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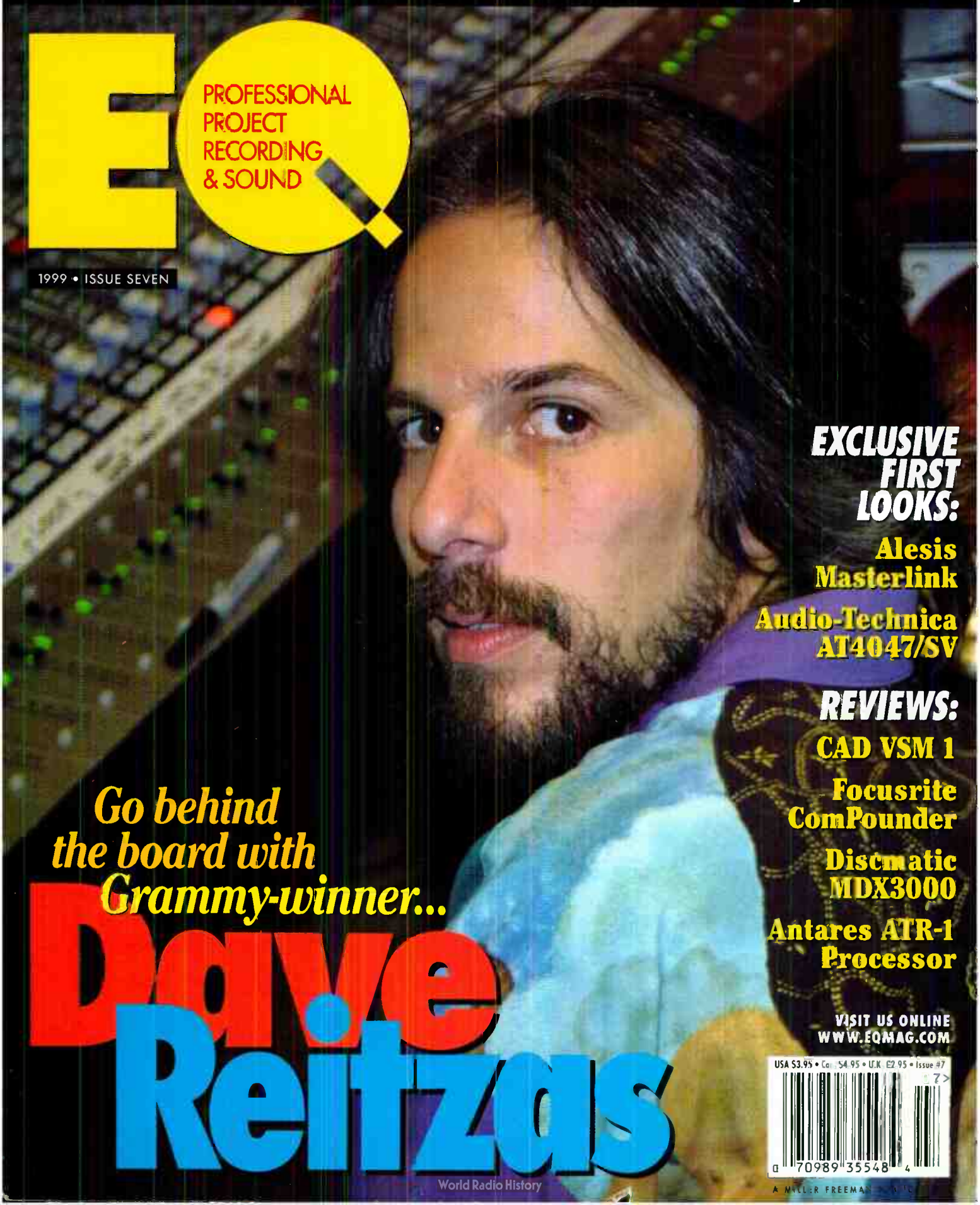
EQ

PROFESSIONAL PROJECT RECORDING & SOUND

1999 • ISSUE SEVEN



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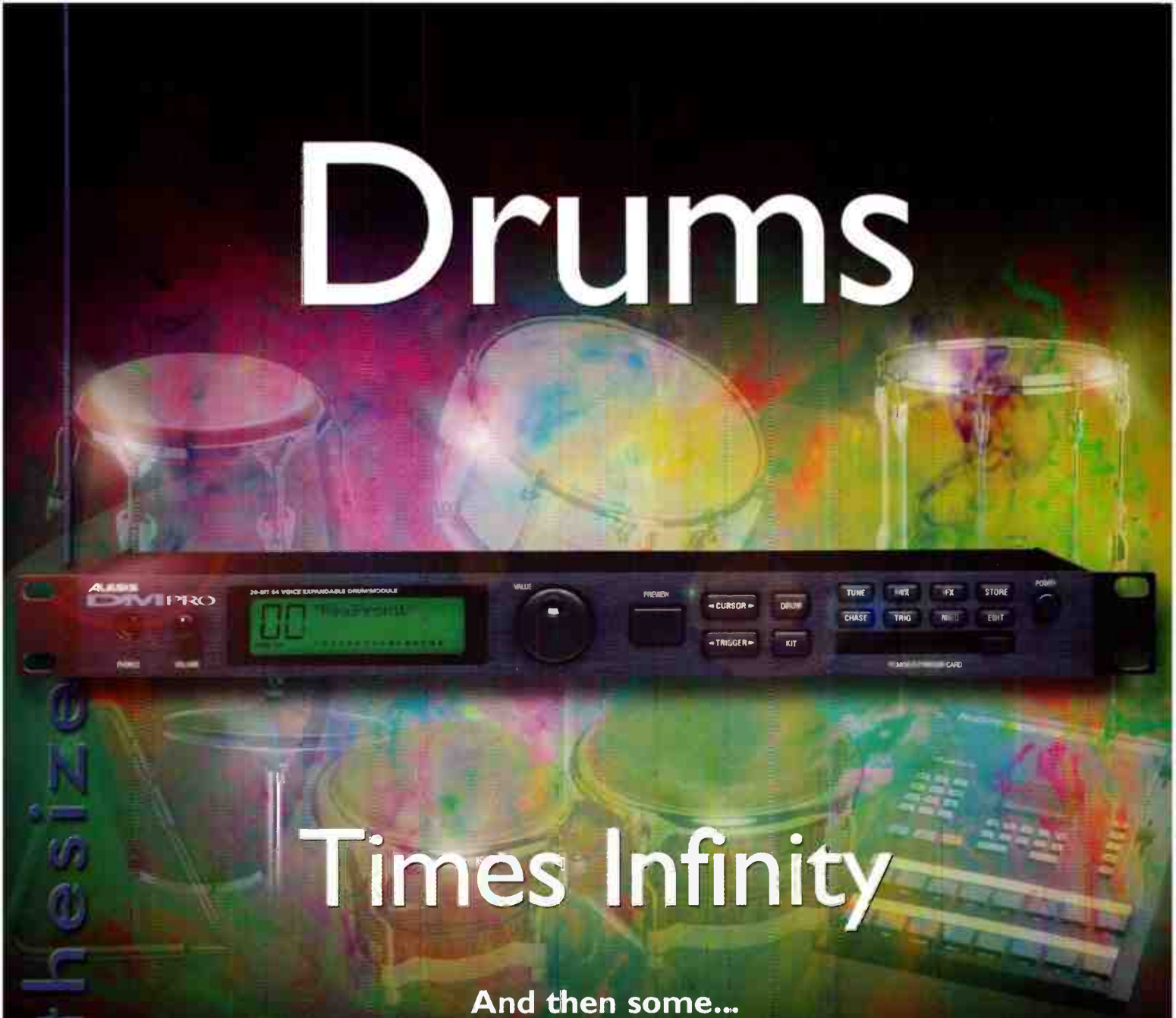

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World Radio History

EQ
PROFESSIONAL PROJECT RECORDING & SOUND
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JULY 1999

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ON THE COVER:
Dave Reitzas in his project studio. Photo by Mr. Bonzai.

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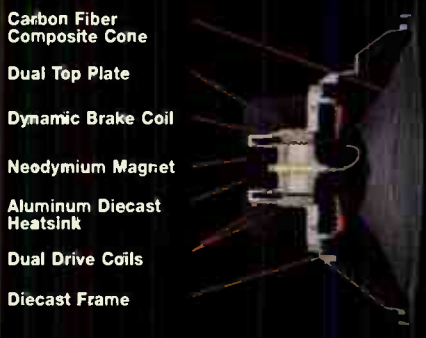

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Vote *Damnit!*

The nominations are in — now it's your turn

OK Generation *EQ*, get ready for your close-up. Now that project recording has democratized the music production process, the public is starting to cast its attention to those of us who, traditionally, have stayed behind the scenes while our colleagues and customers have basked in the glory of hit records, mega-tours, and celebrity status. What we do for a living and how we do it is suddenly gaining increased exposure in the media. From the daily newspapers that are covering project studios in both their arts and business pages, to the music cable channels and Internet sites, more than ever, consoles, tape machines, mics, and those of us who actually know how to work them are finding ourselves in the spotlight.

It should have happened long ago. But, then again, the attention that recording technology is getting in the mass market is both a product of the fact that there are more studios than ever scattered throughout the land and that the public is more interested than ever in the nuts and bolts of creating those productions that they know and love. Hey, George Martin just went on the talk circuit. Behind the scenes documentaries are the rage everywhere from HBO to VH1. More than ever, producers are taking cameras and camcorders into the studio along with their signal-processing rigs to capture their sessions for posterity. And, with the advent of DVD (both -Video and -Audio), producer's cuts and director's interviews are the preferred added value that are being marketed as the new format's primary selling points.

It's a good (make that great) time to be in production. And those of you who are slaving away with your fingers crazy-glued to the faders and your ears throbbing from one-too-many hours in front of the nearfields are finally about to get the recognition that is long overdue.

Which is why we at *EQ* have finally decided (it's about time, huh?) to officially celebrate the most important phenomenon in the contemporary audio scene — the project studio. Frankly, we're surprised that nobody else has done it already. Then again, as the magazine that defined the project studio trend ten years ago, it falls upon our shoulders (and yours) to honor those project studio owners who are equalizing (as in EQ) the way that music is being recorded for albums, videos, games, multimedia, and film.

The editors of *EQ* are proud to present the nominations for the First Annual Project Studio of the Year Award in this issue (see page 50). The nomination form will run again next month (if you need time to think things over). But if you simply can't wait to submit your votes, you can visit our Web site (www.eqmag.com) and zap your choices to our e-mail address at the speed of bytes.

One year ago, we demanded that the old guard of award presenters stand up and recognize that the project studio deserved its due, but our admonitions fell on deaf ears (so much for old age). It's time for Generation *EQ* to stand up and take its close-up. And the editors of *EQ* encourage you to cast your votes and help us put today's project recordist at the forefront of our exciting profession.

So go ahead and vote — damnit!

— Martin Porter, Executive Editor

World Radio History

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MR. RODGERS'S NEIGHBORHOOD

Congratulations to *EQ* and to Nile Rodgers for the interview with the latter (June '99). Many exchanges with artists and producers capture aspects of the creative process, but rarely is this done with such open and essential joy.

Currently, there is much awareness of the stultifying effects of record label signing policies and the narrow, choking nature of radio playlists. Yet, rather than bemoan and rail, Mr. Rodgers evinces an undaunted good spirit and the energy to seek innovative ways to get music to listeners. His positive perspective on the business, combined with his undiminished belief in the transformative power of music itself, were indeed refreshing.

Thanks to you both.

David Flitner
Methuen, MA

GO WITH THE FLOW

Regarding the answer given by Mike Sokol to a question about XLR gender and snake handling in the May '99 issue, he suggests you remember, "the XLR pins always point in the direction of signal flow." We in the broadcast industry have a saying that has been handed down for generations to help remember which plug end goes where. It is particularly handy with remote broadcasts, concerts, or recording. It is simply this: "f**k the truck." It's easy to remember, and it rhymes!

Tony Giverin
via Internet

WAXING NOSTALGIC

Regarding the May issue's Maintenance column, I want to make a small correction: The main reason to pot components in wax was to keep them in place. There was not a huge production of precision resistive elements in those years ('30s to '50s), and the most common was to use a certain length of resistive wire that was then rolled and soldered in place. The wax, which usually is the same used for sealing letters, was then applied to hold those pieces of wires. And if you open a Daven attenuator, as an example, or a old multimeter, or any of those old equipment that needed precision resistors, you will find the same techniques of construction and wax.

I even built a multimeter in the '50s using these techniques: making resistors using resistive wire that was covered with silk, rolling those lengths of wire on the finger, making a bunch of precision resistors, wiring them in the circuit, soldering and testing, and finally applying wax liberally. I used the same techniques to make precision filters, usually bandpass, to measure distortion. I remember losing my meter about 10 years ago, but it was still working and, with the wax, if you had a broken wire, you had to find the reason. The wax used is phenomenally stable — some exist for centuries. I hope this may be of some help, and if you have to remove the wax, the best help will be found in a museum or the like.

Philippe Trolliet
via Internet

OPEN (MINDED) FOR BUSINESS

I am a reader of *EQ* magazine, as well as a touring engineer and system tech with a local production house. My experience includes Gladys Knight, Duncan Sheik, and the Bacon Brothers, among others. Coming from both sides of the soundboard, I am always willing to teach and be taught, but this does not seem to be the case with many engineers. What I am leading up to is a situation I was recently in.

My roll on this occasion was system engineer for a local production company, providing sound reinforcement for a national act (which will remain nameless to protect the guilty). As I mentioned before, I have been in the "visiting engineer" seat before, and always go in with an open mind. This time, the visitor had an attitude from the moment that they stepped into the venue. I understand that coming into a 1500-seat venue after being in an arena only a few years ago has an effect on the ego, but that is the way things go. This particular engineer had a few choice words about the rig we had brought in for this show, and commented [to me], "If [you] think this gear is good, [then you] will always be a club guy while [I am] in demand for national tours." He had no idea of my resume, or my abilities. I didn't want to get into a battle of experience, so I just let that slide. I figured he could do whatever he wants, and the day will be over soon enough. That's when it went to the next level.

I know we all dream of having the best of everything, including the newest gear and name brands. In this case, it wasn't in the budget. We had a Yamaha 3k in the house and a Ramsa 840 on the stage. Outboard gear was the usual Yamaha 900's and 990's and TC 2290 delay. After all the abuse I had taken from this engineer, I was shocked to have him ask how to use a few of these items. I smiled and went through the paces, knowing that all along he had just lost some credit in my eyes. The show went on with little or no troubles, but could have been a much better situation from start to finish.

Maybe it was how I have been taught in the industry. Take *EQ*'s own Steve La Cerra. I have been fortunate to work with him at various BÖC shows. He respects my knowledge of a system, and can trust my input on the pros and cons of a room or situation. He also brings new information or ideas to every show. I can say my mixing skills have grown with the help of engineers such as Steve. I have tried to carry this respect into my touring career.

I just hope that everyone may remember to be open minded. Sometimes the local tech that you abuse may be the next big national tour engineer.

Tim Shapiro
via Internet

THIS BUD'S FOR US

I'd like to say how much I enjoyed this issue. I've been in the music business a long time (42 yrs.), and I recently became involved with a very exciting project. This project includes members of Allman Brothers Band, A.R.U., Blues Traveler, and Derek Trucks Band. It's a collection of 14 songs recorded live over 7 nights — most of it recorded at the Wetlands in NYC. I'm in the process of mixing the first song, and I become informed that it may be released on the 'Net! The first thought I have is, "How or what do I have to do to be sure the tunes don't get lost in the translation?" *Bam!* Somehow I get the April issue of *EQ* and I read an article by The FezGuys about how project studios should provide their clients with Red Book CDs and WAV files. And, once again, I hear a voice inside my head say, "So learn and grow or die!" It looks like I'll be reading *EQ* a lot. Oh yeah, I left the mag on the tour bus, so now I've got to go buy another copy — but it's worth it.

Bud Snyder
via Internet

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he versatility and ease use of the O2R has oven to be a great l for me. It has gone m being something scinating in its depth being irreplaceable. It akes me better. That's you can ask of any ece of gear."

– Gary Chapman

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– Rob Arbittier

"As you can see, I know just enough to be dangerous, and not enough to not need everybody else around me. So, I'm enjoying the freedom, the power that I get from something as user-friendly as the O2R."

– Clint Black

"I love it! It's fat, punchy, warm, deep, airy, transparent... all those things you want a console to be. Then, there's the absolute total recall. Amazing!"

– Mark Hammond

"I've had it with huge, heavy consoles. My pair of O2Rs are not only portable, they give me 48 tape tracks and complete recall of all my settings and effects for each song."

– Alan Parsons

"I traded my $250,000 analog console for O2Rs which should tell you what I think of them."

– Hans Zimmer

STILL MORE O2R PRAISE FROM THE PROS.

Despite all the new competition, O2R is still the digital mixing choice of major artists and producers.

"The O2R has become an invaluable tool for creating music. The fact that I can recall works in progress saves an enormous amount of time."

– Michael Omartian

"Using the total recall on the O2R has allowed us to save incredible amounts of time while working on this record. We literally have started mixing since day one."

– Michael W. Smith

"I find that the automix, scene memory, and digital format conversion features are now indispensible to fast, repeatable creative sessions and mixes."

– Tim Myer

"The Yamaha O2R is the ideal console for amateur or professional boutique studios."

– Christopher Cross

"We did not just look at the bells and whistles. The Yamaha O2R sounds great. It has tons of headroom, is extremely reliable, and is comparable to consoles many times its price."

– Marco Pulcini

"I have one word. AWESOME!"

– Tommy Sims

YAMAHA

For more information, visit www.yamaha.com/proaudio or call (800)937-7171 ext. 633 for literature.
1998, Yamaha Corporation of America, Pro Audio Department, P.O. Box 6600, Buena Park, CA 90622-6600

CIRCLE 60 ON FREE INFO CARD

World Radio History

SHOCKING QUESTION

Q *I have a question that has bothered me for some time. I am referring to the old "electric shock when touching two pieces of equipment" thing. I am a guitar player who has had his lips buzzed many times when working close to the mic, and I have seen some rather large guys get knocked for a loop by this. I know how dangerous it can be, but I really don't have a clue as to how to properly deal with it.*

Three questions:

1. What is the cause?

2. Can it be prevented?

3. When it happens, what can be done to neutralize it?

Tom Haas
A/V Coordinator
Pappert School of Music
Duquesne University
Pittsburgh, PA

A In ye olde daze, guitar amps came with a two-pronged AC plug and a Ground switch (on the rear panel) to tie one of the "prongs" to chassis (ground) via a capacitor. At the time, the prongs were not "keyed," so you could plug in any old way. This led to the random "hot" chassis, which could knock any human being — no matter how macho — right on their keister, assuming that person was grounded (by the lips, for example).

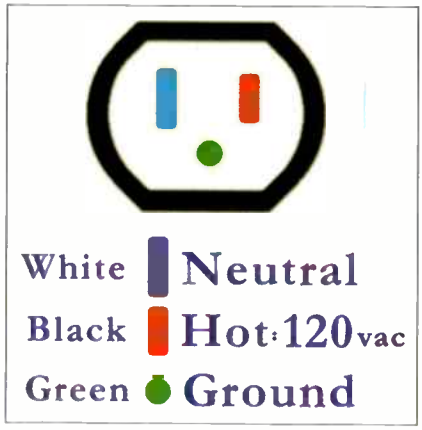
Modern 120-volt AC receptacles are "keyed." The wider slot is Neutral, which is at near-ground potential. The narrow slot is Hot, and the round hole provides Ground. Rewire all vintage amps with a three-pronged plug, while disabling the "ground" switch.

On fig. 1, a "human" color-code was chosen (by me) to indicate ground (the green Earth), Neutral (the cool blue), and Hot (as in red). In reality, the wiring to the outlet is white, green, and black, respectively.

Eddie Ciletti
Contributing Editor
EQ magazine

EAT IT!

Q *One of the guys in our group gets way too much feedback on his vocal mic and never enough volume in his monitor. We have our soundman (somewhat of a novice, but learning) use an EQ set at unity gain with a flat response. This way he can search for offending frequencies (2k and 5k with some shift as the room temperature and humidity changes) when feedback happens. Our singer insists on moving his mouth so far away from the mic at times that I don't think he will ever get enough gain. Then he asks the soundguy to turn him up, and the result is feedback.*



SHOCKING QUESTION: FIGURE 1

I understand that moving away and coming closer at different pressures makes a huge difference. That is kind of twofold in our situation: [1] We are compressing at about 8:1 on the front end; [2] no compression in the monitor. The singer says he needs to move so far away so he doesn't peg the meter and get pops in the mic. Although, that is just in the monitor, not in the front-of-house system. After a year of telling him he needs to suck up to the mic in order to get anything out of it without feedback, he told me he thinks I'm very wrong about sucking up to the mic. He says that because of tone and dynamics, he refuses to do it. He gets very mad that his monitor can't be as loud as the others. We have four people on stage, each with their own monitor. We are playing loud rock. Sometimes the stage volume gets rather loud and he can't hear, but the rest of us can hear ourselves fine! I may be way off base, too, but I'm going on past experience. I know it will work, but I need to find some documentation to support this so it is not just my word. Do you know of any sites that may offer some info on this, and maybe your thoughts as well?

Paul
via Internet

A I think you need a copy of my book, which is available on my Web site (www.soundav.com). Even though the title is *The Acoustic Musician's Guide*, it covers all live sound reinforcement and recording.

You basically are correct. Your singer needs to "eat the mic" as much as possible. You can't rewrite the laws of physics in your own little universe, so there's only so much gain you can get before the system becomes unstable. That's why professional sound reinforcement systems use a lot of extra gear such as 1/3-octave EQs on each monitor channel, hypercardioid microphones, and notch filters (such as the Sabine) to get as much gain as possible.

I've occasionally had singers who sang softly and who wouldn't eat the mic, yet they demanded really loud monitors. It can be done, but at great expense and set-up time. Maybe what he needs to understand is proper mic dynamics. Contrary to intuition, when the singer gets soft, he needs to get close to the mic, while when he shouts he needs to back away from the mic so as not to overload things. This helps even out the dynamics (and, contrary to what he may think, there really is very little dynamic range in a rock mix — hence all the limiters and such). It's an acquired talent, but not hard to pick up. In addition, a good performance mic can take the SPLs and breath pops in stride. A Shure Beta, classic SM58, or similar mics will take it all and ask for more.

Mike Sokol
JMS Productions Inc.
www.soundav.com

STUMPIFIED

Q *A recent rainy Monday afternoon found me armed with pen, paper, calculator, and curiosity, computing my way to the realization that I am far less conversant on some basic technical matters than I'd commonly care to admit. I stumped myself on the following issues; perhaps you help me clarify them:*

1. Regarding the theoretical 6-dB increase in dynamic range per added bit of resolution — is this increase measured in dBV, dBu, dB SPL, or am I missing the point entirely?

2. How many volts affect an increase of 1 dB from the reference 0 dB in both dBu and dBV scales? Is this increase linear, logarithmic, or something else?

3. How many dB SPL at the mic element affect a change of one volt or dBV/u? Does it depend on the sensitivity of the mic? What is the relation between dB SPL and electrical decibel levels?

Hermie Wolf
via Internet

World Radio History

Looking for the lowest price?

Fact is, if you purchase your gear from one of the major retailers, you're going to get a great, low price. The big stores all carry the top brands, receive volume discounts from the manufacturers, and then "price-shop" each other to make sure they're not undersold.

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CIRCLE 51 ON FREE INFO CARD

World Radio History

CIRCLE 34 ON FREE INFO CARD

A The nature of the decibel is often misunderstood, as it can be used to compare the logarithmic difference between any two like values — be they output voltages from two CD players or the thrust of two Saturn rockets. All decibel values relate to a logarithmic change, which is a better match to our perception of sound levels than the linear changes expressed in volts or watts.

Depending on the form of your measurement, that 6-dB change in dynamic range could be measured in any of the values you have noted: dBV (decibels relative to 1 volt); dBu (decibels relative to 0.775 volts); or dB SPL (decibels of sound pressure level relative to the threshold of hearing, 20 microPascals). The first two forms (dBV and dBu) are voltage measurements, while the dB SPL is an acoustical measurement of the change in air pressure.

The difference between dBu and dBV is the 0-dB reference value. A measurement reading of 0 dBu is relative to 0.775 volts, while the dBV measurement is relative to 1 volt (a voltage difference of 2.21 dB). Technically, neither is a true level reading, as sound level is a quantity of power. A third reference called dBm provides information about the relative power, as it refers to 1 milliwatt (mW) of power (which equals 0.775 volts into a 600-ohm load). Ultimately, the change we hear will be a change in power (work done by a loudspeaker or headphone), and this is why level changes are regarded as power differences. The formula for dBu is: dBu=20 log (voltage/0.775), while the formula for dBm is: dBm=10 log (power/0.001 Watts). If we use a power amplifier as an example, increasing the input voltage by 6 dB (such as 0.775 volts rising to 1.55 volts) would result in an output level change of 6 dB (such as the output power rising from 100 watts to 400 watts).

The voltage output from a microphone is equivalent to the dB SPL change in pressure (omni mic) at the capsule. The microphone will sound distorted if this relationship is not maintained. A microphone output producing a 1-volt output is likely to be very close to an extremely loud sound source. A microphone with an (open circuit) sensitivity of 2.8 mV per Pascal (94 dB SPL) would produce approximately a 1-volt output if the sound source produced 145 dB SPL at the microphone capsule. A 51-dB change in SPL at the microphone capsule should result in a 51-dB change in voltage at the output terminals of the microphone. You must calculate the SPL required to produce a 1-volt output based on the sensitivity of your microphone.

The "Useful Calculators" link on the MC Squared Web site (www.mcsquared.com) provides a number of decibel calculators that can be used for exploring the relationship between different voltages, wattages, and sound pressure levels. You can also calculate the results of combining two decibel values or determine resistor values for building resistive pads. All without having to memorize any mathematical formulas.

Wade McGregor
Contributing Editor
EQ Magazine

THE GREAT DEBATE

Q *This issue is coming to a head between my boss and me: I believe in playing stereo sources at large events in my hotel in stereo. That is, with the left and right "pans" panned accordingly. My boss says flat out:* mono.

His reasoning is that if you run everything mono, then everyone in the room will hear everything the same. My argument is that [since] humans have two ears, stereo presentation of stereo material is more realistic. *I even offered less than full pan, maybe, pan half way left and right. No compromise!*

So, what's your opinion regarding live PA for meetings and music: stereo or mono?

Chris Kozicki
via Internet

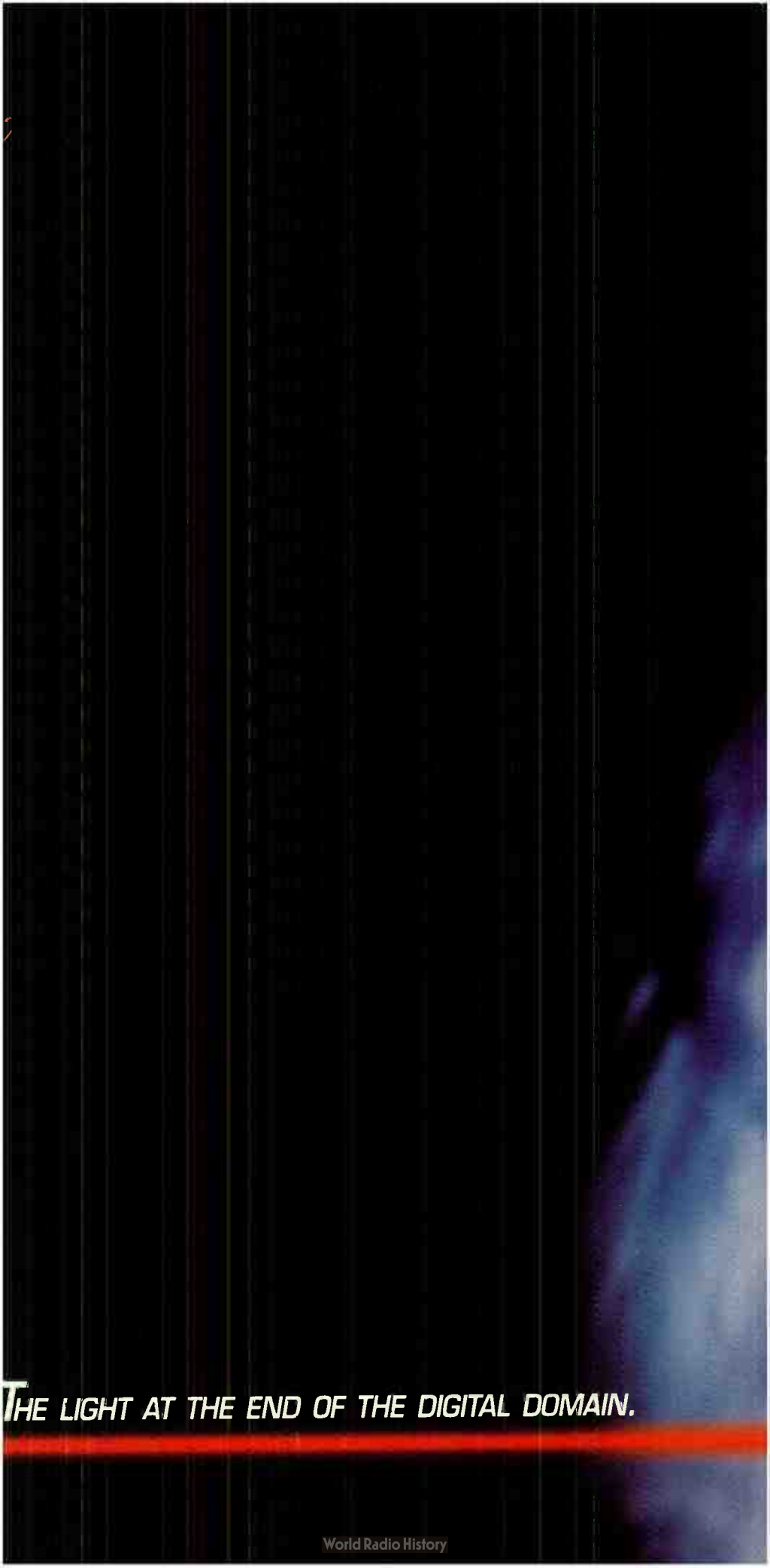
A What your boss says is true; you really want the whole audience to get a decently balanced mix, not just those sitting in the "sweet spot." Your point, though, is also true: mono mixes sound bland and our brain likes the diversity of having different things coming into each ear. Here's what I do for corporate events: mostly mono with stereo effects.

I'll mix a corporate show in mono, sometimes with the pan pots no further than the 11:00 and 1:00 o'clock positions, for just a tiny bit of stereo spread. Then I'll put in a good plate-reverb patch, which I'll pan hard left and right. This gives me a nice, rich soundfield, yet satisfies the need for listeners sitting next to one sound bank or the other to hear the full mix.

I'm going to foresee your follow-up question with this answer. My favorite reverbs are the TC Electronic M3000, my classic Yamaha Rev 7, and, of course, you can't go wrong with a Lexicon.

Mike Sokol
JMS Productions
Hagerstown, MD

World Radio History



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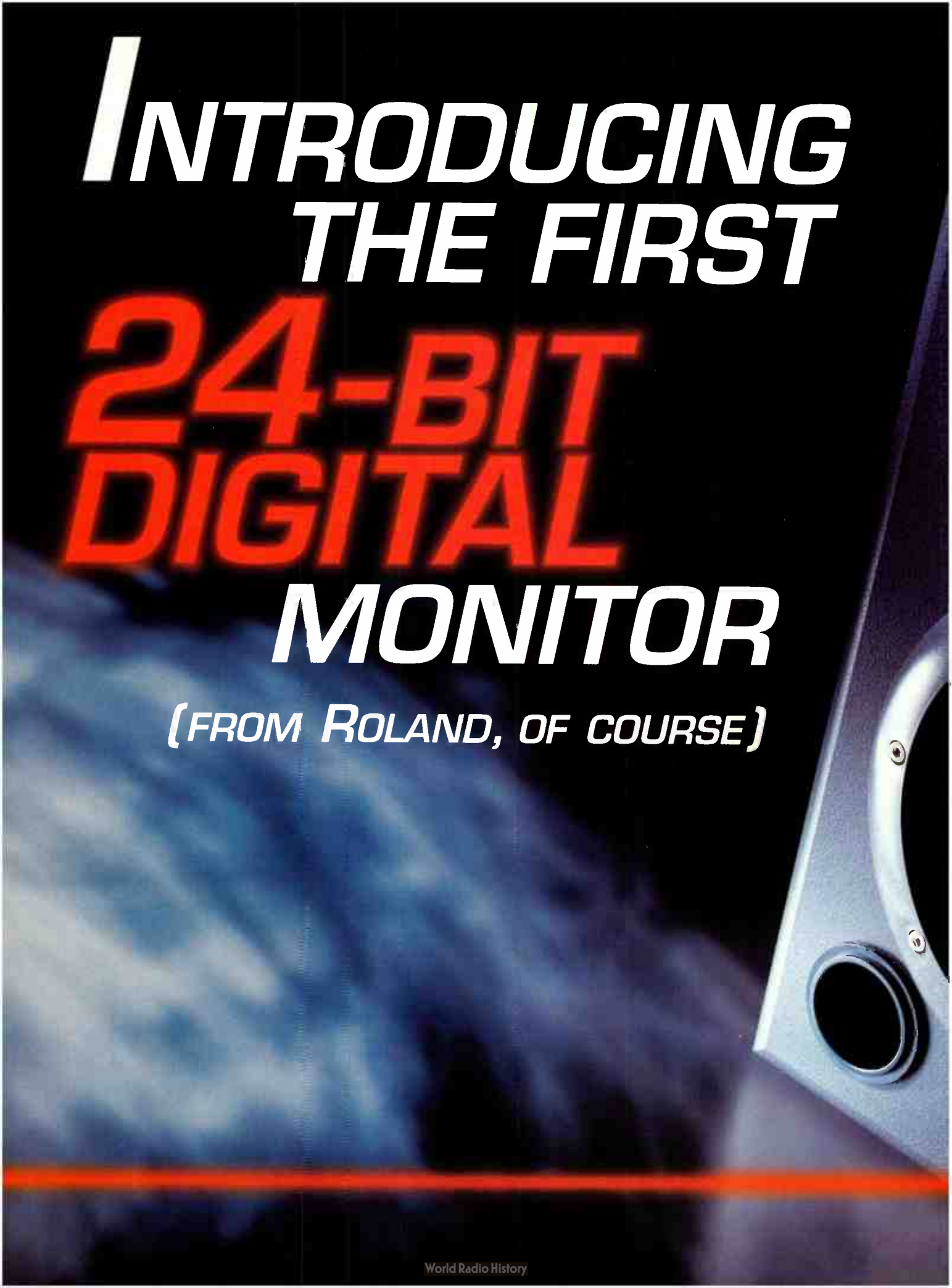

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CIRCLE 58 ON FREE INFO CARD

World Radio History

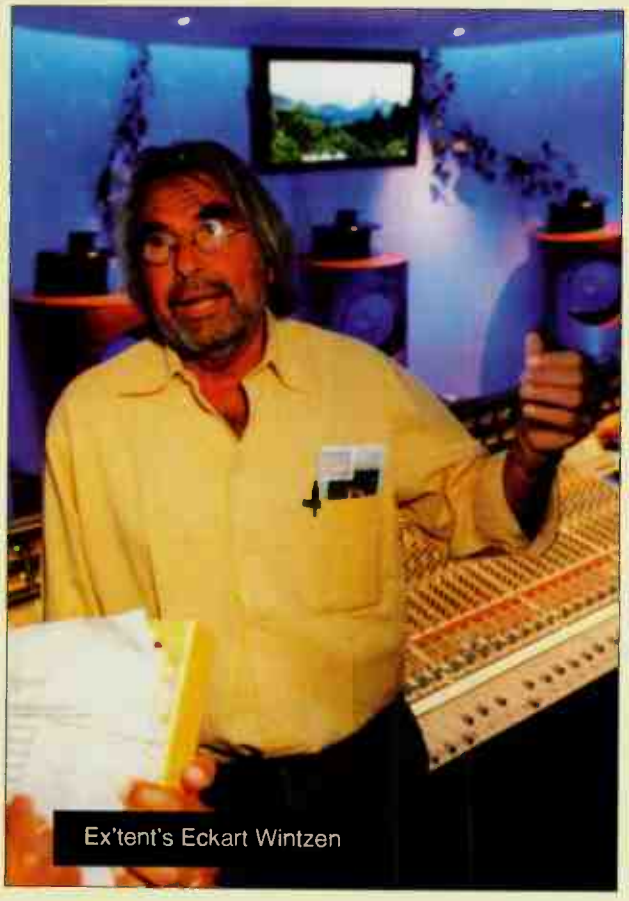
EQ NEWS
JULY • 1999

The Plant Joins Ex'pression

Investment joins The Plant and Ex'pression, expanding the capabilities of both and working for the future of digital sound

The Ex'pression Center for New Media has joined with legendary recording studio The Plant. The union occurred as a result of international investment firm Ex'tent's investment to acquire a substantial ownership in The Plant. Eckart Wintzen, who heads Ex'tent and who is already the principle investor in Ex'pression, believes the deal will be mutually beneficial to both companies. "Ex'pression and The Plant can help each other extend the frontiers of the entertainment business," he states, "leading the way in making people comfortable using digital media."

In investing in The Plant, Eckhart is investing in The Plant's owner, A&R Music, owned and run by Arne Frager, which also owns A&R Management and the PopMafia record label. This provides extraordinary opportunities for the students at Ex'pression, which teaches digital visual media and sound arts. Their 14-month curriculum is designed to prepare students for careers in sound studios, behind special effects computers, and in a variety of multimedia positions in the sound, video, Internet, and entertainment industries. With the addition of the studios at The Plant, students of Ex'pression will have the opportunity to work in studios where commercial recordings are being made. Peter Laanen, CEO of Ex'pression, explains, "The thing is for our students to go to a place where it really happens. This will happen in a variety of ways. Through The Plant, our students will be involved; they are working with real talent and are guided by professional producers."



Ex'tent's Eckart Wintzen

Concurrently, The Plant will benefit from the constant flow of trained candidates for internships and employment from Ex'pression, and PopMafia will be able to send its talent to Ex'pression to gain recording experience and produce demo tracks without having to compete for studio time.

The Plant has been the recording home to artists such as Fleetwood Mac, Santana, Crosby, Stills, Nash, and Young, Van Morrison, Aretha Franklin, and Primus among others. Since November of 1998, The Plant has been undergoing an expansion with the design and development of a 5.1 surround sound mixing studio, called "The Garden." This new mixing room has been designed for either digital or analog mixing projects, in any format, stereo or 6-channel Surround, 48-track, 96-track, or more. Recently inaugurated by Primus, who mixed a new album for Interscope Records, The Garden's most current project is a new album mixed by Third Eye Blind. Among the additional planned expansions at The Plant is a mastering studio due to open this fall in the recently acquired 2,000-square-foot space in its Sausalito building.

In addition to Ex'pression and A&R Music, Ex'tent has invested in Silent Planet, the Internet and digital entertainment design company. Eckart Wintzen's interests, however, lie beyond the investments, into what the media can show the public. "This is all about the business of having fun using new media," Wintzen explains.

What does Wintzen have up his sleeve for the future? Being in California, according to Wintzen, he is likely to grow the business. "We at Ex'tent believe in the organic, natural growth of our activities. Now, having the kernel of our activities in California, it certainly can happen that more opportunities will arise." The Dutch entrepreneur may have major expansions planned, but only time will tell.

Have You Voted for the Best Recordings Yet?

If you are looking to have your opinion represented in this magazine, time is running out. Visit www.eqmag.com and vote for your ten favorite recordings of all time. Then keep an eye out for our fall AES issue, where we will present the 100 Best Recordings of All Time.

If your favorite albums aren't represented and you didn't vote, you have no one to blame but yourself. So log on and make your voice heard.

World Radio History

EQ Business Wire: Who's Doing What

GREG MACKIE STEPS DOWN AS CEO OF MACKIE DESIGNS

Greg Mackie recently stepped down as CEO of Mackie Design, passing the job onto Roy Wemyss, Mackie's COO since late 1996. According to Mackie Digital, two factors led up to Greg Mackie passing on the CEO baton. First, new product introductions and the acquisition of RCF have doubled revenues since Mackie went public in 1995. The administrative demands of the resulting growth were increasingly pulling Greg away from the two things he enjoys most: listening to pro audio users and developing products.

Greg Mackie

Another factor leading to Greg's departure as CEO is that the accomplishments of the management team in the last three years have given Greg confidence that manufacturing, finance, marketing, and engineering will be well-tended while he concentrates on his product development passions. Further, Greg was encouraged by the excitement over new Mackie products at winter NAMM and NSCA. The positive reaction made it clear to Greg that the Mackie "machine" was well-oiled and ready for him to get to work in bringing even more product visions to market.

In other Mackie news, the company has announced an exclusive agreement with Antares Audio Technologies for the development of Auto-Tune real-time pitch correction software for the Mackie Digital 8-Bus console. Auto-Tune is a fully automatable software plug-in that provides the ability to correct the pitch of a voice or solo instrument, without distortion or artifacts, while preserving all of the expressive nuance of the original performance.

For more information, contact Mackie at 425-487-4333 and visit their Web site at www.mackie.com

EVEANNA MANLEY ACQUIRES MANLEY LABORATORIES, INC.

EveAnna Manley has officially taken over the duties of president, CEO, and sole owner of Manley Laboratories, Inc., following the resignation of David Manley and an agreement signed on June 10, 1999 in which he assigned his total shares in the company to her. Founded in 1993 by David and EveAnna Manley, Manley Laboratories, Inc. manufactures vacuum tube high-fidelity and professional studio products under the Manley and Langevin brand names. Since David's departure in 1996, EveAnna Manley has been de facto operating CEO of Manley Laboratories, Inc.

For further details, contact Manley Laboratories at 909-627-4256 and visit their Web site at www.manleylabs.com.

107th AES Convention Preview

The upcoming 107th AES Convention, to be held Sept. 24–27 at the Jacob K. Javits Center in New York City, will combine 18 workshops, the presentation of over 100 industry papers, and several convention technical tours, to ensure that the theme of this year's show, "advancing the art of sound," is accomplished.

Its mission as "Advancing the Art of Sound: Leading the World of Audio into the 21st Century," the convention will incorporate this theme through its workshops and technical papers. Workshop categories include Recording, Live Sound, Broadcast/Video Post Production Audio, Acoustics & Audio for Fixed Installations, and Audio Trends at the Turn of the Century. Various titles within these five categories will run throughout the Convention.

The 107th AES Convention Committee

With over 100 technical papers to be presented on industry issues, technologies, and techniques, the four days of the Convention will include 17 paper sessions. Among the sessions will be Room Acoustics, Multichannel Audio Synthesis, Reproduction and Control, Microphones and Microphone Techniques, Computing and Computing Hardware in Audio, Digital Signal Processing, and the Internet.

Among the tours you can expect to see running during the Convention are The Metropolitan Museum of Art, Musical Instrument Collection, The Steinway Piano Factory, and The Riverside Church: The World's Largest Carillon. Tours of the Hit Factory Studios, Sony Studios, and Sear Studios will also run, in addition to behind the scenes tours of Carnegie Hall, Lincoln Center's Avery Fisher Hall, and the broadcast control centers of NBC and CBS.

For more information, contact AES at 800-541-7299 and visit their Web site at www.aes.org.

Flying Faders Now Available From its Designer

Martinsound now offers worldwide sales and service for Flying Faders™, a leading moving fader automation system they created in 1988. Martinsound will now engineer and build systems for any console, since their exclusive marketing agreement with AMS/Neve came to an end on June 14, 1999. AMS/Neve, however, will continue to support their Flying Fader customers.

Joe Martinson, president of Martinsound, explains, "Flying Faders was developed with our breakthrough 'Just Mix' philosophy. It allows [users] to mix without the normal hassles of automation." In addition to providing Flying Faders sales and support, Martinsound will be adding services. Martinson continues, "We are adding the 'Power User' Seminar to compliment our well-received Flying Faders Technical Class. The Flying Faders Users' Group offers instant technical information and access to the system's original creators via the Internet."

For further details, e-mail info@martinsound.com and visit their

World Radio History

Take a Walk on ACIDplanet.com

Sonic Foundry recently launched ACIDplanet.com, a Web site for ACID music creation software users to self-publish music online as well as share their compositions with the worldwide Internet community. Musicians use ACIDplanet.com to publish their material using Microsoft's new audio codec (MS Audio). ACIDplanet.com also incorporates ITVnet's AudioManager, a system that automates the process of publishing and distributing music on the Internet.

Through this Web site, ACID users gain access to a comprehensive online music studio, equipped with tools, publishing services for many of today's popular audio formats, and a listening lounge for musicians to share their music. Users can also take advantage of ACIDplanet.com to chat with other musicians online, rate and review the music of their peers, access online sales and promotional items, and link with third-party Web sites.

ACID also allows users to add their own instruments or vocals to their music creations by simply plugging into their PC's sound card. The professional tool set includes support for multiple real-time effects with DirectX plug-ins, and also provides easy access to Sonic Foundry's Sound Forge audio editor.

