW BITS LESS

Q Where might I find info on the process of converting 24-bit audio waves to 20- or 16-bit (digitally). I've received Cakewalk 24-bit audio files and wish to import them into our Fostex D-160 20-bit hard-disk recorder. We're not quite set up for PC mastering yet, as our D-160 is quite at home with our analog gear. I'm under the impression we need to go through a sample-rate conversion. Am I wrong?

Bob
via Internet

A Sample-rate conversion is only needed if the files were recorded at something other than 44.1 kHz (for instance, if your final destination is audio CD and your file is 48 kHz). If you have higher-bit resolution files (20 or 24 bits), and you're transferring the signal digitally via S/PDIF or AES/EBU, then the receiving device will automatically truncate the LSB (Least Significant Bits) that it can't use. So if you send a 20-bit data stream to a DAT recorder, it will end up as 16 bits on tape. Truncation is

the least effective way to down-convert 24- or 20-bit data to 16 bits, since all information beyond 16 bits is effectively thrown away.

There are algorithms that do something called dithering, which is a process that adds a low-level noise signal into the data stream. This will allow high-resolution audio information from a 20- or 24-bit file that would be lost in truncation to 16 bits to be audible in the final soundfile. But dithering is a bit of an art, and must be evaluated for each type of music and/or signal chain. Programs like Sonic Foundry and consoles like the Panasonic DA-7 both have dithering options that allow you to accomplish this.

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ADDING EXCITEMENT

Q I've been waiting a long time for Craig Anderton's article like "The Mixing Protocol" in the January 2000 issue. Kudos. Here's a question: So after you have what you think is a great mix that you carry around and play over various systems, why would something like an Aphex Aural Exciter be used? And how?

Dave
via Internet

A The Aphex Aural Exciter is a child of the days of analog tape, where (literally) every time you played the tape, there would be a bit of treble loss. The Aphex helped make up for that, and restored some of the "sparkle" lost during the recording process. However, despite this being the digital age, the Aural Exciter is by no means obsolete. Although I wouldn't really recommend it for processing your stereo master (if your productions lack sparkle, track down the real reason why this happens rather than trying to apply a "fix"), I find it very useful on individual tracks, especially samples with low sampling rates, analog synths (which often have a limited high-frequency response), vocals, certain acoustic instruments, etc. The Aural Exciter is very helpful for blending analog sounds with brighter, "sparkly" digital sounds, allowing them to co-exist in a more harmonious manner.

Craig Anderton
Technology Editor
EQ Magazine

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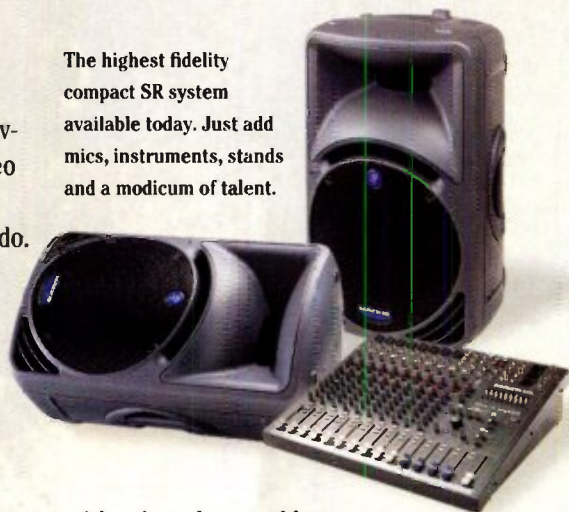
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EQ NEWS

MARCH • 2000

Recording Legend Roy Segal of Fantasy Studios Retires

After more than a half century in professional audio, Roy Segal recently stepped down as the head of Fantasy Studios and the Saul Zaentz Film Center in Berkeley, CA. Over the course of his career, Segal engineered hit records, oversaw the construction of world-class facilities, managed a small empire, and watched the Academy Awards roll in — mostly from behind the scenes, as he preferred it.

"Roy Segal is one of a kind; he's respected and trusted by everyone he works

with, including filmmakers, editors, musicians, and engineers," says film producer and president of Fantasy, Saul Zaentz. "He's been with us for 20 years, looking after Fantasy Studios and the [Saul Zaentz] Film Center. Under Roy's leadership, the crews working at the Film Center have won many Academy Awards. Santana's acclaimed *Supernatural* album was recorded and mixed in Fantasy Studios. Our facilities and the talented people who work here have all benefited greatly from Roy's guidance. We are all going to miss him."

Born in Brooklyn, Segal got his first job in 1949 as a member of Local 1212 IBEW, installing the telecom systems and running PA for the United Nations (first at New Hyde Park, then at the "new" building in Manhattan). In the mid-1950s, he left the UN for Columbia Records, where he worked on hundreds of album projects as an editor. There, he was mentored by Don Paluse (later of Berklee College of Music) and soon worked his way up to engineer.

By the 1960s, Segal was recording with the likes of Big Brother & the Holding Company, Sly & the Family Stone, and Laura Nyro. Segal left New York in 1970 and headed to San Francisco, where Columbia head Clive Davis wanted a studio to support the spate of Bay Area acts he had signed. Segal helped equip and manage the studios (later to become the legendary Automatt), and he engineered for Poco, Redbone, Doctor

Dreamhire Announces Pro Audio Services

Dreamhire, the world's largest pro audio rental house, has introduced Dreamhire Professional Audio Services, which offers state-of-the-art pre-mastering and mastering, inter- and intra-format transfers, archiving, audio restoration, tape restoration, digital editing, tape editing, tape copying, and CD duplication. "There are other places out there who are just doing transfers, but we can really do it all! It's the natural evolution of meeting the demands of our high-end clientele," says Dave Olivier, sales and marketing manager in Dreamhire's NYC office.

All Pro Audio Services will be performed in their studios with top-notch engineers and equipment such as SSL, Sony 3348HR and PCM 9000, Genex GX8500, Studer A827, Sontec EQs, Sonic Solutions, Weiss EQs and compression, dcs converters, and Pro Tools.

Call Dreamhire Professional Audio Services at 212-691-5544 or 800-234-7536 for rates and scheduling.

Room with a VU Correction

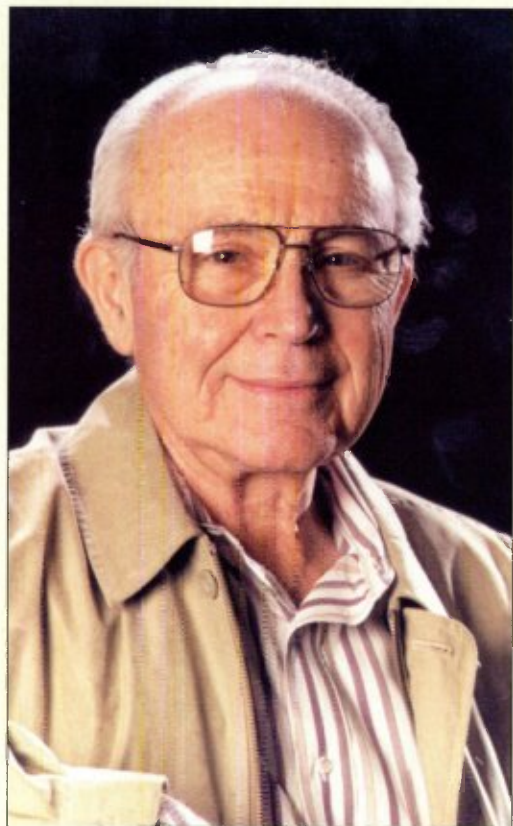
In the February issue's Room with a VU on Sabella Recording Studios, the Web site was listed incorrectly. The correct URL is www.sabella.com

Hook, and the Grateful Dead, among many others. Columbia closed the studios in 1977, and, for three years, Segal worked as an independent engineer.

In 1980, Segal was hired by Fantasy Studios to take the new recording facility from an in-house production facility to a commercial enterprise. Two years later, he was asked to run the film division also. In his first two years as head of the Film Center, the company walked away with two Best Sound Oscars (*The Right Stuff*, *Amadeus*). The Oscars returned to the Film Center in 1996 with *The English Patient*.

"We are all going to miss Roy," says Steve Shurtz, Film Center general manager. "He kept us on a steady course through thick and thin times, through several films. Roy has overseen major updates and constant upgrades, while managing the staff professionally and with heart."

Segal plans to work on his golf game.



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Eddie Kramer Talks at SAE

For four days in December, legendary producer/engineer Eddie Kramer was a visitor to the New York campus of the SAE Institute of Technology. Kramer, whose name brings to mind classic recordings by Jimi Hendrix, Led Zeppelin, and the Rolling Stones, among many others, conducted a series of seminars with senior students. Sessions covered discussions of recording theory and techniques, the music business, and his work with the aforementioned artists; hands-on preproduction, tracking, and mixing; and relationships with record labels.

"Given the fact that we have an international network of 30 schools, it does make sense to have big names like Eddie Kramer doing workshops," says SAE USA senior vice president Marcel Gisel. "Not only at one school, but all over the world. Currently, we are working on a worldwide tour for him. We bring Europeans over to America, and Americans to Europe and Asia."

Kramer espoused his philosophies and opinions on a multitude of topics in his own charismatic style. "Whatever I do," he

told the students, "is driven by the desire to make music sound better." A broad array of subjects was covered — the nuts n' bolts of the music business, analog vs. digital ("thank God for analog tape," he often says), the MP3 audio format ("it sucks"), the history of multitracking, and recording tips and tricks. The three-hour lecture of Day One culminated in a photographic "show and tell" with Kramer projecting images he shot while in the studio and on location with Jimi Hendrix, Robert Plant and Jimmy Page of Led Zeppelin, Mick Jagger and the Rolling Stones, and a symphonic session with original Stones guitarist Brian Jones.

The following day, the students were witness to Kramer behind the glass — guiding them through an entire recording session process, from miking and recording a band live in the studio to mixdown. "The notion of starting at the bottom is tough for some," Kramer states, "but most realize that this is where one starts. I love to teach, period! And I always learn something new from the students." —*Christopher Walsh*

Mackie Designs and EAW Sign Letter of Intent

Mackie Designs, Inc. and Eastern Acoustic Works, Inc. (EAW) announced that they have signed a non-binding letter of intent by which Mackie will purchase all shares of EAW.

Based in Whitinsville, MA, EAW is a high-end professional loudspeaker design and manufacturing firm. It holds leadership positions in both fixed installation and concert touring markets. The company's products are utilized in sound reinforcement systems at major stadiums and arenas, performing arts centers, churches, clubs, and, more recently, in the custom residential market.

The move unites two of the professional audio industry's most successful developers of technology. Both sides point out that the arrangement will prove highly beneficial to each entity, while, at the same time, both companies will continue to focus their primary energies on their respective core markets, products, and customer bases.

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Britishaudio.com Launched for Online Production Music Needs for Postproduction, Multimedia

Britishaudio.com recently announced the launch of its new online production music network, which was created to allow users to preview, purchase, and digitally download broadcast/CD-quality production music for film, television, multimedia, video production, and corporate presentations worldwide.

With the Liquid Express player, end users can save the downloaded music directly to multiple editable formats, including WAV, AIFF, and Avid/Sound Designer II. There is no need to burn a CD to use the music.

Liquid Audio compression technology provides high-quality audio transfers, in addition to accelerated download time. Audio selections are encrypted for secure transactions and digitally watermarked to provide security and tracking for copyright and royalty purposes. All music is available on a blanket license basis.

The britishaudio.com music library

network offers an extensive range of music, including full-scale orchestral, jungle and trip hop, Latin, world fusion, acid jazz, theatrical, Euro pop, big beats, grunge, swing, rock, and country.

Featuring music composed by Emmy- and Grammy-nominated film and television composers, rock legends, and new artists, britishaudio.com's credits range from *Buffy the Vampire Slayer*, *The X Files*, *The Twilight Zone*, *Matlock*, *Perry Mason*, *Diagnosis Murder*, *Murder She Wrote*, *The Earthling*, *The Witness*, *The Arrival*, *Funny Lady*, *The Night They Raided Minsky's*, to *Synthetic Pleasures*. Over 1000 tracks are available as digital downloads with

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Digidesign and Rocket Network Plan for a Strategic Alliance

Digidesign and Rocket Network have announced plans for a technology and strategic partnership that provides Digidesign with a significant equity stake in Rocket Network and a seat on the Rocket Board of Directors. The companies intend to work together to develop technologies and services that enable Pro Tools users to collaborate using Digi Internet studios.

"Digi believes that the Internet will greatly expand collaboration between audio pros in completely new and exciting ways," said Dave Froker, president of Digidesign. "Our strategic investment in Rocket ensures that our customers will have access to the world's best tools and technology for high quality collaboration with other Pro Tools

users — anywhere, anytime."

Rocket Network, Inc. is the first and only company to provide Internet Recording Studios where audio professionals can meet online to collaborate and produce original audio from anywhere in the world. The company's technology provides a cost-effective and convenient complement to traditional studios by reducing production expenses and increasing creative alternatives for professional-quality audio in TV, film, radio, music and Web sites.

Digidesign's Internet studios will be based on an enhanced version of Rocket Network's technology, and enable Pro Tools users to enjoy the industry's richest collaboration experience.

Massenburg, Cherney to Answer Questions on EQ's Message Boards

Legendary recording industry luminaries George Massenburg and Ed Cherney have joined Roger Nichols in sharing some of their vast recording knowledge on www.eqmag.com's message boards.

You can ask Massenburg anything about audio and recording on his "Ask George Massenburg" forum. And Ed Cherney will troubleshoot all your record production concerns on his "Ed Cherney: Behind the Big Board" forum.

And if to you "online" means where you're standing outside of a movie theater, we've still got you covered. Each issue we'll pull one of the more interesting threads and run it here. Remember, if you like what you see, log onto www.eqmag.com.

Thread of the Month: Bass Compression with George Massenburg

Yesterday, a friend brought me a 12-track tune he recorded and wondered if I could do something with the bass. It's very muddy and won't sit well at all. I've tried compression (-8 to -11 dB; attack 60-100 ms; release 20-60 ms; ratio 5:1 to 13:1) and nothing seems to help. He didn't know which/how many mics were used in tracking, but, from the sound, I'm guessing that the cabinet was miked close and off-center with a dynamic mic plus a DI to the board. I've tried adding

EQ in the 400-600 Hz range, plus a little around 4 kHz, but it just won't "work."

Doug
Boston, MA

The first question I'd ask is, "What do you mean by 'work'?" The first thought I'd have is that the "problem" may be musical rather than technical. But, say it's not...

In general, this is the way I approach EQ'ing bass. First, I listen carefully to whether the bass spectra is well "shaped," i.e., whether there is a noticeable "bump" in the response (as might come from a less-than-optimum bass cabinet) or even sharper peaks. I'll correct them by dipping with a parametric section or two or three, carefully choosing frequency and Q.

Now, the tricky part: If the bass was compressed *after* it was (perhaps badly) EQ'd, then I'll usually compress it again, usually with one of my compressors, but I'd also use a dbx if one of mine wasn't available.

Finally, I know of no "magic" frequencies for bass...or anything else for that matter. I seldom find anything at 4 kHz on a bass track, and would suggest that you sweep around to look for where there *might* be something resembling highs.

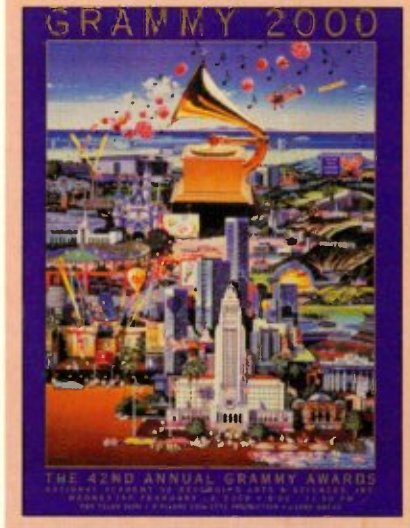
George Massenburg

I assume you've checked that the L/R channels are in phase. This applies to the master outs and/or if there is more than one chan-

Congrats to Grammy Winners

EQ would like to congratulate all the recent Grammy winners. It's always great to see those behind the board honored, including producer Matt Serletic and engineer David Thoener who won Grammys for their work on Santana's *Supernatural*, and Al Schmitt, who not only walked away with the Best Engineered Album Grammy for Diana Krall's *When I Look In Your Eyes*, but also discusses his recording techniques on page 44 of this magazine.

Other winners include Walter Afanasi-eff (Producer of the Year), Club 69 (Remixer of the Year), Markus Heiland (Classical Engineered Album), and Adam Abeshouse (Classical Producer of the Year).



nel being used for the bass and its effects. If not, getting in phase may allow you to adjust the EQ and get much crisper results. Also, be careful to make sure the transients — typically found around 2.5 kHz are sufficiently present. I've read and found that these are really key to a crisp/present bass line.

Ken Favata

Great addition, Ken, and points up something I missed. If there's *any* crosstalk from the bass into anything else — drums, guitar, et. al. — switching the phase on the bass channel will change the bass sound, sometimes dramatically.

Another point to be made on the EQ: the transients (the pluck, one assumes) will be a function of how the string is sounded (pluck or slap or whatever, not to mention where on the string), what kind of strings, how much treble pickup, etc. Doug will perhaps need to really crank the mid EQ after tuning for the best boost frequency (assuming he's using a parametric).

George Massenburg



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ALESIS
CIRCLE 2 ON FREE INFO CARD

Roland VP-9000 Variphase Processor

Roland provides a digital sampler that does a whole lot more than just sample

BY STEVE LA CERRA

Many *EQ* readers are familiar with the age-old problem of sampling an acoustic instrument: when you play the actual note at which the sample was taken, the instrument sounds fine, but as you play notes higher and lower than the original, the sampled sound suffers from the "Mickey Mouse/Darth Vader" syndrome — resulting in un-natural timbre as well as increased noise. One solution has been to multisample an instrument, taking many samples of the instrument across its range and then assigning each sample to a small range of MIDI notes in an effort to improve sound quality. Unfortunately, this doesn't really work when vocals are concerned because, by the time you multisample a lead or background vocal, you may as well just have the singer perform the parts you need anyway. With the introduction of the VP-9000 VariPhrase processor, Roland is on a mission to change that. At its most basic level, the VP-9000 performs the functions of a digital sampler, but there's so much more to the unit that "sampler" is really only a distant cousin.

The VP-9000 VariPhrase processor lives in a two-space rack chassis hiding some pretty impressive processing power that allows you to capture audio and then alter the pitch, time, and formant of the sound in real time via MIDI, all while maintaining the sonic integrity of the original sound. Audio can be pitch-shifted without changing tempo or formant, or you can change the tempo of a phrase without changing its pitch. Perhaps most dramatically, you may also change the duration of a particular note within a phrase or change the rhythm of a groove mid-phrase. All of these edits may be done non-destructively, and then, of course, saved if you like the results.

Before a sound is processed by the VP-9000, it must be sampled or "captured" by the unit. The sampling engine of the VP-9000 comes stock with 8 MB RAM providing 25 seconds of stereo sampling time or 50 seconds in mono. Standard SIMMs may be used to expand the internal memory up to 136 MB for a maximum of about seven minutes of stereo sampling time (or about 14 minutes in mono). Sample rates from 8 kHz to 48 kHz are supported in 8-bit or 16-bit word lengths. In addition to its own file format, the VP-9000 will read Roland S-700, Akai S1000, AIFF, and WAV file formats. For easy archiving and loading of audio data, the unit comes with a 250 MB Iomega Zip drive installed. Both 25-pin and 50-pin SCSI ports are provided on the rear panel for connection of whatever SCSI device you might desire for loading or saving of data.

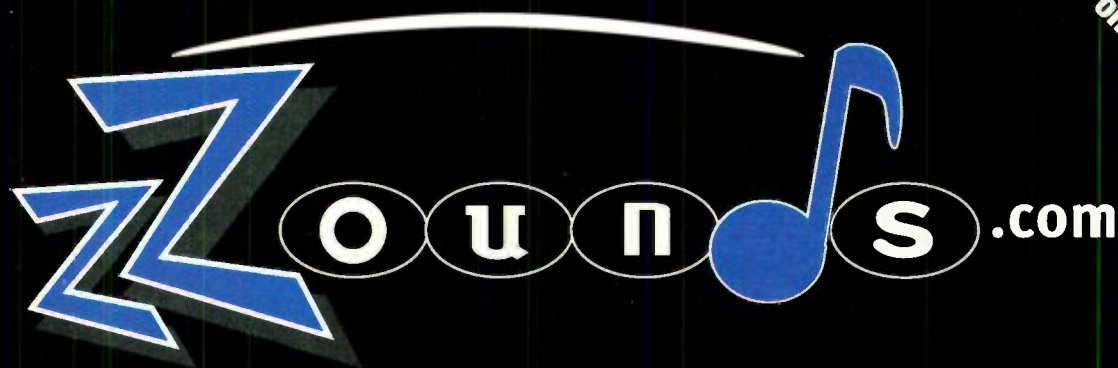
After a sound has been captured by the VP-9000, it is encoded by the unit's processing engine using one of three algorithms optimized for solo instruments, backing arrangements, or ensemble sounds (Roland refers to this process as "training the audio to be elastic"). The VP-9000's engine processes both formant and pitch of the sound, allowing audio phrases to be transposed over an extremely wide range of notes without multisampling and without suffering Mickey Mouse-syndrome. After encoding, the sound may be treated as wave data, the parameters of which can be modified via MIDI in real time. The sound can be played back via 6-voice polyphony at any speed or in any key, it may be re-pitched, or made to swing (rhythmically speaking), or it can be sped up or slowed down on the fly. Using three front-panel, assignable control knobs — as well as any external MIDI controller such as a pitch-bend or modulation wheel — these alterations may be made in real time, non-destructively. Movement of the front-panel knobs is transmitted at the MIDI out jack for recording to a MIDI sequencer.

One of the most striking abilities of the VP-9000 is that, in the middle of a phrase, you can change the pitch of a sound without changing the tempo; or you could use any modulation source to change the tempo *mid-phrase without affecting the pitch*. Sounds may also be processed by an on-board effects engine that generates reverb, chorus, and delay, and includes a multieffect section

continued on page 146



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CIRCLE 55 ON FREE INFO CARD
World Radio History

Yamaha AW4416 Digital Audio Workstation

Yamaha debuts an all-in-one box that really has it all

BY STEVE LA CERRA

Even when you deal with technology every day, it's still pretty amazing to see how much digital audio horsepower can be delivered in packages that are continually shrinking in both physical size and price. A perfect example is the Yamaha AW4416 digital audio workstation. Debuting several weeks ago at Winter NAMM 2000 in Los Angeles, the AW4416 provides an almost frightening amount of mixing DSP power, 44 input channels, 8 busses, 8 aux sends, plus an onboard hard-disk recorder in a package that's only about 22 wide x 18 deep x 6 high (inches) in size.

At the heart of the AW4416 is a digital hard-disk recorder with (at least) a 10 GB, 2.5-inch IDE drive for storage, allowing a minimum of 80 minutes of 16-track, 24-bit/48 kHz recording. The unit is capable of recording (and playing back) uncompressed audio at either 16-bit or 24-bit word lengths, at sample rates of either 44.1 kHz or 48 kHz. In the 16-bit mode, the AW4416 can record up to eight tracks while simultaneously playing back 16 tracks. In 24-bit mode, 16 tracks may be recorded and played back simultaneously. Word length is determined by the user on a song-by-song basis, and both 16-bit and 24-bit songs can exist on the drive simultaneously.

Maximum storage space per song is 6.4 GB; those musicians, engineers, and producers who work in short snips of audio will be happy to hear that up to 50,000 songs may be titled and stored on the drive. Each of the 16 audio tracks may have up to eight virtual tracks layered

underneath — allowing (for example) eight takes of a vocal track to be comp'd into one finished track (song, track, part, and region editing functions are supported). A front-panel jog/shuttle wheel allows precise location and scrubbing of audio, while a built-in autolocator with transport control provides 99 markers per song, as well as auto punch in/out.

The top panel of the AW4416 is reminiscent of Yamaha's hugely successful 02R mixing console, containing a total of 17 60 mm, motor-driven channel faders (16-channel, 1 master). Above each fader is a channel on/off switch and a select switch that "picks" the channel for accessing functions like 4-band parametric EQ, pan and bus assignment, dynamic processing, phase reverse, attenuation, grouping, aux sends, and insert.

That last bit requires some explanation: the AW4416 contains two onboard multieffect processors that, under typical circumstances, will be used

via aux send 7 and aux send 8. However, these DSPs may also be inserted to a specific channel path for dedicated processing on a per-channel basis. For ease of mixing, channels may be designated to four fader and/or mute groups. Scene Memory provides instant snapshot recall of all console settings; additionally, mixes may be dynamically automated via Auto-Mix.

INPUT/OUTPUTS

As you might expect, the AW4416 features a variety of both analog and digital inputs and outputs included as standard. Eight analog mic/line inputs are provided, the first two featuring TRS and XLR input connectors, phantom power, and hardware TRS inserts (channels 3 through 8 are mic/line inputs on TRS connectors). An S/PDIF I/O is provided for interface of a digital 2-track such as a DAT machine; stereo analog outs are also available for main mix out and monitor output. Four

continued on page 142



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World Radio History

Garden View

A real room with a view,
The Vertical Corporation
flies high in
New York City

STUDIO NAME: The Vertical Corporation
KEY CREW: Curtis Curtis, owner
LOCATION: Midtown Manhattan
PROJECTS RECORDED: Billy Pace, Princess Superstar, Curtis Curtis, Rasa-Don (of Arrested Development), T.J. Tindall Experimental Theater Company, Marni Pickens, Dead Marilyn
CONSOLE: Amek/TAC Magnum (36x24x8x2); Mackie HUI for Pro Tools control
MONITORS: UREI 811; Tannoy System 6; KRK Krok; Electro-Voice Sentry 100
AMPLIFIERS: Crown Macrotech 2400 for the UREI 811's; Hafler amplifiers for everything else
COMPUTERS AND SOFTWARE: Pro Tools Mix Plus V5.0 (a four-card system with a total of 22 DSP chips!) plus lotsa' TDM plug-ins; PowerMac 9500 with G3/400 MHz accelerator card, 2.0 GB hard drive, and 144 MB RAM (the G4 is en route); Glyph 18 GB hard drives [2]; Logic Audio 4.0; Digidesign 888; Apogee AD8000
RECORDERS: 24 tracks of Akai ADAM's (two machines); Otari MX5050, 1/4-inch, half-track mastering deck
DAT MACHINES: Panasonic SV-3900 and SV-255; TASCAM DA-50 and DA-30
MICROPHONES: AKG "The Tube" and C414 TLI; Neumann M147 and KM184 [2]; Audio-Technica AT4050; Shure SM81 and SM57 [6]; Sennheiser MD441; Astatic JT-30 crystal mic; Crown PZM
OUTBOARD GEAR: Amek/Neve 9098 mic pre/EQ; Demeter Tube Compressor; Eventide H3000 Harmonizer™; Yamaha REV7 and SPX90; Alesis Q2 and Quadraverb [2]; dbx 160X
KEYBOARDS AND DRUM MACHINES: Arp Odyssey, Solus, Quadra, and Little Brother; Moog MemoryMoog, Source, Micromoog, Etherwave Theremin, and Moog Modular with 30 modules, 2 cabinets, and 960 sequencer; Korg MS-20, Prophecy, 01/W, Wavestation SR, M3R [2], Poly 800, EA-1, and ER-1; Roland Jupiter 8, Jupiter 6, JP-8000, Juno 106,

SH-2, SH-3A, TR-909, TR-808, TR-707, TR-606, TB-303, JV-880, SP-808, SP-202, DR-202, MC-303, MC-202 [2], CR-68, and TR-55; Oberheim Xpander, Matrix 6R, Matrix 1000 [2], OB-Mx (6-voice), and OB-1; EMU Orbit, Vintage Keys, Morpheus, Planet Phatt, Proteus [2], EIII, ESI-32, and Drumulator; Alesis S4 and D4; Quasimidi Raven, RV-309, and Technox; Novation Nova, BassStation keyboard and rack, and Drumstation; Waldorf Microwave and Microwave II; Sequential Circuits Prophet 5 (rev 3, Kenton), Six-Trak, Drumtracks; Casio CZ-101 and VZ10M; Clavia Nord Lead (12-voice); Studio Electronics ATC-1; Yamaha RM-1X and TX-81Z; Electro-Harmonix 040 Mini Synthesizer; Oxford OSC Oscar; AKAI MPC2000 with 32 MB, multiport expander, FX card, Zip, and ROM drives; Acetone Rhythm Ace (1969)
MISCELLANEOUS: SampleCell II; Opcode Studio 5 MIDI interface [4]; Kenton Pro-4; Gretsch drum kit (circa 1978) with Sonor hardware; Marshall TSL 122; Music Man 212-HD (tube amp, 1978); Yamaha and Marantz CD-Rs; Roland SVC-350 vocoder.
STUDIO NOTES: According to Curtis Curtis: This penthouse studio is located in a building right next to Madison Square Garden, which is home to many musicians as well as rehearsal studios, a music store, and even a club. This truly is a room with a view...I can look right down on the Garden from the control room and the live room. I can even tell when the Knicks' games let out — which is good because the street is full of fans and no available cabs! As for the history of the studio rooms, I'm not sure who actually built them, but they are floated and provide pretty good isolation. I've had lots of great sessions here.
EQUIPMENT NOTES: Curtis continues: I love my analog synths. I've been collecting them since the '70s when I got the Roland SH-2. The collection is mostly American and Japanese synths, each with its own personality. The Moog Modular has come in handy for a number of signal processing effects. Sometimes I even set it up on the I/O bus of



the Apogee converters as an insert effect in Pro Tools. Another thing we've been having fun with is the Astatic crystal microphone. It has a pretty narrow frequency range, having been designed for harmonica — but I've been using it for intense female rap vocals. It has a real radio-like quality and cuts through a mix in its own special place. As for the Amek/TAC console, I'm glad I never went through the trouble of putting automation in it. I use it mainly for monitoring now, and if I need the preamp inputs, it has a great British sound.

PRODUCTION NOTES: Curtis states: Lately I've been really paying attention to beat clock. With Pro Tools 5, I can send beat clock all around the studio to the MIDI interfaces to get all of the arpeggiators, LFOs, and drum machines going in time with each other and Pro Tools. Then I record the parts I want back to the computer and it stays rock-solid. I've even been able to make this work with the old 960 sequencer from the Moog Modular. Here's how I do it: I send beat clock to the Novation DrumStation, which has a DIN sync output. I connect that sync output to

the DIN input on a Roland TR-606. The '606 has two 5-volt triggers for the high tom and the low tom. I connect one of these to the shift input on the 960 sequencer. I program the TR-606 with quarter-note beats (or whatever note value I need) and *voilà!* I tweak the filters, keep adjusting the sequencer, and perform a live loop back into the computer. I usually apply the sequencer to the two Moog filters (stereo effect!) from different sections of the sequencer. [Curtis Curtis may be reached via e-mail at info@verticalcorp.com.] **EQ**



PHOTOS BY LINDA OBUCHOSKA

RCA SK-46

Announcing this
blast from RCA's past

MICROPHONE NAME: RCA SK-46
FROM THE COLLECTION OF: William Meredith, Cinesound Company, NYC
YEAR OF MANUFACTURE: Circa 1961
PRICE WHEN NEW: \$59.25 (as of November 1, 1961)
TYPE OF MIC: Ribbon transducer
FREQUENCY RANGE: 50 Hz to 10,000 Hz
POLAR PATTERN: Bidirectional
OUTPUT IMPEDANCE: 200 ohms or 15,000 ohms
OUTPUT LEVEL: -58 dBm for low impedance operation; -60 dB below 1 volt for high impedance operation (@ 1 kHz)
OUTPUT VOLTAGE: 117 μ volts/dyne/square centimeter (low impedance); 1020 μ volts/dyne/square centimeter (high impedance)
HUM PICKUP: -113 dBm, low impedance relative to a field of 1×10^3 gauss
MOUNTING: 5/8-inch — 27 thread
DIMENSIONS: 5 1/8 high x 1 29/32 wide x 1 3/8 deep (inches)
FINISH: TV gray with satin chromium-plated screen
WEIGHT: 13 ounces without cable
MIC NOTES: According to literature from RCA, the SK-46 Program Velocity Microphone was intended for AM, FM, and TV studio or control room announcing. Directional characteristics of the SK-46 were intended to reduce unwanted acoustical background noise, reflections, and feedback. During the same time period, RCA manufactured the SK-35 Anti-Noise Microphone, which was almost identical to the SK-46 except for the addition of internal damping designed to attenuate the pickup of extraneous noise.
USER TIPS: One of the more interesting acoustic characteristics of the SK-46 microphone is its change in frequency response relative to distance from the sound source. At a distance of about 6 inches, frequency response of the mic is within a tolerance of about ± 3 dB. However, free field response of the mic is markedly different, dropping off steeply below around 400 Hz — down to almost -20 dB at 50 Hz. If you're trying to achieve a warm bottom end when using this mic for vocal or acoustic guitar, keep the mic about 6 inches away from the instrument.
Technical data furnished courtesy of Clarence Kane, ENAK Microphone Services, Pittman, NJ.

EQ



PHOTO BY EDWARD COLVER

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CIRCLE 73 ON FREE INFO CARD

World Radio History

CIRCLE 53 ON FREE INFO CARD

In the process of mastering music, Ernest frequently looks at the dynamics in various frequency bands. Out of curiosity, he started applying this kind of analysis to existing recordings that he considered emotionally satisfying to see if they had any common characteristics, and he also compared this to music he didn't find as satisfying. As we go through these examples, remember his criteria were not whether the music was "good" or "bad," "commercial" or "non-commercial"; he was looking solely for music that has an emotional impact, preferably on a significant number of people as to provide a sort of validation regarding a piece's ability to move people.

Consider fig. 1, which shows amplitude vs. time for the treble band of two violin performances of Bach's "Solo Violin Sonata in G (the Adagio)." The upper is Sandor Vegh's performance, and the lower is Itzhak Perlman's. When Ernest sent me the graphs along with an audio CD of the performances, I decided to listen to the audio CD first. I definitely found Segh's performance more emotionally satisfying than Perlman's. Upon looking at the graphs, I noticed that Segh's dynamics were not only wider, but more tightly controlled, ramping smoothly from peak to valley.

Fig. 2 compares two performances of Holst's "The Planets" (in this case, Mars) by the Toronto Symphony on the top, and the Montreal Symphony on the bottom. When listening to the CD, I preferred the Montreal version, and, again, their graph shows more tightly controlled dynamics.

Now consider the graph of the Chemical Brothers' "Block Rockin' Beats" (fig. 3), and its relative lack of dynamics in the treble, midrange, and bass frequencies. Actually, I really like the tune, but that's because it moves my body, not necessarily my emo-

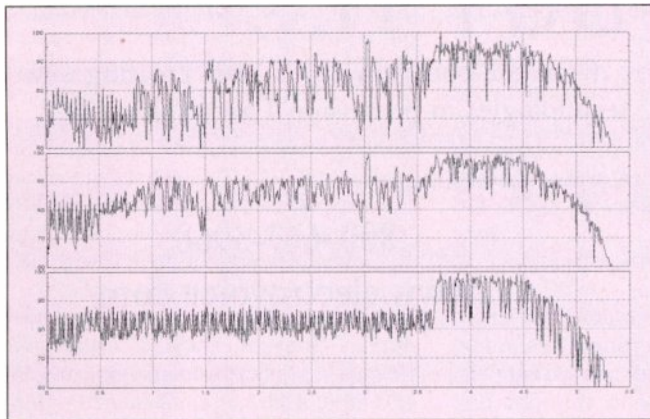


FIGURE 4: Dynamics for the treble, midrange, and bass regions (going from top to bottom on the graph) for "In the Air Tonight," by Phil Collins.

tions. Perhaps this is why many people, when reacting to electronica, find it lacking emotion; the dynamics-killing aspect of excessive compression could be the culprit.

Fig. 4 shows the treble, midrange, and bass graphs for Phil Collins's "In the Air Tonight," which is a very emotional song. Of course, the vocal performance is a big part of that, but note how the bass anchors the tune during the first two-thirds of the song, while the midrange and treble build slowly but relentlessly. During the climax, the drums and the bass guitar kick in, contributing a major surge of bass that takes the tune to a higher level.

THE BOTTOM LINE

As with the feel factor regarding timing, all of this seems obvious in retrospect — "of course dynamics make a difference in music." But, by analyzing these graphs, it's pretty easy to see it's not just dynamics that makes a difference, but the degree of control over those dynamics. In other words, practicing dynamic control is as important as practicing any other aspect of music, such as

pitch discrimination. Perhaps this is also why some people feel automated mixing has taken some of the soul out of music;

ANALYSIS GEAR

For his audio analysis and mastering projects, Ernest uses the following:

Computers: Powermac 7100 [2], PowerMac 9600 [2], and a 300 MHz Pentium II.

Sound Cards: Audiomedia II, SampleCell II, and Ego-Sys Waveterminal 2496

External Monitoring DAC: Audio Alchemy Digital Decoding Engine V1.1

Software (Mac): Momentum Data Systems' DSP Designer, Digidesign Sound Designer II and PowerMix, BIAS Peak, and MOTU Digital Performer

Software (Windows): GigaSampler and Cakewalk Pro Audio

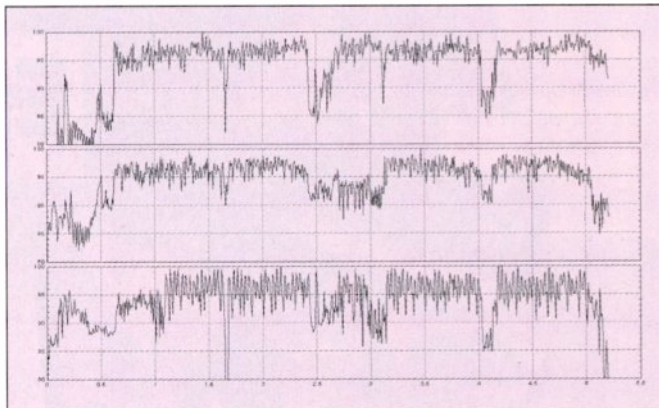


FIGURE 3: Dynamics for the treble, midrange, and bass regions (going from top to bottom on the graph) for "Block Rockin' Beats," by the Chemical Brothers.

in the pre-automation days, engineers were more prone to add dynamics to the mix with faders. I vividly remember watching an engineer at CBS Studios (who had several hits, by the way) keep his eyes completely closed as he mixed, so he could concentrate on moving the faders rhythmically and dynamically. I must say it was a compelling mix.

In any event, in these days when we have so much control over music (be it through digital audio or MIDI), here's one more element that deserves further exploration. If you come up with any interesting insights of your own, you can contact Ernest via www.numericalsound.com.

Craig Anderton has played on, produced, or mixed 17 major-label recordings, presented lectures on technology and the arts in 37 states and 10 countries, and written 15 books. He is also the online content editor for the MPN Network (www.MusicPlayersNetwork.com).

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Standin' at the Crossroads



PHOTO BY JONATHAN POSTAL

What is it that *really* drives your life

BY AL KOOPER

There comes a time in the life of every pro audio enthusiast when the inevitable crossroads appear. You've devoted a high percentage of your time and life to your studio/band/retail business and you're getting that sinking feeling that you may have erred in judgment. Should this be your livelihood or your passionate hobby? Let's examine:

1) **Are you truly supporting yourself from your audio endeavors?** At the end of the year, is your business putting *all* your food on the table? Or is a *second* job truly supporting you? If handing out menus is your prime source of income, then refocus, and realize that the audio part of your life is a *hobby* with potential or no potential. It's best to place yourself in the real world. It is a lifesaver when you divide your life/time more realistically.

2) **Can you afford to invest more money on maintenance and/or new equipment?** This is a toughie. If you *don't* relap the heads on that analog 24-track machine of yours, it might well metamorphasize into a small boat anchor. If you *do* relap those heads, your wife may take off with the kids in tow 'cause popcorn ain't the best dinner to contemplate three nights in a row. Ditto

on purchasing that new digital console that will free up quite a lot more space in your control room. Priorities are everything. Studios come and go, soul mates and flesh and blood appear maybe once in a lifetime.

3) **Has that glamorous life in rock 'n' roll you dreamed of mutated into playing in local bars every night (if you're lucky) for the door take?** If you're single and you can hang with it, I gotta admit — playing music live beats going to an office or slinging hash every day/night. Again, if you're in a relationship, it gets old for a spouse to sit home alone nightly or haunt a barstool perennially listening to the same old tunes. It's hard to admit that you're on a one-way-street to palooka-ville, but so much better when you point your life in a better direction that could possibly brighten every day and every night as well.

These are just three of myriad questions that are important to ask yourself on a regular basis. Denial is a costly sin in the music business. It's sad to watch your heroes from another decade shave their heads and try to play music that couldn't possibly be from their hearts. It brings a tear to one's eye to watch your favorite studio close after years of faithful service, only to be renovated, re-designed, and re-opened in such a configuration that you definitely wouldn't wanna book time in there anymore. But, as the late Hoyt Axton used to say, there are only three constants in life:

1. A cowboy hat blows off in a stiff wind;
2. Sex rules the world; and, last but certainly not least,
3. *Things change*

Make sure you've got what it takes to make those unforeseen changes work for you chronologically, spiritually, and financially. If not, immediately plan what direction you want your life to go in *realistically*, and implement that plan as soon as possible.

Now, I know there are exceptions to the rules. There are *always* exceptions to the rules. Bonnie Raitt, Carlos Santana, Al Schmitt, Tom Dowd, and our own Roger Nichols contradict everything I've said so far. They have either hung on longer than anyone could have been expected to or kept their windows of opportunity open far longer than their peers. Their collective dignities are intact. But they probably represent less than 10 percent of the people who are pondering at the previously mentioned crossroads. For the other 90 percent, let this be a wake-up call.

I was *always* aware that I had a certain amount of time (Andy Warhol's famous 15 minutes) in the limelight and how important it was to know when that time was up and move along. I saved up fantasies to pursue at a later date, and I am pursuing them avidly now with a smile on my face. Teaching school, writing books and for mags like this, DJ'ing, and acting are just a few of the things I was way too busy to investigate when I was a full-time musician-producer. Now it seems like a luxury to implement Plan B. If I

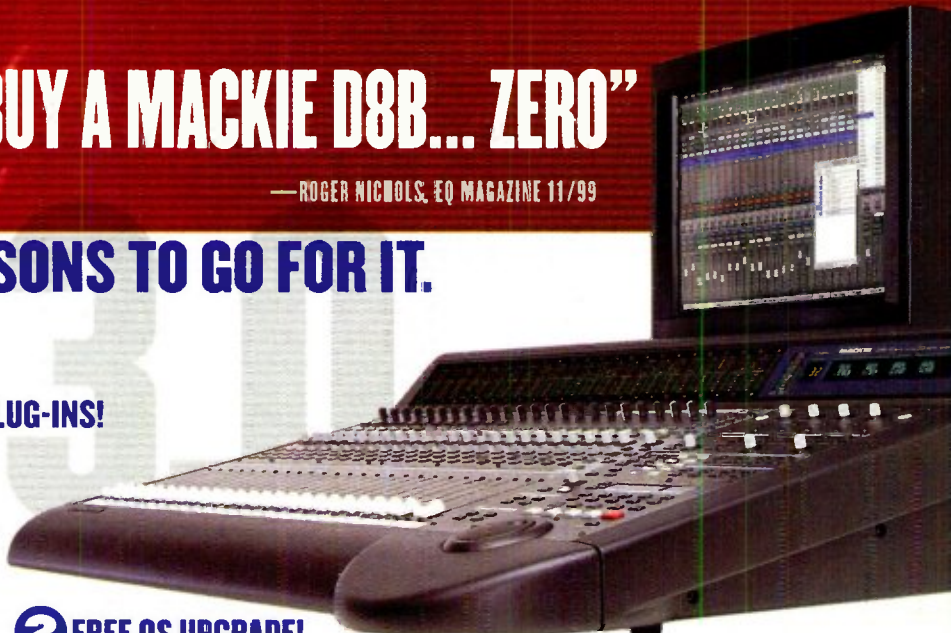
hadn't had a Plan B, or if I never realized that rainbows *do* end, I could have had serious career trainwreckage in my life. But my transition was seamless due to long-range planning. If this doesn't apply to you, well...uh...what can I say? Congratulations! You've actually survived the music business...so far. **EQ**

Denial is a costly sin in the music business. It's sad to watch your heroes from another decade shave their heads and try to play music that couldn't possibly be from their hearts.

