

Johnny Cash "Unchained" · Product Hits of AES · Gloria Estefan Live

U.S. \$4.95 CANADA \$5.95 JANUARY 1997

# MIX<sup>®</sup>

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

## LIVE SOUND SPECIAL

- *Monitor Mixers Speak Out*
- *Touring Consoles*
- *The Who's "Quadraphenia"*
- *New and Improved Remote Trucks*

## Optimizing Drum Sounds

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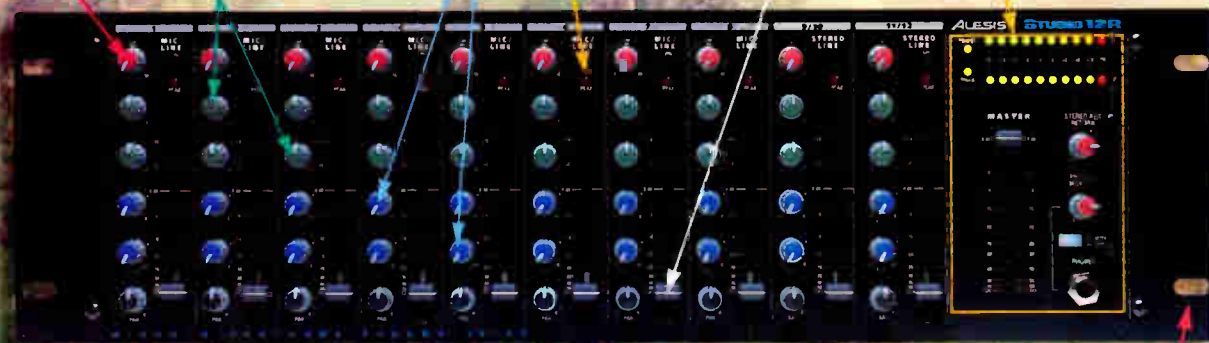
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render the musical image created by the top recording engineers and producers. The AMS monitors are technically uncompromised designs, combining hand-selected models of Tannoy's exceptional Dual Concentric™ drivers, with the finest quality electronics design and construction.

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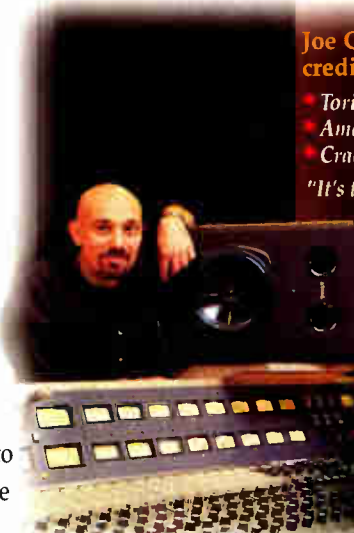


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*Mick Guzauski*

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MEMO

FROM:

Wayne

TO:

John

RE:

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Even with all this great new gear we've purchased, I'm still not happy with the vocal sound we're getting. Suggestions?

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JANUARY 1997, VOLUME 21, NUMBER 1

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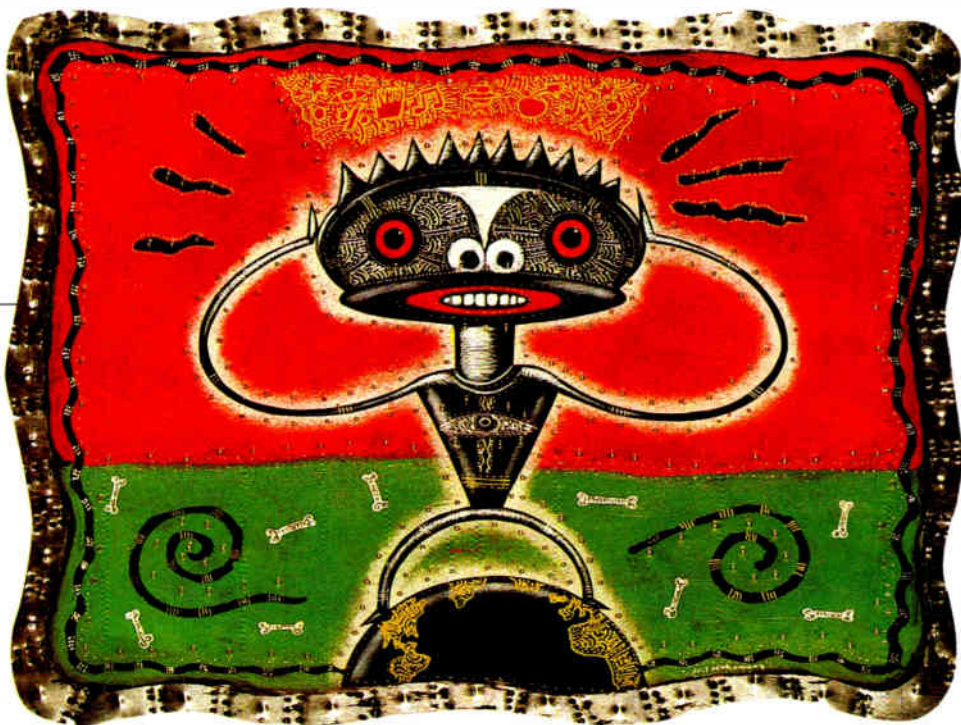
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**Cover:** Sound for the Kiss reunion tour is by Showco of Dallas. Front-of-house engineer Toby Francis mixed on an Artek Langley Recall console. Monitors are mixed by Kurtis Springer on a Yamaha PM400M. Other sound crew members are crew chief David Moncrieffe, monitor system engineer Mike Adams and technician Jacob Mann. House sound was via 88 of Showco's Prism™ speaker cabinets and 16 Prism sub-base enclosures, all powered by Crown amps. The band used 24 Showco BFM Series stage monitors. **Cover photo:** Steve Jennings.

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The 168RC is the first truly affordable, fully digital, 8 bus recording console. Use it with your ADAT or other digital recorder equipped with the ADAT optical interface to create the best sounding recordings you've ever made.

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Powered by Korg's proprietary MSP processor, our SoundLink DRS 168RC offers instantaneous control, processing and routing of all 24 inputs, 16 channels of mixing and 8 bus outputs.

With its combination of analog, ADAT optical and S/PDIF I/Os, the 168RC easily functions as the heart of a fully digital recording system while interfacing with any of your existing analog gear.

The 168RC is equipped with three-band EQs



*SoundLink DRS brings the reality of all digital, fully automated, component based recording to everyone working on the next great recording. For more information about the 168RC Recording Console or any of the SoundLink DRS components, just call (516) 333-8737.*

featuring semi-parametric high and low bands, fully parametric mid bands and 30 memories for EQ setups.

The 168RC also boasts two internal effects processors that run some of the finest algorithms available. Choose from 32 effects types and 50 preset programs.

The 168RC even provides automation functionality that lets you save and recall console settings or record and playback dynamic parameter changes.

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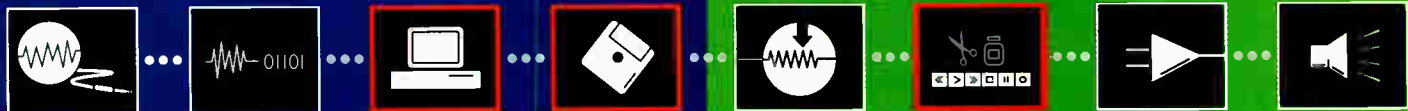
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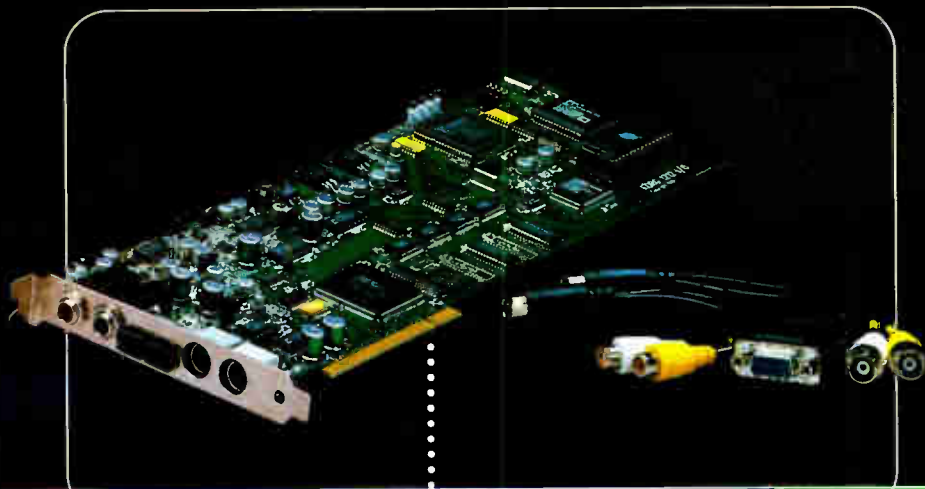
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# SoundLink DRS 1212 I/O Multi-Channel Audio Interface

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With the power of advanced personal computers, full-function multi-channel recording and editing is possible without the addition of costly, specialized hardware. The only true limitation has been in the area of multi-channel I/O. With the introduction of the SoundLink DRS 1212 I/O Multi-Channel Audio Interface, that limitation no longer exists.

The 1212 I/O features 12 inputs and 12 outputs configured as two analog I/Os, an S/PDIF I/O and an eight channel ADAT optical I/O. All the I/Os can be used simultaneously. For even more control and flexibility, the 1212 I/O connects to Korg's 168RC Recording Console, or to the Korg 880A/D and 880D/A interfaces.

The new 1212 I/O even offers a Word Clock input and output, plus an ADAT time code input, for system synchronization. Between the 1212 I/O with Deck II



168RC Recording Console, the heart of the SoundLink Digital Recording System.

For more information about SoundLink DRS components, call (516) 333-8737.

software, the 168RC Recording Console, an ADAT and a Trinity Music Workstation DRS, the combinations and configurations can meet the needs of just about any music production application.

All of the devices will interface with your existing analog equipment and form the basis for a completely digital system that will give you sound and creative control that simply isn't possible in the analog world.

Affordable, fully integrated digital recording  
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# FROM THE EDITOR

## ENGINEERS AND DRUMMERS

I've never been able to figure out exactly why, but a lot of engineers are drummers. I got my start in pro audio 30 years ago, playing Top 40 drums in clubs in Italy. In between bands or gigs, I'd "work sound" for other acts. It wasn't exactly engineering—it was mainly attempting to repair broken-down club P.A. systems. I had built Knight and Heathkit projects and was interested in electronics, a field requiring an affinity for mathematics and numbers. Drummers can at least count to four (one-two-three-four!), so maybe that's the connection.

Today, six drum kits later, I'm still engineering and playing occasional studio gigs, and the art and science of achieving drum sounds is a lifelong passion. Depending on the tone I'm looking for, I'm constantly switching between the '55 Gretsch, '72 Premier and '75 Rogers kits, seven snares and 35 cymbals. The available permutations (back to the math part) calculate to the thousands, if you figure in different mic combinations. On kick drum alone, an M88 doesn't sound like an MD-421, RE20, D-112 or Beta 52.

But no microphone can make bad drums sound good. And quality mics only magnify problems such as squeaky pedals, snare buzz or rattling hardware. Unfortunately, no tuning standards exist for drum kits, and engineers are frequently put into the awkward position of telling players their drums sound bad. To make matters worse, this usually comes up during sound-check or studio setup, and rather than working on the band's overall sound, valuable time is often "wasted" as the engineer and player try some last-ditch efforts—usually involving the horrors of duct tape.

Over the years, we've run numerous articles with tips on drum miking, but this month, *Mix* talks to some top drummers and engineers for their advice on optimizing drum sounds. The wise engineer should learn some fundamentals of drum tuning and perhaps have a few items, such as a kick pillow or a drum key, available for emergencies. A little knowledge and a small investment (cotton balls, anyone?) can go a long way toward getting that great drum sound.

Also with this month's issue, Jeffrey Turner takes the helm as publisher of *Mix*. Jeff pulled up his New Jersey stakes many years ago and headed west for student life at the College for Recording Arts in San Francisco. He later spent four years engineering at United/Western Studios in Hollywood and eventually arrived at *Mix* in 1982, working his way from director of advertising sales to associate publisher. A fellow audio addict, Jeff continues to be active, engineering both live and in the studio. Although his guitar chops are decent, he's not much of a drummer, but we won't hold that against him.

Speaking of music, we're off to this month's NAMM show in Anaheim, and we'll report on all the happenings in future issues.

See you there!



George Petersen

**MIX**  
20 YEARS  
1977-1997



Mix magazine is published at 6400 Hollis St., #12, Emeryville, CA 94608 and is ©1996 by Cardinal Business Media, Inc. Mix (ISSN 0164-9957) is published monthly. One year (12 issues) subscription is \$46. Single copy price is \$4.95, back issues \$6.00. Send subscription applications, subscription inquiries and changes of address to *Mix* magazine, PO Box 41525, Nashville, TN 37204 or call (800) 843-4086. Outside U.S., call (615) 377-3322. POSTMASTER: Send address changes to *Mix* magazine, PO Box 41525, Nashville, TN 37204. Address all other correspondence to *Mix* magazine, 6400 Hollis St., #12, Emeryville, CA 94608; (510) 653-3307; Fax: (510) 653-5142. Periodical class postage paid at Oakland, CA, and additional mailing offices. Editor Responsible (Belgique), Christian Desmet, Vuurgatstraat 92, 3090 Overijse, Belgique. This publication may not be reproduced or quoted in whole or in part by printed or electronic means without written permission of the publishers. Printed in the USA. Canadian GST #129597951; Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement #0478733.

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# CURRENT

## SECOND ANNUAL MIX GOLF TOURNAMENT

The Mix Foundation for Excellence in Audio has announced that the Second Annual Mix L.A. Open is scheduled for Monday, June 16 at the Brookside Country Club in Pasadena, Calif. For more information, call tournament director Terry Lowe at 310/207-8222. ■

## TOM KOBAYASHI ELECTED NEW SPARS PRESIDENT

The Society of Professional Audio Recording Services elected new officers and board of directors at the general membership meeting held at the AES convention in Los Angeles. The new president of SPARS is Tom Kobayashi, CEO of San Francisco-based EDnet. In outlining SPARS plans for 1997, Kobayashi said, "We'll be concentrating on four areas. Vision: to expand SPARS membership into the newer and emerging sectors of the professional recording services industry. Unity: to create unity among membership, manufacturers, suppliers, educators and peer organizations. Education: to further educate owners, employees and technologists through forums, business conferences, white papers, guidelines, practices and personal communication. Technology: to inform our membership of new technology through local regional lunches, dinners and business/technical conferences."

## Q SOUND, HOUSE EAR, STARKEY LABS ADVANCE DIGITAL HEARING AID

Building on their existing five-year partnership, QSound Labs, House Ear Institute of Los Angeles and Starkey Laboratories Inc. have entered the second phase of their research into digital hearing aids. "QSound Labs will play a key role in developing the next stage of digital hearing aid technology, utilizing our expertise in digital signal processing and hearing, and the infrastructure developed for the Cetera digital aid effort," says David Gallagher, QSound president and CEO. "We are pleased to work

with these two leading companies to develop the next generation of hearing instruments."

Meanwhile, QSound, House Ear and *Mix* announced the winner of an AES drawing: Kenny Cordova of Fort Lauderdale, Fla., received QSound's 3D audio tool set, Sonic Foundry's Sound Forge editing package and a subscription to *Mix*. Ian Scott of Burbank won a 3D audio tool set and a copy of Sound Forge.