For more information, check out this new Web site at www.ACIDplanet.com.

Fostex and NTM, Inc. Join Forces

Fostex Corporation of America and online music distribution company NewTechMusic, Inc. have a new joint marketing venture under which all appropriate Fostex digital recording products will now include direct access to a set of software engines that will allow users to create digital music files in MP3 and Real-Audio streaming formats that can then be uploaded for sale on both the NTM (www.newtechmusic.com) and affiliated music showcase Web sites.

NTM's proprietary NewTechMusic Smartpages software will now be bundled with Fostex systems, allowing artists to easily create Web pages on the NTM site to promote and sell their recordings. NewTechMusic Smartpages software is designed to enable even the least Web-savvy musicians to easily and quickly create, upload, and update individual Web pages. Artist Web pages are hosted free of charge on NTM's site and NTM will track all sales by Fostex users and pay them on a 50-50 basis for all CD sales, while sales of individual songs downloaded via MP3 will be paid at twice the statutory rate for singles.

Aris Technologies and Soloan Technology Development Corporation Announce Merger

ARIS Technologies, Inc. and Solana Technology Development Corporation, developers of Musicode and Electronic DNA, recently announced their intentions for a merger. Expectations for the combination of the two companies, their technologies, products, and intellectual property portfolios, include the rapid introduction of audio watermarking technologies and related business information systems for the entertainment, broadcast, and online industries.

At a recent SDMI meeting, the 4C Entity, an industry group composed of IBM, Intel, Matsushita Electric, and Toshiba, announced that ARIS and Solana's systems for watermarking were the two systems to best meet their requirements. Working with the five major record companies on developing copyright protection architectures for new digital media formats and distribution systems, the 4C Entity developed a content protection framework for DVD-Audio. Members of the SDMI are in the development process for frameworks for the Internet and other digital music distribution systems.

President of Solana Technology Development Robert Warren and president of Aris Technologies David Leibowitz will serve as co-CEOs of the company.

For any additional information on this merger, contact Aris Technologies at 617-864-9800 and visit their Web site at www.aristech.com.

Amazon.com Helps Unsigned Artists Get Sales, Exposure

Amazon.com, Inc.'s new Advantage program for music works with independent artists, bands, and labels to secure widespread distribution of their CDs. The Advantage program for music allows independent artists, bands, and labels to sell their CDs to Amazon.com's 4.5 million customers worldwide. The artists enjoying the benefits of Amazon.com's Advantage receive the same level of exposure on the Amazon.com Web site as major artists and labels. In this way, Amazon.com's Advantage program changes the rules for success in the music industry.

For unsigned artists or those on independent labels, Advantage resolves the traditional problem of getting their CDs into stores so that fans can purchase them. Vice president of merchandising for Amazon.com Mary Morouse explains, "In order to match the power of Amazon.com's global distribution, independent artists, bands, and labels would have to get their CDs into an estimated 100,000 retail stores worldwide. With music Advantage, these CDs will be only a few clicks away from 4.5 million Amazon.com customers worldwide."

For more information on Amazon.com's Advantage program or to join, visit www.amazon.com/advantage.

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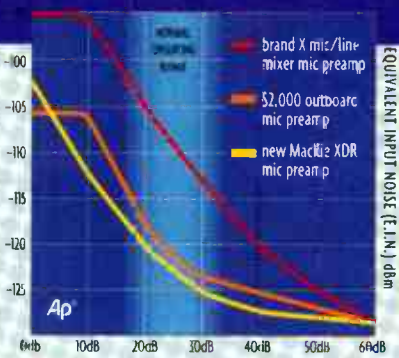

A new standard for low noise in the critical +20 to +30dB operating range.

If money is no object, don't read any farther.

If you can afford $1000 a channel for outboard "audiophile" mic preamplifiers, DO IT! Because no matter how much you spend on a microphone, its ultimate performance depends on how it interacts with the preamp it's plugged into.

Yes. We openly admit it: Many high-end mic preamps can effortlessly amplify the slightest sonic nuance, creating an aural panorama that's breathtakingly realistic, excitingly vivid and truly 3-dimensional in scope. For years, they've provided fidelity that just hasn't been possible with the "stock" mic preamps built into mixing consoles.

Until now.

A massive R&D initiative.

We can confidently say that no other company in the world has spent the sheer number of engineering hours —and $250,000 in R&D costs that we just did on a single new microphone preamplifier design.

The XDR team started with blank paper, concerned only with matching or exceeding the performance of $500 to $2000-per-channel esoteric preamps. They went through hundreds of iterations and revs and spent countless hours subjectively listening (and arguing). They started all over again several times. They scoured the world for rare parts. Then they spent more time critically listening and evaluating the

NEW!

1604-VLZ PRO

16x4x2 · 16 XDR™ preamps

60mm faders • 16 mono chs. • 4 sub buses + main L/R • 3-band EQ with sweepable midrange (12kHz & 80Hz shelving, 100Hz-8kHz mid) • 18dB/oct.@ 75Hz low cut • 6 aux sends per ch. • Constant Loudness pan controls • 4 stereo aux returns • RCA tape inputs & outputs • 16 channel inserts, 16 high-headroom line inputs • 8 direct outs • TRS balanced outputs • Switchable AFL/PFL Solo • Ctl Room/Phones matrix with Assign to Main Mix & separate outputs • Ctl Rm/Phone level control • 12-LED metering plus Level Set LED & RUDE Solo light • Aux 1 & 2 Pre/Post • Aux Send master section w/ level controls • Solo buttons with LEDs • Stereo Aux Return assign section with EFX to Monitor & Main/Submix assign • built-in power supply • solid steel main chassis • BNC lamp socket • Rotatable I/O pod allows 5 different physical configurations

NEW!

1402-VLZ PRO

14x2x1 · 6 XDR™ preamps

60mm faders • 6 mono & 4 stereo chs. • 3-band EQ @ 12kHz, 2.5kHz & 80Hz • 18dB/oct.@ 75Hz low cut • 2 aux sends per ch. • Constant Loudness pan controls • 2 stereo aux returns • RCA tape inputs & outputs • 5 channel inserts, 6 high-headroom line inputs • XLR & TRS balanced outputs • switchable +4/mic level output • ALT 3-4 stereo bus • Switchable AFL/PFL Solo • Ctl Room/Phone matrix with Assign to Main Mix & separate outputs • Ctl Rm/Phone level control • 12-LED metering plus Level Set LED & RUDE Solo light • Aux 1 Pre/Post • EFX to Monitor • sealed rotary controls • built-in power supply • solid steel chassis

NEW!

1202-VLZ PRO

12x2x1 · 4 XDR™ preamps

4 mono & 4 stereo chs. • 3-band EQ @ 12kHz, 2.5kHz & 80Hz • 18dB/oct.@ 75Hz low cut filter • 2 aux sends per ch. • Constant Loudness pan controls • 2 stereo aux returns • RCA tape inputs & outputs • 4 channel inserts, 4 high-headroom line inputs • XLR & TRS balanced outputs • switchable +4/mic level output • ALT 3-4 stereo bus • Ctl Room/Phones matrix with Assign to Main Mix & separate outputs • Ctl Rm/Phone level control • 12-LED metering plus RUDE Solo light • Aux 1 Pre/Post • EFX to Monitor • sealed rotary controls • built-in power supply • solid steel chassis

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IVE ESOTERIC MIC PREAMP SOUND

mic preamp circuitry gives our new VLZ PRO™ Series board microphone preamplifiers.

WARM, DETAILED SOUND
0.0007% THD
NEAR DC-TO-LIGHT BANDWIDTH

OVER 130dB DYNAMIC RANGE FOR 24-BIT, 196kHz SAMPLING RATE INPUTS
ULTRA-LOW IM DISTORTION & E.I.N. AT NORMAL OPERATING LEVELS
IMPEDANCE INDEPENDENT
BEST RF REJECTION OF ANY MIXER AVAILABLE

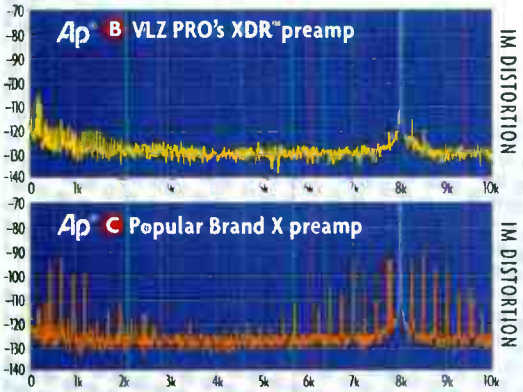
design with every high-end microphone you can think of. Then they brought in veteran recording and live sound engineers for more exhaustive listening tests.

What we ultimately ended up with is not just an awesome sounding design. XDR is also **a)** highly resistant to damage caused by "hot patching" (caused by routing a phantom powered mic through a patch bay); **b)** remarkably independent of cable-induced impedance variations; and **c)** able to reject extremely high RF levels without compromising high frequency response.

Rejecting RFI without tuning out sound quality.

Because a mic preamp must amplify faint one millivolt input signals up to a thousandfold (60dB), its rectification components can also pick up radio frequency interference (RFI) from AM and FM stations, cell phones and pager transmitters—even microwave ovens—and amplify them to audible levels.

We assaulted RFI on three fronts. First, we incorporate bifilar wound DC pulse transformers with high permeability cores that reject RFI but don't compromise audible high frequency response. Second, we carefully-matched high-precision components for critical areas of the XDR preamplifier. Third, we direct-coupled the circuit from input to output and used pole-zero-cancellation constant current biasing (which also avoids increased intermodulation distortion at high signal levels).



XDR vs. Brand X FFT analysis of mic preamp Intermodulation Distortion. Mixer trims at 30dB, 0dB at inserts. The white spike at 8kHz is the fundamental tone used to "generate" the surrounding distortion artifacts—which the Brand X mic preamp has far more of.

Bottom line for the non-technical: Our new VLZ PRO Series has the best RFI rejection of any compact mixers in the world. Period.

Controlled Interface Input Impedance.

If a mic preamp isn't designed right, it will actually sound different depending on the impedance of the microphone and the cable load!

XDR's Controlled Interface Input Impedance system accepts an enormous range of impedances without compromising frequency response. Whether the mic/cable load is 50 ohms, 150 ohms or 600 ohms, XDR mic preamp frequency response is down less than one tenth of a dB at 20Hz and 20kHz!

Ultra-low noise at "Real World" gain settings.

Many mixers that tout low E.I.N. (Equivalent Input Noise) specs can't deliver that performance at normal +20 to +30dB gain settings. Graph A on the other page charts E.I.N. versus gain level for our new VLZ PRO Series vs. a major competitor's mic/line mixer preamps and a "status" outboard mic preamp retailing for about $2,000. As you can see, our XDR design maintains lower noise levels in the critical +20 to +30 gain range than either competitor.

There's still more:

- **0.0007% Total Harmonic Distortion.** The lowest ever in any compact mixer.
- **Flat response.** Not only are XDR mic preamps flat within a tenth of a dB across the bandwidth of any known microphone, but are also only 3dB down at 10Hz and 192kHz!
- **116dB CMRR** 20Hz to 200kHz and above.
- **Super-low intermodulation distortion** at very high operating levels (charts B&C at left) thanks to instrumentation-style balanced differential architecture, linear biasing and use of DC-coupled pole-zero-cancellation constant current that frees the mic preamp from power supply fluxuations.

We could go on and on this way. But like we said at the start of this ad...

Hearing is believing.

Visit your nearest Mackie Dealer. Select a really high-quality condenser mic and try out the new 1604-VLZ PRO, 1402-VLZ PRO and 1202-VLZ PRO. Think of them as expensive esoteric mic preamps... with really excellent compact mixers attached.

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The Basement Tapes

Trevor John uses his Brooklyn recording studio/ school to bring technology to the people

STUDIO NAME: Basement Recordings, The E Room
LOCATION: Brooklyn, New York
KEY CREW: Trevor John, owner/instructor/engineer; Ernest Graham, instructor/producer/engineer; Margueritte Robinson, instructor
BACKGROUND: Trevor John was a musician with an engineering background when he started his own studio in a cramped Brooklyn basement in the mid-1980s. Young people from the surrounding neighborhood would come to the studio loaded with questions. Tired of answering the same questions over and over, John instructed the kids to come back at a specific time so that he could answer them all at once. And, thus, a recording and computer school was born. Today, through agreements with several music and computer industry corporations, Basement Recordings offers digital audio recording classes and computer instruction for people of all incomes. Basement Recordings is a full-service multimedia facility consisting of several classrooms and computer labs, as well as five studio rooms: the Control Room, the X-Lounge, the Live Room, the Video Room, and the E-Room. The E-Room is their project studio, and is detailed below.
CONSOLE: Yamaha 03D and 01V; Mackie
MONITORS: Yamaha NS-10M, MS101II, and MSP-5
RECORDERS: Yamaha MD8; Sony PCM-2500 DAT machine
OUTBOARD GEAR: Yamaha GC2020C comp/limiter and SPX 1000 effects processor; Lexicon PCM70 effects processor; ART ADA TFX Time Effects; Zoom V9120 effects processor; Roland SDE-1000 effects processor
MICROPHONES: AKG Assortment, 3900, 3700, and 414
MIDI EQUIPMENT: Yamaha G50 alternate controller
KEYBOARDS AND SOUND MODULES: Yamaha EX7 keyboard, TG500 sound module, MU100R single-rack sound module, and MU80 single-rack sound module
SAMPLER: Akai MPC3000
RHYTHM MACHINE: Yamaha RY30
SYNCHRONIZER: MOTU Micro Express
COMPUTER: Pentium II 400 MHz (128 RAM, 10 GB HD)
COMPUTER PERIPHERALS: Iomega 2 GB Jaz drive, Zip drive; Yamaha DSP Factory (AX44 and DSP2416 cards, SW1000XG board w/PLG100-DX, PLG100-VL, PLG100-VH plug-in system); Cakewalk/Peavey StudioMix; Agfa 1280 digital camera
COMPUTER SOFTWARE: Cakewalk Pro Audio 8, Overture 2, and Guitar Studio
STUDIO NOTES: Trevor John comments: The E-Room is a project studio in the traditional sense. It's set up for sampling and looping. It's also arranged so that one person can control everything. What really differentiates Basement Recordings from other studios is our 100-MBPS network connecting all of the rooms. With the click of a button, the studio becomes so much more. This intranet allows us to work outside the confines of each particular room. We can even e-mail a file to a studio in Europe, have it worked on over there, and have it returned to us, no problem. Also, most of our equipment is interchangeable between the rooms.
EQUIPMENT NOTES: John continues: I've really gotten attached to the Yamaha 02R, which we have in most of the rooms. Yamaha is like a natural solution in terms of putting it all together. The only thing they don't have is an actual recording device. The 02R has the ability to interface with everything and that's what makes it so powerful. It's also very straightforward and easy to use. In terms of software, Cakewalk is our main thing, and it's getting better and better. We make it mandatory for everybody here to master the Cakewalk stuff. We have Cakewalk in every computer. The potential of that software is unbelievable. The Cakewalk stuff also allows us to pull things into PowerPoint, which is a very popular program. And I believe that [Cakewalk/Peavey] StudioMix represents the future as far as collaborations between hardware and software manufacturers go. Now that I use StudioMix, I don't want to operate without it. EQ

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PHOTO BY WES BENDER

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Roland VM-3100Pro V-Mixing Station

Roland releases the key component for a compact digital recording setup

BY ROGER MAYCOCK

On or about the time you read this, Roland should be releasing the "junior" members of the VM-Series digital mixers first introduced this past January at Winter NAMM (National Association of Music Merchants). The VM-3100 comes in two flavors — pro and standard versions. While the two mixers appear quite similar, there are several important distinctions between them. This month, we'll be looking at the VM-3100Pro, as this unit is better suited to the needs of the recording professional.

For anyone who has ever spent time with one of Roland's VS-Series recording workstations, the VM-3100Pro will appear very familiar. The look and feel of the mixer is very similar to the mixer portion of the VS-1680, and it could easily function as a sidecar to any of the VS-Series recorders. However, the VM-3100Pro is in every aspect a full-fledged, compact digital mixer capable of interfacing with a variety of hardware- or software-based digital recording systems.

The VM-3100Pro's architecture employs a 20-channel/8-bus design with all but the two general-purpose stereo returns supporting 24-bit signals. Channels 1 and 2 provide either 1/4-inch TRS or balanced XLR inputs with 48-volt phantom power. Input channels 3–8 provide 1/4-inch unbalanced inputs. Of particular note, input channel 4 also provides a Hi-Z input for direct connection of an electric guitar. Inputs 9–12 function primarily as two stereo returns. While these inputs can be accessed independently as mono inputs, each signal will appear on either the left or right channel of the master stereo bus — depending upon which side of the stereo pair you decide to use. Inputs 9–12 employ 20-bit A/D conversion.

If you've been counting, thus far we only have 12 inputs. So where are the remaining 8? On the mixer's rear panel you'll find a proprietary RMDB II I/O terminal that, when used in conjunction with Roland's optional DIF-AT digital interface, provides 24-bit, 8-channel I/O support for any recording device that communicates via either Alesis's Lightpipe or TASCAM's TDIF protocols. The RMDB II terminal is the key that enables the VM-3100Pro to digitally interface with a huge assortment of recording systems.

In addition to 3-band EQ with sweepable mids, the VM-3100Pro incorporates two stereo multieffect processors that offer dynamics processing, reverb, delay, chorus, guitar/vocal/keyboard multieffects, Roland's unique COSM (Composite Object Sound Modeling) microphone simulations, and numerous other functions. Without a doubt, the most unique COSM effect is the mixer's speaker modeling technology, which provides the ability to check your mixes on a variety of popular nearfield reference monitors and additional systems such as TVs and boomboxes.

When used in conjunction with Roland's new DS-90 24-bit, powered digital reference monitors, the VM-3100Pro has an uncanny ability to emulate many of the most commonly used studio reference monitors. While the names of these various speakers have "been changed to protect the innocent," it is nonetheless easy enough to ascertain which speaker set you are listening to at any given time. [Toward the end of the last full day of the recent NAB (National Association of Broadcasters) show in Lost Wages, NV, I had the opportunity to get a look at this impressive technology thanks to Roland product specialist Dave Watkins.]

In addition to the standard, analog L-R monitor outputs, the VM-3100Pro incorporates a pair of S/PDIF digital I/O connectors — one optical, the other coaxial. When using the VM-3100Pro with the DS-90 digital speakers, signals are fed to the

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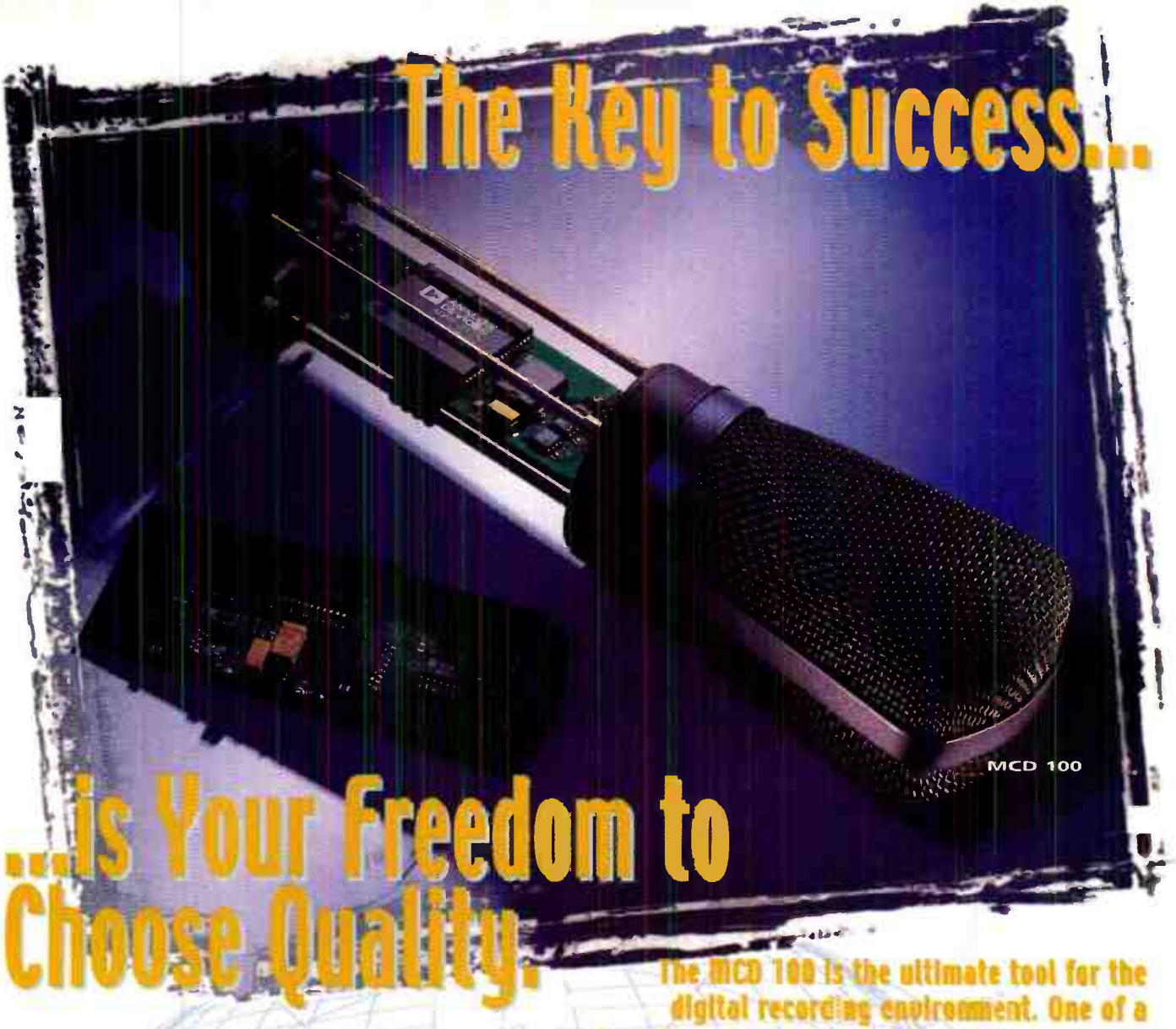
The Key to Success...



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- Proprietary TrueMatch™ "look ahead" DSP prevents the A/D converter from overloading,eliminating digital clipping
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MC 740:
- The best true condenser microphone available anywhere. Multi-pattern with equalization. Remote control available.

MCE 90:
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speakers via either of the mixer's two S/PDIF outputs. The DS-90 has both optical and coaxial S/PDIF inputs and uses a coaxial port as the speaker's thru function to the second cabinet. This arrangement leaves the mixer's second S/PDIF output to feed your DAT, CD-R, or other master recorder.

The VM-3100Pro offers 32-scene memory locations, configured as eight banks of four scenes, for storing and recalling the mixer's settings and routings, including all effects parameters. With comprehensive support for MIDI control, these scenes can be recalled via an external MIDI device (such as a sequencer) using common Program Change commands. While the VM-3100Pro has no onboard support for dynamic automation, it sends continuous controller information for every parameter onboard. Hence, dynamic automation can easily be accomplished with your favorite sequencer — thus providing an inexpensive means of automating scene changes as well as mixer and fader adjustments. The mixer also provides basic MMC (MIDI Machine Control) support for controlling your recorder's transport functions.

There are a tremendous number of parameters in this deceptively small mixer, so, to help you keep track of everything, the VM-3100Pro provides a 136 x 32-dot backlit LCD. The operating system even makes use of numerous icons to help you remember and identify various functions. The mixer also incorporates self-luminous buttons in addition to the usual assortment of LEDs to provide visual feedback as you work. As on the VS-Series recorders, the VM-3100Pro provides Roland's unique "EZ" routing system. EZ Routing is, in essence, the Roland equivalent to a Microsoft® Wizard. It's a straightforward, simplified approach to the issue of assigning input signals, bus assignments, and the like.

Roland's VM-3100Pro V-Mixing Station is deceptively small, yet surprisingly powerful and versatile. Combined with your favorite 8-track recorder, the DS-90 speakers, and your favorite master recorder, a fully digital, separate component recording system is well within the reach of more people than ever before.

Price: $1295. For more information, contact Roland Corporation US, 5100 S. Eastern Avenue, P.O. Box 910921, Los Angeles, CA 90091-0921. Tel: 323-890-3700. Fax: 323-890-3701. Web: www.rolandus.com. Circle EQ free lit. #101.

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...we'll focus on the details.

Creating award-winning digital audio tracks requires a focus on details. LynxONE is built on this philosophy. Professionals praise its impeccable 24-bit performance. But it's the details, such as fault-tolerant data buffering, solid low-latency drivers for Windows NT and Windows 95/98, and flexible clock synchronization that make the difference. Add complete software control, two MIDI ports, custom cables and you've got LynxONE.

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Encompassing the heritage of more than 20 years of delivering professional tools to the professional industry, TC Electronic proudly introduces a high-end vocal processing tool aimed at reducing tedious engineering time spent on doing vocal re-takes - dedicated to the professional vocal recording engineer.

The Intonator not only provides the ultimate solution to vocal pitch correction, but offers various highly useful tools as well, including adjustable De-esser and Adaptive Lo-Cut (ALC™) filtering techniques.

Vocal Integrity

Preserving integrity is a must when dealing with delicate human vocals. By dramatically reducing the amount of re-takes needed, you minimize the risk of fragmenting and potentially destroying the emotional integrity and concistency of the artist's expression.

The Intonator provides you with an ultra-transparent signal path thanks to industry-leading hardware specifications, incorporating TC's world-renowned DARC™-chip technology, 96 kHz internal processing and real 24 bit resolution. Utmost care has been taken in the software development as well, ensuring that all adjustments applied to the incoming signal are being processed in a subtle, yet highly effective manner!

The Human Touch

Preserve the Artist's personal touch by allowing vibrato, initial intonation and limited correction individually. Use the custom scale feature to achieve a unique "Do-not-process-anything-but-this-note" setting. Specify when a specific note must be considered out of tune with the Pitch Window and limit the amount of Pitch correction added to these notes by using the Amount control.

Features:

- Unique Pitch Intonation Processing
- Vocal specific De-essing
- Vocal Specific Adaptive Lo-cut filter
- 96 kHz, 88.2 kHz, 48 kHz and 44.1 kHz compatible on digital and analog I/O's
- Wordclock Input for external clock synchronization
- Fully integrated industry standard connectivity: AES/EBU, S/PDIF & ADAT digital I/O's
- ADIOS™ (Analog Dual I/O's) configuration enables simultaneous recording of processed and un-processed vocal
- Full MIDI automation makes correlation to external reference-signal a breeze
- Audio-to-MIDI conversion allows tracking of correction history
- Easy Edit user interface with dedicated chromatic front panel controls and Alpha dial control
- High resolution display provides instant visual feedback of intonation and corrective action

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Arboretum Restoration-NR Plug-In

Use your PC to trim off excess noise without degrading the signal

BY ROGER MAYCOCK

As more and more production and post-production audio migrate to the nonlinear realms of the desktop, we keep seeing an increasing amount of software plug-ins for the various editing systems that have established themselves on their respective platforms. The Windows/PC platform has undoubtedly experienced the greatest level of expansion, and, this month, we'll be looking at a new offering from Arboretum Systems: Restoration-NR.

Restoration-NR is a high-resolution hiss removal plug-in for Windows 95/98/NT that runs under Microsoft's DirectX. The plug-in features built-in artifact control and uses 32-bit floating-point calculations to perform its functions. As a DirectX compatible plug-in, Restoration-NR can function in any application that supports the protocol.

The first in a new generation of noise-reduction systems, Restoration-NR is designed to remove noise from WAV files and processes both 16- and 24-bit audio at a variety of sample rates, including 96 kHz. This flexibility, of course, is dependent upon your hardware's ability to handle such sampling rates and word lengths, not to mention the ability of the host program to accommodate such files.

Restoration-NR is intended to eliminate broadband noise, including tape hiss, fan noise, extraneous HVAC (Heating, Ventilation, and Air Conditioning), and camera sound noise or background noise incurred during live recording. The program is most effective in eliminating noises that have a consistent characteristic (such as tape hiss). Restoration-NR uses a technique called downward expansion, and is comprised of an extensive filter bank, which sets its filters based on information that the program acquires via its Guess or Learn function (more on this shortly). The technology employed in downward expansion is a significant leap forward over simple equalizing or notch filtering.

The user interface for Restoration-NR is straightforward and easy to grasp. In Sonic Foundry's Sound Forge, the plug-in appears under the DirectX toolbar. Clicking its name will present you with a control panel that resembles, if this were hardware, a half-space rack module consisting of four rotary pots, three function switches, Load and Save switches, plus an Output section consisting of stereo green/red LED ladders and a Lock position for ganging the two independent level faders. The color scheme of the control panel is teal and black, with vivid green and red for the level meters and a bright green LED for the Lock button.

Of the three function switches, the Guess and Learn commands are the keys to using this plug-in with success. These two commands instruct the program to examine your audio file and extract a noise signature. The noise signature is a set of characteristics that the plug-in then hunts down and removes. The Guess command instructs the program to make an "educated guess" about the noise content, while the Learn command is the more accurate of the two functions. With the Learn command, you select a portion of the audio file that contains only noise, then open Restoration-NR and click the Learn button to teach the plug-in specifically what to look for.

After obtaining the file's noise signature, Restoration-NR provides (from left to right) Threshold, Attenuation, Hi CutOff, and Hi Boost controls (appearing as rotary pots). You can use these to achieve the greatest perceptual decrease in the noise floor with the minimum amount of degradation to the target signal itself. Restoration-NR sets its filtering thresholds automatically and adjusts them to the overall level of the noise signature. Attenuation applies the amount of downward expansion to the noise signature, while the Hi CutOff and Hi Boost controls enable you to address the issue of high-frequency degradation.

Restoration-NR's third function switch is the HiRes button. The plug-in can operate using either 512 or 4096 bands of gated EQ. The higher band setting (indicated on screen by an illuminated bright green series of miniature EQ bands) yields greater accuracy and better results at the expense of CPU power and render time.

The plug-in's output section provides exactly the type of real-time visual feedback you would expect from an output meter. When the meters display red, you experience clipped and distorted signals — the tried and true indication that it's time to roll back your levels with the left and right faders. For convenience, these faders can be ganged simply by clicking the Lock button.

Restoration-NR has provisions for naming and storing your various settings as presets that can be recalled and applied to other sound files. You choose a preset via the customary drop-down option box. The Load and Save buttons are for recalling or saving your noise signatures — enabling you to access this data at a later time or to recall a

continued on page 127

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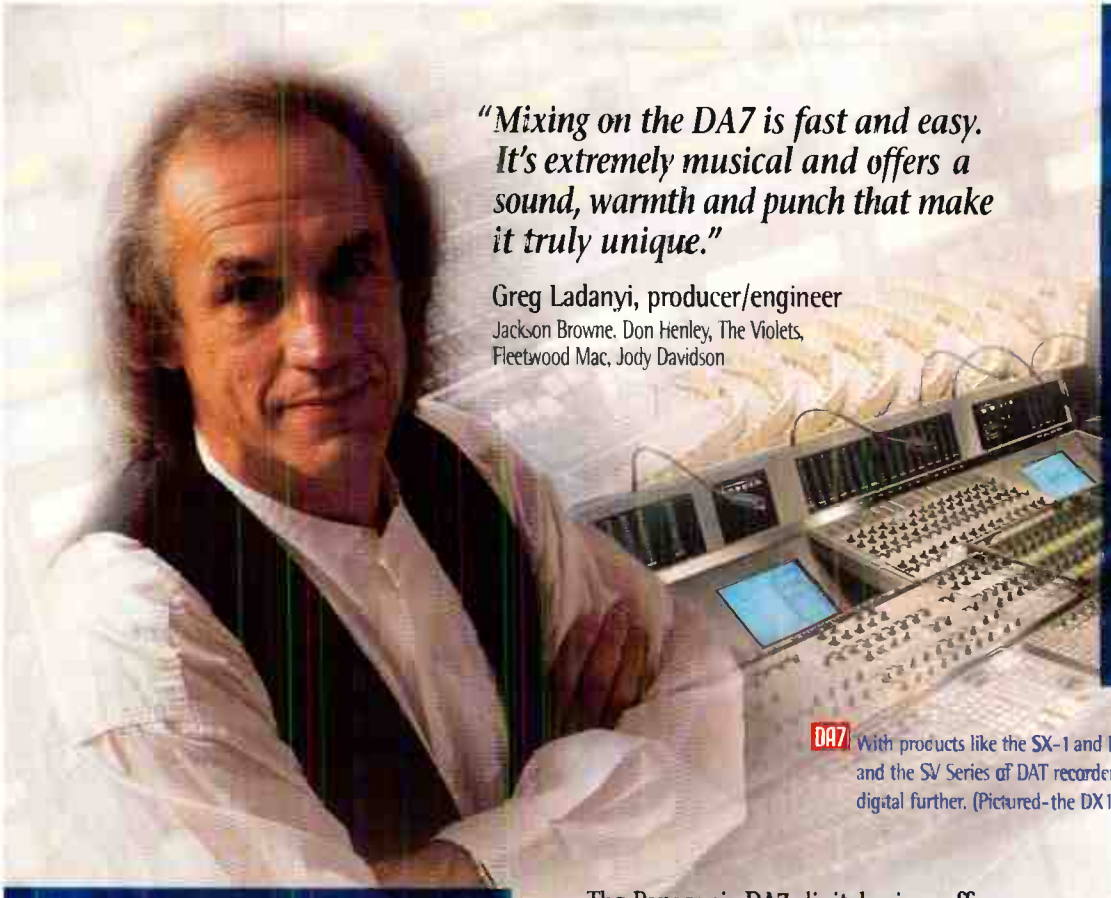

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Greg Ladanyi, producer/engineer
Jackson Browne, Don Henley, The Violets, Fleetwood Mac, Jody Davidson

IF THE DA7 LET YOU WORK ANY FASTER...

DA7 With products like the SX-1 and DX1000 (the DA7's big brothers), and the SV Series of DAT recorders, Panasonic is truly taking digital further. (Pictured-the DX1000 digital console.)

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Let's face it. Today's fast paced production environments require more from a mixer than ever before.

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The Panasonic DA7 digital mixer offers all of this and more. The DA7 has 38 inputs that let you easily route signals between 16 mic/line analog inputs to a hard disc recorder or MDM. You can even get up to 32 channels of analog or 24 channels of digital I/O in ADAT, TDIF or AES format. Or control MIDI devices or sequencer software right from the DA7's 16 MIDI faders.

So if you'd like to speed yourself up without running out of money, take a test drive at your nearest Panasonic Pro Audio Dealer today.

DA7 Many magazine editors have raved about the DA7's exceptional sonic quality, intuitive user interface, automation and affordability. (Some editors even bought the DA7 after the review!)

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Korg 1212 I/O

Answers to questions on using Korg's 1212 I/O

COMPILED BY JAMES SAJEVA AND DAN PHILLIPS

Is the 1212 I/O Card compatible with the new blue and white G3's?
Yes! The new 1212 I/O MacOS software version 1.3, which allows you to use the 1212 I/O with the blue and white G3 systems, is hot off the presses from Korg's R&D department. Download version 1.3 from the Korg Web site at www.korg.com/1212down.html. It's also available from Korg USA's Product Support department by calling 516-333-USER or by e-mailing a request to: support@korgusa.com.

I need to make sure that my computer audio tracks stay in sync with my MIDI tracks, with tracks from external tape recorders and digital tape recorders, and with video decks. How do I do this with the 1212 I/O?
Sync'ing all devices to the same timecode stream will ensure that audio and MIDI tracks start at the correct time. To make sure that everything stays in continuous sync over the duration of the playback (or record), every part of the system must share the same timebase, as well as timecode. For digital devices, sharing a common timebase means synchronizing the word clocks. To do this:

1. Connect the digital audio I/O and/or word clock I/O of all digital audio devices, including the 1212 I/O. You can do this using any available digital audio connection, including ADAT optical, S/PDIF, or dedicated BNC word clock I/O. Make sure that the word clock source for each device is set to match the physical connections, and to ensure that there is one and only one word clock master.

2. If you are using a video deck or analog audio tape machine, stripe the tape with SMPTE and then use a SMPTE-to-word clock converter (such as the Alesis AI-2, MOTU MTP-AV or Digital Timepiece, or Opcode Studio 64XTC) to generate a word clock signal from the SMPTE stream. Connect the word clock output of the converter to your digital audio system, and set all word clock source parameters accordingly.

3. If your audio software offers a choice between sync'ing audio tracks to SMPTE or freewheeling, choose freewheeling. If the software offers a continuous sync option, disable it. These functions are intended to simulate a common timebase in software, but we've already taken care of this by synchronizing the word clocks.

4. When using the 1212 I/O as a set of Windows Wave devices, enable Auto-Sync in the Korg 1212 I/O Wave Device control panel. This ensures that all input and output pairs are precisely synchronized.

On my Mac, a red "X" appears over the 1212 I/O icon at startup. What does this mean?
The 1212 I/O MacOS software versions 1.0 through 1.2 require that the MacOS Virtual Memory feature be turned off. When Virtual Memory is on, versions 1.1 and 1.2 will draw a red "X" over the 1212 I/O startup icon to let you know that the extension did not load. To turn off Virtual Memory:

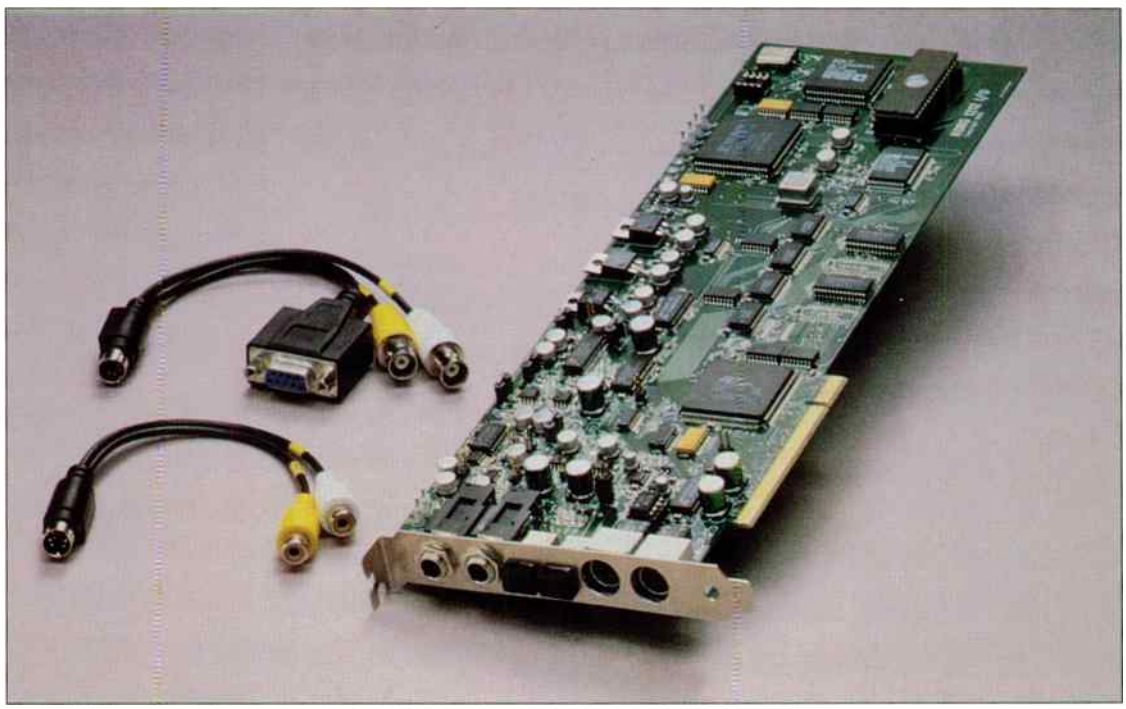
1. Open the Memory control panel and disable Virtual Memory.

2. Re-start the computer.

The new 1212 I/O MacOS software version 1.3 will load even if Virtual Memory is on, so the red "X" will not appear. Note, however, that most digital audio programs still require or at least suggest that VM be disabled, since it can cause performance degradation.

For answers to other commonly asked questions about the 1212 I/O, see the online Frequently Asked Questions section on the Korg Web site at www.korg.com/1212_faq_home.htm.

James Sajeva is with the Product Support department of Korg USA and Dan Phillips is the product manager, Korg R&D.



THE INS AND OUTS OF THE 1212: Get the most out of your Korg I/O card.

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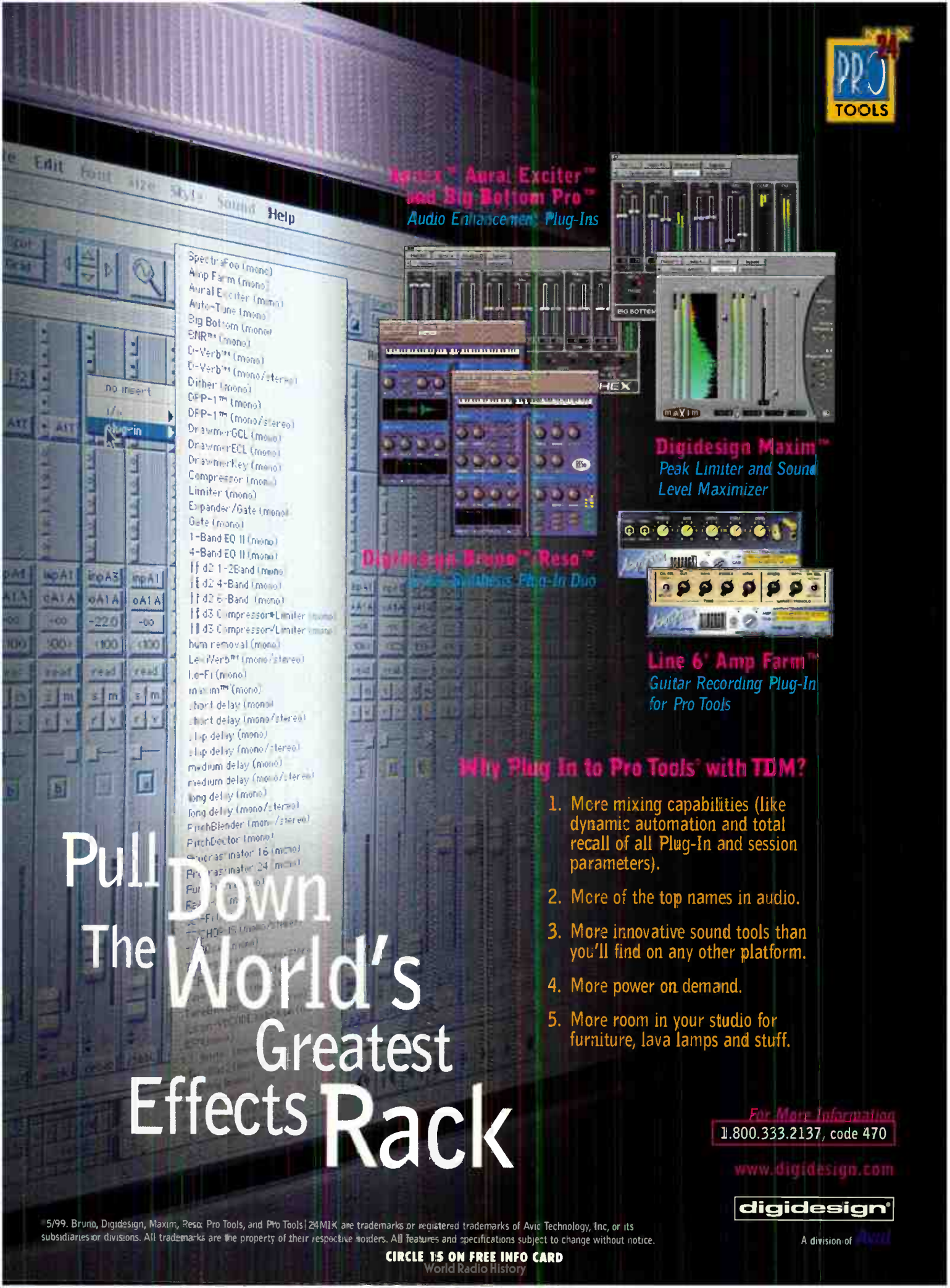

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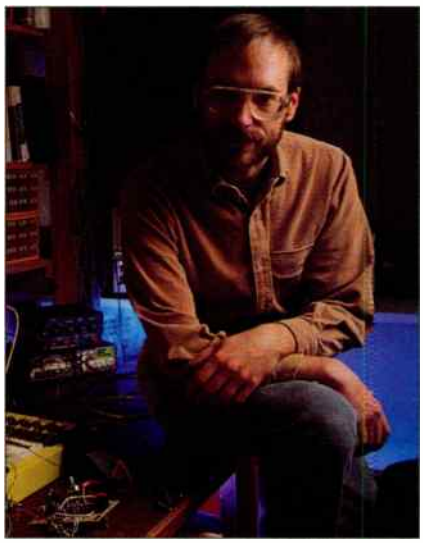
Learning the Hard Way

I've made the mistakes for you, so you don't have to do it yourself



BY CRAIG ANDERTON

Life is frustrating enough, so there's no need to make it any more frustrating. Every day, we're faced with trying to decide which of two or more options is going to be most beneficial in the long run. We weigh risks against rewards, then make the best decision we can. The wrong decision can lead not only to frustration, but also to loss of income and/or reputation — none of which is much fun.