"REASONS NOT TO BUY A MACKIE D8B... ZERO"

—ROGER NICHOLS, EQ MAGAZINE 11/99

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CIRCLE 27 ON FREE INFO CARD

World Radio History

Susan Herndon



PHOTO BY ED FREEMAN

The engineer/
producer/musician
paves her own way in
the recording industry

BY MR. BONZAI

Mr. Bonzai: What's your main equipment here at Madhouse?

Susan Herndon: Trident 80-B — I love this console, and I can take it apart and put it back together again. I also have an Otari MTR-90 Mark III, and my main microphone — you're gonna love this — is a Neumann U 87 with an Innertube Audio

retrofit. The guts have been pulled out and it's retrofitted with a tube. The capsule is from the '87. I use an Akai DR-4 hard disk for all my vocals. I have a JOEMEEK Studio Channel and a few compressors. We just record here — no mixing.

What are you working on now?

I'm mixing the Ra Ra rap record for MCA over at Skip Saylor's on the SSL Axiom MT, and I'm co-producing a rock artist, Mark Mason, with Rick Allen. I like the MT because I can work so amazingly fast. Before we send our tapes into the labels for approval, I will slam through five mixes in two days, and whatever they accept, I just go into a 15-minute recall, spend a few hours, and dial it in. I have all my presets stored.

Can you tell me about your work with Brandy?

I did some vocals with her — no big

Suspect: Susan Herndon

Occupation: Engineer/Producer, Musician, Studio Owner

Birthplace: Atlanta

Residence: West Los Angeles

Vehicle: '89 Firebird "Musclecar"

Pet Peeves: "None. I'm treated really well, and, during the past few years, being a girl has been an advantage. The record labels remember me because I'm one of the few chick engineers. I'm glad to see more and more female assistant engineers in town — girls have more sense and a softer touch."

Credits: Recorded Immature's *The Journey* and mixed *Introducing Imx*. Remixed Tatyana Ali's "Daydreamin'." Recorded Keith Washington, Smooth, Jesse Powell, Brandy, Dogg Pound, Mack 10, K-Ci & JoJo, The Pointer Sisters, and Bizzy Bone.

Notes: The subject has been engineering for 12 years. Co-owns Madhouse Studios, previously known as Granite Recording and Silvery Moon.

Comments: Special thanks to *EQ* reader Leslie Oaks, who wrote to me: "There is an engineer that you should meet...She's amazing. Not your typical engineer. She is not only a girl, she is missing an arm from the elbow down. And she's good — damn good!"

deal. But she's coming in here to record, and it looks like I'll be working on her next record with producers Chris Stokes and Platinum Status. **The Dogg Pound?**

They were doing a guest appearance on the Immature record. Immature has since changed their name to Imx, and I mixed their current album on the "J" over at Pacificque. This is my third record with them, and I've toured with them doing live sound. I'm so proud of those boys — and I couldn't believe it — girls in the audience have actually fainted at the shows. **Who else are you proud of?**

Let's see — I recorded Jesse Powell's record, which went gold about six months ago. I've done a bunch of stuff with Keith Washington — both Keith and Jesse work

with producer Rodney Jerkins. **Why are you so popular with black artists?**



SUSAN HERNDON PHOTOS BY MR. BONZAI

Highways of Creation

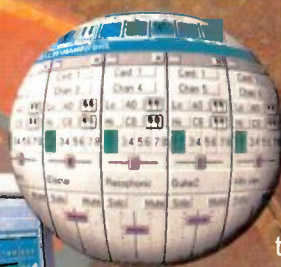
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CIRCLE 13 ON FREE INFO CARD

Umm...no idea. I got a gig and I guess I'm good at it. [Laughs.]

What was your first big triumph as an engineer?

The Immature record. I was the assistant on their first record, with Claudio Cueni engineering. I moved up to engineer on their next record, and on their most recent record I was the mixer. I've grown up with those kids. I worked at Para-

mount Studios for three and a half years, and that's where I met many of the people I still work with today.

Who instructed you in the art of engineering?

My first gig in a studio after doing live sound and radio engineering was at Boulevard Sound, assisting Allen "Blaze" Blasik. I learned so much from him — especially how to get great drum sounds.

Who owns Madhouse Studios?

I do, with my two partners — one is a producer and one is my manager. Everything The Ultimate Group — my management company — does is recorded here. I now have Joe Breuer doing a lot of the recording, and he sends the tapes over to me wherever I'm mixing. I like working here — when I recorded Rick Allen, we had his drums set up for eight months,



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and you can't do that in a commercial studio. We would change things a little every day and get 'em dialed in real tight. **Some may say you have a handicap — but it doesn't seem to be for you.**

It's not.

Did this happen when you were a young girl?

I was born this way, so it's natural for me. **How has that made you a different kind of person?**

It's probably made me stronger. I was never told I couldn't do anything. I

played on softball and basketball teams. My mom put me on the piano when I was six, and I could read music by the time I was eight. I got a guitar when I was 12 — but that was traumatic.

I wanted to be a rock star, and I signed up for a guitar lesson. This old fuddy-duddy told me I could never play guitar because I didn't have two hands. I was so mad — I went out of there crying and I taught myself. I played trumpet in school band. I'll play anything you put in front of me — I have no shame.

How would you describe your recording style?

Lots of bang with my R&B work. Nice vocals — I drop them on the hard disk and I can fly those puppies in so fast. That got me lots of gigs. Getting the hard-disk recorder was the best money I ever spent.

Any secrets?

I keep things simple, and I have certain setups that I use every time. I stick with the things I know, and I have recall sheets on every vocalist I've ever worked with. With vocals, I use my U 87 to record straight to tape. In the mix, I'll usually go through an Avalon 737 with a little compression, and out of there into whatever the best EQ is in the rack, and then a second compressor to catch everything the first one misses. And, in the mix, I always put up all the faders and listen to the song in its entirety before I even begin to get any sounds.

What do you listen to while cruising around in your Musclegar?

Oldies from the '50s, and I listen to classic rock stations.

If you could go back before recording existed, what would you like to hear?

The ancient Native American tribal music.

What is the first music you remember hearing as a child?

My mom playing the piano.

Any heroes?

Rick Allen was a huge inspiration for me. As a drummer who lost his arm, I couldn't believe the man could still play drums. I went from Atlanta to Chattanooga to see him play, and he inspired me to join my first band a week later. It's really cool that here I am working with

continued on page 146



**One fish
two fish
red fish
blue fish**

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CIRCLE 52 ON FREE INFO CARD
World Radio History

Building the Mix

Al Schmitt reveals his secrets to his more than 50 years of making chart-topping songs

BY HOWARD MASSEY

"Legendary" is a word that is often bandied about too freely. But what else could you say about a man whose first session was for the Duke Ellington Orchestra and whose work continues to dominate the charts? After more than half a century behind the board, Schmitt is universally acknowledged as being one of the absolute masters of his trade, a fact that is reflected in the multitude of Grammys he has won and in the more than 150 gold and platinum records he has produced, engineered, and/or mixed for an incredibly wide range of artists: from Henry Mancini to Steely Dan; from Frank Sinatra to Jefferson Airplane; from Eddie Fisher to Duane Eddy; from Barbra Streisand to Neil Young. Soft-spoken yet intense, Schmitt took some time out to talk with us in-between sessions for Diana Krall's *When I Look In Your Eyes* — a project that has since then won him a Grammy nomination for Best Engineered Album of the year.

EQ: How do you feel the rise of the project studio has impacted on how records are made today?

Al Schmitt: In general, the demos that I get now sound better than a lot of records that were made 15, 20 years ago. A lot of it comes from the sharing of information between musicians and the fact that they loan one another gear. I do a lot less work on overdubbing things like guitars and keyboards and synth parts than I used to do because a majority of it now is being done at home. So I work with an artist and we'll do the basic tracks; when everything's done, we'll transfer stuff over to ADATs or DA-88's and they'll take that home and put all the other stuff on what we used to spend hours in the studio doing. When

they get all the overdubs done, we bring it in, we dump it back in, do whatever finessing we have to do, and then we mix it. So it's helping with budgets and so forth.

Is it possible to make a good acoustic recording without a top-of-the-line microphone?

I'm a microphone freak, and I know that a lot of the microphone companies are

getting into making microphones for less than a thousand dollars that are great. The one that kills me is the Neumann 103 — that's a fabulous microphone. Audio-Technica's also making some good microphones for reasonable amounts of money. I've been using the Neumann for dates — and it's rare for me to use a cheap microphone on dates — but I've been using it on guitar



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IF YOU'VE BEEN FLIPPING through the pages of this magazine, you've almost certainly noticed the intense focus on microphones. From the proliferation of exotic new mics to the almost cult-like following of certain historical classics, never has the choice been greater. Or the prices higher. A perfect time, in fact, for Antares to introduce our new Microphone Modeler.

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on an album I just finished. I also used it on trumpet in a section. It sounded fabulous.

If you're working with an inexpensive mic versus a \$10,000 mic, is the placement the same or different?

The placement is pretty much the same. Even with real expensive microphones, no two microphones sound exactly alike; I don't care what anybody tells you.

But will you put them in the same place?

Yeah, I would start out that way, but that doesn't mean I'm going to leave it that way. First of all, it depends on the player and how he plays. Moving the mic an inch can make all the difference in the world. The most important thing is to stand out there when the guy's playing. Whether it's trombone or trumpet or violin, listen to what it sounds like, then try to place the mic where you think it should be placed. One of the best gauges is the guy that's playing the instrument himself. The player can give you a general idea of where the best place is for the sound that they put out, so you should start in that direction. The best friend an engineer has in the studio is the musician. You've got to be friends with the musician — you've got to get out there, you gotta make his life easier because he's gonna make *your* life easier. The more comfortable they are, the better they play and the easier it is to make records.

Do you ever experiment with miking at the musician's ears?

I've tried that a few times. It doesn't always work and it also depends on what else is going on. If you're just overdubbing a musician, maybe you can do that, but if you get other things going on in the same room — in the same vicinity — it doesn't always work that well. You've got to have some sort of separation; you can't have what's playing three or four feet away louder in the mic than the guy that you're trying to mic. Except that you do want to capture the ambience and the leakage because that's what makes the thing sound big. You have to keep that in mind when you're placing microphones — and also where you place the musicians. Most guys who have studios at home are usually doing one instrument at a time — it's usually an overdubbing thing. They usually don't have a rhythm section in there, so they won't have that problem.

How do you generally mic acoustic guitars?

It depends on what kind of guitar it is. If it's a round-hole guitar, I'll usually put the microphone off the hole, maybe 18 inches away. And I'll have the mic up a little, facing down towards the hole. We just did some acoustic guitar on this Diana Krall record, and I used a C12. It's a \$10,000 microphone and it sounded wonderful. But you can get by with AKG 451's; certain Schoeps are also good. I've also tried this new Neumann 103; that sounded great on acoustic guitar, and we were very happy with that.

So you work down by the hole, not up by the frets?

No, down at the hole. Sometimes I use two microphones — I may have one up on the frets and one down by the hole. But the hole is there for a reason. It's like when you're miking a bass — you don't put the mic way up on top on the bass, you put the mic down where the F-hole is. I'll put up a tube U 47, and it usually just sounds wonderful. I had a guy in just recently, and with the tube '47, the bottom end of the bass was great, but I wasn't getting that nice top, so I took a Schoeps and I put it up where his left hand would be — I had it up high — and I just touched a little of it in there, but it gave me that top end and the bass sounded great. The bass player was thrilled because he said he never gets that kind of sound.

If you're using two mics on an acoustic guitar, would you record it in stereo?

If I have the availability of tracks, yes. If not, I'll blend them together.

But will you look for a stereo image?

Not really. You may get a little bit of imaging, but I wouldn't try to get a real broad stereo image on it — maybe just a little bit. And, even if I was going to pan it off center, it would just be a little off — a little left and a little right of cen-

ter — just to give it a little bit of stereo.

How do you approach electric guitar amp miking?

I learned a long time ago that, 99 percent of the time, a [Shure] 57 works. I'll put up good microphones and the musician will usually say, "That's not quite what I really want to hear," so then I'll stick a 57 up and they'll say, "That's it!" So I'll do that and then I'll put a really good mic up — maybe a Neumann U 67 or an M 50 — for the room

How far away would the room mic be placed?

It depends on the room. It could be anywhere from 15 feet to 20 feet.

And the close mic, is that on-axis?

Yes, on-axis, and a little off the center of the cone, on-axis.

When you record electric bass, do you typically use some amp, or is it always just DI?

I use a Demeter tube DI, and my chain on that is, it goes into the Demeter, into a Summit. I'll limit maybe a dB — I want to get the tube sound — and that's it. No EQ.

So you don't typically use bass amps at all.

Very, very rarely. And if I do, then I'll try maybe a FET 47 on the bass amp. But very rarely do we do that anymore; I don't get the call for it much.

What's your approach to recording acoustic piano?

I know that Ed Cherney says the most difficult thing in the world to record is the human voice; I say the piano is the most difficult instrument to record well.

I've been doing so many

piano records — I work with Joe Sample, Bill Evans, on and on and on. Lately, I've been using the new Neumann M 149's on piano. If it's a solo instrument — and by that I mean if the artist is not singing — I'll use an AKG C24 stereo microphone off the piano. So I'll have the two M149's close in on the piano, and then off the piano — if you open

"The biggest mistakes that happen in project studios are the result of the monitoring systems."

the piano lid, just where it curves — I'll have the C24 right up in there. If I have the tracks, I'll use four tracks, and then I can blend them in however I want to. **Where do you place the close mics?**

The close mics are usually a couple of feet off the high end and a couple of feet off the low end, kind of at 45-degree angles to each other. And then you move them around a little bit. Again, it depends on the player, it depends on the instrument. Again, I'm lucky in that I'm going [to] the kind of artists where we rent 9-foot German Steinways, so the pianos all sound good.

Have you done much recording of upright pianos?

Sure. I use to do all that stuff with Mancini years ago — there were a lot of upright pianos. I used to put two mics behind the piano, off the sounding board. You've got to place the mics where they pick up all 88 keys.

So you'd work in stereo.

Yes, but if a guy's doing an effect where he's just playing something up on the high end, then you just worry about that part of it, just zero in on that section.

Do you often re-amp DI signals?

I do that all the time when I'm mixing — I'll feed signal through really good speakers out in the room and then put some mics up reasonably close to the speakers and then maybe some mics further back. I might even use a little bit of delay on it.

What's your take on the resurgence of tube gear over the last few years?

Well, for me, it's not a resurgence since tube gear is all I ever use! [Laughs.] I like old boards — Neve consoles and APIs — and I use all-tube microphones on my sessions. If you walk in on one of my sessions when I'm doing a big orchestra date, there might be 30 mics out there, and they'll all be tube microphones — and 95 percent of them will be Neumanns.

I think my all-time favorite mic ever made — for a microphone that does anything — is the [U] 67. I use it on strings, I'm using it on Diana's vocals, you can use it on upright bass, you can use it on saxes, trombones, trumpets. To me, it's the most flexible mic made that sounds really good. If I was going to buy one mic, that would be that would be the mic I would buy, although now they're very expensive. I'm sorry I didn't buy all those mics for \$300–400 apiece when I had the opportunity!

You mentioned that you sometimes use

a little light limiting when you're recording bass.

Yeah, but I mostly do what they call hand limiting, where you ride the fader on the vocals; I still do that a lot. When I use a limiter or compression, it'll be for sound or for an effect. Maybe I'll squash the hell out of a sound if I'm looking for a certain effect on it, but, in general, I use very little EQ and very little limiting. **I know that, in recording, you get sounds from mic placement rather than from EQ, but do you use very little EQ on your mixes, too?**

Yeah — I almost try to turn it off. If you look over my shoulder at the board, you'll see very few EQs.

Do you find yourself using more compression on mixing than during tracking, or do you still keep it very light?

Very light. If a compressor's [affecting] 2 or 3 dB, for me, that's an awful lot.

So I guess I shouldn't even ask if you ever strap one across the stereo bus.

You know, I've done that; in fact, I just did that recently on [a project where] we were trying to match something that was done in Japan and it needed a little bit of compression overall. I wound up using an old SSL stereo limiter and it sounded pretty good, but I only did like a dB and a half on it. It did work.

Do you do a lot of digital recording, or are you still sticking with analog?

I stick with analog mostly, but I do some digital. Digital is getting better and better, but I still prefer analog. At some point, there won't be any more analog; someday we won't have tape machines any more — it will all be going into the computer, they'll have the sound down so well. Hopefully, I'll be out fishing when that comes about! [Laughs.]

What's the most common problem that you hear in tapes coming out of project studios?

The biggest mistakes that happen in project studios are the result of the monitoring systems. I get stuff where 90 percent of the time it's overloaded with low end for some reason; I think they try to overcompensate for [monitoring deficiencies] in some way.

So I guess the assumption has to be that some of the monitors that people are using in project studios are bass light. They're either bass light, or something's going on [acoustically] in the rooms they are in. I've got to say that, in general, I'm really impressed with stuff coming out of project studios. But, no matter how good the equipment is nor how good the

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speakers are or anything else, a big part of it depends on the guy that's putting it together — the engineer/producer/musician or whoever is doing it. A lot of guys don't know how to balance things, so what sounds right to them may be totally wrong to me.

What are your personal favorite monitors?

I use the Mastering Lab monitors — the hybrid that they put together with the Tannoy 10. I have four of those; I'm trying to get another one so I can do my surround mixes on them. But I did [Natalie Cole's] *Unforgettable* on NS10's. My wife is an audiophile, and she rarely ever comes to the studio, but she came to this studio and she saw the NS10's and she just gave me a working over about how can you do this? [*Laughs.*] You've got \$50,000 worth of musicians out there playing their hearts out and you're listening on this \$300 crap, you know? [*Laughs.*] But it's just what you get used to.

So are you recommending that people stick with NS10's in their project studios?

In an oblique way, I am. The reason why NS10's got so popular was that every studio had them. Years ago, it was the Big Reds with the crossover networks and all that. When it got down to the nearfields, in every studio there was a pair of Auratones, the "Horrortones," as we used to call them. Now, with the advent of all these great new nearfield speakers, you walk in the studio and everybody's got different monitors.

What order do you bring faders up during a mix?

I start from the bottom up, like building a house — I put the foundation down. So it's the bass, the kick, the drums, then getting my echoes set — I have certain kinds of echoes I like to use on things. Then maybe I'll put the guitar or keyboard in. When I get the rhythm section set, then I may stick the vocal in for awhile and just kind of get that comfortable, get my echoes right. Then I'll take the vocal out and start adding other things in — violins or woodwinds or brass. Then I'll pump the vocal back in just to make sure we've got a relationship, and I'll take the vocal back out again and fine tune things, work on my echoes. I don't use a lot of echo, but I use a lot of different echoes. I may use as many as eight different chambers on a mix — sometimes more — all at different lengths. I try not to overburden

the chamber with too many things going in.

So you only send one or two sources to each echo.

Right. And that's pretty much it. I mix fast, so I can usually do a couple of mixes a day; I've done as many as four or five in a day on jazz albums. In general, even if it's large orchestral things and vocals, I'll always get two a day. But I work on the rhythm, getting that foundation first, making sure that's right and making sure the vocal is sitting in the right spot and with the right echo. If I'm working at Capitol, I try to get that live chamber on vocals as much as I can — that's a great chamber. If I'm not mixing there, I use the old EMT250 plate — the R2D2 — on vocals or my [TC Electronic] M5000, or I may use a combination of the two of them. I'll just finesse that for a while — I may spend 20 minutes just working on that, setting different blends, decay times, and so forth, until I get exactly what I want. And that's all that will go to the vocal — those chambers will *only* be used for that; I won't put anything else in there. But on each tune it will be different — I won't use the same setup on each song.

What sort of tricks have you come up with to get a problematic vocal track to sit in a mix?

You've got to equalize and get it set right, though you don't want to overdo that. Again, you should do hand limiting to make sure that you even the vocal out, because if you overdo a limiter, squashing it is not quite the same. Sometimes even taking a vocal [track] and putting it into a speaker in the room. Sometimes just a tiny bit — almost inaudible — will help give it a little depth and help it sit better. But fixing things in the mix usually doesn't work. [*Laughs.*]

What is your general approach to

recording vocals?

Well, you've got to use a good wind-screen, certainly — you've got to make sure that artist isn't swallowing the mic. That's one mistake that a lot of people make — they get too close on top of the mic and the diaphragm just doesn't work right when you're that close. My recommendation is that you stick your thumb to your nose and then spread your fingers out; you shouldn't be any

closer than that. In general, try to keep the singer anywhere from nine inches to a foot away from the microphone.

Do you usually use a large diaphragm condenser mic for vocals?

Yes, but even if you're not, you still don't want the singer to swallow the mic.

Do you mic vocals directly on-axis?

It depends on the artist. Some people have a lot of sibilance problems and you're going to try to adjust for that; others have major pop problems, even with windscreens. Sometimes, if a person sings down, I'll have the mic below them so they are singing into it; sometimes they sing up, and I'll have the mic up. The chain I normally use is the microphone to a really good preamp. I've been using the Martech [preamp] lately or the Mastering Lab preamp — I like both of those a lot, so it's one or the other. Then I'll go into the Summit, compress it a dB

or so, and that's it — I hand limit the rest. But when you're doing it at home, try to keep things on-axis. Also, there's a reason that there's red on the meter; it means be careful. You don't want to slam stuff unless you're looking for some sort of saturation; try to keep things relatively close to zero and get your cleanest sound.

What mics do you favor for percussion overdubs?

I always try to use a nice, really bright microphone — C12's or the M149's, but

*"The demos
that I get now
sound better
than a lot of
records that
were made 15,
20 years ago."*

a lot of times I'll use AKGs or Sennheisers. When I'm doing congas, I only use two mics and I try to XY them over the player's head. I usually place them at head level, pretty much where his ears are, but out over the instruments. For tambourines and shakers, the room determines where you put the mic; you just move it around until you're happy with what you get. There I'll use EQ sometimes, but, if I do, it's usually air. A lot of the home boards don't have that, but a lot of professional boards allow me to add 20,000 cycles. I can add 4 or 6 dB up there, which gives it some air; I try to do that as much as I can.

What's the single most important piece of equipment in the project studio? Where would you spend the most money if you were starting out building a modest room?

Personally, microphones are the most important thing to me, but you've also got to have a good board and you have to have a good monitoring system. The nice thing about using [modular recording systems] in project studios is that, as you get a little more successful and get a little more money, you can add on.

What sort of features should the project studio owner look for in a console?

It's got to have some good EQ because, usually, if you're recording at home, the acoustics in the rooms may not be as good [as in a commercial studio] and you're going to have to use some EQ to do things. I like inline boards so I can see what's happening straight up.

How important is the quality of the mic preamps?

That's the most important thing. I would try to spend some money on some good preamps — buy one and, maybe later on, buy another. That makes a big difference as far as warmth, because a lot of the digital boards, while they sound OK, they sound digital. They don't add that warmth you look for, and that's why a good tube preamp is so important. Save up enough money and get one at a time, and buy microphones when you can save up enough to get a decent microphone. They're always going to go up in value; these things don't lose their value, so a good microphone is a good investment if you can afford it.

I know that, unfortunately, a lot of project studio guys are working 9 to 5 and they're also trying to make these records at home, but when they can — if they're going to invest in themselves

and their studio — they should try to do it with some good preamps and some good microphones. You really can't lose on those, because you can always find somebody who'll buy it from you if you have to get rid of it.

What are the things you listen for in a demo when you're considering working with an artist?

The most important thing to me is the song, that's number one. If I'm judging the artist, I want to hear that material, because a mediocre singer can have a hit with a great song, but even a really good singer will rarely have a hit with a mediocre piece of material. So the first thing I listen for is the material, the song. The second thing is the vocal. If the vocal knocks me out and the song is mediocre, I'll still say, "Well, wait a minute; there's something happening here vocally. Now all we've got to do is find the right material and we could have something good here." Those are the most important things.

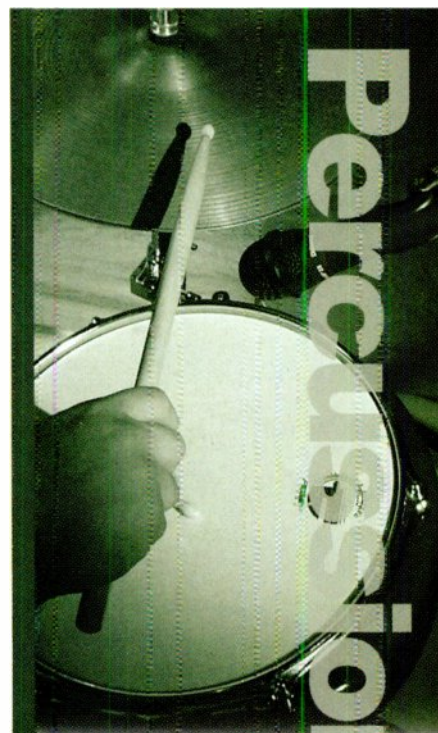
Can bad engineering obscure a good song?

Sure it can. And really good engineering can make a mediocre song or artist sound pretty damn good. I've had that happen — you say, "Wow, this is great," and then as you listen further on you realize that it's not so great; it was a good mix and a really good demo with good effects and all.

Do you have any other advice you can give our readers?

Well, if you're investing money and time in your own studio, you must love what you're doing, so just persevere. Don't let anybody beat you up, don't let anybody tell you that what you are doing is sh*tty. Stick with doing what you're doing; hang in there and keep doing it. Believe in yourself. I can't tell you how many times guys get turned down and rejected and battered about and then, all of a sudden, *wham!* — they just pop through. I don't know a better way to enjoy your life than making a living doing something you really love to do. I'm blessed that way, so it can happen to anybody! If you love doing something, you're going to do it well, and if you do it well, you'll make money from it and have a good life.

This interview is excerpted from Howard Massey's new book Conversations With Record Producers, soon to be available from Miller-Freeman Books.



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Recording in This **Little Room**

Vernon Reid has no regrets in using his project studio to record his latest effort, *This Little Room*

BY RICH TOZZOLI

Vernon Reid's upcoming new Sony 550 release, *This Little Room*, is a classic example of the powerful combination of project studio production and commercial studio polishing. Working out of his comfortable "little room" in New York, Vernon has combined his Grammy-award winning talents of songwriting and guitar playing with his long-developed skills of recording at home on the latest gear.

"Most of the record was done using Cubase VST Version 4.0 and 4.1 on my G3 300 MHz Mac," states Reid. Integral to the use of Cubase was his use of VST plug-ins, such as the Prosoniq plug-ins, GRM Tools, Pluggo by Cycling '74, VST MetaSynth, and the Dpole Filter Module by Waldorf. "I also extensively used the Waves collection, as well as plug-ins I downloaded from the Internet such as MDA," he continues. Reid states that he also relied heavily on his use of Bias Peak V 2.02, as well as Opcode's Vinyl and Filter programs.

Combining hard-disk recording with good microphones, preamps, monitors, and care taken during the recording process can yield excellent results, no matter what the location. Vernon extensively used his tube gear, such as the ART Pro VLA and Pro MPA, as well as his TL Audio Valve EQ's to shape the sound of the record before it even "hit tape." "I would use a Neumann TLM 103 or Groove Tubes mic on the vocalists, run through the tube preamps, with an all Monster Cable signal path," Reid states. The many diverse vocalists on the album include Everett Bradley, William Duvall, Rachid, Kevin Webb, D.K. Dyson, and Carl Hancock Rux. "The record is an in-

timate look at a particular time period in my life, from the middle '90s post Living Color, and it really holds together even with different vocalists," continues Reid. "Each singer brings their own personality and relationship to the song. They are all really good friends of mine, so working with all the musicians was a very intimate process. I'm really happy with the results, and it was great working at home."

Reid's giant "home" guitar sounds were achieved using a combination of live amps and direct signals. The direct path would usually include the Roland VG-8 with a Roland GT-3. For amps, he

would mic a Mesa Boogie Subway Rocket or Tri-Axis, using an Audio Technica 4033 — again through the tube gear. The drum sounds were achieved using loops and a drummer on a Roland V-Drum set, run through the TL Audio Valve EQs to fatten up the sound. Jo Jo Mayer, Leon LaMont, and Ramsey Jones came in to lay their touch to Vernon's songs. "The drummers would intertwine with the loops, in combination with computer sound-design," continues Reid. "We spent a lot of time with the V-Drums, and we strove to have great sounds that would really fit each individual song, but also



PHOTOS BY WES BENDER



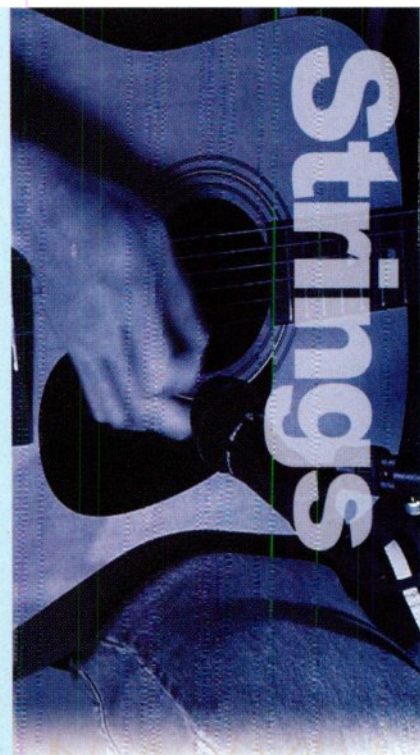
have sounds the drummers were comfortable playing. If it sounds too artificial, you won't get the best performance out of them." Reid monitored the record on his KRK 7000's with a Carver TFM6CB power amp, as well as a set of powered KRK Exposé speakers, and an occasional check on his set of Paradyme Audio's. A Soundtracs Topaz console handled all the signal outputs and monitor feeds.

When it came time to take the record out of the project studio, Reid digitally transferred his files at 24-bit from the computer to the Roland 1680. Working with engineer Troy Hightower, the tracks were then transferred to analog 2-inch tape for mixdown. *This Little Room* was now ready for final production, with mix sessions taking place in New York City at Electric Lady, Kampos Cul-

tural Center, and Mirror Image studios.

Reid comments on the differences he heard and felt when chaining both formats and studios: "Two-inch tape filled out the sound, and it also seemed to have more impact to me. Things that were hitting seemed to hit harder. It was a different listening environment. I was so close to everything at home (proximity wise), moving into the other rooms created a real sense of space, all in a different context."

Reid finishes, "In today's environment, the actual importance of the song gets sidetracked, and, in a way, it really doesn't matter what medium you record on or where you do it. You have to live with it, so anything you can live with is cool. To me, 'have no regrets' is the ultimate philosophy of recording." **EQ**



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The Makeshift Mansion Studio

Facing the challenges of turning an upstate New York mansion into a recording studio

BY STEVE LA CERRA

There's something exhilarating about waking up at 11 AM in the New York countryside, looking out over the Hudson Valley, and knowing that the day's activities center around recording music. There's also a strange and wonderful feeling about taking a shower and shave in...the guitar player's iso booth? Yep. So began my second day of recording a new CD for the band Thick in Selkirk, New York.

Bob Napierski (drummer for Thick) has a "friend of the family" who owns this awesome mansion in Selkirk. After the band began rehearsing there in early 1999, they thought it'd be a cool idea to record their next CD quite literally "in house." They had already sonically explored the many rooms in the dwelling, so it was only natural that the guitar amp would be recorded in the second floor bathroom, which was big enough to support some kicking low end, and bright enough to keep the crunch of the guitar sounding...well...crunchy. And, besides, we didn't mind sharing the bathroom with guitarist Tom Atkins's Mesa Boogie Dual Rectifier Solo amp/4 x 12 cabinet. The only rule was no tossing any towels on the mic stand!

GETTING INTO THE THICK OF IT

Before recording began, we first had to consider what equipment we'd need for the project so that it could sound great but not cost a huge amount of money. A remote truck was out of the question due to the expense. Plus, there'd be no fun and adventure in simply making a call and having the gear show up, ready-to-record in a mobile studio.

The band and I decided to pool our gear and somehow strap it all together

to record the sessions. Tom brought his Mackie 24•8, TASCAM DA-88, a few assorted toys such as a DigiTech TSR-12, Symetrix SX201 parametric EQs, and Sony CD player. In the meantime, I grabbed a TASCAM DA-38, my trusty Demeter VTMP-2b tube mic pre, and a rack full of compressors, including a pair of Empirical Labs Distressors, Purple Audio MC76's, and an ART Pro VLA. In addition, I brought a bunch of mics, including Audix D1's, D2 and D4, beyerdynamic M420 and M201 dynamics and an MCE82 stereo condenser mic, Lawson L47MP and L47, Sennheiser MD421's, Neumann U 87, KM 84's, and TLM 103, plus a few Shure SM57's and 58's. The plan was to spend four days on the project, with the first for setup and auditioning of sounds, the second and third for tracking, and the fourth for overdubs (though overdubbing would be minimal). Tracking would be live with bass, drums, guitar, and lead vocal. It turned out that we overdubbed lead vocalist John Grignon a few weeks later because he was ill during the week of tracking.

AN OUNCE OF PREPARATION...

Thick was very well-prepared for this project; even though I had never seen the mansion, the band had already determined which rooms in the house would work best for their instruments. Bassist Eric Schwanke and Bob found the first-floor dining room perfect for the drum kit. It's a rectangular room of about 25 x 12 feet, with a ceiling height of 12 feet. From the attic up above the second floor (this became my makeshift control room), we ran a 12-channel snake down to the dining room. The snake

barely made the distance for placement alongside Bob's kit. We used a combination of close- and distant-mics in this room for the drums, with an Audix D4 on kick, beyerdynamic M420 on snare, Sony C48 for 'hat, and Audix D1's on rack and floor toms. The beyerdynamic MCE 82 stereo mic was used for cymbals, but it wasn't placed overhead. We put it on a stand in front of the kit, about 6 feet high and 10 feet from the kick drum.

Instead of centering the mic in front of Bob's vintage Ludwig Vistalite kit, we moved it slightly left-of-center to favor the ride cymbal a tad. We used a tall studio boom to place a Lawson L47MP way up the far corner of the room near the ceiling (the L47MP was set to omni). This mic was connected to the Mackie console via the snake with a channel of the ART Pro VLA compressor inserted in the channel path. The comp was set to a ratio of almost 5:1 with fast attack and slow release so that it would squish the room sound.

The result was absolutely wonderful. The remaining drum mics were



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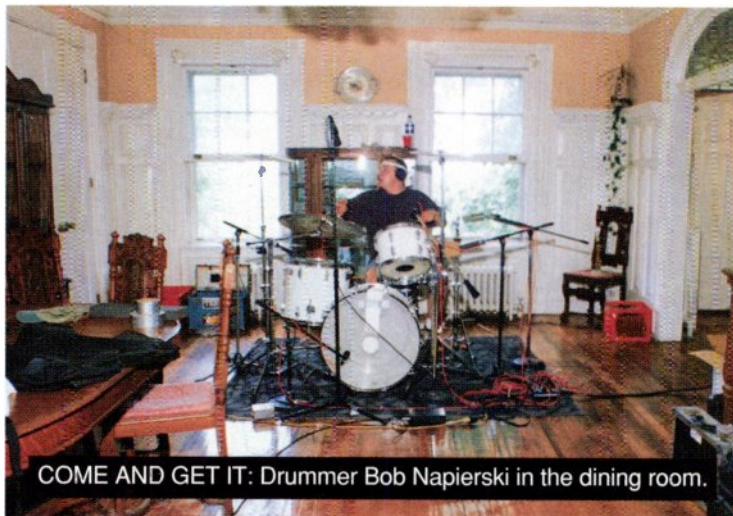
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connected to the Mackie preamps with the exception of the kick mic, which went through an ART Tube MP. Output of the Tube MP went to a Distressor for about 6 dB of compression, and then the signal went to tape. Each of these mics were recorded to a separate track. A headphone send from the Mackie's "phones 1" out was connected to one of the snake return lines. At the snake box next to Bob's kit, we used an old Redco Little Red Cue Box to drive Bob's headphone mix (more about headphones later).

FIRST STRING

Initially, the entire band was going to play in the dining room facing Bob's drums for communication purposes, but there were several detriments in doing this. We could have placed the



COME AND GET IT: Drummer Bob Napierski in the dining room.

amps up on the second floor, using really long instrument cables for connecting Tom's guitar and Eric's bass into their amps. But I'm not a big fan of this because long cables tend to load down instrument pickups, resulting in a loss of tone on the way to the amp. If we put the amps downstairs, we could use short guitar and bass cables, but then

the amps would be in rooms nearby the drums, possibly leaking into the drum mics (we really wanted to avoid this). Also, placing the amps downstairs meant I'd probably have to come up with an idea to skirt a mic snake situation: although the snake had 12 channels, it was 8 XLR send, 4 TRS return. Since there were eight mics on the drum kit, I had already used all of the XLR lines (plus one of the TRS for Bob's cans), and I wasn't

thrilled with the idea of adding TRS-to-XLR turn-around adapters in the mic path — it was just another connection to possibly interfere with the signal. Finally, it presented Tom with the problem of not being in front of his amp to create feedback when he needed it.

Our solution was to put Tom and his rig in the second floor bathroom and

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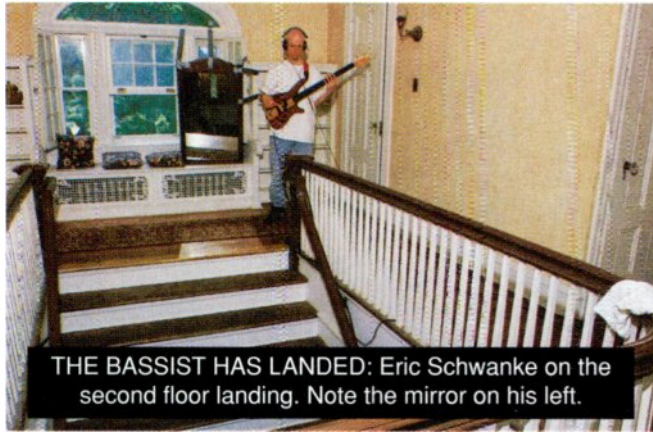
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World Radio History

CIRCLE 15 ON FREE INFO CARD



THE BASSIST HAS LANDED: Eric Schwanke on the second floor landing. Note the mirror on his left.

Eric's SWR bass rig into a medium-sized closet on the second floor. Miking Eric's rig was pretty straight: a Sennheiser '421 about 3 inches in front of one of the speakers with a home run to a channel of the Demeter VTMP-2b pre, from the out of the VTMP-2b into a Purple Audio MC76 compressor, and from the comp to DA-88 via Monster Cable XLR to D-sub harness. His direct sound sourced from the direct out on his SWR bass head, straight to the 24*8, and was

remaining channel of the Demeter VTMP-2b and from the out of the VTMP-2b to a tape track, again using the Monster Cable harness.

Picking the right mic for Tom's amp took a little bit of doing. After trying about five different mics, a Sennheiser '421 nailed the job, giving us enough top-end crunch with the right body in the lower mids. The '421 was placed pretty close to the cabinet, on the lower right speaker, just about dead center

recorded on a separate track. No EQ or compression was used on this channel.

In the meantime, Tom was getting comfortable in the bathroom straight up to my "control room," into the

and 3 inches away from the grille. Interestingly, we had tried the two top 12-inch speakers in that same 'Boogie cabinet, but they didn't seem to have the same tone as this one particular speaker. Just for the entertainment factor, we also ran a DI line straight from Tom's guitar to the console and recorded the signal on a separate track (though we didn't use it).

For communication purposes, Tom and Eric needed headphones, so we dropped a long headphone extension cable from the 24*8's "phones 2" output down to the second floor and plugged it into a Furman HR-2 headphone box. We parked the HR-2 in the hall near the bathroom door and connected two pairs of cans to the HR-2: one pair went into the bathroom for Tom, and the other in the hall for Eric. Eric was playing on the landing of the second floor so he could be relatively close to his amp, yet still communicate with the other guys.

Tom actually cut the tracks while in the bathroom (there's gotta be a wise-crack in there somewhere...), so, by leav-

continued on page 142

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CIRCLE 72 ON FREE INFO CARD

MUSCLE



Engineer/guitarist
Jimmy Johnson tells
how he helped define
the Muscle Shoals
Sound and put the
state of Alabama on
the musical map

By Diane Gershuny and David Sweet

BUILDER



Session Guitarist. Bandmember. Engineer. Producer. Music Publisher. Commercial Studio Owner. Project Studio Pioneer.

If Jimmy Johnson had merely achieved competence in so many facets of his profession, his life in music would be noteworthy. That he became so successful at each makes his career a virtual one-of-a-kind. But it's when you listen to Johnson's stories of a professional life lived almost entirely behind soundproof glass that his unique and staggering breadth of musical experience begins to sound like American pop music history itself.

Not that Jimmy would ever take himself that seriously. Watch his face while he answers, "Dumb luck" to the question, "What contributed most to your success?" and you'll swear he half expects you to supply a better answer. But his opinion turns out not to be typical "aw-shucks" Southern self-deprecation. Jimmy Johnson really believes he's one of the luckiest "pickers" to walk the earth.

MUSCLE BUILDER

B Beginnings

Johnson's musical saga began as a preteen who was disconnected to his family's taste for country music. In high school, his physical talents got him voted "most feared football player," while his guitar licks in the Del Reys garnered him "best musician" status. Actually, Jimmy says, "I played a coronet in middle school — a shorter trumpet! [Laughs.] I played it in seventh and eighth grade, and by the time I went up to high school, I played football. [Laughs.] I learned to read music with the horn, plus the importance of playing with good time. So later, when I picked up guitar, my timing was already there."

Rhythmic precision, perhaps the key to both Johnson's session guitar success and the "Muscle Shoals" guitar style, was thus ingrained. Johnson underscores the point by stating, "If you want to be a great session player, get your time down first — take some percussion or drum lessons."

Jimmy's distaste for mid-'50s country music became a blessing in disguise as a new guitar-driven music began exploding in the youth culture of the time. Rock 'n' roll was its name, and the solid-body electric guitar became Jimmy's game. Gigging by 15, Jimmy's weekend jobs began bringing in more money than a week of his dad

Ray's aluminum factory worker wages.