## WOMEN IN AUDIO HONORS

The Women in Audio Committee of the AES gave out "Granny Awards" at the recent convention in Los Angeles, "in recognition of women's pioneering efforts, perseverance and achievements in the audio and music industry and their willingness to act as role models for other women." The first two awards, presented as part of the Women in Audio Project 2000 workshop, were bestowed on composer/musician/producer Suzanne Ciani and guitarist June Millington.

## RUSS BERGER, MICHAEL BOLTON FOUNDATION TO DESIGN YOUTH FACILITY

In an attempt to fill the social and economic development needs of youth in New Haven, Conn., the Michael Bolton Foundation is developing the first com-

prehensive, multicultural youth facility in the area. The 5,600-square-foot facility will focus on training youth in communications and will include a control room, recording studio and performance area. The foundation appointed the Russ Berger Design Group Inc. for acoustical consulting and design of technical spaces within the facility.

"I am pleased to be part of the team supporting this project for the kids," says Russ Berger. "The Michael Bolton Foundation has a clear goal and has focused their efforts into making this facility a reality for the community."

## BASF CHANGES DISTRIBUTION

BASF Magnetics GmbH of Ludwigshafen, Germany, and BASF Magnetics Corporation have announced a pending change in the distribution of BASF magnetic media and recording products to the professional audio and video industries. Effective December 31, BASF Magnetics Corporation, headquartered in Bedford, Mass., will close. BASF Magnetics GmbH will continue to support its audio/video, pancake and professional products business under new distribution arrangements with JR Pro Sales Inc. (Valencia, Calif.), a group founded

—CONTINUED ON PAGE 12

## 1997 TEC AWARDS CALL FOR ENTRIES

The Technical Excellence & Creativity Awards Nominating Panel is currently accepting nominations for the 1997 TEC Awards. To qualify for review, a product must have been released and in commercial use during the eligibility year of March 1, 1996, to February 28, 1997. Product categories are: Ancillary Equipment, Preamplifier Technology, Amplifier Technology, Computer Software and Peripherals, Microphone Technology, Sound Reinforcement Loudspeaker Technology, Studio Monitor Technology, Musical Instrument Technology, Signal Processing Technology, Recording Devices/Storage Technology, Workstation Technology,

Sound Reinforcement Console Technology, Tape/Disc Manufacturing, Small Format Console Technology and Large Format Console Technology.

Those wishing to nominate products should include the following information: product name and qualifying category; date first commercially available (proof of shipment may be required; beta test sites do not qualify); and a contact name and telephone number.

Send all information to: TEC Awards, 6400 Hollis Street #12, Emeryville, CA 94608; Attn: Karen Dunn. All entries must be postmarked by Friday, February 28. Late submissions will not be accepted. For more information, call 510/939-6149 or e-mail KarenTEC@aol.com. ■



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Mackie acoustic engineer David Bie uses scanning laser vibrometry to map HR824 tweeter dome vibrations. Film at 11.

Designs sought out the most talented acoustic engineers (being able to live in perpetual drizzle was a plus) and then made an enormous commitment to exotic technology such as scanning laser Doppler vibrometry, analyzers, time delay spectrometers and machines that go "ping." The High Resolution Series HR824 is the

result of painstaking research and money-is-no-object components. Not to mention thousands of hours of listening tests and tens of thousands of dollars in tooling.

## FLAT RESPONSE...ON OR OFF-AXIS.

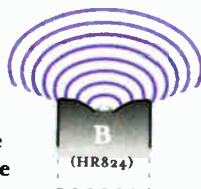
One of the first things you notice about the HR824 is the gigantic "sweet spot." The detailed sound field stays with you as you move back and forth across the console — and extends far enough behind you that musicians, producers and your mom can hear the same accurate playback.



The reason is our proprietary exponential high frequency wave guide. Without it, a monitor speaker tends to project critical high frequencies in a narrow beam (Fig. A) — while creating undesirable edge diffraction as sound waves interact with the edges of the speaker. Imaging and definition are compromised. The "sweet spot" gets very small.

Like biamped speakers, wave guides aren't a new concept. But it takes optimized, internal electronics and a systems approach to make them work in near-field applications.

The HR824's wave guide (Fig. B) maximizes dispersion, time aligns the acoustic center of the HF transducer to the LF transducer's center, and avoids enclosure diffraction (notice that the face of the speaker is perfectly smooth.) The exponential guide also increases low treble sensitivity, enabling the HF transducer to handle more power and produce flat response at high SPLs.



## CLEAN, ARTICULATED BASS.

When seasoned recording engineers heard the HR824 at a recent tradeshow, they couldn't believe the controlled low bass extension — several snoopers around for a hidden subwoofer. They heard low frequency



The Mackie HR824 Active Monitor.  $\pm 1.5$ dB from 42 to 20kHz.

accuracy that simply can't be achieved with passive speakers using external amplifiers. There are many reasons.

First, the HR824's FR Series 150-watt bass amplifier is directly coupled in a servo loop to the 8.75-inch mineral-filled polypropylene low frequency transducer.

It constantly monitors the LF unit's motional parameters and applies appropriate control and damping. An oversized magnet structure and extra-long voice coil lets the woofer achieve over 16 millimeters of cone excursion. Bass notes start and stop instantly, without overhang, distortion or "tubbiness."

Second, instead of relying on ports or slots, the HR824's low frequency driver is coupled to a pair of aluminum mass-loaded, acoustic-insulated 6.5-inch passive drivers. While typical, undersized ports cause vent noise, power compression and low frequency distortion, our ultra-rigid drivers eliminate these problems and couple much more

## HR SERIES™ "sound"

has no "sound" of its own. Rather, the Mackie Designs High Resolution HR824 is the first small monitor with power response so flat that it can serve as a completely neutral conductor for whatever signal you send it.

You'll hear the precise attack, texture and quality of individual bass notes exactly as they're being recorded. On instrumental and vocal tracks, you'll discern details of pitch, timbre and harmonics that passive monitors simply don't resolve.

## SCIENCE, NOT SNAKE OIL.

Internally-biamped, servo-controlled speakers aren't a new concept. But to keep the cost of such monitors reasonable, it's taken advances in measurement instrumentation, transducers, and electronics technology. In developing the High Resolution Monitor Series, Mackie



HR824 Active Monitors accept balanced or unbalanced 1/4" and XLR inputs.

Jacks & removable IEC power cord face downward so that the speaker can be placed close to rear wall surfaces.

# THE HR824 ACTIVE MONITOR.

effectively with the control room's air mass. They achieve the equivalent radiating area of a 12-inch woofer cone, allowing the HR824 to deliver FLAT response to 42Hz with a 38Hz, 3dB-down point.

Third, the woofer enclosure is air-displaced with high-density adiabatic foam. It damps internal midrange reflections so they can't bleed back through the LF transducer cone and reach your ears.

The typical problem of small-monitor midrange

precisely match each transducer's actual output via electronic adjustments. During final assembly, each HR824 is carefully hand-trimmed to  $\pm 1.5$ dB, 42Hz-20kHz. As proof, each monitor comes certified with its own serialized, guaranteed frequency response printout.

The HR824's front board is 1-inch thick with "radiused" edges to further eliminate diffraction. An "H" brace bisects the enclosure for extra rigidity.

Mackie is one of the few active monitor manufacturers that also has

Below: The HR824 Development Team.

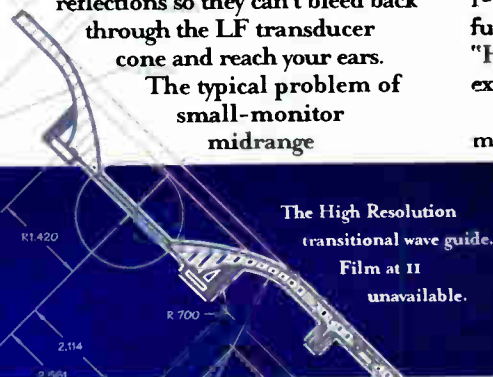
L to R, clockwise: Terry Wetherbee, Cal Perkins, Greg Mackie, David Bie, Paul Brengle, Jeff Hammerstrom, Dan Bonilla and Mats Jarlstrom holding P.D., our Over-20kHz Specialist.



Fig. C: Uneven fabric dome tweeter motion distorts high frequencies.



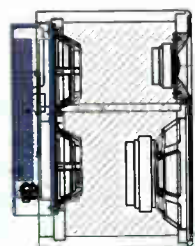
Fig. D: HR824 alloy dome's uniform, accurate piston motion.



"boxiness" is eliminated.

## A TRUE PISTONIC HIGH-FREQUENCY RADIATOR.

We scoured the earth for the finest high frequency transducers and then subjected the likely candidates to rigorous evaluation. One test, scanning laser vibrometry, gives a true picture of surface vibration patterns. Two test results are shown in the upper right hand corner of this ad. Figure C is a conventional fabric dome tweeter in motion. You



needn't be an acoustic engineer to see that the dome is NOT behaving as a true piston.

Figure D shows our High Resolution metal alloy dome at the same

frequency. It acts as a rigid piston up to 22kHz, delivering pristine, uncolored treble output that reproduces exactly what you're recording.

## INDIVIDUALLY OPTIMIZED.

You won't hear it from other manufacturers, but individual low and high frequency drivers can vary more than 10% in sensitivity due to production variations. Because our monitor is active, we can

experience building stand-alone professional power amps. Our HR824 employs two smaller versions of our FR Series M-1200 power amplifier — 100 watts (with 150W bursts) for high frequencies, and 150 watts (200W peak output) for low

**HR** HIGH RESOLUTION SERIES™  
**FR** FAST RECOVERY SERIES™

frequency. Both amps make use of high-speed, latch-proof Fast Recovery design using extremely low negative feedback.

## TAILOR THEM TO YOUR SPACE.

Because control rooms come in all shapes, sizes and cubic volumes, each HR824 has a three-position Low Frequency Acoustic Space control. It maintains flat bass response whether you place your monitors away from walls (*whole space*), against the wall (*half space*) or in corners (*quarter space*). A low frequency

Roll-Off switch at 80Hz lets you emulate small home stereo speakers or popular small studio monitors.

## CONFRONT REALITY AT YOUR MACKIE DESIGNS DEALER.

We've made some pretty audacious claims in this ad. But hearing is believing. So bring your favorite demo material and put our High Resolution Series monitors through their paces.

If you've never experienced an active monitor before, you're going to love the unflinching accuracy of Mackie Designs' HR824s. If you've priced other 2-way active monitors, you're going to love the HR824's \$1498/pair price\* AND its accuracy.



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# IT COULDA HAPPENED!

A REVISED, NONLINEAR HISTORY

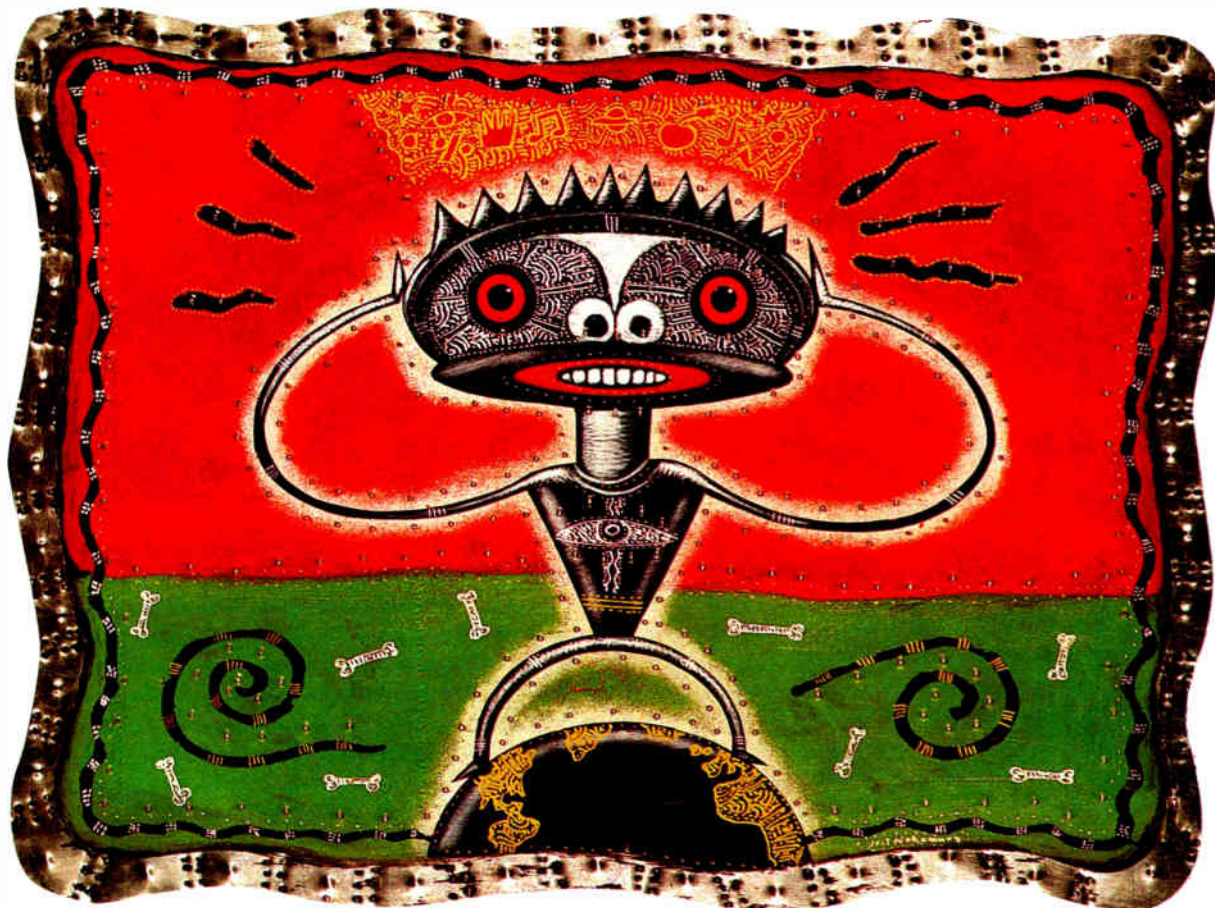


ILLUSTRATION: JOEL NAKAMURA

Welcome to 1997! Let us bow our heads in silence for a moment and review the advances of the past so that we may better plan our future.

## TIME MODULATION

If you view time as a continuum, a line upon which we all travel, then this column may be a bit difficult for you and any others on your line. But if you are comfortable viewing time as a flexible state (if *Pulp Fiction* made sense to you), then this will probably work out okay. Remember, it is merely one's point of view that supports the illusion of time being linear. Don't you watch *Star Trek*?

## MEGA-DISASTERS OF OUR PLANET

This column is about things that

went, are going or will go horribly, horribly wrong in the technical advancement of Man here on Stone Three. As I sit alone and wonder what went wrong with our world, a world that was so strong, I find myself saddened and frustrated by some pathetic turns that we as a purportedly sane technical society have made, are making or will soon make. I am not talking about the silly ones that only cause pain and suffering for mere thousands of people, like the very existence of Lucas Electric. No, I am gunning for the Big Offenders—the ones that have changed life for all those who live with and use technology. And within this class of saddening disasters, I will steer clear

BY STEPHEN ST. CROIX

of those obvious cases of the poor, innocent and misguided, like Tammy Faye Bakker and her understanding of the possibilities brought to her by the technical advancements in the area of makeup. (That one can probably be chalked up as simple substance abuse—with Revlon being the substance.) Or the seemingly obligatory chemical demise of any musician who reaches a certain level of fame and following, or the death by aircraft that seems to take care of those who somehow manage to evade the primary chemical cause of performer termination.