I've been around long enough to be able to look back on years of data and check whether my risk/benefit analyses were accurate. So, in the spirit of "learn-from-my-mistakes-so-you-don't-have-to-learn-them-for-yourself," here are some steps you can take to help minimize frustration as you go about your business.

• **Service is just as important as features when choosing critical gear.** First, it's important to differentiate between *useful* gear and *essential* gear. For example, a useful piece of gear might be an outboard parametric EQ that you use to supplement the EQs in your mixer. An essential piece of gear would be your computer, as hard-disk recording and sequencing come to a halt without it. Because of their differing levels of importance, essential and useful gear require different purchasing strategies.

Useful gear meshes well with mail order or Web buying, because you don't really need local support. For example, if that outboard parametric needs servicing, you can usually handle waiting for the time it takes to ship the unit to and from a repair center, or take it to a local authorized service center if there's one in your area. Your business will go on anyway.

For essential gear, though, you're better off buying locally. You'll pay sales tax and maybe a bit more than mail order, but a local outlet with which you've had a long-term relationship will hopefully give the best overall support. For example, many stores will provide "loaners" if you're in a hardship situation, or be able to fix minor problems (or update software) on-site. This is crucial, because the primary rule of essential gear is *minimize downtime at all costs.* Also, remember that mail order involves risk associated with shipping. If you receive a unit that's DOA, you can't just run back to the store and have them replace it within a few minutes.

Let's get concrete. Suppose you saved $300 by not buying some essential item locally. As long as you never need support, you come out ahead. But if you estimate your business income at $150/day, and not having local support costs you two days of productivity over the life of the product, you lose money on the deal (of course, you lose way more if your business income is greater than $150, or you have more than two days of downtime).

I've used computers for years, and hard-disk crashes have been rare. However, although the risk of the computer self-destructing is small, the cost of the computer self-destructing is huge.

Part of analyzing risks and rewards is taking into account the odds of a product malfunctioning. Generally, the more moving parts something has, the greater the potential for problems. Touchier gear includes anything with digital or analog tape, analog synthesizers with lots of hardware controls, and Devices That Do Unnatural Things (like spin around at 10,000 RPM for hours at a time or are made of glass and glow red-hot in the course of normal operation).

• **The real deal about backing up.** People don't back up for a simple reason: although they know that losing all their data would be devastating, they're lulled into a false sense of security because modern computers are, indeed, remarkably reliable. So they do the risk/benefit analysis and decide that the risk of the computer self-destructing is minuscule, while the benefit of not backing up is that you save a lot of effort (if backing up was truly so easy, everyone would do it). I've used computers regularly for years, and I must say that hard-disk crashes have been extremely rare. However, although the *risk* of the computer self-destructing is small, the *cost* of the computer self-destructing is huge.

You've heard the "you-better-back-up" rant before, so we won't dwell on it. But there is one other ele-

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ment of backup that is often ignored, and that's backing up your customized system, with all your preferences, formatting, shortcuts, etc. Losing your data is bad enough, but even if your files are valueless, getting a system back on track takes a long time if you have to re-install everything, find update disks and patches, and so on. But if you can swap in a new hard drive, format it, then copy the data you've stashed on a couple of CD-RWs or CD-ROMs over to the new hard drive, you can be up and running within minutes instead of hours.

• **Always save update files and patches.** Isn't life grand? An update to your favorite program has just been released, and you can download it free from the Web! So you download a ZIP file (Windows) or StuffIt (Mac) to your hard drive, read the READ ME file (ignore these files at your own peril), and double-click on the update file. The installer puts little things in your system, and updates your program to the latest and greatest version. Next, you blow away the ZIP or StuffIt file to clean up your hard disk and carry on with life.

What you *should* do is save the original update file to removable media (I also save the file in the same folder as the one containing the file to be updated). If your hard disk should crash or the program itself become corrupted, you can reinstall from the original disk, then copy over the update file and re-install that. Otherwise, it's another trip to the Web site and more download time.

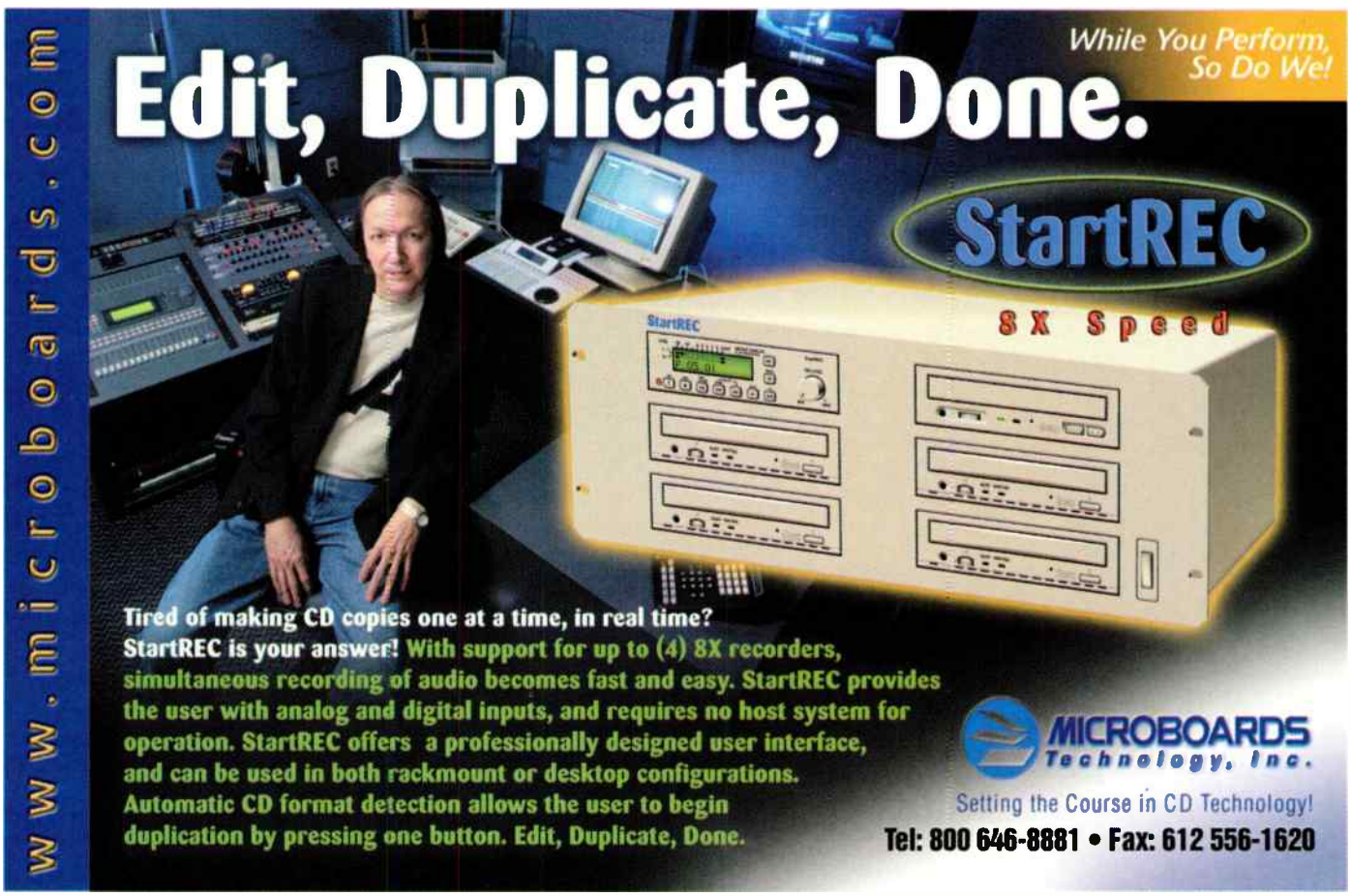
However, here's the really important tip: make sure you *save every single update*. Sometimes, you won't be able to modify your original program with the latest update unless you've already installed previous updates. If your hard drive crashes, re-install the original program (gee, hope you have an install left...), but also have all update files available if needed.

• **Check the Web before going nuts.** This will save you many hours of frustration. I've really become aware of this because of reviewing so much software for *EQ*. It seems that most of the time I need to go to the Web at some point and download a patch to deal with a problem, omission, enhancement, etc.

If something goes wrong when you install or modify a program, *even before you've checked all the obvious possibilities* go to the manufacturer's Web site and see what you can find. Many times I've encountered some weird error message, gone to a Web site and found "If you encounter the following weird error message..." along with a solution. I've wasted hours trying to fix things where the problem was software- or hardware-related, not pilot error. Incidentally, one benefit of going to the Web site is that there might also be other helpful updates or tips available.

Okay...out of words and out of space. As I do more dumb things, I'll be sure to let you know of any more minefields that lie along the way.

Craig Anderton (check out his books at Amazon.com) just returned from a seminar tour of France, England, and Denmark. He is also putting the finishing touches on his next CD, which will be released as an ACID-format loop library as well as on audio.



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CIRCLE 78 ON FREE INFO CARD

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Wheels of Feel

PHOTO BY JONATHAN POSTAL

In which your columnist slowly takes a stab at the time-consuming and costly boot camp of a club DJ

BY AL KOOPER

An old friend of mine called recently to invite me to a club. It seems he had installed the sound system at great expense into said club, and wanted me to hear a quarter of a million dollar sound system of his own design.

One recent Saturday night, while I was in NYC, and aprés the Knicks-Pacers game, I ambled over to said club. I said the magic words to security and was ushered into today's equivalent of Studio 54. My friend and the owner were having drinks in the VIP section of the club, which was a balcony that overlooked the mayhem below. I joined them and felt an instant affinity for the owner. We got along great, and, before the evening was over, I was offered an opportunity to spin discs there at a later date. Now, I have never done any such thing before, but, at my age, that is a turn-on to me. *Something new to do!* I immediately went back and re-read the *EQ* cover story on performing engineers [April '99].

In the ensuing days, I thought about it and it became complicated rather quickly. For one thing, I couldn't use my 10,000-strong vinyl collection because the records are not in all that great shape and no one wants to hear clicks and skips while they're partying their brains out. So I decided to use my 4000-strong CD collection.

Then there is the matter of beats per minute. Every song considered for play needed to have a BPM number assigned to it. That way you can play seamless sets at the same tempos. So off I went to the music store in search of a BPM detector. TAMA makes a nice one for around $100 (Rhythm Watch 100) with a tap feature that is essential for a task this gargantuan. With BPM detector in hand, I strolled through the 4000 CDs at home and extracted 300 that I felt were up to the task of coercing people to get off their asses.

Then I chopped up some Avery labels to a very finite size and, as I calculated the BPMs of each song, I pasted a tiny label next to the corresponding tune listing on the back cover of each CD with its BPM number. I've been doing this for two days now, and have 40 CDs finished. In two weeks, all 300 should be labeled and each CD given a file number.

Then I must construct a database in the computer that will tell me what songs play at various specific BPMs and what CD they are on. That will take another two weeks. I seemed to have bitten off quite a chunk here. The thing is, I want to play *all* kinds of music in my new guise as DJ All Over Da Place (my stage name) that are joined *only* in BPM similarity. In order for this to work, I'm gonna need to rehearse. In order to rehearse, I m gonna need a double CD DJ system to plug into my project studio and get the feel and timing necessary to crossfade tunes. Fortunately, the local music store had one on sale on Memorial Day, and I snapped it up at a ridiculously low price.

Now I realize I'm gonna have to have cases made to hold the CDs that will ship via air to wherever I'm spinning. I'm starting to feel a little crazy now. This is getting to be a serious financial and time-eating investment. What if I'm no good at it? Well, it's still too early to tell.

I also want to have a keyboard and guitar setup with me so I can play along every now and then should the feeling seize me. Probably not too many DJs doing that nowadays. And, most important of all, I want people who miss hearing the old-style music to know I'm doing this so that they can attend and enjoy. If I have to face a young audience used to hip-hop, trance, and industrial jams, I'm gonna fall flat on my face. Now a few of them sprinkled in a sea of yuppies is OK, 'cause they'll think it's something new and tell all their friends. But I will need an ocean of comparatively older folks, hopefully starved for the music of their youth, in order to get over initially. The adding machine in my head is now adding the cost of a press agent to the burgeoning accounts payable column.

Will a guy with good taste and a great tune collection be able to make the transition to club DJ in a matter of months? I doubt it. But it's a start...

So will a guy with reasonably good taste and a *great* tune collection be able to make the transition to conquering club DJ in a matter of months? I doubt it. But it's a start, and it seems like the gigs will be fun, though a bit stressful at first. Oh and by the way, my friend's sound system is so good, I can't wait to hear records with real musicians playing on them coming through it!

Stay tuned and I'll follow up on this weird manifestation in a later column. *But:* To all the great DJs out there, a shout-out of appreciation for the work and costs I know you've persevered to get your shit together. As a fellow musician once said: "...Ya know it don't come easy!" EQ

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West Side Story

Modern rockers launch Stratosphere Sound in New York City

BY ALAN DI PERNA

"I think of this as an investment in art," says Smashing Pumpkins guitarist James Iha. He's talking about Stratosphere Sound, the new Manhattan recording facility he has opened in partnership with guitarist/ songwriter Adam Schlesinger of the New York "smart pop" bands Fountains of Wayne and Ivy and Andy Chase, who also plays in Ivy.

"It just seemed like a good idea to have a place where the three of us could pool our equipment — and our ideas," Iha continues. "I think it's awesome for any musician to have their own studio."

Located in the newly yuppified meat packing district on Manhattan's far West Side, Stratosphere is a 24-track room designed to be a personal-use studio for Schlesinger, Iha, and Chase's own projects, and to function as a full-on commercial recording facility when the three principals are out on the road. The idea is to attract outside clients who are looking for an alternative to the commercial studio vibe.

"We wanted this place to feel casual and pro at the same time," says Schlesinger. "I've worked in a lot of studios where you go in and you feel really intimidated by all these Vanessa Williams gold records all over the place. We like the idea that this feels more like hanging out in your house."

Chase, Iha, and Schlesinger's careers have been intertwined for a while. Iha was an early Fountains of Wayne supporter. He introduced the band to their management and brought them on out the road with the Pumpkins. Schlesinger and Iha co-founded the indie label Scratchie Records a few years back. Andy Chase and Schlesinger are old friends. Stratosphere actually evolved out of a rehearsal space that

THEY'RE NOT DOCTORS...But they pretend to be them in their studio. Stratosphere Sound's Andy Chase, James Iha, and Adam Schleisinger (l-r).

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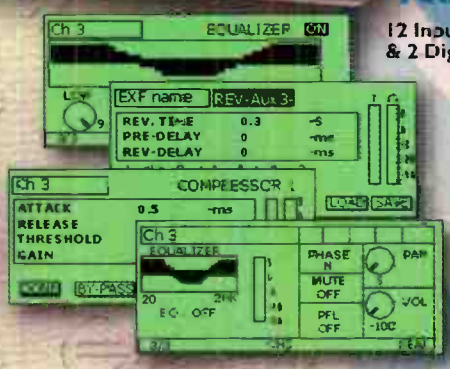

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MISSION CONTROL ROOM: A vintage 32-channel Neve 8068 was a major acquisition for the anolog/digital hybrid studio.

Chase set up with some other musicians about ten years ago. Located at the present Stratosphere site, the rehearsal space progressed through the usual 2-, 4-, 8-, 12-, and 16-track stages, emerging as a full-on pro studio named The Place, based around an Otari MTR 90 MKII analog 24-track machine. Among the indie/alternative acts to record there were Cornershop, Mark Eitzel, Luna, Fountains of Wayne, and Ivy. The Smashing Pumpkins did some tracking on a B side, "The Bells," at The Place, and Iha did preproduction for his solo album, *Let it Come Down* there.

"We'd all started working there," said Schlesinger. "And when Andy's original partners decided to split off, the three of us decided to go in and start a new business of it ourselves. So we changed the name, bought a bunch of new gear, and reopened as Stratosphere."

The major new acquisition was a 32-channel vintage Neve 8068 console with GML moving fader automation. "That was really our dream piece of gear," says Schlesinger. "One of the limitations of The Place was that, as good as we could do there, we always wanted to go someplace else to mix, and sometimes do basics, because we wanted that Neve sound. There was an Allen & Heath console there before. We'd been looking around for a Neve in good condition for a long time, and finally came across this 8068 with GML automation. I worked on an almost identical console mixing the last Fountains of Wayne album up at Q Division in Boston. The guy who runs that studio and mixed our record said, 'If you ever find one of these, you should just buy it 'cause it's the greatest thing ever.' "

"Neves are classic rock," Iha adds. "With the Pumpkins, we've pretty much always opted for a Neve with GML flying faders for mixing. I've done some B side things on SSLs. They're good, but I like Neves better."

The transformation of The Place into Stratosphere also involved some construction remodeling. "Because of the size of the console, we were forced to make the control room face a different direction," says Schlesinger. "Now it's a nice big, airy control room with windows. Before, the windows were all boarded up. We built a little cabinet for the tape machines and other equipment, so now the control room has more space to move around in. There's even room for a couch. We really wanted to maximize that feeling of being in a living room rather than a slick commercial studio. But we didn't go nuts with the construction. The live room is unchanged. It has always sounded great, so why tamper with it?"

"It's a good, natural sounding room with wood floors," Iha adds. "It's a pretty flexible studio. You can rock out a bit, but it also has a very nice, general acoustic sound. You can kind of do whatever you want with it."

"It's not the Power Station, but, for New York City, it's a pretty decent-sized live room," says Schlesinger. "We have a nine-foot Steinway concert grand in there that doesn't even begin to fill the space. And we also have an isolation booth that's big enough for a full drum kit or a bunch of guitar amps."

The studio is stocked with gear culled from the three partners' lifetimes in rock bands. There's a collection of guitar amps (including vintage and reissue Vox AC30's, Marshalls, a Fender Twin, and Silvertone Twin Twelve), vintage keyboards (including a Moog

World Radio History

Prodigy, Roland Juno 60, ARP Omni II, and Farfisa Mini Compact Organ) and microphones (including a Telefunken tube U 47, Neumann U 87, and Sennheiser 441 and 421). The studio's Otari MTR 90 MkII 24-track — which dates back to its earlier incarnation as The Place — has been supplemented by a number of digital recording formats, including a 24-bit Pro Tools system, Alesis ADATs, and TASCAM DA-98, '88, and '38 machines.

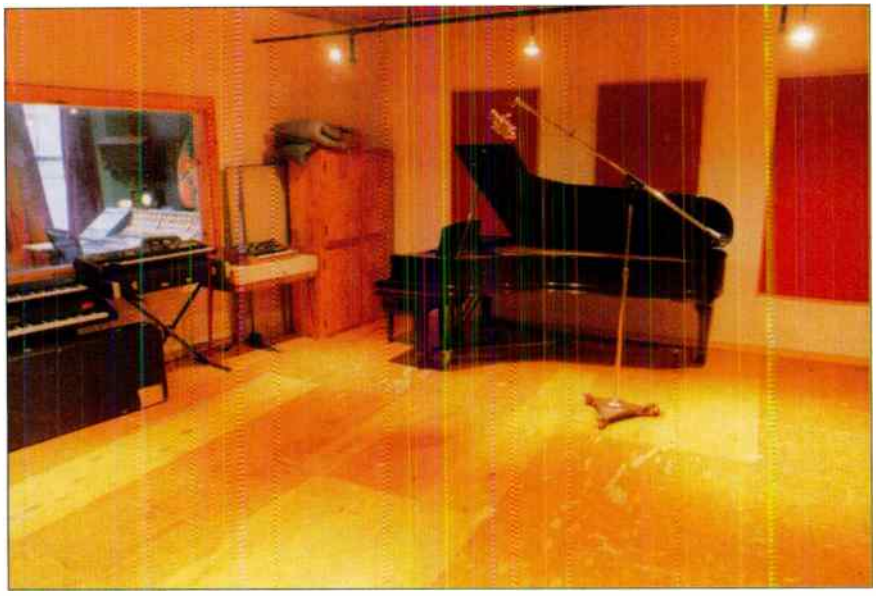
"We like to use both analog and digital," says Schlesinger. "We're about to begin a new Ivy record in the studio, and we'll be using Pro Tools as the main hub of the project. But everything's going to go to 2-inch tape first, then we'll transfer it to Pro Tools. You definitely gain something by going to analog tape first. But with Pro Tools you also have all the fun of being able to re-arrange your song on the spot."

Tracks for the current Fountains of Wayne album, *Utopia Parkway*, were also recorded at the studio. "The Fountains stuff was kind of going on while the whole thing was in transition [i.e., from The Place to Stratosphere]," says Schlesinger. "We bought the console in December [of '98]. It really wasn't up and running until January. And there was still a lot of work going on throughout the next couple of months."

In some cases, the band went to the Big House in Times Square to cut basics, returning to Stratosphere for overdubs. Other tracks originated as demos that Schlesinger made in his home studio. "I have DA-98's, a Mackie board, a MIDI setup, and a couple of nice mics and compressors at home," he says. "I wouldn't try to set up a drum kit in my apartment — I'd get thrown out of my building. But I've done some really good vocal and guitar stuff at home. And on a few of the songs for *Utopia Parkway*, we used those. We liked what we had. It seemed good enough to work with. So we went in and added live drums and overdubbed some other things."

Once construction on Stratosphere was completed, Scratchie Records act Fulflej was the first band to use the studio, recording their new album there. "I guess that was technically the opening project," says Schlesinger. "Fulflej were kind of the guinea pigs for the room."

At this point, everything is coming together nicely for Stratosphere Sound — including the neighborhood. "The area has suddenly become super hot," Schlesinger says. "And it's really weird, because Andy originally chose this [location] just because it was cheap and out of the way. Now it's one of the hottest real estate markets in New York. We're lucky we got this lease before that happened. Now there are art galleries opening, and Belgian restaurants. They're building these yuppie lofts around here that are selling for a million dollars. So it's become a super-trendy area, which is great. Also, it's within walking distance to all kinds of things, like the Village and Chelsea. It's a fun place to work." EQ



IF IT AIN'T BROKE...The live room didn't require many changes when the studio changed hands — it's big enough to hold a Steinway and a large iso booth.

CIRCLE 59 ON FREE INFO CARD

World Radio History

Everybody's All American

Tips and techniques from the original freelance engineer: Elliot Scheiner

BY HOWARD MASSEY

This producer interview represents the return of Howard Massey to EQ*'s pages, where longtime readers will recall his excellent contributions to past issues. More recently, Howard was the technical editor for* Musician *magazine. We welcome Mr. Massey back to our pages, where we will be looking forward to his series of producer profiles (from his upcoming book), reviews, and articles. —HGL*

You'd be hard-pressed to find a producer/engineer more associated with the "American sound" than Elliot Scheiner — a name long linked with such red-white-and-blue mainstays as Steely Dan, Fleetwood Mac, The Eagles, Toto, John Fogerty, Bruce Hornsby, and Jimmy Buffett. The irony of this is not lost on Scheiner, who recalls how his first big break came from working with Irish singer Van Morrison: "I was engineering *Moondance,* and we were getting ready to mix it. It was around Christmastime, and Van said, 'I'm not gonna be here, I'm going home to be with my family, so why don't you mix it and just send it to me?' So, [drummer] Gary Malabar and I ended up mixing it ourselves and that was it. He didn't change anything; he loved it. I felt that was really the beginning of my production career. When the next album came around (*Band and Street Choir*), I was supposed to co-produce that with Van. We began it, but we didn't see eye to eye, so it ended up not happening."

Scheiner started at the famed A&R Studios in New York in late 1967, working under Phil Ramone. "Phil taught me just

PHOTO BY EDWARD COLVER

ROLL WITH THE CHANGES: Elliot Scheiner has turned his considerable engineering expericence toward the burgeoning world of 5.1 surround sound music production, but still has many words of advice for stereo projects.

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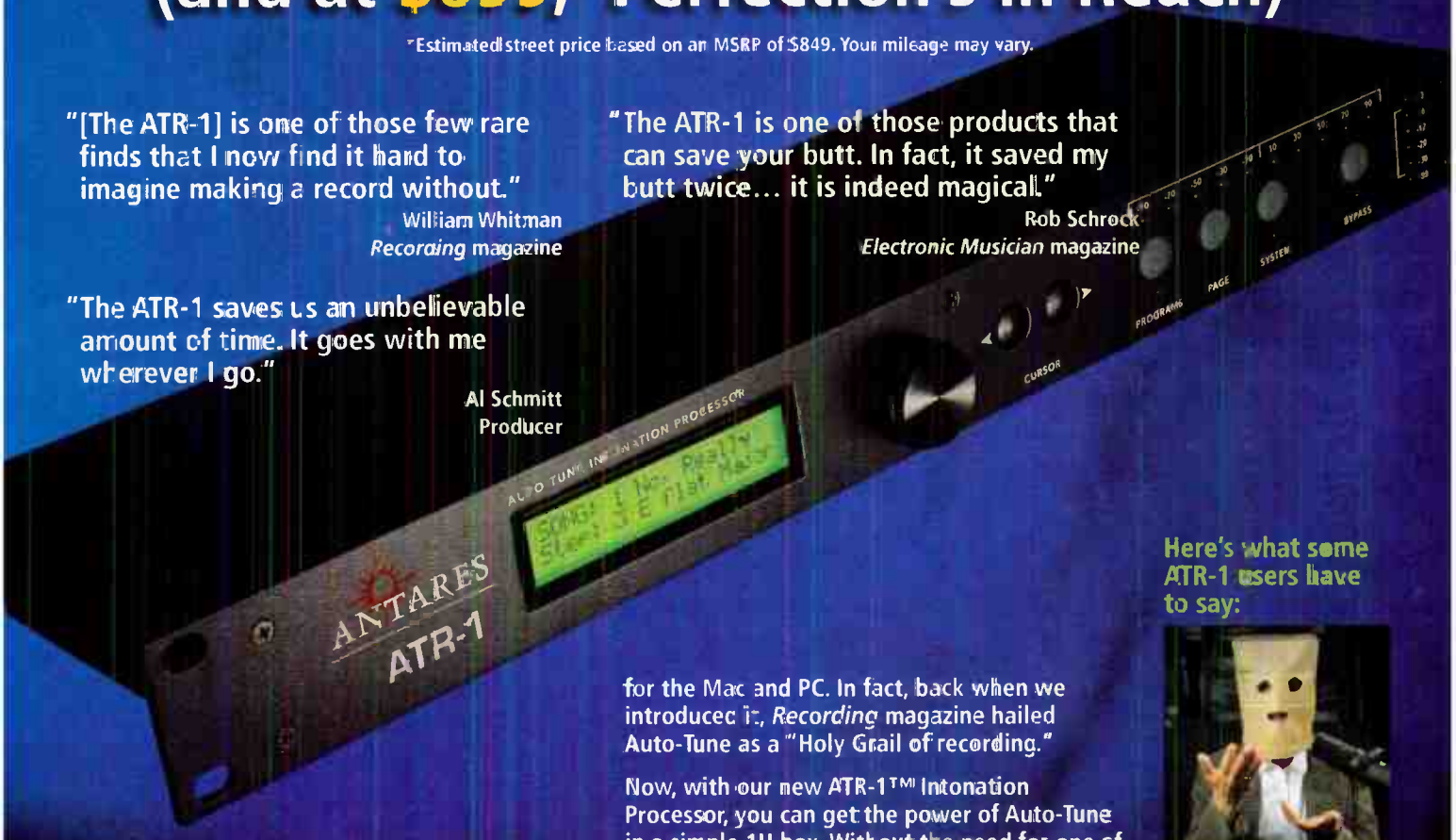

OK, let's be honest. For most of you, "Perfect Pitch in a Box" is right up there on the credibility scale with Elvis sightings and miracle three-day weightloss. Unless, of course, you happen to be one of the thousands of audio professionals who already depend on Antares's amazing Auto-Tune™ pitch-correcting software for the Mac and PC. In fact, back when we introduced it, *Recording* magazine hailed Auto-Tune as a "Holy Grail of recording."

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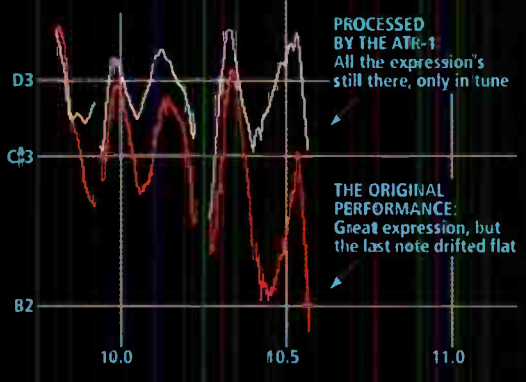

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CAST THIS BALLOT

EQ

PROJECT STUDIO OF THE YEAR AWARD

Nominations

Finally, there is award recognition for some of the most creative and productive facilities in business today — project studios. This is your chance to choose who will win these new, but already important, awards. The following nominations have been compiled from *EQ*'s editors and a large gathering of industry professionals, but, as always, *EQ* is as much your book as it is ours, and so we've left an "Other" option in each category so you can bring our attention to something or someone we might have missed. So please take the time to fill out this form and fax it back to us at 516-767-1745. You can also fill it out online by visiting www.eqmag.com, or snail mail it to us at: EQ Magazine, Project Studio of the Year, 6 Manhasset Ave., Port Washington, NY 11050. The lucky winners will be announced in our AES issue.

(Please choose only one from each category, ***or*** *fill in your own choice in the "Other" section.)*

Producer/Engineer-Owned Studios

- ☐ Dust Brothers, PCP Labs, L.A., CA
- ☐ Steve Albini, Chicago, IL
- ☐ Daniel Lanois, Kingsway, New Orleans, LA
- ☐ Mick Guzauski, Barking Doctor, Mount Kisco, NY

Other: _____

Musician-Owned Studio

- ☐ Brian Wilson, Chicago, IL
- ☐ TLC, Atlanta, GA
- ☐ The Artist, Paisley Park, Minneapolis, MN
- ☐ Butch Vig, Smart Studios, Madison, WI

Other: _____

Indie Record Label Studio

- ☐ Nothing Records, Nothing Studios, New Orleans, LA
- ☐ dmp Records, Tom Jung, Stamford, CT
- ☐ Sumthing Distribution, Nile Rodgers, NY, NY
- ☐ Bad Boy Records, Daddy's House, Puff Daddy, NY, NY

Other: _____

Film/TV Scoring and Soundtracks

- ☐ The Attic, Michael Whalen, Boston, MA
- ☐ Media Ventures, Hans Zimmer, L.A., CA
- ☐ Mutato Muzika, Mark Mothersbaugh, L.A., CA
- ☐ Asymmetrical Sound, David Lynch, L.A., CA

Other: _____

Video Game/Multimedia Studio

- ☐ Tommy Tallarico Studios, L.A., CA
- ☐ Electronic Arts, Redwood City, CA
- ☐ Darryl Duncan, GameBeat, Lake Mary, FL
- ☐ Mark Waldrep, AIX Entertainment, West Hollywood, CA

Other: _____

Project Record of the Year

- ☐ Brian Wilson, Imagination
- ☐ Cher, Believe
- ☐ Beastie Boys, Hello Nasty
- ☐ The Fixx, One Thing Leads to Another [remix]

Other: _____

Project Studio on Stage

- ☐ Erasure
- ☐ Fatboy Slim
- ☐ Air Liquide
- ☐ Chemical Brothers

Other: _____

Project Studio Legacy Award

- ☐ Peter Gabriel, Real World, England
- ☐ Frank Zappa, Barking Pumpkin, L.A., CA
- ☐ Jimi Hendrix, Electric Lady, NY, NY
- ☐ Roger Waters, The Billiard Room, England

Other: _____

Name [printed]: _____

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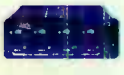

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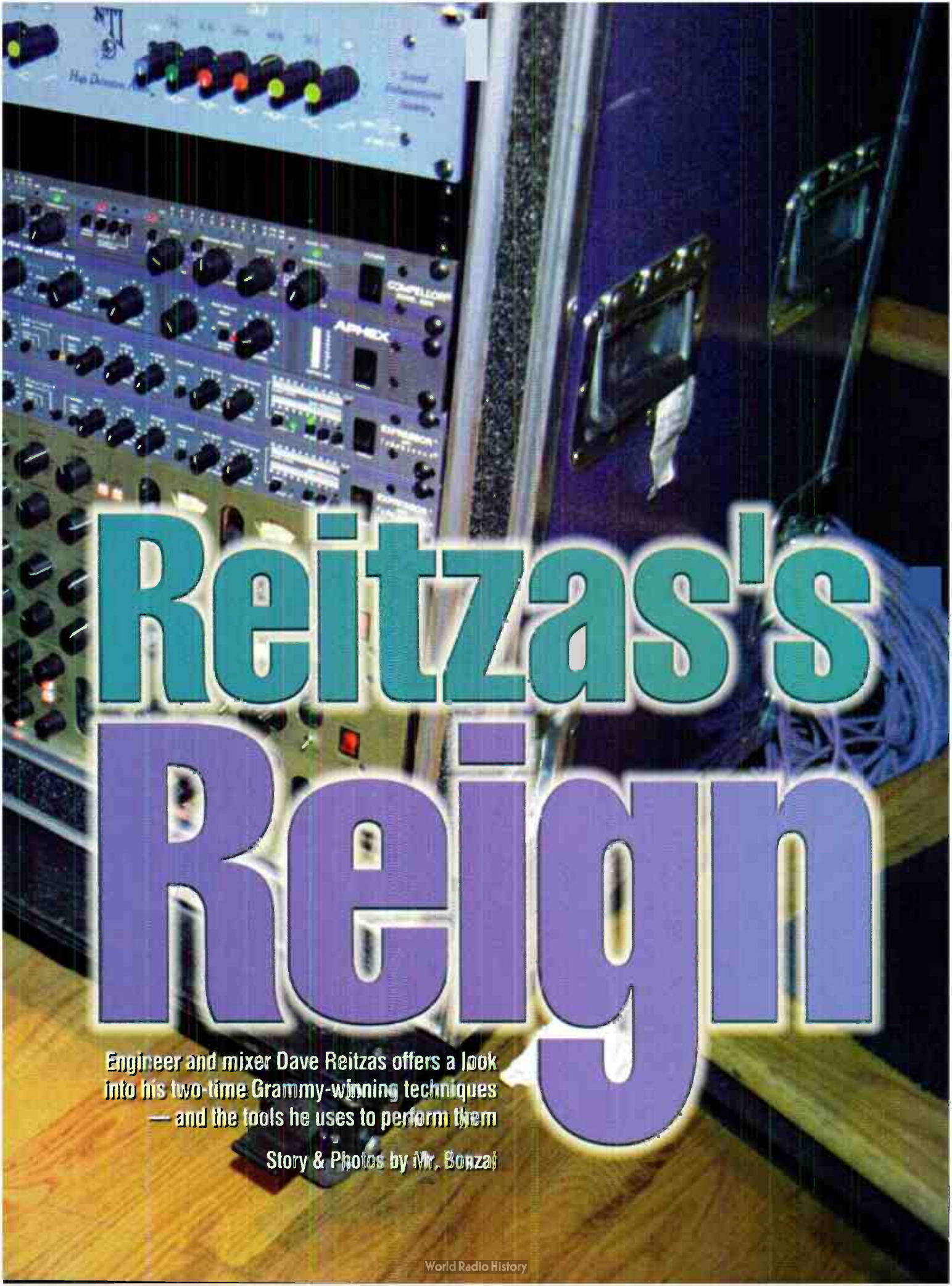

Reitzas's Reign

Engineer and mixer Dave Reitzas offers a look into his two-time Grammy-winning techniques — and the tools he uses to perform them

Story & Photos by Mr. Bonzai

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Reitzas's Reign

History was made when Dave Reitzas joined Madonna onstage at the '99 Grammys. With more than a billion people watching, the engineer was finally recognized alongside the winning artist. A big step for Dave Reitzas; a significant step for the art of engineering.

I first met Dave Reitzas more than a decade ago when he was working as an assistant engineer at David Foster's Chartmaker Studios in Los Angeles. It wasn't long afterward that he graduated to solo engineer on Foster projects with artists such as Whitney Houston and Barbra Streisand. His credit list today includes Madonna, Ricky Martin, Celine Dion, Michael Bolton, Natalie Cole, Barbra Streisand, Frank Sinatra, Kenny G, Gloria Estefan, Babyface, and Jimmy Page & Puff Daddy. Nominated five times, he received his first Grammy for his engineering on Natalie Cole's *Unforgettable*, and his second this year for his work on Madonna's *Ray of Light*.

As a college student, Reitzas studied music, harmony and percussion, with hopes for a career as a drummer. To facilitate the good recording of his unique drum style, he traveled to Los Angeles from his Massachusetts home and enrolled in the Institute of Audio/Video Engineering. As fate would have it, drumming took a backseat to engineering as Reitzas ambitiously began to pursue the professional studios like Cherokee, Rumbo, and, eventually, Foster's studio in Malibu.

Mr. Bonzai: They say you're the fastest engineer with the Sony 3348 digital multitrack — how did you get so fast?

Dave Reitzas: I've been using the 3348 for about seven years, and it's an amazing tool — more than just a recording machine. It also functions as a sampler, a digital copier, a calculator, etc. I took it upon myself to read the manual every day, learn something new, and come up with ways to apply it in my sessions. This went on for a couple of years — finding something in the manual that I didn't know about and then applying it to something it wasn't originally intended for.

The 3348 has an internal sampler that can capture sound, move it forward or backward, reverse it, truncate it, or repeat it. In the past, if you wanted a sound to be repeated or moved in a song, you would have to fly it to an external sampler or tape machine, and then fly it back. With the 3348, I move stuff around all the time, with millisecond accuracy — all inside the machine. I even use the external trigger input for triggering and replacing drum sounds.

How has the advent of hard-disk editing and recording, like Pro Tools, affected your multitrack digital work?

Pro Tools has made my life simpler, yet more creative because now I have more things that I am able to do. Pro Tools accomplishes the same editing functions that I just described, but with new convenience. The positive aspects of hard-disk recording are flexibility, sound quality, functionality, and especially the ability to use plug-in DSP effects. The quality of 24-bit Pro Tools is as good as what I have been doing with multitrack recording — no less than 16-bit on the 3348.

How does it compare with analog?

Like apples and oranges, both delicious but different.

How do you use the big fat analog tape?

I use the big fat analog tape if the artist wants the big fat analog sound. But with some of the processing plug-ins for Pro Tools, and with analog processing in a digital session, you can create much of that warmth of analog tape.

Do you think that digital will replace analog?

The likelihood is the same as the CD replacing the cassette. There will always be people who prefer tape for particular reasons, but this is the brave new world, and I choose to embrace the new technology. I see the benefits of both — analog adds a characteristic to a recording that has a personality of its own. Some sessions call for that, and that's when I'd have a reason to use a tape like Quantegy's GP9. The analog

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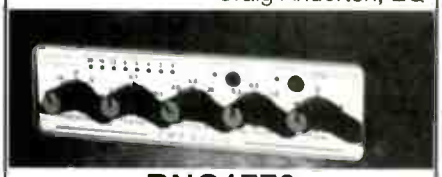

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Reitzas's Reign

OF CORRS: Dave Reitzas with his current project, the Corrs.

tape companies are doing their best to keep up with new technology, and improve what they spent all those years developing.

You take quite a bit of gear along to your sessions. Let's take a look at your small rack. [See photo on pages 60-61.]

OK — on the top I have my Eventide DSP 4000, which is an incredible piece of equipment. It's my special effects unit, with all sorts of weird Eventide algorithms and presets that I use for their weirdness. It has great algorithms from engineers, including Bob Clearmountain's "nemwhipper" that I use for tuning things. I got it when I started the *Evita* soundtrack project for Madonna and I wanted to invest in some equipment that was at the cutting edge. I search for things that have a sound I love, then buy them and use them.

Below that is a space where I usually have an NTI preamp — the PreQ3 — but right now it's set up for an orchestra session this evening. I use these preamps on almost everything. They sound amazing, and I've received a lot of compliments from the artists I use them for. It has what NTI calls the Airband, a selectable high-frequency equalizer built right into the preamp.

The blue box below?

That's my EQ 3 from NTI, a 2-channel equalizer that operates at six frequencies with just + or –. The blue knob is a sub frequency. The green knob is 40 Hz. Then it's 160, 650, 2.5K, and the last one is the Airband. It's limited in the frequency choices, but the frequencies are very musical.

Below that is a TubeTech CL1-B compressor. It has great attack and release times, and it adds a nice sound through its own tubes.

On the bottom is the dB Technologies AD122 analog-to-digital converter. It's very flexible, and it was one of the pieces of gear I used to start doing 24-bit recording with the Sony PCM 9000. I use it all the time for sending things into Pro Tools, recording vocals to 48-track. It's just a very solid A/D converter.

Now let's move on to this larger rack of yours. [See photo of Reitzas sitting on the floor on pages 52–53.]

At the top is another NTI EQ. I have three of those. Below that is a space where I usually have another NTI preamp. Next are four different Aphex compression/expansion devices.

Next down, the gold unit is the Tube Vitalizer — I have two of them. It's a relatively new piece of gear, from the German company SPL [distributed by beyerdynamic, 516-293-3200], that I mostly use on a pair of busses and send things to them that need a bit more clarity. They make very interesting pieces of gear that do different things apart from your average reverb-delay-chorus device. They have designed components that deal with warmth and presence. It's a new line of tube equipment.

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At the bottom of the rack is the Qure equalizer from SPL, which is a tube equalizer. It sounds good for things that need more surgical-type equalization. For example, the NTI is a broad-sounding EQ with fixed frequencies. With the Qure, I get fine tuning, where you can narrow in or widen out on EQ changes.

Anything else that you carry around with you?

Yes, I have a TC Electronic M5000 reverb — great, smooth sounding. I also carry a Spatializer Retro, a Pro Spatializer for spatial effects, and a solid-state Vitalizer, which also has some spatial effects and helps to pull things out of the speakers. I have a Marantz CD recorder. And I also have a full blown Pro Tools 24-bit system. I carry my own speakers: Genelec 1032's with a 1092 subwoofer, and a collection of A-T microphones, guitar pedals, Lava lamps, and assorted gadgets. Everything is wired to a patchbay.

Being a drummer yourself, you're known for your great drum sound — how do you do it?

I think that a great drum sound mostly comes from a great drummer and a great drum set. With the Corrs album [I recently worked on], and Caroline Corr on drums, I was fortunate to have both. It was great to record live drums for this record because most of the first record was drums sequenced from drum pads.

Lately, I've been using the Audio-Technica 4050's as my overheads and the A-T 4060's for the room. Other than that, it's the typical Shure 57's for the snare, Sennheiser 421's for the toms, or sometimes AKG C12 A's, and an AKG 451 or Neumann KM 84 for the 'hat. For the kick drum, I like to use a mic like the 421 up close to the head for the attack and then I'll put an AKG-414 or a Neumann U 47 FET further back from the drum for the bottom end.

The most exciting moment I've ever had recording drums was when I was working with Bob Clearmountain for the first Corrs record, recording Simon Phillips at the Record Plant.

You're also known for capturing great vocals with artists such as Barbra Streisand, Madonna, and Whitney Houston. What microphones do you prefer?

I like to use old Neumann and AKG tube

World Radio History

microphones, or the new Audio-Technica 4060 tube mics, which have worked great with a number of artists, such as on the new Lara Fabian record. I like microphones that have full body and a warm sound. For vocals, I mostly work with the NTI PreQ-3 preamp, into the EQ3, then to a compressor like the TubeTech, and mult the output of the compressor to, usually, eight tracks. I then take the eight outputs into the eight inputs of a comp box and take the single output of the comp box to the input of a track on the multitrack and then monitor on one channel of the console. This is so I am ready to do a composite vocal immediately following the recording of the vocal, or I can give examples of what a comp might be while singers are still in the studio singing.

Consoles?

I work on everything, but I love to work on the SSL9000. It sounds great, and the automation is very user friendly. It's a console that allows you to be creative and musical. A lot of the digital consoles are functionally great, but there's that intermediate step of having to find where an instrument or setting is before you can adjust it. I've been using the [Neve] Capricorn or [Digidesign] ProControl for a lot of digital mixes, but I'm excited about SSL's new digital Axiom MT console.

Your education included music, harmony, and percussion. How important is that training for an engineer?

It's very important — our job is to capture music, and, for me, having a musical background is a necessity. We're called engineers, but there is really a musical aspect, as well as the functional and the sonic aspects. Sound is so subjective, so it's very important to be musical — where you punch in, where you punch out. It's so helpful when you can subdivide for punching or timing, and you can tell when something is in tune, or you can talk in the right language. If the artist says, "Get me in on the G," you don't have to look at your numbers to know where the G is.

What happens when you go into mix mode?

I try to discover the vision of the artist. Then I study what is on tape. I start out by learning the song and where the dynamics are in the recording. I'm trying to build on the things I don't need to change.