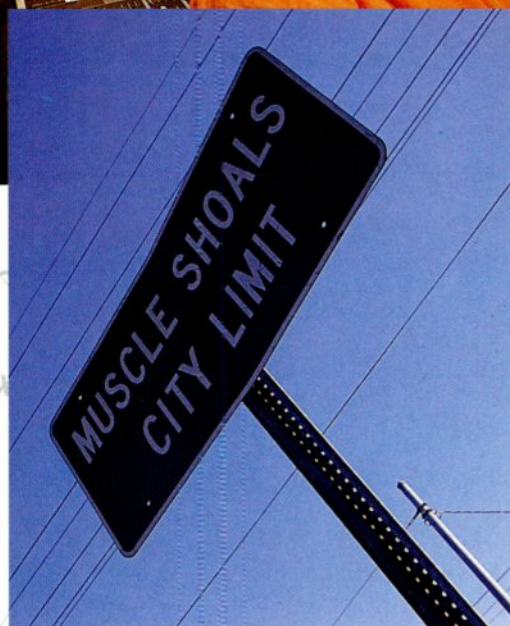
Johnson's engineering career began to take shape earlier, as a preteen, when Jimmy's Uncle Dexter opened the first recording studio in north Alabama. In

her dad had to drive her to the studio." Jimmy jumped at every chance he got to engineer on what would now be regarded as ludicrously primitive gear. "My uncle

had a big mono tape machine and one microphone — which seemed like plenty to us at the time."

How primitive are we talking? Jimmy recalls with a grin, "The tape recorder was called a Pentron, and, in-

stead of a VU meter, it had this eye. It just kind of opened up when the music hit it — it was really weird. [Laughs.] It looked like the top of a vacuum tube placed horizontally. The tape was 1/4-inch, and I'd never seen anything like it before, or since. You'd hit one button, push a lever to get it started, then stand back and watch the eye blink while the band started playing." [Laughs.]

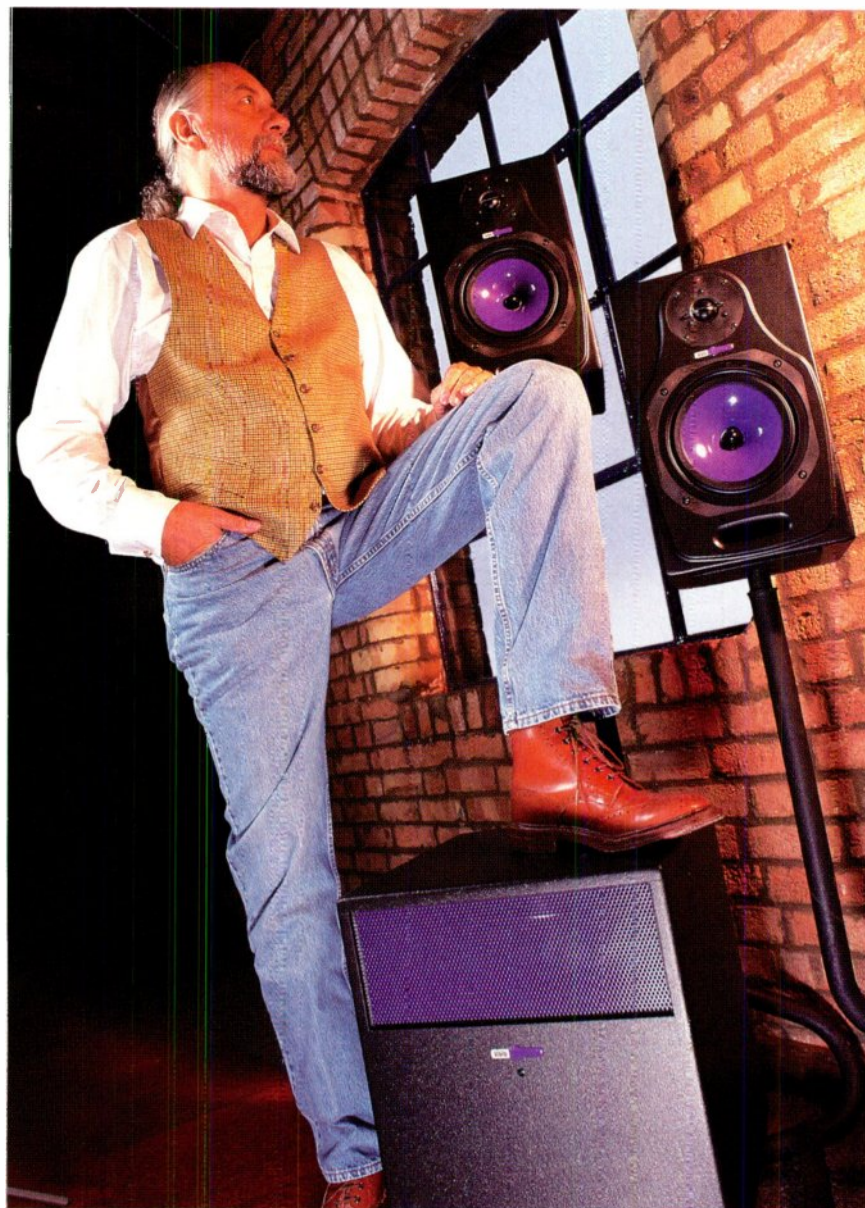


retrospect, the garage-based studio's most notable project was recording Tanya Tucker's first demo. "She was just a very young girl," Jimmy recalls. "I remember

Studio Grunt

Jimmy's engineering opportunities blossomed as a teenager when a local man, Rick Hall, opened Muscle

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Left: Mick Fleetwood with HHB Circle 5 active midfield monitors and Circle 1 powered sub-woofer.

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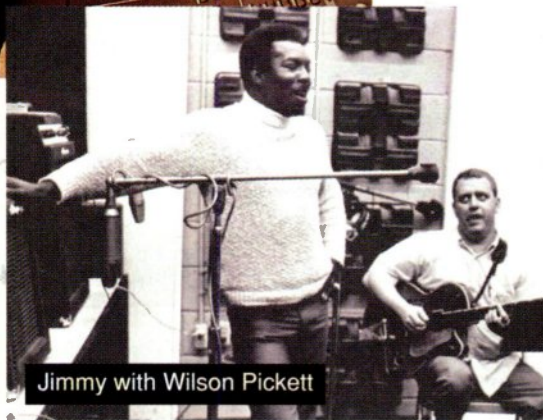
MUSCLE BUILDER

43
Muscle Shoals

Shoals's first recording studio, called Fame Studios. Jimmy was Hall's first employee, and the job was about a country mile from glamorous. Johnson confirms: "I was a janitor, gopher, secretary, and ran his publishing company." But Jimmy also got to work with Hall in the control room, an experience he refers to as his "seven-year, real-life education in how to record and mix." And what an education. Fame ended up being one of the most important R&B-oriented recording studios in the world — despite its tiny size and modest gear.

In his fifth year at Fame, Johnson became a member of the "Fame Gang," a precursor to the Muscle Shoals Rhythm Section (MSRS). From '64 through '66, the band woodshedded in the studio, recording demos for the most part. The personal toll this 60-hour-a-week "studio lifestyle" exacted on Johnson makes one wonder how he survived it. Johnson confesses: "I was smoking five packs a day, drinking 33 cups of coffee, and eating was the major form of entertainment outside of making music." Though he's a trim non-smoker now, such appetites ballooned Jimmy's body at one point to over 300 pounds. On the subject of exercise, Johnson dryly adds, "You don't burn a lot of calories pickin' and twistin' knobs."

In the first of many career surprises, Jimmy's first big hit record came not as a guitarist, but as an engineer. Johnson recalls working on Percy Sledge's 1966 monster hit "When a Man Loves a Woman": "I



was the engineer that day. Roger Hawkins, Spooner Oldham, and Junior Lowe were the musicians, with producers Marlin Greene and Quinn Ivy. That was cut in mono, by the way. It was the first certified million-seller for Atlantic Records; can you imagine that?" The song eventually went on to sell a stag-

gering 25 million units and turned the R&B recording industry's attention toward "the four white kids from Alabama."

The Muscle Shoals Pilgrimage

Immortalized later by Lynyrd Skynyrd's "Swampers" reference (a nickname Leon Russel coined for the band) in "Sweet Home Alabama," booking the studio band on its home turf became sort of a holy grail to top producers, including R&B legends Jerry Wexler and Ahmet Ertegun. In a scenario unimaginable in today's racially divided music industry, top producers flew their big-city black artists to small-town Muscle Shoals, located in the heart of the deep South, to tap the "groove machine" of Jimmy and his fellow Caucasians.

Decades before "whites have no rhythm" jokes became common, the band put their signature fat grooves on a slew of hit records for top black artists. Later labeled "the Muscle Shoals Sound," Johnson describes a particularly memorable moment in its development: "Jerry Wexler was the biggest executive in the business, and (after a falling out with his former studio band Booker T and the MG's) [he] comes down to work with us little country boys. He walks into the studio and we were just shaking in our boots. But that first tune we cut did really well (Wilson Pickett's 'Land of a Thousand Dances'), so we snared a bunch of Jerry's sessions with Wilson and Aretha Franklin as a result."

Early hits for both artists followed, including "Never Loved a

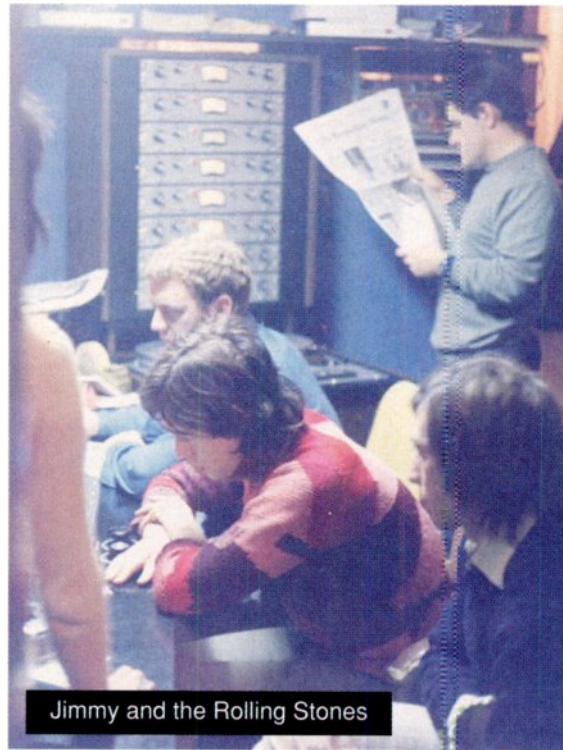
Man the Way I Love You” and “Do Right Man, Do Right Woman” for Aretha. Johnson states: “That was a landmark date for us because it was the first stereo record we cut; we were mono even through (Wilson Pickett’s) ‘Mustang Sally.’” Joining the band for the Aretha sessions was a brilliant 20-year-old Southern guitarist named Duane Allman. Says Johnson, “I’d engineered him when he and Greg were with Hourglass, and he was a fine guitar player even then. He fit right into what we were doing.” Legend has it Eric Clapton recruited Allman for Derek and the Dominoes after hearing his work with MSRS.

By then, the famous producer and the now-famous studio band were becoming fast friends. Johnson laughs, recalling: “Jerry taught us how to drink Chateau Lafitte Rothschild, where, before, our idea of good wine was quite literally Mogan David. We were chugging this French wine not even knowing it was, like, \$600 a bottle! Talk about rednecks!” The producer’s investment in good vibes and good wine for the band paid off, however: Wexler won three consecutive Producer of the Year Grammys from the records

“Jerry (Wexler) taught us how to drink Chateau Lafitte Rothschild, where, before, our idea of good wine was quite literally Mogan David. We were chugging this French wine not even knowing it was, like, \$600 a bottle! Talk about rednecks!”

they did together, and became sort of a second dad to the young musicians.

During this period, MSRS and Johnson put their stamp not only on the Queen of Soul’s albums, but on several of the male kingpins of soul music as well. Two such acts stand out in Johnson’s mind: “I en-



Jimmy and the Rolling Stones

gineered Arthur Connelly’s “Sweet Soul Music” hit for him and got to work with Otis Redding — one of the most talented people I ever had the good fortune to work with.”

Johnson stutters trying to describe how impressed he was by Redding. “He was just the

most...the most creative horn arranger, background arranger, and track arranger I’ve ever seen. It

was all just feel. He would get out on the floor and just start...just telling you what he was looking for, and everybody would just fall in. It was really just unbelievable to watch. The horn lines were so unique, I mean, it was the most amazing thing, because he would create it right on the spot. And he was such a nice human being. He was big and looked kinda tough, but he was really a gentle man with a fabulous sense of humor.”

Jimmy describes one example of Redding’s wit: Atlantic Records’ Ahmet Ertegun and Jerry Wexler evidently both had secretaries who regarded Otis as a “typical dumb Southerner.” So, to the great amusement of Jimmy and the other MSRS members, Otis would call them and give them his best “dumbguy” act, including repeated requests for Ertegun’s assistant to put “Om-e-let” on the phone.

As the ’60s came to an end, Fame owner Rick Hall was recruited by Capitol Records, and decided to close his studio. Roger Hawkins and Jimmy saw opportunity, and purchased a little 4-track studio, convincing their cohorts, bassist David Hood and keyboardist Barry Beckett, to join. With that, Jerry Wexler loaned them the money to make it compatible with Atlantic’s 8-track system, allowing the cleverly named “Muscle Shoals Sound” to open in April of 1969 in, as Trent Reznor will appreciate, a former casket warehouse. Music historians will also note that four years into her career, and three decades prior to her multiple Y2K Grammy nominations for “Believe,” Cher

MUSCLE BUILDER

inaugurated the first recording sessions at the new studio.

Because he had trained as an engineer and knew studio administration and publishing, Muscle Shoals Sound naturally became Jimmy's to run. As a result of his wide industry knowledge (and probably his years of struggling in a recording studio at 50 cents an hour), Johnson came up with a unique compensation formula. "We charged a nominal rate for sessions, but asked clients to sign a contract that cut us in for points on any record that became a hit." It turned out to be a brilliant move, with several hit recordings upping the band's earnings significantly.

How did the Muscle Shoals sound come about? Johnson gives the area's musical and cultural vibe a good deal of the credit, but adds MSRS were so fully booked for so many hours a week that they had to develop a way of learning songs and getting them sounding really good in one or two takes. Necessity being the mother of invention, the grueling pace forged a sound where every note counted, and "maximum feel" won out over the clinical perfection exempli-

occurred that would change their lives forever: the assassination of Martin Luther King. Almost overnight, according to Johnson, the idea of black artists using prominent white musicians be-

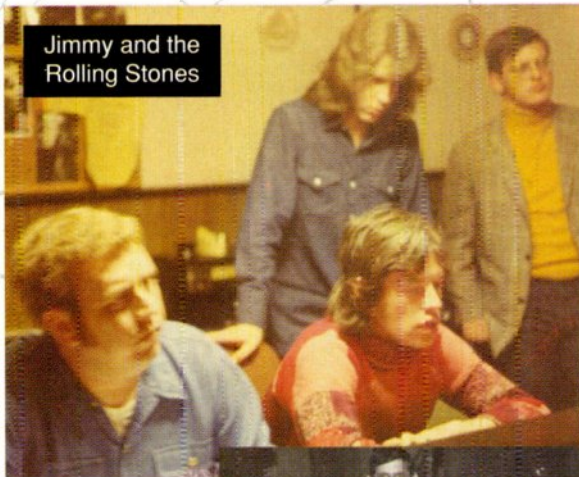
band, and studio black artists sought out to make hit records began to attract a new kind of client: white rock stars enamored with black music.

Muscle Shoals's Second Era Begins

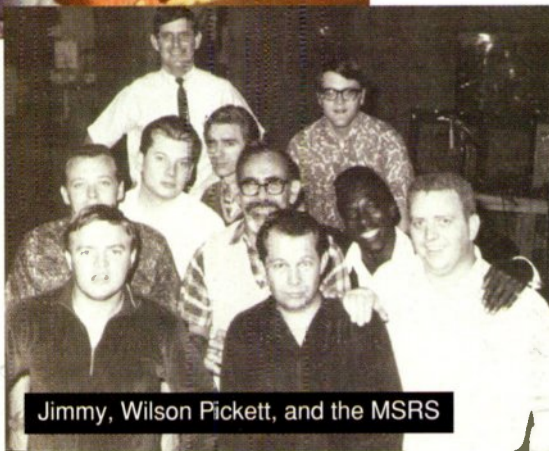
One of the earliest such acts to make the trek to Muscle Shoals were the Rolling Stones in 1970. Jimmy engineered "Brown Sugar" and "Wild Horses," and says this of the band's legendary studio acumen: "Keith and Mick knew exactly what they wanted, and could write a song faster than just about anybody. The band was no-nonsense quick when the red light came on, so it was just real easy working with them."

Many acts followed, including

George Michael, Bob Seger, Rod Stewart, Art Garfunkel, Simon and Garfunkel's reunion ("My Little Town"), and, perhaps most notably, Paul Simon for the making of his hallmark album *Rhymin' Simon*. Apparently, recording with the MSRS had a big impact on Si-



Jimmy and the Rolling Stones



Jimmy, Wilson Pickett, and the MSRS

came politically incorrect. Jimmy recalls the period with lingering sadness. "It wasn't something anyone would admit or even talk about, but you could cut the vibes with a chainsaw. It was like losing

mon. By the time he'd come to Muscle Shoals, Simon had already made several arduous attempts to pull a new sound he had in his head out of studio musicians in New York and elsewhere with unsatisfactory results. Johnson says Simon was incredulous during the very first rehearsal when MSRS nailed his sound better, according to what Simon told them at the time, than any other band had in many attempts. "That made the sessions really fun for everyone, and it showed on the record,"

"We charged a nominal rate for sessions, but asked clients to sign a contract that cut us in for points on any record that became a hit."

fied in the studios three hours to the north — in Nashville.

But months before Muscle Shoals Sound opened, a tragedy

your best friend who won't explain why. We were really devastated, but we had to move ahead." Luckily, their reputation as the area,

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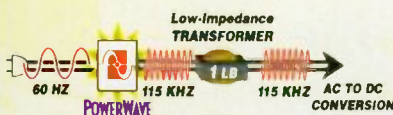
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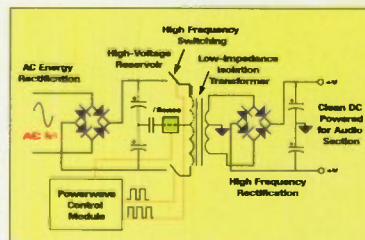
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MUSCLE BUILDER

Johnson adds with a broad smile — not mentioning MSRS was nominated for a Grammy for their work on the album that produced “Kodachrome,” “Loves Me Like a Rock” and other hits for the artist at a critical early point in his solo career.

During this time, Johnson became increasingly busy as a producer, most notably with an unsigned band made up of local musicians who named themselves with the intentionally hokey red-neck name “Lynyrd Skynyrd.” How he helped the band says a lot about what kind of man Jimmy Johnson is.

Friendship Wins Over Money

“I was the first guy to ever produce

Skynyrd,” Jimmy states. “We cut “Free Bird,” “Simple Man,” and all those big hits, right? They were so long, the record companies turned us down. They were nine-minute records. I had 17 cuts in the can,

“I was the first guy to ever produce Skynyrd... They were nine-minute records. I had 17 cuts in the can, and they finally walked away from me because we couldn’t get them a record deal.”

and they finally walked away from me because we couldn’t get them a record deal.”

When Skynyrd was finally signed by MCA, the songs were re-cut, violating the written agreement Johnson had with the band. A co-producer at the time pushed

Jimmy hard to sue — an option he felt would have ruined the band and made him rich simultaneously. But, corny as it sounds, his affection for the guys in the band outweighed taking the adversarial

advice he was getting. Instead, after they’d made it, Jimmy sold the masters he owned to the band to prevent them getting into the wrong hands, with a contingency that if they ever came out, he’d get a percentage.

Time and karma worked in

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DT 831: Advanced design and materials create the broadest frequency response available in the market (5 – 35,000 Hz). Equalized for critical listening of digital recordings.

DT 250: Ruler flat frequency response, circumaural ear cups, and a replaceable cable are hallmarks of this production and professional field recording headphone

DT 231: Designed for the home studio market, the DT 231 represents exceptional value in a sealed headphone design.



DT 831

DT 250

DT 231

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Johnson's favor. Two years later, the band called, informing him, "We just cut a song we wrote about you guys, and it's called 'Sweet Home Alabama.'" (The specific lyrics are "Muscle Shoals has got the Swampers. They've been known to pick a song or two. Lord, they get me off so much. They pick me up when I'm feelin' blue. How about you?") Johnson finishes the story: "And guess what? The records finally did come out. [Laughs.] And that built my house." In fact, 17 of their records were re-released last year; all the Muscle Shoals cuts came out on one CD. And part of those had been released on another record called *The First and the Last*.

Muscle Shoals Sound Expands

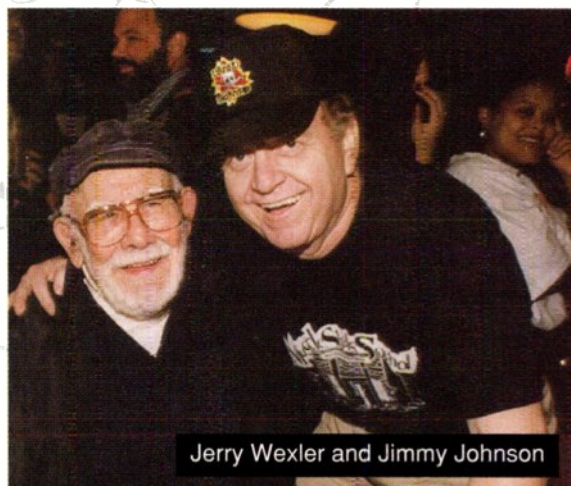
Outgrowing the original facility in 1978, the MSRS partners purchased an old Naval Reserve building to accommodate the expansion from an 8-track to a 24-/48-track studio. In true Muscle Shoals style, the building was chosen as much for its "mojo" and nostalgia as for its location and acoustics. Oddly enough,

"The gear is so good these days, there's no real qualitative difference between my stuff and anything I've ever worked on."

the building had been a popular spot for teenage dances and "sock hops" during the '50s and '60s.

Today, the 31,000-square-foot Muscle Shoals Sound Studio is a state-of-the-art two-studio complex located on the Tennessee River in Sheffield, Alabama, but without John-

son at the helm. Why? "Running a big studio was something I'd done for a long time," says Jimmy, "and you



Jerry Wexler and Jimmy Johnson



Jimmy (center) with his project studio's Mackie console.

need new challenges to stay fresh." Fortunately, selling his interest in the legendary studio didn't diminish Johnson's appetite for creating music.

Jimmy threw himself into the project studio revolution in a big way.

Jimmy J Joins The Revolution

"I converted a little house that was in my family into a studio and offices," Jimmy cheerily states. "And the gear is so good these days,

there's no real qualitative difference between my stuff and anything I've ever worked on." Interestingly, for having engineered so many hits on much-revered vintage analog gear, Johnson doesn't miss it. "It's really about capturing great performances; gear has always been a distant second to that. The Mackie digital console and Fostex hard disk I installed sound really good together, and they're just a ton easier to use — especially if you need to work on two projects simultaneously. There's just no reason to make things hard on yourself."

Jimmy Johnson has come full circle in many ways. From being an enthusiastic 10-year-old, engineering in a garage studio every chance he got, Johnson has grown into an enthusiastic man with four decades of guitar playing, production, and engineering chops he uses to make music primarily in a project studio. While he chairs the Alabama Music Hall of Fame and was recruited to teach recording at a nearby university, these are just additional pages in an extraordinarily broad, successful, and musically rich life — one sure to produce many more chapters.

More information on Jimmy Johnson's life can be found at All-Music.com and <http://fly.hiwaay.net/~jimmyj>.

Diane Gershuny is a veteran music journalist with a deep love for most things Southern, except fried pickles. DK Sweet actually likes the pickles.

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WRAP-UP

BY MITCH GALLAGHER

A LOOK AT THE NEW GEAR THAT WOWED ATTENDEES AT THE LOS ANGELES CONVENTION CENTER AND THE TRENDS THEY REVEAL, PLUS CRAIG ANDERTON OFFERS HIS ANNUAL AWARDS

Twice a year, NAMM (the National Association of Music Merchants) puts on a tradeshow designed to bring together gear manufacturers and music/audio retailers. New pieces of equipment are introduced and hopefully ordered by dealers, prototypes and new concepts are unveiled, educational seminars are held, news is announced, rumors are spread, and various convention-style shenanigans are engaged in. NAMM shows also give industry journalists and press types opportunities to get a glimpse at what's new and how the trends are shaping up.

This year's Winter NAMM show, held in the Los Angeles Convention Center, was no different. (The other annual show, Summer NAMM, is held in Nashville in July.) Loads of new gear debuted, latebreaking news was released on the unsuspecting masses, scads of demos were held, and, in the process, some cool music and sounds were made — not that you could easily hear anything over the frightening din present in the Convention Center's three cavernous halls and numerous private demo rooms.

Undaunted by the noise, *EQ*'s intrepid editors donned comfortable shoes and hit the floor for a four-day crash-and-burn tour of the show. On the following pages you'll find some of the most exciting items we saw, as well as a look at industry trends and the ever-venerable Anderton Awards. The standard caveat applies: Prices, availability, and just about everything else are subject to change at the manufacturers' whims.

MICROPHONES

The recent flood of new mic models slowed a bit at this NAMM show, but several noteworthy items were announced, including the hypercardioid Rode NT3 condenser mic, which uses a JFET impedance converter with a bipolar (transformerless) output buffer. Other features include heavy-duty cast metal/satin nickel body, high immunity to RF interference, a dynamic range of >123 dB, and S/N ratio of 77 dB.

Audio-Technica announced the Sound Addict line of mics with two models, Bark (vocals) and Bite (instruments). A-T also expanded their KitPak series of mic bundles with the KP-Vocals

(three vocal mics with stand clamps, cable ties, and a carrying case), KP-Studio (two studio mics and ATH-M3X headphones in a carrying case), and KP-Worship (two choir mics with hangers, one podium mic, and a handheld dynamic mic in a carrying case).

Earthworks showed their SR69 handheld vocal mic (\$350) and their SRO live sound omni (\$350), which is intended for drums, guitar amps, piano, and recording applications.

With 13 new mic products at the

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show, CAD vastly increased the size of their catalog at this year's NAMM show. Of special interest were the C84 cardioid condenser mic intended for drum overhead, hihat, snare, acoustic guitar, strings, and choir applications. Also new are the TSM 411, a dynamic mic aimed at a wide range of drum and percussion applications, the KBM 412 bass drum mic, and the ICM 416 electret condenser mic designed for cymbal, hihat, and overhead drum miking. CAD further announced the M177 and M277 condensers. The M177 uses a single-pattern version of the Equitek E-300 capsule; the more versatile M277 provides nine switchable polar patterns.

MIXERS

Most of the mixer action at NAMM seemed to be taking place in the live powered mixer area, including new models from Yamaha, Peavey, Mackie, and Electro-Voice. One notable exception was Sony's DMX-R100 digital console (\$20,000), which drew a lot of attention. Among its features are 48 channels, 25 mo-

torized 100 mm faders with 1024-step resolution, 88.2 and 96 kHz sampling rates, a color LCD with built-in touch panel, built-in surround sound monitoring capabilities, surround panning, Sony 9-pin and MMC control, and selection of automation punch points so you only affect automation data between those points. All digital I/O is 24-bit, and all analog I/O uses 24-bit, 128X converters. [See Roger Nichols's First Look in the last issue for more details.]

Peavey's RSM 4062 stage/studio console combines an inline recording architecture for the first eight channels with eight unique mic/stereo line channels for 9–16. These upper eight stereo line inputs can be routed through the channel or bussed over subgroup 5/6, freeing up the channel to be used as a low-Z mic input. The RSM 4062 can simultaneously mix 16 microphones and up to eight additional stereo line sources. Also from Peavey is the RQ 200 compact mixer, designed for hard-disk recording and portable applications. With 9V batteries installed, the RQ 200 is just as much at home on a remote video shoot as it is in the studio. It includes six XLR balanced mic preamps, four channels with mic and stereo line inputs, and EQ.

Panasonic's 2.0 software update for the DA7 digital mixer adds 64 enhancements, such as a new in-



WINTER NAMM 2000

put-to-output routing matrix that acts like a virtual patchbay, 5.1 or 3+1 surround sound modes, implementation of the RS-422 9-pin protocol, independent scene memory crossfades, tweaked compressor attack time, and peak/signal LED threshold adjustment from -10 dB to 0.0 dB.

The V3.0 OS software for the Mackie's D8B digital mixer features third-party plug-

in support, added surround sound mixing features, networking capabilities, sidechain inputs for all 48 onboard dynamic processors, per-channel delay, multiple undo list, and multiple direct outs per channel.

PREAMPS, EFFECTS, AND PROCESSORS

The biggest buzz in processors at the

show had to be Roland's VP-9000 VariPhrase processor. Perhaps the unit should be characterized as a sampler, since audio must be captured before it can be processed, but given how much the VP-9000 can manipulate audio, we'll throw it in here. The VP-9000 allows you to pitchshift audio without altering tempo or formant, change tempo without al-

THE ANDERTON AWARDS

And now, the moment you've all been waiting for: yes, the *Phantom Menace* will be out on video very soon. But while you're waiting, why not attend the only virtual award show in the music industry? You won't get poisoned by rubber chicken, bored by interminable acceptance speeches, or come back to your car to find the stereo missing! And now, in our quest to give recognition to products deemed Way Cool at NAMM 2000, here we go...

- The "Overnight Sensation that Took 15 Years" award goes to FireWire, the high-speed data transfer protocol featured in Yamaha's mLAN system as well as in upcoming systems from Peavey and several other manufacturers. With audio-oriented companies such as Digital Harmony pushing the envelope, FireWire just may be the next "MIDI for pro audio."

- The "We Want the World, and We Want it Now" award goes to the Yamaha AW4416 all-in-one recording audio workstation. It's a mixer with motorized faders! It's a 16-track, 24-bit/48 kHz recorder! It's a sampler! It's a signal processor! It burns CDs! It does your laundry! Well, maybe not your laundry, but it certainly brings new meaning to the phrase "all in one."

- The *South Park* Memorial "Oh My God, They Killed Digital!" Award goes to Alesis for their A6 Andromeda analog synthesizer. This one zeros in on vintage sound (no stair-stepping when you turn knobs), while retaining the kind of 21st century features we know and love such as multiple outs, informative LCD, matrix modulation, and the like. Think purity of sound, with an analog body but a digital brain. Now, \$3500 doesn't sound cheap, but, hey, neither does the Andromeda.

- Roland's HPD-15 garners the "Give 'Em a Hand" award; this is a sensitive, expressive drum controller designed for hand-percussion applications. It's light years beyond the primitive on-off switch contacts that controlled drum synthesizers way back in the late 20th century.

- The "Imitation is the Sincerest Form of Flattery and Besides, That Way We Don't Have to Think of Something New" award goes to all those companies with translucent, iMac-like cases. Ten years from now, people will be saying "that's soooo 20th century," but, for now, it's the style *du jour*.

- The "Nikola Tesla Memorial Mad Scientist" award goes to Roland for their VP-9000 VariPhrase audio processor. It's basically impossible to describe in print...sorry! Take Sonic Foundry's ACID time/pitch-munching properties, put them in a box that can break down static samples into constituent parts and re-work them in a zillion ways — in real time — and you have a rough idea of what lurks within this pricey

(over \$3K) but highly innovative box.

- The "Power to the People" award goes to EMU/Ensoniq, for their ROM authoring system that allows musicians with any of several EMU samplers to create their own sound ROMs for the Proteus 2000 rack module. Yes — take your favorite samples, and make them part of a non-volatile rack synthesizer.

- Steinberg/Propellerheads garners the coveted "Better Living Through Technology" award for Reason, a software-based synth studio that is, frankly, mind-blowing. For \$399, you get a synth, sampler, drum machine, sequencer, batches o' effects, patchbay, REX file player, included sounds, and a whole lot more. That sound you hear is echoes from all the jaws dropping at NAMM.

- The "Anyway, Anyhow, Anywhere I Choose" award goes to Rocket Networks (with honorary mentions to Steinberg and Emagic) for creating the online studio and actually making it work. Need a bass part? Hey, go online!

- Samson wins the "Honey, We Shrank the Transmitter" award for their way-cool Airline series of wireless products. How small are they? The guitar version just plugs into your guitar's output jack — no body pack required. And the receiver is small enough to fit next to your stomp box. If you're into wireless, these are hot.

- The "MIDI Memorial Industry Standard" award goes to Steinberg for their VST 2.0 and ASIO 2.0. Congratulations are also in order for the companies that rejected the "not invented here" syndrome and helped make these protocols industry standards. Runner-up: USB interfacing, which is showing up in a lot of gear these days.

- The "She Comes in Colors" award goes to SEK'D Samplitude, which incorporates the Comparisons coloring system for waveform information. Basically, it lets you analyze different types of sounds based on color; for example, kicks show up as a particular color, making it easy to do drum replacement. The concept seems frivolous at first — until you see it in action.

- Finally, the "Cher Memorial Comeback of the Year Award" is a tie between analog synths (they were everywhere) and MIDI guitar. Yes, the guitar technology that was once supposed to take over the world, then was supposed to die a horrible death, was back in force thanks to Roland, Brian Moore Guitars, and Washburn. As to synths, suffice it to say that Bob Moog was back with a new synth... 'nuff said.

And that brings us to the conclusion of this year's Anderton NAMM Awards. Please file out through the doors to the left and right sides of the hall...thank you very much.

—Craig Anderton

tering pitch, modify the duration and pitch of notes within a phrase, or even re-groove a loop — all in real time and non-destructively. But this doesn't begin to scratch the surface of what this baby can do. Polyphony is six notes, effects are built-in, and real-time control is available via front-panel knobs or MIDI. Roland S-700, Akai S1000, AIF, and WAV file formats are supported, and an internal 250 MB Zip drive provides convenient storage. [See the First Look on page 24 of this issue for more details.] Roland was also showing two new digital graphic EQs, the 2-channel, 31-band SRQ-2031 and 4-channel, 15-band SRQ-4015, both of which use an innovative Frequency Slid-

er and Dial Encoder for selecting frequencies and adjusting gain.

The Earthworks 1024 (\$3500) is a 4-channel single-space rackmount mic pre-amp. Each channel features phantom power, polarity reverse, a standby (mute) switch, stepped gain control, and variable output level. The manufacturer claims response of ± 0.1 dB from 2 Hz to beyond 100 kHz.

The VPRO-1 analog voice processor from Peavey can replace a mixer channel strip for recording or live applications. Features include a mic preamp with phantom power, dual EQs (one with sidechain), a compressor/limiter/expander with metering, an analog enhancer, and a headphone jack.

Zoom had two new processors at NAMM. The RFX-2000 studio processor (\$399) contains 48 effects including reverb. Its mixdown effects can punch up high and low frequencies, add extra dynamics, and "widen" or "boost" the sound of a track or individual instruments. A mastering effect optimizes the sound of a final 2-track mix. The built-in Mic Simulator is claimed to make affordable dynamic mics sound like high-priced condensers. Editing software for PCs and Macs lets users access up to eight additional effects, including a 31-band graphic EQ and a 20-tap delay effect. The RFX-1000 (\$279) comes with 33 professional-quality effects, including Zoom reverbs. Like the RFX-



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2000, a range of special mastering/mixdown effects can be used to punch up, widen, or boost the sound of a track or individual instruments during mixdown or fine-tune the overall sound of a final 2-track mix during mastering.

The busy folks at Behringer announced a slew of new products, including the **Ultrabass Pro** subharmonic processor (\$179), **Ultra-DI** and **Ultra-DI Pro** direct boxes (\$59 and \$159), **Ultra-Curve Pro** digital EQ (\$579), **Ultra-dyne Pro** digital dynamics processor (\$579), **Virtualizer Pro** and **Modulizer Pro** multieffects processors (\$139 each), and the **Ultramizer Pro** 2-band dynamics processor (\$229).

Summit was showing their full line of Element 78 mic preamp/EQ products, including the **MPE-200** dual-channel preamp EQ, **MPE-200S** preamp/EQ slave, **EQ-200** 4-band EQ, and **EQ-200S** EQ slave. Introduced at the show was the **Extension 78** plug-in for Digidesign's Pro Tools. Extension 78 allows for remote MIDI control of the Element 78 line of signal processors.

Electrix had two new processors to offer, the **EQ Killer** and the **Filter Queen** (\$299 each). The Filter Queen is a half-rack version of the company's Filter Factory, while the EQ Killer is a stereo 3-band EQ designed for real-time operation, featuring momentary switches for dropping the EQ bands in and out of the signal path.

Two new channel strip-style preamp/compressor/EQs were being shown at the JOEMEEK booth. The **VC3Q** (\$400) is the equivalent of one channel of the JOEMEEK VC5 Meequalizer with the exception

of fixed-frequency EQ bands. The **VC6Q** (\$600) adds mid sweep and other features such as phase reverse, 20 dB pad, mic/line switch, input peak indicator, a gain reduction meter, and an expanded output meter.

Presonus had several new items at the show, including the **Quad Com** (\$900), a 4-channel compressor/limiter and the **Quad Gate** (\$900), a 4-channel gate. Also new from Presonus was the **Digimax** 8-channel preamp with peak limiting and digital outputs (\$1500), the **EQ80** 8-channel, 4-band parametric EQ (\$2300), and the **Blue Tube** half-rack stereo tube mic preamp (\$200).

Plug-ins continued their inexorable rise toward audio processing dominance. Waves was showing two new processors in their **Pro-FX Plus** processing bundle (\$850 for TDM, \$450 for native. Pro-FX Plus replaces the Pro-FX bundle; upgrades are available.). **Doppler** adds motion effects and is aimed at post, film, and game sound designers. **Enigma** offers a new approach to filtering and modulation, and provides an array of creative sound design possibilities. Waves also announced complete support for Digidesign's RTAS plug-in format.

Antares introduced RTAS-compatible versions of their **Auto-Tune** and **Microphone Modeler** plug-ins (\$399 each), which are currently available for TDM, MAS, VST, and DirectX formats. Antares was also previewing their upcoming **Speaker Modeler**, which is said to make any "reasonably wide-range monitors" sound like any of a variety of speakers, from studio monitors to computer speakers.

Surround Bundle, a collection of six real-time 8-channel surround plug-ins, was being shown at the Steinberg booth, running on the Nuendo platform. A compressor, loudness maximizer, 7-band parametric EQ, reverb, and two low-frequency processors are included in the bundle. Easy channel linking ensures balanced levels when pro-

cessing a surround mix. Also on display at the Steinberg booth was **Mindprint's T-Comp**, a stereo tube compressor (\$1100). Stereo inserts, a bass filter in a sidechain, and Adaptive Mode for program-dependent compression round out T-Comp. The unit can be upgraded with **DI-Mod** for 24-bit digital I/O capability.

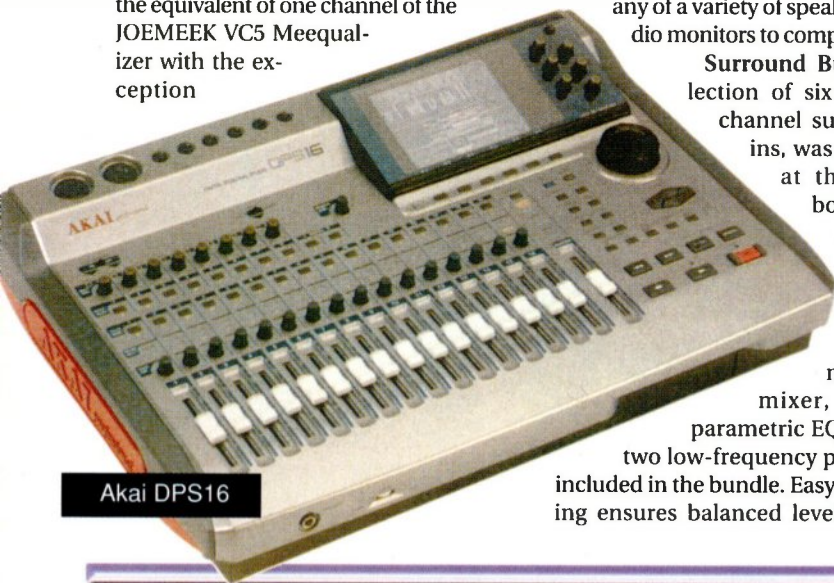
Kind of Loud was showing new versions of their **RealVerb 5.1** surround reverb for Minnetonka's Mx51 surround mixing environment and MOTU's MAS plug-in format. Stereo versions of RealVerb were also announced for Digidesign's TDM and RTAS formats.

Several modeled guitar processors were being shown at NAMM, but perhaps the biggest buzz surrounded the **Line 6 Pod Pro** (\$800), a two-space rackmount version of the popular Pod digital guitar processor. The Pro offers 32 amp models, 16 cabinet models, and digital effects. Twenty-four-bit AES/EBU and S/PDIF digital outs are standard, as are XLR analog outs. Line 6 also addressed bassists with **Bass Pod** (\$500), which features classic bass amp and cabinet models as well as bass-specific effects. Pod users can also access the new **ToneTransfer Web Library** at www.line6.com for new sounds for their gear.

MONITORING

Fostex was showing their **NF-1A** nearfield monitor (\$1598 per pair); a self-powered version of the **NF-1** speakers introduced at the fall AES show. **Hafler** launched their new **M5** compact two-way passive monitors (\$249). The M5 is magnetically shielded and features a 5.25-inch midbass driver and a 25-mm silk-dome tweeter. KRK was showing prototypes of several new monitors as well as a new **FireWire**-based speaker interconnect system designed to allow easy monitor interfacing with digital audio systems. In other digitally compatible monitor news, **Genelec** announced the **2029B** (\$1375 per pair), an AES/EBU 24/96-compatible version of their 2029A active digital monitors.

NHTPro announced that they were changing their name to **Vergence Technology**. The new company also introduced the **B-20** stereo subwoofer system, which features two 10-inch subwoofers



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mated to a dedicated external amplifier (\$2000), and the C-20 active center monitor, designed to match with and expand the A-20 monitor system.

In addition to new power conditioner products, Furman showed a revised version of their HDS-16 (\$699) headphone distribution system and HRM-16 remote headphone mixer (\$599). Also new was the HR-6SPLT headphone cable splitter (\$89). **SAMSON** introduced a new line of pro reference headphones, including the RH600, RH300, and RH100, which claim linear frequency response from 20 Hz to 20 kHz. **BEYERDYNAMIC** expanded their headphone offerings with the budget-priced DT231 closed-ear system, which offers response from 20 Hz to 18 kHz.

ART also jumped into the monitoring fray with their HPFX headphone monitoring system with effects. Designed to function as a traditional headphone splitter or as a front-end for a computer-based audio recording system, the HPFX offers two mic preamps, four independent headphone outs, built-in digital effects, and a stereo or mono mix input.

SELF-CONTAINED MULTITRACK RECORDER/MIXERS

If you're one of the legion of recordists who favors all-in-one solutions, Winter NAMM had many pleasures in store. **ROLAND** updated their VS-1680 to the VS-1880, dropping the price significantly in the process. Among its new features is improved CD burning. **Fostex** also introduced a new unit, the VF-16 digital multitracker (\$1299), which features 16 tracks plus eight virtual tracks, two digital multieffects, and a full-featured mixer. Eight tracks can be recorded simultaneously via analog inputs, 16 using the ADAT interface in addition to the analog inputs. **Akai's** new DPS16 (\$2695) one-ups the company's DSP12 with 16 tracks of recording and support for 24/96 operation. A stereo multieffects processor is optional (\$400).

A standout of the show was **Yamaha's** AW4416, which combines elements of the company's 02R and 01V mixers with a 24-bit, 16-track recorder, and a built-in sampler triggerable from eight front-panel pads. Features include an internal hard drive, external SCSI port, a 44-channel



CM Automation Dashboard

mixer, 32-bit effects, 4-band fully parametric EQ, eight busses and eight aux sends, 17 moving faders, four fader and mute groups, and an optional built-in CD burner (\$3799 with built-in CD burner). I/O can be expanded with optional interface cards. [See the First Look on page 26 for more details.]