No, I will attempt to keep the topics of this month's offering within the approved subject window—audio- and video-related technologies, analog and digital. I



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home studio technology  
takes a leap in quality  
and a drop in price.

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**EMAGIC**

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won't succeed, but I will attempt it nonetheless. So in the words of that beloved TV star who once weekly warned America's hearts by threatening to inflict serious physical harm on his oppressed wife, "Awaaaaay we go!"

1) Beta/VHS—If it weren't for Billy's Gates of Hell (see item 3), this would go down in history as the saddest, most embarrassing technical misstep of all time. But it's a great second-place offering.

One day in the late peizo-electric period, Sony came along and prepared to give unto the masses a viable first attempt at low-cost video recording. But, as is sometimes the case, they decided at the last moment that it was not good enough, and that it would take so much money to fix that it might not even be worth finishing. They shelved it and began a totally new design from scratch, determined to avoid all the mistakes and compromises that limited the potential of their first system. This first system (which we will call Alpha) sat patiently in abandoned stasis while Sony diligently worked on the next

attempt. But another company showed up and offered to buy this Alpha first attempt—feeling it could afford to put the remaining yen into wrapping it up and still come out far cheaper than developing its own.

**It is up to you  
to keep  
lossy compression  
out of our industry  
until media  
and storage costs  
drop to the point  
that it is simply  
not needed.**

simply because there was *no* initial R&D overhead to amortize. Sony apparently thought that this was amusing enough to sell all rights to Alpha

for the rumored proverbial one dollar. The purchaser finished it off, changed the name from Alpha to Video Home System (VHS) and used every cent that it didn't spend on development on advertising.

Meanwhile, Sony finished its *much* improved second try, which we will call...Beta. We will call it that because that's what Sony calls it. Beta had higher resolution, less noise, a better tape path, better head contact, more location control and about 50 other improvements over VHS. This is no surprise, as Beta was meant to fix all the problems that plagued VHS.

So Beta was far beta than Alpha, but Alpha won. Why? What's the deal here? It certainly wasn't performance. It wasn't price, either. Nor was it convenience (the Beta cassette is much smaller and offered much longer play times). Simply put, it was advertising. More bucks generated more exposure for the dramatically inferior throw-away format, so it prevailed. Sad but true.

Some of you may remember that I have told this story of woe before. To you, I say that it can not be told too often. In fact, I implore you to tell it to

**For Musicians  
Who Bought  
The Other  
Digital  
Multitrack  
SORRY!**



your children, and tell them to tell their children. Only in this way can we hope to prevent such a tragedy in the future. And speaking of the future, here is a tragedy that we *can* still prevent.

2) Lossy Compression—There may yet be time to stop this travesty if we all get together and help one another right now. Come on, brother, help one another...Oh. Sorry. I do congratulate all of you who cast your vote against embarrassing, nauseating lossy compression by refusing to be duped into purchasing either Sony's silly MiniDisc or Philips' phony digital cassette.

But don't be seduced into complacency by your successful blow against throwing data down the drain to save a buck. The battle has just begun. It is up to you to keep lossy compression out of our industry until media and storage costs drop to the point that it is simply not needed. This is not some far-fetched digital dream, my friends. This is a close race—one that we may actually *win*. Hard drives are already down to \$200 a gig! A very short time ago, I paid \$75 for a 128-meg magneto-optical disk. Now 256-meg versions are ten bucks! Very soon the computational overhead and quality damage

of lossy compression won't be worth it, and it will go away—if we stand our ground.

Follow the MiniDisc and digital cassette lead—say "No!" to missing data, and this tragic mistake may actually be avoided. On the other hand...

**I get more done  
in a day  
on my Mac  
than most people  
can do in three days  
on a monster-fast  
Pentium.**

3) Macintosh/Wintel (Billy's Gates of Hell) c:/data/msword/sentence.  
long: History will someday look back on Little Billy Gates and blame him personally for perpetrating upon the entire world such a stupid, lame, crippled and arcane operating system that

the people of Earth ended up spending endless nonproductive hours fighting it, therefore allowing the general state of technological advancement to fall far behind what it should have been, so that aliens with Macs or some other OS that actually worked and didn't slow them to a pathetic, embarrassing crawl could come along and simply take over our planet because we were so backward and technically retarded.

Okay, so DOS was real, real bad. But now there's Windows—specifically, 95. I am aware that those of you who use Windows platforms on a daily basis are for some reason apparently blind to the horrors that Microsoft has perpetrated upon your collective souls. I am not sure exactly *how* this blindness comes to be, but I am forced to acknowledge that it exists. I am also aware that I am speaking out *against* the chosen OS of the majority of my readers in favor of a sadly misunderstood competitive OS that enjoys only a minuscule share of the computer market. And I am also well aware of how dangerous it is for a writer to attack his very own read-

—CONTINUED ON PAGE 236

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# THE SYNTH IS DEAD

**LONG LIVE THE SYNTH!**



ILLUSTRATION: NATHAN OTA

January being NAMM-show month, I thought I'd talk a little about the state of synthesis. But first, I want to take this opportunity to point out, in case you haven't heard, that *next* year's winter NAMM convention, for the first time I or anyone else I know can remember, will not be in Anaheim. They're moving it to the Los Angeles Convention Center for two years (Why? Because Los Angeles will be, I kid you not, "safer"), a place I studiously avoid, even when it hosts the AES.

It seems the Anaheim Convention Center is due for a major reconstruction and expansion over the next couple of years. It will be open most of the time, but apparently the NAMM brass were worried that sending conventioners into a hall full of scaffolding and dropcloths was dangerous. NAMM brass, obviously, have never been

in your average modern nightclub, where scaffolds and dropcloths are an essential part of the decor. Regardless, they have decided that a convention center ten (extremely hostile) blocks from any decent-sized group of hotels and restaurants is preferable to one in a town that, no matter how you feel about its food or accommodations, epitomizes the term "family-oriented." Not to mention "cheap." It's going to be a long couple of years.

Anyway, onward. If you take a quick glance at the state of electronic music today, you might think it's reached a dead end. All of the major synthesis methods of the past 20 years—FM, L/A, subtractive, additive, wavetable and so on—have pretty much been subsumed by the great sampling monster. All of the major players in the

business—Roland, Yamaha, E-mu, Ensoniq, Kurzweil—are making ever more powerful music machines whose power comes mainly from the amount of ROM samples loaded into them, and/or the amount of RAM sample memory that can be filled up by the user. Those libraries of clever patches that use various synthesis techniques to emulate old instruments or create exciting new ones, which used to circulate among user groups and in the classified ad pages of the music magazines, are now few and far between. Instead, the magazines are full of double-truck, full-color ads touting the latest CD-ROMs full of hundreds of megabytes of samples—screaming guitars, funky basses, four-bar grooves, brass sections falling from airplanes and exotic instruments from far-flung regions of the world—available either as audio

BY PAUL D. LEHRMAN



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files or preformatted for the sampler of your choice.

Granted, there is more to today's electronic instruments than just their ability to blow samples in and out. Many of them offer a host of "traditional" synthesis features like complex multi-pole resonant filters, cross-modulation, multistage envelope control and multiple modulation paths for real-time control of various parameters, which certainly makes them more interesting than the simple hit-the-key-and-let-it-loop sample-playback engines of the past. But the idea of creating a sound from scratch, using some kind of electronic or mathematical process that lets you create a structure from the ground up, seems to be a thing of the past.

Fortunately, however, that's not true. There is actually some very interesting stuff going on in several corners of the synthesis world. I'm not talking about the "retro" analog synths that seem to be flooding the market, along with those combination coffee makers/mic preamps and tube CD players. I'm talking about a totally new approach to synthesis that has nothing to do with

sampling, but which has only become practical in the past couple of years.

You've probably heard about "physical modeling," and in fact it's been around for quite some time—the first demonstration I saw of it was at IRCAM,

**With a physically modeled sound, everything is up for grabs, and any part of the sound can be influenced in real time using just a few instructions.**

the French government-financed music and acoustics research center (someone please tell me why *we* don't have any of those) in 1984. Physical-modeling keyboard synths have been on the market for about three years, but it's only

now that they're getting past the expensive/experimental stage (Yamaha's first attempt at FM, remember, was *not* the DX7!) and are looking like they're ready to become a major force in the electronic music world.

Physical modeling works by creating mathematical models of the components of real sound-producing physical objects (such as reeds, tubes, plucked or bowed strings, brass mouthpieces, violin bodies etc.) inside a computer processor; these models are then "stimulated" and interact with each other in real time. The amount of CPU horsepower needed to pull this trick off is substantial, which is why not long ago you could find it only in places like IRCAM. But Yamaha (which has been working on this for ten years now) managed to put a heavy-duty physical modeling engine into its VLI, now approaching its third birthday, and its younger, smaller brother, the VL7. Other companies have been experimenting with the technology, including Korg, with its Wavedrum and Prophecy; Technics, with its WSA1 "workstation" (the MIDI world uses this term even more freely than the audio world); and Roland, with its VG-1 guitar syn-

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\*Number of panners depends on Pro Tools hardware configuration.



Dolby Surround Decoder TDM Plug-In

Dolby Surround Tools provide all the functionality of Dolby's hardware products, plus additional features including surround panners and modes for video game developers. For example, surround game encoder and positioner not only make it possible to create sound effects for video games that players can move interactively, but for the first time allow for confidence monitoring of these effects.

thesizer. But Yamaha's implementation remains by far the most interesting.

Two factors make physical modeling so revolutionary. One is that you can combine elements of different instruments that simply do not exist in the real world, to create new instruments that sound as if they *could* exist. Some of you may recall that one of the many remarkable instruments that Professor Peter Schickele, the "discoverer" of the apocryphal classical composer P.D.Q. Bach, brought to the world was the "tromboon": a bassoon reed and bocal inserted into a trombone slide. Because I was a bassoonist, and I had a friend who played the trombone, I was able to create one of these myself—and believe me, it sounded no less vile when I played it than when performed by Schickele's chamber ensemble. But with a physical-modeling synth, you can stick a virtual double-reed into a virtual brass horn and put a virtual slide on it, and you can then easily play it in tune, with appropriate vibrato, a realistic envelope and maybe even, if you want to get fancy, a rubber plunger. (Of course, the visual element of multicolored metal pipes emerging from the player's lap in four different directions, like a set of IV

tubes for a dying robot, is missing, but I consider that a small price to pay.)

The other factor is that physical-modeling synths are real performance instruments. With most sampled sounds, when you hit a key, what happens next is pretty much preordained, with maybe a little filter or vibrato action under the control of the player. With a physically modeled sound, *everything* is up for grabs, and any part of the sound—reed pressure, tongue attack, pickup location, size of the tone holes, stiffness of the string—can be influenced in real time using just a few instructions. These can of course be handled by a wheel, a slider, a pedal, keyboard aftertouch, or in the case of the Yamaha synth, what you do with your breath, before, during or after the keystroke. It means that understanding "matrix modulation," something that has been a big selling point for a lot of synthesizers but which few people bother to use effectively, is now crucial to getting a useful sound out of the instrument and can lead to modes of expression that older synths can only dream about.

The down side is that these instruments take awhile to learn to play. With

everything that can be going on, it takes a great deal of practice to coordinate the various controls into coherent performances. You really have to think about what you're doing and be able to mentally isolate the various physical gestures a wind or brass or string player makes, and translate them into the physical gestures the synth wants. A woodwind player might normally bite hard on the reed and at the same time squeeze the instrument to get a more penetrating sound, but you can't do that on a VLI, because breath control and aftertouch may be doing very different things. Non-wind players will run out of breath until they get used to the idea of playing phrases that stop once in a while. Overblowing a French horn can produce beautiful harmonics—or elephant-like noises, depending on how hard you blow. If that parameter is hooked up to a modulation wheel, then you have to learn how to move the wheel subtly, so as not to destroy the musical effect. It's a good thing, perhaps, that the economics of the technology dictate that most physical modeling instruments are monophonic—they play but one note at a time. (A polyphonic version of the synth was

## Dolby Surround Encoder TDM Plug-In



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**Dolby**

announced when the VL1 was released, but I have seen no evidence of it since. Just as well.)

I doubt that it would surprise anyone to hear that Yamaha's initial foray into physical modeling was expensive and not easy to program. The technology is great, but the user interface is the same old, same old: You still only get to adjust one parameter at a time. Furthermore, the core technology—how you juxtapose different instrument parts to make new instruments—was not accessible to the user. While the instruments certainly have plenty of parameters to fool with, the basic instrument models were fixed in stone. As one Yamaha engineer puts it, "We could let people hit a saxophone with a hammer, but they wouldn't like how it sounded."

This has now changed with a new version of the operating system for the VL1 and VL7, and a Macintosh editing program that uses visual icons to create trombones, as well as tubellos, flurinets, trumpitars, digeridistortolins, and all sorts of things Professor Schickele (not to mention Dr. Seuss) would be proud of. The program is made to be as easy

as possible. The instruments that are created are quite basic in nature, and the performance parameters accessible from them are very limited. For example, you can turn breath control on and off, but you can't specify what it does. Nevertheless, it's a great step forward, and a more complex "expert" editing program is reportedly in the works for those with even more courage.

As far as the expense is concerned, Yamaha has recently attacked that front with a small module called the VL70m, which contains most of the functionality of the VL7 in a General MIDI module-sized package. (Of course, it's not General MIDI, in that it can only play one note at a time, but that didn't stop Yamaha from putting a computer interface on the back just like its GM/XG boxes. Go figure.) This little sucker lists for \$800. It has the bulk of the synthesis features of its older siblings, although not quite the same control features, and by necessity the LCD screen is smaller and more cramped. But it will take a breath controller just like the big boys, and it even has an input for a Yamaha wind controller like the WX11, which the older models don't, for really interesting performance possibilities.

Conquering complexity and price point, however, are only part of the battle of using an exciting new technology to keep true synthesis alive. The rest is getting people interested enough in learning how to play a new instrument. The more realistic a physical model is, the more physical control can be exerted to make it do expressive things, and therefore the more knobs, levers, wheels, pedals and things to suck and blow into can be called into play. For musicians who are used to just playing keys, adding these other parameters can be a real challenge. While they've always been there as part of MIDI, few instruments in the past have *demand*ed that musicians pay attention to them. Physical modeling instruments do just that—and the world of synthesis should be better off for it.

Next month, I'll talk about the other direction synthesis is going: cheap, cheap, cheap. So cheap, in fact, that soon you may not need any hardware at all. ■

*Paul D. Lehrman has been fooling around with electronic music for 30 years and is still looking for the right sound.*

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# Head Out on the Highway

by  
**George  
Petersen**

Eons have passed since the Audio Engineering Society's convention last came to Los Angeles in 1990. Yet if truth be told, there wasn't much excitement about its return to the City of Angels. California's Southland offers spectacular sights and sounds, but, unfortunately, downtown L.A. pales in comparison to recent AES locales such as Copenhagen, Manhattan, Amsterdam, San Francisco and Paris. Let's face it: Figueroa Street ain't exactly the Champs-Élysées.

The packed parking lots surrounding the convention confirmed AES' "Head Out on the Highway" theme. Life in Southern California revolves around freeways and cars, and it seemed most attendees were either commuting to the show or travelers with the sense

## Product **HITS** 101<sup>ST</sup> **AES** CONVENTION

The following are some of my favorite items from the show floor. Our AES coverage continues next month, looking at workstations, sound reinforcement and more AES hits in our new-product sections.