I used to have tendency to listen to the kick drum and try to make it better. Then I'd listen to the bass and I'd have to make the bass better to match the kick. And then everything else had to get changed because of the kick and the bass. You'd end up with a mix that sounded completely different from the way that it was recorded. Now I try to let the tracks speak for themselves, and then make adjustments as necessary.

Your rough mixes, such as the one for Whitney Houston's "I Will Always Love You," and Madonna's "You'll See," ended up as the final mixes. How did that happen?

It's because they came from the heart and there was very little brain activity involved. It's an emotional, unanalytical attempt to work with what you are immediately feeling from the song. As soon as you start adding automation and going section by section, it starts to become a thought-out process. [There's] nothing wrong with that, but the rough mixes are uninhibited, spontaneous. It's almost like a live perfor-

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Zenon Schoepe, EQ Magazine August 1998

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mance — something magical going on.

Anyone from the past who you would have liked to work with?

I wish that I could have worked with Jimi Hendrix, Led Zeppelin, Jeff Buckley, or Sublime.

How about the present?

I'd love to do a record with Metallica or Tom Petty. Very deep records!

Advice for getting a good start as an engineer?

Pay attention. Be prepared. Learn from your mistakes. Listen.

Could you give me some quick reflections on the producers you've worked with? David Foster?

Foster is so gifted musically and knows how to make decisions. I'm where I'm at today because of David. He always reminded me that it was going to be my name on the album, and I'd better be proud of the efforts I put into each project.

Walter Afanasieff?

Killer bottom end and awesome snares! Walter is another incredibly talented musician and a great friend. It's amazing to watch him create in the studio.

Phil Ramone?

Phil has so much history in this business and he's given me great advice about how to make a session run smoothly. He's so re-

World Radio History

laxed, yet on top of every detail.

Babyface?

Coolness and simplicity.

Mutt Lange?

I learned from Mutt a whole new way of listening to feel. He's got such a great sense of rhythm and arrangement.

How would you summarize your job?

My job is to create an environment to capture musical moments and convert them to a listenable product. I am trying to figure out what the artist is looking for, what the producer is looking for, and trying to facilitate that. To reach that goal, I will use whatever equipment or tricks that I know. But it's not so much what gear I use, it's more a matter of finding out what the artist is looking for and then using the gear that is appropriate.

Many engineers have aspirations to take charge as the producer. Are you satisfied with your role as an engineer?

I am very satisfied as an engineer and a mixer, and I'm currently expanding into more productions. My role is to be a part of the musical team and use my experience as an engineer to augment the talents of the producers and the artists — we all need each other.

Dave Reitzas can be contacted at Reitzas@compuserve.com.

new

Platinum ComPounder™ from Focusrite delivers a huge array of sounds

This new dynamics processor brings you a rack full of high performance Focusrite CLASS A compression, limiting and Gating in one unit to take your sounds to the next level. Use when ever dynamic control is required for:-

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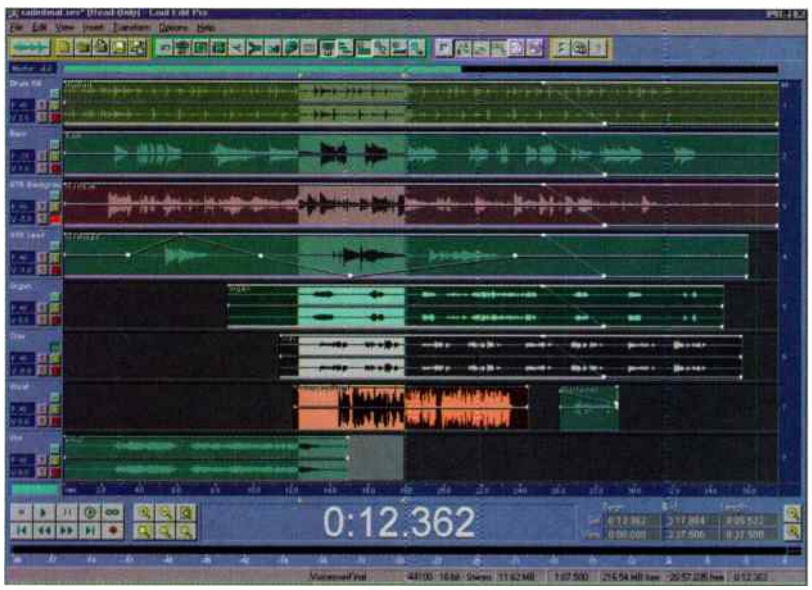
SUMMER NAMM PREVIEW

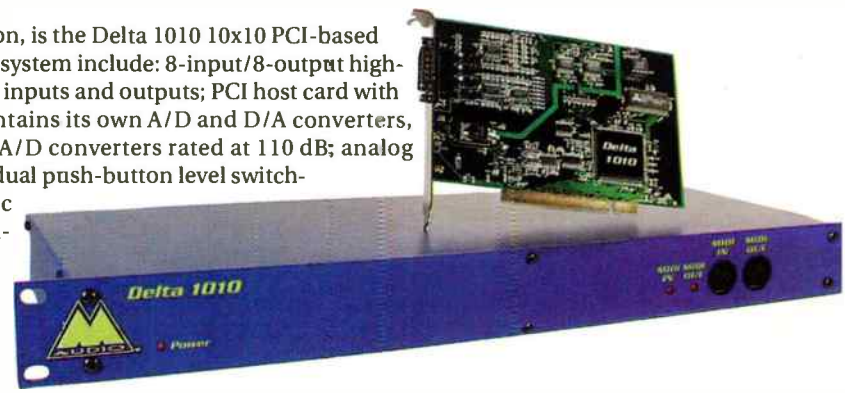


AN EVEN COOLER EDIT

Syntrillium Software Corporation announces the release of Cool Edit Pro Version 1.2. Cool Edit Pro is a digital audio editor, recorder, and mixer application for Windows 95/98 and Windows NT. Major features of this latest release include new Full Reverb, Hard Limiter, and Pitch Bender effects; RealMedia G2 support; real-time preview and enhanced quality for almost all effects; and automatic silence detection and deletion. Version 2.1 also includes a set of video tutorials that demonstrate how to navigate in Cool Edit Pro and use its main features. As with the Version 1.1 release, Version 1.2 upgrades are available free of charge to licensed users of Versions 1.0 and 1.1. Users can download a fully functional demonstration version from Syntrillium's Web site at www.syntrillium.com. For more information, call Syntrillium at 602-941-4327 or fax them at 602-941-8170. Circle EQ free lit. #102.

DELTA'S DAWN

New from M Audio, MIDIMAN's digital audio division, is the Delta 1010 10x10 PCI-based digital audio system. Features of the 24-bit, 96 kHz system include: 8-input/8-output high-performance audio; S/PDIF, MIDI, and word clock inputs and outputs; PCI host card with external break-out box configuration (break-out box contains its own A/D and D/A converters, MIDI, and word clock); D/A converters rated at 117 dB; A/D converters rated at 110 dB; analog I/O balanced or unbalanced on 1/4-inch jacks with individual push-button level switches for +4 dBu or –10 dBV; hardware sample-accurate sync links multiple PCI Host cards; and Windows 95/98, Windows NT, ASIO, and MacOS drivers. The suggested retail price is $995.95. For more information, call MIDIMAN at 626-445-2842, fax them at 626-445-7564, or visit www.midiman.net. Circle EQ free lit. #103.



World Radio History

FOUR STARS

Soundcraft introduces the Series FOUR, a front-of-house console that offers control in a compact package. The Series FOUR is a fully modular, VCA-equipped console that follows the layout of the Series FIVE, but in an altogether smaller footprint. It is available in 24-, 32-, 40-, and 48-input frame sizes, with each size having an additional complement of four stereo inputs. The stereo mic/line inputs have full EQ as standard; more can be added in place of mono inputs. The EQ includes two parametric bands with sweep shelving/bell highs and lows. There are ten auxes, four of which are mono/stereo switchable and have direct access to the built-in 16 x 8 matrix. For more information, call Soundcraft at 615-360-0471 or fax them at 615-360-0273. Circle EQ free lit. #104.

EXPRESS YOURSELF

The Kurzweil Expressionmate is a MIDI processor that can be added onto any MIDI device. It comes as two parts: the desktop control box and the 600-mm ribbon controller fashioned after the K2500 long ribbon. The control box transposes incoming MIDI notes per zone; allows MIDI control over MIDI volume, pan, expression, sustain, sostenuto, etc.; allows for fixed controller values to be generated, as well as user-defined sys ex strings; and provides for breath controller input (Yamaha BC-1t, BC-2t, BC-3t all supported), two footswitches (one can be a CC pedal), and two programmable front-panel buttons. The 600-mm ribbon controller can be used as single zone or split into three discrete zones acting independently, each assigned to a separate MIDI channel; can be operated as a handheld device, or can be placed on a synth or other MIDI controller; and can be oriented with the cord extending out from the left or right. The unit comes with a microphone stand adapter to mount the control box. The suggested retail price is $549. For more information, call Kurzweil at 253-589-3200 or fax them at 253-984-0245. Circle EQ free lit. #105.

SECOND-GENERATION RADAR

Otari introduces RADAR II HDR series digital multitrack — the second generation of the company's hard-disk multitrack recording system, RADAR. RADAR II is the world's first stand-alone 24-bit, 48 kHz sampling, 24-track hard disk recorder. The unit features a 9-GB removable hard drive and an all-new remote control console that emulates the operation and feel of a remotely controlled analog tape recorder. An optional T/DIF link with 24-track digital I/Os allows the recorder to communicate directly with digital consoles. It is also upwardly compatible with RADAR via user-selectable 16- or 24-bit operation. Multiple RADAR II's may be linked together (up to 192 tracks), and the enhanced RE-8 II controller provides track arming and optional metering of up to 48 tracks of audio. RADAR II also features an "auto-reclaim" function that lets the user automatically recover unused disk space to maximize storage capacity at all times. RADAR II is compatible with a variety of user-defined storage and backup options, such as Exabyte drives. For more information, call Otari at 818-598-1200, fax them at 818-594-7208, or visit www.otari.com. Circle EQ free lit. #106.

World Radio History

SUMMER NAMM PREVIEW

CD BURNING SOLUTION

TASCAM introduces the CD-R624M and CD-R624W software solutions for Macintosh and Windows. The CD-R624 packages both burn 100-percent Red Book-compliant audio CDs and popular data CD formats. Everything a user needs to get started is included in the package, including cabling, blank media, tutorials, and even a CD labeling kit. The CD-R624 can also create data CDs to back up computer files and create MP3 audio files. The CD-R624W version's hardware includes an Adaptec PCI SCSI card (2903 bus master) plus a TEAC CD-R56S/614 6X24 external drive. The software includes a SEK'D Red Roaster 24 v5.20, an Adaptec EZ CD creator v3.5b, and Xing AudioCatalyst v2.0. For more information, call TASCAM at 323-726-0303, fax them at 323-727-7635, or visit www.tascam.com. Circle EQ free lit. #107.

THE RIGHT MX

Behringer's MX3242X 4-bus mixer features an internal effects section with 20-bit AD/DA converters, a 24-bit DSP, a 48 kHz sampling rate, and the advanced reverb algorithms of Behringer's popular Virtualizer processor for natural reverbs, delays, and modulation effects. The unit includes 16 channels in a compact inline design, 4 subgroups, 4-band EQ with swept mids on main channels, 6 aux sends, 4 stereo effects returns, individual 8-segment LED indicators for each channel, 100-mm Panasonic faders, global 48-volt phantom power, and a built-in talkback mic. Solo switches are provided for every aux send, aux return, and subgroup for more control. The MX1804X is a rack-mount/table-top mixer offering the same effects featured on the MX3242X. It has 6 mono channels, 4 stereo channels, 2+2 busses, and 10 channel inputs. Both of these new mixers feature an external power supply. The suggested retail price for the MX3242X is $1279 and the MX1804X is priced at $569. For more information, call Behringer at 516-364-2244, fax them at 516-364-3888, or visit www.samsontech.com. Circle EQ free lit. #108.

TUBE TONES

DOD's new VGS50 valve guitar system puts both real tube tones and flexible multieffects processing in an affordable floor-controlled package. The VGS utilizes a 12AX7 tube to provide four analog distortions, in addition to the processor's four solid-state distortions. The unit also boasts a total of 18 effects, with up to seven available at once. In addition, a built-in expression pedal permits real-time control of nine different parameters such as Analog Wah, Pitch Bend, and Volume. DOD's "Learn-a-Lick" feature allows up to 10 seconds of a CD or cassette to be sampled then slowed down — with no change in pitch — to make learning licks and solos a snap. The suggested retail price is $299.95. For more details, call DOD at 801-566-8800, fax them at 801-566-7005, or visit www.dod.com. Circle EQ free lit. #109.

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Darla just turned 24. Champagne, anyone?

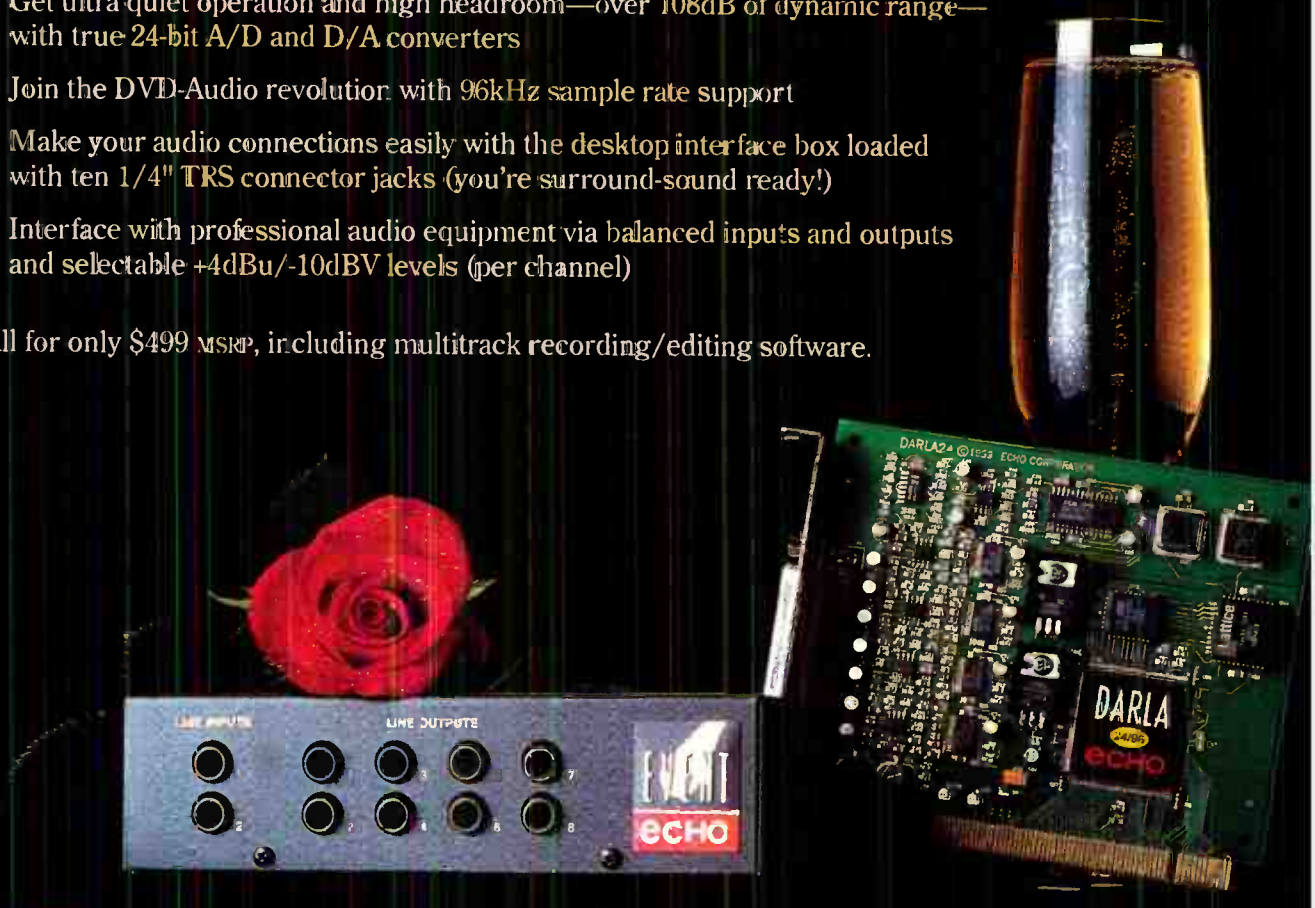
Darla, along with big sisters Gina and Layla, set the standards for excellence in computer-based digital multitrack audio. The best specs. The most flexible features. The widest compatibility. The easiest setup.

And now the baby of the family has really matured.

Meet Darla 24. Not just a simple evolution of a product, but a major leap forward in performance and value.

- Get ultra-quiet operation and high headroom—over 108dB of dynamic range—with true 24-bit A/D and D/A converters
- Join the DVD-Audio revolution with 96kHz sample rate support
- Make your audio connections easily with the desktop interface box loaded with ten 1/4" TRS connector jacks (you're surround-sound ready!)
- Interface with professional audio equipment via balanced inputs and outputs and selectable +4dBu/-10dBV levels (per channel)

All for only $499 MSRP, including multitrack recording/editing software.



EVENT ELECTRONICS

Darla 24™ Professional Digital Multitrack

The little one from the world's most trusted family of affordable digital audio recorders has grown up—*big time.*

For PC and Macintosh computers. Available now at finer music stores.

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SUMMER NAMM PREVIEW

DJ KAOSS

Following the release of the ELECTRIBE dance-oriented synthesizer products, Korg USA is introducing the KAOSS PAD dynamic effect/controller. This product allows real-time control over digital effects processing for any audio source, including records, CDs, samplers, or keyboards. The KAOSS PAD's X-Y pad controls the way in which effects are applied by modifying separate parameters in the horizontal and vertical directions. For example, the user can simultaneously control the delay time and feedback of a delay line, or simultaneously modify the cut-off and resonance of a filter. The X-Y pad can be scraped or tapped lightly to control the effect sound. Available this summer, the KAOSS PAD will list for $350. For more information, call Korg USA at 516-333-9100 or fax them at 516-333-9108. Circle EQ free lit. #110.

First Look: Audio-Technica AT4047/SV Mic

The first thing you'll notice about the AT4047/SV is Audio-Technica's departure from Darth Vader black for this mic (yes, I had to get one more *Star Wars* dig in). Replacing the black is a chrome-on-chrome look, for a bit of a nostalgic feel. I like silver mics — especially when I do live gigs in the sun, where anything black gets cooked (more on that later). A well-designed suspension mount is included. This mount has a positive lock on the mic, which assures no embarrassing tumbles to the floor (the mic, not me). An optional foam windscreen is also available for close vocal or outside work.

Controls include a 2nd-order (12 dB/octave) 80-Hz, low-cut filter and a 10-dB pad. You may never need to use the pad, since the mic is rated for 149 dB SPL without it, and 159 dB SPL with the pad engaged. A full 48-volt phantom power, which is now included on most mixing consoles and all mic preamps, is required to power it up. I can't wait to try this mic on trombones and trumpets, both of which can easily overload a condenser mic (look for a full review next issue). Yes, this is approaching munitions levels and, in fact, I do intend to use a pair of them on timpani for the yearly Antietam Battlefield July 4th concert with the Maryland Symphony Orchestra. There will be real howitzers for the 1812 Orchestra! However, before you think this is just a brute force mic, let's review the details that will allow it to be a rapier rather than a broadsword.

The 4047 utilizes a completely new design with discrete FET drivers as well as an output transformer. This allows the engineers at A-T to balance the three major elements that define the sound of a microphone: the capsule, electronics, and output transformer. They chose to make it a cardioid pattern only, and, while it has a dual diaphragm, the rear element is not used electronically to produce the pattern. It's done with a more conventional acoustic cancellation. This gives a completely different sound to this mic from any of the others in the well-known A-T "40" Series. They call it warm but with a defined presence. I like to think of this as yet another paintbrush with which to paint my acoustic picture. Some situations require a wide brush for slopping on lots of thick paint, while other situations require a tiny sable brush. The design of the AT4047 promises lots of patina, not just a cheap gloss coat.

In addition, much attention has been paid to the element's tension and damping, which contribute to phase accuracy. As I've written before, a phase accurate transducer can transfer more of a sense of immediacy than one that's phase compromised. And, finally, careful selection of the electronics produces a noise floor too low for me to write about here. Yes, I'll have the official figures next month from the lab, but let's just say it's shockingly low.

Possible applications include drums (kick or overhead), horns, acoustic and electric guitar (the trend in pro sound is to use studio grade mics on cabinets), close and backup singers, and broadcast vocals. The nostalgic sound will attract a first look, the reliability of the design will make the station engineer happy, and the low price will get a nod from accounting. Also, as a promotional item, the first 600 mics sold will include a custom "tweed" flight case at no extra cost. The case will not only protect the mic, but also let everyone know you're in retro-mode. I think this mic is going to fly off the shelves.

—Mike Sokol

Price is $695 (including shock mount). For more information, call Audio-Technica at 330-686-2600 or fax them at 330-686-0719. Circle EQ free lit. #111.

World Radio History

WHAT A CARD

Not only does the Soundscape Mixtreme PCI card provide 16 channels of 24-bit digital input and output for your computer, there's also a powerful 80 MHz Motorola DSP (Digital Signal Processor) on board. Mixtreme comes with multimedia drivers for Windows 95, 98, and NT4, allowing use with most PC-based MIDI/audio sequencers and recording/editing software packages, or with video editing systems like Adobe Premiere, In-Sync Speed Razor, or Ulead Media Studio. Users can install multiple Mixtreme cards, giving a flexible digital mixing solution with up to 64 channels of I/O and multiple DSPs. The built-in EQs are fully parametric, allowing bandpass or notch filters with variable Q, cut and boost, and center frequency. Users can place as many EQs as needed in a mixer channel and all will be active simultaneously. For more information, call Soundscape at 805-658-7375, fax them at 805-658-6395, or visit www.soundscape-digital.com. Circle EQ free lit. #112.

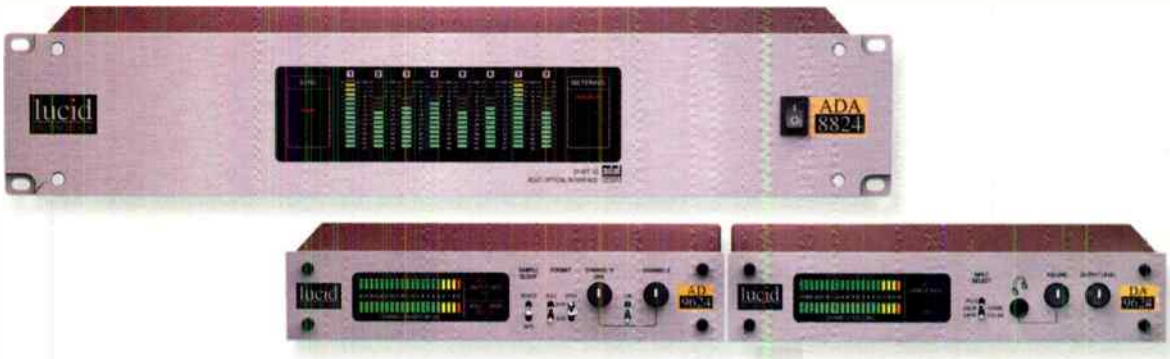
THE LOW-END THEORY

Community introduces the VLF218, a subwoofer with dual 18-inch drivers. The VLF delivers powerful output (in excess of 128 dB SPL) and high-impact transient response. The woofer is suitable for portable sound reinforcement and DJ systems, as well as fixed installations in music and dance clubs, theaters, performing arts centers, and in other venues requiring big bass output. The dual 18-inch drivers pump large volumes of air. Heavy-duty cast frames provide long-term mechanical stability during rugged use. Exclusive air-cooling design harnesses air movement in the ports to cool the magnets. This, coupled with Ferrofluid cooling, quickly transfers heat from the voice coil to the magnet structure. A vented-pole piece dissipates internal heat by drawing outside air through the motor assembly. For more information, call Community Professional Loudspeakers at 610-876-3400 or fax them at 610-874-0190. Circle EQ free lit. #113.

Capture Every Exhilarating Detail

Take your recordings to the next level with 24-bit converters from Lucid Technology.

Lucid provides the ultimate in sonic detail when going from analog to digital and back again.



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Eight channel 24-bit I/O with
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Stereo 24-bit 96kHz converters with AES/EBU
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TECHNOLOGY

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SUMMER NAMM PREVIEW

SM7 SEQUEL

Designed expressly for discerning speech and music applications, the Shure SM7A cardioid dynamic microphone features the same smooth, wide-ranging frequency response (50-20,000 Hz) and natural sound reproduction qualities as its predecessor, the SM7. Central among SM7A features, a redesigned humbucking coil provides broad-bandwidth shielding from electromagnetic hum generated from sources such as computer monitors, neon lights, and other electrical sources. Other features include bass roll-off and midrange emphasis controls, which provide a choice of four different response curves; internal air-suspension shock isolation, which virtually eliminates mechanical noise; a built-in pop filter; and a locking yoke-mount. The suggested retail price is $584. For further information, call Shure Brothers at 847-866-2200, fax them at 847-866-2279, or go to www.shure.com. Circle EQ free lit. #114.

HHB TO DISTRIBUTE ASHDOWN AMPS

HHB Communications have collaborated in a joint venture with U.K. amplification products manufacturer Ashdown Engineering to distribute their bass and acoustic guitar amps throughout North and South America. The ABM bass range, with its trademark vintage VU meter, is comprised of three amp heads with outputs of up to 900 watts, six combos, seven cabinets, and a powered sub. The lower-cost MAG range features one head, five combos, and three cabinets. For more information, call HHB Communications at 310-319-1111 or fax them at 310-319-1311. Circle EQ free lit. #115.

MULTIPURPOSE DESK

The Multi-Desk System 2 from Middle Atlantic Products is an affordable resource ideally suited for project studios. A rectangular-shaped desk (model MD2-DSK) or one of two corner workstations (models MD2-CNR1 and MD2-CNR3) serve as the central platforms upon which an MD2 system can be expanded according to user needs. All three units stand at a lowered height that is ideal for keyboards and mixing, and are built to comfortably accept any mixers with tall meter bridges. All Multi-Desk 2 components ship flat and can be assembled with nothing more than a Philip's head screwdriver. Serving as the key building block that enables users to expand the system is the Multi-Desk sideracks (model MD2-R12). The suggested retail price for the MD2-DSK is $489, while the sideracks (MD2-R12) list for $244.50 each. The workstations, MD2-CNR1 and MD2-CNR3, list for $722.25 and $800, respectively. For more information, call Middle Atlantic Products at 973-839-1011 or fax them at 973-839-1976. Circle EQ free lit. #116.

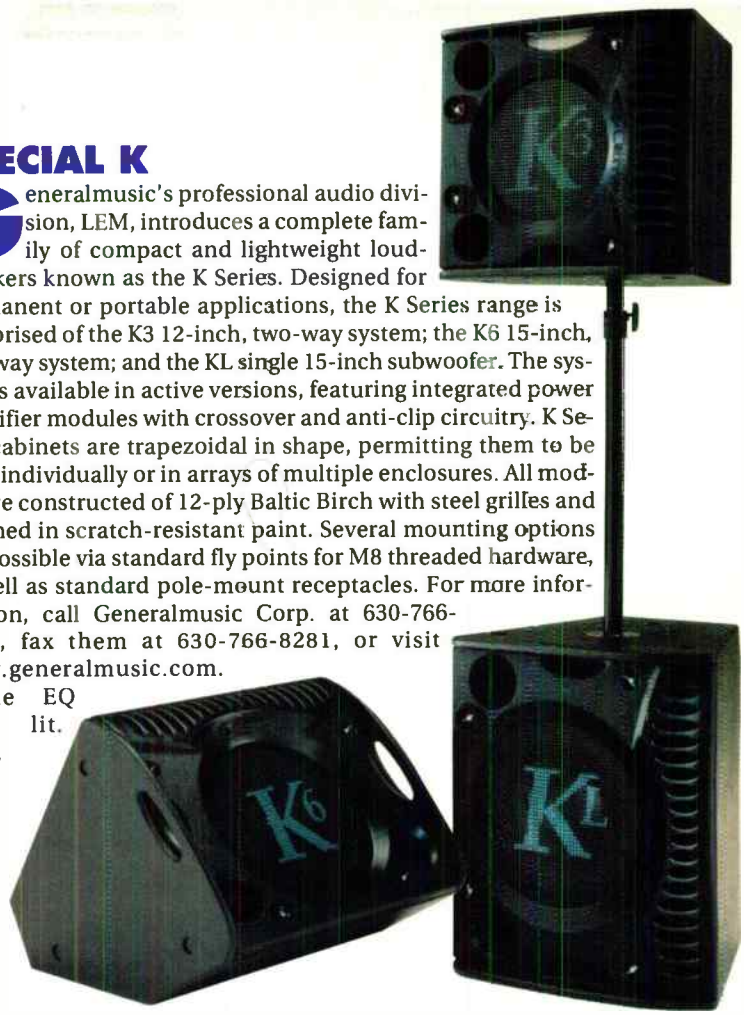
World Radio History

COMBO DEAL

Tech 21 adds a 60-watt acoustic combo amp with reverb to its amplifier line. The Bronzewood 60 offers an instrument channel and a mic channel with XLR input and phantom power. Controls for the Guitar channel include a compressor, a notch filter, a phase switch, a preamp gain, active tone controls, mic shift, and a Blend control that mixes in the desired amount of SansAmp tube/microphone emulation circuitry. The Mic channel has 3-band active tone controls, an individual level control, gain, and a separate reverb mix control to adjust the ratio of the 3-spring Accutronics reverb between the two channels. A Tech 21 12-inch speaker and a high-frequency horn are housed in a cabinet covered in brown crocodile-embossed vinyl. For studio and live applications, the SansAmp circuitry enables the Bronzewood 60 to be run direct to the mixer of a recorder or a PA system via an XLR direct output. The suggested prices are $645 for the amplifier and $395 for the extension cabinet. For more details, call Tech 21 at 212-315-1116, fax them at 212-315-0825, or visit www.tech21nyc.com. Circle EQ free lit. #117.

SPECIAL K

Generalmusic's professional audio division, LEM, introduces a complete family of compact and lightweight loudspeakers known as the K Series. Designed for permanent or portable applications, the K Series range is comprised of the K3 12-inch, two-way system; the K6 15-inch, two-way system; and the KL single 15-inch subwoofer. The system is available in active versions, featuring integrated power amplifier modules with crossover and anti-clip circuitry. K Series cabinets are trapezoidal in shape, permitting them to be used individually or in arrays of multiple enclosures. All models are constructed of 12-ply Baltic Birch with steel grilles and finished in scratch-resistant paint. Several mounting options are possible via standard fly points for M8 threaded hardware, as well as standard pole-mount receptacles. For more information, call Generalmusic Corp. at 630-766-8230, fax them at 630-766-8281, or visit www.generalmusic.com. Circle EQ free lit. #118.



No Matter How You Serve 'em, Nothing Stacks Up Like A Meek!

There are hundreds of compressor limiters for sale in the world. Some offer extra knobs and facilities, yet all miss the fundamental point that a compressor was invented to produce a psychoacoustic effect of power and dynamics and not to perform any electronic protection.

Joemeek is a creative tool and meant to effect, not protect! So, no matter how you stack 'em, JOEMEEK offers a "**world class vintage**" sound like no other compressor on today's market.

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CIRCLE 29 ON FREE INFO CARD

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SUMMER NAMM PREVIEW

EMULATE ANY SOUND

The Marquis JM120 tube-integrated modeling amplifier from Johnson Amplification combines a tube-driven preamp, a fully programmable digital effects processor, and two 12-inch speakers in a single compact package. The combo offers 18 popular amplifier tones such as Black Twin, Tweed, Rectified, Blues Combo, Boutique, High Gain, Class A Clean, Class A Dirt, and more. The list price is $1099. For more information, call Johnson Amplification at 801-566-8800 or fax them at 801-566-7005. Circle EQ free lit. #119.

Alesis MasterLink ML-9600 Master Disk Recorder

While DAT has had a good, long run as the mastering medium of choice, a new product has finally surfaced that offers a significantly improved feature set and the ability to grow with the evolving needs of our industry. Alesis Corporation has just introduced the MasterLink ML-9600 high-resolution master disk recorder, a combination of hard-disk recorder with DSP capability and CD-R burner.

What makes the MasterLink so promising lies in its ability to not only record up to 24-bit, 96 kHz digital audio direct to disk, but, more importantly, burn the data directly to widely available, inexpensive CD blanks via the integrated CD-R drive in a new Alesis format known as CD24. Using CD24 technology, the MasterLink becomes the world's first system capable of producing CDs that record and play with up to 24-bit, 96 kHz resolution. While CD24 is a proprietary format and not compatible with the Red Book CD audio format used by common CD players (yes, it reads and writes Red Book also), the data is written to disk in the AIFF format and can be read by common CD-ROM drives as the disc format is ISO 9660. This makes MasterLink files accessible to virtually any mastering facility, even if they don't own a unit.

As stated a moment ago, you can burn Red Book (16-bit, 44.1kHz) CDs and the MasterLink will perform the sample-rate conversion for you — even if your source files are of mixed word lengths and sampling rates. The 3.2 GB hard disk provides roughly 5 hours of 16-bit, 44.1 kHz recording time and better than 95 minutes at 24-bit, 96 kHz. The drive will accommodate 16 playlists, each with 99 tracks, providing an abundance of room for multiple projects or multiple sequences of the same project.

Operation is intuitive and uncluttered. By simply pressing a dedicated "Create CD" button, the unit's internal 4X CD-R drive will burn a standard Red Book CD (74 minutes of program material) in about 20 minutes — all without tying up your computer's resources. Similarly, a single button toggles between Red Book and CD24 audio formats. And speaking of the ability to grow, MasterLink's software can be updated via the CD-R drive. What updates? Only time will tell, but the unit has the ability to add updates to its operating system as well as the potential for 3rd party plug-ins to its DSP capability.

MasterLink's DSP capability is referred to as Finishing Tools. These "finishing tools" are provided to help you create a polished stereo master and include EQ, compression, normalization, and peak limiting. They enable you to optimize the timbre and dynamics of each individual program, as well as to establish a professional sonic consistency from track to track. It should be noted that the DSP format is proprietary and, as such, is not DirectX or VST compatible.

The rear panel provides both balanced (XLR) and unbalanced (RCA) analog inputs and outputs. The MasterLink employs 24-bit converters with 128X oversampling for both A/D and D/A conversion. At 24-bit, 96 kHz, the unit's frequency response is 20 Hz–40 kHz, +0, –0.5 dB, while THD+N is an extremely low <0.002% @ 1kHz, –1 dBFS. For digital I/O, the MasterLink provides support for both the AES (terminated on XLR connectors) and IEC958 Type I (terminated on coaxial connectors) formats.

Slated to ship this fall, the unit is well-suited for delivering finished masters to duplication houses, delivering stereo mixes to outside mastering facilities, handling inexpensive archival of material, and, with its instant start capability (via an internal RAM buffer), makes a viable tool for the radio broadcast environment. —*Roger Maycock*

Price is $1699. For more information, contact Alesis Corporation, 1633 26th Street, Santa Monica, CA 90404. Tel: 800-5-ALESIS. Web: www.alesis.com. Circle EQ free lit. #120.

World Radio History

DITCH YOUR WIRES

Sennheiser announces the Digital 1000 wireless microphone system. Operating in the 900 MHz ISM frequency band, the Digital 1000 system features four user-selectable channels, 16-bit A/D-D/A conversion for CD-quality sound, and scanner-proof transmission security to prevent eavesdropping. The digital circuitry of the system eliminates the need for a compander and the audio degradation commonly associated with it. The Quadiversity receiver is fitted with four internal antennas, microprocessor controlled for freedom from dropouts. All transmitters are powered by a 9-volt battery. The system is priced at $895. The Digital 1000 wireless system is available in three versions: handheld, body pack, and instrument. For more information, call Sennheiser Electronics Corp. at 860-434-9190, fax them at 860-434-1759, or go to www.sennheiserusa.com. Circle EQ free lit. #121.

VOCALS WITH VIGOR

Designed with a hypercardioid polar pattern and a tailored vocal frequency response, the beyerdynamic TG-X 58 is ideal for vocalists. The TG-X 58 comes with a rubberized handle to reduce handling noise and a locking on/off switch. Its uniform polar pattern offers high gain before feedback. Supplied accessories include the MK-8 mic clip and gig bag. For more information, call beyerdynamic at 516-293-3200 or fax them at 516-293-3288. Circle EQ free lit. #122.

PUSH THE ENVELOPE

The new Q-TRON+ envelope follower from Electro-Harmonix adds the power of a built-in Effects Loop and Attack Response Control to the original Q-TRON. The Effects Loop lets the musician place a sound effect between the Q-TRON+'s envelope detection circuitry and filter sections without changing the envelope drive. The harmonics created by a distortion pedal can now be processed by the filter without degradation to the signal's natural envelope and with full dynamic response. Electro-Harmonix claims that plugging other devices, such as the Electric Mistress flanger or Deluxe Memory Man analog delay, into the Q-TRON+ creates an array of new sounds. The Attack Response Control lets the player select between a slow, smooth, vowel-like attack and a fast, snaked response of the original Q-TRON. The Q-TRON+ is available for $278. For more information, call Electro-Harmonix at 212-529-0466, fax them at 212-529-0486, or visit www.ehx.com. Circle EQ free lit. #123.

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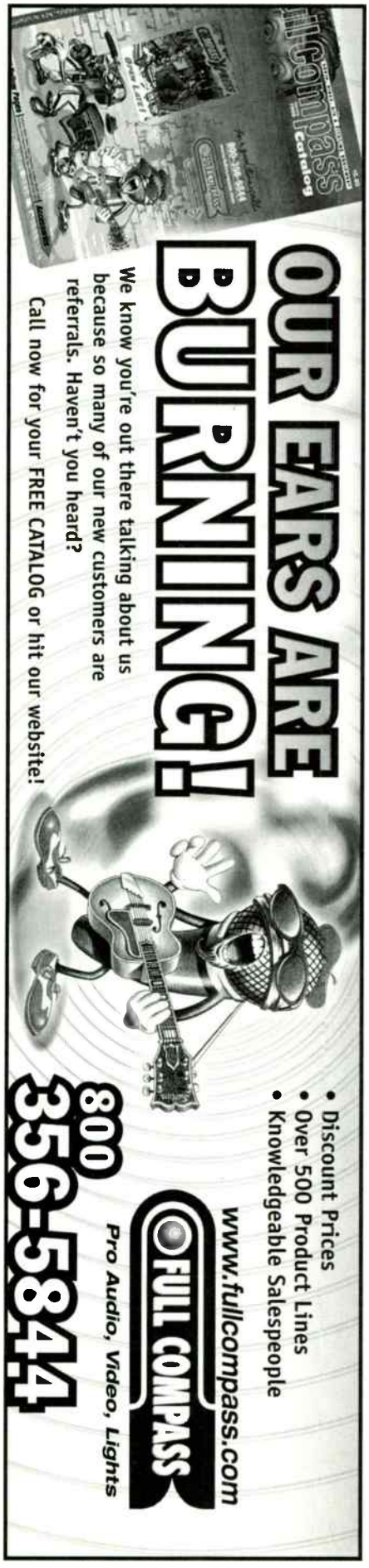

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ON-STAGE COMBO

Zoom has now combined a live effects guitar processor with an easy-to-use drum machine and a guitar-intensive riff sampler in the new GFX707. The unit's on-board drum machine includes 45 preset rhythm patterns featuring high-quality PCM sounds. The internal samplers let players sample sounds from CD, MD, or tape for learning riffs and phrases and create multilayered effects in live performance. The system also includes 48 Zoom guitar effects, including a variety of distortions, reverbs, delays, modulation effects, and more. Designed for performance, the system features analog edit knobs for easy adjustment of effect parameters in real time. A large LED clearly shows all critical information on dark stages and other low-light situations. The GFX707's built-in expression pedal controls volume, wah, and other effect parameters. The unit can be powered by four AA batteries or an optional AC adapter. The suggested price is $229. For more information, call Zoom at 516-364-2244, fax them at 516-364-3888, or visit www.samsontech.com. Circle EQ free lit. #124.

HOUSE MUSIC

Configured vertically as a virtual point source, Hot House's ARM 265 reference monitor exhibits solid imaging, fast transient response, and a bandwidth over a 9-1/2-octave range. The biamplified monitor consists of twin 6.5-inch woofers and an ultra-low distortion-recessed dome tweeter in a rear-vented 6th order alignment. When configured as a 3-way system in various combinations with Hot House's ASB Active Sub-Bass units, the LF bandwidth, transient capability, and peak SPL at the mix position rivals that of large main monitors available. The peak SPL is 126 dB per pair, the frequency response is 30 Hz to 20 kHz, and the signal-to-noise ratio is 102 dB. The suggested retail price is $6499 per pair. For more information, call Hot House at 914-691-6077 or fax them at 914-691-6822. Circle EQ free lit. #125.

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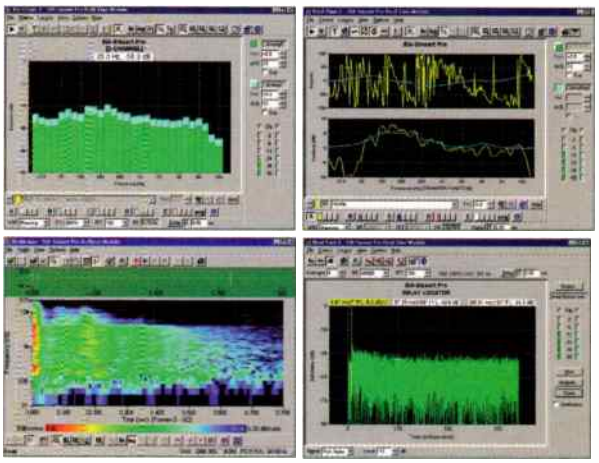
JBL Professional is now distributing the original SIA-SMAART for Windows 3.1, which was developed to provide sound system contractors, acoustical consultants, and audio professionals with an accurate and easy-to-use sound system optimization and acoustical analysis tool. SIA-SMAART Pro is actually a suite of two distinct program modules; a Real-Time module and an off-line Analysis module. The SIA-SMAART-Pro Real-Time module offers the features of a standard FFT-based real-time spectrum analyzer enhanced by real-time Transfer Function capability. The Transfer Function feature is a tool for assessing the performance of an entire sound system, a specific part of a system, or a single system component. For more information, call JBL Professional at 818-894-8850, fax them at 818-830-7802, or visit www.jblpro.com. Circle EQ free lit. #126.



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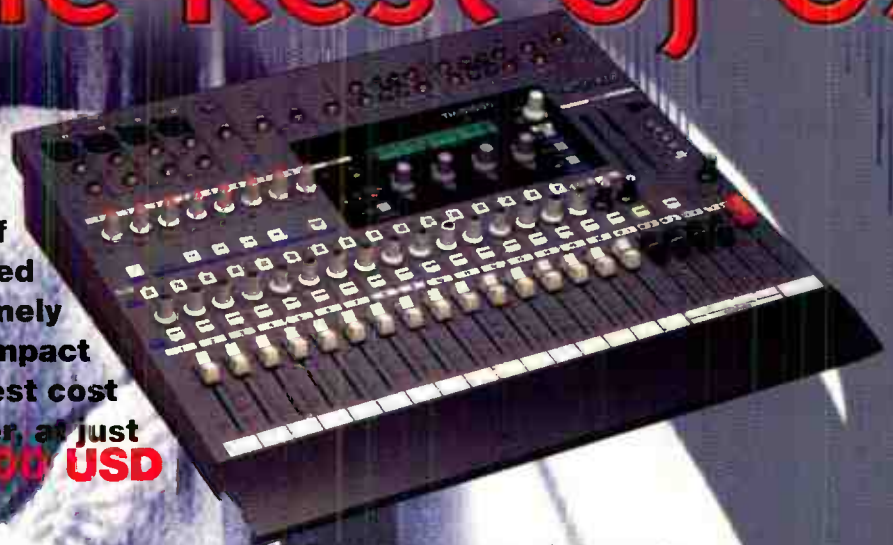

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FORMAT WARS

DVD-AUDIO AND SUPER AUDIO CD

BY BOBBY OWSINSKI

All right, we know what you are thinking: After the big "Special No Mention of *Star Wars*" banner on top of the last issue, we go and jump on the Lucasfilm bandwagon and design a feature based on the omnipresent film. But the truth of the matter is that the way we listen to music is on the verge of a drastic — even revolutionary — change. Now that DVD is becoming commonplace on the shelves of the local electronics superstore, two new formats also are about to enter the lexicon of the consumer, and this time they're audio specialty items. The DVD-Audio disc and Super Audio CD (SACD) are getting more and more press these days, so we decided to give you a quick (but thorough) overview as to what to expect from, and how to prepare for, each format.

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SOME BACKGROUND FIRST

Before we talk about DVD-A and even SACD (since they're loosely related), some DVD basics are in order. The DVD distinguishes itself from a CD in two ways; storage capacity and file system.