AUDIO INTERFACES AND CONTROL SURFACES

The computer-based audio arena continues to be a hotbed of activity. Several companies were showing USB audio/MIDI interfaces, which obviate the need for internal PCI cards. **Swissonic** introduced the rackmount USB Studio/D, which features two phantom-powered balanced mic inputs with insert jacks, two high-impedance instrument inputs, four stereo line inputs, one tape input with switchable headphone preamp, S/PDIF digital I/O (coax and optical), and an internal power supply.

TASCAM has adapted their "Portastudio" paradigm to the computer age with the US-428 (\$599), a 24-bit digital audio workstation controller combining a hardware interface with computer functionality. The US-428 works with both Windows- and Macintosh-based sequencing

platforms and can control any number of software faders through eight hardware faders; groups of eight software faders are selectable with buttons located beneath the US-428's jog wheel. A built-in MIDI interface is included as a bonus.

The **Steinberg Nuendo PCI 96 52** for the Nuendo postproduction system offers up to 26 ins/outs. Features include: three ADAT digital I/O, a S/PDIF digital I/O, a 9-pin ADAT Sync input for sample accurate transfers, and word clock I/O.

MOTU's 1296 is a 2U rackmountable computer-based hard-disk recording system for Mac/Windows that offers 12 simultaneous channels of 24-bit, 96 kHz input and output on balanced XLR connectors. The 1296 core system includes a PCI-324 audio card with three "Audio Wire" connectors, allowing expansion to 36 simultaneous I/O channels. The 1296 audio interface will also be sold as an expansion I/O that can be mixed and matched with MOTU's entire line of audio interfaces, including the 2408, 1224, 24i, and 308.

An expansion port on the **SeaSound SoloEX expandable audio interface** (\$849) allows SoloEX owners to add a SeaSound a8 8-channel line level expander or other upcoming expansion interface. The SoloEX

comes with ASIO, Sound Manager, and MME drivers, plus Steinberg's Cubasis AV and Sonic Foundry's Acid Rock.

The **Radikal Technologies** USB-compatible SAC-2K control surface (\$1700) is a human interface for computer-based software. It offers 12 rotary encoders, eight motorized channel faders and a motorized master fader, solo and mute buttons, switches that determine the functions of the various controls (including functions such as synth editing), and a central control center for navigation, marker placement, and transport control (including a large LED to show time display).

Designed to standalone or to function as a companion to the Motor Mix digital mixer worksurface, CM Automation's Dashboard digital editor worksurface provides eight channels worth of hardware control over a wide variety of computer-based workstation editing and mixing functions.

CONVERTERS AND DIGITAL GADGETS

A number of manufacturers were showing handy tools for digital audio aficionados. **Apogee** was showing the AP8AD (\$1500) and AP8DA (\$1200) 8-channel 24/96 capable A/D and D/A converter cards for recorders and mixers supporting Yamaha's YGDAI and mini-Ycard slots (such as the 02R and 01V mixers, and the D24 recorder). A unique extender system allows the card to work in both full-size and mini slots.

In addition to Version 2 software for the WR-DA7 digital mixer, **Panasonic** was showing the AD96 and AD96M 8-channel A/D converters — the "M" version adds high-end mic preamps to the package. A built-in ADAT interface connects to a variety of devices, and single-wire high-speed AES and optional dual-wire AES mode connections ensure compatibility with all types of digital audio equipment.

Lucid introduced the SRC9624 sample rate converter (\$1995), which supports a wide range of real-time sample rate conversions, as well as varispeed and pull-up/pull-down. Both single- and dual-wire 96 kHz connections are available.

The ADA-7000 and AE-7000 are **Roland's** new R-BUS-compatible interfaces for V-Mixers and V-Studio workstations. The ADA-7000 provides eight channels of 24-bit A/D/A conversion, while the AE-7000 offers eight channels of 24-bit AES/EBU I/O connections.

If you've been struggling to get dig-

ital audio routed around your studio, **M-Audio's** CT-14 and OT-14 digital audio thru boxes may be the solution you've been looking for. The half-rack one-in/four-out boxes allow distribution of coaxial S/PDIF and ADAT or S/PDIF optical signals, respectively.

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tem on the road? Magma can help you out with the CB2 two-slot CardBus PCI expansion system for Windows computers (\$695). The CB2 connects to the computer via the PCMCIA slot, and includes a 0.5 meter cable. The similar CB2S two-slot CardBus PCI expansion slot for Mac (\$1095) includes a SCSI controller card.

New from ART is the DIO (\$249), a stereo 24-bit A/D/A converter supporting sample rates up to 96 kHz. Unique to the DIO converter is a tube warmth circuit offering control over the character of the processed sound.

Steinberg's Nuendo 8 I/O is a 24-bit, 8-channel A/D and D/A converter (\$1999). The 1U rackmount enclosure features Intelligent Clock Control (ICC), SyncCheck, SyncAlign, TDIF/ADAT converter, and a Bit Splitter. All digital inputs and outputs operate at 24-bit resolution.

The WD8 is a precision word clock generator from Swissonic. The unit has two word clock inputs, eight parallel outputs, and a Digidesign superclock output, as well as AES/EBU I/O. The WD8 is said to be stable to 1-2 ppm, and can generate clock at 44.1, 48, 88.2, and 96 kHz rates. Swissonic also introduced the AD8 and AD8 Pro 24/96-compatible 8-channel A/D converters, which incorporate mic preamps into each channel. The AD8 has ADAT Lightpipe outputs, while the AD8 Pro has four AES/EBU outs.

SOFTWARE

Cubasis VST (\$99) from Steinberg is an entry-level digital recording studio for Windows. Combining the MIDI with 32 tracks of digital audio recording, digital effects, and virtual synthesis, plus CD mastering. Cubasis VST includes the Neon Synth, the VB-1 Bass Synth, and LM-9 Virtual Drum Machine. In addition, Steinberg announced two new software/hardware bundles: The Cubasis VST Project Pack for Windows (\$349) is a 32-track system with stereo S/PDIF I/O, and a microphone input. The bundle contains Cubasis VST multitrack recording and editing software, WaveLab Lite audio mastering, editing, and CD burning software, and the Steinberg Project

Audio Card. The Cubase VST Studio Pack for Windows (\$849) is a 64-track system with 24-bit, stereo S/PDIF I/O and 8-channel ADAT I/O. The Studio Pack contains Cubase VST 3.7 multitrack recording and editing software, WaveLab 2.0 audio mastering, editing, and CD burning software, and the Steinberg ST 24/96 audio card.

The Cakewalk Pro Suite (\$829) includes Cakewalk Pro Audio 9 digital au-

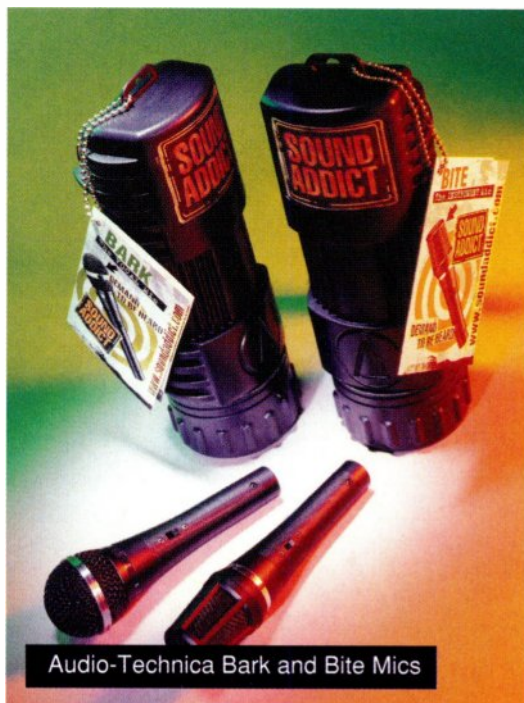
(pan and volume), MIDI piano roll-style data editing, and 16 automatable controller curves per MIDI track.

Emagic was showing Logic Audio 4.2 for Mac/Windows 98, a free upgrade for registered owners. The new version adds sample accurate sync (via ADAT 9-pin protocol), Roland VS support, and enhancements to the Score Editor, Sequencer, and audio engine. SoundDiver 3.0 (Mac/Windows, upgrade \$49 for registered owners) features a redesigned graphic user interface and user-defined key commands. It also accepts MIDI control from devices like the JL Cooper Fader Master Pro, Peavey PC1600X, or CM Automation's MotorMix. MT4 (\$149) is a two-in/four-out USB MIDI interface with MIDI activity LEDs. In other MIDI interface news, MIDIMAN was showing their Midisport 1x1, Midisport 2x2, and Midisport 8x8/5 USB-compatible interfaces.

SoundsLogical WaveWarp 1.2 digital audio processor is a modular, real-time, audio effects processor for Windows 95/98/NT, running native on a Pentium-class PC with any Windows-compatible sound card. With over 260 modular components, WaveWarp provides the building blocks for creating elaborate audio effect algorithms from scratch. WaveWarp supports live audio inputs and 8-, 16-, 20-, 24-, and 32-bit WAV files at any sample rate. All internal calculations are performed with 32-bit floating-point precision.

Minnetonka Audio Software has ported their Mx51 surround sound authoring system to work with any multi-output Windows sound card, such as the MOTU 2408 and 1224. Mx51 uses Minnetonka's Build-Your-Own-Mixer architecture. The Surround Panners can be controlled by a mouse, or with the Microsoft Force Feedback joystick, which lets you feel Surround Panning as you hear it.

The Syntrillium Software Cool Edit 2000 (\$69) is an audio recorder, editor, and effects processor for Windows 9X, Windows 2000, and Windows NT. Cool Edit 2000 offers more than 20 DSP effects, full MP3 import/export in addition to 23



Audio-Technica Bark and Bite Mics

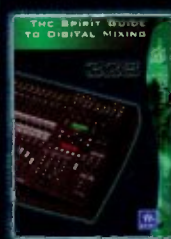
dio/MIDI recording software, NemeSys GigaSampler LE sampling/synthesizer software, several DirectX audio effects (Cakewalk Audio FX 1 Dynamics Processor, Audio FX 2 Vintage Analog Simulator, and Audio FX3 SoundStage Designer), and Musician's Toolbox II, a two-CD-ROM collection of digital audio and MIDI loops, digital video libraries, and sound production tools.

SEK'd Samplitude version 5.5 hard-disk recording program for Windows incorporates Comparisons technology that codes frequency information, as well as amplitude, into colorized waveform displays. Other new features include additional fade options, waveform scaling options, an "object" editor that allows processing specific objects while leaving the rest of a track untouched, MIDI object mixer automation

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other file formats, 24/96 record/playback capabilities, and dozens of other features.

TC Works Spark 1.5 digital audio editor (\$499) features all new cut editing en-

hancements, and the ability to use the powerful Master view section as a plug-in, independent of the Spark application, in both VST and/or MAS for Mac. Also, the Cut Editor now allows the user to work on

two transitions simultaneously. TC also announced Spark TDM (\$699), which is compatible with Digidesign's Pro Tools|24 Mix systems. The TDM version includes de-noising and de-clicking functions, as well as a new TDM FX window that allows up to four TDM plug-ins to be used simultaneously with up to 20 native plug-ins.

SYNTHS AND SAMPLERS

On the synth front, Alesis was making a big noise with their A6 Andromeda analog synthesizer (\$3500). The Andromeda offers true analog synthesis, with 72 knobs and 144 buttons provided for your tweaking pleasure. The 61-note keyboard has 16-note polyphony and is 16-part multitimbral. Among the massive list of features are matrix modulation capabilities, an arpeggiator, an analog-style sequencer, digital effects, and tons more. You can even make its pitch drift if you turn off the background tuning function.

Speaking of analog synths, industry pioneer Bob Moog was showing the Performance Synth (under \$2000), a Min-

continued on page 144

NAMM GETS TRENDY

Tradeshows are always a great place at which to get a feel for the continuing and emerging industry trends. And with the on-going blurring of the border between the MI (music industry) and pro audio categories — a trend in itself — the Winter NAMM show has become a prime place to get an industry overview. Not only are many important new products introduced there, but most of the major players in the manufacturing community are gathered together under one roof, checking each other out and trading insider news and rumors.

In the world of pro audio and recording, a number of trends are gathering steam. To be expected is the continued proliferation of 24-bit/96 kHz-compatible equipment; audio interfaces, recorders, processors (hardware and software), and even speakers are now touting compatibility with high-resolution audio. Likewise, interest in surround sound continues to grow as multichannel-compatible hardware, software, and plug-ins become available.

Of interest to those working with native audio applications (those that don't require dedicated DSP chips to work) is the new breed of "card-less" interfaces. TASCAM, Roland/Edirol, Swisronics, and others were showing USB-compatible audio/MIDI I/O interfaces — no PCI card required. Look for FireWire-compatible interfaces very soon (KRK was showing a new FireWire studio monitor interconnect system, for example), which will feature high enough bandwidth to carry many channels of audio si-

multaneously.

The trend toward self-contained recorder/mixers continues, and has arguably reached its zenith: Yamaha's new unit even includes the option for a built-in CD burner. It's now possible to track, process, edit, mix, and master your project from beginning to final audio CD all in one box — no cables, no muss, no fuss.

On the slightly negative side, there was a vague underlying rumble of concern at the show about compatibility between certain systems. Third-party sequencer manufacturers, in particular, seem to be having some difficulty establishing compatibility with Digidesign's newest-generation DAE/TDM protocols. Not that this is a surprise; many of those third-party manufacturers are releasing their own hardware solutions, and Digidesign recently added vastly improved MIDI support to Pro Tools with the release of version 5 software. Will we see a return to the days of "buy all your software and associated hardware from a single manufacturer"? Let's hope not; many of us have built our studios on the ability to pick and choose computer-based equipment and software as our wants and needs dictate.

On the positive side of the computer-based audio equation is the continued trend toward complete studio-in-a-computer system solutions. A number of new software synths/samplers put in appearances at the show, and there seems to be no stopping the onslaught of cool new plug-ins.

—Mitch Gallagher

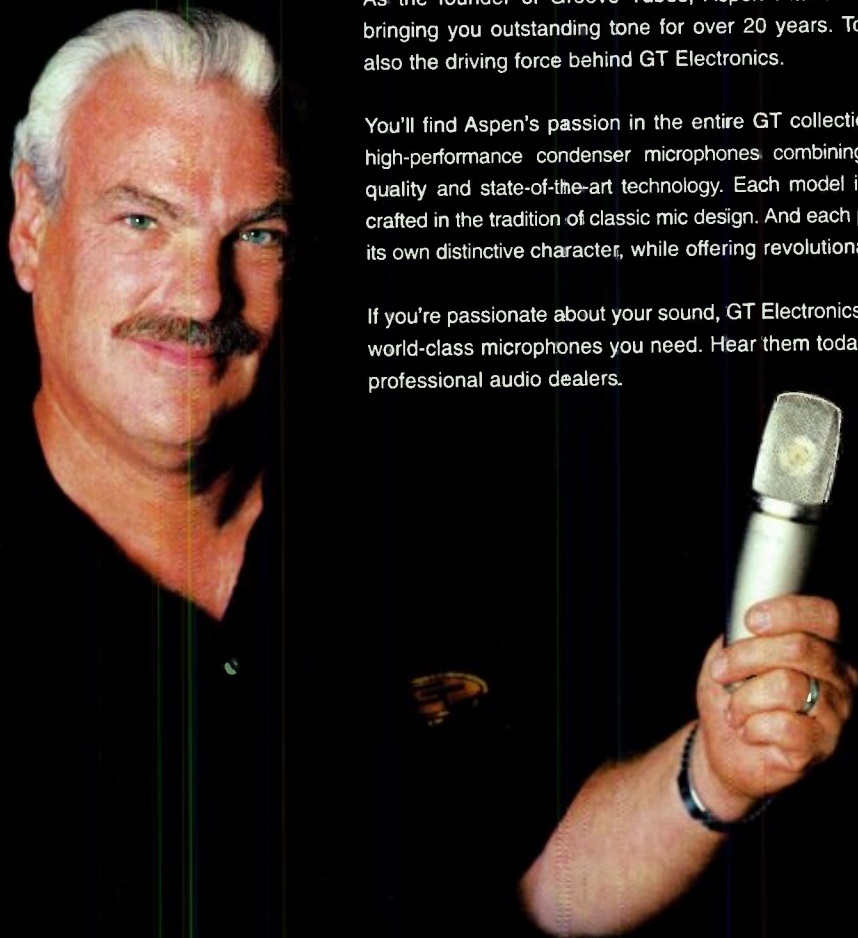
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Mastering by the Masters

by Bobby Owsinski

Six of mastering's
finest discuss their
art and the proper
way to premaster

More so than any other job in audio, mastering is more than just knowing the process and owning the equipment. It's about the cumulative knowledge gained from long days of listening to great and terrible mixes; or working on all types of music, not just the type you like; or saving the client's butt without him ever knowing it; or doing 10 times more work than the client ever sees.

So, rather than writing an overview article on the present state of mastering, I decided to let some of the Masters of Mastering tell you themselves. All of these interviews were excerpted from my soon-to-be published book, *The Mastering Engineer's Handbook*. Most of them were about four times longer than what you'll be reading, and, as a result were really difficult to edit because the information was so pertinent and fascinating. Contrary to the popular notion that mastering engineers are protective of their methods and techniques, today's mastering gurus are extremely helpful and open.

As you'll see, there are some common themes and responses that run through these interviews. I hope you'll have as much fun and learn as much from reading them as I did doing them.

Greg Calbi

Greg Calbi started his career as a mastering engineer at the Record Plant New York in 1973 before moving over to Sterling Sound in 1976. After a brief stint at Masterdisk from 1994 to 1998, Greg returned to Sterling as an owner, where he remains today. Greg's credits are numerous, ranging from Bob Dylan, John Lennon, U2, David Bowie, Paul Simon, Paul McCartney, Blues Traveler, and Sarah McLachlan, among many, many others.

EQ: Do you have a philosophy on mastering?

Greg Calbi: I do. It really depends on the relationship with the person who brings me the tape. My philosophy in general is try to figure out how to improve what the person brings me and then try to figure out what his intent was. In other words, I don't just plug in my own idea without first really communicating with the client.

One time somebody said something to me that I thought was the best compliment that I ever got in mastering. He said, "The reason I like your work is because it sounds like what I did, only better." And that's kind of what I've always tried to do. I try not to change the mix, I just try to enhance it.

What do you think is the hardest thing for you to do?

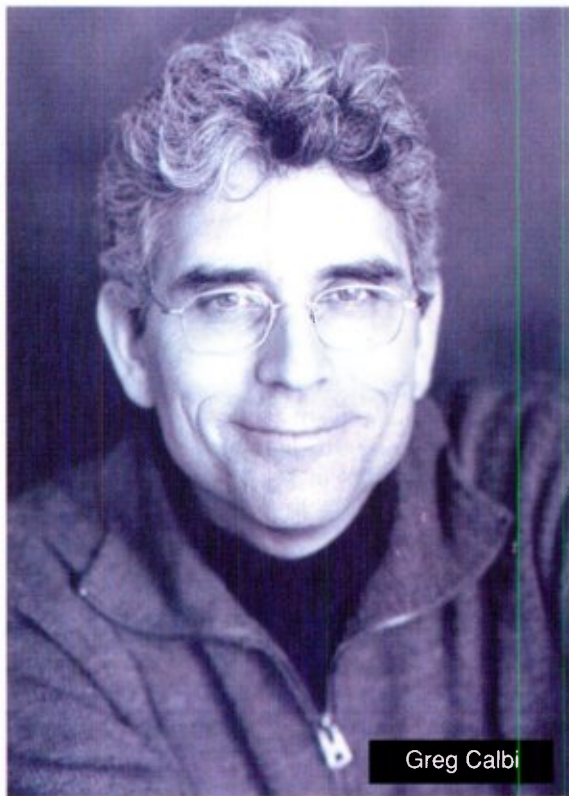
Hard rock and metal has always been the hardest thing for me to make sound good because the density of the music requires a lot of aggressiveness. But what happens is, if the aggressiveness goes just that one step too far, it diminishes the music. You reach a point where

all of a sudden it starts to reverse itself, where big becomes small and exciting becomes overbearing, and it works against the rhythms of the music. So you have to push it to the point, but if it's just one step past that point, it loses impact.

See, that's the thing. There are guys that know how to make things sound really loud and big, but over-compression will keep the rhythm from working right. That's the thing that drives me nuts about the Finalizer and all this other stuff. It's like once you take away the beat, then you just don't have the same intensity any more.

The other thing that's hard is when the low end is thin and light, because it's really hard to create low end when there is none. If you have a real muddy project, you can always clear stuff away and find something in there, but it's really tough when the bottom end isn't there. And most of the problem projects have to do with the bass being recorded poorly. If you made a book of excuses, the chapter on bass would be eight times bigger than the chapter on everything else. He brought the wrong axe, we couldn't get another bass player, it was an acoustic bass, the room, the miking, the direct, the buzz, the hum. It goes on and on.

But the fact of the matter is that you never have a great-sounding CD if you don't have a great bass sound. It can't be great unless the bass is great. It could be good, but bass is what takes it to the level where it's



Greg Calbi

Mastering by the Masters

as loud as somebody else's.

Can you hear the final product in your head when you first run something down?

Well, you do get ideas. If you've been in it awhile and you've heard a lot of things, then you know where to go. Like, if you put on a rap record, you know that it's very rhythm oriented and it has to be really snappy and punchy on the bottom end. You know that some of the elements are really important and that this kind of music seems to feel better if it has them.

Or they may have had a monitoring system that had a lot of bottom end and the tape comes out bottom light as a result, but they thought they had it right. That's why probably the single most important piece of equipment that a mastering engineer can have is his monitor, and he has to understand that monitor and really know when it's where it should be. If you know the monitor and you've lived with it for a long time, then you're probably going to be able to make good recordings. The only problem with that is, if the monitor is something that is a little bit esoteric and only you understand it, it's very insecure for the producer or the artist because they don't think it's there and you have to reassure them all the time. That happened to me when I first worked at A&M and I had a monitor system where I knew what it should sound like, but it was really kind of wrong for everyone else. They had to trust me, and they did, but I could see them get really insecure and concerned. So, in my studio, I've gone to great lengths to make it a very neutral system that everyone can relate to.

Is your console custom-built?

Yeah, we build our own equipment. It's built mostly as an integrated system to avoid a lot of extra electronics and isolation devices and so forth. When you buy most pieces of audio equipment, each one has its own isolation transformers or electronically balanced outputs, or however they arrive at a balanced output. But when we buy outboard equipment, we completely rebuild it and put all of our own line amps in and take out the transformers or the active transformers. You'd be amazed at how much better they sound as a result. If it's done right, there's nothing better.

We have all separate power to each one of our rooms and a very elaborate grounding setup, and we've proven to ourselves that it helps time and time again. We have all custom wire in the console. We

build our own power supplies as well as everything else; the equalizers, everything.

Would you have any words of advice to keep somebody using one of those "mastering processors" out of trouble?

I just don't think that you should do anything that draws attention to itself. Like, if you're going to use a compressor or limiter on the bus, if you use it to the point where you really hear a change in the sound, you're going a little too far. You always have the consolation of knowing that the mastering engineer can take it to another level anyway, and he's experienced in how to do that.

Some of the automatic settings in these devices really aren't as good as they make them out to be. And, when you use them, you have to realize that you're going to degrade the sound because compressors and limiters will do that. Analog and digital are very, very much alike when it comes to signal processing. If you put a compressor in the circuit, not even compressing, you will hear a difference, and it will sound worse.

What is the hardest thing that you have to do?

One of the things that is really hard is when the recording isn't uniform. In other words, if a whole bunch of elements are dull and then just a couple of elements are bright, then it's not uniform. And that's the hardest thing to EQ because sometimes you'll have just one element, like a hihat, that's nice and bright and crisp and clean, and everything else is muffled. That is a terrible situation because almost anything you do is going to affect the hihat. It's very hard to do anything with the rest of the recording. You find yourself dipping and boosting and trying to simulate air and

openness and clarity and all the things that high-end can give you, and so you have to start modifying the bottom a lot. You do the best you can in that situation, but it's usually a pretty big compromise.

Then there's something that's been overly processed digitally — where it gets so hard and brittle that you can't do much with it because once you've lost the quality, you can't get it back. If I am starting out with something that is really slammed and distorted and grainy and smeary, I can maybe make it a little better, but the fact that a lot of that quality is already gone is going to handicap that recording. It is never going to be as present as the way something that is really clean can be. That is part of what

"If you put a compressor in the circuit, not even compressing, you will hear a difference, and it will sound worse."

—Bernie Grundman

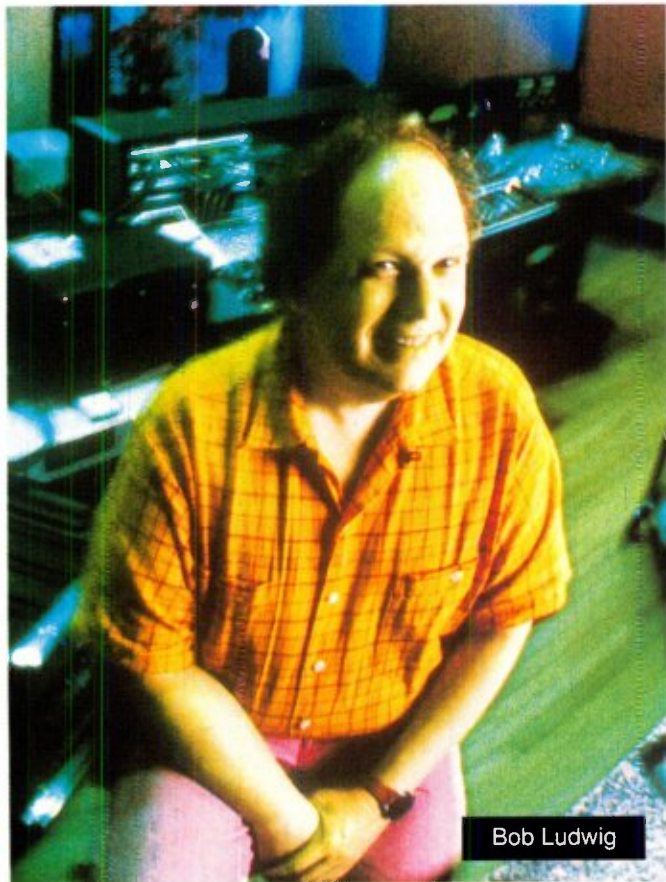
gives you presence; when it's clean. The cleaner it is, the more it almost sounds like it is in front of the speakers because it's got good transients.

What makes a great mastering engineer as opposed to someone who is just competent?

I think it would be trying to get a certain kind of intimacy with the music. It doesn't even have to be music that you like. Music is a human expression, and you have to be willing to open yourself up to wherever it is that the artist is trying to go with his music or whatever he's trying to communicate. So mastering is more than just knowing how to manipulate the sound to get it to where somebody wants to go. It's a willingness to enter into another person's world, to get to know it, and to actually help that person express what he is trying to express, only better.

Bob Ludwig

After having worked on literally hundreds of platinum and gold records, and mastered projects that have been nominated for scores of Grammys, Bob Ludwig certainly stands among the giants in the



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Mastering by the Masters

mastering business. After leaving New York City to open his own Gateway Mastering in Portland, Maine in 1993, Bob has proved that you can still be in the center of the media without being in a media center.

EQ: What do you think the difference is between someone who's just merely competent and someone who's really a great mastering engineer?

Bob Ludwig: I always say that the secret of being a great mastering engineer is being able to hear a raw tape and then, in your mind, hear what it could sound like, and then know what knobs to move to make it sound that way.

You know where you're going right from the beginning then, right?

Pretty much. It's a little bit like the Bob Clearmountain school, where, after 45 minutes of mixing, he's practically there and then spends most of the rest of the day just fine tuning that last ten percent. I think I can get 90 percent of the way there sometimes in a couple of minutes, and just keep hanging with it and keep fine tuning it from there. It comes very, very fast to me when I hear something.

Since you're not in a big media center, how many of your sessions are attended?

When I started my own business after working at Masterdisk and Sterling Sound before that, our business plan called for a 20 percent reduction in overall business, but the opposite actually happened. We thought that half the people that had attended sessions in New York would attend up here. It turns out more people attend sessions here than in New York, which was a total surprise.

Why do you think that is?

To tell you the truth, I think a lot of people have heard about the effort we've gone through to make our room as acoustically perfect as possible. And they know that we've got speakers that retail for \$100,000 a pair. So a lot of people just want to come and see what it's about. So many times people come into the room and they go, "Oh, my God!" or something like that. It's a trip to get that kind of reaction from people.

Do you think that there's a difference between the way people master from coast to coast?

Well, I don't think there's so much a difference between coast to coast as there is just between some of the major personalities in mastering. Some engineers might master almost everything into the analog domain because they love working with analog gear. I cer-

tainly do that sometimes, but I would say that I've tried to accumulate what I think is the very best new gear, as well as funky old gear that has a certain sound. If a tape comes in sounding really, really good, I have gear that will stay out of the way and do exactly what I need without inflicting any damage on the thing at all.

Talking about different engineers, there are some engineers that just like to slam the hell out of everything. It seems like their only criteria is how loud they can make it, not how musical they can make it. And, for me, I'm under pressure from A&R people and clients to have things loud, but I try to keep the music at all costs. I'll think nothing of doing a Foo Fighters record one day where it's totally appropriate to have it smashed, then the next day do something that's perhaps even 4 dB quieter than that because it suddenly needs the dynamics for it to breathe. **The dynamics wars...where did that come from?**

I think it came from the invention of digital domain compressors. When digital first came out, people knew that every time the light went into the overs or into the red that you were clipping, and that hasn't changed. We're all afraid of the over levels, so people started inventing

these digital domain compressors where you could just start cranking the level up because they were able to do things that you couldn't do with any piece of analog gear. Because it was in the digital domain, you could look ahead in the circuit and have a theoretical zero attack time or even have a negative attack time if you wanted to. It will give you that kind of an apparent level increase without audibly destroying the music, up to a point. And, of course, once they've achieved that, then people started pushing that as far as it would go. I would say the average level of a CD has peaks on a VU meter that are at least 3.5 dB hotter than they used to be, if not more. Sometimes as much as 6 dB hotter than they used to be.

I always tell people, "Thank God these things weren't invented when the Beatles were around because, for sure, they would've put it on their music and would've destroyed its longevity." I'm totally convinced that overcompression destroys the longevity of a piece. Now, when someone's insisting on hot levels where it's not really appropriate, I find I can barely make it through the mastering session.

Do you think we've reached the limit of that?

Yeah, I honestly do, because we're not that far away from music dynamics approaching steady-state tone.

"I'm totally convinced that overcompression destroys the longevity of a piece."

—Bob Ludwig

If you look at many of today's CDs on a digital level meter, the peak levels barely go lower than the maximum. It would be a steady stream of digital "Over" levels if the digital domain compressors didn't artificially prevent the red "Over" light from coming on. It's difficult to believe that it could be compressed much more than it is now. That's why I'm so excited about 5.1 [surround sound], because there's no radio competition, at least for this year anyway.

Tell me about your signal path.

In the analog domain, it goes from the tape machine into George Massenburg/Sony electronics that are as minimal and audiophile as one can get. The output of that goes right into either a either a dCS, Pacific Microsonics or sometimes Apogee analog-to-digital converter. If I need other outboard gear, we've got Neumann EQs, NTP, and Manley compressors. In the digital domain, I have all the Weiss 96/24 stuff. The bw102, which has the 96 kHz de-esser in it as well, is

complete with a mixer, compressor, and equalization.

We put a lot of attention on analog at our place. We've got a lot of different ways of playing back analog tape. We've got a stock Studer A820. We've got a Studer that's got Cello class A audiophile electronics. We've got a stock ATR, a tube ATR, and an unbalanced ATR. We also have one of the Tim de Paravicini 1-inch 2-track machines with his fantastic tube electronics. When you record with his custom EQ curve at 15 ips, it's basically flat from 8 cycles up to 28k.

What's the hardest thing that you have to do? Is there a certain type of music or project that's particularly difficult?

I think the most difficult thing is when the artist is going through this period of where he just can't let go of the project. You get into the psychological thing where in the same sentence they say, "I want you to make the voice more predominant, but make sure it doesn't stick out." Just contradictory things like that. They'll say, "This

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Mastering by the Masters



The Tracking Room at Glenn Meadows' Masterfonics, now owned by Emerald Entertainment

mix is too bright," and then you'll dull it up like half a dB, and they say, "Oh, it doesn't have any air any more."

Do you have a specific approach to mastering?

To me, music is a very sacred thing. I believe that music has the power to heal people. And, of course, a lot of the music that I work on, even some of the heavy metal stuff, is healing some 13-year-old kid's angst and making him feel better, no matter what his parents might think about it. So I treat music very, very seriously.

Glenn Meadows

Glenn Meadows is a two-time Grammy winner who has owned the Nashville-based Masterfonics since the '70s (most recently purchased by Emerald Entertainment). He has worked on scores of gold and platinum records for a diverse array of artists, including Shania Twain, LeAnn Rimes, Randy Travis, Delbert McClinton, Widespread Panic, and Bananarama, as well as for producers and engineers such as Tony Brown, Jimmy Bowen, and Mutt Lange.

EQ: What's your philosophy on mastering?

Glenn Meadows: I think that mastering is, and always

has been, the real bridge between the pro-audio industry and the hi-fi industry. We're the ones that have to take this stuff that sounds hopefully good or great on a big professional monitor system and make sure it also translates well to home systems. We're the last link to get it right or the last chance to really screw it up and make it bad. And I think we're all guilty at times of doing both.

That being said, do you listen on typical home hi-fi systems?

No, my mastering room has an in-wall Kinoshita monitoring system. It's about an \$80,000 or \$90,000 speaker system when you include the amplification. What we found is that, when you have it sounding really great on that, it sounds good on everything else you play it on. Yeah, it's a different characteristic than a home system without the dome tweeters and that thin, ethereal top end that comes out of there, but if the components in the big system are in good shape and they've been maintained properly, you're going to get that same perspective. It also doesn't rip my head back and forth trying to go to different monitoring systems.

What I think is really difficult is that if you put up two or three different monitors to get a cross section,

then you don't really know when anything is right because they all sound so different. I used to run little B&W 100's and I'd also have the requisite Yamaha NS-10's in the room, and, during that time when I was switching back and forth, I found my mastering suffered radically because I didn't have an anchor any more. I didn't have a point where I knew what was right because the character of the speakers was so different from each other. Once you listened to one for a couple of minutes, you lost your reference point on the other.

The reason people come to a mastering engineer is to gain that mastering engineer's anchor into what they hear and how they hear it, and the ability to get that stuff sounding right to the outside world. So if you start putting all this stuff up on small speakers, and try this and try that, you've basically created a big confused image for the mastering engineer.

What brought about the level wars that mastering engineers seem to be fighting these days?

We had level wars in vinyl right near the end of it, where everybody was trying to get the vinyl hotter and hotter and hotter. And, at least in vinyl, you had this situation where, when the record skipped, the record label would say, "Well, it's too loud, and you're gonna have returns." What put the fear of God into the producer was returns. So they would tend to back away and we could kind of stay within the limits of the medium where you got a 23-minute side, and you couldn't cut it any hotter because it just won't fit at that level.

We originally thought we had that type of limitation on digital, but what ended up happening is that there're so many tools out now for doing the dynamic range squash that you can literally get tracks now where you put them in a workstation and it looks like a 2 x 4. It comes on at the quietest passage on the beginning of the intro, and it's full level. You get into what I call "dynamics inversion." Spots in the record that should get louder actually get softer because they're hitting the compressor/limiter too hard.

I don't think that the record companies and the producers at this point have enough insight or understanding about what radio has learned a long time ago, which is the tune-out factor for distortion. Radio has spent a lot of time researching how far can you push it before people are annoyed and won't listen any

more. As a result, radio is tending to back down a lot with their compression, but it still gets compressed when they mix it, we compress it when we master it, and they compress it when they broadcast it. If you

look at some of the radio stations on a VU meter on a calibrated system, they have maybe 3 dB of dynamic range. We are putting out CDs that maybe have 6 dB of dynamic range.

Whose fault is it?

I think it's a wrap-around effect from broadcast. To be very honest with you, there is the impression that if the song doesn't jump off the CD for the program director's initial listen, then he's going to hit the "next track" button. So, we get into this round-robin deal where we've got to make the cuts louder and louder so that they jump off the CDs faster.

But, as the quality of the music is going down, so are the record sales. I don't think anybody has tried to make a correlation between the fact that if it's fatiguing to listen to, the people at home are going, "I can't even listen to the whole record. It's in my face. It never gets quiet. I could only listen to five songs. Take it off and throw it away. It's irritating."

What makes a great mastering engineer?

The ability to use discretion. The ability to listen to a piece of product and say, "You know, this really doesn't need much of anything." At this point in my career (I've been doing this for almost 30 years now), if I put a client's tape up and I don't have a pretty good clue by the time I'm at the end of the first run of the first song as to what that song needs, they ought to go back and remix. I find that the real value of a mainstream mastering facility versus trying to do it yourself or doing it in a small back-woods-type place or a basement place is that the experience of the engineer comes into play and it can save you money and time. We have had situations where clients say, "We can't pay your \$210 an hour. We know how long it takes to master." And I said, "Well, tell me about what you did the last time." "Oh, we went to this guy and it was \$25 an hour." "How long did you spend?" He said, "We spent four days." "Three or four hours a day?" "No, he worked 10, 12 hours a day. It cost us a fortune." And I'm just shaking my head in disbelief and I'm saying there is no reason that an album of what you're putting out should take more than 7 or 8 hours at the most. I said, "To be real honest with you,

"I really hate, and have a much more difficult time, working with material that has been pre-mastered."

—Glenn Meadows

Mastering by the Masters

if I had to spend more than four or five hours on the record to get 98 percent of what can be gotten out of it, I'm wasting your time."

I don't mean to be arrogant, but it has to do with the experience of the engineer working in his environment. He's in the same room every day for years. I can walk into this room in the morning and know if my monitors are right or wrong just by listening to a track from yesterday. To me, that's the value of a mastering engineer. What they bring to the table is the cross section of their experience and their ability to say, "No, you really don't want to do that."

Is there something that a producer can do beforehand that makes your job easier, or something that just makes it a lot harder?

I really hate, and have a much more difficult time, working with material that has been pre-remastered. I actually think what we have done is we have created a new Scotch tape in the industry that's called "Finalized." That word from the Finalizer has almost become a generic term just to encompass that whole large scope of things that people stick at the end of their mixing chain before they go to their storage medium.

I'm not crazy about any of those mastering-in-a-box type deals, because most of what they do is all undoable. Most people using them are listening in less than ideal environments, and they can't hear a lot of the stuff that's going on. Plus, your ears become so used to it that it becomes like an addiction where more is better. If it is louder, it is better. If it has got more bass and more top, it is better. And they bring that in, and you have a tape that is sitting right at zero or clipping on the DAT and they want you to master it. You're going like, "Well, there's barely much left to do. You have kinda killed it already."

Doug Sax

If ever there was a title of "Godfather of Mastering," Doug Sax has truly earned it, as evidenced by the extremely high regard that the industry holds him in. One of the first independent mastering engineers, Doug literally defined the art when he opened his world famous The Mastering Lab in Hollywood in 1967. Since then, he has worked his magic with such diverse talents as The Who, Pink Floyd, The Rolling Stones, The Eagles, Kenny Rogers, Barbra Streisand, Neil Diamond, Earth, Wind and Fire, Rod Stewart, Jackson Brown, and many, many more.

EQ: Do you have a philosophy about mastering?
Doug Sax: Yes. If it needs nothing, don't do anything.

I think that you're not doing a service adding something it doesn't need. I don't make the stew, I season it. If you add salt when it doesn't need any, you've ruined it. I try to maintain what the engineer did. A lot of times they're not really in the ballpark due to monitoring, so I EQ for clarity more than anything.

When you first run something down, can you hear the final product in your head?

Oh yes. Virtually instantly. Because, for the most part, I'm working with music that I know what it's supposed to sound like. But once in a while I'll get an album that is so strange to me because of either the music or what the engineer did that I have no idea what it's supposed to sound like, and I often will pass on it. I'll say, "I just don't hear this. Maybe you should go somewhere where they're glued into what you're doing."

How has mastering changed over the years from the time you started until the way it is now?

My answer is maybe different than everyone else's. It hasn't changed at all! In other words, what you're doing is finessing what some engineer and artist has created into its best possible form. If an engineer says, "I don't know what it is, but the vocal always seems to be a little cloudy," I try to go in there and keep his mix and make the vocal not sound cloudy. That's what I did in 1968 and that's still what I do in 2000. The process is the same.

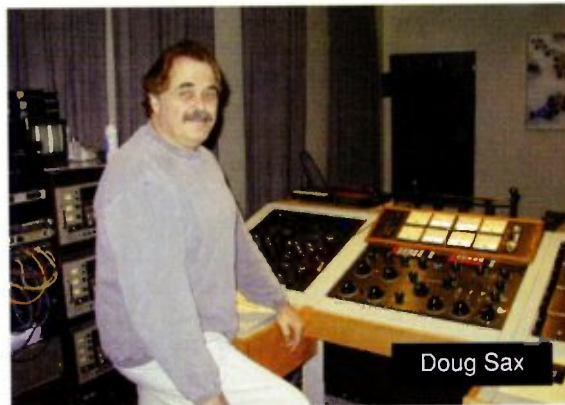
I'll tell you what the biggest difference is today from back then. The biggest thing is dynamics. Nobody wants dynamic range now.

Why do you think it has changed?

It has to do with the fact that there's an increasing amount of music listening being done in the car. And there's one thing that doesn't work in the car and that's dynamics. Long, sexy fades that ease you out of one song and into another are worthless in the car.

What's the hardest thing that you have to do?

I come from a time when an album had a concept to it. The producer worked with one engineer and one



Doug Sax

studio, the group recorded everything, and there was cohesiveness as to what was put before you. Once you got into where they were going and what they were doing, you sort of had the album done. To me, the multiple-producer album is the biggest challenge because you might have three mixes from Nashville in different formats, a couple from New York, and two that are really dark and muddy and three are bright and thin. The only good part that I see about this is that you absolutely have to have a mastering engineer. There's no question, the mixes don't go together and they don't work. The hard part is to find some middle ground so that the guy that has the bright thin tape is still happy with what he's done and not drive off the road when the dull thick one hits after the bright thin one. So that is the biggest challenge in mastering, making what is really a cafeteria sound feel like a planned meal.

Were you the first independent mastering engineer, or one of the first?

Absolutely. I was one of the pioneers when there was no business. We opened up our doors in December 27 of 1967, and by '71 you couldn't get into the place. By '72 we were doing 20 percent of the top 100 chart, and there weren't a lot of competitors. There was Artisan in L.A. and there was Sterling and maybe Masterdisk just starting in New York. Now there seems to be a thousand [places] because the reality is that it's very easy for someone to go into this business now. You can get a workstation with all the bells and whistles for a song and a dance. A Neumann lathe setup in 1972 was \$75,000, and that was just the cutting system. You still needed a room and a console. So there was only a few people doing it and you had to have a big budget. But now, you fire it right up.