### **CONSOLES, CONSOLES, CONSOLES...**

The best-kept secret in the audio industry was a prototype Tascam digital mixer: Beautiful to look at, yet it wasn't passing audio. Tascam previewed the mixer to elicit user comments before final designs are wrapped up. Deliveries are said to begin this summer.

For now, the mixer has two 24-channel strips, providing a maximum of 40 TDIF (DA-88/DA-38) inputs on mixdown, with 16 analog mic/line inputs. AES and S/PDIF inputs are planned. Aux sends and returns will be a combination of analog and digital. Two automation packages will be offered, with all console functions under MIDI control or an external computer/software package. A backlit LCD showing parameters, 20 rotary encoders, jog/shuttle MMC transport controller with ten locate points, and support of MTC, Sony 9-pin and DA-88 sync are planned. Pricing is said to be "competitive and well under \$10,000."

Much less of a secret was the Yamaha 03D. The brochure proclaims it as "The Ultimate Music Production Console," which is unlikely, as it's a smaller, scaled-down version of Yamaha's successful 02R digital mixer. Marketing hype aside, the 03D has 24 inputs, four buses, six aux sends and moving-fader automation with full recall. The mixer accepts

one I/O card, allowing eight digital inputs (AES/EBU, TDIF, ADAT or Yamaha format), four digital sends and four digital bus outputs. DSP includes 4-band parametric EQs, two internal effects processors and the same LCD screen as the 02R. De-



*Crane Song HEDD 20-bit processor*

to stay in areas such as Hollywood or Santa Monica—anywhere but downtown L.A.

However, it should be noted that convention chairman Van Webster and a group of dedicated committee members assembled a superb variety of interesting events, papers, seminars, workshops and tours. The shuttle buses rolled smoothly. And once you got inside, the expanded facilities of the L.A. Convention Center offered a pleasant, workable environment, including an exhibit floor packed with nearly 500 companies showing new technologies.



*Tascam digital console prototype*

liveries start in a couple of months. Pricing? Under \$4,000.

Another AES digital console debut—albeit with a slightly higher MSRP—is the AMS Logic DFC, a fully automated digital console designed for multiformat film dubbing and post. Based on the Logic audio processing engine, DFC is available with up to 256 audio paths in any combo of mono/stereo channels or 4-, 6- or 8-wide preduh inputs. Features include one- to three-operator positions, “one-touch” routing, mappable EQ and dynamics, surround panning in any format, up to six 8-track-wide stems, 9-pin and bi-phase control and Flying Fader-based Encore automation. I/O choices include 16- or 20-bit ADCs/DACs, 24-bit AES/EBU, SDIF, MADI and TDIF. An integral AudioFile MT multitrack disk recorder/editor is optional.

AMS Neve also announced a major upgrade of its flagship analog mixers. The VX (music) and VXS (multiformat) consoles offer better performance over the V Series with greater transparency. Both desks are equipped with AMS Neve’s cross-platform Encore moving fader automation, with mix data displayed on a TFT screen in the meter bridge. The VXS adds surround mixing and post fea-



PHOTO: GEORGE PETERZEN



## LIQUID AUDIO

Five years from now, the 101st AES may be best known for the debut of Liquid Audio®. There are numerous companies offering means of delivering audio-on-demand on the Internet, but Liquid Audio is doing it right.

The principals of this Redwood City, Calif., company are established audio pros, evident by the process’ superior audio quality. In A/B/C listening comparisons with competing Internet delivery systems, Liquid Audio was the clear winner. The company has also licensed a software version of Dolby Digital™ AC-3 compression and incorporated it into the process.

A range of products is available. Liquifier™, the pro mastering package for preparing files, handles Dolby Digital encoding, waveform editing, audio-with-multimedia creation and uploads to Web sites and databases. A Pro Tools plug-in is also in the works. The Liquid Music Server™ not only delivers high-

—CONTINUED ON PAGE 31

tures, such as support for three additional ATRs/dubbers, switches for monitor select/record arming and optional assignable joysticks.

Euphonix premiered its next generation CS3000 digitally controlled analog console, offering an improved control surface with moving faders, upgraded automation, master VU and phase metering, multimachine control, SnapShot Recall™ (one-frame reset of all faders, mutes, EQ, dynamics, routing, etc.) and Hyper Surround™. The latter is Euphonix’s new software-based panning/busing system, providing for any or all sur-

round sound formats, even multiple formats at the same time. The first CS3000 goes into Media Ventures (Santa Monica, Calif.), the studio of Hans Zimmer and Jay Rifkin.

Question: When is a console not a console? Answer: When it’s a controller! Mackie’s HUI (Human User Interface) provides a visual, tactile control surface for tracking, mixing and editing on Pro Tools systems. HUI has eight assignable, touch-sensitive moving faders, dedicated pan

and send encoders, jog/shuttle wheel, transport keys, alphanumeric display of plug-in parameters, timecode/beats/footage readout, 4-character LED “scribble” strips, 10-key data pad, 16 LED meters and dedicated keys for Undo, Save, etc. A control room section with talkback mic, monitor volume and headphone assign is standard. HUI communicates via MIDI and/or RS-422, so it will eventually be compatible with sequencing software.

JL Cooper’s MCS-3000 Media Control Station offers control of workstations and disk recording systems. Features include eight touch-sensitive motor faders, 60 programmable function keys, five rotary encoders, jog wheel/shuttle ring, 100-locate-point transport controller, LED timecode display and a two-line/40-character backlit LCD. Optional plug-in cards add RS-422/232/435, Sony 9-pin, ADB and GPI control.

These controllers are a good start. Now I want an impressive looking 80-channel, 7-foot surface with one-knob-per-function, to control a couple Yamaha 02Rs hidden in a machine room. Maybe next year...

## MONITORS: POWER UP!

AES had lots of new powered monitors. Listed alphabetically, here are a few:



Genex GX8000 disk recorder

The Audix (Wilsonville, Ore.) PH-15 and PH-25 monitors feature 40-watt amps. The dual-woofer PH-25 (\$579) produces 6 dB more than the single-woofer PH-15 (\$429). Add \$20/pair for mag shielding.

HHB (Portland, Maine) debuted ATC's active studio monitors, including the SCM 50A-Pro and SCM 100A-Pro, featuring a space-age "No Grille" enclosure. ATC's SCM 20A-Pro Active Portable System is a 6-inch LF/1-inch-dome tweeter design offering a die-cast aluminum cabinet with integral heat sinks for the beefy internal 250- and 50-watt amps.

Bag End's (Barrington, Ill.) Infrasub-18 is a powered sub using ELF™ (Extended Low Frequency) technology to output 8 Hz to 95 Hz ( $\pm 3$  dB) from an 18-inch driver in a compact (24x21x18-inch) cabinet housing a 400-watt power amp and the ELF electronics.

Dynaudio Acoustics (distributed by AXI, Rockland, Mass.) showed several systems. The CA4 pyramidal, free-standing, three-way active unit provides 40 to 25k Hz response; a powered sub takes it down to 35 Hz. The BM15A is the active version of Dynaudio's TEC Award-nominated near-field, and the new BM6A is a compact (7-inch LF/1-inch HF) system powered by dual 100W for 45 to 20k Hz response and peaks of 115 dB.

Event Electronics (Santa Barbara, Calif.) followed up its 20/20bas Series with Tria, a tri-amped mini-system with two compact two-way monitors and a floor-mount subwoofer. Tria locates all its power amps in the sub-module, thus keeping the amp weight off the console bridge. Tria offers a big sound at a small price: \$799 complete.

Genelec's 1029As are housed in aluminum cabinets, weigh 12 pounds and feature room response EQ, volume control, mag shielding and two 40-watt amps in each. A companion 1091A (\$700) 80-watt powered sub has a single 8-inch driver in a vented enclosure, extending system response from 40 to 20,000 Hz,  $\pm 2.5$  dB.

KRK's Exposé series of two-way monitors have 7- or 8-inch LF drivers and 1-inch inverted dome tweeters. Bi-amping is via 180-watt internal amplifiers on each driver, with response from 45 to 20k Hz ( $\pm 2$ dB). Their hexagonal cabinets and finned ports make these a beauty to behold. The E-7 retails at \$2,995/pair; the E-8s are \$3,995.

Mackie's FP824 is a bi-amped 8-inch/1-inch system—the first I've heard that actually uses passive radiators cor-

rectly (it has two 6.5-inchers). Response is 45 to 20k Hz with  $-3$  dB points at 38 Hz/22.5 kHz. The onboard 150- and 100-watt amps put peak SPLs per pair in the 120dB range. Retail: \$1,498/pair.

Quested Audio (Mazomanie, Wis.) is now delivering the VS2205, a bi-amped system (150 watts total) with two 5-inch woofers and a 28mm tweeter. The VS2108 has an 8-inch woofer, 28mm tweeter and 100-watt amps driving each component. A VS1112 powered 12-inch sub is optional with either system.

Distributed by Sascom Marketing (Oakville, Ontario), Spendor's SA200 and SA300 are two-way near-fields. HF is powered by a 50-watt amp, LF has a 150-watt amp. Features include HF and LF equalization and active filters.

The NP4s from Spirit (Auburn, Calif.) are a two-way design incorporating 200 watts of internal bi-amplification: 100W to each 7-inch woofer and 1-inch tweeter. Frequency response ( $+1/-3$  dB) is 40 to 20k Hz. Max SPL is 115 dB @1m. Retail is \$1,000/pair.

## RECORDING TECHNOLOGIES

The shape of MDMs to come? HHB un-

veiled the Genex GX8000, a stand-alone disk recorder using 5.25-inch, 2.6GB magneto-optical cartridges. The unit records up to eight 20-bit tracks simultaneously, and its AES/EBU inputs handle from 8 to 24 bits. Only slightly more complex to operate than an ADAT, the GX8000 has an onboard SMPTE chase synchronizer, with reverse play and lock to timecode. Options include 8-channel A/D and D/A converters and bi-phase sync.

Sony's PCM-7040 is the replacement for its workhorse PCM-7030/7050 studio timecode DAT decks. The PCM-7040 supports a re-chase mode, which maintains sync even when the master recorder is in fast-forward or rewind. RS-232, 37-pin parallel and Sony 9-pin control are standard. Its 4-head design allows Read-After-Write for confidence monitoring and Read-Modify-Write for smooth punch-ins/outs. List is \$9,950.

At \$3,295, the new Fostex D-15 is said to be the "lowest priced timecode-capable DAT recorder available." However, to add necessary features such as word clock and video sync, stripping tapes from external timecode sources

## FIELD EVALUATION: STUDER HEAD CLEANER

Maintenance is important for top-notch studio performance. So when the Studer Head Cleaner (SHC) debuted at AES, I had to check it out ASAP. You see, I always travel with a pair of Stephens 24-tracks in road cases in my hotel room, in case I have ideas at 3 a.m. and need to lay down some tracks.

With Studer's adoption of Nashville as its U.S. home, the company chose a well-known Tennessee firm as the exclusive third-party supplier of SHC. Intended for larger facilities with lots of heads requiring cleaning, SHC is supplied in sizable 750cc containers. Owners of smaller studios may also want to stock up on SHC, as emergencies (such as shedding tapes) can happen at any time. It's best to be prepared.

Pour a small amount of room temperature SHC in a glass beaker, as shown in the photo, or if desired, place SHC in a slightly larger container with some ice to reduce its temperature. After cleaning the headstack with standard cotton swabs, I couldn't verify whether this application left any residue. Just then, the bottle began sliding off the console meter bridge. Reaching for it, I slipped on an acetate disk blank (I also always travel with a Neumann record lathe), and on the way down, I *accidentally* ingested about 160cc of the SHC.

Minutes later, I was still alive (SHC uses a patented semi-nontoxic formulation), and I resumed listening tests. The Stephens seemed warmer and fuzzier, as did everything else in the room. I'm not sure about the residue issue, but my head seemed a lot cleaner.

—George Petersen





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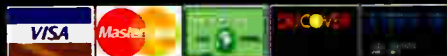
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and outputting LTC or converting absolute time to LTC, you'll have to add the \$595 optional sync card. Even so equipped, at \$3,890 it's still quite a deal.

The D827-MCH MkII, Studer's fourth-generation 24/48-track DASH-format recorder features a new autolocator, 20-bit A/D-D/A converters, an improved tape transport, standard 24-bit EDR (Extended Digital Resolution) capability, 180-second onboard sampler with edit-track slip and track-bounce features, and MADI and AES/EBU interfaces. The 24-track is field-upgradeable to 48 tracks.

### SIGNAL PROCESSING

I've been a fan of Night Technologies' EQ<sup>3</sup> AirBand™ analog equalizer since it debuted at the 1993 AES. The absence of phase distortion and its silky sound are impressive, but its \$3,000 price was problematic for many users. Now, by eliminating some frills, Night offers the EQ<sup>3D</sup>, a stereo 6-band program equalizer with variable frequency AirBand control at an affordable \$995.

Having transformed PCs into high-performance signal processors, Power Technology (San Francisco) is at it again. They've applied their DSP-on-a-

PC-card approach to the FX•Pack, a rack-mount card cage/power supply that holds up to four of its ISO-format, 32-bit floating-point DSP-FX multi-effects cards, connected via Ethernet for control via Windows PCs, Macs (!) or either in a networked situation. At AES, a Mac Powerbook controlled eight channels of effects, all under an intuitive visual interface. Price: \$1,229 with one card; additional cards are \$799.

Lexicon's MPX 1 (\$1,299) has two microprocessors: the proprietary Lexichip II for reverb and a separate DSP for simultaneous effects. The interface is fast and powerful, and the MPX 1 sounds are glorious. On a related note, Lexicon's Pitch Shift II intelligent pitch shifting/harmony card for the PCM80 is awesome—easily the best investment a PCM80 owner can make.

Yamaha's REV500 offers lush, thick reverbs with smooth decay. Features include 20-bit A/D and D/A converters and built-in snare drum and cross-stick sounds, allowing reverb parameters to be set without an external signal source. Retail? A paltry \$499.

dbx's Blue Series A/D converter is based on a 27-bit process and offers a choice of onboard noise shaping ap-

proaches, including the ability to create NS curves using a graphic interface.

Crane Song (Superior, Wis.)—renowned for its analog designs—enters the digital domain with HEDD (Harmonically Enhanced Digital Device), a digital processor combining 20-bit converters (for analog or digital I/O) and real-time harmonic enhancement to create tube-like sounds in the digital domain. Its ADCs and DACs can be used separately or with HEDD processing. HEDD's effect is intoxicating, particularly on rock tracks, adding warmth and a gutsy LF fullness. Retail is \$2,400.

The Digital Noise Filter (\$4,500) from GML (Van Nuys, Calif.) was designed for de-noising film archival sources, but could prove useful in other applications. Developed jointly with the Walt Disney Company, this 2-channel digital I/O unit combines a processor and 8-band desktop remote controller.

### THE LITTLE THINGS...

Not all of AES involves big-buck, high-ticket items. The little things also deserve mention, but unfortunately, here's one that's notable for other reasons. J-CON™ Concept (Chesterfield, Va.) showed a range of adapters that in-

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**106:** Invisible. This automatic compressor is so transparent that some people think it isn't working! Effortlessly maintain perfect levels without having to constantly adjust ratio, attack, release and threshold.

**107:** The award winning, #1 selling Tubessence mic preamp is the perfect marriage of solid state and vacuum tube circuitry. Upgrade the sound of all your mics with uncolored detail, presence and warmth.