Storage Capacity: While the storage capacity of a current CD is 650 MB, the capacity of a DVD can be one of four levels, all far exceeding the CD. This is accomplished by having more and smaller pits on the substrate than that of a CD. Add to this the fact that DVD can have two layers and be double sided, and the power of DVD becomes readily apparent. (See fig. 1.) Because a laser with a smaller wavelength is required, a CD player cannot read a DVD. *A DVD player can read a CD, though.*

Please Note: There's some unfortunate confusion as to the actual capacity of a DVD because it's measured differently than the computer norm. For example, a DVD-5 has 4.7 billion bytes (G bytes) not 4.7 gigabytes (GB). The confusion occurs because DVD is based on multiples of 1000 while the computer world measures bytes in multiples of 1024. Therefore, a DVD-5 has a capacity of 4.38 gigabytes.

File Format: Today's CD can be thought of as essentially a "bit bucket" in that there is no intelligence built into the different file formats required for audio CD, CD-ROM, CD-R, etc. DVD differs in that the various types use basically the same DVD-ROM-like format with a bit of intelligence built into the specification.

DVD uses a file format known as Universal Disc Format, or UDF, which was designed specifically for use with optical medium and avoids the problems and confusion that CD-ROMs had because of the many different file formats used. In fact, UDF permits the use of a DVD by DOS, OS/2, Macintosh, Windows, and UNIX operating systems, as well as dedicated players. What's interesting is that a dedicated DVD player will access only the information that it requires and all other files will remain invisible. It also means that the file system for use with computers is already built into the format, which widens the potential market without having to jump through programming hoops.

DVD-V BASICS

DVD-Video burst upon the scene two years or so ago primarily as a high-quality movie delivery system, but the audio portion of the format is still quite an improvement over the Red Book CD standard. And because there's automatic provisions for multichannel audio and a built-in (but limited) 96/24 option, DVD-V may yet become a major delivery format for audio before all is said and done.

"ONE OF THE NEAT AND POSSIBLY CONFUSING TRAITS ABOUT DVD-A IS WHAT'S KNOWN AS SCALABILITY, WHICH IS A 25-CENT WORD FOR 'LOTS OF OPTIONS.' "

Sonics: The audio portion of a DVD-V can have up to eight bit streams (audio tracks). These can be 1 to 8 channels of common Linear PCM (LPCM), 1 to 6 channels (5.1) of Dolby Digital, or 1 to 8 channels (5.1 or 7.1) of MPEG-2 audio (see fig. 2). Also, there are provisions for optional DTS or SDDS encoding as well.

The LPCM bit stream, which is the same uncompressed format as today's Red Book CD (which is standardized at 44.1 kHz and 16-bit), can use either a 48 or 96 kHz sample rate with a bit depth of either 16, 20, or 24 bits. Now, on the surface, this seems great and makes you wonder why another format for multichannel audio is even considered, but then you realize that the bit rate for the audio data is capped at 6.144 Mbps. The bit rate (sample rate X number of bits X number of channels) is equivalent to the size of the pipe that the audio data has to flow through and, in this case, the pipe isn't big enough to fit six channels of 96/24 audio. In fact, all you can squeeze through is two channels of 96/24. If you want multichannel, you're back at 48k but at least the bit depth is raised to 20 bits for six channels. (See fig. 2.) So now we have to go to some sort of data compression scheme to fit all of the channels down the pipe at a higher audio quality.

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DVD-AUDIO AND SUPER AUDIO CD

The standard compression scheme for DVD-V is Dolby Digital (or AC-3), which compresses six channels (5.1) of up to 24-bit audio to fit through the DVD-V audio pipe but is limited to only a 48 kHz sampling rate. Plus it is a lossy compression algorithm with a maximum bit rate of 448 kbps (although 384 is mostly used), which means that some data is thrown away in the encoding process (although the goal is to only throw away the data that you won't miss). MPEG-2 Audio, which can be configured either 6-channel (5.1) or 8-channel (7.1) at 48/16, is also an optional compression scheme, but hardly used (especially in the U.S.) due to lack of decoders in the marketplace. Even though MPEG-2 does have a higher bit rate at 912 kbps, the algorithm has its share of inherent coding problems, which effectively negates its lower data compression.

DVD Name	Number of Sides	Number of Layers
DVD-5	1	1
DVD-9	1	2
DVD-10	2	1
DVD-18	2	2

FIGURE 1

Audio Coding	Sample Rate (kHz)	Word Length	Number of Channels	Max Bit Rate
LPCM	48	16	8	6.144 Mbps
	48	20	6	
	48	24	4	
	96	16	4	
	96	20	3	
	96	24	2	
Dolby Digital	48	24	6	448 kbps
MPEG-2	48	16	8	912 kbps
DTS (Optional)	48	20	6	1.4 Mbps

FIGURE 2

Although an optional coding process, DTS encoding can also prove to be an interesting choice since it can potentially encode up to eight channels of 96/24 with less data compression than either Dolby Digital or MPEG.

JUST WHAT IS DVD-AUDIO?

The DVD-Audio disc should be in the stores by Christmas, and there's a lot to like about it. The main feature and difference between DVD-A and its video cousin is the ability to provide significantly higher audio quality. Just having the ability to do so doesn't necessarily mean that the highest fidelity audio will happen though, because, for better or worse, the final decision as to the sonic quality is largely in the hands of the content producer.

Sonics: DVD-A differs from the audio portion of DVD-V in that the data pipe is a much larger 9.6 Mbps compared to DVD-V's 6.144 Mbps. Even with the wider audio pipe, six channels of 96/24 LPCM audio still exceeds the allotted bandwidth (multiply 96k X 24 bits X 6 channels to get the resultant 13.824 Mbps bandwidth). Therefore, there needs to be some type of data compression to not only fit the required amount of data through the pipe, but increase the playing time as well.

For this requirement, MLP (Meridian Lossless Packing) was selected as the standard data compression for DVD-A. MLP, which gives about a 1.85 to 1 compression ratio, is seemingly lossless, meaning that no data is thrown away during the compression process. Dolby Digital is listed as a lossy compression option. Also possible is the use of other coding technologies besides LPCM such as DSD and DTS.

Of special note is the fact that DVD-A is also what is known as Extensible. This means that it's relatively open-ended and can utilize any new audio coding technology that becomes popular in the future.

Scalability: One of the neat and possibly confusing traits about DVD-A is what's known as scalability, which is a 25-cent word for "lots of options." Audio-wise, the list of options is truly extensive. The program producer is able to choose the number of channels (1 to 6), the bit depth (16, 20, 24), and the sample rate (44.1, 48, 88.2, 96, 176.4, or 192 kHz). (See fig. 3.) What's more, the producer can also mix and match different sample rates with different bit depths on different channel families. For example, the front three channels (family 1) can be set to 96/24 while the rear (family 2) and sub channels are set to 48/16. This is important for more efficient bit budgeting if additional space for videos or stereo mixes is required.

Playback Time: Even with DVD-A's increased storage capacity, there's still not enough room to contain 74 minutes of discrete multichannel Linear PCM (LPCM) program at the high sample rates and bit depths. So the option exists to compress the audio data several ways.

As stated before, for the high sample rates and bit depths (88.2, 96, 176.4, or 192 kHz/24-bit), Meridian Lossless

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DVD-AUDIO AND SUPER AUDIO CD

Packing, or MLP, is provided. This method is attractive in that it can almost double the playing time with supposedly no loss in data and therefore audio quality (see fig. 4). For the lower sample rates and bit depth (48k/20-bit), Dolby Digital (AC-3) is also provided as an option.

SMART Content: One of the more interesting aspects of DVD-A is a new feature known as SMART (System Managed Audio Resource Technique) Content. SMART Content is an auto downmix provision that lets a consumer with only a stereo system have the multichannel mix automatically downmixed to that format. In other words, the 6-channel 5.1 mix automatically becomes a stereo mix if there's only two channels in the playback system. While on the surface it might seem like a scary thing having that great multichannel mix automatically fold down to stereo, SMART Content gives the producer a choice in the way this downmix will take place by allowing the producer to select one of 16 downmix coefficients that get stored along with the audio data. SMART Content has the added byproduct of potentially eliminating the need to include a separate stereo mix on the disc, there-

QUICK CHECK: PROS AND CONS

DVD-AUDIO ADVANTAGES

Extensibility: Open technology has provisions for new innovations beyond LPCM in the future.

Scalability: The program producer chooses the number of channels, bit depth, sample rate, and encoding method.

Value-Added Material: Liner notes, album cover artwork, music videos, artist commentary, and Internet links can all be included.

Copy Protection: Strong encryption methods makes DVD-A harder to pirate than any previous digital medium. Watermarking provides easy copyright identification.

DVD-AUDIO DISADVANTAGES

Will the Consumer Accept Another Format? Will 96/24 make enough difference to the average consumer to plunk down $5–600 on yet another piece of entertainment hardware?

Must Connect to a TV to Navigate: A television or video monitor is an integral part of disc navigation.

Lack of Moving Pictures During the Song: Many in the production community believe this to be a liability, even though up to 20 still pictures per song may be used. However, if material such as liner notes, artist/producer, and even engineer bios and commentary are used, this could actually be a nice adjunct. After all, one of the main complaints about CDs was the lack of information relative to what was previously found on LPs. File this under, "Too Early to Tell."

Some DVD-A Discs Won't Play In Some Current DVD Players: Since DVD-A was specified well after DVD-V hit the marketplace, DVD-A discs will not play on the first generation of players already out there.

SACD ADVANTAGES

Sonic Performance: Wide bandwidth goes from DC to 100 kHz with a 120 dB dynamic range. No adverse filter artifacts thanks to elimination of the brickwall filter. Widespread positive reviews regarding audio quality.

Plays on Current CD Players: With both backwards and forwards compatibility, consumers won't feel forced to buy expensive new hardware or give up their current libraries.

No TV Needed to Operate: Standalone player does not require connection to television to navigate.

SACD DISADVANTAGES

Yet Another Format: As with DVD-A, will the average consumer be willing to buy another piece of expensive hardware? Will consumers be confused with yet another format choice?

Is the Sonic Performance Really Better? While DSD seems every bit the equal to the current state of LPCM, advances in converter technology could eventually move LPCM beyond the seemingly closed format of SACD.

New Production Equipment Needed: Because of the DSD technology, new production equipment, from recorders to editors to digital consoles, is required. Given the fact that LPCM equipment abounds worldwide, will the production community balk at the format?

Initially More Expensive: Not only will the production equipment be more expensive (some estimates are as much as 10 times LPCM), but initial player cost will be $5000 (for stereo only with no digital outputs).

Only Stereo at First: Both the players and discs will initially be released in stereo only.

No Value-Added Material at First: The first discs will not have text or graphics, only music. In fact, the first discs may not even have a stereo Red Book layer, negating the backwards compatibility.

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by freeing up space for either higher quality audio or additional data information. While this looks good on paper, it's still too early to tell what it will sound like in practice.

Copy Protection: Of primary concern to all the committees and groups working on DVD-A was the inclusion of strong anti-piracy measures and copyright identification. In fact, the encryption and watermarking issues have taken the longest to resolve and have held up the release of the format until now. However, the encryption standard has already been decided upon and the watermarking issue should also be set in stone by the time you read this article, clearing the way for the format's introduction.

A point of concern regarding the inclusion of watermarking (which identifies the manufacturer, artist, and copyright holder by embedding a digital code in the noise floor) has been about the possible degradation of the audio quality as a result. Having personally participated in the watermarking listening test, I can state with some certainty that watermarking is virtually undetectable even under microscopic studio conditions and should not prove to be a deterrent to audio quality in any way. In fact, watermarking should prove to be a boon to content owners in general since it will work on any digital transmission, including Web downloads, which should result in a lot less pirating and a lot more royalties. One thing is for sure, most record companies feel that watermarking is the key to their future survival in this increasingly digital world, and this portion of the spec will be absolutely ironclad before the format is released.

Value-Added Content: One of the attractive features of DVD-A is the ability to add additional content such as liner notes, music videos, and even Web URLs that enable the consumer to access related material on the Internet when played from a computer's DVD-ROM drive. This could prove another immediate advantage, since consumers have always complained about the lack of information found on CDs. Couple this with additional artist commentary, discographies promoting back catalog titles, bios, links to Web sites (and, therefore, aftermarket sales), and even a place to finally put those videos that MTV never played, and the value-added material could bring the format to life.

Each track (song) has the ability to

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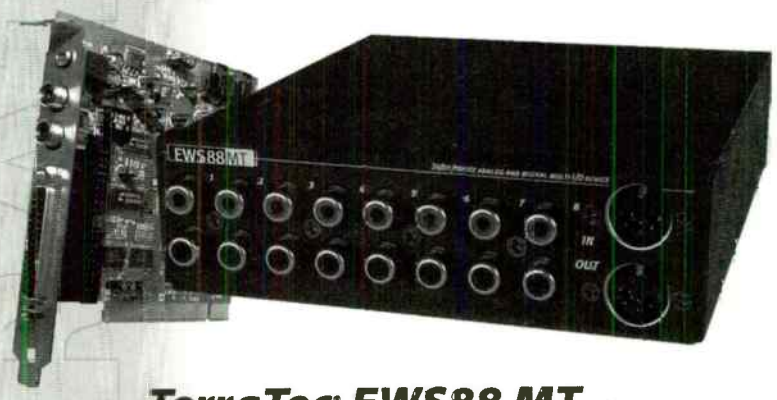

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FORMAT WARS

DVD-AUDIO AND SUPER AUDIO CD

display up to 20 still images that can run like a slide show in an automatic or manual mode. This can either be a great way to display artist or song information or a lame attempt to add some info that no one wants to see, depending on how it's implemented. Videos can also be added in the video portion of DVD-A, providing there's sufficient room.

SACD: IS SUPERIOR SOUND ENOUGH?

Thanks to the promise of improved sonic performance as well as backwards and forwards compatibility, the Super Audio CD (SACD) is certainly an intriguing prospect in the multichannel delivery wars. With the massive corporate muscles of Sony and Philips behind this format, SACD could well prove to be quite a formidable challenger in the multichannel sweepstakes. SACD's vision has changed somewhat from what was first announced, as the product that will initially be released will be scaled back in terms of features.

The SACD is a dual-layer disc (basically a DVD-9) with one layer dedicated to normal Red Book CD-type audio and the second to a high-density layer for a 6-channel surround mix, a 2-channel stereo mix, and potentially extra data such as text and graphics. What makes this interesting to the record companies is the ability to be both backwards and forwards compatible, meaning that consumers can play an SACD on their current CD player and play a current CD on a SACD player as well. Because of the requirement for new watermarking circuitry, SACD discs are not playable in existing DVD-ROM drives, however.

Sonics: SACD touts an improvement in sonic quality due to a new twist in a current recording process known as Direct Stream Digital (DSD). DSD uses essentially the same delta sigma oversampling method used in most modern high-quality analog-to-digital conversion systems where a single bit measures whether a waveform is rising or falling rather than measuring an analog waveform at discrete points in time. In current systems, this one bit is then dec-

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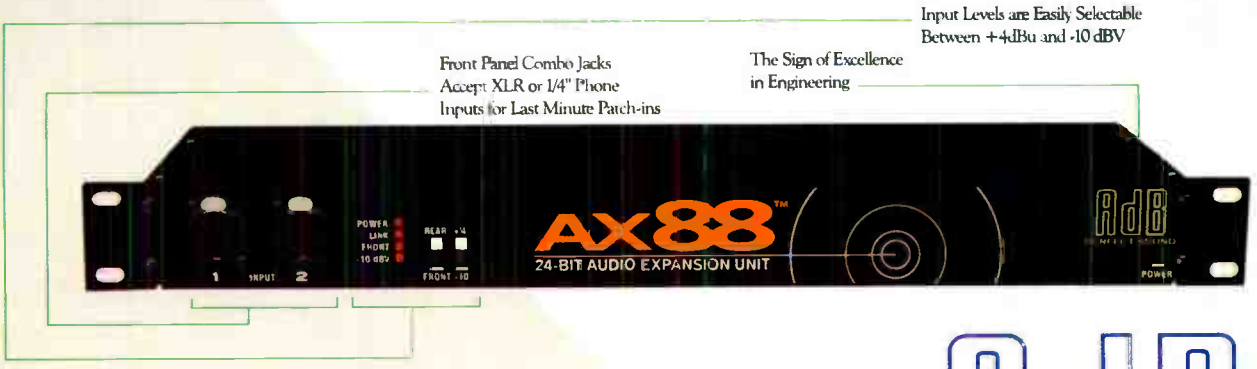

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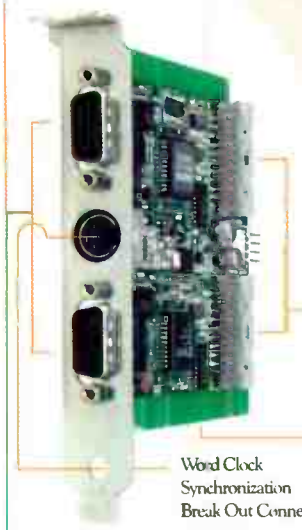

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FORMAT WARS

DVD-AUDIO AND SUPER AUDIO CD

imated into LPCM causing a varying amount (depending upon the system) of quantization error and ringing from the necessary brickwall filter. DSD simplifies the recording chain by recording the one bit directly, thereby reducing the unwanted side effects.

Indeed, on paper, SACD with DSD looks impressive. A sampling rate of 2.8224 MHz (which is 64 times 44.1k in case you're wondering) yields a frequency response from DC to 100 kHz with a dynamic range of 120 dB. Most of the quantization error is moved out of the audio bandwidth, and the brickwall filter, which haunts current LPCM systems, is removed. To enable a full 74 minutes of multichannel 100/24 recording, Philips has also developed a lossless coding method called Direct Stream Transfer that gives a 50 percent data reduction. Yet some critics speculate that DSD is a closed system with little room for improvement in that both the frequency response and dynamic range cannot be improved much beyond the current spec. Others note the fact that no data interfaces, DSP chips, and little supporting software exist, while their LPCM counterparts abound.

Other Data: As in DVD-A, text, graphics, but no video, can accompany the audio data. However, this will take the form of today's Blue Book "Enhanced CD," which doesn't look to be quite as elegant an implementation as the UDF file format utilized by DVD. In fairness, this area of SACD doesn't seem to have been given much thought, since the disc is intended for the audiophile market. We may see some new features and execution as the format matures though.

Sony released an SACD player in Japan in May 1999 and expects a *stereo-only* player to be available in the U.S. for $5000 retail by the end of the year. SACD discs, like DVD-As, are supposed to initially retail for $24.95, and later drop to a magic number of $19.95. The apparent reason for the stereo release is that there's no multichannel DSD recording and editing equipment available yet, even in prototype form.

Audio Coding	Sample Rate (kHz)	Word Length	Number of Channels
LPCM	192	16, 20, 24	2
	176.4	16, 20, 24	2
	96	16, 20, 24	1 to 6
	88.2	16, 20, 24	1 to 6
	48	16, 20, 24	1 to 6
	44.1	16, 20, 24	1 to 6
MLP	96	16, 20, 24	1 to 6
Dolby Digital	48	16, 20, 24	1 to 6
DTS	48/96	16, 20, 24	1 to 6

FIGURE 3

Audio Coding	Sample Rate (kHz)	Word Length	Number of Channels	Approx Play Time
LPCM	192	24	2	65 min
	192	20	2	78
	96	24	2	129
	96	20	6	52
	48	24	6	86
	44.1	16	2	422
MLP	192	24	2	117
	192	20	2	141
	96	24	6	78
	96	20	6	94
	48	24	6	157
	44.1	16	2	767
Dolby Digital	48	24	6	1550
DTS	48	24	6	425

FIGURE 4

WHAT DO I NEED TO GET GOING WITH DVD-A OR SACD?

Working in either format is out of the league of the project, or even the average commercial studio at the moment. To take full advantage of the DVD-A format, you would need the ability to record, mix, and store at 96/24, which is currently not too widespread. This will change soon, since almost the entire audio industry is waiting for the same converter chipset in order to implement their 96/24 features. Still, if you want to record at 192 or 176.4 kHz, these converters are still prototypes, so don't expect to see them readily available for some time. Authoring tools for DVD-A are available now from Sonic Solutions, but this stage is relegated to the mastering facility and/or the authoring house.

So how can you get ready for DVD-A right now? Mix to 8-track analog (no kidding!) and let the mastering house deal with the conversion to the digital domain. This will cost far less than buying any of the required hardware and software and will leave you with a robust archive master that will probably outlive most digital formats anyway. The downside is we're back to our old friend tape hiss again.

SACD is a different matter completely. Virtually all of the DSD gear at

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FORMAT WARS

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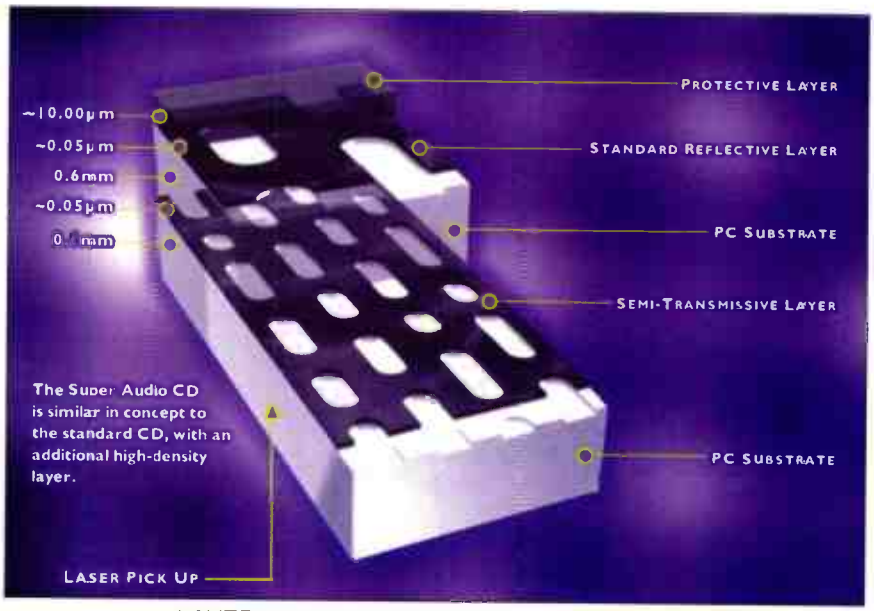

LAYER EFFECT: Inside the layers of the SACD.

the moment is prototype only, so, unless you have an in at Sony, you've got a wait ahead. Even when the gear becomes available, it will mean that all of your current PCM-based gear will be rendered useless! Plus it looks like there'll be only one vendor to buy from (Sony) for a while as well. But if DSD lives up to its highly touted audio quality, those wanting only the best will buy in with no second thoughts.

So if you're lucky enough to be on the cutting edge of technology, you probably have an immediate decision to make. For the rest of us mere audio mortals, it's time to sit back for a while and watch and listen to the market make our decision for us. EQ

PUTTING THE "V" IN VERSATILE: DVD-Audio's potential.

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CIRCLE 65 ON FREE INFO CARD

NO WONDER THE HR824 HAS THE BEST BASS RESPONSE OF ANY 8" MONITOR. IT'S REALLY A 12" MONITOR IN DISGUISE.

TIGHT, RESPONSIVE BASS FLAT DOWN TO 39HZ. Reviewers and owner's warranty card responses are unanimous: The HR824 has the most accurate bass they've ever heard from an 8-inch monitor. And bass **quality** is as astonishing as the quantity. Fast low frequency transients like kick drum slaps and electric bass notes have a crisp, articulation that makes other monitors sound like mush.

ANOTHER TRANSDUCER INSTEAD OF A PORT. The more LF transducer cone area a speaker has, the more bass it can produce. But a huge low frequency transducer isn't an option on a compact near field monitor.

A transducer and a port can't equal the LF output of the HR824's two transducers.

To augment primary bass output, other monitors resort to using ducted ports that can convert cone movement into extra low frequency air movement. But for optimal output, a ducted port needs to have the **same area** as the low frequency transducer — an 8-inch near field monitor would need an 8-inch vent. Needless to say, you haven't seen any vents this big on other near field monitors. When vent size is reduced, bass output is compromised. And, forcing a lot of energy out of small ports can create audible wheezing and whooshing.

Instead, the HR824 adds a large passive transducer with the cone area of another 8-inch woofer. This ultra-rigid, honeycomb laminate piston tightly couples with the HR824's active bass transducer. With a combined cone area greater than a single 12-inch woofer, you get exceptionally extended bass without port noise complaint.

Last fall we won the pro audio industry's coveted TEC Award for best near field monitor. Modesty prevents us from listing the impressive field of competitors but you'll probably encounter their ads in this very magazine

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Internal power amplifiers are "fed" by phase-accurate, low distortion electronic circuitry instead of a crude coil-and-capacitor passive crossover. The HR824's proprietary logarithmic wave guide not only widens treble dispersion but also smooths the midrange transition between high and low-frequency transducers. Thanks to the wave guide's flaring design, the HF transducer's output is **acoustically the same diameter** as the LF transducer's at the critical 3500Hz crossover point.

Rear view: The HR824's electronics conceal an ultra-rigid, honeycomb composite passive transducer.

The HR824's LF transducer even contributes to midrange accuracy. In many monitors, woofer cone harmonic vibrations bounce around inside the enclosure and then exit through the thin woofer cone. The result: smeared imaging and muddled details. Instead of a chintzy chunk of fluff, the HR824's enclosure is utterly packed with high- density absorbent foam. Cone vibrations go in, but they don't come back out.

DON'T SKIMP. It's amazing how many studio owners will mortgage the farm for money-is-no-object, esoteric microphones... and then monitor on cheap, passive loudspeakers. If you aren't using *some* brand of ACTIVE near field monitors you're seriously compromising your creative product.

HEARING IS BELIEVING. We urge you to visit your nearest Mackie Designs Dealer and carefully audition **all** of their active monitors with some demanding, bass-rich program material. Judge our claims (and those of our competitors) for yourself. We think you'll agree that the HR824 is truly the best of the best.

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EASTERN FLING

Sweet Basil's in Tokyo is a live sound engineer's (and sushi lover's) dream

PHOTO BY REVERAND CHE

BY STEVE LA CERRA

Author and engineer Steve La Cerra enjoys the many amenities at Sweet Basil's.

The Roppongi district in Tokyo, Japan is a bustling area full of restaurants, bars, clubs, and various other forms of entertainment — legal and otherwise. Situated in the heart of Roppongi is Sweet Basil's, a dinner theater/club hosting international acts. Although the building is rather large, the venue seats only about 300 people due to a spacious, uncluttered room design. It's a rectangular room with the stage at one end, tables on the floor in front of and to the sides of the stage, and a U-shaped balcony on the top floor.

The club is actually built on three

World Radio History

levels: the first is street-level with an indoor parking area leading to the dressing rooms and production offices. The next floor up is the stage and first level of the club, and a balcony completes the picture. Stairs and elevators service all floors, and the mix position is in the balcony. Any engineer who has had to run from FOH to the stage during a show for an audio emergency will be happy to hear that a private stairway runs directly from one end of the balcony to the backstage area — negating the need for running an obstacle course among the patrons.

FIRST CLASS

Everything about Sweet Basil's is first-class, from the PA (designed and installed by Clair Brothers Audio, Japan) to the accommodations, to their house crew. The front-of-house mix position is at the rear of the room (along with lighting land) in the center of the U-shaped balcony (the stage is at the open end of the "U"). A 48-channel Yamaha PM3500 is the centerpiece of the PA system, accompanied by a well-stocked rack that includes a Lexicon PCM81, two Yamaha SPX990's, a Roland SDE-330, a Sony A-8 DAT recorder, a Sony MDS-E55 MiniDisc recorder, a Sony CDP-L3 CD player, and a TASCAM dual-cassette recorder. The main mix bus is fed via stereo matrix out of the console into a pair of Klark-Teknik DN300 31-band graphic EQs, and then to a pair of TOA DP-0204SR processors (more on the matrix in a minute). The TOA units provide crossover and master system limiting for the rig, one per channel. In addition to the aforementioned equipment, there are also a bunch of patchable dynamic units in the rack, including six dbx 160A's and two Drawmer DS-404 quad gates.

One of the most striking aspects about Sweet Basil's is that the mix position — like the rest of the club — is immaculate. The club provides real chairs so that you can sit comfortably to mix a show while still being able to see the entire stage area (we found it quite refreshing!).

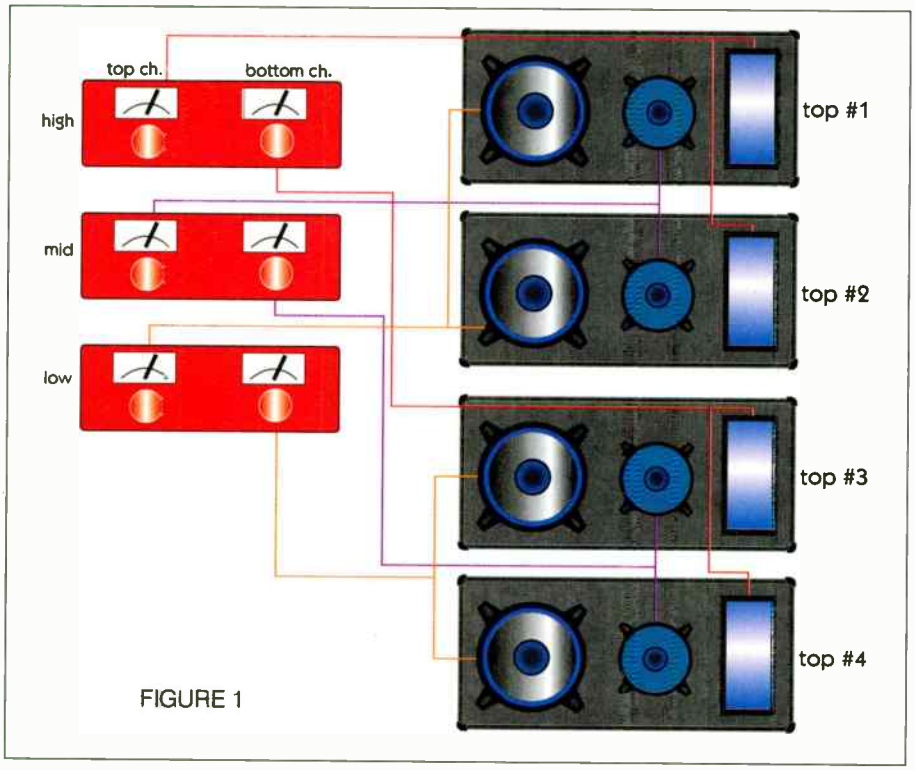

FIGURE 1

FEED ME!!!!!

Several stereo matrix feeds from the PM3500 serve to facilitate PA coverage throughout the room. Matrix 1 routes the stereo mix bus to the Klark DN300's/TOA DP-0204SR. Output from the TOA units requires a total of six lines — low, mid, and high for left and right channels — running from the FOH rack, across the room to the amp rack, which is situated in the stage-left wing near the monitor mix position. In the amp rack are a total of six Clair Brothers CBA2000Q amps, custom made by QSC. The left and right sides of the PA get three CBA2000Q's each for triamping of highs, mids, and lows. All of these amps have one channel designated as "top" and the other as "bottom." This refers to the Clair R4 Series III mains cabinets (18, 12 and 2-inch driver per cabinet). Flown four cabinets per side and oriented horizontally, two are considered "top" and two are referred to as "bottom." Corresponding drivers from the pairs share an amp channel. For example, the horns from the top pair of R4's are wired in parallel and driven by one amp channel. Wiring the drivers in this manner allows the system to be tweaked for consistent room coverage (see fig. 1).

While the top cabinet of each fly projects audio straight towards the rear wall, the bottom three cabs are angled slightly downward to fill the back and main floor areas of the club. This arrangement provides thorough coverage for most of the room with the exception of the seats under the balcony, along each side of the room. These areas receive little direct coverage from the main PA. To solve this problem, the L/R mix is routed into matrix 5 and matrix 6 from the PM3500. These matrix outs are sent to an additional amp, driving a pair of Electro-Voice FM1502 ER wedges placed under the balcony to fill sound into those areas. For recording purposes, stereo matrices 2, 3, and 4 are used to feed audio inputs of a VTR,

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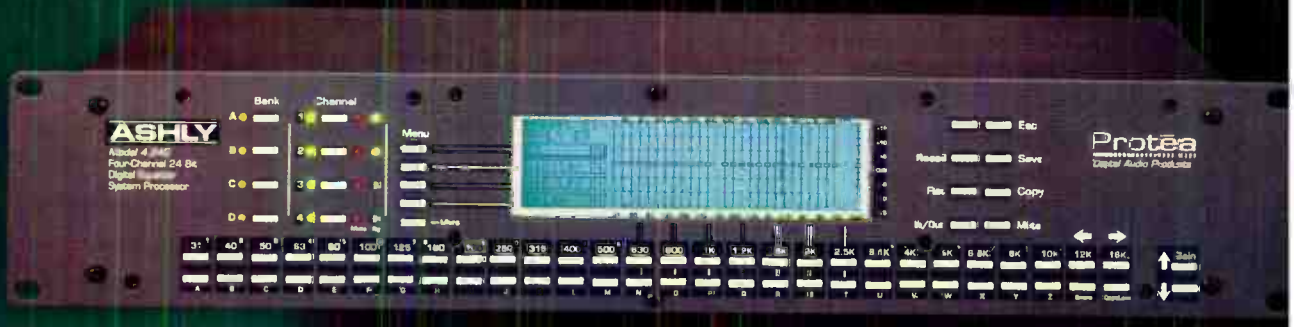

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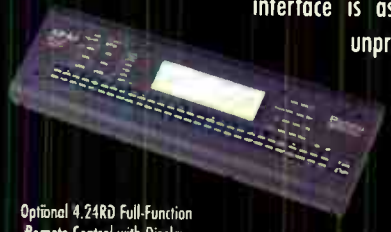

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the Sony A-8, and the Sony MDS-55.

Amplifiers for the monitor rig live in a rack that supports a second 48-channel Yamaha PM3500 for monitor mixing. A minimum of eight monitor mixes can be provided, typically on biamped Clair 12AM monitors. Each monitor contains a 12-inch woofer and a 2-inch horn driver; most of the monitors are powered by CBA 2000Q's with built-in crossover/processing for the 12 AMs.

As you might expect, the venue is outfitted with an excellent selection of microphones including Shure Beta 57's, 58's, and 87's; Shure SM57's, '58's, and '98A's; an Electro-Voice RE20; Sennheiser MD421's; and AKG C414's and C460's, as well as Countryman direct boxes.

MIXING IT UP

Up on the stage-right balcony are a set of floor-to-ceiling windows that allow natural light to come in during the day, and also provide a view of the street area for patrons. Because some shows start during daylight hours, light coming through these windows could be distracting. As the house lights dim just before a show starts, automated rollers drop curtains in front of these windows to further darken the room. In addition to the visual impact, the curtains also serve to dampen the room slightly by covering all that glass — so keep this in mind during soundcheck, because the room will be a bit less live at show time.

Due to the fact that the mix position is about as far away from the stage as you can get, you will not hear an up-front-ness and immediacy to your mixes. At FOH, you'll hear additional ambience off the rear wall/bar area and from the ceiling, which is only about 10 to 12 feet overhead at this point in the room. To really get the sonic picture, go downstairs (pretty much anywhere downstairs will do) and listen. You'll notice that the low-mids have a lot more punch and the entire mix will be louder and more in-your-face.

DETAILS, DETAILS

A lot of attention was paid to detail at Sweet Basil's Tokyo. For example, gear is loaded in from the street level through a garage so, if the weather is unfavorable, you're sheltered. A small freight elevator backstage serves to get gear and people up to the stage level. The entire band/crew area was one of the nicest we've ever seen, with two dressing rooms — each with a 'fridge — plus additional rooms for the house crew, as well as an office (I was shocked at how clean this area was kept). If you have time after the soundcheck/before showtime, walk out the door to the left and up the street towards Roppongi Crossing. There are some killer bakeries along the strip and, of course, you'll also be able to find some great sushi!

Any engineer who has had to run from FOH to the stage during a show for an audio emergency will be happy to hear that a private stairway runs directly from one end of the balcony to the backstage area — negating the need for running an obstacle course among the patrons.

[EQ *magazine would like to thank Gene Pelland and Frank Simon of Clair Brothers Audio (U.S.), and Sammie at Clair Brothers Japan for their help in preparing this article.*]

In addition to being the senior editor of EQ, Steve "Woody" La Cerra mixes FOH for Blue Öyster Cult — who recently completed a week of shows at Sweet Basil's Tokyo. We haven't seen much of him around the office lately because rumor has it that he's trapped in a sushi bar. He may however, be reached online at WoodmanEQ@aol.com.

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The *SM4-CL* offers you not just a stereo compressor, but two completely independent mono compressors inside this compact 1/3rd rack space.

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FIRST LOOK: OTARI LIGHTWINDER

Routing audio from one place to another — such as from stage to mixing console — can been a deceptively straightforward process: You plug a mic into a stage box, and, if the snake is wired properly, the destination receives audio. *Hmmmmmm.* Easier said than done. We've all run into the usual sound-reinforcement nightmares such as mis-wired channels, reversed polarity, and lifted legs. Then, of course, there's interference from RF and EMI, as well as plenty of room for dreaded ground problems. If these kinds of problems aggravate you during on-location gigs, take notice — Otari has come up with a system to help you beat the wiring rat's nest. (Before we get your hopes up, let's mention that, right now, these systems are *very* expensive, but, remember, the trickle-down theory applies to new technology as well as economics.)

With Otari's digital transmission system, will RF and EMI interference become things of the past

Otari's Lightwinder is a series of multichannel audio transmission systems, capable of transmitting audio (and data) over fiber-optic "snakes" Designed to replace conventional copper-wire multipair, the Lightwinder concept is rather simple: you plug in a microphone or line-level signal, the analog audio is converted to a digital signal and transmitted over fiber-optic link. At the other end, the digital signal is D/A'd for input to a mixing console (or any other appropriate device). Since Lightwinder's abilities extend far beyond this just getting signal from point A to point B, let's take a closer look.

BY STEVE LA CERRA

THE LIGHTWINDER CONCERT SERIES

Designed for theater and concert applications, Lightwinder Concert consists of two main components: the Stage Master (LW-10S) and the Console Master (LW-10C). The two rack-mountable units work together to transmit and receive up to 64 audio channels over a distance of up to 3000 meters — reportedly with no signal degradation (!). As in most live-sound situations, a mic or line-level signal may be plugged into a standard stage box. From the stage box, audio is patched via Canare FK37 connectors into the rear of the Stage Master in banks of 16 channels, facilitating strategic positioning of sub-snakes around the stage area. Monitor outputs for each set of 16 channels are provided to enable an easy split connection to a monitor console.

Inside its modular chassis, the Stage Master has four sets of 12-channel, 20-bit, delta-sigma A/D with 64X oversampling (sample rate is 48 kHz). Front-panel controls for the A/Ds include a rotary switch for selection of mic or line level and a rotary gain control. As a result, microphone signals may be amplified *before* conversion, thus helping to preserve the integrity of the signal. Once converted, the 48 channels of digital audio are then sent out of the Stage Master over an armored fiber-optic cable with a diameter of about 1/4-inch. At the other end of this fiber-optic link, Otari's Lightwinder Console Master is waiting with 20-bit, 8X oversampling D/As to receive the fiber-optic signal, convert the digital data to analog audio, and feed analog mic (or line-level) signals to your console. Additionally, the Console Master has 16 channels of A/D so that signals may simultaneously be returned from the mixing desk to the stage for connection to an amp rack, or for communication purposes (correspondingly, the Stage Master has 16 channels of D/A).

Overall specs for this two-way digital audio routing scheme include a frequency response of 10 Hz to 22 kHz, dynamic range of 108 dB, crosstalk of 108 dB, and a noise level of –129 dB for maximum mic gain. Each channel of the Stage Master has mic/line trim, a gain control with up to 68 dB of amplification, phantom power, and an input level LED. On the rear panel are fiber-optic connectors for main and sub I/Os, Canare FK37-31S connectors for 48 stage inputs (3 sets of 16), 16 stage outputs via Canare FK37-32S, monitor throughs for the input signals, and inputs for A and B power supplies.

ENTER THE COLOSSEUM

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Colosseum Series, a modular fiber-optic audio transmission system based on the LW-50 mainframe. A Colosseum system employs from 2 to 16 LW-50's with one frame designated as the system master and the rest acting as slaves. Mainframes are available in 2-, 4-, 6-, and 8-space rack sizes, each capable of holding 2 to 8 modules. Colosseum offers a variety of I/O modules including an 8-channel mic/line input with 20-bit A/D, 8-channel line output with 20-bit D/A, 4-channel (stereo) AES/EBU input and output modules, and a 16-bit Intercom module for use with Clearcom, RTS, or Telex 'com systems. In addition to rear-panel DB-25 connectors for audio I/O, Colosseum modules also have front-panel XLR jacks for direct connection. NTSC or PAL video may be run between stations with the Video Link option, and an external sync option allows video, word clock, or frame-sync to external sources at either 44.1 kHz or 48 kHz. Lightwinder Colosseum is capable of running 64 channels of 24-bit audio *in each direction*, making it appropriate for use in theater, theme park, remote broadcast, recording studio, and film and video post applications.

SEE THE LIGHT

Otari supplies Lightwinder Colosseum with computer software called LightView. Designed to run on any PC with Windows NT, Windows 95, or Windows 98, LightView uses your computer's serial connection to communicate with a serial port on the master unit, providing control over the entire system. Additional PCs may be connected to the slave units for independent "local" control of the slave 'frames. LightView recognizes all of the mainframes and modules by querying the system, then allows you to set levels, turn limiters or phantom power on/off, and route the various inputs to outputs. From within LightView, audio levels may be adjusted in 0.5 dB increments without switching noise — enabling changes or correction during a live performance. Of course, you can save this information as setups for recall and you'll be happy to hear that, if the computer fails or becomes disconnected, parameters remain set to the last state.

BEYOND THE SMOKE AND MIRRORS

Now here's the really good news about the Lightwinder Series: fiber-optic cables are not susceptible to RF interference or EMI, and they provide complete ground isolation. In addition to the redundant power supplies, Lightwinder has redundant signal paths for reliable audio operation under adverse conditions. Since the built-in mic pres can be situated nearby the mics, you're not sending a low-level mic signal over hundreds of feet of cable — thus minimizing the chance for a compromise in signal quality. Perhaps most importantly for those who constantly set-up or tear down in sound-reinforcement situations — the fiber-optic cable is about 1/20th the weight of 64 pairs of copper wire!

The Otari Lightwinder Series is available now, with prices starting around $30,000. For more information, call Otari Corporation at 818-594-5908, fax them at 818-594-7208, or visit them on the Web at www.otari.com. Circle EQ free lit. #127.

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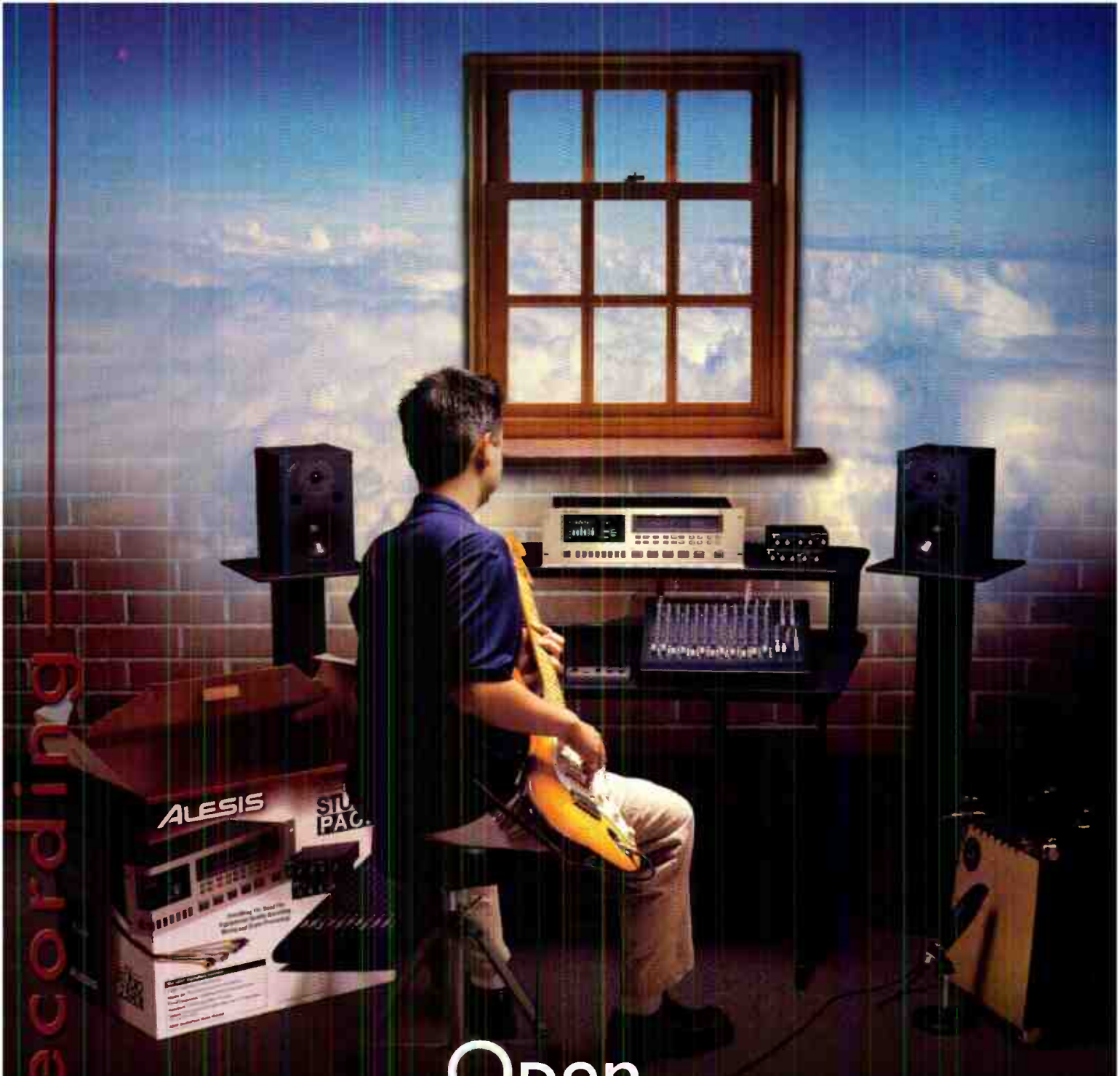

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cabinet. The pulsed signal supplied on the CD does a string of two in-polarity pulses followed by a single reverse polarity pulse. On the tester, this appears as two pulses of the green LED, followed by one pulse of the red LED. The LEDs are nice and bright, easily seen across the room or in a bright light. I hate to squint.