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Mastering by the Masters

No tones. I'm one of the instigators in railing on these guys to go back and print the tones so I could at least get my machine to be where your machine was. And there was no such thing as nearfield monitoring. It didn't exist. So people used to go to these strange studios with big speakers in the wall, most of which were useless as far as relating to the world, and the engineers never knew that they were out in left field because they had nothing to take home. The cassette was just starting, and only handful of engineers that I can think of actually had a 15 ips tape machine at home that they could take home a mix and find out where they were.

I started the process in the early '70s, just in self-defense. I would say, "Look, before you do anything, come in on-the-house with your first mix and find out if you're in trouble. We'll listen to it and get you straight." I just got tired of watching these guys eyes open the first time they ever heard it out of the studio. "Oh, my God. I couldn't hear any highs in the studio. I kept adding highs." That absolute horrendous reality is the reason really why nearfields came in.

The truth of the matter is that today's tools are getting so much better. I hate to say this as a mastering engineer, but, used right, the Finalizer can do some awesome things. There was nothing like that three years ago. Digital technology is moving so fast, and it's gone from, in my view, absolute garbage to "Hey, this is pretty good." What used to be something that was really unmusical to me, I have to say, is now getting there.

A lot of mastering engineers badmouth the Finalizer because you can make your product loud instantly, and I get a kick out of that. Mastering engineers don't like that because they used to be the ones that made it loud. But the reality is that everyone's going to have it and, as a result, everyone can make their CD loud. Once that becomes absolutely no trick at all, then the question becomes, "Are there things that maybe we should do besides just make it loud?" I'm hoping that there's still going to be a business for someone that treats the music with love and respect when they're mastering it. And I think there's going to be a small reversion away from, "I want the loudest CD."

I get people in here new off the street that say, "I want the loudest CD ever made," and I say, "You're in

the wrong place." Once in awhile they'll pull out a CD and put it on and it's absolutely blazing. And I'll say, "Find out where that was mastered and go there and get what you're looking for." But I still do more Gram-

my-nominated albums for engineering, so I have to be competitive from the standpoint that you don't want to turn it up a bunch when you put the thing in a CD player.

Describe your signal chain — or is that proprietary?

No, it's not proprietary. As a point of interest, whether the source is analog or digital, if it needs EQ, I EQ it as an analog. That makes sense because, if you come in with 96/24, I just look at it as good-sounding analog. I do what I want with it, then I'll get it down to 44.1 and 16-bit in the best way possible. So whether it's 1/2-inch or 1/4-inch analog or digital, it goes into good converters and comes up as analog. Then the EQ is passive with the same equalizer I've had since 1968. The limiters are all tubes, and they're transformerless. Ninety-nine percent of what I do is done between those two devices.

What do you use for monitors?

I use my own. They're two 15's with a midrange horn and a tweeter, and they've been here since 1968. I have no

"I hate to say this as a mastering engineer, but, used right, the Finalizer can do some awesome things."

—Doug Sax

nearfields.

That's fantastic that the gear you have has weathered the test of time.

Yes. It's the same concept that I have about mastering. I don't master any differently today than I did in 1968. The speakers still allow me to put the right stuff on, and if they steer me wrong, then they're worthless.

Eddy Schreyer

Noted veteran engineer Eddy Schreyer opened Oasis Mastering in 1996 after mastering stints at Capital, MCA, and Future Disc. With a list of chart-topping clients that span the various musical genres such as Babyface, Eric Clapton, Christina Aguilera, Fiona Apple, Hootie and the Blowfish, Tracy Chapman, Offspring, Take 6, Korn, Dave Hollister, Pennywise, Exhibit, Jesse Powell, and Tupac, as well as soundtracks from movies like Howard Stern's Private Parts, Phenomena, and Pleasantville, Eddy's work is heard and respected world-wide.

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Mastering by the Masters

EQ: Do you have a philosophy about mastering?

Eddy Schreyer: Yes, I do. I would say that mastering is the ability to create a sonic product that gives the song balance and competes with the current market in terms of sonic quality and level.

What do you mean by balance?

Frequency balance. Balance is making adjustments with compression, EQ, and such so that it maintains the integrity of the mix, yet achieves balance in the highs, mids, and low frequencies. I go for a balance that it is pleasing in any playback medium that the program may be heard in. And, obviously, I try to make the program as loud as I can.

But all mixes can't be cut as loud as others, so there's many limiting factors as to how loud something can go, and there is also limiting factors on what balance can be achieved. Some mixes just cannot be forced at the mastering stage because of certain ingredients in a mix. If something is a little bottom light, you may not be able to get the bottom to where you would really like it. You have to leave it alone, so it remains thinner because it distorts too easily.

There are a lot of people that are complaining that things are so squashed these days and it's because of everyone trying to get their competitive level up.

What I am hearing is that various houses are really over-compressing, trying to get more apparent level. The trade-off with excessive compression to me is the blurring of not only the stereo image, but the highs, too. An over-compressed program sounds pretty muddy to me. In the quest to get the level, they end up EQ'ing the heck out of these tracks, which, of course, induces even more distortion between the EQ and the

compression. I am hearing things that are very, very loud, but, in my opinion, not a very good sound. I am hearing a program that is just way over EQ'd because they're trying to get back what the compressor has taken away.

How do you determine what's going to work and what isn't?

You go as loud as you can and you begin listening for digital clipping, analog grittiness, and things that begin to happen as you start to exceed the thresholds of what that mix will allow you to do in terms of level. Again, just spanking as much gain as you can, be it in the analog or digital world, doesn't matter. You go for the level and properly control it with compression, then you start to EQ to achieve this balance. Of course, it all depends on the type of mix, how it was mixed, the kind of equipment that was used, how many tracks, the number of instruments, and the arrangement.

Just the number of instruments can be a very limiting factor on level, also. For example, a 96-track mix may not go as loud as a 24-track mix because there is too much signal to be processed.

Can you hear the final product in your head when you first do a run through?

Usually, yes I do. Typically, when I first put up a mix, the first thing I do is just go for the level.
continued on page 146

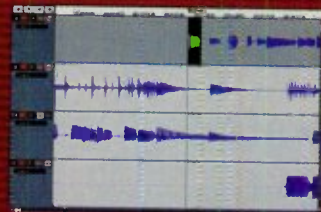
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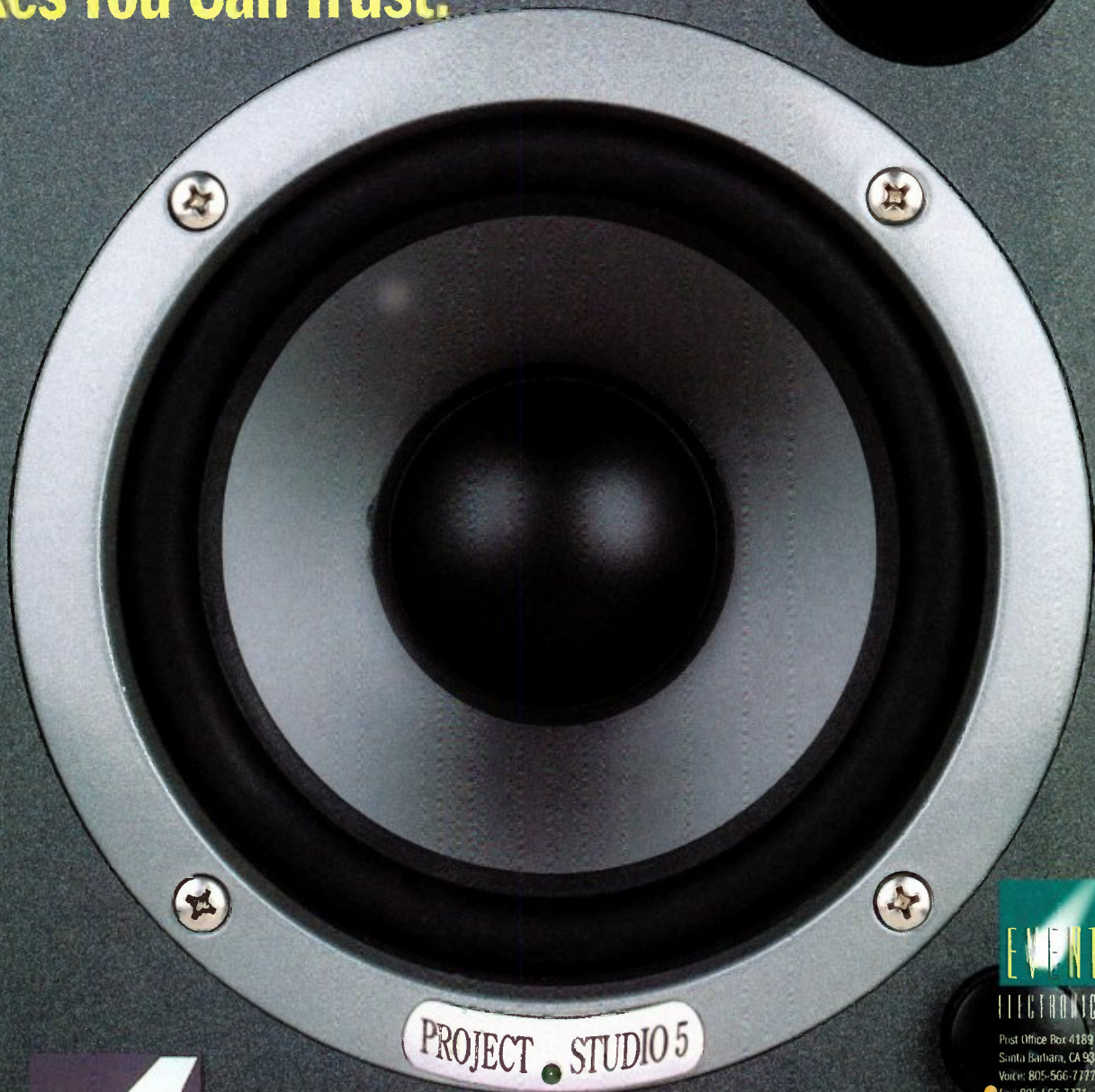
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Special Preview by Roger Nichols

Close-up
of the Sony
DMX-R100
Digital
Console

DRE-S777 U.S. Tour • America's Cup • Nigel Olsson • New Products

.....
A Supplement To Miller Freeman PSN

World Radio History



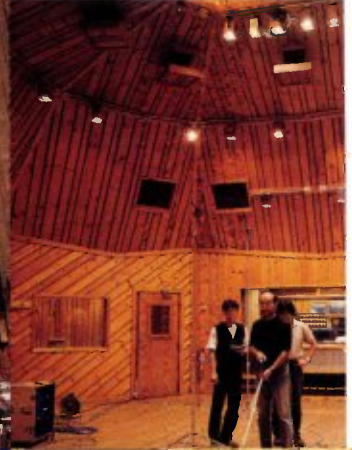
THE GRAND CANYON | Arizona



GIANDOMENICO STUDIOS | Collingswood, NJ



CATHEDRAL OF ST. JOHN THE DIVINE | New York, NY



AVATAR STUDIO | New York, NY

IN SEARCH OF THE PERFECT REVERB...



MECHANICS HALL | Worcester, MA



OCEAN WAY RECORDING | Los Angeles, CA

PRO AUDIO REVIEW 1999 REVIEWER'S PICK



DRE-S777

We've sampled and captured the actual reverberant characteristics of some of the finest acoustic environments in the world. Why? Because this is the underlying principle behind the Sony DRE-S777 Digital Sampling Reverberator.

The DRE-S777 uses highly advanced signal processing to capture real sound spaces with incredible, detailed precision. The result? The most realistic reverb ever... because it recreates the "real" ambience of actual

concert halls, cathedrals and studios. To quote Tom Jung from the 12/99 issue of Pro Audio Review, the DRE-S777 is "Second only to being there." An entire CD-ROM filled with some incredible sounding plates and spaces comes with the unit*.

A growing library of optional CD-ROMs is available including "European Halls & Churches" and the latest US release that includes some great American studios, churches, concert halls and the ultimate reverberant space, the Grand Canyon.

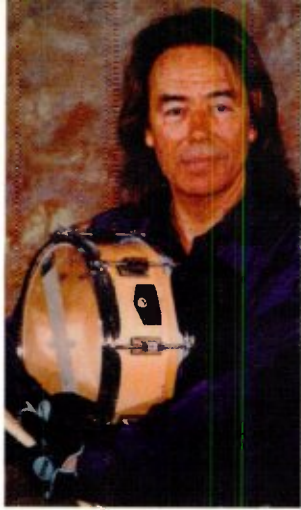
The proof is in the listening, so call 1-800-472-7669 ext. S777 today to order your **Free Demonstration CD and VHS video tape** and experience the difference between reverb effects and "real" space.



SONY

1-800-472-SONY ext. S777
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Easy Listening

Drummer Nigel Olsson swears by his Sony MDR-7505 & 7509 headphones for both live and studio work.

If you've spent any time at all near a radio, you are familiar with Nigel Olsson's work. As the drummer and background vocalist in Elton John's band, he played on such classic albums as *Don't Shoot Me I'm Only the Piano Player*, *Goodbye Yellow Brick Road*, *Captain Fantastic*, and many others. Today, 30 years after their first collaboration, John and Olsson are still working together.

Another long-time collaborator with Olsson is Sony headphones, which started five years ago when he first heard one.

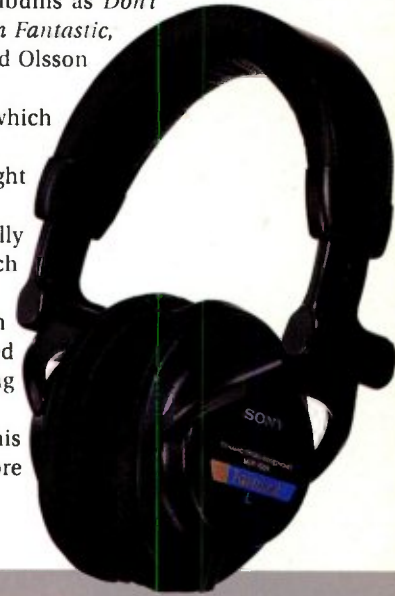
"This new model, the MDR-7505, is clear and crisp," said Olsson. "The comfort is great — they're tight enough to stay on my head and padded enough not to hurt. You don't feel them."

Features of the MDR-7505 include a swivel mechanism for various listening positions, an acoustically sealed ear cup for listening in loud environments, excellent power handling, and a gold-plated, Uni-match connector for universal compatibility with desktop and portable devices.

"Onstage, the MDR-7505 don't block everything out," said Olsson. "When I play, I don't want to be in a cocoon. With these headphones, you can hear what you are doing and you can hear the crowd. I've used headphones onstage for a long time now, which is great because it eliminates the monitors, keeping onstage noise lower and protecting my ears."

But, when in the recording studio, Olsson said he likes the Sony MDR-7509 Studio headphones. This new top-of-the-line model has been designed specifically for studio use with the ability to handle more power and deliver a stronger bass response — the perfect headphone for demanding studio work.

"I'm using the 7505s on my electric kit and the 7509s in the studio," said Olsson. "They both perform excellently."



Smooth Sailing

with Sony Wireless Mics

Providing capabilities of on-the-ship coverage, Total RF, the 10-year-old Pennsylvania-based integrator, has installed wireless systems featuring three Sony wireless microphones on six 12-meter yachts — a total of 18 wireless mics — for this year's worldwide broadcast of the America's Cup yacht race off the coast of Australia.

"Total RF prides itself on tailoring wireless packages with trouble-free success for the most demanding applications, anywhere on the globe," said Total RF president Steve Gansky. "We have designed and implemented state-of-the-art wireless communication solutions for events ranging from the Barcelona Summer Games to the New York City Marathon."

"For this year's America's Cup broadcast, we used the Sony WRT-820A portable receivers and WRT-822 bodypack transmitters because they are very economical, very small, and have worked well for us in previous America's Cup races," said James Malone, vice president of Total RF. "We have attached one microphone to the ship's captain, one to a tactician, and a third to the owner on each yacht. There's a single antenna on the yacht deck bringing the RF back on a single cable to a splitter in what we call the 'yacht box.' There are also six hardwired deck mics on the ship."

The audio is mixed into a MIDI controllable console operated remotely via an RF datalink from shore. The final audio is then sent back to the broadcast center on a digital microwave path.

"We found that with all the

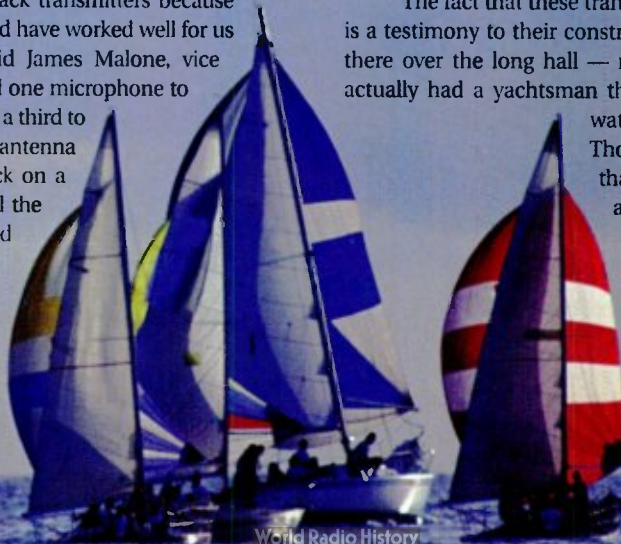
additional RF equipment, including data transmitters and microwave on the ship, the Sony mics handled very well," said Malone. "They reject out-of-band signals and the audio quality has been excellent. They also are very low current consumers so we can leave the transmitters on for six to seven hours."

There are two signal paths back to a rooftop site onshore: the first is the microwave link and the second path, which serves as a backup, is a Sony transmitter with a modified amplifier. The Sony WRR-840A receivers are being used to receive this audio back at the broadcast center.

"This serves as a back-up path if the microwave links are not up in the early mornings during checking of the microphones," explained Malone.

"The fact that these transmitters endure four months on the ocean is a testimony to their construction," said Gansky. "They really hang in there over the long haul — reliable, set 'em and forget 'em. We have actually had a yachtsman throw their transmitter overboard into the water when having a less-than-stellar race. Though it was never recovered, legend has it that on a quiet night, if you listen closely with a receiver, you can still hear this transmitter from the bottom of the ocean."

Total RF has had a presence in New Zealand since late Summer 1999, testing the systems. The America's Cup broadcasts will run from January to March 2000. The host broadcaster is TV New Zealand, with ESPN taking the U.S. feeds.



Sony DMIX-R10 Digital Console



Sony Leaves “No Stone Unturned”

As It Storms the Midrange Digital
Console Marketplace

An Advance Preview by **Roger Nichols**

Sony has entered the small-format digital console market with the launch of the DMX-R100. Here is a first look at a digital console that has been positioned between the small format digital consoles that exist in the market, and the high-end digital consoles such as the Sony Oxford OXF-R3.

The DMX-R100 gets a lot of its operating savvy from its big brother, the Sony Oxford OXF-R3. The Oxford has given Sony years of experience in some of the best studios in the world with some of the top producers and engineers. The Oxford sounds great and is a pleasure to work on.

The DMX-R100 design left no stone unturned. Sony has crammed a lot of features into a 45x26-inch package. The features that set the Sony DMX-R100 apart from other small format digital consoles are 100 mm

the additional monitors). The unit also features built-in MS decoder on linked stereo inputs; surround panning, by touching where in the picture of a room you want the sound location; both Sony 9-pin and MMC machine control directly from the console transport control window; the selection of automation punch points so you only affect automation data between those points; and it's a Sony.

No longer do you have to wonder what it would be like to record your multitracks at higher sample rates. The DMX-R100 will handle 44.1 kHz, 48 kHz, 88.2 kHz, and 96 kHz. When the high sample rates are selected, the frequency response expands to 40 kHz. You can even EQ the high end up there at 40 kHz if you want to. The only drawback of high sample rate operation is the extra bandwidth requirements. The number of channels and auxes available has to be cut in half.

All digital I/O is 24-bit, and all analog I/O uses 24-bit 128x converters. The console is equipped with 24 analog inputs and 8 aux inputs. The first 12 analog inputs have two input connectors. Twelve "A" inputs are through XLR connectors that feed the microphone "head amps" with an unbelievable -126 dB noise floor. The first 12 inputs also have insert connectors for insertion of outboard analog processing gear. There are 1/4-inch balanced TRS connectors for the "B" line level inputs. The second set of 12 line inputs is coaxial XLR/1/4-inch TRS connectors.

There are also 24 tape returns that come from the optional card slots. These 24 tape returns can be analog, AES, ADAT, or T/DIE, depending on which optional I/O cards are fitted. The console has 8 buss outputs and 8 aux outputs, plus the stereo main mix outputs. The 8 main buss outputs are used for 5.1 surround outputs. Six channels of monitoring are standard so that you don't have to use aux sends for control room monitors.

Besides the digital outputs to the 8 busses, there is a stereo digital main output and two stereo digital aux outputs. The aux outputs are paired with digital aux inputs for connection of external digital effects. There is a digital 2-track input for monitoring stereo digital recorders.

All of the inputs and outputs can be re-routed internally. Aux inputs can show up as additional mix inputs, 2-track digital inputs can be routed to input faders

DMX-R100

gets much

of its

operating

savvy from

its big

brother,

the Oxford

OXF-R3

O



faders with 1024-step (10-bit) resolution that gives you 0.1 dB steps (highest resolution of any small format console); faders with adjustable touch sensitivity (many full-size consoles with moving fader automation won't let you do that); 88.2 kHz and 96 kHz sample rates; color LCD with built-in touch panel; optional plug-in digital input card with built-in sample-rate conversion (so you can fly CD samples into a 48 kHz mix); and built-in surround monitoring capabilities (you don't have to use aux outputs for

Sony DMX-R100 Digital Console



budgets down by allowing some of the work to be done away from the gazillion-dollar studios. I like to do the same thing. I cut basic tracks and record the orchestra dates at the big studio, and work on the overdubs at a smaller facility or at my home studio. I then usually go back to the big studio for the mixing. I prefer to stay digital throughout a project.

— you are not limited to cross patching in groups of eight inputs.

Data can be input using knobs on the console or via the high-resolution color LCD and touch panel. The parameters of each channel are displayed graphically on the screen to allow comprehensive feedback on equalization and compression operations. The graphics look exactly like the graphics presentation on the Oxford. Nice touch! There is a 15-pin video monitor connector on the back panel that duplicates the display on the LCD monitor.

The automation portion of the console utilizes both snapshot and dynamic settings to be stored and recalled via the built-in 3.5-inch floppy drive — up to 99 memories for the snapshots of every parameter on the console (with the exception of the analog mic/line preamp settings). Dynamic automation can be synchronized with SMPTE or MTC (MIDI Time Code). Dynamic automation includes the touch sensitive faders, pan control, equalizers, dynamics, and AUX signal settings. The dynamic automation can also recall snapshots at timecode-based cue points. Automation data can be written in both absolute and trim modes.

As you know, more and more artists and producers are building project studios in their homes. These little rooms help to keep the

I can't wait to get my hands on the DMX-R100. I got to see it at the 1999 AES show in New York, but they slapped my hands every time I tried to hide it under my jacket.

I engineered many projects on the Sony Oxford console and recall myself saying, "This Oxford would look really good in my home studio." Well, maybe a mini Oxford will do. ■

DMX-R100 Tech Specs

Frequency Response (Line in to PGM out): 20 Hz to 20 kHz ± 0.2 dB
Frequency Response (Mic in to PGM out): 20 Hz to 20 kHz ± 0.3 dB
Harmonic Distortion (Line Input): 0.01% at +4 dBs, 1 kHz
Harmonic Distortion (Mic Input): 0.1% at -60 dBs, 1 kHz
Dynamic Range (Line in to PGM out): 10 \pm dB
Total Delay (Line in to PGM out): 2.5 ms
Analog converters (A/D and D/A): 24-bit 128x oversampling
EQ 4-band parametric + Hi/Low cut Filters: 0.25 dB resolution
Dynamics (Compress/Duck/Expand/Gate): Attack time 1 sample.
User Delay (A1 Inputs): 0-999 samples
Sync: Internal/ Word Clock/ Digital input/ Video

Digital Inputs

AUX RET 5/6 7/8
 (4 channels)
 2TR IN 2 (2-channel stereo)

Digital Outputs

PGM (2-channel stereo)
 AUX SEND 5/6 7/8
 (4 channels)

Additional Digital I/O

Through optional I/O cards.

Analog Inputs

Inputs A 1-12
 Inputs B 1-12
 LINE IN 13-24
 2TR IN 1 (stereo)
 AUX RET 1-4
 (4 channels)

Analog Outputs

PGM OUT (stereo)
 AUX SEND 1-8
 STUDIO MONITOR (stereo)
 CONTROL ROOM MONITOR 1-5

Analog Inserts

INSERTION 1-12 (send and return)
Additional inserts can be added with optional I/O cards.

Additional Signals

REF WORD: In, Out through
 REF VIDEO: In, loop through
 TIME CODE: In, Out
 MIDI: MTC, In, Out, Thru
 REMOTE: In, Out 1, OUT 2
 PC PORT: Mini 8-pin DIN
 FOOT SW: Punch in, Punch out
 MOUSE: 6-pin
 KEYBOARD: 6-pin
 USB: future use
 SERIAL: 9-pin male
 MONITOR: 15-pin female

From the depths of the Grand Canyon to the hallowed halls of St. John the Divine Cathedral, Sony engineers recently sampled the reverb of unique spaces across the United States for the second DRE-S777 optional CD-ROM. After sampling the finest concert halls and churches of Europe for the first optional CD-ROM (see

SoundByte #5, "Globetrotting for Sound," pg. 7), Sony engineers set their sites on some of the classic acoustical locales in the United States. From the beautifully ornate Mechanics Hall in Worcester, MA, to some of the top recording studios on both coasts, there seemed to be an ambient reverb for virtually any production application.

DRE-S777

The U.S. Sampling Tour

Cathedral of St. John the Divine

If you are looking for a BIG reverb, look no further. The main hall of the cathedral has close to a five second reverb time. But, the hidden treasures sampled here are the side chapels. Chapel 1, for example, is an octagonally shaped room with a beautiful stone sculpture in the middle that offers a bright ambience sure to add sizzle to voice or instrument. Chapel 2 is more rectangular and offers a slightly warmer sound with a little longer decay time.



E2 at Enterprise Studios

E2 has a BIG studio sound offering over one second of reverberation and is a great "in between" location when you don't need the size of a concert hall but want something bigger than a typical studio room.



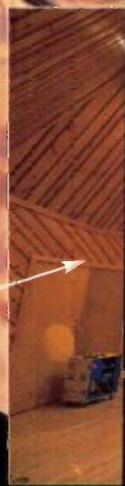
Giandomenico Studios

A hidden gem! Many classical recording producers have used this studio space, yet it is relatively unknown in the recording community. In fact, its primary use is as a photography studio! Originally designed as a movie house in the '20s and '30s, it used to be the entertainment-gathering place for the local population. Resembling a small airplane hangar, the acoustics offer over two seconds of full, fairly bright reverberant ambience. Thanks to the absorbent material on the back wall (where the projectionist used to be) and the ornate wall architecture, individual reflections are minimized and the resulting reverberation is beautifully smooth and diffuse.



Avatar

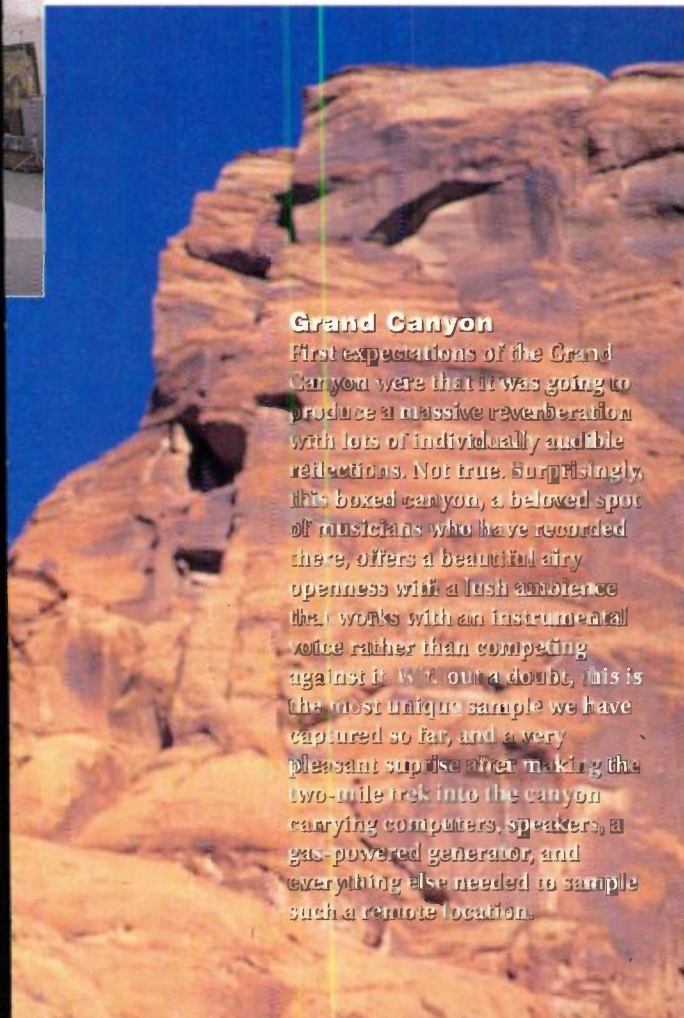
Attention Drummers! With its high conical ceiling and wood paneling throughout, Avatar's studio A offers that classic "live drum" sound.





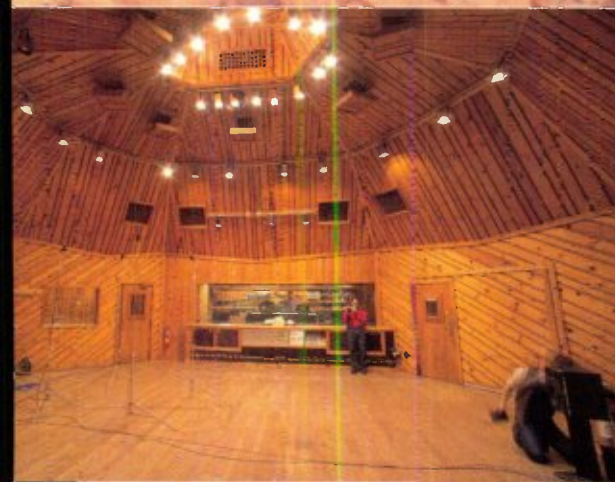
Mechanics Hall

The first thing you notice in Mechanics Hall, after the visually stunning architecture is the stillness of the room. The Hall was built on the 3rd level of the building, which raises it above the hustle and bustle of street-level activity. Additionally, a skylight ventilation system was designed, eliminating the need for side windows, further attenuating any outside noises. There is a very neutral, warm sound to the hall with a relatively short decay time thanks to the intimate size of the hall, which holds a maximum of 1500 people.

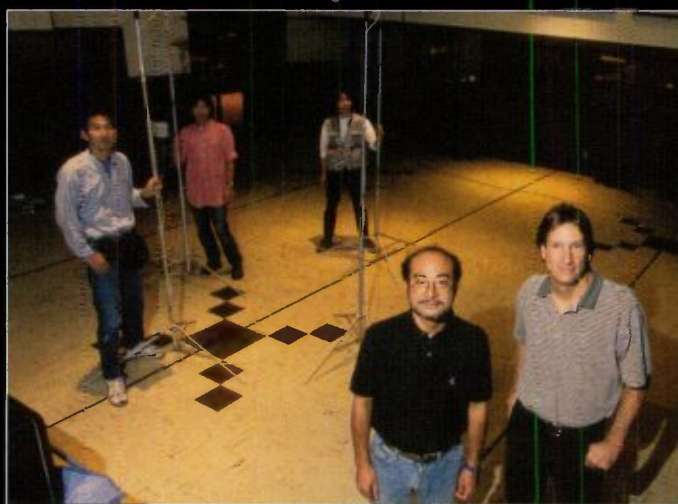


Grand Canyon

First expectations of the Grand Canyon were that it was going to produce a massive reverberation with lots of individually audible reflections. Not true. Surprisingly, this boxed canyon, a beloved spot of musicians who have recorded there, offers a beautiful airy openness with a lush ambience that works with an instrumental voice rather than competing against it. Without a doubt, this is the most unique sample we have captured so far, and a very pleasant surprise after making the two-mile trek into the canyon carrying computers, speakers, a gas-powered generator, and everything else needed to sample such a remote location.



Allen Sides On DRE-S777



"A number of classics have come along in the digital reverb area," said Ocean Way owner Allen Sides (pictured above right, with Sony engineers). "Sometimes technology is lost, sometimes it's improved upon. I would have to say the DRE-S777 is pretty startling."

As part of their U.S. Tour, Sony engineers recently "recorded" in the legendary Studio B at Ocean Way for the upcoming DRE-S777 CD-ROM reverb disc that will feature spaces from around the country. With a history dating back to 1952, this classic studio room has hosted many legendary music artists. With the new DRE-S777 CD-ROM reverb disc, you won't have to travel to California to get the sound of Studio B.

"Many clients come to Ocean Way because of the big live rooms, and when they're mixing, they send the music back out into the studio through loudspeakers, and bring it back through microphones to get that sound," commented Sides.

Sides worked closely with the Sony engineers when recording the room, lending his many years of experience and golden ears to the project. "I walked around Studio B with them and pointed out the sweet spots," he noted. "This is a spot where I usually record rock n' roll drums, here is where I place the ambient mics, and here is where I get the longest decays and such. I gave them at least two of what I thought were the best positions in the room."

Sides commented that when he was recently doing a 5.1 surround mix with a full orchestra, he used the DRE-S777. "Sometimes you had to pinch yourself to think you're not actually sitting in the hall," said Sides. "It's very impressive." He is also currently using the unit on an upcoming feature film.

"Measuring rooms and duplicating reverbs is nothing new," concluded Sides. "What is different here is that the DRE-S777 provides a level of resolution that is a magnitude higher than we've ever had before. Being able to push a button on the S777 and call up Ocean Way Studio B is pretty amazing."

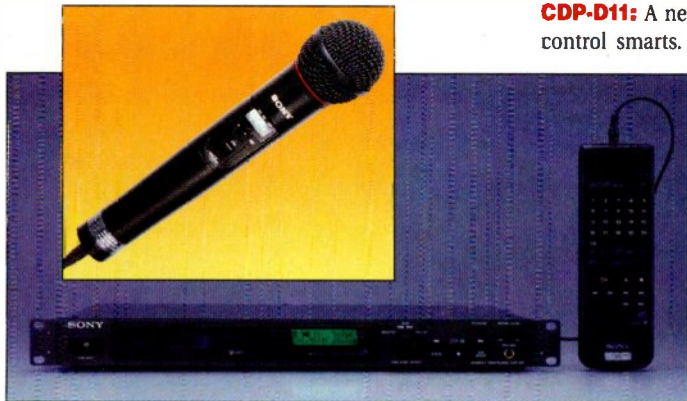
Village Jazz Oxford

Audio engineer Andy Strauber and National Mobile Television's Ben Jenkins seated in the Oxford console room of the HD-2 Production Truck at the Village Jazz Festival. Among the artists recorded in High Definition and 24-bit digital for a 5.1 surround mix was legendary jazz musician Chick Corea.



New Products for

NAMM 2000



CDP-D11: A new 1U high rack-mountable CD player, with a durable chassis/transport design and control smarts. The CDP-D11 features both parallel and serial control (via RS0232), as well as play/record relay jacks for cascading multiple machines. It also has a control-S jack for accommodating the supplied wired/wireless remote control. The CDP-D11 has XLR balanced outputs and SPDIF optical and coaxial digital outputs. Vari-pitch control is also included and a back-lit LCD.

WRT-807A: A high-quality great-sounding hand-held dynamic microphone transmitter. It incorporates a PLL synthesized design with 94 UHF frequencies. It also incorporates Sony's best dynamic element (same as F-780/9X). Its all-metal rugged construction will help assure years of reliable performance. The WRT-807A has an LCD of all transmitter functions and includes a locking on/off switch. It provides five hours of continuous operation with a single "AA" alkaline battery and is compatible with all Sony 800 MHz UHF receivers.

WRT-822A: A PLL-synthesized UHF body-pack transmitter that is designed for the most demanding applications, from theatrical production to broadcast and live sound. The WRT-822A is available on TV channels 64-69, and so it enjoys compatibility with all 800 MHz Sony receivers. It includes an LCD of channel, frequency, AF and RF status and battery indicator. Its light magnesium alloy casing makes it both durable and lightweight.

WRR-802A: A half-rack size, UHF, diversity receiver, featuring 94 selectable channels of PLL-synthesized tuning and an XLR balanced output. It offers a back-lit LCD which includes indication of group, channel, frequency, AF and RF indication, and transmitter battery status. The WRR-802A is available on TV channels 64-69. A rack-mount adapter kit is available as an option.

SRP-F300: A digital multi-speaker system processor, with 24-bit 96 kHz quality. It features two XLR balanced inputs and six XLR balanced outputs. An assignable matrix allows signals from either input to be assigned to any and all outputs, allowing extremely flexible routing and system configurability. The SRP-F300 includes processing for graphic and parametric EQ, compression and limiting, channel delay, and tunable bandpass/cross-over filters. The SRP-F300 is totally PC controllable and includes comprehensive GUI-based software for control of all parameters. The SRP-F300 also features 50 memory locations with security lockout, front and back control ports (RS-232), and full front-panel metering and status indicators. This flexible processor is designed to optimize performance of both public address systems and studio monitor systems.

MXD-D3: A combination CD player MiniDisc recorder/player, designed for independent playback of either media as well as normal and high-speed (4x) digital dubbing of CDs to MiniDisc. Its 20-bit, wide-bit-stream technology assures the best possible recording quality. A large, independent display shows index and title information for both CD and MD. Advanced features include time-shift recording, smart space recording, input sample rate converter, and digital record level control.

CDP-CX300: A 300-CD player/changer that provides an affordable solution for CD library/archive playback and background music system applications. It allows MegaFile™ storage with a second compatible CD changer, providing a total capacity for 600 CDs. CustomFile™ stores and displays titles for all CDs.



Top to Bottom: WRT-807A wireless microphone (inset), CDP-D11 CD player, MXD-D3 CD/MD recorder/player, WRR-802A wireless receiver, and the SRP-F300 digital multi-speaker system processor.

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- Real-time computation gives controls extreme precision and an analog feel
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“After working with the Oxford in my studio, I don’t want to mix on any other console.”

– Mick Guzauski, Barking Doctor Recording

Mick Guzauski, whose client list reads like a “Who’s Who” of the Hot 100, recently purchased an Oxford console for his own studio. After over a hundred mixes in just a couple of short months, Mick has a few opinions to offer: *“The flexibility of the Oxford is much greater than any conventional console. And the work surface is a big improvement over the traditional console - intelligently laid-out and easy to use. As for sound quality, it’s simply the best console I’ve ever heard. The EQ is the most musical sounding, and the A/D and D/A converters are the cleanest I’ve ever heard. The Oxford is an incredibly precise tool. For example, not only does it have five band EQ, but it has five different equalizer choices and four different compressor choices - unheard of in any console until now. As for my clients, I’ve had 100% great response. For technology and sound quality, the Oxford is the way to go.”*

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World Radio History

EQ Live

EQ LIVE



ASHLY MX-508 STEREO MICROPHONE/ LINE MIXER

BY STEVE
LA CERRA

Ashly's MX-508 is an 8-channel mic/line level mixer built into a three-space rack-mount package. Intended for use in small club systems, church, and corporate PAs, for location recording and broadcast, or as a submixer for larger PA systems, the MX-508 features balanced XLR mic and TRS line inputs and 1/4-inch send and return jacks for each channel. Rear-panel L/R outputs are on a pair of balanced, transformer-coupled XLR jacks as well as a pair of transformerless, 1/4-inch TRS jacks. Also found on the rear panel are gold-plated, RCA jacks for stereo tape or CD I/O, 1/4-inch TRS jacks for sends 1 and 2, stereo 1/4-inch jacks for return 1, a mono 1/4-inch jack for return 2, and a main mono output jack. An additional group of sub in/out jacks are also pro-

vided for linking multiple MX-508's together; we'll get to those momentarily.

Ashly has managed to pack a lot onto the front panel of the MX-508 without making it look cluttered. Controls for each of the eight inputs include input level trim with clip LED, a mic/line switch, 3-band EQ (high- and low-shelf plus mid sweep), two aux sends, pan pot, and level control. A 20-dB pad switch is located on the rear panel near each mic input. To the right of the eight input channels is an aux section that provides output level pots for aux 1 master and aux 2 master, as well as concentric level and pan pots for aux returns 1 and 2. Two more concentric pots allow control over the level of the tape/CD to the L/R masters, plus level of that signal into aux 1. At the far right of the panel is the master section, which features a three-color LED for main output level (calibrated from -21 VU to "clip") and

independent rotary pots, plus mute switches for left and right main outputs, a phantom power switch that applies +48 volts to all eight mic inputs simultaneously, a mono output control, headphone jack with level control (switchable between L/R out and aux 1/aux 2), and a power switch.

As we began to use the MX-508 in a variety of situations, it became clear that a lot of thought went into its design. The front panel is well laid out and clearly labeled, making the unit extremely easy to use (though the concentric controls might be a bit on the small side for large hands). At the factory, aux 1 is set to pre-fader/pre-EQ, while aux 2 is set to post-fader/post-EQ. Changing this configuration is easily accomplished by removing the bottom panel and moving a jumper for each send on each channel. It takes only a few minutes and the technically meek need not be intimidated.

Changing the aux sends was also an excuse for us to look under the hood and see the MX-508's internal construction. What we found was an extremely clean

Ashly's mic/line mixer keeps quiet — making it good for many live applications

topology with a truly modular design. Each channel's input controls and output jacks are on separate circuit cards, all securely mounted to their respective panels. Audio ICs are socketed for quick replacement if necessary, and all pots use metal shafts — which we much prefer over plastic for longevity. A channel card could be removed for repair or even replaced with a spare, leaving the rest of the MX-508 functioning. A multi-pin connector near one edge of the input card accepts a transformer for the input, should you require this addition in the future.

One of the more interesting features of the MX-508 is its ability to link with another MX-508. In addition to the rear-panel I/Os mentioned, the unit also has sub in and sub out jacks for L/R, aux 1, and aux 2. When linking two MX-508's, the sub out from one mixer is patched to the sub in of another, linking the L/R busses without having to use up any channels. Auxes 1 and 2 may be similarly linked simply by patching a TRS cable from "aux 1/aux 2 sub out" on one mixer to "aux 1/aux 2 sub in" on another unit — allowing all channels on both units to access the two aux send busses.

During a location session, we recorded an acoustic guitar and vocal directly to a TASCAM DA-88 via the MX-508. Using the insert jacks, we were able to patch a compressor into the vocal channel via two different methods: first we inserted the comp via TRS-to-dual-TS (Y-cable), plugging the TRS into the Ashly, then plugging the TS connectors into the input and output jacks of the comp. We were also able to use standard 1/4-inch TS cables for insertion, connecting a TS cable from the MX-508's send jack to the compressor in, and then a separate TS cable from the comp out to the channel return jack. This was very simple, and you'll never have to worry about having enough insert cables.

Initially, we used the two auxes as busses to the tape tracks, but, after a bit of experimentation, we learned that, by inserting a TRS connector halfway into the send jack (i.e., only as far as the first click), the channel signal could be 'tapped' as a direct out, routing the signal directly to a tape track.