These products are covered by one or more of the following U.S. Patent numbers: 4150253, 5359665, 5334947, 5450034, 5424488, 5483600.

clude 3-pin AC to ¼-inch, banana and other types. It's based on the concept that in a pinch, any AC extension cord could be used as a speaker cable. However, its potential for LETHAL ELECTROCUTION is very real, particularly in non-professional live sound applications, where wiring mixups are common. If you ever plan to use an extension cord as a speaker cable, just throw some wire cutters and a couple screw-lug ¼-inch plugs into your gig bag. It's a lot cheaper than a funeral.

One useful accessory I absolutely recommend is Gold Line's new Gold Lite/1k. Requiring no batteries, this is a 1kHz tone generator and phantom power detector, built into a female XLR connector. Connected to a phantom source, the unit lights an LED and outputs a 1kHz tone. Priced at \$39.95, this is the ideal pocket troubleshooting toolkit, whether onstage, on location or in the studio. Innovations, large or small, is what AES is all about.

AES returns to New York this fall, from September 26-29, but if you need an AES fix in the meantime, "Head Out on the Autobahn" to Munich for the 102nd convention (March 22-25). Auf Wiedersehen! ■

—FROM PAGE 27, LIQUID AUDIO

quality, scalable audio and media over IP networks, but enables transaction-based music commerce and automatic royalty tracking/reporting via e-mail. The Liquid Audio Player™ is a free, downloadable player for consumer use; capabilities include streaming audio at any modem speed, downloads of CD-quality, Dolby Digital music files, and display of art, lyrics and production/copyright credits while listening.

How it works: Let's say an artist wants to do a fan-club CD of Christmas songs. Her major label won't handle it, because it's a low-volume item. In fact, no one knows how it would sell. Handled through traditional channels—press CDs/ship to stores—10,000 CDs may not be enough. If it sells well, there won't be enough time to press more for holiday sales. And as it's seasonal, nobody wants to press too many and eat the returns. Using Liquid Audio, fans can download the

album and CD graphics for a modest fee and later cut a CD-R from the files. No overstocks, no returns and no shortages.

While CD-R drives aren't exactly a household commodity, this is sure to change as prices drop in the future; as this happens, the need for systems such as Liquid Audio will only increase.

More importantly, Liquid Audio could create new distribution avenues for low-volume or specialty releases. Local bands could release product and offer it to a global market through the Internet; majors could upload recordings from each venue along a concert tour for consumer purchase; and new markets could open up for spoken word or limited-audience works.

On a related note, EDnet has already teamed up with Liquid Audio as a means of point-to-point transfer of audio files between studios over EDnet's digital network. More info? Check out [www.liquidaudio.com](http://www.liquidaudio.com).

—George Petersen

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# Retail

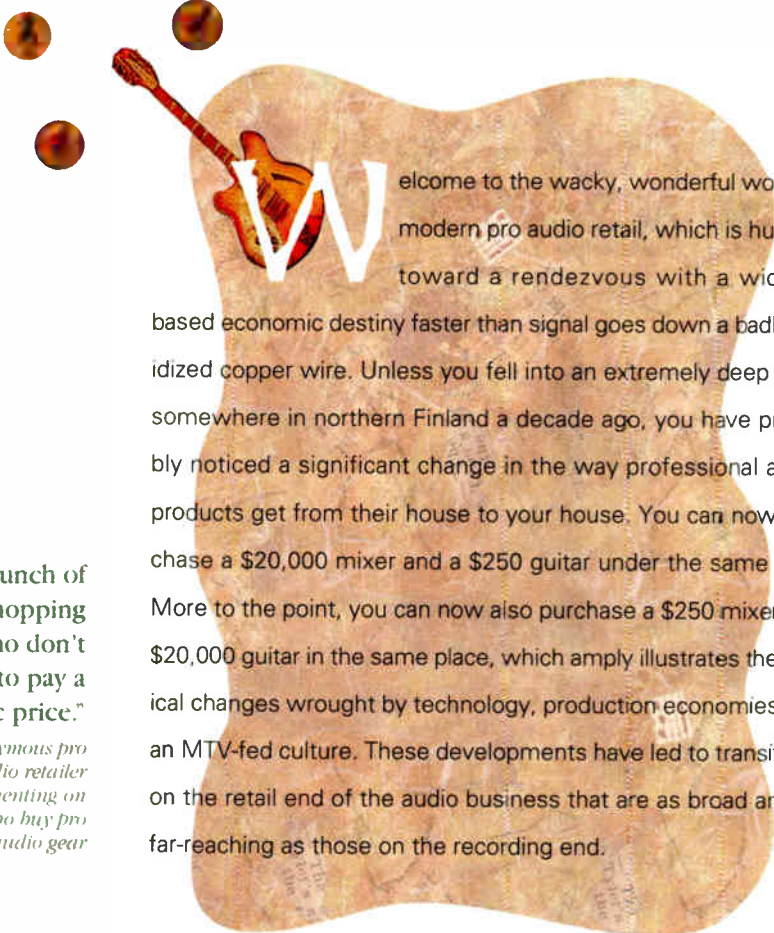
THE CHANGING WORLD

# Wars

PRO AUDIO SALES

**“A bunch of phone-shopping slugs who don’t want to pay a realistic price.”**

*—Anonymous pro audio retailer commenting on people who buy pro audio gear*



**W**elcome to the wacky, wonderful world of modern pro audio retail, which is hurtling toward a rendezvous with a widget-based economic destiny faster than signal goes down a badly oxidized copper wire. Unless you fell into an extremely deep cave somewhere in northern Finland a decade ago, you have probably noticed a significant change in the way professional audio products get from their house to your house. You can now purchase a \$20,000 mixer and a \$250 guitar under the same roof. More to the point, you can now also purchase a \$250 mixer and \$20,000 guitar in the same place, which amply illustrates the radical changes wrought by technology, production economies and an MTV-fed culture. These developments have led to transitions on the retail end of the audio business that are as broad and as far-reaching as those on the recording end.

**“The age of service is over; now they just want you to come in with your money and leave with a box under your arm as fast as possible.”**

*—Anonymous studio owner commenting on shopping for equipment*

**by Dan Daley**



Illustration by Colin Johnson



Historically, the audio retail business in the U.S. had a clear delineation between musical instrument-related (MI) and professional audio sales. The modern MI dealer evolved from an artisan-based economy about 150 years ago, when instruments like guitars began to be mass-produced. By 1950, stores like Manny's in Manhattan and Sam Ash on Long Island were able to outfit any kind of band, from marching to skiffle. Until that time, there was little need for professional audio equipment dealers; New York recording professionals would walk over to Cortland Street in lower Manhattan and buy tubes, connectors and everything else they needed for what were for the most part home-made systems, from consoles to monitors. The pro audio business was in its own artisan stage; professionals would go to mostly foreign manufacturers such as Neumann and Sennheiser for ready-mades like microphones, and to the few

domestic manufacturers, such as Ampex, for tape machines. The rest they would cobble together and maintain themselves.

The 1950s and '60s saw the rise of the independent studio and the arrival of mass-manufactured audio systems, from consoles to signal processing, and the following decade saw the birth of retail operations to service them—companies like Martin Audio and Audio Techniques in New York and Sound Genesis, LA Audio Industries, Everything Audio and Audio Concepts in Los Angeles. Still, one type of store sold instruments to musicians and a different store sold the tape machines that recorded them—and for good reason. “Studios used to be large concentrations of capital with chiefs of maintenance who you could talk to on a high level of technical discourse, and they were not generally musicians,” recalls Mike Bogen, director of pro audio sales with Dale Pro Audio, one of the few remaining dedicated pro audio dealers in the U.S. (Bogen was formerly vice president of the now-defunct Martin Audio, which was purchased by a junk bond-funded conglomerate in the '80s only to rapidly disintegrate under the withering fire

of recession and a changing business landscape.)

“Today, even the larger studios no longer have maintenance people on staff anymore,” Bogen continues, “and they’ve become used to a black box mentality in which everything is pre-made and price is the basis for most purchases. The stores have more and more products and lower and lower margins, so everything is based on volume in order to make a profit. And in the end, the customer is both the winner and the loser—saving a few dollars but losing the level of service that pro audio truly requires.”

Bogen and his cohorts came from that early period in pro audio retailing. Another was Hamilton Brosious, one of the founders of Audio Techniques, who now specializes in equipment brokering and studio liquidations. At one time the leading MCI console and tape machine sales rep in the U.S., Brosious watched as Audio Techniques underwent the trial of a changing retail sector. “The project studio changed everything; their source of equipment was becoming the MI store,” he says, referring to the period in the late '70s that saw the introduction of the first down-market record-

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ing systems, such as TEAC open-reel 4-track decks. These types of systems could be sold legitimately by either MI or pro operations, Brosious says, but they were the leading edge of an army of evolving systems—such as the Tascam PortaStudios—that were below pro audio's putative specifications and right up the price alley of MI stores and their core clientele of musicians.

"A lot of pro audio dealerships were based on a few product lines," Brosious says. "We had MCI, and Martin had Otari. As Otari moved to other distribution methods and as MCI faded, the dealerships that relied on having them exclusively suffered." Bogen recalls when dbx began to offer its 160 compressor through MI stores as well as pro audio dealers in the early '80s, establishing beachheads for pro manufacturers who were just becoming aware of the economic possibilities of the personal recording revolution.

#### THE BIG SHIFT

A big change took place in 1988, when Manny's bought Audio Techniques to establish an independent pro audio arm to augment the bursting back room of the store on West 48th Street. Two years

later, Sam Ash, whose Manhattan store was located directly across the street, opened its own pro audio division. The sale made sense, Brosious recalls, as the large-console market moved further up-scale, and manufacturers had taken to direct sales to keep retail costs down.

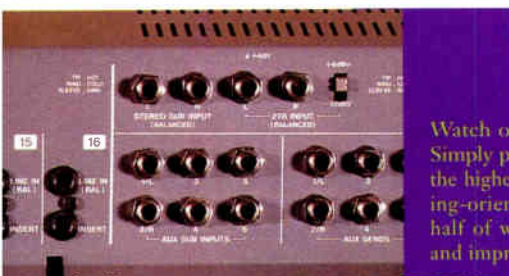
**The advent of MIDI gave MI retailers a new customer base that the pro audio dealers were not prepared to handle.**

—David Angress

The same happened for large-format analog multitrack tape machines. "The basis for a store like Audio Techniques was eroding," Brosious says. "Pro audio dealers wanted exclusive sales on a few consoles, and now you had 15 stores in the New York area that sold Mackies.

The manufacturers realized there was no longer an advantage in having an exclusive distributorship."

Doug Cook, who ran the pro audio department at Manny's, was named president of the newly acquired Audio Techniques. Eight years later, he is vice president of pro audio sales for Manny's, as the product lines and staff of the division that was once Audio Techniques are being combined back into Manny's—in a storefront adjacent to the original MI store. "Pro audio now represents about 40 percent of Manny's total revenues, a percentage that skyrocketed in the last few years but has been relatively stable since then," he says. "We thought it made sense to put products like computers and pro audio together under one roof again. Consolidating makes sense because the recording industry has evolved to the point where users don't need as much hand-holding as they used to. Inexpensive products sound and work great these days, so that's another reason for a consolidation of how they're sold. And in this consolidated location, we believe we can provide a higher level of service for those people and technologies that do require it. Because even as



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a lot of stuff gets less sophisticated, some of it gets even more sophisticated, like the Telos ISDN codecs we're now carrying, which is a new product line for Manny's pro audio."

Service across the board in pro audio, though, proved to be prohibitively expensive, something that Cook concedes led to Manny's consolidation. The same was true of another aspect, more pervasive with pro audio sales than with MI: extended personal credit, which Cook says was delaying payment on as much as 70% of Audio Techniques' sales.

Though Cook notes that no jobs were lost on the pro audio side of sales after Audio Techniques closed on June 28, the department had lost several key players before that. Sales reps Bill Dexter, Danny White and David Prentice all went across the street to 72-year-old Sam Ash Music, which has reacted to the changing business landscape with

an opposite tack. The New York metro area chain, which already had seven stores by the early 1990s, is now up to 13 with the addition of two new storefronts in Florida, which is itself becoming a new front in the retail wars. Neither of those stores has a pro audio department, but a spokesman for Sam Ash says a division could be added in the future. And while a few at Sam Ash quietly regard the store's expansion policy as better for its MI side than it is for pro sales, Prentice says other expansions in pro audio in New York—the company is taking over Audio Techniques' former space around the block at 1600 Broadway—bode well as more MI-originated users move upscale. "The customer base has changed," he explains.

"It's become less facility-based and more individual-based. But they still have many of the needs of a regular studio. What we can do by expanding is offer more equipment and, as importantly, offer availability. The short-term gain of incremental sales are not of as much benefit as the long-term gain of being able to adequately stock equipment at a time when there's more of it than ever before, and to hold onto highly trained sales people."

Prentice says there are multiple ways in which retailers can react to what's going on (Sam Ash expands its pro audio division while Manny's consolidates, for example). However, growth seems to be the operative model at the moment. Guitar Center has grown into the country's largest MI/pro dealership, valued at \$251 million with 27 locations nationally from its Agoura Hills, Calif., base. And combined with keyboard sales, pro audio is the fastest growing component of the chain's product lines, according to David Angress, vice president of merchandising for technology products. "The chains have the buying power, and the larger the chain, the larger the leverage," he says. Guitar Center added pro audio in the late '70s; Angress explains that pro audio quickly became a staple of MI retail's growth because pro audio was already growing toward a commodity type of model—less expensive products for which profit was volume-based. The retail orientation of MI was perfectly suited for this situation.

"MI stores already knew how to excite a customer confronted with multiple brands of one product at the same price point," Angress says. "As the prices

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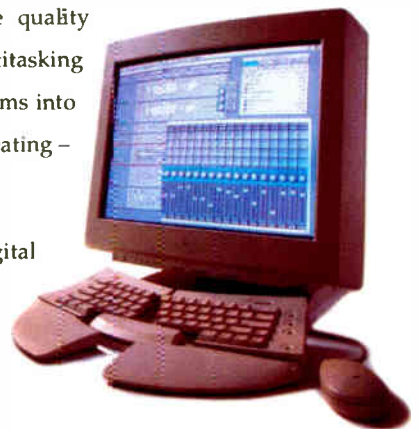


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**Audio History**



came down, it got easier for us and harder for pro audio dealers, with their emphasis on fewer high-end sales and limited products lines. Also, the advent of MIDI gave us a new customer base that the pro audio dealers were not prepared to handle. In fact, that was the point at which MI dealers gained an advantage over pro audio dealers in terms of being on an equal footing technolog-

ically. It was at that point that more [technology] was being purchased by musicians than by engineers." The result is an upper strata of manufacturers who now sell high-cost products directly to high-end users and...well, everything else, which is edging ever closer to the Wal-Mart approach to mega-retailing.

#### MUSIC DEPOT

The *ne plus ultra* model of a pro audio Wal-Mart is on the verge of becoming a reality. Mark Begelman, one of the founders of the Office Depot national chain of office supply megastores (and now a board member of that publicly traded company), bought the four stores

of Ft. Lauderdale-based MI retailer Ace Music last December and plans to use them to launch a chain of discount mega-music stores nationally sometime next year. Begelman was reluctant to discuss the plans any further but did say that he would apply the same techniques to a music store chain as he did with Office Depot. "The methods are applicable to professional audio," he says. "We have the service aspect covered." And, he added almost cryptically, "I hope it doesn't move things further in a commodities-type direction."