It was a good thing I ran the polarity test, because I found my Tri-Polar surround speakers were wired in reverse from the rest of the L-C-R monitors. They did sound a little "phasey" during setup, but I wasn't quite sure what the problem was. So a quick wire reversal on the back of the power amp solved the problem. But note that this wasn't a wiring mistake on my part. I indeed did have the cables connected correctly. That particular brand of speaker was wired in reverse from the rest of the monitor cabinets. And it's possible for identical stereo speakers from the same manufacturer to have one of the cabinets wired in reverse. Been there, seen that. (And I'm talking major name-brand manufacturers who shall remain nameless.)

The Woodworx polarity tester is a very inexpensive unit that looks as if it were designed primarily for the home-theater and vehicle installer. Be assured, though, that it will also work to test FOH sound system speakers. Remember, out-of-polarity speakers can rob you of your bass, and the extra excursions the speaker cones go through can cause bottoming out and structural failure in just a few moments of full power. Sound Check is cheaper than the price of a single re-cone job for a pro loudspeaker. So if you've never wanted to pony up the bucks for a full-feature polarity tester (with XLR and 1/4-inch TRS inputs and a dedicated "clicker"), then you might consider Sound Check from Woodworx as an inexpensive fix.

Mike Sokol is an audio engineer and communications integrator with 30 years in the audio industry. As if writing for EQ magazine weren't enough, Mike's begun work on a few psycho-killer short stories — just to help him work through the tensions of doing live sound and dealing with 5.1 surround. Check out his Web site at www.soundav.com for details.

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"Carvin gives the end user a roadworthy, high-powered amplifier (DCM2000) at a price that is almost too good to be true. Little wonder, then, that these amps have been showing up in quite a few local bands' rigs."
– Pro Audio Review, March 1998 – Roger Williams III: Systems Engineer

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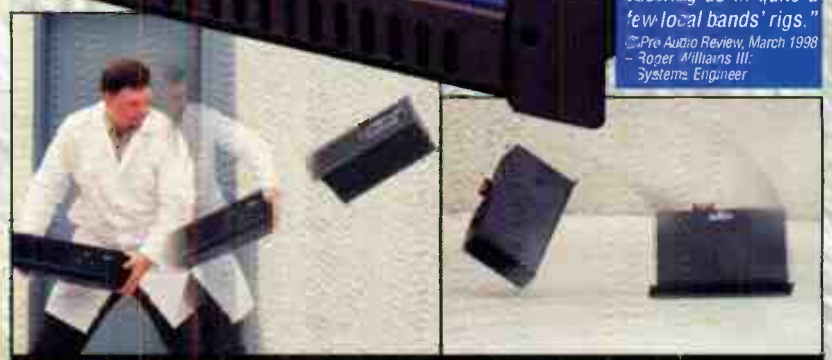
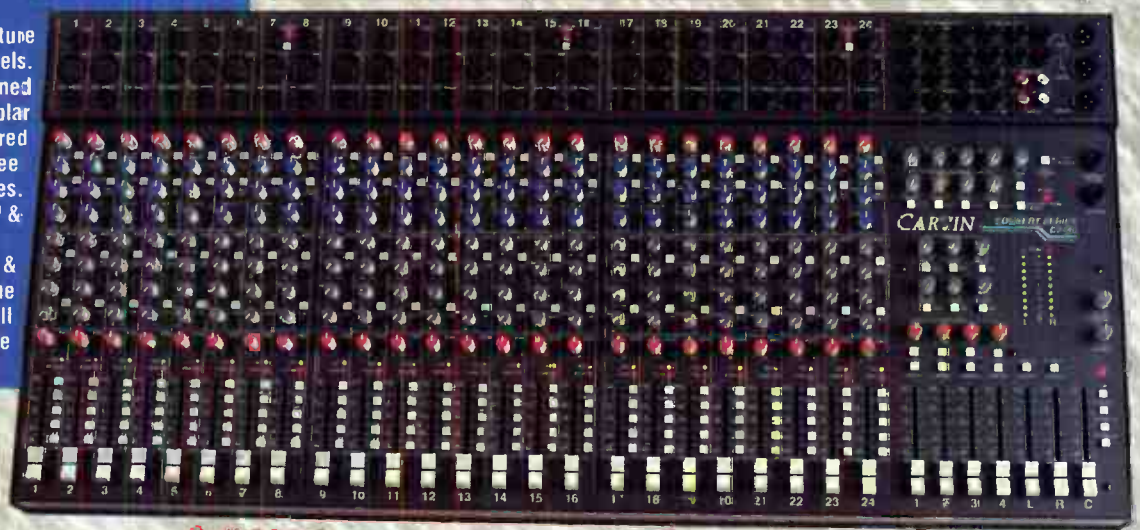


Carvin engineers tested the DCM amp construction by tossing them onto solid concrete. All amps worked flawlessly after impact! Of course, Carvin doesn't recommend trying this kind of abuse, this test just shows the lengths Carvin goes to test its gear.



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CIRCLE 67 ON FREE INFO CARD

EQ Drive!

STEVE MACK: REALNETWORKS'S REALMUSICIAN

BY THE FEZGUYS

Are you convinced that everybody who works for Internet audio technology companies is a programmer, a sadist, or merely tone-deaf? Do you accept the notion that these people stay up late, fiendishly inventing new ways to complicate the life of a musician by creating overly complex applications that run on unstable operating systems? Well take heart! One of "our own" people works in the thick of it at RealNetworks. His name is Steve Mack, and this month we talk with him about what it's like to be a musician helping to shape the tools we use to get our music on the World Wide Web.

Steve explains some of his multifarious duties as co-creative director of the Media Publishing Dept. of RealNetworks. He didn't create that title, he tells us. Actually, "I don't give a shit what my title is as long as I get to do fun stuff!" Asked to be more specific, he offers this explanation: "I prime the pump. Anything that moves or makes noise is my responsibility. Any video or audio that goes up on our (Real) Web sites I have something to do with, by recording it or giving guidance." While it's true that he often gives advice to Real's larger corporate clients, he's not above handing out tips to beginners. But he feels that the manuals for RealNetworks products are "really pretty good," and a person will learn more by downloading, installing, and using the software then by asking him up front. Nonetheless, he takes real pleasure in showing musicians how they can do cool stuff to take advantage of RealNetworks's technology. He's a natural gadabout, genuinely enjoying his calling as an auctioneer for practical Internet audio.

Born in Greenwich Village, NYC, Steve has lived all over the world. His dad worked for General Motors as a corporate guy doing "God knows what." When Steve grew up, he became an "itinerant musician for many years," traveling around the world as the singer in a noisy, melodic, and diverse '80s rock band called That Petrol Emotion until landing, currently, as a songwriter/singer/guitarist in Anodyne (aka "Marfa Lights" in Europe). We'll get back to his first love in a moment, but first, let's find out about working in the bosom of the Internet audio world.

The project studio owner as Internet audio advisor

World Radio History

It's "never a dull moment," at RealNetworks, he says. His job interview consisted of: "Do you know audio? Yes? You're hired!" He laughs at the memory and warns that the process has now become "pretty ferocious." Steve reports that hopeful hirees sit in straight-backed chairs under bright lights while a disembodied voice with a thick German accent intones: "How long can you go without food and water?" After four years at RealNetworks, Steve says he's considered an authority, which he feels is happily surprising, given that "we're more or less making it up as we go along." Like any other young and growing organization, there are new problems every day, and he has to constantly come up with creative solutions. "A lot of it's practical problem solving," he explains, "there's a handyman/fixit-guy mentality for basic problem solving on the Internet. This is why more and more audio engineers are showing up. They're very good at tracing faults and finding problems. We start at the source and modularize the problem to figure out where it's gone wrong. Then we figure out a way to patch around the problem in the meantime and hopefully fix it in the morning."

So what might be wrong with working in this environment? "I don't get enough time to play music," he fairly shouts. But the times are changing still. In the beginning, with a mere 30 employees, it was not uncommon to work 100-plus-hour weeks. "It's a lot more reasonable now that there are 500 employees." As Steve puts it: he finally has "a little more help."

Naturally, The FezGuys thought it might be useful to ask him a bit about the RealJukebox, the latest in a long string of reinvented Internet audio applications from RealNetworks.

"RealJukebox (RJ) is the first step towards completely digitizing the way people consume music." That's a mouthful for anyone, and Steve isn't a promo hack. There must be something to this. We ask him to elaborate. "Well, RJ not only makes it simple to load CDs into computers and organize your own custom playlists, but it also makes it easy to download music in a variety of formats, like a2b, LiquidAudio, etc. It's one-stop shopping. The more people realize the convenience, the more people get hooked on it."

What about the Music Industry, the Lords of SDMI, and their RIAA Piracy Paranoia platform? "The whole piracy issue...that's just people squawking. It's the same squawk the majors put up against DAT technology, against the CD — against cassettes for God's sake! We all know the industry will always find a way to make money off of music; that's what they're good at. They've done it for years." Steve explains how listeners' habits are changing: "If I'm 15 years old and want to hear the new Metallica song *now*, I don't want to go to Tower Records. I want to hit a button on a Web site and pay 99 cents for it *now*!"

Interestingly, Steve wasn't initially a believer in RJ. In keeping with his refreshing candor, he feels that "all of our stuff is rectangular, and I wish it wasn't. But our focus is on making the technology work. Real always includes software development kits (SDKs) so people can move the user interface technology forward by building customized interfaces."

"What's really going to drive acceptance of these new technologies is more bandwidth," he says. "I used to have a 56k dialup account. Now, geeky/cutting-edge guy that I am and with DSL installed at home, I go straight to the Web for anything and everything. I have better connectivity at home than at work." It's only a matter of time until high-bandwidth is readily available to any and all Internet users. Anyone that has used Internet connections at high speeds knows it's like the difference between opaque Pixel Vision video and crystal-clear HDTV broadcasts.

Along with the bandwidth increases, the codecs are getting better. "Music sounds pretty good at 128kbps," states Steve, "but there are codecs in development, namely MPEG AAC, that are even better. Another year, another codec." Though Real won't do multitracking, the company hopes people will build multitracking tools that export files straight to RealJukebox/RealProducer. "Real wants to be the conduit between the musician and the Internet," he says.

World Radio History

"The Internet is where people get music heard. At some point I'm going to be able to record all my stuff in my basement, throw it online from my own Linux (server) box, and turn around and sell it to my mailing list. I can make records and break even on them without having to sell even 5000 CDs. I can sell CDs or just offer downloads to dump right into their RealJukebox."

The FezGuys asked Steve to tell us about his first love: making music. He describes running Bang Bang Studios in London for four years. "We started off with an A80 Mark I Studer 2-inch 16-track. I had cannibalized all the 7-1/2 IPS cards to keep the 15 IPS cards running when a new partner, who had an A80 Mark II 2-inch 24-track, showed up in the nick of time." When Steve moved back to the States, he kept his TC delays, Lexicon reverbs, Genelec monitors, and all his mics, "waiting for the right day." He bought a brick house with an underground, insulated basement. And, he acknowledges, he has "very understanding neighbors."

As a working musician and typical musical packrat, he's been collecting guitars and amplifiers for the last few years, "building my own playground." He admits he's still slightly wary of the digital recording environment. "I started off in the analog world, I still love analog, and at the end of the day I don't trust hard drives." He reports that some engineers pronounce: "we don't need tape." He retorts, "I like tape! There's nothing I like better than rocking reels and slicing tape. If it was good enough for the Beatles, it's good

continued on page 127

THINGS THAT ARE NEW

More money spent and more takeovers. AOL buys Spinner (Internet radio programming) and Nullsoft (makers of Winamp and the Shoutcast MP3 streaming system) for some ridiculous stock swap estimated at $400 million. AOL wants to leech cash from you by being the bullet boy for any and all digital music activity. Good luck. Then there's giddy MTV sucking up TCI Music's SonicNet, Addicted To Noise, and The Box in exchange for a 10 percent cut in the Buggles Project (including Imagine Radio, a competitor to Spinner.com). They buy, they sell, they grow, they swell.

Why should anyone other than stockholders care about all this corporate clustering? Repeated consolidations show how very important the Internet is to large media corporations. Though unlikely to be immediately noticeable, it might make it harder for small bands to get noticed by cool small content sites, since those same cool small content sites are more and more often controlled by a parent company's bottom line.

Also: As mentioned in the main story, the second beta of the RealProducer for Macintosh is "on its way" and the RealNetworks G2 player for the Mac is finally out. The squeaky wheel gets the grease!

HARD DISK RECORDING SHOPPING LIST...
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BITHEADZ AS-1 RETRO SOFTWARE SYNTHESIZER

Can software synthesis replace analog synths? BitHeadz thinks so, and backs up that claim with a cross-platform (Mac/Windows), multitimbral, stereo, polyphonic software synthesizer playable from a MIDI keyboard. Like other software synths, it requires a fast computer for minimum latency and maximum polyphony. (This review covers version 1.2 for Windows.)

The Mac version supports Sound Manager (or any digital card that can "talk" to it) and Digidesign's Direct IO (for Digi's PCI bus cards, such as Audiomedia III). The Windows version requires a DirectX-compatible sound card; I used the S/PDIF out on an AWE64, which delivers far better fidelity than the analog out. The company is also working on compatibility via ASIO with several popular programs, including Creamware's Pulsar system and the Lexicon Studio (the Web site has latest compatibility info).

Turn your computer into an analog synth from yesteryear

You can play the AS-1 through a MIDI keyboard hooked into the computer's MIDI In, as an output device for a sequencer, or via an on-screen keyboard. The Mac version includes a driver to speak directly to the serial port and is OMS/FreeMIDI compatible.

WHAT KIND OF SYNTH?

The Retro AS-1 comprises several "sub-applications" that launch separately. These include modules for parameter editing, creating "setups" that arrange programs in layers or splits, and mixing multitimbral configurations (16-channel setups of various programs with parameters for volume, pan, global effects sends, mute, solo, program select, etc. — like a hardware synth's "combi" patch). Other modules include an on-screen keyboard, system configuration editor, and status indicator showing polyphony and CPU load. With this many windows (fig. 1), a high-resolution monitor (e.g., 1024 x 768) helps considerably.

Running at an 8–48 kHz sampling frequency with 16-bit resolution (96 kHz capability is built into V1.2, but is still being tested with various hardware), the synthesizer engine includes:

- Three audio oscillators with nine waveforms (as well as sync and FM options from another oscillator or filter output)
- Two modulatable filters with multiple inputs and 14 different responses (high-pass, low-pass, bandpass, state variable filter, 4-pole with resonance, etc.)
- Eight LFOs, each with six different shapes and optional sync to MIDI clock
- Eight envelopes
- Four ramp and four random modulators
- Arpeggiator that syncs to MIDI clock
- Twenty-four possible "matrix modulation"-type routings (including channel or poly aftertouch)
- Layers and splits
- All parameters respond to MIDI control (accepts up to four controllers simultaneously, and real-time control over almost all parameters via NRPNs)
- Typical 32-note polyphony with a fast Pentium II
- Effects (two insert effects per voice, two global effects, two global FX sends per MIDI channel)

The program comes with several banks of patches (about a thousand patches total), many of which are quite tasty.

BY CRAIG ANDERTON

TEST Drive!

MANUFACTURER: BitHeadz, 4400 Capitola Rd., Ste. 202, Capitola, CA 95010. Tel: 831-465-9898. Web: www.bitheadz.com.

APPLICATION: Create synthetic timbres in software on your computer and play them with standard MIDI keyboards and controllers.

SUMMARY: The AS-1 lacks the finesse of a true analog synth, but delivers performance consistent with digitally controlled analog synths at a very reasonable price, along with greater flexibility — if your computer is macho enough.

MINIMUM SYSTEM REQUIREMENTS: 32 MB RAM, 800 x 600 display, CD-ROM drive. Uses password-based copy protection. Mac: 120 MHz PPC, MacOS V 7.6.1. Windows: DirectX or ASIO-compatible sound card, 200 MHz Pentium, Windows 95/98.

STRENGTHS: Relatively inexpensive; multiple modulation sources; very flexible "matrix modulation"-type routing; excellent MIDI implementation; cross-platform compatibility; easy to figure out; FM and sync for oscillators; comprehensive complement of parameters.

WEAKNESSES: Noticeable "stepping" when changing some parameters due to parameter quantization into steps; noticeable latency with slower computers; calibrations are in arbitrary units; envelopes are touchy to adjust.

PRICE: $259 **EQ FREE LIT. #:** 129

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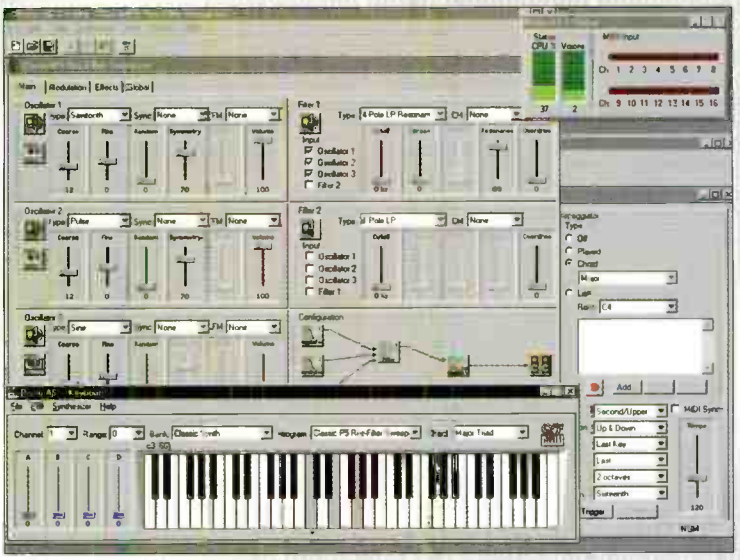

FIGURE 1: The main AS-1 screens. The keyboard is in the lower left, editor in the upper left, arpeggiator in the lower right, and status window in the upper right.

ABOUT THE EFFECTS

The two insert effects can choose from EQ (parametric and shelving), stereo reverb, chorus, delay (delay times can sync to MIDI clock), flanging, overdrive, and distortion. The two global effects select among reflection, delay, and reverb. You can adjust parameters while holding notes (nice), and the quality is reasonably good.

POLYPHONY

Performance depends on the CPU type, clock rate, sample rate, and bus speed. More complex voices, multitimbral setups, and other programs running concurrently use additional CPU power. According to the company, a 200 MHz system with 64 MB RAM allows only mono voices with Cakewalk Audio Pro 8, and only 3-4 discrete mono tracks with the Windows Media player. Stand-alone is a different matter: with my admittedly anemic platform (200 MHz MMX/32 MB), eight complex voices used up about 50 percent of the available CPU power.

For recording applications, you can bounce the synth output (including effects and multitimbral setups) to a hard-disk file, producing an AIFF file on the Mac or WAV on Windows. Import this into your digital audio recording program to free up the AS-1, then make more synth noises.

USING IT

The Retro AS-1 sounds excellent — as you call up the various analog type presets, it's easy to be impressed. However, due to controls being quantized into steps, the "feel" is more like digitally controlled analog synths, such as the Oberheim OB-8, Prophet-5, etc. For example, if you sweep the hard sync manually, you'll hear the oscillator

continued on page 129

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THE NEED FOR SPEED

Just when you thought that EIDE drives were getting really fast with the new 33.3 MB/s UDMA-2 drives, an even faster kid has moved onto the block. It's known as Ultra ATA/66 (a.k.a. Ultra DMA/66 or Fast ATA-2). As you might suspect, drives that support this transfer protocol allow host computers to send and receive data at 66.6 MB/s, which is twice the data transfer speeds of Ultra DMA/33 drives.

Doubling the burst transfer rates of these cost-effective, large-capacity IDE drives reduces data bottlenecks; you'll have a faster system because the drive can finally begin to catch up with the PC's internal bus speed; and, of course, you can have more audio tracks and/or improved video performance.

With Ultra ATA/66, EIDE drives just got faster

In addition to speed, a special error-correction scheme, known as CRC (Cyclical Redundancy Check), was introduced with Ultra ATA/33 drives to verify the data's accuracy as it passed through the drive. Ultra ATA/66 uses the same process. Using CRC, both the host controller and hard drive load bursts of data into special registers (smart storage bins) and compare the two for errors. If errors are found, they'll again request the data until no errors are found.

BY DAVID MILES HUBER

COMPATIBILITY & SYSTEM REQUIREMENTS

Regarding backwards computability, Ultra ATA/66 hard drives are said to work just fine with both Ultra ATA/33 and DMA controllers, as well as with existing EIDE/IDE and CD-ROM drives. Simply plug your power and 40-pin data connectors into the drive, let the CMOS auto-detect it, and you should be in biz (at least in theory).

On the other hand, if you want to take full advantage of this new rate, your system must have:

- Ultra ATA/66-compatible logic either on the system motherboard or on an Ultra DMA PCI adapter card
- An Ultra DMA-compatible BIOS
- A DMA-aware device driver for the operating system
- Ultra ATA/66-compatible IDE device such as a hard drive or CD-ROM drive (anyone for a sonic-boomin' 80-spin CD-ROM?)
- A special 40-pin, 80-conductor cable

One of the more obvious changes is the need for a new and special data cable. Although the 40-pin connector types remain the same, the cable itself has changed with the new spec. Instead of having 40 wires (one for each pin), the new cable is designed with 80 wires (40 signal conductors and 40 ground lines, which act as shields) that are interleaved between all signal lines. This special cable reduces crosstalk, improves signal integrity, and is absolutely required in order for Ultra ATA/66 to work. (The system's smart enough to detect the presence of this new cable and won't turn on without it.)

Since Ultra ATA/66 is fully endorsed by such hard drive manufacturers as Western Digital, Fujitsu, IBM, Maxtor, Quantum, Seagate, and Toshiba, you can expect to see these cost-effective drives hit the streets during the coming months. You can also expect to be seeing Intel and other CPU-based motherboards that fully support this protocol during the course of the year.

Don't hold me to this, but it's my understanding that presently (and y'all know how long "presently" lasts in the computer biz), there's only one hardware controller card that fully supports Ultra ATA/66 — the Ultra66 from Promise Technology, Inc. (www.promise.com). This PCI card comes bundled with the required 80-wire cable and works in conjunction with your motherboard's ports so you can connect more IDE devices.

OK all you speed demons out there, now that you know the scoop: Gentlemen (if there are any women Formula 1 racers on the circuit now, forgive me), start your engines! EQ

SHOWING PROMISE: The Ultra 66 can keep your hard-disk moving right along.

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MIDIMAN MIDISPORT 2X2 USB MIDI INTERFACE

Many of us with a laptop, a PC without an available hardware slot, or one of the new generation of iMac or G3 Apple computers have been waiting with bated-breath for the introduction of a MIDI interface that connects to the computer via USB. (The new Universal Serial Bus standard that lets you connect up to 127 external hardware devices to a single port.) Well, our time has come, as several units are finally beginning to hit the streets.

MIDIMAN makes it easy to get your MIDI gear through your USB-equipped computer with their new interface

One of the first USB units to become available is the MIDISPORT 2X2 MIDI interface from MIDIMAN. This small, rugged box (which is about as bright as a key-lime pie on Easter Sunday) is extremely simple in form and function, offering access to up to 32 MIDI channels via two, independent MIDI input and output ports.

THE LONG AND THE SHORT OFF IT

The layout is straightforward. The front panel houses a single MIDI In jack for the A-port, a set of green LEDs that tells when there's activity on all I/O ports, and a hypnotically pulsating USB LED that tells you the box is working, as well as a MIDI Thru switch that lets you play your MIDI instruments when the computer's switched off. This useful switch simply routes the MIDI In ports thru to their respective Out ports. The back panel of the box contains the MIDI Out jack for the A-port, both the In/Out jacks for the B-port, and last, but not least, the USB connector.

Installing the MIDISPORT on my laptop was easy. Upon plugging in the box, Win 98 detected it, asked me to put in the Win 98 disc, and then for the driver disk. Right off the bat, the green USB light began to pulsate, letting me know that the box was working properly. After plugging in a few synths and configuring my laptop's newly installed sequencer to talk to the MIDISPORT, I began by playing a simple file. It worked as the instruments started rockin' on the first try. The interface has worked flawlessly for me ever since.

MY 2 CENTS

In short, this little puppy is perfect for musicians who have USB-capable computers and want portability and/or don't have the need for a ton of MIDI ports. (You can chain multiple MIDISPORTS together to get additional ports.) I'm a big fan of devices that are small, simple, inexpensive, and work every time, and this one fits the bill. Long live USB! EQ

BY DAVID MILES HUBER

TEST Drive!

MANUFACTURER: MIDIMAN, 45 East Saint Joseph Street, Arcadia, CA 91006. Tel: 626-445-2842. Web: www.midiman.net.

APPLICATION: Compact 2-in/2-out (32 x 32 channel) MIDI interface for USB-equipped PC or Mac computers.

SUMMARY: A small, inexpensive USB interface that's great for moving computers like Win-98 PC laptops and iMacs into the world of MIDI.

STRENGTHS: Simple install procedure; compact and rugged design; front-panel "thru" switch lets you play your MIDI gear even when the computer's turned off.

MANUAL: The instruction manual is amazingly complete for a double-sided leaflet. It even takes the time to introduce us to the world of MIDI, system setups, and using the interface with software music packages. Since install procedures and troubleshooting are continually changing in the newborn world of USB, the setup instructions have been placed in a readme file on the driver diskette.

SYSTEM REQUIREMENTS: Computer that fully supports USB. PC running with Windows 98 or Mac with sequencing software that supports Opcode's OMS drivers.

PRICE: $129 **EQ FREE LIT. #:** 130

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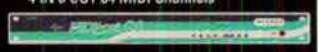

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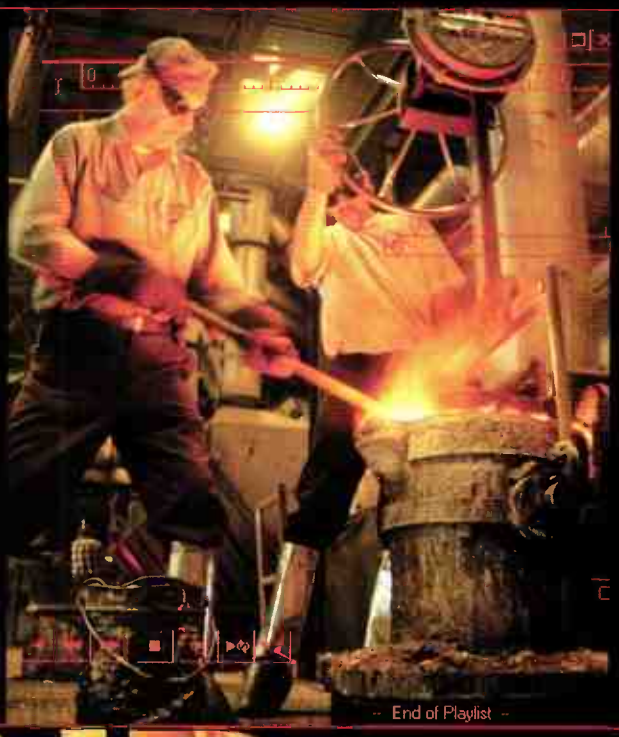

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CIRRUS: ON A MISSION

BUT CIRRUSLY...Cirrus manages to bring their gear-ladden studio techniques onto stage with them.

BY STEPHEN JAMES BARRY

Cirrus, from Long Beach, CA, is Aaron Carter (turntables, bass, and vocals) and Stephen James Barry (guitar, keyboards, and vocals. In 1997, their first single, "Superstar DJ," made the Billboard *Top 10 dance charts; the title track from their second CD,* Back on a Mission *(Moonshine MM80093-2), originally appeared on the* Mortal Kombat II *soundtrack. Their latest single, "Stop and Panic," released in May '99, features remixes by DJ Dan, Micro, Deepsky, and Coffee Boys.*

Cirrus's debut CD, Drop the Break *(Moonshine MM80065-2), proved you don't need big-bucks gear to deliver the goods. It was made with a Mac Plus, Performer V3.1, Roland Juno-106, EMU Proteus, Ensoniq EPS, dual Technics SL-1200 turntables with a Gemini Scratchmaster mixer (Aaron's main tools), bass, and guitar. Aaron's mother, who served as musical director for Pentecostal Baptist church in Compton, sang on the album, while Stephen's mother provided the spare bedroom in which it was recorded.*

Cirrus's latest release continue stheir tradition on integrating their studio recordings with live performance

Shortly after the release of Back on a Mission, *we asked Stephen to tell us how Cirrus integrates the studio with live performance, and how success has transformed their project studio. —Craig Anderton*

Before we could afford an ADAT, we'd sequence everything and take all our equipment (the computer, the synth modules, and instruments) either to the school we were attending [Golden West College] for a 2-year recording program, or to a little project studio that had some DA-88's and a Carvin live sound mixer. We'd then lay the

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The biggest thing in samplers wouldn't even fit on this page

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parts on to 16 tracks and start mixing. We submixed when we had more than 16 tracks. We'd record the live parts, like scratching, directly to the DA-88. Getting the sequencer to lay down a flawless pass was the most difficult part — we were novices and we'd have glitches. Eventually, we could afford a MOTU MIDI TimePiece, and SMPTE gave a lot more flexibility in terms of replacing some of the sequenced parts.

After Moonshine released a few singles and saw potential, they fronted us some money and our studio started to evolve. We bought a couple of Yamaha ProMix01 mixers (one submixed into the other) and an ADAT, took the singles we had, added seven more tracks, mixed everything down to DAT, and had an album.

Toward the end of the first album, we moved into our own house and started building a "real" studio. Every spare penny we made went into buying new gear, whether pawnshop prizes we found on the road, like a Roland SH-101, or new gear, like Tannoy monitors. Current favorite gear still includes the Juno-106 as well as the SH-101, Nord Lead, Roland R-70 drum machine, EMU E4XT, and the Akai MPC 2000, which Aaron likes to take on the road for sampling and writing.

For guitar, I use a divided pickup and split the output between a Roland VG-8 and Axon AX-100 MIDI controller that works great. I like the VG-8 for guitar sounds, but not for synthetic sounds, so I use the AX-100 mostly to trigger the Juno and SH-101.

We have two ADATs, an XT and an original "black face," but now we're getting more into using Pro Tools. We only have eight channels of Pro Tools, though, so, if we run out of tracks, we go to the ADAT. When we're ready to mix down, we dump the sequences to tape, then take it to a commercial studio and mix in real time. We mixed the first album ourselves, then went to a professional mastering studio. For the second album, we hired a professional mixing engineer, Steve Miller, and I think you can hear the difference.

With respect to mixing, we take mostly a live approach in the studio — tweaking lines, filters, messing with certain parts. We often record alternate takes so we can pick whatever we like in the studio and work with that.

We're going to go back to analog mixers because we're getting tired of the sound of digital, which can sound kind of "squeezed." However, part of that might be that signals often have to go through a lot of conversion stages when interfacing analog gear to the digital mixer and using inserts and aux busses.

TAKING IT LIVE

It's not difficult to translate the studio sound into live, because much of our studio approach is so live-oriented. However, we do scale down our gear. For instance, the MPC replaces the samplers. We also use an ADAT XT to hold tracks from instruments that are too delicate to take on the road, or when we need multiple parts from an instrument but have only one with us. This is an extension of when we started out and put basic beats on a DAT we'd play over — but ADAT lets us do a lot more. Essentially, the ADAT represents every piece of gear we can't take with us.

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CIRCLE 28 ON FREE INFO CARD

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FIRST LOOK: ZOOM SAMPLE TRAK 224

The Zoom SampleTrak 224, intended for DJs and musicians, records and plays back up to 24 sounds on three banks of eight pads, which can be played with a simple tapping motion. Users can take these sounds, shape each one with an array of edit tools, enhance them with Zoom effects, and compose music with the versatile eight-song sequencer.

Zoom allows DJs and musicians to easily create and edit effects with their versatile new sampler

The sampler section allows up to three sound-quality grades and stereo/mono switching. Depending on their needs, users can choose between Hi-Fi for best sound, Standard, or Lo-Fi for long recording time. Sampled waveforms can be stored in the internal backup memory or the optional external data cards. An internal sequencer lets you memorize a pad-playing session to create eight original songs. The songs can then be assigned to pads 1-8 for real-time playing.

The ST-224 also incorporates 22 sound effects. A mixer function allows you to assign an effect to one or more specific pads. Knobs and rotary controls on the panel can be used to vary effects parameters in real time.

An Autosync function allows the beats per minute (BPM) of a sample assigned to a pad to be matched to the BPM of any selected sample. Changing the length of a sample is possible without changing pitch. This, for example, allows users to easily adjust the tempo of a drum loop and bass pattern sampled from a CD.

BY MICHAEL SANCHEZ

CONFIGURATION

The analog signal supplied to the ST-224 is converted into digital form by an A/D converter, and the resulting waveform data is stored in the memory of the sampler section (main memory).

Sampled and stored sounds can be played back in various ways, by hitting the pads on the unit, for example, by the internal sequencer, or under the control of an external sequencer connected via the MIDI In jack. The maximum number of samples that can be played simultaneously is eight mono samples and four stereo samples. The sound of the samples played by the pads or sequencer can be altered if desired by the effects section, and then appear at the Output R and Output L/Mono jacks. The SampleTrak also has a Resampler function that lets users reshape and mix down sampled phrases in the digital domain to create new samples.

MEMORY

The Main memory is a volatile memory whose contents are lost when the ST-224 is turned off. This memory temporarily holds waveform data, pad parameter setting data, and song data for the internal sequencer. The Backup memory is a non-volatile memory whose contents are retained when the unit is turned

World Radio History

off. It serves for permanently storing the entire contents of the main memory (bulk data). Only one set of bulk data can be stored in the Backup memory. The Data Card is an external storage medium inserted in a slot in the rear panel of the unit. Like the Backup memory, it serves for storing bulk data, but it can hold more than one bulk data set (as many as the card capacity allows).

PAD PARAMETERS

The types and values of parameters that can be used for pads 1-8 and the Source pads are as follows:

Source Pad (Source Mix): When this parameter is set to "on," the signal supplied at the input jacks is always sent to the output jacks. When set to "off," the signal is sent only while the Source pad is being pressed.

Pad 1 (Level): This parameter sets the output level for each sample. The – and + keys or the Edit 1 wheel can be used to select a setting between 1 and 100.

Pad 2 (Tuning): This parameter allows pitch tuning for each sample in units of 1 cent, over a range of ±3 octaves. The – and + keys serve to change the setting in cent units, and the Edit 1 wheel in semitone units. The tuning setting can also be made in BPM units.

Pad 6 (Panning): This sets the panning position of the sample. When the setting is "L50," the sample plays in only the left channel. A setting of "0" is center, and a setting of "R50" is for the right channel only.

Pad 7 (Reverse): This switches between reverse playback (on) and normal playback (off).

Pad 8 (Trigger/Gate): This parameter selects between three playback modes: Trigger playback, Retrigger playback, and Gate playback.

EFFECTS

All effects can be adjusted using the Edit 1 wheel and Edit 2 knob. Effects include Time Stretch, Scratch, Delay, Reverb, Flanger, Step Cry, Chorus, Phaser, Pitch Shifter, Dimension, Distortion, Ring Modulator, Low-Pass, High-Pass, Extreme EQ, Resonance, Lo-Fi, Compressor, Tremolo, Auto Pan, Volume/Bass, and Exciter.

The suggested retail price is $499. For more information on the Zoom SampleTrak ST-224 or Zoom's other products, call Samson at 516-364-2244, fax them at 516-364-3888, or visit www.samsontech.com. Circle EQ free lit. #131.

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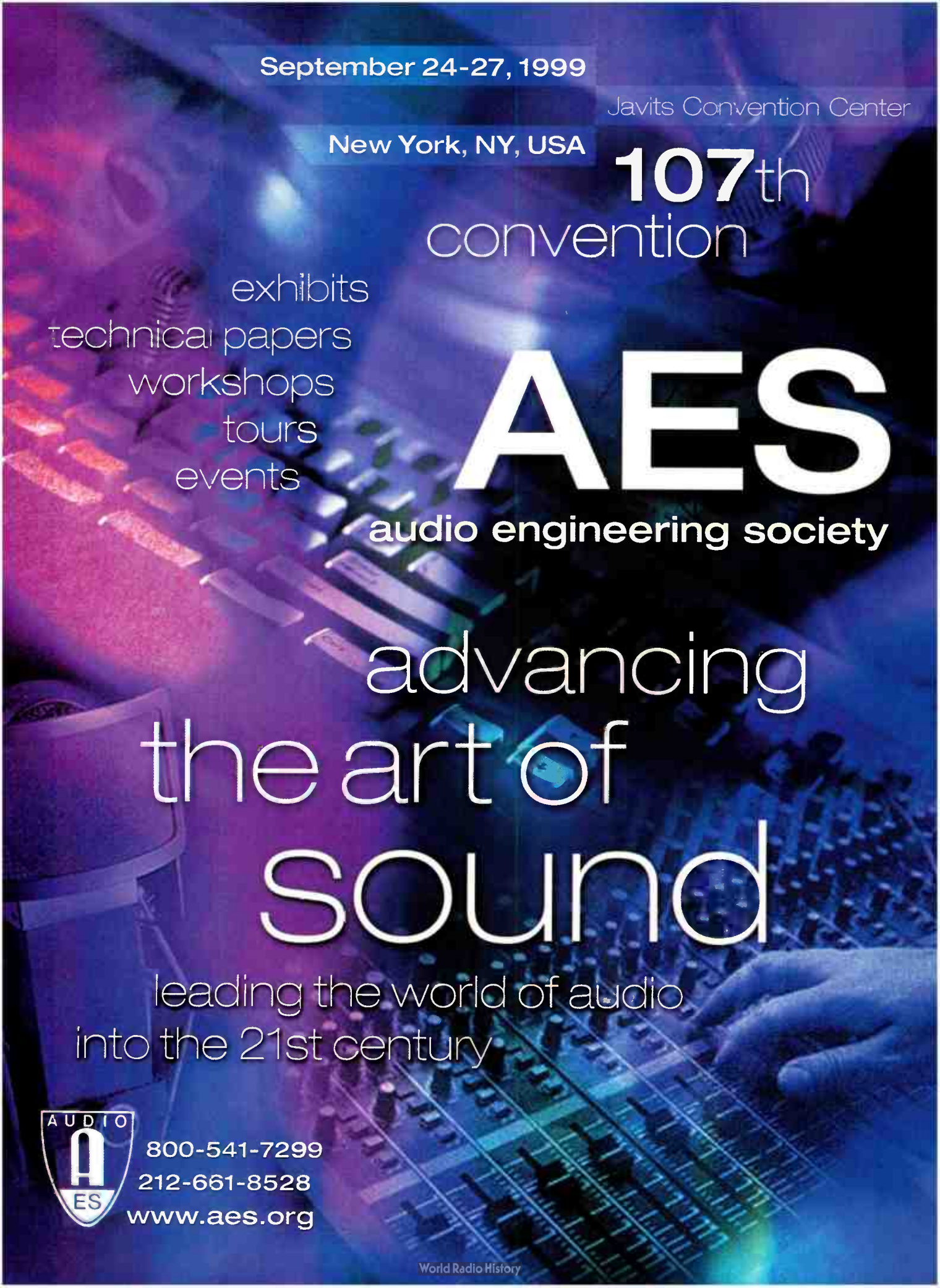

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REVIEW SHORT: GUITAR CENTER SYNCHROLOOPS

Produced by Doug Scott and Robby Scharf for Guitar Center, this CD (available in WAV or audio format; $99.95 each) contains six folders of loops (over 1000 loops, 341 MB total). All loops are 120 BPM and mostly in the key of E, making them easy to mix and match; like most sample CDs, changing tempo or pitch requires a digital audio editor, or a program like Sonic Foundry's ACID.

Drums (123 MB, 386 files) includes folders for disco, funk, hard rock, Latin, light rock, misc. drums (with individual cymbal hits, some great JV1080 drums, Casio VL-Tone, etc.), old school, reggae rock, rock (takes up almost half the drum samples and files), shuffle, and swing. These aren't the only drums you'll ever need, and some are overly processed for my taste, but they work well with the other loops.

Percussion (81 MB) is great, particularly the African, Brazilian, and mouth sounds. Of the instrument sounds, Bass (49 MB) is variable — many of the samples have hiss or buzzes. Some Guitar (26 MB) sounds (particularly blues) could have used a bit more editing, and the rock sounds are mostly FX, not chugga-chugga rhythm sounds. The funk and soul sounds are excellent, and the wah-wah guitar sounds are outstanding. Sitar has some very cool effects.

Synchrojams includes Rahul & Parvinder's wonderful sitar/tabla jams (8 MB), while Synchrobands (6 MB) are various riffs (e.g., guitar, bass, and organ) with funky, lo-fi sound quality. If you're scoring a movie where the detective walks into a bar, this music might be playing in the background.

SynchroFX (14 MB) has a bunch o' weird sounds, including some great vinyl noise, a few sax effects, neatso vocoder thangs, noise, etc.

Finally, there are 18.5 MB of Synchromasters, which are the only loops on the disc that need to be licensed for use. They combine various loops that show off complete arrangements, and are good for auditioning the CD.

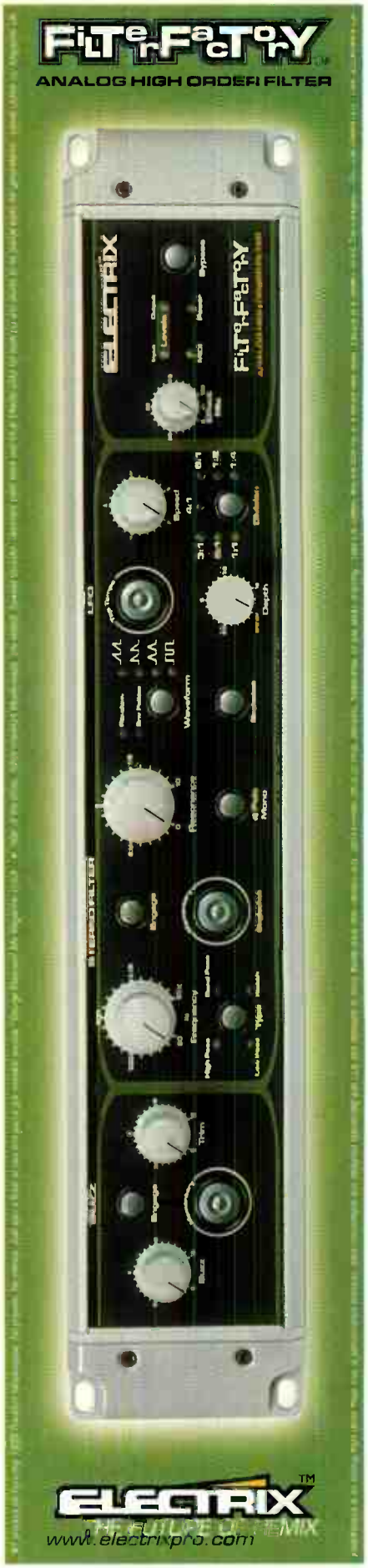
Technically, the quality is good, but not perfect — some of the loops are off by a few milliseconds, there's occasional distortion, a few loops have clicks, and a good noise-reduction algorithm would help in several places. Although these "problem" loops are in the minority and easily fixable, one wonders why they weren't caught before the CD was pressed.

GC has tried to make using this CD as painless as possible, and they've scored well in that respect. Samples are generally not normalized, so if you bring in, say, a hihat, it won't overpower the kick. In addition, very few sounds are dry (almost all the drums have ambience). This is great if you don't want to mess with processing, but a drag if you prefer to add your own.