SPECIFICATIONS

Frequency Response: 20 Hz to 20 kHz, +0.5/-1.0 dB

Phantom Power: 48 volts DC. Maximum total current draw is 80 mA. Maximum single channel current draw is 14 mA

Distortion: Less than 0.05% at +4 dBu, 20 Hz to 20 kHz

Equivalent Input Hum and Noise: Less than 129 dBu, 20 Hz to 20 kHz @ max preamp gain

Crosstalk: Less than 65 dB for adjacent input, 20 Hz to 20 kHz

The MX-508's mic inputs are clean and quiet, delivering an extended frequency response that sounded very natural. The channel clip LED lights at 3 dB below clipping, which took a bit of getting used to because we were expecting to see it light green when signal was present and turn red to indicate clipping. To set gain for the best possible signal-to-noise ratio, we increased gain until the LED went on, and then backed off the gain control until the LED went out again.

During various studio sessions we

we'd been using (a Kawai MX-8SR).

When we patched several keyboard modules into the inputs of the MX-508 we were able to really put the channel EQ through the paces. In general, the EQ behaves smoothly, particularly the high-frequency shelf band, which added very little noise but definitely brightened up our keyboard sounds. The high and low EQ bands have a stop point at 0 dB of gain, which we liked; it'd be nice to have this feature for the mid band, or a defeat switch for the entire EQ section. Low-shelf

EQ was useful for adding slam into synth bass sounds, though we found the low-shelf turnover a bit low to really change the timbre of a vocal mic. Of course, this same characteristic made the low-shelf very useful for reducing mic stand rumble. Mid sweep EQ was about what we expected, with a bandwidth narrow enough to correct any feedback problems likely to occur in a live situation.

Ashly has done a really fine job in designing the MX-508. Though casual musicians may find it a bit out of their price league, the MX-508 is an excellent choice where quality sound and robust construction takes precedence over bells and whistles. In particular, it's perfect for school, church, and corporate PA installations, bar-type PA systems where abuse is the norm, and road rigs requiring the flexibility of extra channels for submixing into a larger

console. We can definitely see it living in a road rack with a keyboard rig, submixing the keyboard channels to stereo for routing to house and monitor consoles or serving as extra effect returns for the house console. Add plusses for the modular construction and ability to link multiple units for expansion, and Ashly's MX-508 is a winner.

ROAD Test

MANUFACTURER: Ashly Audio, Inc., 847 Holt Road, Webster, NY 14580-9103. Tel: 716-872-0010. Fax: 716-872-0739. Web: www.Ashly.com.

APPLICATIONS: Permanent PA installations; small club PAs; submixer for stereo keyboard rigs; additional mic/line returns for studios.

SUMMARY: A well-constructed mic/line mixer with a quiet audio path.

STRENGTHS: Balanced main outs on XLR and TRS jacks; good-sounding mic preamp; phantom power and inserts on all channels; modular construction facilitates servicing; multiple units may be chained for systems requiring more inputs.

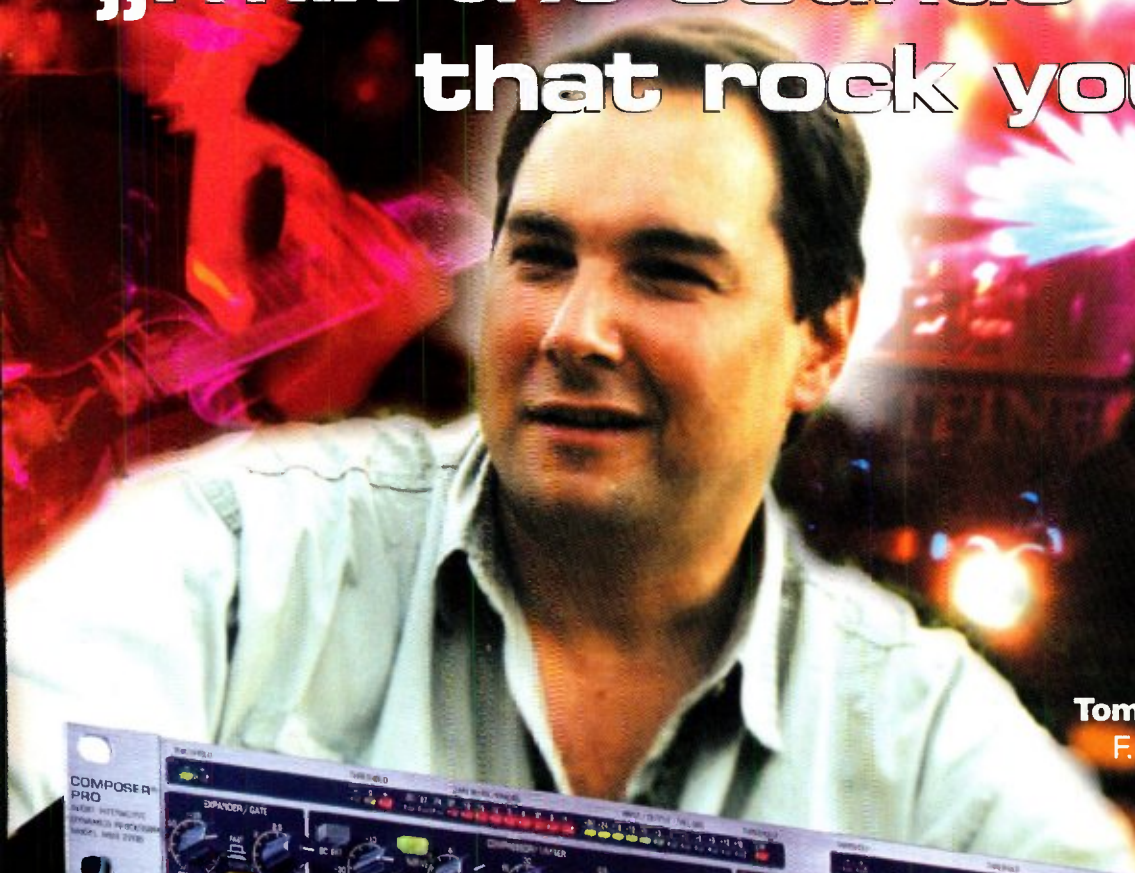
WEAKNESSES: Modest feature set; no defeat switch on channel EQ (see below); aux return 2 is mono; some controls may be a bit tough to access for large fingers.

PRICE: \$1519

EQ FREE LIT #: 106

used the MX-508 as an effects submixer and as a keyboard submixer into our Yamaha 02R. Used with our effects, the Ashly mixer made a noticeable difference in the noise floor — basically getting out of the way and not adding any noise to the signal chain. We also thought our effect units just plain sounded better through the unit than they did through the mixer

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JUST LISTEN.

THE GUITAMMER COMPANY'S BUTTKICKER LOW-FREQUENCY TRANSDUCER

In this era of 5.1 reproduction systems, many companies are coming out with subwoofers or mass energizers to better reproduce low-frequency audio. These manufacturers claim that their products will go lower and work more accurately than the competition's. Unfortunately, many of these devices do not have a natural operating range that extends down

to the lowest end of the audible spectrum, let alone to subsonic frequencies put in a mix to be felt.

Enter the Guitammer Company's ButtKicker. This linear motor's spec sheet lists a frequency range from 5 Hz to 200 Hz and a resonant frequency of 9 Hz. This impressive response is due to the driver's elegantly simple design. Instead of using a conventional voice coil that moves in opposition to a fixed magnet, this device uses a large stationary inductor that drives a

high-mass, piston-shaped magnet. The piston holds itself in operating position with its own magnetic field, so there is no need for a mechanical support. The combination of high rotor mass and low friction suspension yields a very robust transducer with amazingly high and accurate output. The driver has a nominal impedance of 4 ohms, and Guitammer recommends driving it with a 350–700-watt amplifier. Understandably, the motor has a thermal switch to prevent overheating. The unit works most efficiently when oriented vertically, although horizontal mounting and shaking are also possible.

BY MARTIN A. SANTOS

IN-STUDIO TESTINGS

A few colleagues and I conducted tactile evaluations of the driver in several situations. In one trial, an amplified oscillator signal was sent to a ButtKicker that was mounted on a plywood surface. Sweeping the tone from above 200 Hz down to 4 Hz and back up again made the device transition smoothly through its range. The prototype under review had no motor cover, so its performance could be observed as well as felt. The piston response was very impressive. Cranking up the amplifier's output made the magnet cycle almost two inches above and below center position, considerably more excursion than most conventional drivers can achieve. Standing or sitting on the energized surface made the listen-

er feel an amazing amount of frequency specific vibration.

To check the unit in a project studio/home theater situation, a driver was mounted from below to the joists of a suspended floor. Yamaha two-way monitors reproduced the majority of the program information while frequencies below 80 cycles were sent to the ButtKicker via an external electronic crossover. A variety of material was auditioned through this setup, including movies with considerable subsonic content and several recent re-release major label CDs.

It immediately became clear that the ButtKicker is tremendously powerful. Driven off a large Crown amplifier, the transducer easily shook the whole room. In fact, the unit had to be dialed back substantially to keep its performance in context with the conventional speakers. Once balanced properly, the device augmented the Yamahas beautifully, dramatically extending the range of reproduction. Video versions of movies with rockets taking off and dinosaurs stomping around offered exceptional impact and excitement with the ButtKicker delivering the soundtracks' sub information.

The transducer went so low so effectively that it actually showed off significant hidden flaws in a few of the sources. One review CD, which passed through a very prestigious mastering

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studio, displayed an abrupt high amplitude thump during a particular song. The anomaly was at a frequency well below 20 Hz. Checking several different copies of the source material yielded the same results. Subsequent discussion with one of the project's engineers revealed that the tracking studio had some problems with the analog tape machine's punches.

Another major label project repeatedly produced arrhythmic subbass thumps. In this case, the ButtKicker made the listener privy to reproduction of the bass player's fingers coming to rest on one string after he had plucked the adjacent one. Judicious use of a channel's high-pass filter during tracking would easily have eliminated the problem. Clearly the ButtKicker provides a practical means of scrutinizing recordings to eliminate unwanted subsonic garbage, without having to build an expensive control room that supports airborne sub frequencies.

STUDIO AND STAGE-MONITORING TESTS

Further assessment was done in a large studio and in a live stage-moni-

toring scenario. In both cases, the test space floors were too inert to easily energize. On these occasions, the shaker was affixed to a small platform which was isolated from the building floor by large rubber feet. The listener sat in a chair on the platform while sub information was sent to the ButtKicker. A variety of nearfield monitors reproduced the rest of the program frequencies. The motor augmented the other drivers very well, giving the test music plenty of rich low-end power. Like all shaking devices, the ButtKicker's output most naturally supplements conventional speakers that have a range down to about 100 Hz or lower. When used with ear monitors, headphones, or cabinets that lacked low end, there was a slight perceivable gap between the ButtKicker and the higher frequency drivers. Even under these circumstances, though, the ButtKicker made a substantial contribution to the listening experience.

Many floating or framed control room floors would shake effectively

with the ButtKicker bolted directly to them. To facilitate driver operation and prevent vibrating studio gear apart, it might be even better to float a separate section of floor that extends around the engineer's chair only. The driver would have to move less mass, making it more efficient, and the console would not be subjected to unnecessary vibrations.

SHAKING UP THE BACKSTREET BOYS

The ButtKicker already has seen a variety of uses. Last year, The Guitammer Company installed 86 drivers in the Dome Theatre of Ohio's Center Of Science And Industry. The first major concert application was on the 1999 Backstreet Boys tour where six drivers were bolted under stage risers for the vocal group's band members, who were all on personal monitors. In the future, home and professional recording studios, movie theaters, simulators, and live concert performances all could benefit from wise application of the ButtKicker. While the

continued on page 142

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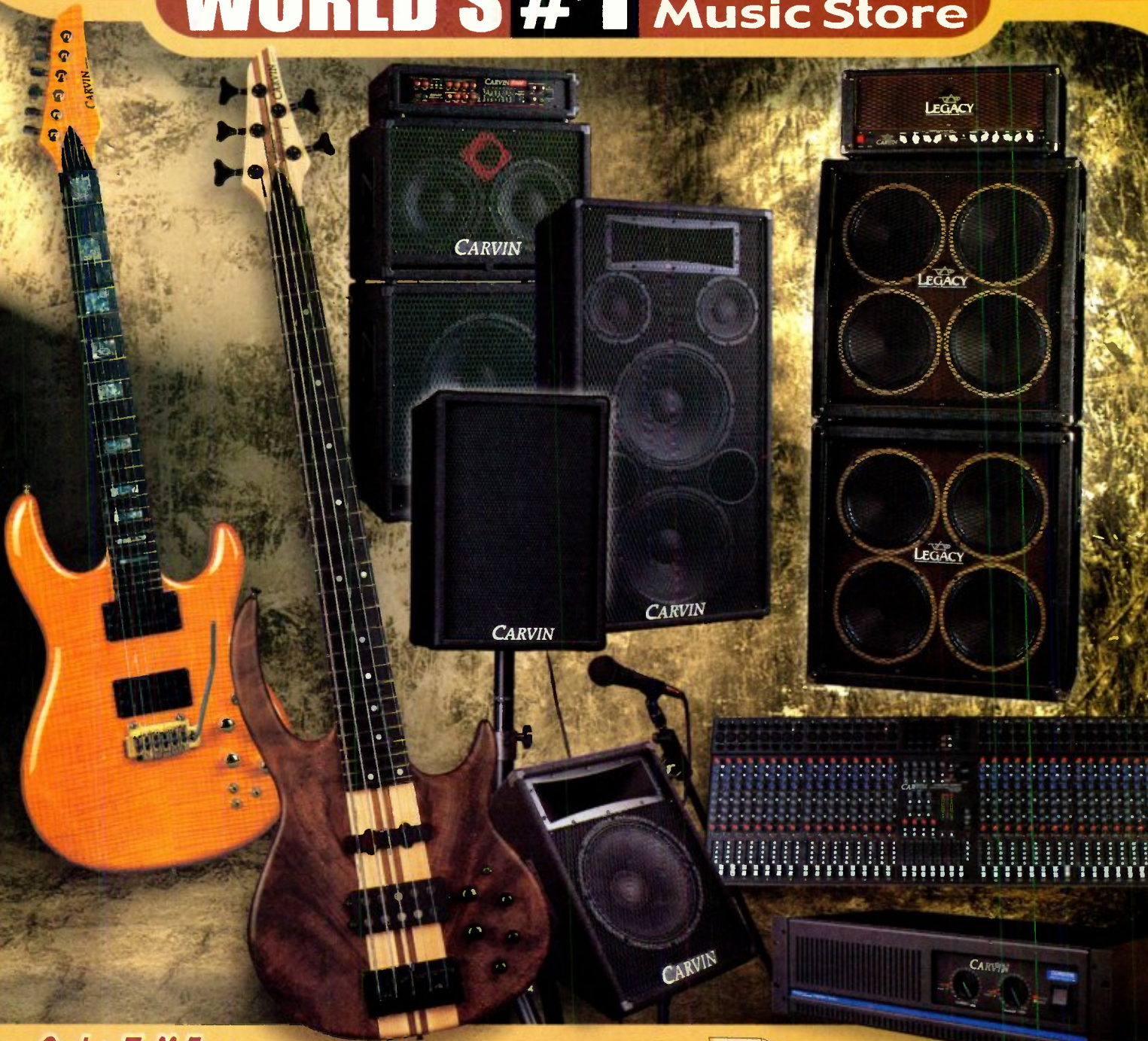
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THE CD-R CHECKLIST

Many studios now mix to hard disk, storing the music with 24-bit resolution. They want greater-than-CD quality without proprietary tape formats or

bit-splitting, so they burn their hi-res mixes to CD-ROM as sound files. I often see albums arrive for mastering on two or even four recordable discs.

Everyone looks for ways to save time. When there are two or more discs to make, increasing the burn speed is tempting, providing that relia-

BY DAVID TORREY

bility doesn't drop. Over the years, I developed a list of suggestions for creating cleaner burns. This checklist goes from the basic to the more technical, but it might help improve the quality of your final product. Many suggestions came from technical people at companies that produce burners, bus controllers, and disc-writing software.

Three main rules (broken by many — at their own peril):

- Don't let the bottom of the disc touch anything other than a CD player or the case it came in. I'm amazed at the scratched-up, greasy-fingerprinted premasters that I've seen. Handle CD-Rs like vinyl records — edges only.

- Use quality media. In many burners, silver or gold media performs better than dark green. Asian clone brands can cost well under \$1.00 per disc, but for 25 to 50 cents more, you can buy the best blanks on the planet. Is your music worth the difference? Even if your burner can sense the medium and recalibrate the laser to match, that's still no excuse to use inferior discs. My favorite? Taiyo Yuden. (Call Marilyn at APDC (800-522-2732).)

- Paper labels are fine on the copies you make for friends. Leave them off your premaster, because they increase the error rate! You may not hear any degradation on your player, but low error rates are critical to premasters. Label the CD-R with magic marker, preferably outside the area where data is written on the bottom of the disc.

COASTER BUSTERS

Writing discs at higher speeds increases the risk of a buffer underrun. This problem occurs when the computer

Tips and troubleshooting for burning CD-Rs from a computer

cannot pass data to the CD-R drive quickly enough to keep the drive writing continuously. By definition, a Red Book audio CD has to be written in one continuous pass. The slightest interruption in the flow of data to the CD will produce a coaster. Here are some items to look at if you have a problem:

- Make sure you have enough memory. Many recording/editing/burning programs are specified to work with 16 or 32 MB of RAM, but 64 MB is a more realistic minimum.

- Make sure that at least 10 percent of the capacity is always free on the hard drive that you use for storing mixes. The drive has to work much harder if it has to pack data into small, leftover sections of disk space.

- Defragment your disk drives often. I use two large "working" drives, and eight others for archival storage. When a working drive fills up with mastered projects, I transfer the projects to an archive drive, then I erase the working drive and defragment it. (This takes only a couple of seconds.) Now the data can flow onto and off of the drive in large contiguous blocks, and the chances of interruptions in the data stream decrease.

- Log off your network. If there is any chance that someone else can access your machine through a Local Area Network, make sure to disable that option. One manufacturer goes so far as to recommend unplugging the network cable and rebooting, so that the network card is not accessing the data bus looking for network traffic.

- If you have a SCSI CD writer, make sure it is terminated properly. The manufacturer's documentation should have clear instructions for checking this. Many controllers can terminate the controller end of the SCSI cable automatically, but it's always worth checking.

- While you are at it, check that you have the latest versions of the drivers for the SCSI controller and firmware for the SCSI CD writer. These can usually be found at the manufacturer's Web site, or you can call their tech support line.

- Burn CD-R discs from a hard disk image, rather than on the fly. Most CD burning programs allow you to adjust

the levels of individual tracks, dither the fades and crossfades, then burn the CD immediately. This is convenient, but it demands that you have enough CPU and memory capacity to do the job in real time, while the CD is being burned. If you experience problems, select the option of creating a CD image. This intermediate step will perform all the computation for levels and fades offline, then write the image to hard disk. (You will need enough spare hard-disk space to store all the data that will be written to the final CD-R.) As the final step, burn that hard-disk image to CD-R. The computer now has less work to do, and music data will flow more smoothly to the CD-R drive.

- This principle also applies to making copies of CDs. Reliability will increase if you read the source CD onto hard disk as an image, then burn the image to CD-R in one pass. The hard drive supplying the music data is much faster than the fastest CD reader, so error rates will drop.

WINDOWS ONLY (THOUGH THE PRINCIPLES APPLY TO MACS)

- Log off the Internet. Don't multitask. Close all applications other than the software that burns the disc. To check your situation, try the "three fingered salute" (CTRL-ALT-DELETE). This will display all the programs that are using resources. Anything other than EXPLORER and SYSTRAY may be unnecessary to the burn. Consider removing schedulers, alarm clocks, pop-up messagers, and resource monitors such as Norton Utilities. These can unexpectedly take control of the system data bus, creating a glitch on the CD-R.

- The "Sleep" and "Screensaver" modes on some PCs can be quirky. If you burn a long CD, some machines will try to enter standby mode after a predetermined length of time. This shouldn't happen at all, but is worth a look if you are tracking an elusive problem. This type of problem can also happen when older ISA-standard SCSI controllers are mated with newer motherboards containing only one ISA slot. PCI bus controllers have fewer problems. Try disabling the Sleep

and Screensaver options, both in BIOS settings and in Windows itself.

- Configure your machine as a network file server. Go to My Computer/Control Panel/System/Performance/File System. Most PCs work fine when set to the normal DESKTOP COMPUTER. If you are experiencing problems, choose NETWORK FILE SERVER. This gives priority to disk activity over screen activity. You might notice an occasional hesitation when the screen redraws, but that is a good tradeoff — the computer is making sure that music data is flowing smoothly.

- Disable auto insert notification. Go to My Computer/Control Panel/System/Device Manager. Double click the CD-ROM icon. Highlight the CD-ROM that is installed in your computer and click the SETTINGS tab. Uncheck the AUTO INSERT NOTIFICATION box. Now the machine will stop needlessly interrogating the CD drive every two seconds, wondering if the disc was changed.

- Many tech support people advise that Windows 95 is more stable than Windows 98. I've found that Win95 rev. C, the last version, works well and is the least likely to produce the infamous Blue Screen of Death. Win98 brought with it a whole new set of...umm...features that many prefer to do without when music is the primary task of the computer.

- Last resort: Try slowing down the burn speed! If your drive is rated at 8X, there is a very good chance that it will be more reliable at 4X, possibly better yet at 2X. For a pre-master, doubling the write time is worth it.

You may not need all these steps to burn a clean CD, but having a well-stocked bag of tricks is good insurance!

David Torrey started building gear when he was nine (1962!), and he hasn't stopped since. He designs the toys at DRT Mastering (drtmastering.com), which specializes in fat analog sounds. He's also written a few articles for EQ over the years. You can reach him at davidt@drt-mastering.com.

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CYCLING '74 PLUGGO PLUG-INS

BY RICH
TOZZOLI

On the outside, Cycling '74's Pluggo is 74 different VST audio plug-ins that users can drop into their PowerPC-based Mac host sequencer. On the inside, Pluggo is a multifunction program that allows you to create your own plug-ins.

When you install Pluggo, it will put all the files in the folder containing your sequencer and its VSTPlugIns folder. The installation process allows you the choice to install all 74 plug-ins, or just a few. If you choose not to install them all, the installer will create a folder called "VSTPlugIns (Disabled)." In addition, the Plug-in Manager application and additional documentation will show up in a folder aptly called "Pluggo Stuff."

Users can choose to install the Regular Pluggo Installer, or the Installer for MAX/MSP Users. (I'll explain this later.)

Most of the Pluggo plug-ins work just like any audio plug-in. In Cubase, they show up on the Insert, Send, or Master Effects pop-up menus. The quality

of Pluggo plug-ins is excellent. I couldn't possibly write about them all, but here are some cool and different ones:

The "Fragulator" put my mix into a buffer that played it backwards with the forward audio. The "Degradar" trashed my signal by use of selective downsampling. *Warning:* Playing back your mix at 4 bits can be wickedly hazardous to your ears. "Raindrops" dripped my mix into the speakers. It is unique, and I applied it to a 303 track in Rebirth with great results. "Dr. Dop" is an excellent Doppler-panning program, and features a very cool custom interface. The "Harmonic Filter" cascaded my audio in time with a user-selectable set of filters, creating sounds like those that I've

never heard before. Simply put, Pluggo rocks, and is a sound designer's dream program.

Pluggo currently supports any VST 1.0-based application such as Cubase VST 24, Cake-walk's Metro, Emagic Logic, and Opcode's Vision DSP and StudioVision. Version 2.0

should be released by the time this prints, adds support for MOTU's Digital Performer and also provides MIDI support for VST 2.0 applications. The system requirements for Pluggo are a Power PC with a 604 or G3 processor running at 150 MHz or faster, System 7.5.3 or later, and a VST-compatible sequencer application. Also needed are at least 32 MB of memory and 20 MB of hard-disk space.

Pluggo also includes some unique plug-ins that can send and receive audio and

control information, and others that can be used to synchronize effects changes in real time. Making this happen behind the scenes (screens) is PluggoSync — a plug-in that generates control information that takes tempo from an internal clock or a sequencer click track. This means that PluggoSync can set delay times that chase a changing tempo, even in VST 1.0 applications. Very cool. Pluggo also features its own PluggoBus, a way to route audio

TEST Drive

MANUFACTURER: Cycling '74, 1186 Folsom Street, San Francisco, CA 94103. Tel: 415-621-5743. E-mail: info@cycling74.com. Web: www.cycling74.com.

APPLICATION: Plug-ins for VST users.

SUMMARY: Seventy-four plug-ins. The never-ending plug-in.

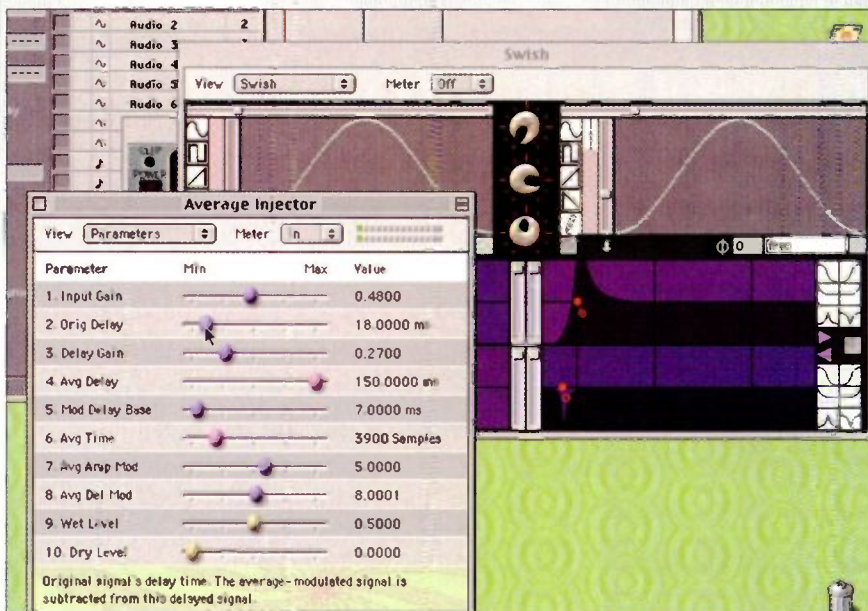
STRENGTHS: The "plug-in that never ends" is a diverse, effective and creative collection of sonically pleasing plug-ins. These include delays, flangers, and choruses, as well as FX that are "way out of the ordinary." The ability with MAX/MSP to create your own plug-ins is invaluable, and a true taste of the future. A no-brainer for the price.

WEAKNESSES: Because Pluggo can get deep, more written documentation would be useful; some of the interfaces are very basic, but you can't complain for the value; Mac-only at present.

PRICE: \$74

EQ FREE LIT. #: 101

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plug-in power to a whole
new level



between plug-ins on different audio tracks. It is designed so that Pluggo plug-ins can send audio signals directly to each other, opening up even more sonic possibilities.

Most Pluggo plug-ins appear with individual editing windows, but some may use the host sequencer's interface. Each plug-in has a unique screen display, made by the individual developer. Some will display egg sliders and some may feature a graphic screen, which is a custom MAX interface. By holding down the command key and clicking on a slider, a pop-up menu will appear featuring various parameters available for editing. One of the parameters featured is "Randomize All," which sets the parameters to random values. A great way to come up with some wild settings you might never think of.

But wait, there's more! Pluggo also opens any plug-in made with MAX/MSP development tools (see, I told you I would explain further), and will allow you to control its parameters. MSP, which is published by Cycling '74, is a set of DSP extensions to MAX, consisting of over 75 objects that synthesize, process, analyze, and delay audio signals in real time. MAX, published by Opcode Systems, is an object-oriented, graphical programming environment. (Take heart, I had to learn all of this, too....) Pluggo's signal processing capabilities are provided by the MSP audio extensions to MAX. Instead of writing code with things like data declaration statements and functions, Pluggo for MAX/MSP allows you to drop boxes onto a workspace and wire them together. The low-level code is taken care of for you. Just create an audio plug-in as a MAX/MSP patch, drag it onto Pluggo's Plugmaker application, and, with a little work, you've designed your own plug-in. The important thing to remember is you can just install the 74 Pluggo plug-ins and not install MAX/MSP, keeping life simple, but less creative.

What about Windows users? Currently, Pluggo and MAX/MSP are available only for the Macintosh. Cycling '74 sources say that the Windows version will be on its way early next year. One last note of interest: The Cycling '74 Pluggo-the-Month club (www.pluggo.com) is available for users to download additional plug-ins and to post their own creations. One can only imagine what creations will show up on that site!

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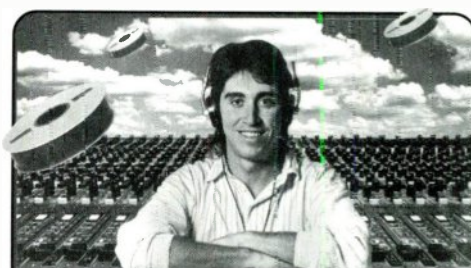
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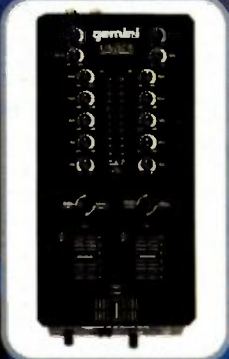


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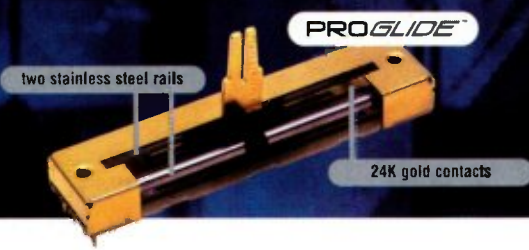
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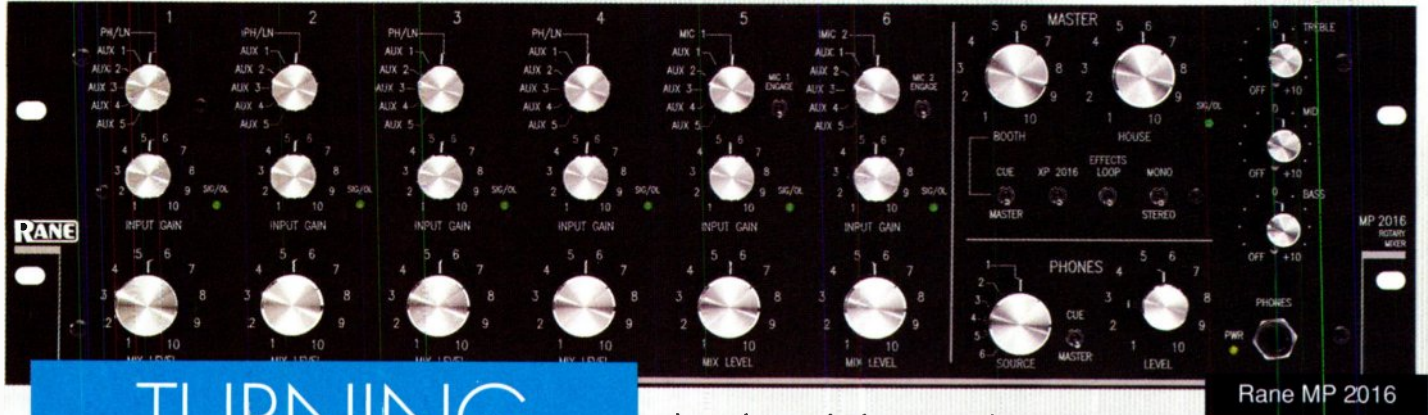
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TURNING THE TABLES AT NAMM

BY DJ RUSS REIGN

This year's NAMM show definitely had an increased presence of DJ-related products. Ten years ago, the so-called "underground" DJ culture began to creep from the clubs and warehouses it once called home to the commercialized screens of MTV. Today, manufacturers are standing in line with new products aimed at this burgeoning market. Let's take a closer look at some of the hardware that will shape tomorrow's music.

The release of Gemini's new series of dual-CD players helps to bridge the gap between quality and affordability. Packed with the kind of features expected from higher-priced competitors, the new series has more robust body construction and includes an impressive ten-second anti-skip memory. Gemini was also pitching the VMX series mixers as a complement to the new line of their CD players. All four models contain Proglide crossfaders that give smooth

channel control. The VMX series ranges in price from about \$300 to \$500 and includes all the features necessary for a scratch/battle DJ.

Vestax gave us a glimpse of the future by showing the VRX-200, the world's first consumer vinyl cutting machine. This innovative device will allow DJs to transfer music from tape, compact disc, or any other line source to an actual vinyl record within the confines of their own home or studio. Sound quality and durability will be almost equal to that of traditional vinyl. The unit will retail for around \$6000 (blank records for recording are \$10) and should be available sometime in the next few months (but you know how NAMM is, right?). Vestax also showed their line of club and scratch mixers, along with a new line of turntables and CD players.

Perhaps the most impressive piece of DJ equipment on the floor was Denon's new 2600F dual-CD player. With all the bells and whistles any jock could ask for and a retail price of around \$1700, this product will pick up where the legendary 2500 left off without missing a beat. This new workhorse offers two "hotstarts," independent cue points that can be positioned anywhere on a CD for

loop, stutter, and other cuing functions. The track up/down buttons associated with older models have been replaced with a search dial for quicker access to high track numbers. The machine includes built-in signal processing for real-time filter, reverb, and flanger effects. Additionally, an automatic key adjust feature allows changing the speed of a track for beat mixing without altering the selection's key. The "digi-scratch" function even emulates the sound of scratching a vinyl record.

Another Denon product worth noting is the DP-DJ 150 turntable. The unit includes a coaxial S/PDIF digital output for direct recording to MiniDisc, CD-R, or any other digital media, while retaining the source's sound quality. This is also the world's first turntable to incorporate the automatic key adjust function present in the 2600F CD player. This well-built and rugged unit will retail for under \$500, and its impressive torque ratio rivals that of the famed Technics SL-1200 series.

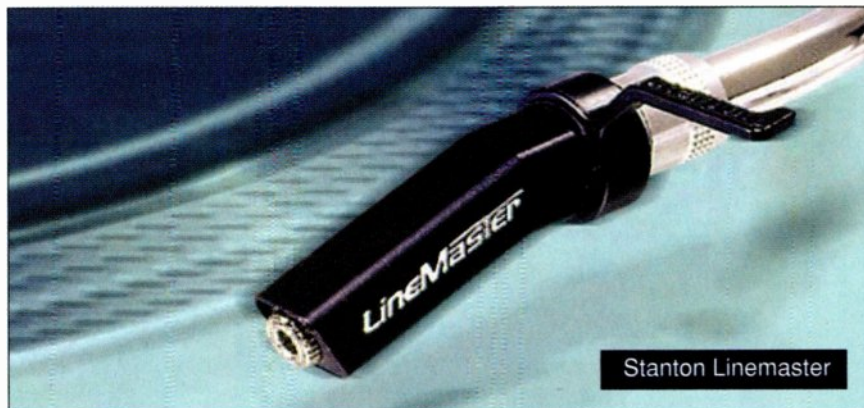
Pioneer's EFX-500 is quickly becoming the standard effects unit for

The recent tradeshow highlighted many new products to help performing engineers keep spinning

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Stanton Linemaster

both club and mobile DJs. A large, digital jog dial allows the DJ to "play" this unit in the same manner as an instrument. Provided effects include jet, zip, wah, fuzz, and ring modulation. This clever multi-effects has an automatic BPM counter and even includes a 3-band equalizer/isolator for dynamically separating bandwidths on the fly. And, best of all, there's no loss of quality when you route the master output through the EFX-500. With a retail of around \$500, this unit offers some serious bang for the buck.

The release of Rane's MP 2016 rotary mixer has club DJs jumping for joy. Practically identical in both look and feel to the legendary UREI knob mixer, this powerhouse is popping up in the DJ booths of many of the world's most well-known nightclubs. With four switchable phono/line inputs and five auxiliary inputs, you can hook up your turntables, CD players, synths — basically anything with an output that makes noise.

Actually, Rane has improved on UREI's design by replacing the obsolete pan knobs with input gain controls on every channel. If you are a serious DJ looking to make an impact on the dance scene, this is the mixer to check out. Rane's optional XP 2016 processor unit can provide an active crossfader with contour control, another feature not present in the UREI. This external unit also contains bass, mid, and treble tone controls on every mixing bus.

Stanton also unveiled some impressive products at this year's show. The RM-THREE professional DJ mix-

er was designed with the house/techno programmer in mind — firm volume faders will hopefully endure all the abuse that today's mixmasters can dish out. This aesthetically pleasing unit also offers six line, three phono, and two mic inputs for a large array of mixing options. Retailing at around \$300, the RM-THREE is one of the lowest priced "A-List" mixers on the market today.

Always recognized for their turntable cartridges, Stanton maintains the trend with the Trackmaster II, a Roger Sanchez-endorsed model with elliptical stylus for increased sound quality.

Sick of showing up at a new venue and being expected to be the sound technician as well as the DJ? My favorite product from NAMM turned out to be Stanton's Linemaster. This amazing device screws into a turntable's tonearm in the same manner as a standard cartridge, but there is no needle here! Instead, you patch an outboard unit (i.e., MiniDisc player, MP3 player, CD player, etc.) into the Linemaster, which routes the sound through the turntable and into your mixer. The era of juggling equipment and searching for a screwdriver moments before your set is over. Simply bring the proper adapter, plug in your Linemaster, and you're ready to move the crowd!

DJ Russ Reign has been spinning in New York clubs for seven years. His progressive and hard-house sound has moved crowds in such legendary venues as the Tunnel, Limelight, and Ohm.

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CIRCLE 22 ON FREE INFO CARD
World Radio History

Marshall Electronics, Inc. MXL2001-P and MXL2003 Condenser Microphones

Marshall Electronics
mics are priced
to fit in almost any
project studio

BY EDDIE CILETTI

You wouldn't think large diaphragm condenser mics could get any more affordable, but Marshall Electronics — importers of Mogami cable — have dared to step into an already crowded bullpen with a pair of deals you can't pass up. They're offering two microphone models: the MXL2001-P (\$199.95) and the MXL2003 (\$399.95 with shockmount). Each mic features a 6-micron and a 3-micron (one-inch diameter) diaphragm, respectively. This difference alone would be responsible for two sonic signatures. (Thinner diaphragms deliver a flatter, more extended frequency response. Thicker diaphragms slow things down a bit, and deliver a slightly more obvious upper-midrange presence.) The 2001 has an output transformer, while the 2003 is transformer-less.

So now you're asking, "For this little money, what's wrong with these mics?" A quick comparison with a very early Neumann U 87 and a Soundelux U95 revealed surprisingly comparable sonics on vocals — listening on Sony 7606 headphones. Cranking the gain on a Great River MP-4 (4-channel preamp with Jensen input transformers), each Marshall mic had a higher noise floor than the two "reference mics." That's only fair, right? (For a quick comparison of Marshall and other mics, check out table 1, as well as the sidebar.)

The 2001 is priced to compete with dynamic mics you'd use on drums — where noise isn't a problem — and you could always consider the noise as "dither" for whatever digital multitrack you use. (Yes, my cup is

half full....) The MXL2003 is 2 dB quieter. Its thinner diaphragm and transformer-less electronics extend the frequency response 3 kHz beyond that of the MXL2001.

THE BASEMENT TAPES

For the first test, I placed a pair of MXL 2003's as overheads on a very basic drum kit. (The track called for brushes and no toms. The mics were four feet above the snare; no snare mic was used.) For comparison, I placed a pair of AKG SE 300B's (with cardioid capsules) in parallel with the Marshall mics. (I own the AKGs and know what they sound like on drums.) The MXL 2003's fed a Great River transformerless preamp, while the AKGs went through the band's Behringer board.

The MXL 2003, with its 1-inch diaphragm, had a more pronounced bottom end than the AKG capsules, which are about half the diameter. This "bump" was confirmed on the frequency response chart — nearly 4 dB up, centered between 20 Hz and 50 Hz. I placed one 2001 on the beater side of the 14-inch kick drum and another 2001 on a Takamine acoustic guitar. (The other instrumentation included an electric guitar and electric bass.)

BASS ROLL-OFF

Working in small quarters — and with an electric guitar that was a bit heavier than I'd like — getting the acoustic guitar to cut through was a bit of a challenge. I was forced to place the MXL2001-P very close to the guitar and asked the player to use a thicker pick to get his axe to challenge the electric guitar. This worked surprisingly well, though I then regretted having committed the MXL2003's as overheads. That's because the MXL2003 features a



COMPARING MICROPHONES FOR SENSITIVITY AND NOISE

I slipped online and collected the published specs of popular and, mostly, expensive microphones just to see what's possible. For a reality check, I've included specs for the AKG SE 300B mic body, which is 1 dB quieter than the MXL2003 and 3 dB quieter than the MXL2001-P. (Part of AKG's more affordable "Blue" line, I use the SE 300B with cardioid and omni capsules.) The other mics that are more expensive are significantly quieter. Soundelux has the courage and confidence to also publish their unweighted noise specs.

The following microphone specifications are as defined on the Neumann Web site.

Sensitivity (@ 1 kHz)

The sensitivity indicates the RMS voltage a microphone generates when exposed to 1 Pa = 94 dB sound pressure under free-field conditions. The value refers to a frequency of 1

kHz and a load impedance of 1 kohm. The values are slightly higher with no-load operation. For studio condenser microphones, the free-field sensitivity usually ranges from 8 mV/Pa to 40 mV/Pa.

Equivalent (loudness level due to inherent) Noise

Apart from the audio signal, the output signal of each microphone always contains a low-noise signal. To indicate the extent of this noise voltage, it is given as a fictitious sound pressure level. With an ideal noise-free microphone, a sound pressure level of this value would result in an output voltage equivalent to the inherent noise voltage.

The inherent noise is measured and weighted according to CCIR 468-3, also DIN/IEC 651 (A-weighted) in order to correlate the result with the sensation of the human ear. For studio condenser microphones, the equivalent noise level usually ranges from 20 to 30 dB (CCIR), or 10 to 20 dB (A).

bass roll-off switch (6-dB/octave starting at 150 Hz), good for reducing the proximity effect that occurs when close-miking an instrument or vocalist. There is also a 10-dB pad.

WEEKEND WORRIERS

I was not available to engineer on the weekend, so the band recorded a more challenging (and more "electric") set of tracks, using both pairs of Marshall mics all over the drums (MXL2003 on kick and floortom; MXL 2001's on overheads) as well as vocals. Using the console preamps, the individual tracks were routed to an ADAT LX-20 recording in 20-bit mode.

The band was surprised; not only that things turned out well — engineering *and* playing is hard work — but that the results were good, impressive even. (Translation: They wanna buy the mics!) Using no EQ (as per my suggestion), the MXL2003's captured very usable tracks. There is a slight rise in high-frequency response beginning at 2 kHz and extending to 20 kHz, above which the output rises even more before things start to roll off (above 23 kHz). This is notably smoother and more extended than most dynamic mics.

JUST BEAT IT

Chinese production makes Marshall mics affordable. Construction is kinda "Russian"; that is, the weight from the heavy metal case will surprise you, and the grille should withstand imprecise attack from most "animal" drummers.

*Using no EQ (as
per my suggestion),
the MXL2003's
captured very
usable tracks.*

This is mostly meant in a good way, as in "the overkill" factor. The finish of the mics is great, and assembly seems solid, although threading for the mic stand adapter seems a little rough. Perhaps a little lube might smooth that out.