Fred Rubin, Ace's vice president (whose father started the company 43 years ago), says that companies like Martin Audio were unable to make the transition to a more competitive retail environment. What's happening now, he says, is simply a "market evolution, but a natural one."

Ace's sale has the MI retail industry perturbed and nervous. It has probably accelerated expansion plans on the part of some, particularly in light of the fact that Sam Ash's first foray outside the New York metropolitan area was into Florida. But if the large-scale retail drama is going to be played out on a national scale in coming years—and it likely will, considering that other industries have moved in a commodities direction, including computer and hardware supplies—what are the prospects for the remaining dedicated pro audio (i.e., non-MI) dealers?

According to some, they have to find new niches to concentrate on within pro audio. Greg Lukens, vice president of Wheaton, Md.-based Washington Pro Systems, says that company, founded ten years ago by the children of Washington Music founder Chuck Levin, services specific, higher-margin niches such as government audio, installed sound systems and video as a way to hedge itself against the larger swirl of MI/low-end pro retailing. Still, he finds, "I put in a lot of time helping someone design a \$60,000 vocal booth, and I had a gross profit margin of 15 percent on the deal. Then someone else underbid me by \$500 and I lost the sale. The market is reduced to a lowest common denominator, and as a result, service is becoming pitiful."

Retailing is just one component of the larger market of pro audio, and its course over the last few years parallels that of other components. Recording studios have been under increasing pressure as down-market equipment further enhances personal studio capabilities; their response has been to find

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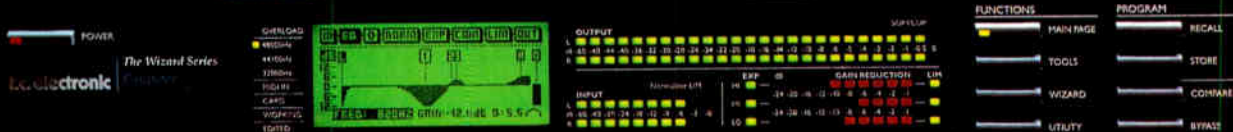
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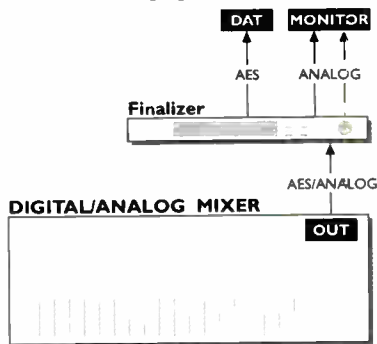
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niches such as post-production and to expand using much of that same lower-end technology. The manufacturers themselves have moved toward larger corporate models, with conglomerates like Harman International (which has acquired independent manufacturers such as Soundcraft, BSS, AKG, Lexicon and Studer), and Mark IV Audio (which owns companies such as Altec and Vega and which has now placed its pro audio group on the block for an estimated \$200 million). The corporate environment in pro audio is a far cry from either the garage-based origin of the business 50 years ago, or from the mom-and-pop environment that was retail until 15 years ago.

Naturally, some traditional pro audio dealers express displeasure with the shift to mega-retailing and allege it will limit personal service even further. "Home Depot is a wonderful hardware store, as long as you know exactly what nail you want," says Manny's Doug Cook sarcastically. "It's just going to confuse the issues and push people further into price-based purchases." Adds Dale Pro Audio's Mike Bogen, "At this point, the clientele is anyone who can spell 'audio.'"

And there is a sense that the way in which the studio business has constructed itself is about to change forever; "A lot of my expertise and career was based on equipping complete studios, and very few studios are put together like that anymore," says Ham Brosious sadly.

For many of the dealers in this story, pro audio has been more a way of life than a career, as it is for studio owners, engineers, producers and musicians. There is concern expressed in their voices over the fact that the field seems to be moving toward depersonalized megastores and disembodied 800 numbers. But there is also an acceptance of this shift as an evolutionary one. As its technologies become ever less expensive, the pro audio economy needs to create a consumer mentality among professionals in order to survive. It was, after all, the marketing department, not the engineers, that put the fins on a Cadillac. ■

*Dan Daley is Mix's East Coast editor.*

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● "I use the Ghost for several radio shows doing live performances. The EQ is amazing, I'm on air in 5 minutes! Doing dance stuff is one, doing live stuff is another. But I use only one board for both of them, The Soundcraft Ghost." - Barney Broomer, Sonic One Rotterdam.

● "Ease of operation and the numerous in-line inputs for my synthesizers and samplers is why I purchased the Soundcraft Ghost console."  
- says President of Saban Entertainment and producer of Mighty Morphin Power Rangers Shuki Levy.

● "I didn't know how useful mute groups could be and how good the EQ had to be until we used the Soundcraft Ghost." - Stefaan Windey, La Linea Musicproductions b.v.b.a., Belgium.

● "It sounds great and the EQ is very precise which makes it very easy to pin-point the frequencies I need to work on. Ghost enables me to finish mixes on the console at home, without having to use any other studio." - Phil Kelsey (Remix Engineer)

● "The console is very user-friendly and is constructed so well that it can easily withstand the rigors of even the most hectic of production schedules."  
- Corey Dissin, Producer at Paul Turner Productions.

● "Both myself and our Production Director Jeff Thomas used the console for PowerStation and were equally very, very impressed. For the money, the console is fantastically versatile, has good headroom and a very impressive EQ." - Alex Lahey (Engineer for PowerStation)

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# OPTIMIZING DRUM SOUNDS

## Tips for Engineers & Musicians

### DRUMMERS CAN MAKE A GLORIOUS NOISE,

but when your mics also capture the sounds of pedals, unwanted head overtones (ringing) and hardware squeaks/creaks, the vibe of an otherwise killer performance is compromised.

Most producers and engineers encounter situations where it's necessary to troubleshoot drums that aren't producing optimum sounds. *Mix* asked a range of experts for tips on getting the best results out of a kit, live and in the studio. The responses ranged from basic common-sense pointers to creative problem-solving ideas that really work.

### STEVE EBE

Over the past 15 years, Nashville-based drummer Steve Ebe has performed or recorded with numerous artists including rockabilly legend Carl Perkins, fusion guitar wunderkind Shawn Lane, roots rockers like Sonny Landreth, Sonny

the hourglass-shaped pillow made by Drum Workshop. It attaches to the shell with Velcro, so it doesn't move around. It's low-mass and low-profile, so it's not soaking up any more volume than necessary. If I need to muffle the snare, I use gaffer's tape in one of two ways: I either loop the tape with the adhesive facing out or fold two or three waffle-like creases in the tape before applying near the rim.

"Having a variety of sounds available is crucial. The drummer should always have a wide variety of sticks, brushes and bass drum beaters. A variety of heads should be handy for last-minute tonal changes.

"I use Aquarian [Anaheim, Calif.] heads and always have coated and clear, as well as one- and two-ply heads on hand. The Super Kick 1 bass drum head sounds tremendous! A handy way to carry spare heads is to remove the center post from an old fiber cymbal case and place them in there. It's the perfect size.

"When playing hard, I sometimes experience de-tuning or tension rods backing out from vibration. It's no good to tune a drum if it won't stay there. To prevent this problem from happening, I use Lug Locks, or the new Index Tension rods by Rhythm Tech [New Rochelle, N.Y.] on any problem drums. Not all drums suffer from this problem, though. I have a Solid snare drum that won't budge. It's an amazing snare.

"A lot of people don't pay attention to where the cymbal sits on the stand. Use the doughnut-shaped felt pads on both sides of

### BY RICK CLARK

George and Webb Wilder, country artists Marty Stuart and George Ducas, and soul music king Steve Cropper. Ebe was also part of the band Human Radio, who recorded an album for Columbia Records.

"The single most important thing is to have a well-maintained, professional-quality drum set with new heads," Ebe says. "Drum Workshop [Oxnard, Calif.] drums are the best in my opinion. They are loud, punchy, clean and easy to tune over a wide range.

"I usually muffle only the bass drum, using

the cymbals, but don't screw them down too tight with the wing nut. There is also a nylon sleeve or surgical tubing type of sleeve that goes over the metal post. A lot of drummers let those things wear out, or they don't use them at all. As a result, the cymbal contacts metal and creates all kinds of rattles and sounds. I always keep a bunch of sleeves in my stick bag, so I'm ready when I play on someone else's kit."

#### **PAT FOLEY**

By the time Pat Foley began working for Slingerland Drums as Director of Custom Products three years ago, he had already amassed an impressive list of credits as a designer of unique drum sets for the stars, including Greg Bissonette's sets (which looked like they were exploding) for the David Lee Roth tours.

The Jacksons' 1984 Victory Tour, the garbage can-looking trap set for Twisted Sister, as well as sets for Bernard Purdie, Jim Christie (Dwight Yoakam), Taylor Hawkins (Alanis Morissette) and many others.

Foley's drum tech credits include Faith No More, Los Lobos, Mötley Crue and many more. As a producer, Foley has done a number of major-label projects, including The Untouchables for MCA, The Redskins for London and Laura Pallas on Island.

"Microphones have no preconceptions," Foley says. "They don't know whether you have a big drum or a small drum in front of them. A lot of people will say, 'I want a really big drum, because I want a really big sound.' In fact, I've done a lot of records where I've used very small drums that just sound huge, because with a smaller drum, you can generally tune the

PHOTO TREATMENT: TIM GLEASON





head lower and still maintain a little bit of tension on it. Because the bottom head responds quicker, you often can get a smaller drum to actually sound bigger. A lot of people would be surprised to see that the kits many of their 'heroes' are playing are not nearly as big as they might suspect.

"At Slingerland, we're getting back to offering classic sizes and setups. The fact is, most of the great records that you and I grew up listening to, that we loved so much, were not made with 'power' toms and all of these elaborate types of super-deep bass drums that drum companies offer nowadays. They were made with standard, traditional-sized toms that evolved because they worked very well.

"One overall tip for tuning, is to think of a drum set as one instrument, rather than a collection of instruments hanging together, and tune them accordingly. If you strike your 12-inch tom, and your 16-inch resonates a little bit, don't be quick to dampen down that 16-inch to stop that resonance. Just tune it in such a way that it rings *sympathetically* with the 12-inch, so it enhances the overall sound of your set. Be conscious of the harmonics that you're hearing: Make sure that when you strike one, and the one next to it rings a little bit, that it's ringing in tune. Then the drum set becomes one instrument and sounds much more musical than deadening and isolating the individual components.

"Most people have their own techniques of choosing the intervals that they want to use, but the important thing in tuning concerns the relationship between the top and bottom heads of the drum. If I gave a quick tuning lesson, I'd say tune the tom toms with a tension that feels reasonable on the top head; snug it up and then start with the bottom head matched to the sound of the top head to where they are basically creating the same pitch. Then, once you've become tuned into what you are listening for, strike the top head and you

will hear a slight waver between the top and bottom heads. That is like a phasing situation, because there is a slight delay before the bottom head responds. I normally have someone bang on the top head while I just slightly de-tune the bottom head, until I hear those two pitches ring together. Then you'll have a nice sustaining note.

"Another thing people do if their drums don't have the sustain they want, or they don't have a big enough sound, is adapt their drums to the RIMS mounting system [made by Pure-Cussion of Minneapolis]. It comes standard on the drums we make here

**People would be surprised to see that the kits many of their 'heroes' are playing are not nearly as big as they might suspect.**

**—Pat Foley**

at Slingerland. It stands for Resonant Isolation Mounting System. RIMS suspends the drums by the tension rods, so you don't have to place a mount on the shell, which tends to restrict the vibrations."

#### **DON GEHMAN**

Since the mid-'70s, Don Gehman has produced some of the most successful albums of the popular music era, including both Hootie & The Blowfish albums, Tracy Chapman's Platinum comeback effort, *New Beginning*, R.E.M.'s *Life's Rich Pageant* and many of John Mellencamp's biggest releases, including *The Lonesome Jubilee*, *Scarecrow* and *American Fool*.

One of the things Gehman is known for is his "Band in a Box" approach, where he brings most of the instruments, amps and outboard gear needed for his productions. Gehman is an avid fan and endorser of Drum Workshop drums and works as his own drum tech for all of his production work.

He says, "Drummers who usually play live often hit cymbals way too loud, in relation to the drums. Generally speaking, it's my biggest problem in the studio as a producer/engineer.

As much presence that you want to dig out of drum heads, you often wind up dragging a lot of cymbals in through the drum mics. Over the years, my problem has been to try to figure out how to maintain a balance in the set where the cymbals aren't making noise all over the record.

"DW drums are a solution. I haven't found anything that comes close. Most of that is because of sheer level—they're the loudest drums I've found so far. I've measured them on meters and they just seem to be a good 6 dB louder. It's the same with the kick drum. It's louder, and that means you're ahead right off the bat.

"I carry cymbals around with me, and if a drummer is an especially hard hitter, I will go for the thinner cymbals. Zildjian has these cymbals, which are thinner and quieter; I think they're called "A" customs. They're a little shorter duration, but they don't take up as much 2kHz midrange; the area where I'm boosting up the drums, I don't pull up quite as much of that on cymbals. It works itself out in the long run.

"Tuning tricks are hard to describe. I'm the drum tech on my sessions, so I usually tune drums on most sessions for the drummer. The search on each drum to find whatever sweet spot it's got is the best trick that I know. You should take them down all of the way, and then start to bring them up and you can feel the spot where the drum starts to come alive. Then work both heads around that sweet spot and try to get the drum to speak as clearly and loudly as you can.

"I like drums that are real pitch-curve. I like snare drums that go 'boing,' as well as the toms. That usually means unequal tuning between the heads, top to bottom. Generally, I set up the bottom heads lower than the top ones, which might be the opposite of what a lot of other people do.

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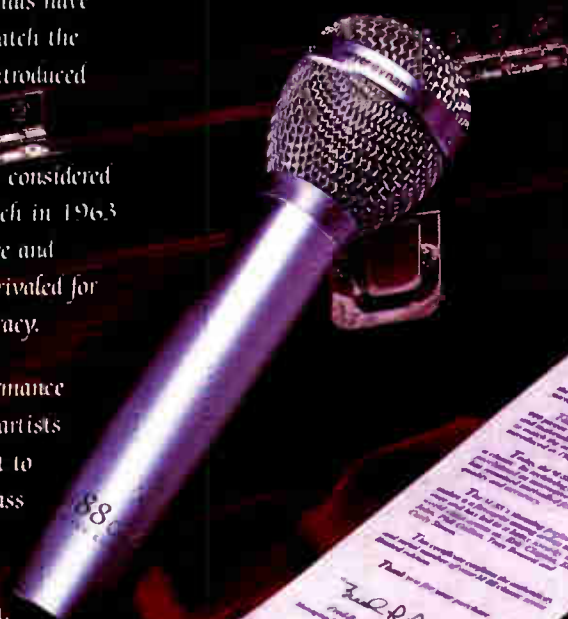
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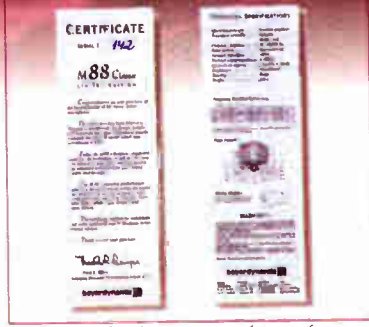
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"I don't use any padding, except on kick drums. On kick, I will use those little DW hourglass pads and front heads with holes as small as I can get away with. I usually encounter trouble with kick drums that are totally sealed. It's hard to get the resonance of the drum at the right duration. That's my biggest problem with front heads, at least for the way I put the bottom end together. They seem to eat up space that I would like the bass [guitar] to have. Drummers love it, and certainly it adds a lot of tone and action, but it's right in the heart of where I would like to put a bass guitar. It's that 150- to 200Hz area that gets gobbled up when the front head is sealed.