Overall, this CD gets high marks for creativity; it's not a "me-too," genre-specific CD. It's ideal for multimedia types who may need to do a hard rock background for a local commercial, then create a sitar snippet for a '60s retrospective. Nevertheless, for sample veterans, there are also enough cool bits you can't get elsewhere to justify the bucks.

CONTACT: Synchroloops, Guitar Center, 5155 Clareton Dr., Agoura Hills, CA 91301. Tel: 818-735-8800. Web: www.guitarcenter.com.
PRICE: $99.95.
EQ FREE LIT. #: 132

BY CRAIG ANDERTON



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EQ MULTIMEDIA

CHAMBER MUSIC (AND VIDEO)

BY ROGER MAYCOCK

Chamber of Poets break new creative ground with their multimedia DVD release

At a time when music videos all seem to look the same, a new and refreshing artistic endeavor from Dwight Marcus and Charles Barth is about to land at a store near you. Collectively known as the Chamber of Poets, these multimedia artists have released a collection of short "chapters" on DVD titled News From The West *(Slingshot Entertainment). The project marks a radical departure from conventional music videos, TV, or film, and represents an entirely new direction for the integration of music, sound effects, the spoken word, and visuals.*

News From The West, *by the very nature of its release on DVD, gives new definition not only to the term "home entertainment," but also to the creative options available to today's project studio. Marcus and Barth produced the entire project (minus the shooting and processing of the film) in their studios. The release features session players Mike Miller, Bernie Dresel, Chuck Findley, and several others carefully woven into an intricate audio/visual collage that ultimately combines to form an entertainment experience unlike anything you've ever seen.*

DVD is the ultimate home entertainment medium for the foreseeable future, and News From The West *exploits DVD's present capabilities to the fullest. Marcus and Barth have taken 5.1 surround sound to a new level, while the images draw the viewer into a world that is equally compelling. It is difficult to believe that such an impressive experience could come from a project studio alone — but it did. Here is their story.*

EQ: How did you arrive at the name Chamber of Poets and how do you describe your form of art?

Dwight Marcus: Back in the late '80s, Charles and I decided that beat poetry had not gotten a fair shake, so we started something called the New Beat Ensemble. We compiled some books of my written work and began to collaborate on some beat-inspired

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projects that somewhat picked up from where Allen Ginsberg and others of that period had experimented. Slowly, as the New Beat Ensemble turned into a musical performance group and began to encompass larger values than just the spoken word, we arrived at the name Chamber of Poets, as it seemed to suit everything we were into by then.

Charles Barth: During this time, we started experimenting with Mac-based sequencing and the integration of sampling technology. With the addition of a female vocalist, the "core" of our group began experimenting with several projects. Sometimes these were songs with spoken word, and other times we brought in large groups of people to try various readings — all accompanied by a variety of samples and sequences that were quite innovative for that time.

Marcus: Throughout much of the experimentation we realized that something was still missing. While pop songs are a great medium, as are poems on the printed page, they never seemed to converge the way we wanted when they emerged from a pair of loudspeakers. So we began to incorporate visuals, and that's when the real Chamber of Poets was born.

Chamber of Poets is an environment where we don't draw the line between sound effects, music, the spoken word, or visuals. There's no clear demarcation between all these elements — it's all one big holistic, synergistic effort. We call this combined form of media "Pulse."

We're concerned about very short slices of time, or pulses, and what's happening in terms of the "dialectic" between all the various audible and visual elements of the composition. With each chapter on *News From The West*, the sound effects may say one thing, the text may say something else, and the music may be conveying yet a third message. We've attempted to set up a dialog that exists between these elements to create an experience that's very different from traditional film.

Barth: The compositions incorporate the same types of elements that the viewer already knows, but are packaged in such a way that they strike with a very different, yet intense, emotion. The project is a modern visual experience with theatrical support. The essence of what it's based on is the complexity and the flexibility of what it's like to experience poetry. I believe Chamber of Poets opens up an emotional experience on a multitude of levels — it's literally poetry for the next millennium, and DVD is the medium that has enabled us to bring our vision to life.

There are so many snippets of sound in this project. How did you go about creating all the source material, and how did you organize it throughout the duration of the project?

Marcus: We used Chamber of Poets as a live musical and spoken-word performance ensemble to shake down a lot of material. We then revisited that material, which was recorded on everything from DAT to 2-inch analog to ADAT and sequenced material — even Mitsubishi 32-track. After determining from the live sessions what

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POETS UP CLOSE AND PERSONAL: Chamber of Poets used the new technology of DVD-Video to expand their creative horizons.

worked and what didn't, we then had an organizing principle that helped us determine what we would integrate with film.

While we had a seemingly endless amount of material from previous recording efforts, most of the material was created specifically for this DVD. The DVD contains 13 shorts plus 5 bonus cuts, so there's a lot of material on the disc — both new and "historical." We would take multiple performances that may have initially been radically different from each other, and, with the help of Digidesign Pro Tools, find a way to extract and modify those elements so that they could be combined the way we wanted.

Barth: We constantly experimented. As we entered the final stage of this project, one of the most interesting aspects (looking at it in retrospect) was how much material we had on ADAT tapes. We had loads of material that was originally recorded on Sony 3324 DASH and 2-inch analog that had been transferred to ADAT for backup. We discovered that we actually preferred the sound of the material from the ADATs. The sound had a more defined, solid character, and, as a result, the ADAT tapes served as the source material for a huge percentage of this project — which we then transferred to Pro Tools for further editing.

As we brought the material into Pro Tools, we always had to pay close attention to the sample rate so that, ultimately, all tracks from a variety of sources had a uniform sample rate prior to DVD mastering. *News From the West* is an example where we had a 24-track source that was transferred into Pro Tools, from which we chose a few pieces and then re-cut the drums by hand. Pro Tools was an invaluable tool throughout much of this project.

Marcus: This process enabled us to achieve all the benefits of capturing great-sounding live performances utilizing a variety of recording techniques such as tape saturation, and then putting that material into Pro Tools. From there, we could manipulate it in ways that previously would never have been possible — including undoing some of the human frailties of those performances. We also took several string and brass passages that were originally performed on keyboards, re-scored them, and, finally, re-recorded them with live players directly into Pro Tools.

Barth: Out of necessity, submixes became quite common throughout this project, but we always saved the material in such a way that we could go back and redo it if we later decided the mix wasn't right. The file management system was quite involved, but it allowed us to revisit items that needed correction. With so many tracks, we constantly had to manage our disk space on the computer, so we were

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POETS' TOOLS: Alesis ADATs and Digidesign's Pro Tools played a big part of the disc's porduction.

regularly dumping to Iomega Jaz drives and eventually burning CDs of the material.

Normally, composers for TV and film work to a "locked" video, whereby the picture is finished and will see no additional edits. How did you go about combining audio and video for Chamber of Poets?

Marcus: The traditional sound-for-picture process invariably places audio in the back seat of the production process. Our project was characterized by a very interactive give and take between both audio and video, with audio or text frequently driving production. While there were exceptions, we usually took a track that was fairly complete, imported it into the Avid, where the editors, myself included, would start to tool it. If we ran into a "logjam" or some condition that wasn't ideal, Charles and I would send the file back to Pro Tools, this time creating a QuickTime file that allowed us to then craft the track to the QuickTime visual. We'd start working with hits, finding what worked and what didn't. Afterwards, the file would go back to the Avid where it would serve as the basis for the finished track. This process would frequently go back and forth several times until the track reached the condition where it was 95 percent there, at which point we knew we had to lock it in.

Barth: As I was managing the edits inside Pro Tools, I learned to split segments up into large blocks that followed a movement or section of the overall track. This made the edits easier to manage. We placed markers that corresponded to timecode so that we knew where the segments needed to go if we temporarily removed them for editing. Using timecode against the QuickTime files was a critical factor in being able to remove and replace data.

We stayed entirely in a nonlinear audio and video environment until the last two weeks of the project. At that point, all of the video was officially transferred from the Avid onto Digital Beta. From there, a Beta SP copy was made, and, in our Pro Tools suite, we locked everything in the traditional way to the SMPTE output of the Beta SP tape. At this point, we were ready for final mixing.

While you certainly used Pro Tools extensively, you also used a Yamaha 02R and several Alesis M20 digital multitracks on this project. How did those tools figure into the overall picture?

Marcus: The 02R served two purposes throughout the project. First, the 32-track version of Pro Tools that we were working with was not 5.1 compliant, so we couldn't do true 5.1 mixing in that environment. To work around this, we used the assignments in Pro Tools like stems so that we could control the pan positions externally. Second, as we were running multiple Pro Tools systems, we didn't want to lose anything as a result of the analog portion of the signal chain. Hence, we needed a way to sum the signals from the multiple systems.

Barth: The output of the Digidesign 888 modules were assigned 1–6 with left and right front, left and right rear, center, and bass. Those signals would enter the 02R on six faders fixed at unity gain. The second and third Pro Tools systems were duplicated at the board. Then, if there were something that we needed a free pan on, we would assign that signal to its own dedicated output from one of the remaining outputs on the 888 modules. That signal would then enter the 02R on a dedicated input so we would be free to work with it as needed.

We used the M20's for both source recording of multitrack material and as our final delivery, or mixdown, medium. They really made an incredible difference to our finished project. The clarity of sound made possible by their 20-bit architecture was noticeable immediately. They made the audio so much more enjoyable to listen to, and everyone who was working on the project noticed the difference. The M20's were responsible for handling the final 6-track mix stems plus the stereo mix on tracks 7 and 8. This also ensured that the 5.1 and stereo mixes would be in sync when the tapes were delivered to the mastering facility for DVD authoring. The M20's timecode functions were a lifesaver for us, both in generating timecode for itself and its reliability in tracking. Its intelligence in the timecode realm and sample-accurate sync really made it the only way to drive the rest of our systems.

What most significant things did you learn as a result of this DVD project?

Marcus: We were most concerned

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World Radio History

SOUND FOR PICTURE

STUDIO NAME: Hacienda Studio
LOCATION: Calabasas, CA
KEY CREW: Don Davis, film composer and studio owner; Michael Jay, design consultant and project supervisor; design by Chris Pelonis of Pelonis Sound and Acoustics; Rick Rusamente, acoustical interiors and installation; Mark Casselman, wiring and patchbay installation
PROJECTS RECORDED: Score for the Warner Brothers film *The Matrix* was mixed at Hacienda by Larry Mah
CREDITS: In addition to composing the score for *The Matrix*, Emmy Award-winner Don Davis has orchestrated films such as *Die Hard II*, *Robin Hood: Prince of Thieves*, *The Last Action Hero*, and *Toy Story*. Davis has also written music for television programs that include *Beauty and the Beast*, *Seaquest DSV*, NBC's *House of Frankenstein* miniseries, and *Star Trek*.

Don Davis uses his project studio to compose scores for popular movies and television shows

CONSOLE: Four cascaded Yamaha 02R's
KEYBOARDS: Yamaha Disklavier and EX5; Roland D-50
MIDI SOUND MODULES: Kurzweil K2500R; EMU Emulator E4X; Korg Wavestation SR; Roland S-760 samplers [12]
MONITORS: Genelec 1032A (for left-center-right monitoring) [3]; Event 20/20bas (surround) [4]; M&K MPS-150 subwoofer
AMPLIFIERS: Hafler Pro2400 and P1000; Lucasfilm THX CC4.5
COMPUTERS & SOFTWARE: Mac G3/300; Bit 3 PCI expansion chassis; Digidesign Pro Tools|24 Mix Core card and two DSP Farm cards; Adaptec SCSI accelerator card; Miro DC30 Plus video card; Viewsonic G810 monitor; 17- and 9-GB hard drives
SOFTWARE: Digidesign Pro Tools|24; MOTU Digital Performer; Adobe Premier Video Editor
RECORDERS: TASCAM DA-88; Panasonic AG-DS555 video deck
DAT MACHINES: TASCAM DA-45 HR (24-bit DAT recorder) and DA-302 (dual DAT); Panasonic SV-3700
OUTBOARD GEAR: Lexicon 300L w/LARC; Eventide H3500 Dynamic Ultraharmonizer; TC Electronic Fireworx and Finalizer; Roland SRV-2000 reverb; Yamaha SPX90; Drawmer DL241 (dual comp); dbx 120xp Subharmonic Synthesizer
SYNCHRONIZATION EQUIPMENT: Aardvark Aardsync II and Sync DA; Burst SG-4; MOTU Digital Time Piece and MIDI Time Piece AV [4]; Digidesign 888/24 interface [2]; Sony 32-inch video monitor
POWER CONDITIONING EQUIPMENT: Equi=Tech ET12.5 Symmetrical Power System
STUDIO NOTES: Hacienda Studio was conceived as a multifunction facility that can accommodate the various components of film and music synchronization. Its primary purpose is mixing, and it has the capability of handling 5.1 surround mixes with 24-bit resolution, remaining entirely in the digital domain. The room has been acoustically treated and tuned for accuracy in music monitoring. It also has an ample isolation area with tie lines to accommodate the recording of small live instrumental ensembles, drums, vocals, and piano.
EQUIPMENT NOTES: Davis continues: Pro Tools|24 makes it possible to deliver as many tracks of music to the dubbing stage as may be required without ever having to utilize tape. I find that I have been relying heavily on the editing aspects of Pro Tools — both before and after the mixing process. Also, the abundance of samplers makes virtual mixes of the samplers live-to-hard disk possible. EQ

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CAD VSM 1 Tube Microphone

Warm up your tracks with this new tube mic from CAD

BY MIKE SOKOL

A tube mic can restore some of the analog sound we used to get with good tape decks running hot levels. A large part of the "sound" of this sort of gear was due to the fact that the equipment would distort fairly gracefully, rather than hitting a digital brick wall or the rails of a low-voltage power supply. This would do at least two things: soft limit the signal and add a few interesting harmonics. There's just something about the natural compression and coloration of a tube (or "valve" if you're from England) that's very musical and flattering. That's why, sometimes, by simply using a good tube mic, you can start out with a great sounding track. And that's where the VSM 1 from CAD comes in...

There had been a lot of chatter on the street about the new CAD VSM 1 microphone, including plenty of laudatory words from well-known engineers and producers. Enough of a buzz, in fact, that several of my engineer friends had asked me if I had heard anything about the mic. Therefore, when I finally received a pair of the real thing for this *EQ* Audition, I had to invite them over for a look and listen.

The mic's look is very "retro" — with just a hint of RCA77 styling from the rounded grille and black/gray finish. The shockmount took a little getting used to, since it's unlike any I've ever seen before. A "U" shaped yoke uses just a pair of O-rings to secure the mic. At first, this seems a little flimsy, but it appears to do a good job of isolation without subjecting the mic to the potential of a fall to the floor. It's a good (and certainly unique) design.

Since this is a tube mic (using a hand-selected 12AX7 valve), there's a separate power supply that plugs into a wall outlet and a 7-pin cable goes to the mic. Other than the warnings about not killing yourself with high voltages when replacing the tube, the instructions are relatively straightforward. (Yes, tube voltages can be lethal. I once knocked myself out on the 650-volt power supply of an Ampeg SVT amp, so please be careful.)

IS THAT A TUBE IN YOUR POCKET, OR...?

I had the opportunity to do several recordings with the VSM 1, and, since CAD sent me a pair of them to try, I first used them on a solo piano piece I recorded at the Kepler Theatre in Maryland. There was just a bit of tube warming from the VSM 1's, which seemed to match up perfectly with the recently restrung 7-foot Steinway as it helped calm down a little of its brashness.

I then loaned one of the VSM 1's to an "electronic artist" buddy of mine to record female vocals and flute for a current project. He was completely into getting as much "analog" sound as possible, while still being able to work in experimental mode. A week later he called back to say he was just enamored with the mic because it turned out to be perfect for the talent's voice. Furthermore, as a flute mic, it seemed capable of maintaining a true musical quality without going nasal like some mics do.

While he had the one mic out on loan, I used the other one in my own studio for a mic audition with Linda Williams (Of "Robin and Linda Williams" and *Prairie Home Companion* fame). Robin noted that it had a nice "Brown Sound" on her voice, with warm mids and a very smooth top and bottom (referring to the desirable timbre of a vintage "tweed" Fender amp). I liked it a lot on her voice. Since she has such beautifully intimate overtones that we didn't want to mask, she really didn't need a "hyped" condenser sound to add interest to her voice.

We had lots of fun with this pair of mics, and I can think of other applications that should work well, such as drum overheads or even acoustic guitar. We can describe the VSM 1 sonic quality with words such as "warm yet smooth," and "a little bit sassy." Frankly, the quality of such mics can be downright emotional at times — an excellent quality in a microphone.

The VSM 1 is a superior tube mic. You'll want it to "warm up" your digital tracks with a bit of analog flavor (but without the negative side effects that come with analog tape decks). Go listen to a CAD VSM 1— and get a little closer to the fire.

PRICE: $1299
MANUFACTURER: CAD Professional Microphones, 250 Corporate 90 2550 S.O.M. Center Rd., Willoughby Hills, OH 44094. Tel: 440-593-0110. Web: www.cadmics.com.
EQ FREE LIT. #: 137

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ARBORETUM

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signature for the purpose of applying it to other sound files.

System requirements are modest. You'll need a machine with at least a 166 MHz processor, Windows 95/98/NT, a DirectX (also known as Active Movie) compatible host application, and a sound card.

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REALNETWORKS

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enough for me." Nonetheless, Steve expects he'll also have a Mac and a PC and be "trying out as many different platforms as I can get my hands on."

So what does Steve Mack, the analog audio guy and working musician, bring to RealNetworks? Though there's "not a lot of need for analog audio engineers at work, I'd like to think I have the better ears in the place. I've been engineering longer." He suggests his experience brings a more prepared approach. "Anything that can go wrong, will go wrong. I want to have at least two backups to every system we put up. Whether it's a streaming event, a download situation, or a product demo, everything has to be over-engineered, and that attitude comes from being a live sound man." Steve "discovers issues in using the tools as a musician" would. He can then go to the right people inside the corporate structure and say: "This is what's got to happen." He remembers when it was a "semi-hostile relationship" between his group and programmers. But now they get coffee and bagels and are included in the planning stages. "Things are pretty darned good."

Your FezGuys had to ask about RealNetworks's glaring lack of support for Macintosh or any other platform besides Windows. "You got us there," he admits. "We finally got a decent version of the G2 Mac player and producer, and we know there are still problems. It's frustrating to constantly apologize to people. They look at me like I'm a fool! It's extremely high on my agenda just to get the Mac version of the RealProducer installed and running. Beta 2 will be up imminently." [It should be up by publishing time.]

Steve has his hands full but obviously loves his work. To see where he works, go to www.real.com. Check out some of his music at: pages.prognet.com/marfa/. Take heart, Internet audio refusniks! Though your cause has been just, there are some of us on the inside. Now if we could just get a DSL line into the FezLab for $20 a month...

The FezGuys are Jon Luini and Allen Whitman, and they never say, "Yeah, whatever." They want to know what you think! Tell them at www.fezguys.com.

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Focusrite Platinum ComPounder

Check out this all-in-one dynamics processor that can pack a lot of punch in the low end

BY ZENON SCHOEPE

EQ LAB REPORT

MANUFACTURER: Focusrite Audio Engineering Ltd., UK. Distributed in the U.S. by Group 1 Ltd., 200 Sea Lane, Farmingdale, NY 11735. Tel: 516-249-1399. Web: www.g1ltd.com.

APPLICATION: Project and commercial recording; postproduction.

SUMMARY: Dual-channel, stereo linkable compressor-limiter-gate with opto circuits in the gate and limiter and "inductor" compressor Bass Expander.

STRENGTHS: Superb compression control and "Bass Expand" really is valid; nicely rounded dynamics package that offers something a little different.

WEAKNESSES: Gate section less controllable than other sections; "Bass Expand" trick may overshadow the box's other abilities.

PRICE: $899 **EQ FREE LIT. #:** 133

I can't exactly remember when it happened, but around about its Green period, Focusrite metamorphosed from its rather staid persona into a decidedly funky one. Aside from the ever so slightly tighter slacks, more colorfully adventurous wardrobe, and the occasional nod to hip musicians, it has managed to reinvent itself in the incongruous position of purveyor of high-quality gear to the high-end and to the informed beginner. In keeping with the mood set by the Platinum Voicebox and Tone Factory (both designs were quite unlike anything else before that had the F-word on it), the new ComPounder takes a different run at the business of dynamics control. As such, it will probably be the hardest unit to justify in the Platinum range because, from my experience, dynamics are the least well understood of outboard rack components by recording musicians — but then, the pitch is pretty heavy.

We are told that this dual-mono, stereo linkable, compressor-limiter-gate has separate gain elements in each processing block; opts for second- rather than third-order distortion; employs a discreet Class A VCA in the compressor; has opto circuits in the gate and limiter; and inductor circuit design in a separate compressor Bass Expander.

For a unit that lives well within the affordable end of the dynamics spectrum, this is no stripped down box of compromises. Indeed, the pot and switch count is staggering. The two channels of processing are split across the front panel with a separate defined section for the gate and the limiter living within the compressor block. The compressor and limiter can be stereo linked separately with control handed in both instances to Channel 1. The limiter has a single threshold pot, bypass switch, and activity LED.

The gate gets a bypass and fully variable threshold and switchable release/hold pot, switchable fast/slow attack, and switchable 70-dB/15-dB range. Alternatively, the section can be switched to work as a 2:1 expander or keyed from a rear-panel jack socket. Metering amounts to four attenuation LEDs. Each channel has a –10 jack output and +4 XLR output, while XLR and TRS jack inputs can be switched between the two levels.

The compressor is certainly the most interesting and able of the box's repertoire. There's fully variable threshold, ratio (1.3:1 to overcompression by way of switchable hard and soft knee slopes), attack (100 µs to 100 ms) and release (100 ms to 4 s) with a switchable program dependent setting and gain make up. This section includes metering for input level and gain reduction with a useful output level overload LED. Fairly standard so far, but the inclusion of a Bass Expand pot turns things around a bit. This effectively allows low end to bypass the compression circuit and be dialed in after the event. From the plots supplied to me, you could regard it as wide bell that starts rising below around 100 Hz on a pot marked flat to fat. However, press a button marked "Huge," and the effect shifts east by 100 Hz.

This is achieved by the aforementioned wire wound inductor, which is said to generate bass harmonics and phase delay much as old board designs did. Correct it may not be, but great it does sound because it equates to separate control of the bass and the rest of the spectrum, and you can, to illustrate the process, clamp down hard on the non-bass element of a signal to the point where it is all but swamped by the low end. Some of you will have

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World Radio History

BITHEADZ AS-1

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step through each semitone (like the OB-8); but if you sweep it with an LFO, the change is more continuous.

Programming is relatively easy. A few shortcuts would be nice (e.g., double-clicking on a fader's knob to return the parameter to its "normal" setting, saving particular screen views, etc.), but the process is obvious if you know synths.

As to performance, latency on my machine (with the default buffer settings) was a noticeable 43 ms. Presumably, a more macho machine improves on that. You can optimize for faster response, but at the expense of polyphony. The tonal quality of complex waveforms lacks purity (it sounds like aliasing) in the upper keyboard ranges, and there is noticeable "stepping" (due to quantizing the control range into steps) on filter sweeps.

While I'm in picky mode, the parameter values are expressed in arbitrary units, not the more helpful Hz, dB, etc. Also, the modulation page envelope parameters seem scaled inappropriately; for example, the decay exhibits very little change from 0 to 50, but 50 to 100 represents a major differential.

Despite these grumbles, though, this is a very powerful synthesizer that stays as true as technically possible to its "analog" mandate. The bottom line is that, for $260, the AS-1 re-creates many of the great "vintage" sounds of yesteryear. The manual, on disc as a PDF file, is very good (bonus points for listing where all files are installed for both Mac and Windows). The explanations of how to tweak your computer are helpful, and when I found a bug in the updater from version 1.1, tech support had a fix posted on their Web site within hours.

In fairness, Retro's only real limitations are the ones shared by most software-only synth solutions; as machines get faster, those limitations are rapidly becoming moot. Meanwhile, the advantages are compelling: low cost, quality sound, flexible software patching, and an inherent editor/librarian. And it sure beats paying several grand for a vintage synth — especially if replacement parts are no longer available!

Craig Anderton (check out his books at Amazon.com) just returned from a seminar tour of France, England, and Denmark. He is also putting the finishing touches on his next CD.

CHAMBER OF POETS

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about MPEG "squeezing" the video and Dolby Digital depositing artifacts in the sound. Both concerns proved, for the most part, to be non-issues. Even though we're talking about rather intense compression schemes, the end results were extremely satisfying and should not deter audio purists from taking an active role in similar projects.

Barth: We also gained a new appreciation for the 5.1 process itself and the potential it has for the consumer. While 5.1 surround sound is not yet common at the consumer level, we hope that it will become so before long, as it lends an entirely new dimension to the listening process. People experience their day-to-day lives in an environment where sound reaches them from all angles — it really is time to begin listening to creative endeavors in the same way. The consumer needs to be educated, both about the benefits of surround sound and the equipment that makes it possible. We believe that time is now.

For more information, visit www.chamberofpoets.com or e-mail chamber@lycosmail.com.

CIRCLE 42 ON FREE INFO CARD

World Radio History

Discmatic MDX3000 CD Duplicator

The fastest way to turn your studio into a duplicating house

BY ANTHONY SAVONA

Discmatic may not be a household name to studio owners, but their parent company, CBC AMERICA, is well-known in many areas, including surveillance video and computer products, and have now decided to put their expertise to work in CD duplication.

The MDX3000 duplicator reviewed here is the entry-level unit in their duplication line. Other models include the MDX4000 four-bay tower CD duplicator, the MDX7000 tower CD duplicator, which can burn up to seven discs at a time, and the AD1050 automatic CD duplicator that can burn up to 50 discs from multiple masters, unattended.

The MDX3000 is a tower CD duplicator that can burn up to three CDs simultaneously. It consists of Discmatic's EZ-ONE duplication engine and three Panasonic CD-R reader/writers (although TEAC CD-R55S CD-R drives are also supported). The EZ-ONE is the brains of the operation, holding a 4 GB hard drive and the unit's firmware. That firmware distinction is significant: there is no software information on the hard drive — all of the unit's operating data is contained on flash ROM, which makes for a more stabile system that is independent of Macintosh or Windows operating systems.

Upgrades can be easily added via a CD-ROM that is obtained directly from Discmatic (or their dealers and resellers) or by downloading it onto CD from their Web site. (No, you cannot hook the MDX3000 to an external computer, so you have to have a computer with a separate CD-R drive to make a disc from the Web.) There is a SCSI port on the back of the unit, but that only allows connection of an external CD-ROM drive, which can act as a dedicated master CD reader. According to Discmatic, however, the next version of the MDX3000 will probably allow up to eight units to be daisy-chained together via the SCSI port, allowing you to upgrade when you are ready.

The unit can read data at 12X or 8X and reads audio at 4X. It writes at 4X. (Discmatic also has an 8X version available.) Supported formats for the MDX3000 include CD-ROM, CD-DA, CD-EXTRA, I-TRAX, Mixed Mode, Multi-session, HFS, Hybrid, PhotoCD, VideoCD, CD-i, PSX, Sega, and Rock Ridge (UNIX).

Using the machine is fairly straightforward, and we were up and running in no time — and without having to consult the manual. All of the duplicator's functions are accessed through the 6-key keypad and viewed on the four-line LCD. The keys are labeled as: Yes, No, Up Arrow, Down Arrow, Enter, and Stop. Despite the sparseness of keys, the MDX3000 does not dump you into hierarchical menu hell. Sure, you have to scroll up and down through a few screens to access some of the features, but it moves quickly, and the key commands are obvious.

World Radio History

COPY MACHINE

There are several ways to copy a disc. You can make a direct CD-to-CD transfer (or CD-to-CDs), you can copy a disc to the hard drive and then onto a disc(s) or you can copy both onto disc(s), and hard drive simultaneously. Let's start with the most basic copying process: CD-to-CD.

After the machine powers up, which happens pretty quickly thanks to the flash ROM, the main menu appears on screen, giving you access to menus entitled: Start Copying, Start Comparing, Copy CD to CD, Image Functions, Utilities, and Setup Menu. From here, choose Copy CD to CD by moving the cursor down with the Down Arrow key and press Enter. The MDX3000 then asks how many copies you would like and, even though it only has three drives, you can enter any number you'd like and the unit will keep track of the discs recorded and keep asking for discs (even popping out the CD drawers) until it reaches the number requested.

Then it asks for the master CD, and, once inserted, analyzes the disc and the individual tracks. It then opens one or two of the remaining bays, depending on the quantity you selected, and asks for the blank discs. Pop them in, and you are done — unless you are one of those people who enjoy watching the status screen, which keeps you apprised of the situation with the size of the file already written (along with the final file size in parentheses so you know how much you've got to go), the number of discs left to do, and the number of both good and bad discs.

Copying a disc to the hard drive operates in a similar way, except that you are required to name the file, which Discmatic refers to as an "image." The image name can be anything up to 14 characters in length. Once the image is saved on the hard drive, you can access it by name whenever you need to copy it.

The MDX3000 has a separate menu for dealing with images. By selecting Image Functions, you can load a new master CD onto the hard drive, view a list of the images already on the hard drive, delete an image, rename an image, defragment the hard drive, and even undelete an image (assuming the hard drive has not been defragmented).

COPYING COMPILATIONS

While it is not possible to leave unfinished images on the hard drive to be added to and finished at a later date — a feature that some duplicators provide — the MDX3000 does allow a compilation CD to be made and the image of that compilation can be left on the hard drive. To do this, select the Create Compilation command from the Utilities menu. The duplicator then asks you to choose the length of disc you will be using (in addition to the standard 74-minute CD-Rs, the duplicator can handle 21-, 63-, and 80-minute CD-Rs). From there, the unit lets you select a track from the master CD by displaying a track listing along with the running times of each individual track. After the first track is input, you have the option of adding a 2-second gap between subsequent tracks. When you have finished adding all the tracks you want from the current disc, you can swap out master discs and keep on going.

You can use the View Compilation command at any time during the process to see how much time you've used up and how much time remains.

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EQ LAB REPORT

MANUFACTURER: Discmatic, marketed by CBC (AMERICA) Corp., 55 Mall Drive, Commack, NY 11725. Tel: 800-422-6707. Fax: 516-864-9710. Web: www.discmatic.com.

APPLICATION: Entry-level CD duplication system for studios.

SUMMARY: Solid, but basic, standalone system that is good for those who need duplicating abilities without hard-disk hassles.

STRENGTHS: Ease-of-use; informative status displays; flash ROM operating system; reliable; can add external CD-ROM drive to act as a dedicated master reader.

WEAKNESSES: Light on features; cannot network with other similar units or DAW (although next version will link with similar units).

PRICE: $3035 **EQ FREE LIT. #:** 134

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Antares ATR-1 Intonation Processor

Antares latest "miracle" product provides a quick fix for minor vocal mishaps

BY CRAIG ANDERTON

Antares's first MI product, the sample-editing program Infinity, had the uniquely mind-bending ability to create a sustaining loop with just about any sample — even stubborn cases, like cymbals. Their latest "miracle" product line, Auto-Tune, corrects pitch problems. Originally introduced as a TDM plug-in (reportedly, some people bought Pro Tools specifically to run Auto-Tune), then in other plug-in formats, the latest member of the family is the ATR-1 — a hardware pitch corrector designed for studio or live use.

Working with Auto-Tune reminded me of Anderton's Law of Noise Reduction ("noise reduction works best on signals that aren't too noisy in the first place"). The ATR-1 can't make a horrible vocal sound good; it's more for situations where a singer has done a fabulous take, but with a few pitch glitches. Nor does it work with polyphonic material. But the ATR-1 also does more than expected, as we'll find out.

GOZINDA/GOZOUTA

This 1U box is compact (5 inches deep) and unpretentious. Rear panel I/O is line-level analog (XLR balanced and TRS 1/4-inch phone). The only other connectors are MIDI In, footswitch, and DIN jack for the AC wall transformer output. (Incidentally, the latter has a separate line cord so it doesn't hog barrier strip space; note the unit has no on-off switch.) A/D and D/A conversion are 20- and 24-bit, respectively, with 56-bit internal processing. There is no digital I/O, which isn't too surprising given the oddball sampling rate of 46.875 kHz.

The front panel is also simple: 2-line LCD, 6-stage LED input meter, 10-step pitch correction meter (the equivalent of a compressor's gain reduction meter), data knob, two cursor buttons, three programming buttons, and a bypass switch.

YOU'VE BEEN SET UP

Once it's set up, the ATR-1 is easy to use. You choose or create a scale (out of 50 user-programmable scales) to which incoming note pitches will be constrained. The ATR-1 analyzes the incoming pitch in a few milliseconds, much like a guitar-to-MIDI converter. It then decides what to do with the pitch based on various parameter settings. For example, you can choose whether certain note pitches (typically, non-scale pitches) will be ignored so the signal isn't corrected to undesired (even if correctly pitched) notes, or even whether notes will be subject to pitch correction at all.

The ATR-1 provides variable correction speed. The slower settings let through more of the natural voice effects (e.g., slides and vibrato) before locking to pitch, while fast settings switch to the new pitch as soon as the ATR-1 senses the need for a fix. The fastest setting can sort of "flat-line" vibrato; if desired, you can then introduce "perfect" vibrato from the on-board, multi-waveform LFO. (Delayed vibrato up to 3.5 seconds is available, and is triggered by note attacks.) Don't buy the box for the vibrato feature, though; it sounds much rougher and funkier than the vibrato achieved by simply modulating a delay line's delay time in the 2–5 ms range.

What *does* sound great is the box itself, which handles the signal with kid gloves. As long as you're not asking for outrageous amounts of correction (like more than two semitones — hmm, better get a new singer!), the timbre of the voice remains intact.

EQ LAB REPORT

MANUFACTURER: Antares, 464 Monterey Ave., 2nd floor, Los Gatos, CA 95030. Tel: 408-399-0008. Web: www.antarestech.com.

APPLICATION: Fix pitch problems with vocals (and other monophonic instruments), create special effects.

SUMMARY: For those frustrating situations where a take is perfect except for a few mistakes, the ATR-1 can be invaluable. It won't turn garbage into greatness, but it does work exactly as advertised.

STRENGTHS: Actually works *and* sounds good; useable for non-vocal sources; useful MIDI command set; allows for various degrees of humanization; excellent manual; low latency.

WEAKNESSES: No digital I/O; vibrato isn't all that great.

PRICE: $849 **EQ FREE LIT. #:** 135

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STUDIO VS. LIVE

The "program" mode is plug-and-play: select the scale and speed, adjust the sensitivity according to the level of background noise, then sit back while the source material gets corrected. "Song" mode strings together up to 15 steps (more if you "link" programs), which you can select with MIDI program change commands (or via front-panel controls). This mode is useable for live, or in the studio when you need to deconstruct and modify a solo line piece-by-piece.

TWEAKOLOGY AND MIDI

If you don't live in an A = 440 world, the pitch reference is variable from 435 to 445 Hz. Also, MIDI control offers some cool features. For example, controller 01 (mod wheel) can introduce the ATR-1's vibrato, or you can use pitch bend (up to ±1 semitone). MIDI controllers are able to override the speed setting, step through programs, and control vibrato rate and/or delay. Furthermore, you can "play" a part with MIDI note commands to constrain vocals to those notes (à la DigiTech Studio Vocalist). The only feature I'd like to see is a "quantization percentage" control that would let you move a note a certain percentage closer to pitch, rather than directly on it.

As to the footswitch, it can parallel the bypass switch or step to the next higher-numbered program.

YOU CAN TUNA PIANO, BUT...

With the ATR-1, you actually *can* tuna fish. No, just kidding — but the ATR-1 does more than advertised. I used it with a guitar solo, mixing the original signal with the "corrected" output. By bending notes and setting a relatively fast speed, the effect was very much like chorusing or double-tracking. In addition, the low detection time (Antares quotes under 4 ms) is a real plus.

Of course, there are other ways to correct pitch, like using a hard-disk editing program's pitch shift algorithm to correct individual notes or phrases, but this is incredibly time consuming compared to simply patching in the ATR-1. No, it's not perfect. There are definite limits when a singer is truly ghastly, and if there's excessive background noise or the voice is extremely breathy, there may not be enough accurate pitch information for the ATR-1 to figure out what's going on. Nonetheless, for 95 percent of what you need to fix with vocal pitch problems, the ATR-1 is one of those rare "quick fixes" that actually works. It can indeed turn a near-miss into a final take, and that just about says it all.

(By the way, I regret to report there is no truth to the rumor that a bill is being introduced in Congress that will require all karaoke bars to patch an ATR-1 permanently into any associated sound system.)

Craig Anderton is working hard on his next CD release. To check out some of his recent music production work, surf to www.kac-cohen.com. His books (Multieffects for Musicians, Home Recording for Musicians, Digital Projects for Musicians, *etc.) are available online at Amazon.com.*

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CIRCLE 40 ON FREE INFO CARD

World Radio History

Current *Events*

Phantom power (and microphone interconnect basics) from the "ground" up

BY EDDIE CILETTI

Way back in the July '97 issue of *EQ*, I wrote an article about how to build a 48-volt phantom power supply. That article is still on my Web site (www.tangible-technology.com) and continues to be very popular. Even though the connection from supply to microphone was detailed in the text, a few people completely missed it. To clarify, I've created an annotated picture, fig. 1, which will be worked to the max in this article.

If you're new to the audio scene, let's start with a few basic electronic concepts then move on to microphones and see how the connections are made.

AC/DC

What's that you say? You don't know your AC from your DC? Audio is considered an alternating current, a.k.a. "AC" (so is 120-volt "wall" power). However, electronic circuits need direct current (DC), from batteries or power supplies, to turn them on. Like a speaker in reverse, a dynamic mic consists of a coil of wire suspended in a magnetic field. When vibrations move the cone or "diaphragm," the energy stored in the magnet is transferred to the wires. (A dynamic mic is passive, and needs no power.)

In a condenser mic, a polarizing voltage (DC) is applied to a diaphragm that is conceptually similar to a drumhead — coated with a molecularly thin conductive layer. The signal is not strong enough to venture into the outside world without an internal buffer/preamp (active electronics) that also requires power.

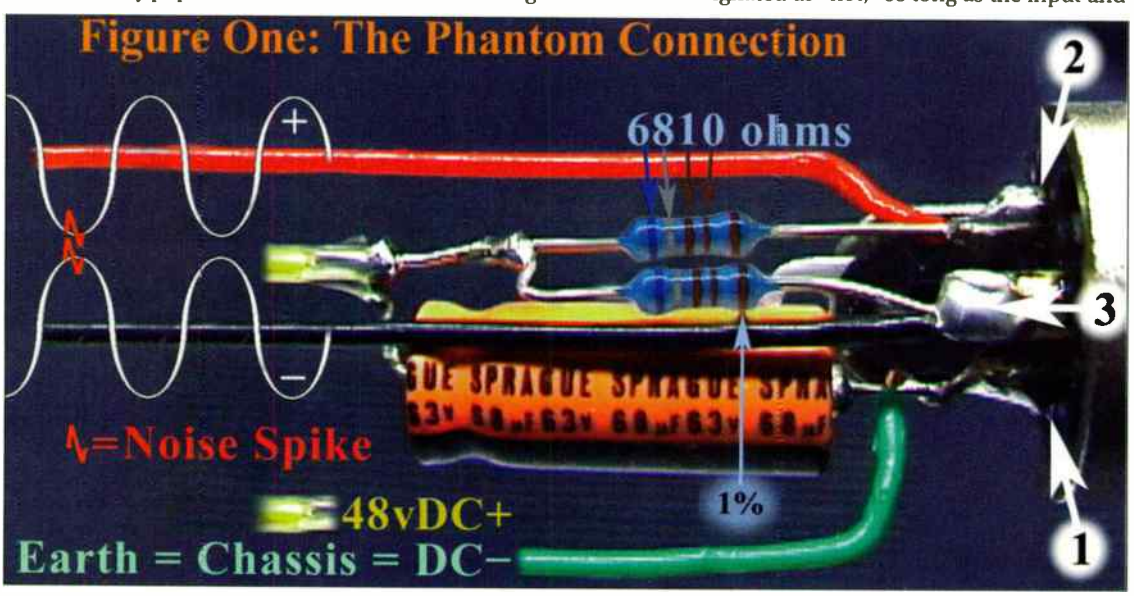
Compared to both consumer (–10 dBV) and professional (+4 dBu) line levels, microphones produce a signal that can be considerably lower in level, hence the need for an external preamplifier. Every precaution is taken to minimize noise. By design, this begins with using two wires for the signal — referred to as "balanced" — *plus* a shield. Contrast this with a *passive* electric guitar — that is, one with no active internal electronics (i.e., a battery is required). A guitar cable uses a single conductor plus a shield — an *unbalanced* signal.

COLOR CODED

With the exception of vacuum tube condenser mics, which have proprietary interconnecting cables and connectors, a professional mic outputs its signal via a three-pin XLR connector. The rear of a female XLR is shown in fig. 1, with a red wire on pin-2 and a black wire on pin-3. Pin-1 is called "ground," and the reference to terra firma implies that the metal body of the mic will ultimately connect to the "earth," and is therefore safe to touch even if you are barefoot in a pool of water (the green wire). A good ground connection also improves noise immunity.

In most cases, a balanced signal appears on both pin-2 (hot) and pin-3 (cold). "Hot" and "cold" refer to polarity, plus and minus (+ and –), respectively. As you can see on the left side of fig. 1, the same signal appears on pin-3 with reverse-polarity, that is, 180 degrees "out-of-phase." Even though the AC signal is constantly changing, it is important to establish a reference, in the same way that a loudspeaker has "polarized" terminals. A kick drum creates air pressure that moves the mic diaphragm, generating a positive going voltage on pin-2. After trips to and from all of the processing and recording gear you can imagine, a woofer should re-create that same in-your-face gust of air. (Only better, of course!)

With properly designed balanced gear, output polarity equals input polarity, so it doesn't matter whether pin-2 or pin-3 is designated as "hot," so long as the input and



World Radio History

output wiring is consistent — with regard to polarity — throughout your system. You will occasionally have to interconnect unbalanced gear, in which case the tip (of a 1/4-inch plug) or the center-pin (of an RCA connector) is always "hot." However, be very careful when interfacing unbalanced gear that uses XLR connectors. If one is designated pin-2 hot and the other as pin-3 hot, all you will get is not!

LOW, SEE?

A microphone's source impedance is 200 ohms. Speakers are lower at 4, 8, or 16 ohms, but a Professional "lo-Z" mic is optimized to drive a long cable without signal degradation. This is in direct contrast to a passive electric guitar, which is an unbalanced, hi-Z device that is susceptible to every snap, crackle, and pop technology can generate.

Note: The built-in preamps in modern condenser microphones do not necessarily produce signal on pin-3, but the impedance of pin-3 must match that of pin-2 for noise immunity.

Common Mode Rejection is the term used to describe how well a preamp can ignore the fact that you ran a mic cable right next to a wall wart.

FEELING REJECTED

Two (identical but) out-of-phase signals do not combine on a mixer, they cancel. A mixer, by nature, sums all the channels. But subtracting a balanced signal — by using a "differential" input amplifier (active) or a transformer (passive) — generates two results. First, the audio signals "add up" instead of cancel. Second, any noises common to pin-2 and pin-3 (like the red "spike" in fig. 1) are left behind. "Common Mode Rejection" is the term used to describe how well a preamp can ignore the fact that you ran a mic cable right next to a wall wart. Try that with a guitar cable!

TRANS-SENSUAL

A vintage preamp is not likely to have phantom power because either dynamic mics were used or the condenser mics of the day had their own external supplies. In addition, you will occasionally run into a piece of gear with a 1/4-inch mic input. To connect a balanced dynamic mic, you will need a transformer/adapter, Radio Shack part number 274-016. It may not be audiophile-grade, but it will get you started.

DON'T BE SCARED

Though miniaturization started before "solid state" electronics, transistorized circuitry ushered in a new era of devices whose power requirements were considerably lower than their vacuum tube counterparts. Older versions of the Neumann U 87 included a "window" in the case to expose a meter that indicated the presence of either the internal battery or the external phantom power.

Battery operation implies that very little current is required. That a system was devised to send power down a standard mic cable was even cleverer. Quite simply, +48 volts DC is piggybacked on top of both AC signals — on pin-2 and pin-3 — via two resistors, without disturbance. (This is the "phantom" signal.) The negative or "return path" to the DC supply is connected to pin-1.

To create a phantom power adapter, your project box should include two connectors: a female XLR as mic input and a male XLR to feed the mic signal to the preamp. Then — with a suitable 48-volt DC power supply — make the positive and negative connections to the yellow and green wires, respectively, as shown in fig. 1. (Most parts are available from such catalog suppliers as Radio Shack, MCM Electronics, Digi-Key, and Mouser Electronics.)

Note: The typical value of the two resistors is 6.81 kohm. More than just the audio and the source impedance (of pin-2 and pin-3) must be balanced. The "phantom" resistors must also match to a tolerance of at least 1 percent — .1 percent tolerance would be even better.