On the frequency response chart, the MXL2001-P shows a 6-dB/octave roll-off below 100 Hz, looking like there is a built-in, high-pass filter. Inside, you can see that the designers considered a bass roll-off switch. (This "option" was



COMPARISON TABLE

Make	Model	Sensitivity	Equivalent Noise	Weighted	Unweighted
Marshall	MXL2001-P	15mV/Pa	20 dB	A (IEC 268-4)	—
Marshall	MXL2003	16mV/Pa	18 dB	A (IEC 268-4)	—
Neumann	M149 tube	30/44/50 mV/ Pa Omni/cardioid/fig-8	16/13/11 dB Omni/ cardioid/fig-8	IEC 651 A-weighted	—
Neumann	U87ai	20/28/22 mV/ Pa Omni/cardioid/fig-8	15/12/14 dB Omni/ cardioid/fig-8	IEC 651 A-weighted	—
AKG	C414 B-ULS	12.5 mV/Pa -38 dBV all patterns	14 dB	A-weighted	—
AKG	C414 B-TL II	12.5 mV/Pa -38 dBV all patterns	14 dB	A-weighted	—
AKG	SE 300B	10 mV/Pa -40 dBV	17 dB w/ Blue Line capsules	A-weighted	—
Soundelux	U95S	27mV/Pa	16dB—>26dB->	A-weighted	Unweighted

TABLE 1: Microphone comparison chart. For the Noise spec, lower numbers are better.

phased out on later PC production runs.) The MXL2001-P is sold with a plain vanilla, stand adapter. The MXL2003 comes with a shockmount, the MXL-56, sold as an accessory for \$49.95, which fits both mics. Note also that the Marshall "cardioid" pattern is not as tight as those designed to minimize feedback (PA mics are more hypercardioid). The "relaxed" cardioid pickup pattern yields more pleasing off-axis response.

WHY ARGUE?

Both the MXL2001-P and the MXL2003 performed better than expected. How closely do you scrutinize a product that is priced to be so "right on the money?" In headphones, I got off on the sound, and that's what a vocal mic is about. If

you can't afford a Neumann, AKG, Soundelux, Lawson, Gefell, etc., both Marshall mics have "that big vocal mic sound." In addition, for those who can afford the big names, the MXL2001-P and MXL2003 could easily replace many of the dynamic utility mics you've been using.

The higher noise is an acceptable trade-off considering the amazing price, especially when compared to the aforementioned manufacturers, whose products cost at least five to ten times more. Marshall's MXL-series mics are for everybody!

Eddie Ciletti's life story and audio archive are available online at www.tangible-technology.com.

EQ LAB REPORT

MANUFACTURER: Marshall Electronics, Inc., P.O. Box 2027, Culver City, CA 90230. Tel: 800-800-6608/310-390-6608. Web: www.mars-cam.com.

APPLICATION: Large diameter (1-inch) condenser microphones for instruments and voice.

SUMMARY: Affordable condenser mics with cardioid pickup pattern. The MXL2001-P offers a standard mic stand adapter, while the MXL-2003 features a bass roll-off, 10-dB pad, and shockmount. Models include the MXL2001-P (6-micron, with output transformer) and the MXL2003 (3-micron, transformerless).

WEAKNESS: The mics are somewhat noisier than their way-more-expensive competitors, but who can argue with the price?

PRICE: \$199.95, MXL2001-P; \$399.95, MXL2003; \$49.95, MXL56 shockmount.

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AKG C3000B Microphone

AKG's new and improved version of their popular C3000 mic turns out to be both

BY SCOTT COLBURN

In Laundry Detergent Land, "New & Improved" really just means "slightly altered formula," "fancy new box shape," or "wow, look how much you'll be paying now!" — but the product itself isn't really new, and it's usually not much improved, either. Fortunately, AKG takes the claim much more seriously.

And it's a good thing, too, because AKG's new C3000B microphone — which has been made to replace the popular C3000 (now retired) — is truly an upgrade from its original (yet trusty) version. The differences are many, the improvements are great.

The new C3000B has a single cardioid pickup pattern. You will note that the old C3000 had two diaphragms (which interacted with each other to provide either a cardioid or hypercardioid pattern). "Hey," one may say, "that's not good, I'm getting less!" *Au contraire, mes amies* — while one may think that going from a double diaphragmatic to single diaphragmatic design would not be an improvement, I would bring to mind the old adages "less is more" and "jack of all trades, but master of none." The C3000B — with its lonely, single diaphragm — masters the single cardioid pickup pattern, as opposed to attempting mediocrity over many cardioid patterns via the use of multiple diaphragms. Remember, it's not the number of diaphragms, it's the end result on the *Billboard* charts. The front of the C3000B exhibits a wonderfully wide and clear pickup pattern. As you move to and around either side of the mic, the pickup pattern quickly drops to a slightly less-wide response on the backside. The frequency response on the back of the mic is very dull, with mostly high mids (around 2 k to 4 k) becoming prominent — I imagined

using this in film work during ADR to indicate movement from on-screen to off-screen sound without capturing the ambience of the room (which would be a dead giveaway and not so good). Because of this dull backside, this condenser allows some sort of isolation, in that the frequency response is poor and rapidly deteriorates as distance increases. This is to say that the focus in front is strong and clear, even with extreme distance.

The C3000B's bass cut switch is similar to its predecessor, with a 6-dB/octave slope below 500 Hz. The 10-dB pad differs from the C3000 due to the B version's pad ahead of the preamp, which allows for a 10-dB increase in SPL capability. The mic is rated to handle 140 dB SPL without the pad, and 150 dB SPL with the pad in place. It is also interesting to note that a decrease in phantom power yields a decrease in maximum SPL rating. I tested this mic on a rather loud electric guitar cabinet — the amp was cranking 130 to 140 dB SPL. Although an SM57 would have created a preferred sound in this application, the C3000B held up to this type of musical torture. There were minor distortions occurring at this level of joy, but not so much as to be undesirable to the clearly crazy. Again, not the preferred application for this mic, but an interesting test to see if it actually could take a high SPL, and it pretty much did.

The capsule is reportedly made of the same material as the popular C414, and is of the same diameter. The C3000B is closer to the C414 in frequency response, and therefore exhibits the "AKG sound" much better than the C3000 did. The diaphragm is made of plastic foil and is gold sputtered on one side to prevent shorting at high SPLs, and is mounted in a solid metal body with an equally tough wire mesh for capsule protection. The meshing provides a type of pop-filter for vocal use. Plus, it's pretty.

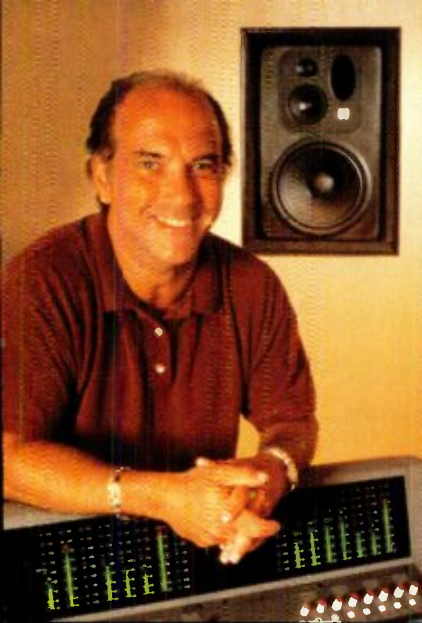
In real-world testing, I noticed that the C3000B had a kind of "smile" frequency response, which equals accentuated highs and lows.

The 3000B excelled in one particular area — close and distant miking on acoustic instruments. In comparison to the C3000, the B version returned a much deeper bass response and a more

clearly defined high end. Since the C414 is commonly used as overheads for drums, I used the C3000B for the same applications, placing it in the same position one would a C414 for drum miking, and was amazed at the smooth, full frequency response. Each drum and cymbal beat could be heard clearly, making the C3000B a new contender for standard drum overhead miking techniques.

I placed the C3000B in recording situations that directly compared it to other "standard" mics. For example, it is considered common practice to use a SM57 on a snare, a C414 as an overhead, a 421





Neil Karsh is the Vice President of Audio Services for New York Media Group. Recently, Karsh selected LSR monitoring systems for two of his Manhattan facilities, *Lower East Side* and *East Side Audio*.

“We’ve installed the first of our LSR 5.1 surround systems at East Side Audio and it’s a great addition. The sound is extremely clear and is enjoyed by our mixers and our clients. Everyone is very pleased with the result.”

New York

LSR. Profiles

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Los Angeles



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EQ IN REVIEW

on toms, a U 87 on vocals, etc. In comparison, the C3000B holds up against all of the trusty usuals. One may prefer the sound (as I did) of an SM57 on a Marshall over the C3000B on the same equipment, but the C3000B certainly held its own. On most acoustic instruments (cello, violin, acoustic guitar, koto, piano, flute, and saxophone), I compared the C3000B to another mic that lists at twice the price (no names, no names...). I split the mics left and right, and was pleased that the result was a perfect, phantom, center image. The colorization of sound is slight, and what little colorization resulted was pleasant. This mic smoothes out the rough edges beautifully.

The C3000B comes with a standard spider suspension mount, which is an improvement over the plastic clip supplied for the C3000. However, the clip is still made of plastic, which makes me wonder how rugged it will prove to be in the long run, and is a little difficult to work with in positioning. In many shockmounts that I've worked with, spinning the mic on axis is fairly easy. With the C3000B, I had to disengage the mount, spin the mic, and then re-engage the mount. This is easy enough to learn, but since the mechanism for the mount needs to be cranked down, precise positioning is a bit of an art. The mic and shockmount come in a cardboard box with foam layers. I think I'd like a bit more protection for this mic than a cardboard box. I know that this is one way of keeping costs down, but even a SM57 comes in a rugged zippered bag.

In conclusion, the C3000B is a definite improvement over the C3000, with a wider frequency response and improved electronics. This mic displays a smooth, pleasant, almost "happy" recorded quality that works well on close and distant acoustic instruments. It is not an all-around utilitarian microphone, but it will occupy a glad space in many of your recordings.

I love being an engineer in this era, with the plethora of new microphones being introduced that are every bit as good as their 10-, 20-, or 30-year-old predecessors. After all, we are recording in the 2000s, not the 1960s — a \$498 C3000B just might be the coveted C12 of the future. Hey, it could happen!

PRICE: \$498. **CONTACT:** AKG, Tel: 615-360-0499. Fax: 615-360-0275. **Web:** www.akg-acoustic.com. **Circle EQ free lit. #102.**

Scott is secretly producing some of the most creative music projects in the Seattle area. See www.gravelvoice.com for more details.

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EQ April '99



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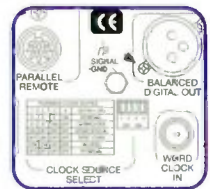
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CIRCLE 79 ON FREE INFO CARD
World Radio History

Blue The Mouse Microphone

The only kind of Mouse
you'd want to find
living in your studio

BY STEVE LA CERRA

The latest offering from Baltic Latvian Universal Electronics (more concisely known as Blue) is The Mouse: a medium-diaphragm, solid-state condenser microphone designed for studio applications. Deriving its name from a physical profile reminiscent of Walt Disney's favorite rodent, The Mouse is intended for use as an instrument microphone on just about anything from vocals to piano to guitars to drums and percussion. The Mouse employs discrete, Class A amplification circuitry for the capsule and a rotating capsule/grille assembly for ease of placement.

Unlike many condenser mics requiring phantom power, operating voltage for The Mouse is 40 volts DC. Since this requirement is easily met by 48-volt phantom supplies, The Mouse will not starve for voltage under high-SPL conditions, allowing it to maintain a wide dynamic range. The microphone is shipped in a beautiful padded, velvet-lined wood box; optional accessories for The Mouse include The Shock and The Pop Filter (more about those later).

Out of the box, it's evident that The Mouse is well-constructed, with a fit and finish of parts worthy of a mic in this price category. Gently moving the capsule within its yoke-type mount reveals a series of shock-mounting devices designed to eliminate transmission of vibration to the diaphragm. First, there's a set of shock absorbers inside the "ears" of the mic, where the capsule grille is suspended in the yoke. Then, within the grille assembly, is another set of three shock mounts that isolate the capsule from the grille. We popped the front and rear grilles off for a close ex-

amination of the capsule; it obviously was made with a lot of care and precision — definitely not a generic, off-the-shelf design you might find in a lesser microphone.

There are no external controls on

the microphone. At the bottom of the body is an XLR receptacle and a threaded socket for a mic stand. As with any mic that mounts directly to a stand, care must be taken not to strip the threads through constant





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mounting and un-mounting of the mic. We recommend use of a quick-disconnect clip which can be screwed into the mic and left there, or you can just mount the mic to a stand and leave it on the stand.

Blue was kind enough to furnish The Mouse along with The Shock, The Pop Filter, and their Cranberry microphone cable. Note that the former two accessories will also fit a Neumann U 47 or U 48, performing double-duty for owners of those mics. Both The Shock and The Pop Filter attach to The Mouse by placing the mic body in the center of a well-padded clamping ring (or two in the case of The Shock), and then latching the clamp closed. Simple and effective. The Pop Filter is an elegant alternative to the typical "stocking-on-a-hanger" device and looks like it will hold up to repeated use. It is important to note that you can't use The Pop Filter and The Shock at the same time because the length of The Mouse's body is a little too short to accommodate them simultaneously.

Our first session with The Mouse was recording an acoustic steel-string guitar, and, in this application, it sounded gorgeous: transparent and well-balanced, conveying a sense of power that other mics have missed on the same guitar. Our guitarist had a habit of tapping his foot while playing, which we heard as a low-level thump when we used the mic without The Shock. Placing the mic in the suspension almost completely

eliminated this problem.

We noticed that The Mouse has a very subtle proximity effect: you have to get within about two inches of the capsule before you'll hear the bass response gently bump up. In the case of the acoustic guitar, this proved to be an advantage because we could place the mic near the sound hole without getting a lot of "boom."

Since the folks at Blue invited us to use The Mouse on any instrument we could think of, we tried it directly at the air hole in the front head of a Tama 22-inch double-head kick drum. The Mouse really couldn't handle the air movement produced by this drum at close range, sounding like its diaphragm reached the excursion point. Pulling the mic back about 10 inches away from the front head didn't help much, but when we moved The Mouse out into the room for ambient pickup, it captured a well-balanced picture of the entire kit with a knock in the low end that was tight and well-controlled.

Next, we recorded a male vocalist using The Mouse and The Pop Filter. If you're looking for a mic to flatter a thin-sounding vocalist, look elsewhere. Though it might be considered by some folks to sound lean in the lower mids, it's more a case of The Mouse being accurate. You'll get none of the thick, overemphasized lower-mids some other mics deliver, but you'll also find the recording cuts through the mix very easily. The mic might be a touch sibilant for

SPECIFICATIONS:

Polar Pattern: Cardioid
Frequency Range: 20 Hz to 20,000 Hz
Sensitivity: 21 mV/Pa (@ 1 kHz into a 1 kohm load)
Noise Level: 7 dB A weighted (per DIN/IEC 651)
Maximum SPL: 134 dB for 0.5% THD
Power Requirements: 48-volt phantom

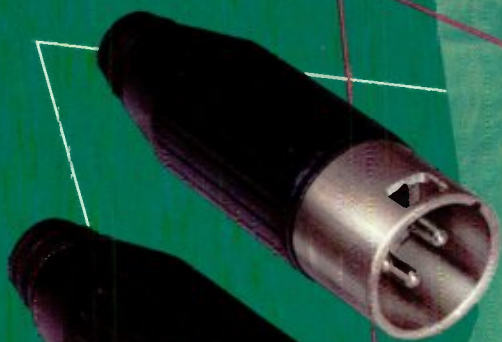
a naturally bright vocal, a characteristic easily corrected by moving the capsule slightly off-axis to the vocalist. The Mouse really excels at capturing subtle detail — enough for our vocalist to comment that he felt he was working less than he might with other mics to deliver his performance. The Pop Filter definitely helped get rid of plosive noises and is undoubtedly one of the most elegant solutions to a pop screen that we've ever used.

We even tried The Mouse on instruments like snare drum and hand percussion. Snare drum reproduction was very realistic, especially when the drummer played side-stick: the lower mids didn't build up like they would when using a mic with significant proximity effect. This same quality made the mic great for hand percussion — The Mouse could be placed very close while maintaining clarity and keeping the true timbre of tambourine, maraca, and shaker. We found the ability for the capsule to pivot an advantage when tweaking mic position, maintaining the positions we set throughout our sessions.

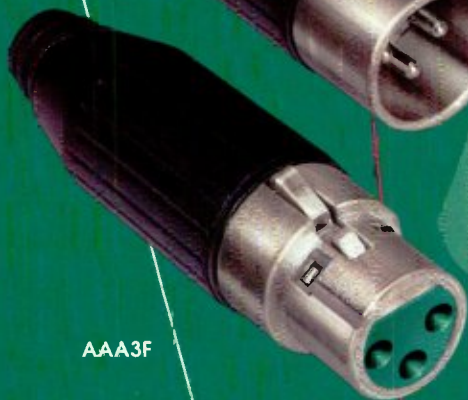
Blue has definitely hit the mark with The Mouse as an excellent all-around studio instrument and vocal microphone. It doesn't add unnecessary color to the instrumental timbre, has a striking ability to resolve low-level detail, and won't add any noise to your recording chain. Definitely recommended.

PRICES: The Mouse, \$2295; The Shock, \$350; The Pop Filter, \$250.
CONTACT: Blue (Baltic Latvian Universal Electronics), P.O. Box 910, Agoura Hills, CA. Tel: 818-986-2583. Fax: 818-784-7564. Web: www.bluemic.com. Circle EQ free lit. #103.

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CIRCLE 48 ON FREE INFO CARD

Lawyers and Players: MP3 in the Spotlight



PHOTO BY STEVE JENNINGS

The continuing fight over Web music distribution

BY JON LUINI AND ALLEN WHITMAN

Our old pal Michael Robertson at MP3.com is being sued by, at last count, "at least" ten major record labels for his site's My.MP3.com service. This service is billed by MP3.com as a "virtual CD player that CD owners can use to listen to their own CDs from any net-connected computer." The idea is that you insert a CD into your computer and the CD info (not the music) is uploaded to their servers. If it's in their database of 45,000 releases, you then can stream (not download) MP3 files of the album.

The heart of the lawsuit is the issue of who has control over your songs and how they are distributed. The RIAA's (often spokesperson for the big record labels) president and CEO Hillary Rosen clearly explains their stance: "...it is not legal to compile a vast database of our members' sound recordings with no permission and no license." MP3.com claims they are only storing a copy of a CD (already purchased by a consumer) on their servers for that consumer to listen to anywhere.

The FezGuys always prefer to see dif-

ferences resolved out of court, but, in this case, neither MP3.com or the music industry seem to be able to do so. Both have now published open letters to each other pointing fingers in efforts to sway public opinion. This time, however, MP3.com doesn't appear to have the same support it enjoyed in previous encounters with the established music industry. In particular, the Digital Media Association (DiMA), designed for Internet-based companies to interface with the traditional gang, generally agrees that MP3.com has violated copyright law. Interestingly, MP3.com is not a member of this organization (which includes 38 new media music companies, including Emusic.com, Myplay, Liquid Audio, and CDNow).

Lon Sobel, editor of *Entertainment Law Reporter*, adds a relevant observation: "The copy was made by MP3.com, not by the consumer; I couldn't imagine how they thought that was legal."

Certainly, the purchaser of an album has certain rights for reproduction of that album for private use, but it's becoming apparent that Mr. Robertson is going beyond even basic civility. If the music business is Willy Wonka's Chocolate Factory, Michael Robertson is Veruca Salt whining for an Oompa-Loompa.

Reading between the lines, it's clear the slow-moving RIAA and its members are, as usual, merely reacting to technology advancements instead of sourcing them. Another prime example is the still-percolating SDMI standard for portable digital music players (it was supposed to be finished by the Christmas 1999 shopping season). As for MP3.com, it appears they are moving further towards being a self-described "Music Service Provider," ultimately acting like an ISP, selling you global access to music you've already paid for. On the upside, some people may find it a worthwhile service to be able to listen to their music collection remotely. On the downside, it's not clear how artists will be fairly compensated out of these revenues. We're not sure we trust MP3.com to be making those decisions alone. If MP3.com and the RIAA can't even agree to negotiate, then resolution seems unlikely. Maybe it's time MP3.com joined DiMA.

Also jumping with jolly jurisprudence is the National Association of Recording Merchandisers (NARM). They're going after Sony in court, accusing the major label of unfair trade practices by "forcing" NARM-member retailers to sell CDs that

contain hyperlinks directing consumers to other retail Web sites, as well as "showing favoritism" to partly owned record club Columbia House and online retailer CDNow. If you find yourself cursed/blessed with the attention and resources of a label, do everything in your power to hold onto your Internet rights. You're going to need them. If you're a smaller artist, one can't help but wonder if NARM member retailers will refuse to sell your CD because you included a URL to your own Web site.

Maybe the horrid noises being made by all the litigants will cancel each other out like identical audio signals played out of phase with each other, leaving only the gentle sussuration of the musicians' collective heartbeats. Well, as Deborah Harry sang: "dreaming is free..."

THE OLD GUARD GROKS NEW MEDIA

Starting to get the picture is BMI's DLC (digital licensing center), which announced a digital rights system aimed at making it easier for small Internet sites to gain access to BMI's huge repertoire of songs. The DLC is purported to be an "end-to-end click-through" system, allowing users to complete copyright licensing agreements with BMI 24 hours a day, 7 days a week. Ideally, this should make it easier for Webcasting and online radio companies to use BMI-administrated works. It's a step in the right direction, at least. Typically consistent with big-business follow-through: the damn thing's been announced, but (as of this writing) the service is not available on their Web site (www.bmi.com) and there is no date listed for when it will be.

Now, how about an automated section for artists to become members of BMI? Under "I Am A Songwriter/Composer," there are forms for: Address Change, Direct Deposit Authorization, Song Registration, and Document Reproduction Request, as well as useful links to U.S. Copyright forms. Under "I Am A Publisher," there are FAQs on how to join, but no online forms. All forms are in Adobe Acrobat (.pdf) format, so you'll want to make sure you've got the free Reader www.adobe.com/products/acrobat/readstep.html installed on your computer to open them.

This just in: Green Witch Radio (www.greenwitch.com) (MP3 Internet Radio featuring indie bands) has been acquired by powerhouse CMGI (owners of huge pieces of search engine Altavista and ISP NaviSite).

Green Witch will be merged into CMGI's iCAST company, an online entertainment hub that champions self-publishing as well as offering user-generated and syndicated audio and video content and live and archived events. Hopefully this will lead to more resources for the development of open MP3 streaming server Icecast www.icecast.org. Green Witch has long supported Icecast, an open-source and compatible method to Shoutcast (anyone with a server can stream their own radio stations).

NEW MP3 PLAYERS

The beginning of 2000 may become known as when Macintosh MP3 players hit the bigtime. After years of limited MP3 player availability, suddenly (just like the iMac) they're everywhere.

Player: Audion v1.2

Price: \$17.95 (or \$39.90 with N2MP3 encoder)

OS: Mac

Plays: Files, Streams, CD

URL: www.panic.com/ppack/audion/

Summary: Solid and useful product.

Description: Billed as "a top-notch CD player, an incredibly flexible MP3 player, and a smooth network-audio player all in one," and somewhat similar to Soundjam (especially when purchased with the N2MP3 encoder), the Audion offers the usual combination of different faceplates, equalizer, and playlists. Unique features are a three-button control to play MP3 files, a CD, or a network stream (such as Shoutcast or Icecast) as well as CDDB (CD Database) caching. After the free 15-day demo, Audion is still usable, though sessions are limited to 30 minutes. Upon install, Audion asks whether you'd like to make it your "Internet Helper App." It's good of them to allow us to choose.

Player: GrayAMP

Price: Free

OS: Mac

Plays: Files

URL: www.digithought.net/software/grayamp/

Summary: Great if you only want to hear music.

Description: This very basic MP3 player runs on all (even older) Macs. GrayAMP doesn't take up excess CPU cycles with pointless add-ons like visualization plugins. To quote the blurb: "GrayAMP is an MP3 player, plain and simple. It's small, but includes all the major features (such as full playlist support). The interface is Finder-like and MacOS 8 friendly. In the spirit of MP3s, GrayAMP is free."

Player: Amp Radio v1.5

Price: \$10

OS: Mac

Plays: Files, Streams

URL: www.subband.com

Summary: Not too fancy, good backup choice for streaming.

Description: Amp Radio offers a "station" tracker. The tracker is supposed to be a "true hierarchical playlist manager with drag-and-drop capabilities." This player can record streams to disk. Like the Audion, upon install Amp Radio offers you the choice of being your default "Internet Helper App."

Player: FreeAmp v2.0

Price: Free

OS: Linux and Win95, 98 and NT (currently). Macintosh, Solaris, and BeOS ports (in progress).

Plays: Files, Streams

URL: www.freeamp.org

Summary: Open-source is good! We eagerly await their Mac port.

Description: FreeAmp plays MPEG 1, MPEG 2, and MPEG 2.5s along with MP3 files. It allows you to save Shoutcast and Icecast streams to disk, as well as being a music browser and playlist editor. **EQ**

Meet Moe,

Moe Me. Everyone knows Moe - he's the guy that has to have his monitor louder than everyone else. He really loves to feel it.

Meet the solutions to Moe, Rolls Personal Monitor Systems. Rolls makes more headphone monitor systems than anyone else, and we guarantee they'll keep Moe (and you) happy.

The new Rolls HM60 Headphone Monitor System, along with the HM58 and HM59 Monitor Remotes are the ultimate in monitor mixing and headphone distribution. It mixes a main stereo signal with up to four mono sub-mixes, and has compression and eq for total headphone sound control.



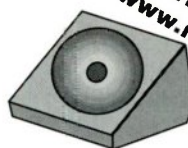
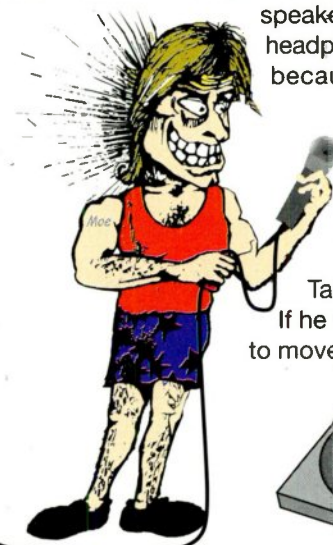
The PM50s and PM50sOB mix a stereo monitor signal with a balanced mic signal. Moe can plug his microphone into the PM50 - the signal passes through the unit without signal loss, and goes into the mixer. His monitor send comes from the mixer and goes into the Monitor input. Now Moe can adjust the monitor level and his own mic level himself.

The PM52 is the simplest of the bunch, it acts like a monitor speaker. It goes in-line and you plug headphones into it. It requires no power because it's using a speaker level signal.



Rolls also has headphone amplifiers like the HA43 Four Channel, RA53 Five Channel, and the RA62 Six Channel Headphone amplifiers.

Take Moe with you to the nearest Rolls dealer. If he complains that he still wants his arm-hairs to move, well, get him a fan.



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CIRCLE 43 ON FREE INFO CARD

YAMAHA AW4416

continued from page 26

"Omni Out" jacks on the rear panel are assignable from four group outs or four aux outs. Omni Outs may also carry a mono output or an additional stereo output for use as say, a headphone cue.

Input and output facilities of the AW4416 may be expanded by using either or both of the two rear-panel, mini-YGDAI card slots. As of this writing, there are six different audio interface cards available for the AW4416. Three of these are digital interfaces: the MY8AT (8-channel ADAT Lightpipe I/O), MY8TD (TASCAM TDIF 8-channel digital I/O), and the MY8AE 8-channel AES/EBU digital audio interface. The remaining three cards are analog interfaces: the MY8AD (8-channel, analog inputs on TRS jacks), MY4AD (4-channel, XLR analog inputs), and MY4DA (4-channel, XLR analog outputs). Use of the cards allows a maximum of 44 input channels to be used simultaneously. A third slot allows the workstation to accept an optional CD-RW drive for use as a mixdown deck.

In addition to the audio interface capabilities, the AW4416 is equipped with a variety of "utility" connectors such as word clock I/O, MIDI in, out, and thru, MTC output, a mouse connector to facilitate navigation of menus, a "To Host" port for direct connection to an external computer, and a SCSI port for audio data backup. A foot switch jack facilitates remote control of start, stop, and punch in/out functions.

If all of that isn't enough, Yamaha has also built a sampler into the AW4416. A "sampling pad" section uses eight trigger buttons in two banks for a total of 16 accessible sounds in an 8-voice mono configuration. Total sampling time is 90 seconds at 16-bit, 44.1 kHz. Sample pads may be assigned to any input channel of the mixer section for easy sampling of external analog audio. Perhaps most interestingly, an audio phrase from the internal hard drive, a CD-ROM or SCSI-connected drive may also be assigned to a sample pad for quick fly-ins of repetitive parts such as background vocals(!).

Yamaha expects the AW4416 to begin shipping in July 2000 at a suggested retail price of \$3399 without the CD-RW drive, and \$3799 with the CD-RW drive. For more information contact Yamaha at (Tel.) 714-522-9011, or on the Web at www.yamaha.com. Circle EQ free lit. #104.

MANSION STUDIO

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ing the bathroom door open slightly, he and Eric could see each other. Unfortunately, with Bob downstairs, neither Tom nor Eric could see Bob — which naturally made playing difficult. Our solution was much better than doing something modern like, say, using video cameras and monitors. We took two big mirrors, set one at the top of the stairs, the other at the bottom of the stairs, and adjusted them until Tom and Eric could see Bob downstairs and vice versa. It worked like a charm!

HEADPHONE MADNESS

With all of the gear positioned, connected, and tested, the last issue to address was headphone mixes. In effort to keep things simple, I thought it might be a good idea to run one headphone mix to Bob and a separate mix for Tom and Eric. Meanwhile, I could monitor the L/R bus in the attic/control room. The Mackie 24*8 has two separate stereo headphone outputs. In theory we could have used sends 3/4 for one headphone mix and sends 5/6 for the other headphone mix, but the problem was that the console — like a lot of project consoles — has only four knobs to cover 6 sends. The first two knobs always route to send 1 and send 2 (we set those up for a bit of snare 'verb). The second pair of knobs can route to sends 3/4 or sends 5/6, but not 3/4 and 5/6 simultaneously. This becomes a problem when, for example, you want to send the kick drum to sends 3, 4, 5, and 6 simultaneously (in other words, to both stereo 'phones mixes). You can send it to 3/4 or 5/6 — but not both. We came up with a pretty good solution that didn't take rocket science.

Multiple sources can be assigned to the 'phones outputs, so we double-assigned sources to the 'phones, routing my "control room" mix *plus* "aux 3/4" to phones 1 (Bob's mix), and the control room mix *plus* "aux 5/6" to phones 2 for Tom and Eric. Tom and Eric got my L/R mix (all instruments) via the "monitor," and then aux 5/6 *in addition* to the L/R. When Tom and Eric needed more snare drum, I went to the snare channel, switched the aux to 5/6, and turned it up. *Voila!* More snare in 'phones 2, mix unchanged in 'phones 1.

Eventually we found out that since Bob was in the same room as his drums, he really didn't need much drums in his cans because he was hearing enough of

them acoustically. The L/R mix was removed from Bob's cans, and aux 3/4 was used to add just the guitar and bass to his mix.

Almost all of the "grunt work" was done on the first day, including getting sounds, tuning the drums, placing mics, and roughing out headphone mixes. The next morning, we each rolled out of bed around 10 AM and had breakfast together outside by the pool in the fresh air and sunshine! After a bit of noodling on the basketball court, we came into our "studio" fresh, tweaked a few mic positions and drum tunings, and started tracking songs. The whole vibe of the sessions was very laid back and, as a result of the relaxed atmosphere — plus a lot of careful preparation on the part of the band — they typically nailed their rhythm tracks in one or two takes per song.

We worked this way for the next few days, tracking about half the songs on day two and the other half on day three. If we started getting burnt on a song, we'd take a break for a couple of baskets or toss some steaks on the grill, then come back with new ears until our rhythm tracks were completed. It was probably the best tracking session I've ever done, and certainly the most interesting. Makes me want to come up with a bundle of money to buy that mansion and turn it into a permanent studio!

The self-titled debut CD from Thick is available from High Strung Music. Visit their Web site at www.highstrungpro.com/thick.

Steve La Cerra's most recent CD, Flight, is available from Amazon.com or by calling Indiego Global Distribution, 888-311-0796.

BUTTKICKER

continued from page 116

transducer is currently only available in the shaker version, Guitammer is also working on an air-moving unit driven by the same motor. This AirPump™ also yields impressive performance and may promise even broader application of the driver.

For more information, contact The Guitammer Company Inc., P.O. Box 82, Westerville, OH 43086. Tel: 888-676-2828. Fax: 815-346-9532. E-mail: info@guitammer.com. Web: www.guitammer.com. Circle EQ free lit. #105. Martin A. Santos is an engineer at MD Systems/Clair Brothers Audio.

We loved *Recording* magazine's SampleTrak review so much, we had to rip it off.

"Effects quality here is exactly what's needed for remix and dance music production. Filters and the ring modulator have a very "analog-ish" sound, and the time-based effects are clean and crisp."

"A lot of attention has been paid both to sonic details and to real-time effects control. Case in point: not only does the scratch effect sound very record-like, but rocking the Edit 1 wheel makes it behave that way as well."

"The ST-224's internal noise is virtually nonexistent."



"Resample allows you to take material already in the ST-224, route it through the machine's effects and alter it, then save the results to another pad without routing anything out of the box... This feature takes the ST-224 and puts it into a higher league."

DAC Crowell
Recording, September 1999

"In the end, the Zoom SampleTrak ST-224 is less like a phrase sampler and more like a little shrunken-down sampling workstation... one that doesn't cost all that much more than those little loopers. Lots of KA-BOOM! for the buck."

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CIRCLE 44 ON FREE INFO CARD

World Radio History

NAMM 2000

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imoog-style keyboard, at the Big Briar booth. The new board retains the classic features of the Minimoog, but will feature MIDI and other updated capabilities. In other analog synth news, a company called **Touched by Sound** was showing **Mephisto** (\$3995), a cool-looking eight-voice analog keyboard with 36 motorized faders and loads of features. Peavey was showing the **Paradox**, a two-oscillator monophonic rack-mount analog synth with a separate control surface (\$1000).

Yamaha hit the show with a 61-note version of their S80 keyboard, the S30 (\$1295), which offers 64-note polyphony, 64 multi-mode resonant filters, and 24 MB ROM. In addition, the company unveiled their next-generation samplers, the A4000 (\$1595) and A5000 (\$2295). The A5000 features 126-note polyphony, 20-bit A/D converters, 24-bit D/A converters, improved sample editing and loop processing functions, six effects processors, a bundled nine-CD library, and the ability to burn backup CDs directly from the sampler; the A4000 offers half the polyphony of its big brother.

EMU unleashed a barrage of new modules in their booth. The first was the aptly named **B-3** (\$895) — you guessed it, 64-note polyphonic tonewheel organ sounds galore, plus distortion, harmonic percussion, and rotary speaker effects. An additional 32 MB of sound ROM can also be added to the single-space unit. The **Xtreme Lead XL-1** synth (\$895) also has 64-voices of polyphony, but provides 32 MB of “cutting edge” sounds aimed at dance production needs. Like the B-3, it can be expanded with a 32 MB ROM upgrade. In addition, the company announced an upgrade that provides 128 voices of polyphony, four ROM expansion slots, six outputs + digital output, and an additional 16 MIDI channels.

But did they stop there? No, **EMU** also unveiled the **Mo' Phatt Urban Dance Synth**, which carries on the legacy of the synth/groove-oriented Planet Phatt module, and a new **RFX** effects board for the E4-series samplers (\$795), which provides 32 channels of 32-bit processing and an integrated 15-bus stereo digital mixer. The RFX also supports 24-bit I/O using optional expander cards.

Korg was showing the new **Version 2.0 Triton OS**, which enhances the keyboard's sampling capabilities (free to

Triton owners). Also drawing a lot of attention was the new **MS2000 analog waveform synth** (\$799 rack, \$1100 keyboard). The new unit recreates the tones of analog synths and provides 35 knobs for real-time sound manipulation. Want more? There's also a 16-band vocoder in the MS2000, modeled on the classic Korg VC10. A cross-platform-compatible version of the **OASYS** PCI card was also put through its paces (\$2200). Like the Mac-only version, the new card provides 12 ins and outs, 24-bit digital connections, word clock, an ADAT timecode port, and built-in effects, mixing, and synthesis capabilities. Last but not least, Korg debuted the latest addition to the Electribe family, the **ES-1 rhythm production sampler** (\$599), designed to let users easily create samples and combine them into patterns and grooves. The unit has 95 seconds of sampling time, effects, resampling, and time slice functions for working with loops.


As is traditional at NAMM shows, **Roland** released a seemingly endless array of new products, including the **XV-3080** and **XV-5080** synth modules and the **XV-88** 88-note keyboard synth. The new beasts offer massive amounts of internal ROM, and are all mega-expandable with optional ROM cards — up to four times the capacity of previous Roland synths. One hundred-twenty-eight-voice polyphony is standard, as is a brand-new effects processor with independent reverb, chorus, and multieffects. The flagship **XV-5080** also features an R-BUS connector for dumping eight channels of output straight into a Roland VM-series digital mixer or **VSR-880** digital studio recorder.

On the software synth/sampler front, a lot of noise was being made. **Emagic** announced the **EXS24 Emagic Xtreme sampler** for Mac and Windows (\$299). The new sampler runs under Logic Audio version 4.0 or later and supports WAV, AIF, SDII, and Akai S1000/S1100 format samples at resolutions up to 24/96. The EXS24's architecture supports complex structures as well as subtractive synthesis-type capabilities. A future version is slated to support Digidesign's DirectConnect protocol, providing compatibility with Pro Tools environments. The **Emagic ES1** software synthesizer is now available for TDM-based systems as well as any Logic series program from Version 4.0 upwards (standard ES1, \$99; TDM version, \$299). ES1 integrates seamlessly within Logic's internal digital mixer so that all plug-ins effects can be applied to its output and all parameters can be automated.

Among the myriad new products announced at the Steinberg booth was **Propellerheads' Reason** (\$399), a combination of an analog synth, sampler, drum machine, mixer, effects, pattern sequencer, ReCycle-based loop player, and more. Each unit in Reason's virtual rack has its own front-panel for easy editing. To patch units together, hit the Tab key to turn the rack around, then make the desired connections using trusty virtual patch cables. How powerful is Reason? From the demo and press release we saw, it looks truly amazing. Steinberg was also showing **Waldorf's** virtual reincarnation of the **PPG Wave synthesizer**. Modeled after the Wave 2.3, the new VST-compatible synth includes 32 wavetables of 64 different waveforms each, up to 64 notes of polyphony (depends on CPU power), eight multitimbral parts, real-time MIDI control, and more.

Unity Composer (\$99) and **Unity PlayerM** (\$199) are new versions of **Bit-Headz** Mac/Windows **Unity DS-1** software sampler. **Unity Player** is a playback-only version of **Unity** for those who don't require full import, sampling, and editing capabilities. **Unity Composer** integrates the **Unity** sampler engine as a sound source in **Sincrosoft's** **Amadeus** scoring software, which provides up to 16 staves per system plus hundreds of music symbols. **Unity Composer** and **Unity Player** can both load any **Unity**-format samples and programs.

Creamware was showing **PowerSampler** (\$598), which runs on a **PowerSampler** PCI DSP board installed into a Mac or PC. Because the sampler runs on the DSP board, no load is imposed on the host computer, freeing it for other applications. Among **PowerSampler's** features are 32 stereo voices, a mixer, effects, 24/96 capability, ultra-fast drivers, and support for the **NemeSys** **Gigasampler** interface. Optional interfaces provide eight additional analog I/O or 16-channel ADAT optical connections. **PowerSampler** can be used standalone or as an expander for **Pulsar** (which is now Mac-compatible).

GigaStudio 160 for Windows (\$699) is an integrated, expandable sampling workstation from **NemeSys** that incorporates sampling, synthesis, and sound design. It features up to 160 streaming disk-based voices, 64 MIDI channels, 24/96 support, **QuickSound** sound database, professional automatable effects, enhanced format conversion, and integration with editing tools. A junior version, the **GigaStudio 96** with 96 voices and 32 MIDI channels, lists for \$399. 

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

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

SIGNATURE _____

DATE _____



ROLAND VP-9000

continued from page 24

with 40 effects newly developed by Roland.

In addition to the SCSI ports mentioned earlier, rear-panel features of the VP-9000 include MIDI in, out, and thru ports, as well as six audio output jacks: a stereo output plus two pairs of "direct" outputs. There are also coaxial and optical digital I/Os for interfacing the VP-9000 with DAT machines, CD players, or MiniDisc machines. Front-panel interfacing includes a stereo headphone jack and a TRS audio input jack for connection of external analog audio sources.

The Roland VP-9000 will be available in April at a suggested retail price of \$3295. For more information, contact Roland Corporation U.S. at (Tel.) 323-890-3700 or visit their Web site at www.rolandus.com. Circle EQ free lit. #108.

BONZAI BEAT

continued from page 42

him 15 years later.

Any business advice?

Be honest, stick to your guns, and don't take any crap from anybody. Oh — and always take the gig that nobody else wants. Always. I've gotten some very cool gigs that way.

Any old sayings that irritate you?

"Not bad for a girl."


Anybody in the world you'd like to record?

I would love to work with Babyface or Quincy Jones, Bonnie Raitt — I would love to just meet Bonnie. Sheryl Crow — I've got a lot of respect for her.

What is the difference between a blimp and an airplane?

I don't know how to fly a blimp, but I can fly an airplane. What gets me is that I can have a pilot's license, but they won't give me a motorcycle license.

What is the biggest mistake of your life?

Hey, I'm just getting started — give me some time to mess up! Honestly, I've been very lucky and blessed. My dad got me a Heathkit when I was eight, and I built my own AM radio. My first studio gig was with Richard Barron at Boulevard Sound — he used to say I could solder wings on a butterfly. He was willing to take a chance on me, and others have done the same. But I'm still a baby in this business. Will this really be in *EQ*? 

MASTERING

continued from page 96


el without touching EQs unless there is something blatantly wrong. So, I pretty much do get a picture in my head. The extreme is that a good mix is sometimes even more difficult to master in some respects than something that has a blatant problem, so I have got to be very careful because sometimes less is better.

Sometimes you throw up a mix and it's so kick heavy — with an 808, for example — that it is absolutely distorting from the get go, so then you're tweaking right from the beginning. You immediately start to drop the bottom and try to get that balance going so you can dial out some of the kick, then the level starts increasing. I've mastered records where I pulled 4, 5, 6, 7, 8 dB out of the bottom, and, all of a sudden, I'm able to get 4 dB more overall program level. So, when something is not balanced, it can really create big problems.

When you get handed a project, what are the steps? Describe a whole project, like Christina Aguilera, for example.

Well, Christina is an extreme example because of the complexity of the album. In other words, that particular album was mastered over the course of six to eight weeks, maybe longer. Songs were being remixed and getting swapped, so it was a little longer process than normal. If anything, it was better because I didn't have to deal with the typical 12 or 13 songs in one day and nail them all with one mastering session. An average album rolls in where I am doing that in five to six hours. Is a certain type of music harder than others?

I truly find that the R&B-type pop records are a little easier than rock records. Rock records get a little trickier because the balances are so critical. It just seems that a well-arranged R&B pop track is pretty simple for me to hear, whereas rock seems to need more sonic continuity than R&B tracks. Latin is similar to R&B.