"Building tunnels is probably the fix that I use most of the time on drums that aren't DWs, to get the kick

drum to work. I will build tunnels out in front of the kick drum to extend the front mic, so that I can get more tone and also to get more rejection, because the drums aren't loud enough. I'll take a piece of foam, mic stands and blankets and basically extend the shell with a tunnel that's maybe two feet long.

"I usually use a mic on the front of the head, as well as one inside. By combining the two, this allows you to move that mic more out in front of the kick, so you can affect the resonance of the drum."

#### **ROBERT HALL**

Journeyman drummer and drum tech Robert Hall has handled the studio fine-tuning percussion chores for producers like John Hampton, Jim Gaines, Joe Hardy and Jim Dickinson. Since 1987, Hall has teched for R.E.M. in the studio and, periodically, on the road. He has also worked with Little Texas, Chris Layton (Stevie Ray Vaughan) and Mickey Curry (Tom Cochrane), among numerous others. Hall founded Robert Hall's Memphis Drum Shop, a full-service operation that has attracted business from drummers all over the

country, thanks to Hall's expertise.

"First off, new heads are the best thing you can do to get a great sound, live or in the studio," he notes. "Heads go dead just like guitar strings do, but most people don't address that nearly as often as they do with strings.

"The bottom, or resonant, heads really have almost as much to do with the overall sound of the drum as the head you play on. Many drummers replace the top and still keep the bottom heads that came with the drum when they were new. Generally, the heads that come on drums when they are new are less than the best quality, because that's a way [manufacturers] can keep the costs down.

"It is most important to set up a snare drum with the snare wires—whether they're engaged or tensioned up—at an equal distance from each side of the drum. When they're pulled to one side or the other, you'll be driven crazy trying to get rid of that buzz. If the snares are set up properly and you still have some kind of sympathetic buzz, you can de-tune the tension rods on either side of the snare wires themselves, the two closest to it on either side. You can actually de-tune a

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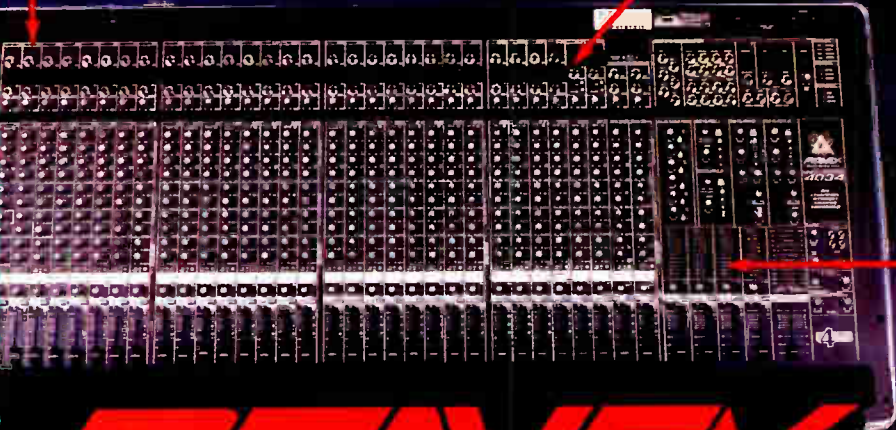
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# PEAVEY

## The Little Details

When comparing competitive consoles you can miss the little things that make such big differences. Little things like mutes that mute the sends, but not the PFL. Little things like meters and inserts on the subs (headroom... shmeadroom, I want clip LEDs on my Aux masters!) Little things like assign capability on all 4 stereo returns. These and a bunch more\* may not show up on paper but make a big difference in the real world, where the rubber meets the roadie.

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little bit, and a lot of the time, that'll take away that [sympathetic] buzz that one of the tom toms is causing.

"A cool way to get resonance out of a floor tom is to take some felt cymbal stand washers—or little 2- or 3-inch foam squares—and set them under the floor tom legs. Get the tom off the ground, and double the resonant factor of the drum.

"Concerning the bass drum, many people oil the hinges but don't realize that the pedal spring itself can make a lot of noise. Sometimes newer springs and newer pedals make noise and you can literally stretch them by pulling the beater forward a little bit, and doing it back and forth, before you ever put the pedal on the drum. Stretching that spring can get some of the manufacturing kinks out of it and it'll quiet it

up—without using any oil or anything.

"There are a couple of heads by Aquarian that are new to the market and get the most incredible bass drum sound. They allow you to put the heads on without any kind of muffling inside the drums, so you don't lose the true drum roundness and the sound that the wood is producing by filling it up with a pillow or blankets or anything like that. You can put that head on and get this wonderful controlled bass drum sound, and it actually seems to add a little bit of low end to the sound of the bass drum as well. One series is called Super Kick, and the other is called Impact or Imp. Both are terrific live and in the studio. A lot of people aren't hip to them yet, but everybody I've turned on to them have really been happy with them.

"If a drummer has a lot of ringing in his toms that he wants to get out, and duct tape on the heads seems to choke or take the sound away too much, you can drop three or four cotton balls inside the tom toms. When you hit the drums, the cotton balls kind of come off the heads and then they settle back down and it's like a little natural muting system. You still

get a really nice, full, round drum sound, but then it stops the ring just a little bit after the note. Naturally, the larger the toms, the more the cotton balls you can put in there.

"When you're using a bass drum without the front head and use a lot of packing, you get a lot of attack and punch, but sometimes lose that desirable low end. In the old days, we would take a '20s- or '30s-style marching band bass drum, that was 26 to 28 inches in diameter, with calf heads front and back, and set that drum in front of the drummer's bass drum and not only mic the kit bass drum, but also mic the front side of the big calf-skin bass drum, which acts like an ambient woofer. It adds all of this low end that you can mix into the final sound and really give some low end to this otherwise just punchy kind of bass drum sound. That's a trick that producer Jim Dickinson taught me about 25 years ago. I've used that so many times; it's crazy, but it really works great."

#### CRAIG KRAMPF

Over the past 30 years, Craig Krampf has drummed on more than 200 al-

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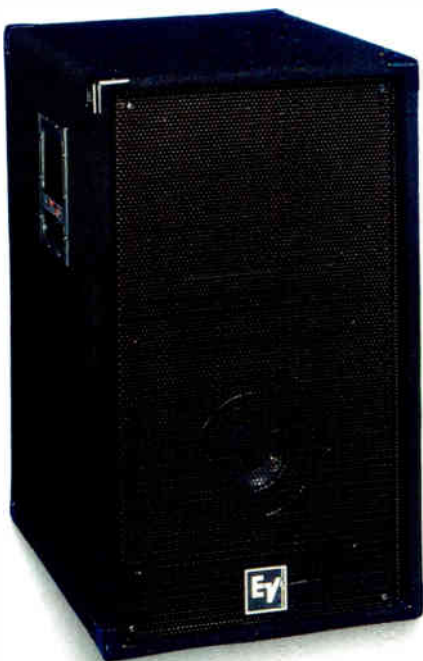
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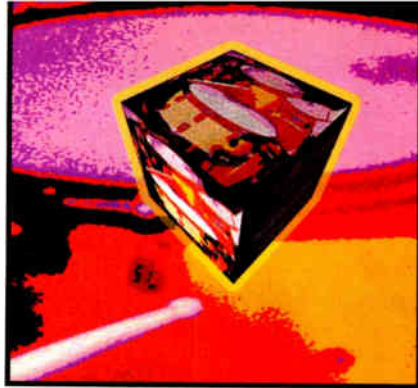
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bums, including 60 Top 40 hit singles, plus many movie and TV soundtracks like *Chueless*, *The Breakfast Club*, *Flashdance* and *Rocky III*. These efforts have garnered more than 40 Gold and Platinum awards, as well as a number of Grammys. Krampf's hit session credits include Kim Carnes' "Bette Davis Eyes," The Motels' "Only the Lonely," The Church's "Under the Milky Way," as well as a diverse range of releases by artists such as Son Volt, Steve Perry, Alabama, Alice Cooper, Santana and many others. As a songwriter, Krampf won the prestigious BMI Million Broadcast Performances Award for co-writing Steve Perry's Number 3 hit single "Oh Sherrie," and won a Grammy for the *Flashdance* track "I'll Be Here Where the Heart Is," which he co-wrote with Kim Carnes and Duane Hitchings.

"When I was younger," Krampf says, "no one seemed to know anything about bearing edges. There were no publications, like there are now, for younger drummers to learn from. The bearing edge is where the head sits on the drum. If that bearing edge has lumps on it, or if it is rough in one area, or that area is a little higher or lower than the rest of the bearing edge, then your head isn't seated on that drum properly.

"I've known a number of people who, when they change heads, have become very fanatical about looking over that bearing edge. If you are very careful, and don't take too much off, you can use a little light sand paper or steel wool and maybe smooth some rough spots out. Nevertheless, there are real professionals out in drum stores who have some great equipment and work on bearing edges. Those can always be straightened out. It's one of those little things that adds up to ensuring the high quality of your sound.

"Around 1980, I went to using clear Remo Ambassador drum heads and a ProMark square felt beater. As a result, I'm not denting my bass drum head.

With round beaters, you start denting the head. For years, Dr. Scholl's foot pads were the famous thing to use to help prevent that problem. Nevertheless, the round beater would wear through that, and after putting another on you would just start chasing that because you didn't want to dent or break your head. Now there are actual manufacturers out there who make special dots and special things that you can put on your head to prevent that damage.

"Recording is like being under the microscope and every little thing does matter in the studio. Anytime anything is taped or stuck on top of a drum head, you're killing sound and certain frequencies; you're deadening your head. I was absolutely amazed when I went to that clear head with a square beater. My bass drum sound improved at least 60%. There were actual lows that engineers could show me that they were getting now on that drum, that didn't exist before. Some people maybe have a little bit of trouble since the square felt beater weighs perhaps just a little bit more. The action isn't quite as quick and, maybe if you are a real funk drummer or fusion drummer, you probably couldn't get the quick action out of it. Regardless, that is one of the tips for bass drum that works for me.

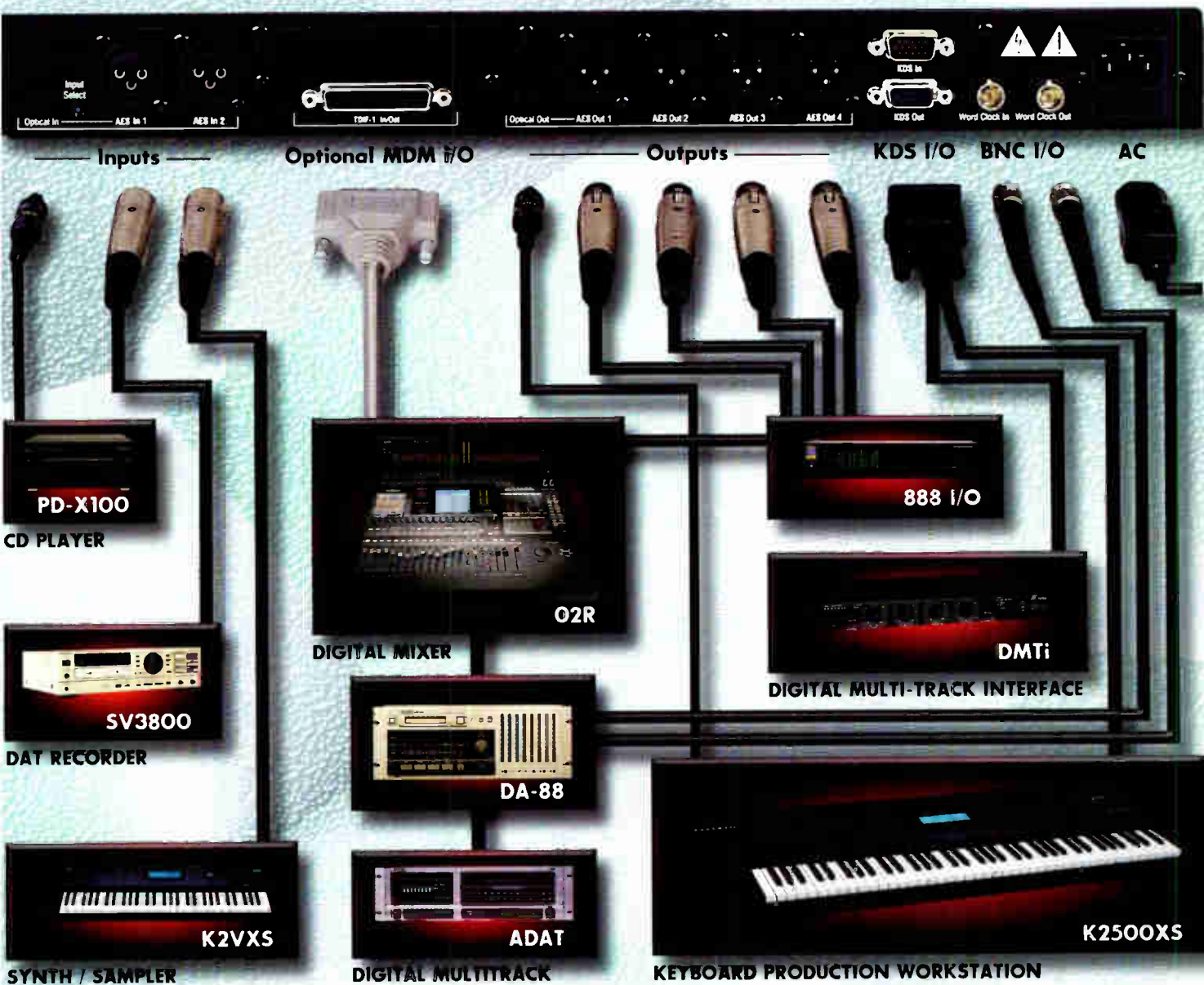
"If I'm doing something live, I have always been in the habit to have a spare bass drum pedal and a spare snare drum sitting right behind me on-stage. It's a wretched feeling to have your bass drum pedal go down, or to break a snare head and not have a replacement. I was caught once or twice, when I was very young. In the studio, I've got three pedals and usually seven to nine snare drums that come along with me.

"In the studio, you should give the engineer enough time, before the other players get there, to get the drum sounds right. If you have the time, and the studio is available and it fits in everybody's schedule, and it is not going to cost a fortune, I love to get set up the night before and have the time to just have you and the engineer there and take the time to experiment and find the best area in that particular studio and try different mics and things. More drummers, and musicians in general, need to understand the engineer's position." ■

*Rick Clark is a Nashville-based writer, songwriter and producer.*

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# Connect to the Future.



The DMTi is a 1U rack module designed to be used as a stand alone digital signal format converter, digital patchbay, as well as for use interfacing Kurzweil's K2500 series production stations to popular MDM formats such as TDM, and ADAT formats found on MDMs produced by Sony, Tascam, Alesis, Fostex and others. The DMTi allows communication between Alesis Adat or Tascam DA-88 with their respective proprietary 8 channel digital formats and AES-EBU or SPDIF digital formats.

The DMTi was also designed to interface with Kurzweil's proprietary 8 channel digital protocol KDS-Kurzweil Digital Stream (offered as an upgradeable option for the K2500 series). The DMTi can perform sample rate conversion (in real time) on up to 4 stereo pairs of incoming digital data while acting as the master or slave clock; the DMTi can transmit 44.1K or 48K clock and can transmit or receive BNC word clock.