The resistor color code is interpreted as follows. The first three stripes from left to right are the significant figures. For example: 1st stripe (blue = 6), 2nd stripe (gray = 8), 3rd stripe (brown = 1). The 4th stripe is the decimal multiplier; in this case, brown = one "zero" instead of the number "one." The fifth stripe is the tolerance: brown = 1 percent. Therefore, from that you can conclude that the value is 6.81 kohms. Low-noise metal-film resistors were used in fig. 1 along with a "local" capacitor to filter any noise.

Questions? Comments? E-mail me at edaudio@tangible-technology.com.

CIRCLE 07 ON FREE INFO CARD

World Radio History

GROOVE: CIRRUS

continued from page 113

With the ADAT, we set locate points for the different songs, and each has its own SMPTE stripe, so we can change song orders easily. (We play guitar, pads, scratching, or whatever to fill the space while waiting to locate.) The MPC syncs to the SMPTE, so we mix what's in there (vocal samples, beats, bass lines, etc.) with what's on tape. We can't change the structure of the song because of the sync, but we can change the song's vibe — tweak lines, add arpeggiation, mute high-energy tracks if we want to chill out more, etc. All this allows us to do more than the three of us could normally do live. We don't use ADAT on every song, but most of them.

The XT has been very reliable for us on the road; the "black face" ADAT wasn't. We should probably carry a backup, but our engineer, Ken DeSantis, is also our tech, so he can fix gear when it breaks down. He's also an instrumentalist and is Ray Charles's second engineer, and he's been a friend, so he kind of does us favors and goes on the road with us.

We like to use samples from various sources, and don't think that sampling should be stigmatized the way it sometimes is. We cover every instrument except wind instruments, so we know how to play — but sampling is an art form in itself. Part of that art is knowing what to sample, changing it, putting it in the computer, and making it your own. Taste is more of an issue than technique with this type of music.

Having Aaron in the group is really good for us, because he DJs extensively; he's always out playing records for people and seeing what works. Anyone can match a beat, but you have to know how to build energy, climax a room, and bring it to the point where no one can stop dancing, as well as where to put the peaks and valleys. Aaron is good at communicating when to make changes in the arrangement.

For live, Aaron just uses the turntables for scratching and doing tricks. However, sometimes in the studio, we'll throw down some beats and just put on some crazy records, like bagpipes, just to see what the vibe would be like. We experiment until we find something that grooves.

We're definitely into the technology, and soak up everything we can from periodicals like *EQ* and *Keyboard*. Also, I'm on the Internet quite a lot to listen to other people's music and collect samples. You'll hear lots on the Internet you'll never hear anywhere else; you can get a real vibe from the younger kids who are totally plugged into the Internet but don't have an outlet for their music. Some of it's really cool, and you can get a sense of where music might go in the future. EQ

COMPOUNDER

continued from page 128

sat up at this observation because the implications for kick-in-the-guts bottom end are obvious, and does it work well. Spare those woofers or unseat them. Interestingly, the effect is different from what you can achieve with careful low end EQ contouring because there seems to be more happening with the Bass Expander, almost like an exciter for the LF. I also have to concede that Focusrite's claims that it remains punchy are true. It's not, however, a universal cure-all; dance music, bass — in fact, anything with a thump in it — is prime material for the Bass Expander, but it is foul on acoustic guitars and piano, for example. However, you don't have to use it for that. It's also important not to let this pot and switch possess the rest of the box.

The compressor is a very, very fine set of processing and easily able to do anything you would ask of it. It's extremely controllable, capable of a wide range of gain reduction textures, and can do duties on the extremes of vocals or main mixes. The limiter suits this well, and because it is independent, you can use it as intended to mind errant overshoots and it squeezes nicely. In comparison, the gate is least spectacular. Nothing wrong with it, it has the bits you'd want, but I like fully variable range controls and separate release and holds. These, though, would have added to the pot count, and I would not welcome control sacrifices anywhere else in this soundchain.

The ComPounder amounts to a very fine combination of features with the sort of performance and quality you take for granted with Focusrite at any price point. In addition, they've managed to bring something new to the party as they have with the other Platinums. We could do with a whole lot more of this all 'round. EQ

DISCMATIC REVIEW

continued from page 131

This may not seem like a big deal, but we've used CD burners without this function, and are always debating whether or not to try and cram that last track on. So it's nice to have.

TROUBLE IN PARADISE

The owner's manual is only 28 pages long and called a "User's Guide." This is not really a big deal, since the unit is very easy to use. Still, we did run into a problem...

After several successful copies, the machine suddenly became a coastermatic. We kept getting the message "Bad Master" in the display, despite the fact that this same disc was copied perfectly the previous day. At the time, we were attempting to burn two discs directly from the audio CD master. About halfway through, all the drawers opened, giving us our master disc and two coasters. We swapped the master disc, put a clean disc in the second drawer, and tried again. Once again, everything looked good until the middle of the disc or so, then "Bad Master" struck again.

At this point, we got smart and put the MDX3000 into Simulate mode, which does everything the machine would do if it were burning a disc without actually burning it. The same problem continued *sans* coasters.

A quick call into customer support provided the simple fix. Being a review unit, the MDX3000 came with a rather clogged-up hard disk. We had deleted all the images that had come with the unit and had also defragmented the hard drive (which literally took about a second). What we hadn't done was reformat the hard drive — all of you regular computer users may be cringing now (like we were), but with the MDX3000, this is not a big deal, thanks once again to the fact that all of the operating commands are on flash ROM. Like the defragmentation, the reformatting took a literal second, and we were back in business again — no more "Bad Master." The problem did not come back, either.

WRAP UP

Looking at the MDX3000 as the entry-level duplicator it is, it's a good deal. You get a 4X CD duplicator, 4 GB hard drive and three CD-R writer/readers for $3035. And that's all you need; the unit is completely self-sufficient. Plus, if you are computer-phobic, there's no software to mess with, and even upgrades to the flash ROM are easily dealt with. The best part is that within five minutes of opening the box, you can be up and running.

For the studio just beginning to get into CD duplication, the MDX3000 is a good investment, although you may want to wait for the newer version, which includes the SCSI daisy-chaining ability, so the unit can grow along with your business. EQ

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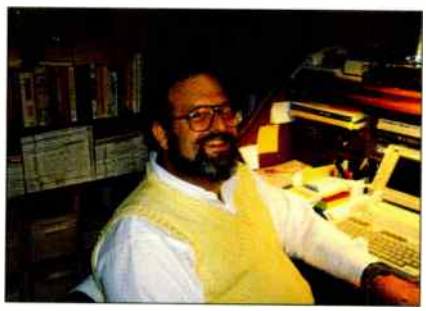
Replacement Blues

Do you know when it is time to upgrade or replace your equipment?



BY MARTIN POLON

One of the most vexing problems facing studio operators today involves justifying last year's studio gear to this year's customers. Nearly everybody agrees that it is imperative to keep one's studio gear either up-to-date or truly retro. Yet establishing a reasonable replacement cycle for studio equipment is very important to maintaining business plans, utilizing the tax laws to justify equipment purchase schemes, studio charges, and employee attitude.

The pressure that the customers place on studio owners/operators to provide the very latest equipment or the very most authentic recording gear of the '50s, '60s, and '70s — or a mix of the two — is truly legendary. Of late, we are even finding some studio customers attending the NAB (National Association of Broadcasters) annual meeting in Las Vegas, the NAMM (National Association of Music Merchants) exhibitions, and the AES (Audio Engineering Society) trade show in various locales solely to check out the new gear so as to have ammunition to demand new facilities from their favorite recording studio.

Resisting customer pressure to acquire equipment ahead of your own predetermined schedule is a matter of establishing relationships with your clientele that carry value in the skill you and your staff bring to your sessions over the value of new equipment for the sake of it. On some occasions, a band will demand specific new products and be willing to pay for it. That is a very specific circumstance under which by all means you should acquire anything they want! Otherwise, here are some guidelines you may want to consider in establishing your own equipment replacement and/or acquisition priorities.

1. Mixing Consoles (Permanent): Surveys suggest that, to remain state-of-the-art and competitive to client requests, many studios feel that they should replace or significantly upgrade a main studio console every two years. If you have more than one recording room in your studio, then consider that staggering your studio upgrade cycles is a practice that many studios do utilize. The time frame that you come up with to replace or upgrade a mixing console can be one year, two years, or three, but it must be a time frame that you establish based on — as we said — maintaining a viable business plan, an ongoing tax strategy, equipment purchase plans, studio hourly rates, and staff morale. Needless to say, in retro studios, the fix is to rebuild or upgrade your existing period console.

Establishing a reasonable replacement cycle for studio equipment is very important to maintaining business plans.

2. Mixing Consoles (Portable): This category is based more on wear and tear than it is on client acceptance of anything that is not state-of-the-art. Most permanent mixing consoles rarely wear out in the short term. Portable mixers used in location recording take more physical punishment than any other category of studio technology. So replacement in this category should be solely based on physical wear, reliability, and cost of replacement.

3. Computers: Replacement of computers in studios has become a one- or two-year evolution since each year's model is significantly faster than the previous year's model, has an ever larger internal hard drive, more RAM sockets, faster internal and/or L2 cache busses, etc. Obviously, this is not a hard and fast rule, but as both computer operating system software and digital recording software continue to improve and evolve on what seems to be a yearly basis, the need for more speed, larger storage, and all of the other bells and whistles of personal computer evolution seem to become necessary!

4. Signal Processing Electronics: The use of signal processing electronics that have a desirable sound, that are reliable, and continue to be valued by the studio's clientele does not have to involve a replacement timetable. This is especially true for so-called classic components or for modern versions of these classics. There are, however, periodically specific units that develop a buzz amongst studio clientele or that have a new sound popular with users and that eventually nearly every studio will add to their arsenal of signal processing electronics.

5. Recorders: Whether recording involves vintage re-built Ampex tape recorders in a retro studio, state-of-the-art computer hard drives either singly or in RAID arrays, CD-ROM burners, DATs, digital multitrack recorders, or MO (magneto-optical) recorders amongst others, the life span of any recording unit must be based on functionality, reliability, mean time rates between failures, and usage. Recording drives can be rebuilt or replaced, but, except for some standout new technology, are not one of the highest profile items that attract customer attention for yearly replacement.

6. Microphones: Microphones are another high visibility item in a studio, but, unlike mixing consoles where age is considered a negative factor by some customers, an array of well-respected microphones from many generations of recording practice can increase a studio's clout with its users.

The bottom line here is that the measure of a studio's quality should not be taken by the age and cost of its equipment, but it frequently is just the same! EQ

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- George Petersen, Mix Magazine

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DIGITAL MIXERS

MACKIE
Digital 8 Bus Mixing Console

New

Everything you've been waiting for and more!!! The new digital 8 bus from Mackie features great sound quality, full recording and mixdown capabilities, motorized faders and an array of digital features geared to take you flying into the next century. See for yourself what the entire industry is raving about.

FEATURES-
- 48 channels of automated compression, gating, EQ and delay
- Built in 3-way meter display keeps you on top of your mix.
- Built-in meter bridge.
- Ultramix II automation for complete control, hook up an S-VGA monitor and you'll feel like you spent a lot more money.
- All functions can be automated, not just levels and mutes. Store EQ, reverb, compression, gating and even Aux send information.
- Fast SCENE automation allows you to change parameter snapshots on every beat.
- Reads Standard MIDI tempo maps, displaying clock info on the built-in position counter.
- Truly the cutting edge of mixing technology.

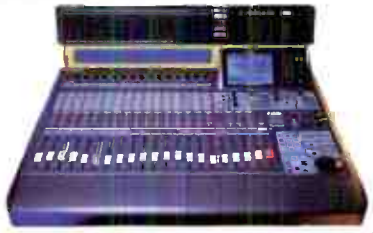
* monitor, mouse & keyboard sold separately

Panasonic
WR-DA7 Digital Mixing Console

New

Stop dreaming about your digital future, it's here! The Panasonic WR-DA7 digital mixer features 32-bit internal processing combined with 24-bit A/D and D/A converters as well as moving faders, instant recall, surround sound capabilities, and much more. Best of all, it's from Panasonic.

FEATURES-
- 32 Inputs/6 AUX send/returns
- 24-bit converters
- Large backlit LCD screen displays EQ, bus and aux assignments, and dynamic/delay settings.
- 4-band parametric EQ
- Choice of Gate/Compressor/Limiter or Expander on each channel
- 5.1 channel surround sound in three modes on the bus outputs
- Output MMC
- Optional MIDI joystick



* meter bridge optional

TASCAM
TMD1000 Digital Mixing Console

You want to see what all the digital mixing buzz is about? The NEW TMD100 from Tascam will have you smilin' & automatin' in no time. It features fully automated EQ, levels, muting, panning and more in an attractive digital board with an analog 'feel'. Your digital future never looked, or sounded, so clear.

FEATURES-
- 4 XLR mic inputs, 8 1/4" balanced TRS inputs.
- 20-bit A/D D/A conversion, 64x oversampling on input, 128x on output.
- Store all settings, fully MIDI compatible
- ***Optional IF-TD1000*** adds another 8 channels of TDIF and a 2-channel sample rate converter.
- ***Optional FX-1000*** Fx board adds another 4 dynamic processors and another pair of stereo effects.

New

DIGITAL RECORDING

Lexicon
Lexicon Studio Recording System

The Lexicon Studio System interfaces with your favorite digital audio software for a complete hard disk recording package. Supporting both PC and Mac, Lexicon Studio can be expanded up to 32 voices from a variety of I/O options. For recording, editing, mixing and DSP, Lexicon Studio is here.

FEATURES-
- The Core-32 System PCI-Card is capable of supporting 32 audio streams simultaneously. It can also be used as a time code or clock master or slave.
- The PC-90 Digital Reverb daughterboard attaches to the Core-32 providing 2 discrete stereo reverbs.
- The LDI-12T delivers up to 12 channels of simultaneous I/O supporting analog (+4 XLR and -10 RCA), s/pdif, and ADAT.
- Direct support of Steinberg Cubase VST and many other software programs.

OPTIONS-
- The LDI-16S provides 8 channels of +4 XLR balanced analog I/O, and 8 channels digitally through TDIF. 3 option packages are:
  AES-8 8 channels of AES/EBU digital I/O
  ADT-8 8 channels of ADAT digital I/O and sync
  STC-1, Post option including read and write of LTC, read and generate of VITC, Window-burn, House Sync and a General Purpose Interface for triggering external devices from the system).

EFFECTS PROCESSING

t.c. electronic
ULTIMATE SOUND MACHINES
Finalizer Express

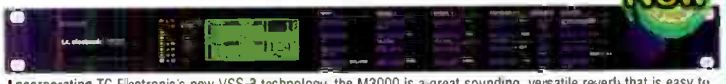
New

The Finalizer Express is a fast and efficient way to turn your mix into a Professional Master! Based upon TC's Multi-Award winning Finalizer Mastering Technology, it delivers the finishing touches of clarity, warmth and punch to your mixes, putting the world of professional mastering within your reach.

FEATURES-
- 24-bit resolution A/D & D/A converters
- 16 & 20 bit dithering
- TC's unique Multiband Comp & Limiter Algorithms
- Boost and cut over three bands with the Spectral Balance Controls
- Soft Clipping and Look Ahead Delay.
- Finalize Matrix for 25 variations in style and rate
- Optimize overall level with the Automatic Make-Up-Gain
- Extra compression in each band using Emphasis keys
- Record fades from the built-in Digital Fader or the optional TC Master Fader via MIDI.
- Connections include AES/EBU, S/PDIF, Optical Toslink & MIDI I/O's.
- High Res LED Metering of I/O & multi-band gain reduction

M3000 Professional Reverb

New



Incorporating TC Electronic's new VSS-3 technology, the M3000 is a great sounding, versatile reverb that is easy to use. Combining ultimate control of early reflections with a transparent reverb tail, the art of reverberation is brought to a new level. Whether it's a phone booth, cave or concert hall, the M3000 delivers high-quality ambience.

FEATURES-
- VSS-3, VSS-3 Gate, C.O.R.E & REV-3 reverbs as well as Delay, Pitch, EQ, Chorus, Flanger, Tremolo, Phaser, Expander/Gate, Compressor and De-Esser
- 300 high-grade factory presets including Halls, Rooms, Plates, Ambience, Gated Reverbs, and more
- Up to 300 user presets in internal RAM and 300 more using an optional PCMCIA card.
- Dual engine configuration featuring 24-bit A/D/D/As.
- Connections include AES/EBU, Coaxial S/PDIF, Optical Tos-Link/ADAT & analog XLR I/Os, MIDI IN/OUT/THRU, Clock Sync and External Control.

lexicon MPX1 Multi-Effects Processor

The MPX-1 is truly an outstanding, multi-effects device. Using Lexicon's Lexchip, it offers outstanding reverb or ambience as well as a separate processor for effects for awesome power in the studio or on the road.

FEATURES-
- Intuitive user interface for easy editing, built-in help.
- Balanced Analog I/O (1/4" & XLR)
- 56 effect algorithms
- Digital Inputs & Outputs (S/PDIF @ 44.1KHz)
- 18 Bit A/D; 20 Bit D/A Conversion, 32-bit processing
- >90dB of Dynamic Range
- Intelligent Sorting by Name, Number, Application, etc.
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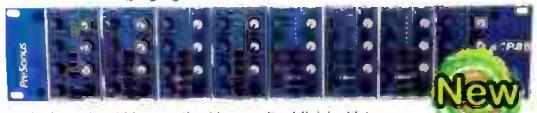
- Dynamic MIDI® patching & MIDI automation

COMPRESSORS

PreSonus ACP88 8 Channel Compressor



New

Stemming from their popular ACP44, the ACP88 comprises eight channels of compression, limiting and noise gating for a variety of studio applications. It features individual side chain for each channel and it's attractive blue anodized finished lets you show your true sonic colors.

FEATURES-
- 8 separate compressors/gates with individual controls.
- Servo balanced or unbalanced inputs & floating balanced or unbalanced outputs.
- Individual side chain jacks for spectral compression and a separate sidechain jack for gate processing.
- Each channel boasts full gain reduction metering, compression threshold indication & gate open/close.
- Front panel buttons include hard/soft knee compression, peak/auto compression, bypass, gate range and link.
- Link feature uses a unique summing bus for multiple combinations of master/slave link setups.

dbx Model 566 "Silver Series" Compressor

The new Silver Series introduces a 2 vacuum tube circuit design making the 566 no ordinary compressor. Loaded with features including custom designed analog VU meters that monitor tube level, gain reduction, or output levels. Full sidechain functionality, including sidechain monitor, Contour function allows low frequency material to pass through the threshold without triggering un-musical compression effects.

FEATURES-
- Hand selected Premium 12AU7 vacuum tubes
- +4/-10 operation
- Drive control for a wide variety of great tube effects
- PeakPlus limiter on each channel
- Complete sidechain, OverEasy, and Auto functions
- Optional TYPE IV Conversion System outputs
- Separate 1/4" sidechain insert send and return

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HARD DISK RECORDERS

Roland

New

VS1680 Digital Production Studio

The new VS-1680 Digital Studio Workstation is a complete 16 track, 24-bit recording, editing, mixing and effects processing system in a compact tabletop workstation. With its advanced features, amazing sound quality and intuitive new user interface, the VS-1680 can satisfy your *wanderlust*.

FEATURES–
- 16 tracks of hard disk recording. 256 virtual tracks.
- 24-bit MT Pro Recording Mode for massive headroom and dynamic range.
- Large 320 x 240 dot graphic LCD provides simultaneous level meters, playlist, EQ curves, EFX settings, waveforms and more.
- 20-bit A/D D/A converters
- 2 optional 24-bit stereo effects processors (VS8F-2) provide up to 8 channels of independent effects processing.
- New EZ routing function allows users to create and save various recording, mixing, track bouncing, and other comprehensive mixer templates for instant recall.
- 10 audio inputs: 2 balanced XLR-type inputs w/ phantom power, 6 balanced 1/4" inputs, and 1 stereo digital input (optical/coaxial)
- 12 audio outs: 8x RCA, 2x stereo digital & phones.
- Direct audio CD recording and data backup using optional VS-CDR-16 CD recorder.

DIGITAL MULTI-TRACK RECORDERS

TASCAM

DA-88 Modular Digital Multitrack

The standard digital multitrack for post-production and winner of the Emmy award for technical excellence, the DA-88 delivers the best of Tascam's Hi-8 digital format. Its Shuttle/Jog wheel and track delay function allow for precise cueing and synchronization and the modular design allows for easy servicing and performance enhancements with third-party options.

FEATURES–
- 1:48 minutes record time on a single 120 min tape
- Expandable up to 128 Tracks using 16 machines
- User-definable track delay & crossfade
- Shuttle & Jog capability
- Auto punch with rehearsal
- SMPTE, MIDI and Sony 9-Pin sync capability
- Options include RC-808/848 Remote Controllers, IF-88AE/IF-88SD digital interfaces, MU-Series meter bridge, MMC-88 MIDI machine control interface, SY-88 Sync Card

DA-38 Digital Multitrack for Musicians

Designed especially for musicians, the DA-38 is an 8 track digital recorder that puts performance at an affordable price. It features an extremely fast transport, Hi-8 compatibility, rugged construction, ergonomic design and sync compatibility with DA-88s.

ALESIS

ADAT M20 20-bit Digital Audio Recorder

The M20 represents Alesis commitment to meeting the high-standards of world-class audio engineers, producers, studio owners and high-end video and film post production studios. A new professional digital multi-track, the M20 records 20-bit for outstanding sound quality. Combined with a host of production features like SMPTE/EBU, the M20 is a powerful tool.

FEATURES–
- SVHS Recording format - up to 67 minutes recording.
- 18-XLR connections (9 in and 9 out) as well as a 56-pin ELCD connection.
- 24-bit, 64x oversampling recording, 20-bit, 128X oversampling playback
- Digital I/D
- Includes LRC remote and a digital cable.

ADAT XT20 Digital Audio Recorder

The New ADAT-XT20 provides a new standard in audio quality for affordable professional recorders while remaining completely compatible with over 100,000 ADATs in use worldwide. The XT20 uses the latest ultra-high fidelity 20-bit oversampling digital converters for sonic excellence, it could change the world.

FEATURES–
- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.
- Remote control
- Servo-balanced 56-pin ELCD connector
- Built-in electronic patchbay
- Copy/paste digital edits between machines.

ADAT LX20 Digital Audio Recorder

The most affordable ADAT ever made, the new LX20 features true 20-bit recording at a price you won't believe. Compatibility with all other ADATs and digital consoles, the LZ20 provides the same sync options and digital inputs as the big brother XT20 at a lower price point.

CD RECORDERS

FOSTEX

CR200 Professional CD Recorder

The Fostex name is not all this CD Recorder has to offer. The CR200 features S/PDIF I/Ds, balanced XLR analog input, 5 record modes as well as a full function remote. A great choice for burning CDs in any studio or home recording environment.

FEATURES–
- Converts any input signal to CD 44.1kHz standard
- Uses both Professional and Consumer CD formats
- S/PDIF Inputs and Outputs for versatile interfacing.
- AES/EBU In, XLR Balanced Ins, Unbalanced Ins & Outs
- 5 Record Modes Records To Red-Book Standards
- IDs Recorded Automatically
- Durable Platter Mechanism Resists vibrations
- Full function Remote Included

STUDIO DAT RECORDERS

TASCAM

DA-45HR Master DAT Recorder

The new DA-45HR master DAT recorder provides true 24-bit resolution plus standard 16-bit recording capability for backward compatibility-making this the most versatile and great sounding DAT recorder available. With support for both major digital I/O protocols plus the ability to integrate the machine into virtually any analog environment, the DA-45HR is the ideal production tool for the audio professional.

New

FEATURES–
- Word Clock
- 24-bit A/D and 20-bit D/A with dither
- XLR balanced and RCA unbalanced analog I/D
- AES/EBU and S/PDIF digital I/D
- Word Sync In/Thru
- Alphanumeric data entry for naming programs
- Independent input level adjustment capability
- Output trim for XLR balanced analog output
- Optional RC-D45 Remote Controller

Panasonic SV-3800

The SV-3800 & SV-4100 feature highly accurate and reliable transport mechanisms with search speeds of up to 400X normal. Both use 20-bit D/A converters to satisfy even the highest professional expectations. The **SV-4100** adds features such as instant start, program & cue assignment, enhanced system diagnostics, multiple digital interfaces and more. Panasonic DATs are found in studios throughout the world and are widely recognized as the most reliable DAT machines available on the market today.

FEATURES–
- 64x Oversampling A/D converter for outstanding phase characteristics
- Search by start ID or program number
- Single program play, handy for post.
- Adjustable analog input attenuation, +4/-10dBu
- L/R independent record levels
- Front panel hour meter display
- 8-pin parallel remote terminal
- 250x normal speed search

FOSTEX

D-15 Pro Studio DAT Recorder

The new Fostex D-15 features built in 8Mbit of RAM for instant start and scrubbing as well as a host of new features aimed at audio post production and recording studio environments. Optional expansion boards can be added to include SMPTE and RS-422 compatibility, allowing the D-15 to grow as you do.

FEATURES–
- Hold the peak reading on the digital bargraphs with a choice of 5 different settings
- Set cue levels and cue times
- Supports all frame rates including 30df
- Newly designed, 4-motor transport is faster and more efficient (120 minute tape shuttles in about 60 sec.)
- Parallel interface • Front panel trim pots in addition to the level inputs

D-15TC & D-15TCR

The D-15TC comes with the addition of optional chase and sync capability installed. It also includes timecode reading and output. The D-15TCR comes with the further addition of an optional RS-422 port installed, adding timecode and serial control (Sony protocol except vari-speed)

SONY PCM-R500

Incorporating Sony's legendary high-reliability 4D.D. Mechanism, the PCM-R500 sets a new standard for professional DAT recorders. The Jog/Shuttle wheel offers outstanding operational ease while extensive interface options and multiple menu modes meet a wide range of application needs.

FEATURES–
- Set-up menu for preference selection. Use this menu for setting IDs, level sync threshold, date & more. Also selects error indicator.
- Includes 8-pin parallel & wireless remote controls
- SBM recording for improved S/N *(Sounds like 20bit)*
- Independent L/R recording levels
- Equipped with auto head cleaning for improved sound quality.

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TUBE MICROPHONES

AKG

SOLIDTUBE
TUBE MICROPHONE

The SOLIDTUBE combines the best of solid state and tube technology to provide a "warm" sounding microphone suitable for professional recording applications.

FEATURES–
- Large diaphragm condenser
- Integrated pop screen surrounds the capsule, reducing excessive pop noise
- ECC 83 (12AX7) vacuum tube which provides perfect transfer characteristics
- Includes elastic shock mount
- Low-cut switch, Ground lift switch

audio-technica.

AT4060

Combing premium 40 series engineering and vintage tube technology, the AT4060 delivers a versatile and competent studio microphone. Low-noise and high SPL capabilities make the AT4060 a premier vocal mic as well as strings, guitars and other demanding applications.

FEATURES-
- 20 - 20,000 Hz freq response
- Dual gold-vaporized large diaphragm elements
- Includes the AT8560 power supply, AT8447 shock mount, rack mount adapters and case.

MICROPHONES

SHURE

KSM-32

The new KSM32 side-address microphone features an extended frequency response for open, natural sound reproduction. Suitable for critical studio recording and live sound production, Shure steps up to the plate with another classic.

FEATURES-
- Class A, transformerless preamplifier circuitry for improved linearity across the full frequency range.
- Exceptionally low self-noise and increased dynamic range necessary for highly critical studio recording.
- 15-dB attenuation switch for handling high SPLs.
- Switchable low-frequency filter to reduce vibration noise or to counteract proximity effect.
- Great for vocals, acoustic instruments, ensembles and overhead miking of drums and percussion.
- SL model also features an elastic shock mount which greatly reduces external vibrations.

BPM
CR10

Hand-crafted in East Berlin, the BPM CR10 Studio Condenser Mic features a full frequency response for competition against the best of the best.

FEATURES-
- 1" Gold diaphragm
- Suitable for most guitar and vocal recording applications.
- Includes Custom Aluminum Road Case, XLR-cable, wind screen and elastic suspension.

SAMPLING

AKAI

New

S5000 & S6000 Studio Samplers

Akai is proud to announce its next generation of samplers with the introduction of the S6000 and the S5000. Building upon Akai's legendary strengths, both machines feature up-to 128-voice polyphony and up-to 256 MB of RAM. They use the DOS disk format and .WAV files as the native sample format allowing standard PC .WAV files to be loaded directly for instant playback - even samples downloaded from the Internet into your PC may be used. And of course, both the S6000 and S5000 will read sounds from the S3000 library.

FEATURES–
- OS runs on easily upgradeable flash ROM.
- 2x MIDI In/Out/Thru ports for 32 MIDI channels
- Stereo digital I/O and up to 16 analog outputs.
- 2x SCSI ports standard
- Wordclock connection
- Optional ADAT interface provides 16 digital outs
- .WAV files as native sample format

S6000 ONLY FEATURES–
- Removable front panel display
- User Keys
- Audio inputs on both the front and rear panel allow you to wire the S6000 directly into a patchbay from the back and override this connection simply by plugging into the front.

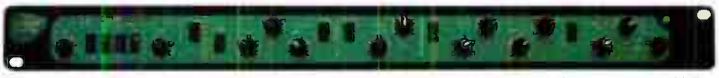
E-MU

E-mu Systems, Inc.
E6400 Professional Sampler

The e-64OO from EMU features an easy interface that makes sampling easy. Automated features like looping, normalizing and more allow you to flexibly create your own sound palettes or access any of the 400 sounds provided on 2 CDs for unlimited sound creation. It is upgradeable to 128MB of RAM (4MB standard) and features 64 voice polyphony, 8 balanced analog outputs, SCSI, stereo phase-locked time compression, digital re-sampling and more. A dream machine.

MIC PREAMPS

Focusrite
Green 3 "Voicebox MKII"



The Voicebox MKII provides a signal path of exceptional clarity and smoothness for mic recording, combining an ultra-high quality mic amp, an all new Focusrite EQ section optimized for voice, and full Focusrite dynamics. The new MKII now includes a line input for recording and mixdown applications.

FEATURES–
- +48V Phantom power, phase reverse, and a 75Hz high-pass filter.
- Mute control and a true-VU response LED bargraph are also provided
- Includes a Mid-Parametric band with controls especially designed to enhance vocal characteristics.
- Single balanced Class A VCA delivers low distortion and a S/N ratio as low as -96dBu
- Dynamics section offers important voice processing functions such as compression and de-essing combined with a noise reducing expander.

dbx 586 Vacuum Tube Mic Pre

The DBX 586 Vacuum Tube Dual Mic Preamp uses hand selected and matched premium 12AU7 vacuum tubes ensure ideal characteristics for a warm, distortion free signal path. Custom designed analog VU meters monitor tube level insert path or output levels well Line/Instrument and mic inputs make the 586 versatile enough to use with virtually any input source.

FEATURES–
- Mic on/line/instrument inputs on each channel. +4/-10 operation.
- Drive control for a wide variety of great tube effects
- 3-Band EQ with sweepable frequency
- Optional TYPE IV Conversion System outputs
- Separate 1/4" insert send/return on each channel

JOE MEEK VC1 Studio Channel

The Joe Meek Studio Channel offers three pieces of studio gear in one. It features a transformer coupled mic pre, compression and a professional enhancer together in a sleek 2U rackmount design!

FEATURES–
- 48V phantom power, Fully balanced operation
- Mic/Line input switch
- High pass filter for use with large diaphragm mics
- Extra XLR input on front makes for easy patching
- Compression In/Out & VU/Compression meter
- Enhancer In/Out switch and enhance indicator
- Internal power supply 115/230V AC

MONITORS

KRK SYSTEMS, INC.

M6000/S
Studio Monitors

The KRK M6000.S are designed for close-field monitoring. A smooth frequency response in a compact size make these units portable and efficient.

FEATURES-
- High power handling
- 62Hz - 20kHz, ±3dB.
- Compact and portable
- Low distortion
- Smooth frequency response
- Custom Gray finish.

Hafler

TRM-8
Powered Studio Monitors

Winner of Pro Audio Review's PAR Excellance Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Trans•nova power amp circuitry.

FEATURES-
- 45Hz - 21kHz, ±2dB
- 75W HF, 150W LF
- Electronically & Acoustically matched

MACKIE.

HR824

These new close-field monitors from Mackie have made a big stir. They sound great, they're affordable, they're internally bi-amped. "What's the catch?" Let us know if you find one.

FEATURES-
- 150W Bass amp, 100W Treble amp
- Full space, half space and quarter space placement compensation
- Frequency Response 39Hz to 22kHz, ±1.5dB

TANNOY

Reveal

The latest playback monitor from Tannoy, the Reveal has an extremely detailed, dynamic sound with a wide, flat frequency response.

FEATURES-
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ACROSS THE BOARD

continued from page 154

ginning of the data dump, it is actually file data that is needed by the Fostex in order to load the sound files back in correctly. After you get the data into your PC, I would make an audio CD. Make sure you leave the noise on the front of each selection. The data must be sent back to the Fostex as an audio file through the digital input. If you have the data on an audio CD, you can use a CD player with digital out to get the data back into the Fostex.

From Ola Lagarhus, Norway: I have questions about using 20-bit and 24-bit converters with 16-bit machines such as my TASCAM DAT machine or my Pioneer audio CD recorder. How will a 24-bit converter perform with a 16 bit recorder?

Answer: I get this question very often. There is a specification for digital converters called linearity. This is the accuracy of the absolute value of each of the bits. Let's say that it took a 10-volt signal to give us a full level digital signal. A 16-bit converter has ±32768 digital steps between zero signal and the full level 10-volt signal. This means that the smallest bit would be .00030517578 volts, and each of the other bits should be exactly twice the value of the bit below it. The more error in the bit value, the lower the linearity. The resistors that determine the values of the bits are trimmed by a laser. The more accurate the trimming, the better the linearity. One-bit converters, or Delta Modulation-type converters have only 1–4 bits that actually do the measuring, and all of the bit values are mathematically derived inside the chip. This means that each bit will be exactly double the bit value below it, resulting in high linearity.

Twenty-bit converters have four more bits, which means that the smallest bit is 16 times smaller than the smallest bit of a 16-bit converter. The smallest bit of a 24-bit converter is 256 times smaller than the smallest bit of a 16-bit converter. Because of the higher accuracy required to produce the higher-bit converters, the top 16 bits of one of these converters will usually be much better than all but the very best 16-bit converters.

Remember that only 16 bits of the signal will be recorded on a 16-bit machine. Feeding the machine with a 20-bit or 24-bit converter will not give you any more dynamic range. The dynamic range is based on the number of bits available for storage.

Dithering or noise shaping helps the dynamic range equal to about 1 or 2 bits. If I was going to buy a 24-bit converter to use with a 16-bit recorder, I would get something like the Apogee 24/96 box with built-in noise shaping and the ability to do track splitting for storing 24-bit /96 kHz data on an 8-track recorder. You could use it for your 16-bit recording now, and you won't have to change if you upgrade your recorder.

And finally...

From Don Barry: What about doing live, no retake, 2-track and let's go stuff. I do portable recording for kid schools and local church choirs who want CDs of their music. I go out with a small Mackie board, some Shure KSM32's or SM81's, and a TASCAM portable DAT, and I just turn the machine on and go. I bring it home and S/PDIF into my PC and Sound Forge to clean up, edit, EQ, compress, normalize, and then burn CD-Rs on a 2X-HP drive. I hear a really great sound for less than $2000 in gear. What am I missing?

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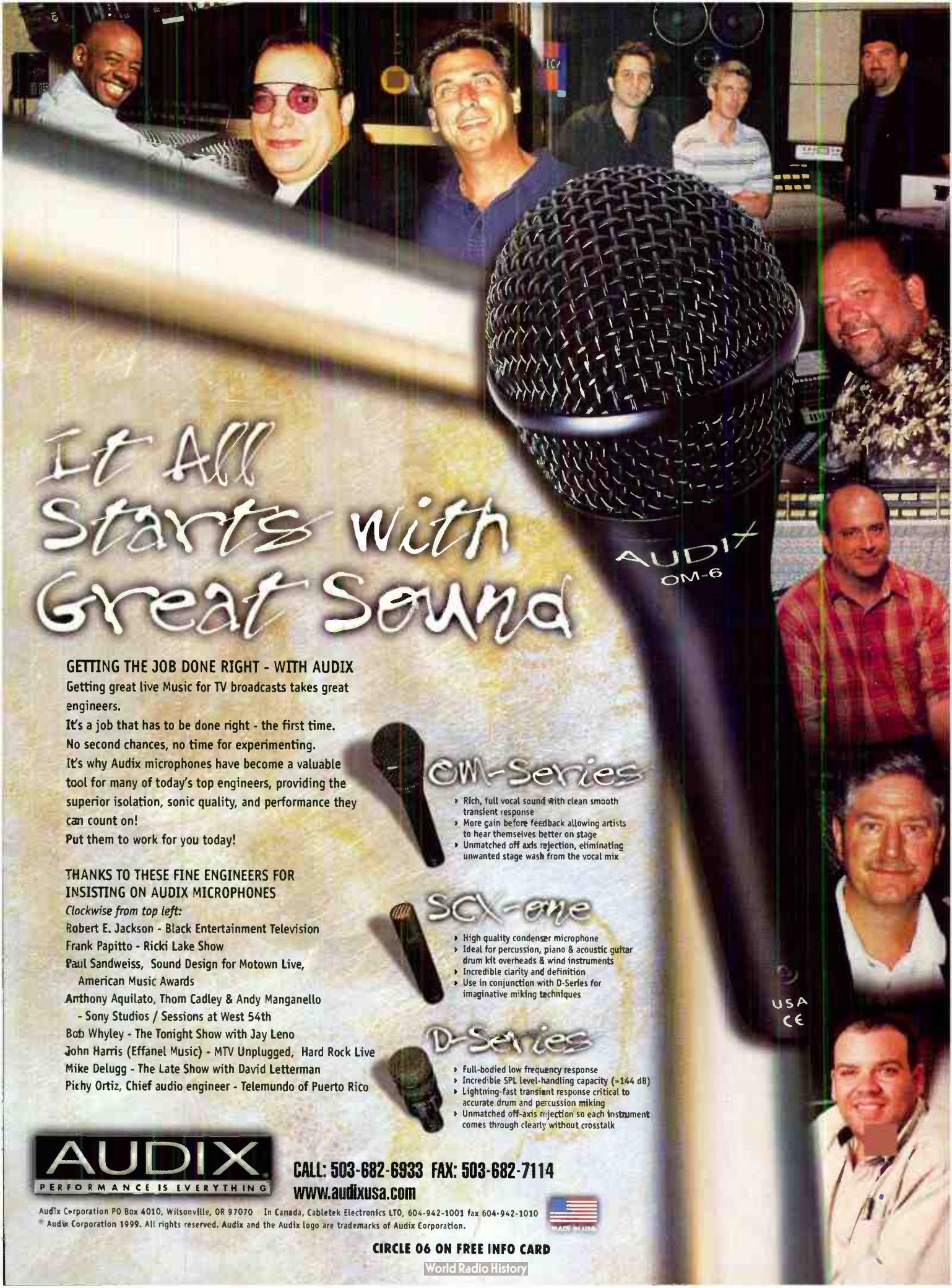

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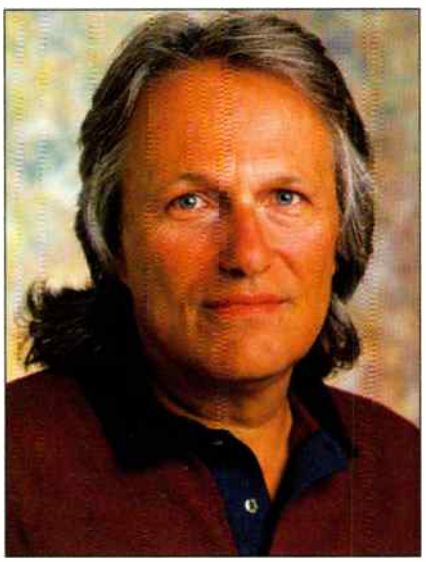

Treat your gear right and it'll do the same to you

BY ROGER NICHOLS

I know for a fact that automobiles have a mind of their own. When you are nice to them and keep them clean, they run better. If you stroke the steering wheel just so, you can coax it to start so you don't have to walk home.

I am also a firm believer that audio equipment can turn on you in a heartbeat if you don't treat it nicely. When my digital delay is acting up, I can get it to work fine by plugging it into an outlet of its own on the other side of the room. My Harmonizer™ came back to life after I installed a CPU cooling fan over the digital converter chips.

On the other hand, my G3 laptop computer likes to be slapped around. The LCD screen keeps turning white so I can't see anything. It has never done it when I have taken it in for service, but it happens about 10 times per day when the service tech is not watching. I had to take videos of the screen before the tech would even believe that it was happening. (The guys in the studio thought I was nuts when I would run across the control room, grab my video camera, and start videotaping the screen on my laptop.) So, every time my screen turns white, I have to give it a backhand to the upper left corner of the screen. It then works fine for half an hour or so, then I have to give it another smack.

Then there is the Neve console that I have to whack on the side with my shoe. Kicking it doesn't work, I have to take my shoe off and smack it on the side by module one and the crackling noise goes away.

How about Pro Tools? How many of you have a love-hate relationship with your Pro Tools system? Right now, I bet there are at least a dozen people begging their Pro Tools system to please *save* one more time before crashing.

My computer mouse has fun with me all of the time. I click the button to pull down a menu, drag down to the selection I want, and then, just as I am letting go of the mouse button, the mouse pointer moves to the menu selection just above or below the one I really wanted. I know the neighbors can hear me when I yell, "NOOOOOO," and all of my animals scatter to the far corners of the house. (They have learned to split up so I can't find all of them at once. When I lived in Nashville, I learned to take frustrations out on my dog.)

How many of you have a love-hate relationship with Pro Tools? Right now, I bet there are a dozen people begging their Pro Tools to please save one more time before crashing.

Feedback is a way that equipment has of communicating its anger with you. After a mic preamp has to endure out-of-tune vocals for a while, a nice little feedback squeal always works to stop the session for a few minutes. New digital equipment has come up with its own way of slowing down sessions. Some nice subtle digital hair on the tail off of a piano chord, or that crunchy distortion in the DAT copy because the DAT machine didn't like the wire you were using. Hey, all of this new digital equipment is connected. Digital audio contains user bits. Do you use them? I don't think so! This is how digital audio equipment exchanges information. "Uh oh, here comes that same demo this guy's been working on for a year," says the digital console to the CD recorder. "Maybe if I make a bad CD, this guy will take me back to the store where he got me!" The CD recorder answers, "Hey, everything will be OK. You're lucky, you could've been bought by Jeff Baxter." That was a cheap shot. I guess I should apologize to my CD recorder.

Finally, I noticed that all of my equipment is much happier since I started feeding them balanced power. Nothing hums anymore. I guess it's because they finally know all the words.

READER QUESTIONS

I don't have room to answer all of my e-mail, but sometimes I get a lot of versions of the same question. Here are a couple of them.

From Chris: I have a Fostex DMT8 digital recorder. In the manual it says that I need a DAT machine to archive the data from the hard disk. I have a PC with a CD-R. Is it possible to archive to the PC? What type of interface board would I need?

Answer: Yes, it is possible to archive to your PC. You need an audio interface board that has a digital audio input. There are some inexpensive Sound Blaster-compatible boards that have digital audio inputs, or you could go with one of the I/O boards that are specifically designed for digital audio recording. There are tons of them advertised right here in *EQ*. Your local dealer probably has a few also. Make sure you start recording before you start dumping data from the Fostex. Although it sounds like noise at the be-

continued on page 150

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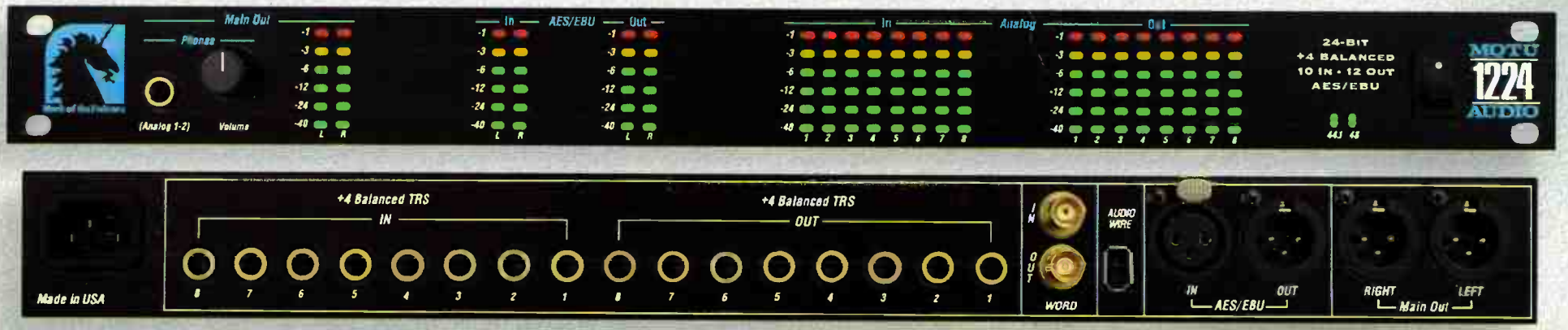

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