The only catch becomes, just as in my Japanese projects, it's a little trickier to dissect vocal balances if they are not sung in English. I'll often turn to a client and ask about a word in Spanish or Japanese. "Was that okay? Was that discernible?" Because the Japanese market tends to go for a little higher vocal level because it is tough to hear the lyrics in the language. Ultimately, though, balance is still the key. 

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CIRCLE 68 ON INFO CARD

ROGER NICHOLS

continued from page 162

played the DAT tape and the CD ref through the same Apogee PSX-100 converter. They sounded exactly the same. That meant that something had to be wrong with the LBR (Laser Beam Recorder) that was used to cut the glass master, or something in the plating or pressing process had to be causing the sound to change. HELP!

We sent new masters to the CD plant — a 1630 tape and a PMCD master. The plant pressed test CDs from the 1630 and the PMCD feeding three different LBR glass master machines. We had test pressings coming out of our ears. They all sounded different, but none of them sounded as good as the original CD ref.

I called Glen Meadows at Masterfonics (now Emerald) in Nashville. He told me that many of the producers in Nashville were having similar problems with CD pressings, so they did some tests. They sent master tapes to the JVC plant in Alabama on Exabyte, 1630, and PMCD. They cut glass on two different systems, one of which was called the K2 system. The pressings done on the regular LBR

sounded different than the original masters. The K2 glass masters (special low-jitter system) sounded the same as the original masters. Some record labels in Nashville who own their own CD pressing plants have their CDs pressed at JVC using the K2 system.

We called the record company and the proverbial sh*t hit the fan. No way — not even for Steely Dan — were they going to allow the pressing to be done at JVC, period. Well, I guess that answers that!


The only possibility was to find a place that did custom high-quality glass mastering that was compatible with the plant the record company was using. We were in a crunch because the CD was supposed to hit the stores February 29th. This meant that, on Friday February 11th, the CD plant had to press up at least 100,000 to pre-ship to distributors for the small record stores so that everyone would have the CDs for sale on the same day. After some searching, I found out that the Denon CD plant in Georgia does custom glass for many customers. BMG Classical uses Denon to press their CDs. Denon is a high-end audio company, and I would expect nothing less from them. I contacted Denon and they agreed to rush us a test pressing to evaluate. I sent them the Steely

Dan masters, and two days later (last Friday, February 11th) I got the test pressing. We listened to it, and it was fine. It sounded like the ref and we were good to go. The metal parts were sent to the record company's CD plant and pressing started.

The CD plant is supposed to send me a pressing from the Denon metal parts on Monday, February 14th so I can see if it sounds as good as the test pressing right from Denon.

Hang on — here is FedEx with my test. I'll be right back with the results...

Yeah! Whoopie! It was perfect! Somehow the problem was in either the glass masters or the plating process afterwards that makes the stampers that press the CDs.

Well, at least I don't have to change jobs just yet. I will be doing further investigation into the problem and let you know. Just remember, all of the expensive test gear said the pressings were perfect. The quality control people at the record company said we were crazy, the test equipment said the pressings were perfect. When asked if they listened to the CD pressing, they said, "No, do we need to?" Still, the best piece of test gear is your ears. Use them and protect them. Cool. 

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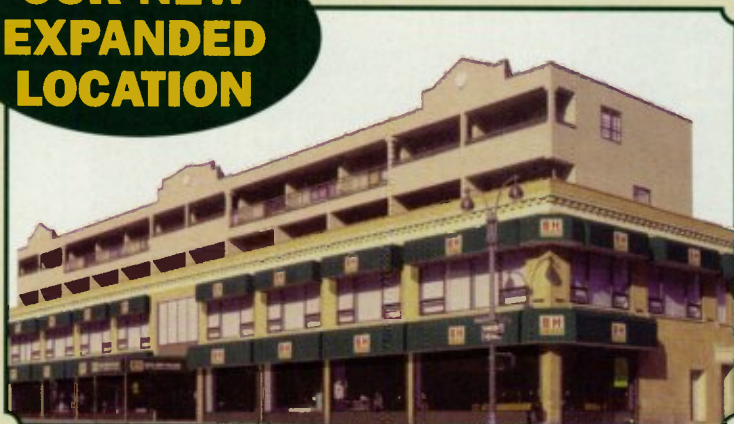
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HARD DISK RECORDING



DIGI001 Digital Audio Workstation For Mac And PC

A completely integrated digital recording, mixing and editing environment for the Mac and PC, the DIGI-001 offers a 24-bit multi I/O breakout interface along with Pro Tools LE software—based on Digidesign's world renowned ProTools software. The DIGI-001 interface features 18 simultaneous I/Os made up of 8 analog inputs and outputs—two of the inputs are full featured mic preamps with phantom power, and digital I/O including standard S/PDIF as well as an ADAT optical interface that can also be used as a S/PDIF I/O. ProTools LE supports 24 tracks of 16 or 24-bit audio and 128 MIDI tracks and also features RealTime AudioSuite (RTAS) effects plug-ins. For ease of use, MIDI and audio are editable within the same environment and all mixing parameters including effects processing can be fully automated.

FEATURES—

- 18 simultaneous, 24-bit ins and outs with support for 44.1 and 48 kHz sample rates
- 20Hz - 22kHz freq. response ± 0.5 dB
- 2 channel XLR mic/1/4" line inputs with -26 dB pad, 48v phantom power, gain knob, and HP Filter at 60Hz
- 6 ch. line inputs (1/4") TRS balanced/unbalanced w/ software controlled gain
- +4dB balanced 1/4-inch Main outputs
- Balanced 1/4" monitor outs with front panel gain knob
- 1/4-inch unbalanced line outputs channels 3-8
- Headphone output with independent gain control knob
- 2 channel S/PDIF coaxial digital I/O
- 8 channel ADAT optical I/O can also be used as 2 channel optical S/PDIF

Pro Tools LE

- Supports 24 tracks of 16 or 24-bit audio and 128 sequenced MIDI tracks
- Sample-accurate simultaneous editing of audio & MIDI
- Real-time digital mixing capabilities include recall of all mixing parameters, support for edit and mix groups and complete automation of all volume, panning, mutes and plug-ins.
- Route and mix outboard gear in realtime
- MP3 and RealAudio G2 file support (Mac)
- Two plug-in platforms offer multiple options for effects



processing—Real-Time AudioSuite (RTAS) is a host-based architect that allows an effect to change and be dynamically automated in realtime as the audio plays back. —AudioSuite is a file-based format, that renders a new file with the processed sound.

- Bundled RTAS plug-ins include: 1 and 4-band EQ; Dynamics I—compressor, limiter, gate and expander/gate; Mod Delay—short, slap, medium, and long delays with modulation capabilities for chorus or flange effects and dither. AudioSuite plug-ins include Time Compression/Expansion, Pitch Shift, Normalize, Reverse.

MIDI Functions

- MIDI functions include graphic controller editing, piano roll display, up to 128 MIDI tracks and editing options like quantization, transpose, split notes, change velocity and change duration.
- MIDI data can be edited on the fly



MOTU AUDIO Hard Disk Recording Systems

The MOTU Audio System is a PCI based hard recording solution for the Mac and PC platforms. At the heart of the system is the PCI-324 PCI card that can connect up to three audio interfaces and allows up to 72 channels of simultaneous I/O. Audio interfaces are available with a wide range of I/O configurations including multiple analog I/O with the latest 24-bit A/D/A converters and/or multi channel digital I/O such as ADAT optical and TDM I/O as well as standard S/PDIF and AES/EBU I/O. Each interface can be purchased separately or with a PCI-324 card allowing you to build a system to suit your needs. Includes drivers for all of today's hottest audio software and AudioDesk, multitrack recording and editing software for the Mac.

THEY ALL FEATURE—

- MacOS and Windows compatible
- Includes software drivers for compatibility with all of today's popular audio software plus AudioDesk, MOTU's sample-accurate audio workstation software for Mac OS
- Host computer determines the number of tracks that the software can record and play simultaneously, as well as the amount of real-time effects processing it can support
- Front panels display metering for all inputs and outputs

- **AudioDesk Audio Workstation Software** for Mac OS features 24-bit recording, multi-channel waveform editing, automated virtual mixing, graphic editing of ramp automation, real-time effects plug-ins with 32-bit floating point processing, crossfades, support for third-party audio plug-ins (in the MOTU Audio System and Adobe Premiere formats), background processing of file-based operations, sample-accurate editing and placement of audio, and more

2408 mkII FEATURES—

- 7 banks of 8 channel I/O: 1 bank of analog, 3 banks of ADAT optical, 3 banks of Tascam TDM, plus stereo S/PDIF
- Custom VLSI chip for amazing I/O capabilities
- Format conversion between ADAT and DA-88

- 8x 24-bit 1/4" balanced analog I/Os
- 24-bit internal data bus for full 24-bit recording via digital inputs
- Standard S/PDIF I/O for digital plus an additional S/PDIF I/O for the main mix
- Sample-accurate synchronization with ADATs and DA88s via an ADAT SYNC IN and RS422

1224 FEATURES—

- 24-bit analog audio interface
- State-of-the-art 24-bit A/D/A
- Simultaneously record and play back 8 channels of balanced (TRS), +4 dB audio
- 24-bit balanced +4

- XLR main outputs
- Stereo AES/EBU digital I/O
- Word clock in/out
- Dynamic range of 116 dB (A-weighted)
- Front panel displays six-segment metering for all inputs and outputs
- Headphone jack with volume knob

388 Features—

- 8 channels of coaxial S/PDIF using 4 RCA input and 4 RCA output connectors
- 8 channels of optical S/PDIF using 4 toslink input and 4 toslink output connectors

- 8 channels of AES/EBU using 4 XLR male and 4 XLR female connectors
- Word Clock I/O allows the 308 to synchronize with digital audio environments

24i Features—

- 24 high quality, 24-bit analog inputs
- Balanced 1/4" analog outputs
- Optical and coaxial S/PDIF outputs

- Front panel headphone outp. it with level control
- Word Clock I/O
- Connect up to three 24i rack I/Os to a PCI-324 audio card for a total of 72 inputs and six outs

CD RECORDING/MASTERING

ALESIS

MasterLink ML-9600 High-Resolution Master Disk Recorder

The Alesis MasterLink ML-9600 is a 2-track 24-bit recorder that combines hard disk recording, CD burning, digital signal processing, and mastering functions to create compact discs in the standard "Red Book" 16-bit/44.1kHz format, or high resolution CDs that utilize Alesis' revolutionary CD24 AIFF-compatible technology. MasterLink is capable of recording and playing up to 24-bit/96kHz resolution CDs using the inexpensive, readily available CD-R media. The amazing sonic quality, powerful built-in tools and CD24 technology offers a uniquely versatile and affordable solution for everyone from large commercial audio facilities to project studios and recording musicians.



FEATURES—

- 24-bit 128x oversampling analog to digital and digital to analog converters
- Supports 44.1, 48, 88.2, 96 kHz sample rates and word lengths of 16-, 20- and 24-bit
- 20Hz-20kHz frequency response at 44.1/48 kHz sample rates
- 20Hz-40kHz, frequency response at 88.2/96 kHz sample rates
- 113dB signal-to-noise ratio (A-weighted)
- Matsushita ATAPI CD-ROM drive allows up to 4x CD burning using standard CD-R discs.
- Built-in sample rate conversion and noise shaping to change sample rates and bit resolution as needed
- Reads and Writes 16-bit 44.1kHz Red Book Audio CDs

- Alesis' exclusive CD24 is a high-resolution mastering format that reads/writes files up to 24-bit 96kHz in the ISO 9660 disc format: AIFF compatible file format that can be read by MacOS, Windows and Unix computer platforms.
- Built-in 3.2GB IDE hard drive
- Hard disk max recording times 95 min. @ 24-bit/96kHz 310 min. @ 16-bit/44.1kHz
- Create and store up to 16 playlists containing as many as 99 tracks

Analog Inputs and Outputs

- Balanced XLR connectors (+4dBu input and +19dBu max. output)
- Unbalanced phono (RCA) connectors (-10dBV input and +5dBV max. output)
- 1/4-inch TRS headphone output

with level control

Digital Inputs and Outputs

- AES/EBU balanced XLR inputs and outputs
- S/PDIF unbalanced phono (RCA) inputs and outputs

Editing

- Gain control
- Cropping allows adjusting start and end points.
- Join and Split features allow combining and separating song sections

DSP Finishing Tools

- Equalization, Compression, Normalizing and Peak Limiting

Includes

- Infra red remote control and rackmount brackets

marantz

CDR 640 CD Recorder

Marantz' flagship CD recorder benefits from 10 years of CD-R experience. Designed without compromise aided with the help of professional end-users, ensuring maximum flexibility and stability in the most rigorous studio environments.

Features—

- Balanced XLR Analog in/out
- Analog RCA/Phono in/out
- AES/EBU & S/PDIF in/out
- Records on CDR and CDRW audio and data disks
- High resolution 20 bit Sigma/Delta AD conversion
- Full SCMS Copy bit manipulation
- 0.5 dB accurate level metering
- Variable Audio Delay (0-4sec). Offset your audio to compensate for late track ID's
- Preset function stores personal settings
- Optional RC640 Wired remote control



MICROBOARDS

StartREC Digital Audio Editing/ CD Duplication System

The Microboards StartREC is the first digital audio editing system combined with a multitrack CD recordable duplication system for professionals. Audio is recorded to the internal 6.2 GB IDE hard drive using analog or digital inputs. Sample rate conversion is automatic. Tracks can be edited and sequenced using the StartREC's user friendly interface and up to 4 CDs can be recorded simultaneously. StartREC is the ideal solution for studio recording, mastering, post production or any pro audio environment requiring digital audio editing and short run CD-R duplication.

Features—

- 2X, 4X, or 8X recording speeds
- 6.2GB IDE hard drive
- Editing functions include move, divide, combine or delete audio tracks, add or drop any index or sub index, and create track fade in or fade out
- Coaxial S/PDIF or AES/EBU digital input plus optical S/PDIF I/O
- XLR balanced and RCA Line inputs and outputs



- Automatic sample rate conversion from 32 and 48kHz
- Automatic CD Format Detection feature and user friendly interface provide one touch button operation
- Front panel trim pot and LCD display provide accurate input signal and time lapse metering
- SCMS (Serial Copy Management System) is supported, regardless of the source disc copy protection status
- **StartREC Models include:** ST2D00 (2) 8x wr writers, ST3000 (3) 8x writers and ST4000 (4) 8x writer.

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DIGITAL MULTI-TRACK RECORDERS

TASCAM

MX-2424 24-Bit 24-Track Hard Disk Recorder



Co-designed by TASCAM and TimeLine Inc., the MX-2424 is an affordable 24-bit, 24-track hard disk recorder that also has the editing power of a digital audio workstation. A 9GB internal hard drive comes standard as well as a SCSI Wide port that supports external LVD (Low Voltage Drives) hard drives from up to 40 feet away. An optional analog and several digital I/O cards are available so the MX-2424 can be configured to suit your work environment. SMPTE synchronization, Word Clock, MIDI Time Code and MIDI Machine Control are all built in for seamless integration into any studio.

- Records 24 tracks of 24-bit audio at 44.1 or 48 kHz, or 12 tracks at 88.2 or 96 kHz. Up to 24 tracks can be recorded simultaneously using any combination of digital and analog I/O.
- Supplied 9GB internal drive allows 45 minutes of audio across all 24 tracks
- Wide SCSI port on the back panel allows you to add multiple drives. A front 5-1/2" bay available for installing an additional drive, or an approved DVD-RAM drive for back-up.
- ViewNet MX, a Java-based software suite for Mac and PC offers DAW style editing of audio recordings, dedicated system set-up screens that make set-up quicker and easier and track load screens that make virtual track management a snap. Connects to a computer via a standard Ethernet line.
- Can record to Mac (SDII) or PC (.WAV) formatted drives, allowing later export to the computer. The Open TL format allows compatible software to recognize virtual tracks without have to load, reposition and trim each digital file.

Transport Controls-

- Jog/scrub wheel
- MIDI In, Out, and Thru ports are built-in for MIDI Machine Control.

- #### Editing-
- Built-in editing capabilities include cut, copy, paste, split and ripple or overwrite
 - 100 levels of undo
 - Supports destructive loop recording and non-destructive loop recording which continuously records new takes without erasing the previous version.

Build-In Synchronization-

- TBUS protocol can sample accurately lock 32 machines together for 384 tracks at 96kHz, or 768 tracks at 48kHz.
- Can generate or chase SMPTE timecode or MIDI Time Code
- Word Clock In, Out, and Thru ports

I/O Options-

- Optional analog and digital cards all provide 24 channels of I/O. There is one slot for analog and one for digital.

- IF-TD24 - T-DIF module
- IF-AD24 - ADAT Lightpipe module
- IF-AE24 - AES/EBU module
- IF-AN24 - A-D, D-A I/O module with DB-25 connectors

Software Updates-

- System updates are made available through a front panel Smart Card slot or via computer directly from the TASCAM web site.

DA-78HR Modular Digital Multitrack

The DA-78HR is the first true 24-bit tape-based 8-track modular digital multitrack recorder. Based on the DTRS (Digital Tape Recording System) it provides up to 108 minutes of pristine 24-bit or 16-bit digital audio on a single 120 Hi-8 video tape. Designed for project and commercial recording studios as well as video post and field production, the DA-78HR offers a host of standard features including built-in SMPTE Time Code Reader/Generator, MIDI Time Code synchronization and a digital mixer with pan and level controls. A coaxial S/PDIF digital I/O allows pre-mixed digital bouncing within a single unit, or externally to another recorder or even a DAT or CD recorder. Up to 16 DTRS machines can be synchronized together for simultaneous, sample accurate control of 128 tracks of digital audio.



Features-

- Selectable 16 bit or 24 bit High Resolution audio
- 24 bit A/D and D/A converters
- >104dB Dynamic range
- 20Hz - 20kHz frequency response ± 5 dB
- 1 hr. 48 min. recording time on a single 120 tape
- On-Board SMPTE synchronizer - chase or generate timecode
- On-Board support for MIDI Machine Control

- Internal digital mixer with level and pan for internal bouncing, or for quick mixes
- Track slip from -200 to +7200 samples
- Expandable up to 128 tracks (16 machines)
- Word Sync In/Out/Thru
- Analog output an DB25 balanced or RCA unbalanced
- Digital output on TDF or 2 channels of S/PDIF

A TO D CONVERTERS

APOGEE Rosetta 24-bit A to D Converter

The high-end quality analog to digital solution for the project studio. With support for both professional and consumer digital formats you can now record your audio at a higher resolution and with greater detail than standard converters found on MDM's, DAT's and DAW's. Ideal for mastering or tracking.

FEATURES-

- 24-bit, 44.1-48, 88.2-96 kHz Sample Rate ($\pm 10\%$)
 - 116dB dynamic range (unweighted)
 - Improved UV22HR for 16 and 20-bit A/D conversion
- FRONT PANEL:**
- Power switch • Sample Rate (44.1, 48, 88.2, 96kHz) selector • 16-bit (UV22), 20-bit (UV22) and

- 24-bit resolution selector • S/PDIF-ADAT optical selector • Soft Limit on or off • 12-segment metering w/over indicator & Meter Clear switch • Level trim
- REAR PANEL:**
- XLR balanced inputs • 2 x AES/EBU for 88.2/96kHz 2 channel path, Coaxial S/PDIF, switchable S/PDIF or ADAT optical outputs • Wordclock out



LUCID AD 9624 24-bit A to D Converter

Transparent analog to digital conversion designed to bring your music to the next level. XLR balanced inputs feed true 24-bit converters for revealing all the detail of the analog source. 16-bit masters can take advantage of the AD9624's noise shaping function which enhances clarity of low level signals.

FEATURES-

- 24-bit precision A/D conversion • Support for 32, 44.1, 48, 88.2 & 96kHz sample rates • Wordclock sync input • Selectable 16-bit noise shaping •



- Simultaneous AES/EBU, coaxial and optical S/PDIF outputs • 20-segment LED meters w/ peak hold & clip indicators • **ALSO AVAILABLE:** DA9624 24-bit D/A converter

DIGITAL MIXERS

Roland

VM Basic 72 Digital Mixing System

The all digital Roland V-Mixing System, when fully expanded, is capable of mixing up to 94 channels with 16 stereo (32 mono) onboard multi-effects including COSM Speaker Modeling. Utilizing a separate-component design, comprised of the VM-C7200 console and VM-7200 rackmount processor, allows the V-Mixing System to be configured to suit your needs. Navigation is made easy via a friendly user interface, FlexBus and EZ routing capabilities as well as a large informative LCD and ultra-fast short cut keys.



- 94 channels of digital automated mixing (fully expanded)
- Up to 48 channels of ADAT/Tascam T-DIF digital audio I/O with optional expansion boards and interfaces
- Separate console/processor design
- Quiet motorized faders, transport controls, total recall of all parameters including input gain, onboard mixer dynamic automation and scene memory
- 24 fader groups, dual-channel delays, 4-band parametric channel EQ + channel HPF
- FlexBus and "virtual patchbay" for unparalleled routing flexibility

- **VS8F-2 Effects Expansion Board** -- Provides 2 stereo effects processors including COSM Speaker Modeling. Up to 3 additional boards can be user-installed into the VM-7200 processor, for 8 stereo or 16 mono effects per processor.
- **VM-24E I/O Expansion Board** -- Offers 3 R-Bus I/Os on a single board. Each R-Bus I/O provides 8-in/8-out 24-bit digital I/O, totaling 24 I/O per expansion board.

- Up to 16 stereo (or 32 mono) multi-effects processors using optional VS8F-2 Effects Expansion Boards (2 stereo effects processors standard)
- COSM Speaker Modeling and Mic Simulation technology
- 5.1 Surround mixing capabilities
- EZ Routing allows mixer settings to be saved as templates
- RealTime Spectrum Analyzer checks room acoustics in conjunction with noise generator and oscillator
- Digital cables between processor and mixer can be up to 100 meters long - ideal for live sound reinforcement.
- **DIF-AT Interface Box for ADAT/Tascam** -- Converts signals between R-Bus (VM-24E expansion board required) and ADAT/Tascam T-DIF. Handles 8-in/8-out digital audio. 1/3 rackmount size.
- **VM-24C Cascade Kit** -- Connects two VM-Series processor units. Using two VM-7200 processors cascaded and fully expanded with R-Bus I/O, 94 channels of audio processing are available.

EFFECTS & PROCESSING

Lexicon

MPX-500 24-Bit Dual Channel Effects Processor



The MPX 500 is a true stereo 24-bit dual-channel processor and like the MPX100 is powered by Lexicon's proprietary Lexichip and offers dual-channel processing. However, the MPX500 offers even greater control over effects parameters, has digital inputs and outputs as well as a large graphics display.

- 24 presets with classic, true stereo reverb programs as well as Tremolo, Rotary, Chorus, Flange, Pitch, Delay, 5.5 second Delay and Echo
- Balanced analog and S/PDIF digital I/O
- 4 dedicated front panel knobs allow adjustment of effect parameters. Easy Learn mode allows MIDI patching of front panel controls.
- Tempo-controlled delays lock to Tap or MIDI clock

t.c. electronic

M-One Dual Effects Processor



The M-One allows two reverbs or other effects to be run simultaneously, without compromising sound quality. The intuitive yet sophisticated interface gives you instant control of all vital parameters and allows you to create awesome effects programs quickly and easily.

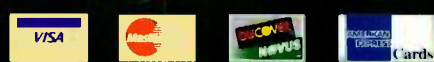
- 20 incredible TC effects including, Reverb, Chorus, Tremolo, Pitch, Delay and Dynamics
- Analog-style user interface
- 100 Factory/100 User presets
- Dual-Engine design
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing

D-Two Multitap Rhythm Delay



Based on the classic TC2290 Delay, the D-Two is the first unit that allows rhythm patterns to be tapped in directly or quantized to a specific tempo and subdivision.

- Multitap Rhythm Delay
- Absolute Repeat Control
- Up to 10 seconds of Delay
- 50 Factory/100 User presets
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing



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MICROPHONES



C414 TLII "Vintage TL"

Combines the best of old and new: legendary C12 acoustics and the latest generation of C414 transformerless FET electronics. Although similar in design and shape to the C414BULS, the TLII features a capsule that is a faithful sonic recreation of the one used in the classic C12 tube mic combined with computer-aided manufacturing techniques that assure greater uniformity in response from microphone to microphone.

FEATURES-

- Cardioid, hypercardioid, omnidirectional and figure 8 polar patterns
- Warm, smooth microphone that is suitable for high-quality digital recording.
- Frequency response 10Hz to 20kHz



C4000B ELECTRET CONDENSER

This new mic from AKG is a multi polar pattern condenser microphone using a unique electret dual large diaphragm transducer. It is based on the AKG SolidTube design, except that the tube has been replaced by a transistorized impedance converter/preamp. The transformerless output stage offers the C4000B exceptional low frequency

FEATURES-

- Electret Dual Large Diaphragm Transducer (1st of its kind)
- Cardioid, hypercardioid & omnidirectional polar patterns
- High Sensitivity
- Extremely low self-noise
- Bass cut filter & Pad switches
- Requires 12, 24 or 48 V phantom power
- Includes H-100 shockmount and wind/pop screen
- Frequency response 20Hz to 20kHz



RØDE NT-2 Condenser Mic

The RØDE NT2 is a large diaphragm true condenser studio mic that features both cardioid and omnidirectional polar patterns. The NT-2 offers superb sonic detail with a vintage flavor for vocal and instrument miking. Like all RØDE mics the NT-2 is hand-assembled in Australia and is available at a breakthrough price.

FEATURES-

- Dual pressure gradient transducer
- 1" capsule with gold-sputtered membranes
- Low noise, transformerless circuitry
- Omni and cardioid polar patterns
- 135dB Max SPL
- High pass filter switch and -10dB pad switch
- Gold plated output connector and internal head pins
- Shockmount, Flight Case, and Pop Filter included
- 20Hz-20kHz frequency response



audio-technica.

AT4047 Cardioid Condenser

The AT4047 is the latest 40 Series large diaphragm condenser mic from Audio Technica. It has the low self noise, wide dynamic range and high sound pressure level capacity demanded by recording studios and sound reinforcement professionals.

FEATURES-

- Side address cardioid condenser microphone for professional recording and critical applications in broadcast and live sound
- Low self noise, wide dynamic range and high SPL
- Switchable 80Hz Hi Pass Filter and 10dB pad
- Includes AT8449/SV shockmount



MICROPHONE PREAMPS

AVALON DESIGN

VT-737SP Mono Class A, Vacuum Tube-Discrete Preamp-Opto-Compressor-Equalizer



The VT-737SP is a vacuum tube, Class A processor that combines a mic preamp, instrument DI, compressor and sweepable 4-band equalizer in a 2U rack space. Like all Avalon Design products the VT-737SP utilizes a minimum signal path design with 100% discrete, high-bias, pure Class A audio amplifiers and the best active and passive components available. Used by renowned artists and studios world wide and the winner of the Electronic Musician 1999 Editors' Choice Award for Product Of The Year.

FEATURES-

- Combination of TUBE preamplifiers, opto-compressor, sweep equalizer, output level and VU metering in a 2U space
- Four dual triode vacuum tubes, high-voltage discrete Class A with a 10 Hz to 120kHz frequency response ± 0.5 dB
- The Preamp has three input selections- The first is a high performance XLR balanced mic input transformer with +48v phantom power, the second is a high impedance instrument DI with a 1/4" jack located on the front panel and the third is a discrete high-level Class A balanced line input.
- High gain switch boosts overall preamp gain and a passive-variable high pass filter, hardware relay bypass and phase reverse relay is available for all three inputs
- The Opto-Compressor uses a minimum signal path design and features twin Class A vacuum tube triodes for gain matching. A passive optical attenuator serves as a simple level controller. Variable threshold, compression ratio and attack and release offer dynamics control from soft compression to hard-knee limiting.
- The dual sweep mid-EQ can be side chained to the compressor allowing a broad range of spectral

- control including de-essing. The EQ can be assigned pre and post compressor from the front panel to add even greater sonic possibilities.
- Two VT-737 SPs can be linked together via a rear panel link cable for stereo tracking
- The Equalizer utilizes 100% discrete, Class A-high-voltage transistors for optimum sonic performance.
- The low frequency passive shelving EQ is selectable between 15, 30 60 and 150Hz with a boost and cut of ± 24 dB
- The high frequency passive shelving EQ is selectable between 10, 15, 20 and 32 kHz with a boost and cut of ± 20 dB
- The low-mid frequency is variable between 35 to 450 Hz while the high-mid frequency is variable from 220Hz to 2.8 kHz. Both mid-band frequencies offer a boost and cut of ± 16 dB and a hi-Q/lo-Q switch.
- When the EQ to side chain is used, the low and high EQ is still available for tonal adjustment
- The Output level is continuously variable and utilizes another dual triode vacuum tube driving a 100% Class A, high-current balanced and DC coupled low noise output amplifier.
- Sealed silver relay bypass switches are used for the most direct signal path

POWERED STUDIO MONITORS

VERGENCE A-20 Studio Reference Monitor System



Incorporating a pair of 2-way, acoustic suspension monitors and external, system-specific 250 watt per side control amplifier, the A-20 provides a precise, neutral studio reference monitoring system for project, commercial and post production studios. The A-20's control amplifier adapts to any production environment by offering control over monitoring depth (from near to far field), wall proximity and even input sensitivity while the speakers magnetic shielding allows seamless integration into today's computer based studios.



- Type Modular, self-powered near/mid/far-field monitor.
- 48Hz - 20kHz frequency response ± 1 M
- Peak Acoustic Output 117dB SPL (100ms pink noise at 1M)
- XLR outputs from power amp to speakers
- Matched impedance output cables included.

- 6dB LF Cutoff 40Hz
- 5 position wall proximity control
- 5 position listening proximity control between near, mid and far-field monitoring
- Power, Overload, SPL Output, Line VAC and Output device temperature display.

Amplifier

- Amplifier Power 250W (continuous rms/ch), 400W (100ms peak)
- XLR, TRS input connectors
- Headphone output
- 5-position input sensitivity switch with settings

Speakers

- 2-way acoustic suspension with a 6.5-inch treated paper woofer and a 1-inch aluminum dome tweeter
- Fully magnetically shielded with an 18-inch recommended working distance

PS-5 Bi-Amplified Project Studio Monitors

The PS-5s are small format, full-range, non-fatiguing project studio monitors that give you the same precise, accurate sound as the highly acclaimed 20/20 series studio monitors. The use of our-tom driver components, complimentary crossover and bi-amplified power design provides a wide dynamic range with excellent transient response and low intermodulation distortion.

FEATURES-

- 5-1/4-inch magnetically shielded mineral-filled polypropylene cone with 1-inch diameter high-temperature voice coil and damped rubber surround LF Driver
- Magnetically shielded 25mm diameter ferrofluid-cooled natural silk dome neodymium HF Driver
- 70 watt continuous LF and 30 watt continuous HF amplification per side
- XLR-balanced and 1/4-inch (balanced or unbalanced) inputs

- 52Hz-19kHz frequency response ± 3 dB
- 2.6kHz, active second order crossover
- Built-in RF interference, output current limiting, over temperature, turn-on transient, subsonic filter, internal fuse protection
- Combination Power On/Clip LED indicator
- 5/8" vinyl-laminated MDF cabinet



Hafler

TRM-6 Bi-Amplified Studio Monitors

Offering honest, consistent sound from top to bottom, the TRM-6 bi-amplified studio monitors are the ideal reference monitors for any recording environment whether tracking, mixing and mastering. Supported by Hafler's legendary amplifier technology providing a more accurate sound field, in width, height and also depth.

FEATURES-

- 33 Watt HF & 50 Watt LF amplification
- 1-inch soft dome tweeter and 6.5-inch polypropylene woofer
- 55Hz - 21kHz Response
- Magnetically Shielded
- Electronically and Acoustically Matched

Also Available- TRM-8

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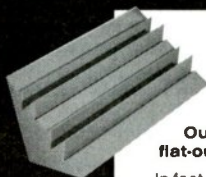
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TC Native Bundle™

TC Electronic hardware effects processors are the cornerstone of many top recording studios. These five plug-ins, featuring the incredible TC native reverb, bring that legendary TC-quality audio

processing to your MOTU system desktop. The TC Native Bundle neatly places at your fingertips over 20 years of audio processing R&D, deployed in native 32-bit floating point glory. Incredible sound, well-crafted presets, low CPU overhead, and intuitive controls make these TC Native plug-ins a joy to use.



ChannelStrip™

ChannelStrip is like having a mageduck mixing console inside your PowerMac. Even artists who regularly use top-of-the-line, large format consoles are raving about the "high-end console" sound they get from ChannelStrip. How did Metric Halo do it? By combining 61 standard, fully-automatable audio processing facilities into

a single, complete plug-in with 64-bit floating point precision. ChannelStrip is heavily optimized for efficient operation in your MOTU native recording environment, so you can use it throughout your mix. How does ChannelStrip actually sound? Producer Andy Gray-Ling puts it like this: "...I'm absolutely mind-blown. It sounds amazing..."

Antares Microphone Modeler™

Now the microphones you own can sound like the microphones you wished you owned. Mic Modeler allows any reasonably full-range microphone to sound like virtually any other mic. Using patented Spectral Shaping Tool™ (SST) technology, Antares has created precise digital models of a wide variety of microphones, from historical classics to modern exotics, as well as a selection of industry-standard

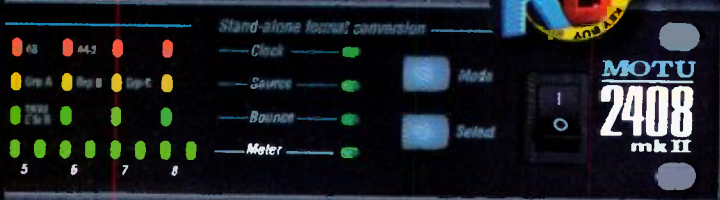
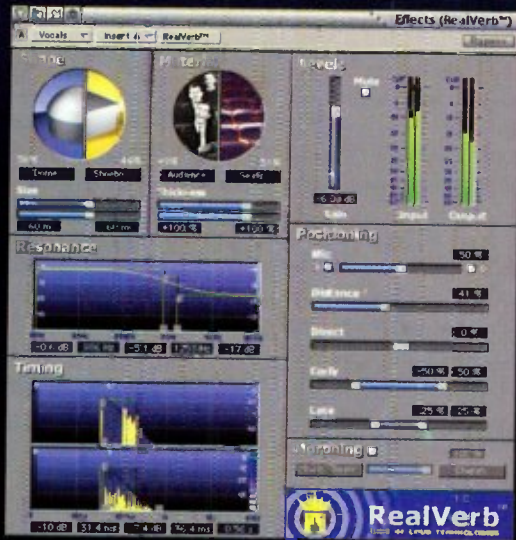
workhorses. Just select which microphone you are actually using and then select what mic you want it to sound like. You can further fine-tune the sound with modeled tube saturation, proximity, windscreen effect, and more. Mic Modeler is an easy, cost effective way to extend your existing mic collection, or to obtain that classic, vintage sound — without the excessive price tag.



new plug-ins for MAS



MOTU AUDIO SYSTEM



RealVerb™

On the heels of their groundbreaking RealVerb 5.1™ surround reverb plug-in, Kind of Loud Technologies presents RealVerb™, a new stereo reverb plug-in for MAS. RealVerb uses complex spatial and spectral reverberation technology to accurately model an acoustic space. The bottom line? Great sounding reverb with the ability to customize a virtual room and pan within the stereo spectrum.

RealVerb even lets you blend room shape, material, and size according to the demands of your mix. And RealVerb was designed from the ground up for automation: adjust controls in real-time without distortion, pops, clicks or zipper noise. You can even morph between presets – in real-time. Don't rely on your old standby – let RealVerb bring new quality and space to your recordings.

2408mkII audio interface™

To mix your project with these advanced plug-ins, listen to it through our new 2408mkII audio interface — now with balanced quarter-inch, 24-bit analog I/O

(8 in / 8 out), with inputs that are switchable between +4/-10, plus a volume knob for the main outs. Same price. Same incredible product. Just more value.

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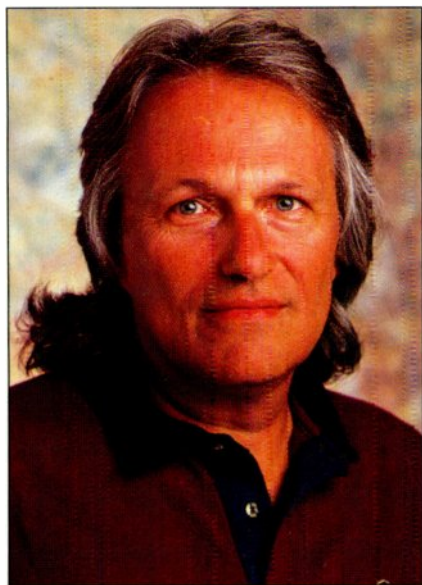
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CIRCLE 81 ON FREE INFO CARD

CDs Give Me *the Jitters*



The case of the mysteriously bad test pressing

BY ROGER NICHOLS

I thought seriously about changing professions last week. How about tourist helicopter rides in Maui, or maybe just a hot dog cart on the beach in Miami. What about a house pet massage therapist in Montana, or a storm chaser in the Midwest? I could sell Pope-sicles in front of the Vatican in Rome. Yeah, that's it!

Two weeks ago, I received a test pressing from the CD plant that is pressing the new Steely Dan CD. The record company asked me to approve it before they pressed 72,000,000,000 of them. I was staying in a hotel at the time, and decided to play it back on my portable CD player and listen on my Sony MDR-7506 headphones. Before the vocal came in on the first song, I thought that it didn't quite have the clarity and sheen I remember from the mixing last summer. Maybe it was my CD player and I would have to lis-

ten the next day at the studio. In my suitcase, I found a CD reference disc from the mastering session. I put it in the portable CD player and listened to the first song up through the entrance of the vocal. It was perfect. Exactly what I remembered and ten times better than the test pressing. The next day, I listened at Sony Studios in New York with Elliot Scheiner and Dave Smith. The difference between the two CDs was amazing.

I remember some friends talking about a project that they were working on in Japan. Whenever there was a problem, the boss would say, "Who is fired?" I was wondering that same question.

At first I thought that the pressing was so bad that error correction was causing the difference in sound. Dave Smith at Sony ran the test pressing through an error checker, and it came back perfect.

Maybe I didn't have the latest ref before the masters were sent to the record company. Maybe there was a screw-up in the transfer to the master tape used for the CD plant. I assumed that the test pressing was an accurate representation of the master they used. I was going to be wrong. I verified that the CD ref that I had was made from the exact master tape that went to the CD plant. I had a new ref made from the same data file on the Sonic Solutions to verify that my CD ref was accurate. It sounded exactly the same as my CD ref.

Don't tell anyone this, but during the mastering we turned up the overall level of the whole album 6 dB. It was exactly a shift up of 1 bit. No math would be performed on the data to raise the noise level, but, because of it, there were a few overs on loud passages during snare drum hits. We listened carefully and decided that, since the overs were not audible, we would leave them alone. We tried using limiting, but you could hear a slight change in the sound. We sent an over list along with the master to the CD plant.

THE OVERCOMPENSATION PROCESS

If a CD plant sees overs, they will usually contact the source of the master and request an approval before pressing CDs. Lots of artists want their CDs to be so loud that you can listen to the CD without a CD player. Cranking the level up with compressors and limiters is just not

enough for them, so they goose the level up even further until the over lights come on at every boom or smack of a backbeat. To keep the CD plant from going ballistic, the mastering house makes a copy of the audio and turns the overall level down by .1 dB. This assures that the chopped-off wave forms that result from digital clipping do not show up as overs when checked by the CD plant. Copy the audio from a Brandy CD into your waveform editor and look at it once. The waveforms look like square waves because they have been chopped off so drastically.

Sometimes the CD plant (they usually ask first, but who knows) will run the master through a processor that drops the level down .01 dB, thus eliminating the over problem. I asked the CD plant if they did this to our master, and they said no. I suspected a falsehood, and decided to check for myself. I read all of the audio data from my CD ref (the good sounding CD) into my computer. I also read the audio in from the test pressing. I ran a program that compares every sample of one audio file with every sample of another audio file, and produces a third audio file containing the difference between the two files. The computer said, "The file you have created contains only zeros." This told me that the audio data was exactly the same on both CDs. Then why did they sound so different? We are talking a big difference. Everyone could hear the difference. My MiniDisc copy sounded better than the test pressing.

IT WAS JITTER!

The plant used the correct master, cut the glass master at 1X, and, as far as I could tell, did everything right. But the CDs sounded different...unless you played them on a \$10,000 CD player. Then they sounded the same. I copied the audio from the bad pressing into my computer and burned a CD-R from the audio file. The CD-R sounded just like the ref. We thought that maybe the CD ref was wrong. Maybe the test pressing was right and something about the jitter in the CD-R burners made the CD sound better than what it was supposed to sound like. I had the mastering facility make a DAT tape from the same Sonic Solutions file. I

continued on page 149

This Mic Is Anything But Flat...



The Neumann M 147 Tube

For years, vintage Neumann tube mics, such as the venerable U 47, have been high-priced, highly prized commodities. Why, when advances have created mics with near-perfect, virtually transparent reproduction, have producers and engineers travelled to the ends of the earth in search of these vintage relics? Because of the way they sound (especially the way the sound sits in the mix).

Enter the M 147 Tube.

Using the same capsule as the classic U 47 and its smaller cousin the U 47 FET, the M 147 Tube microphone brings a warmth, presence and detail to vocals that is simply unattainable from any other mic being produced today, regardless of how much it looks like a Neumann. The fact is, there is really only one way to get that classic sound you seek. Fortunately, it's priced well within your reach.

...That's Why The Pros Love It.



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Neumann – The Choice of Those Who Can Hear The Difference

What The Professionals Are Saying About The Neumann M 147 Tube:

"So far, I'm thrilled to pieces with the Neumann M 147 Tube. I don't think there's any instrument that I wouldn't try them on. Whatever instrument I used them for, I was very impressed with the sound. I wish I had about five or six of them!"

- **Al Schmitt,**
as quoted in *EQ*,
March 1999

"I would recommend the M 147 highly for rock, rap, pop, jazz or blues vocals; drum room and/or kick drum miking; all tube and solid-state instrument amplifiers; nylon string guitar; and low-volume or indistinct sound sources that need some extra presence, and for any type of digital recording. In short, I like the M 147 a lot -- so much so that I bought one."

- **Myles Boisen,**
Electronic Musician,
August 1999

"The particular kind of presence it adds is really unique and desirable, and it's really not available from any other mic or easily obtainable with an equalizer. Typically, condenser mics that have a forward character are really just brittle and edgy, and the M 147 is completely different from that."

- **Monte McGuire,**
Recording,
July 1999

"I asked the singer on my session which mic she preferred and, when presented with a finite budget, her pick (and mine) was the M 147. Classic Neumann sound, tube electronics, the U 47 legacy, and a price that won't savage your bank account. Gotta love it!"

- **Rick Chinn,**
Audio Media,
February 1999

"The M 147 proves again that however close the imitators get, there is no substitute for the genuine article. This is the real McCoy and although it cannot be called cheap, its simple approach means that it is far more accessible than a valve Neumann would normally be expected to be. Another classic in the making."

- **Dave Foister,**
Studio Sound,
February 1999

"It's my opinion that the tone of the Neumann would not require much EQing during mixdown; a decided advantage. Its high end would sit nicely in a mix, and its round but controlled low end would not have to be cut to provide room for other instruments."

- **Mitch Gallagher,**
Keyboard Magazine,
June 1999

CIRCLE 36 ON FREE INFO CARD

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1296

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1296

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- 117 dB S/N
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- Expandable to 36 channels



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