This device is well suited for use with popular digital mixers such as Yamaha's O2R, or Korg's Soundlink, or as a translation device from MDM to Digidesign's ProTools systems. The DMTi allows many different digital input formats to be user routed to a variety of digital output formats and sample rate converted. The Alesis and Tascam option cards are needed for conversion to and from these popular MDM formats. The DMTi can be seen and demonstrated at your local Kurzweil dealer.

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## Haunted Mansion Scam Exposed!

"We were taken for a ride by this crook and her 'music playing ghosts' spit out a betrayed patron of Madame Wiley's haunted jazz house. Wiley had been charging \$40 admission since last month when her house allegedly became spooked by the spirits of jazz greats. They had been performing twice nightly.

Paranormal experts, intrigued by the regular visitations, quickly unearthed Wiley's nefarious scheme. "We found these two tone generators," reported Captain J. Muir, lead investigator, holding up a Yamaha P50m piano tone generator and VL70m virtual acoustic tone generator.

Mrs. Eunice P. Wiley, convicted felon and frustrated musician, had been performing the piano parts using a Yamaha P50m piano tone generator. With the P50m's 12MB of waveROM condensed into 6MB, 40 types of effects and 3-band EQ controlled by front panel



sliders, it was easy for her to accomplish any piano or electric piano sound. After studying the jazz greats in prison, she was accomplished at their techniques.

For the sax and horn parts, Wiley ingeniously chose the Yamaha VL70m. She blew into a Yamaha breath controller as she played a keyboard, triggering computer models of the wind instruments—not samples. "That was what had all the patrons fooled. She was playing an expressive melodic lead instrument with uncanny acoustic properties," explained Muir. The otherworldly sounds patrons heard as the spirits supposedly arrived from the netherworld was also one of the VL70m's 256 voices, not a gaping hole torn in the spiritual continuum. "Wiley picked up the P50m for only \$499.95 and VL70m for just \$799.95, yet she raked in some mondo bucks. She's a devious criminal mind and a pretty fair musician," commented Muir.

# MYSTERIOUS SYMBOLS AFFECT MUSIC INSTRUMENTS

Astronomers and scientists are befuddled by a recent spate of "appearances" of an unusual symbol in cornfields, oatmeal cereals, Yamaha synthesizers, tone generators and computer sound cards and galaxies. This symbol apparently supercharges digital instruments, making them sound and work better than ever before.

"We first noticed this XG symbol in a new constellation at the edge of our galaxy," said Rurt Aspirin, pharmacist. "Now it's appearing everywhere here on earth. This must be the work of intergalactic forces beyond our comprehension."

Paul Philly, musician, says this about his Yamaha MU80 XG tone generator. "All of a sudden it went from 128 voices to 480, just like that! Also, I can now add one effect to a specific voice

and three effects plus EQ to my entire mix. I can't do any of that with GM alone. Also, I can even plug my guitar into the MU80 and add XG distortion effects right in the tone generator. Where have you been all my life, baby!"

The XG symbol has given GM a galactic shot in the arm, agreed another musician. "I write music for computer games and I was limited to 128 voices. Do you know how difficult it is to create the music from HELL with those limitations. It sounded like a barking puppy. Now, with my Yamaha CS1x synth and QY700 XG mini-studio, I create THE MUSIC FROM HELL!! Anyone with a GM computer sound card can hear it but people with Yamaha DB50XG or SW60XG sound upgrade cards can FEEL it. It's smokin'."

"I was eating my cereal and it start-

ed bubbling and this weird shape popped out of it," said Bobby Fleisher, an eight year old from Connecticut. "My mom told me to stop playing with my food, but I didn't do it!"

Even grand pianos have been affected by the XG phenomenon. "My Disklavier piano went nuts. It sounds like the LA Philharmonic in my living room," said one stunned housewife, owner of a Yamaha Disklavier DGHBlXG.

"We're trying to pinpoint the source of XG," said Aspirin. "It seems only Yamaha devices, Quaker cereal and Iowa cornfields have been affected by its intergalactic waves. But XG blows the lid off GM's limitations so pandemonium is spreading as people try to grab any XG product they can get their hands on."



## TIPS FOR SENDING YOUR TEEN TO COLLEGE

Your teen can benefit from a college survival kit that has all the essentials, including a Yamaha acoustic guitar startup package and a case of macaroni and cheese, according to the Manongahala Institute of Dining Commons Administrators. "This is a great guitar kit for aspiring folkies. It comes complete

with the F310 acoustic guitar, a tuner, strings, picks, polish, cloth and a beginner's guide to playing guitar," says the Institute.

"The macaroni provides nourishment for the body, the guitar provides nourishment for the soul," says one happy, strumming freshman.



FOR MORE INFORMATION ABOUT ANY OF THE PRODUCTS SHOWN IN THIS ISSUE PLEASE Call (800) 291-4214 ext.825 or visit us at [www.yamaha.com](http://www.yamaha.com).

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# TOP SECRET PENTAGON PROGRAM LEAKED

A source inside the Pentagon has revealed exclusively to the Inquisitor that the nation's military HQ is working on technology that not only defends the country's airspace but actually makes a reliable guitar-to-MIDI converter.

"The problem with converting guitar playing to MIDI signal has always been tracking speed. It's easy to launch a missile but it's not easy to convert guitar and bass performance to MIDI. However, we have a breakthrough," said the source, an Admiral involved with the clandestine project. "We have devised a method, using a neural network (an artificial intelligence system), that is extremely advanced at tracking and

detecting pitch, velocity and expression with unprecedented speed and accuracy. In fact it doesn't require the guitar or bass player to learn a new playing technique."

The Inquisitor asked experts outside of the military industrial complex to evaluate the G50. "Yamaha has helped the government build this G50 MIDI converter and it works like a charm," said one music technologist. He demonstrated the system by attaching the Yamaha G1D pickup to an electric bass and connecting it to the G50. He ran the G50 output into the Yamaha MU80 tone generator. "Now I can get my guitar tone AND any other instrument I want. Or I can play

just the other instrument. But watch this," he said, wailing on the bass. "It doesn't miss a thing."

Joey Friday, guitarist with Hard Iron, agrees "I just cranked on my Strat and out comes this harp sound. It matches my every move. It was beautiful, man. And when I ran the guitar and the harp at the same time, they just grooved perfectly. The MU80 pulls it all together, dude."

The MU80 has 729 realistic XG voices, plus on-board effects for the internal voices and the guitar. "I plugged my guitar into the MU80's A/D input to use the MU80's internal amp and speaker simulation effects. And, layered with the guitar, the MU80's overdrive on the harp sound was wicked, nian," said Friday.

Admiral X at the Pentagon further points out that by adding the Yamaha MFC10 foot controller—with its programmable foot switches and pedal controller—to the G50 system, you can have instant access to any program. "It's an extremely powerful system and the most technologically advanced of its kind. The Russians have nothing like it."



G50



# CLEANING UP AT THE NAMM SHOW

## JANITOR FINDS TRUE CALLING AT THE YAMAHA PAVILION

Melvin Muckraker has always dreamed of cleaning up in the music business. His wish finally came true at NAMM, the annual convention of music merchants in Anaheim, CA. Great music, the rumor of free T-shirts, and the need to dust and vacuum drew him into the Yamaha pavilion and the experience changed his life forever. Hanging out after hours with Yamaha's marketing and product people changed his life.

"My broom-pushing days are over," announced Muckraker, "These new Yamaha products are so cool, I've decided to get into the business and sell PA to those wacky musician types."

The former janitor says he was scouring the cocktail glass ringlets from the Yamaha conference tables when he made friends with the charming, yet dense marketing manager, Hal O'Tosis. Despite the fact that it was 3 a.m. in the morning with no other dealers in sight, O'Tosis mistook the lowly custodian for a viable music merchant.

"At the time, I thought he was the representative from Music R Us, in Cleveland Ohio," admitted O'Tosis. I proceeded to show him our new EMX640 Powered Mixer. He said he'd seen it all before. One could mistake the Yamaha EMX 640 for "just another powered mixer."



EMX640

But, as I pointed out, this one's different. The EMX640 has two 200watt amplifiers—that's more power than the competition. It

also has two 7 band graphic equalizers—most of the competition has only one. You know you'll need two EQs if you use monitors. It also has on board digital reverb. Nothing below \$700 has that! He was impressed. And quality, and performance? The EMX640 is built by Yamaha using its world famous DSP technology in the reverb and its H.E.D., High Efficiency Design technology, in the power amps. When I asked for his order, I thought he was playing hard to get, so I showed him more.

O'Tosis proceeded to the Yamaha MX12/4 mixer. "I told him that the sound is clean and pure. He said that in his business, it couldn't be too clean. I agreed. But at \$599.95 for a 12 input, 4-bus console you wouldn't expect it. Not only that, the Yamaha MX12/4 comes with a 7 band graphic EQ and a digital reverb built in! Nobody else has that! You'd have to pay hundreds to buy those and add them to somebody else's mixer."

Speaking of reverb, Muckraker was amazed at the quality of the new Yamaha REV500. "It's another new product here at the show, featuring a third-generation DSP chip, for which Yamaha is a world leader, plus 32-bit technology and 20-bit A/D and D/A conversion. The REV500 includes an easy user interface with the innovation of an internal tone generator that allows the user to audition all of the programs without an external sound source. You can depend on Yamaha for new, "why didn't I think of that?" ideas.

Still no order! Kind of a stunned look. So I pulled out all the stops and went right to the top. The new, Yamaha O3D. Yamaha is becoming the world leader in digital mixers and the O3D is new here at the show. Complete digital



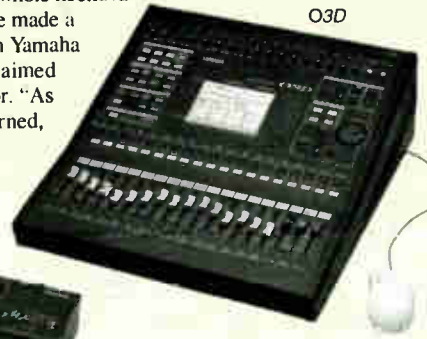
REV500

audio path, automation, motorized faders, stunning sonic quality and under \$4,000.00 for a complete system, it's the hit of the show!

But what really turned Muckraker's head was the amazing MD4 Digital Multitrack Recorder! The MD4 makes it so easy for the novice and professional to experience the creative flexibility of 4-track recording without a cassette—all for just around \$1,199 retail! When he saw the 4-input, 4-bus mixer and 4-track digital recorder with MiniDiscs for archiving and storing music, he confessed to being a janitor but promised to return with an order and get into the biz.

Since purchasing his MD4, Muckraker has been recording his remakes of "Dust My Broom," "Take Out the Papers and the Trash" and "Dust in the Wind" utilizing the handy track and song editing, fast search and locating and other features not possible with cassette multitrack recorders.

"For not a whole heckuva lot of cash, I sure made a clean sweep with Yamaha Pro Audio," exclaimed the former janitor. "As far as I'm concerned, everything else is rubbish!"



O3D



MX 12/4

NATIONAL  
**The Inquisitor**  
Nobody Expects The Inquisitor. Vol. 32 Issue 1455

# Gloria Estefan in Miami

## “¿COMO ESTÁN MI GENTE?”

Asking a question that has far more cultural implications than, say, “How ya doin’, Cleveland?” Gloria Estefan opened the evening that was a personal and musical homecoming in her home city of Miami by asking its residents, “How are my people?” She was coming to the end of the U.S. leg of her first tour in five years, with four shows before this one, at the Miami Arena, cancelled due to a combination of a sore throat and exhaustion. The cancellations were no doubt done with extreme reluctance, since Estefan already had a heavy touring schedule booked in Europe, and because the energetic Latina icon seems to thrive on interacting with live audiences. But the tour’s end was scheduled to culminate with an HBO broadcast of one of four Miami Arena shows, and that impending event helped make many tour-end decisions.

One decision that had been made weeks earlier was the choice of Dave Hewitt’s Remote Recording Services as the audio truck for the broadcast. Hewitt and his most

recent mobile incarnation, the Silver Truck, are both roadworthy

veterans, and both are undergoing considerable change in the face of increasingly inexpensive and smaller technology. “The day of the bread truck and the ADAT are here,” Hewitt concedes in his usual avuncular manner. “But they still need people like me and this truck for the big stuff.”

The big stuff in this case is truly big: Estefan is performing with a 16-piece band, and several guest artists

appear in the course of the two-and-a-half-hour show. The truck will have close to 100 mic inputs coming off the massive stage at one end of the Miami Arena, a venue that’s better suited to performances by the local NBA team, the Miami Heat, than it might be to the hip-shaking that Estefan generates among her audience.

Once inside the auditorium, as the 8:30 p.m. downbeat approaches, there looks to be several hundred seats still vacant; those were tickets that HBO would pick up due to the fact that the cameras—seven of them, including a robot cam over the FOH position—obscure sightlines from those seats. Still, the electricity of anticipation is palpable throughout the crowd. Inside the Silver Truck, Eric Schilling, chief engineer at Crescent Moon Studios, the four-room facility built by Gloria Estefan and husband/producer Emilio in 1990 in Miami, is finalizing his patches and fader moves, along with co-mixer and L.A.-import engi-

neer Bart Chiate. (Chiate keeps telling anyone who will listen that this is his “last night in the business.” This writer finally bites, only to be bitten back by the oldest punch line in pro audio: “Every night is my last night in this business,” smiles Chiate, pleased at having finally nailed someone with the gag.)

Hovering over the whole scene is Hewitt, assisted by his longtime technician Phil Gitomer, who mans his usual position in the rear of the truck, loading the rented pair of Sony 3348 digital multitrack decks, which will have staggered start times to allow him to reload one deck at a time to guarantee a seamless performance. The same goes for the pair of Sony PCM-800 MDM decks, and the DAT and analog cassette decks that have their assignments and their inherently redundant tasks. “The one thing about remote recording is that you rarely get the chance to get it right more than once,” says Hewitt. “And redundancy is the price you pay for that.” While the plethora of cables and equip-

## Remote Recording Services Takes HBO Show Live

BY DAN DALEY





ment—not to mention the five to seven people who are in the truck throughout most of the proceedings, with frequent visits by Emilio Estefan fine-tuning the sound for broadcast—makes the truck quite close. Hewitt's rig has a few human amenities that help to offset the effect, including a hand-carved mezzuzah by the truck's side door, made from the same cherry wood that trims the gray carpeting on the truck's walls. "The thing about building a truck as a studio is that you're always dealing with compromises," explains Hewitt. "You want to get isolation in the walls, but you have to consider the effect it has on the weight of the vehicle. You want to be able to get isolation and distance from the site, but at the same time you have to consider the length of the cable runs and how that affects the strength and consistency of the signal. These are considerations you don't have to deal with in land studios."

These days, Hewitt is more willing than he used to be to fly ahead of or behind the truck, as it wends its way from gig to gig. But he's proud of the new \$100,000 Peterbilt semi that he bought recently to haul it, and he's respectful, from long experience, of what it takes to sit in its cab for miles on end. "You can get three people really comfortably in there," he says. "It's much bigger than it seems. And I'm going to rig the sleeping compartment as an office, with a hinged table for a laptop and things like that. You'd be amazed at what you can get done in a space like that on the road." Hewitt is aware of how technology has invaded the domain of the once-wildcat world of cross-country trucking, and how

it's also domesticated it by allowing central offices to keep tabs on every truck via telemetry, rooftop parabolas and laptops where logbooks used to be. "It's a tough life," he comments, standing in the small anteroom of the back of the truck that serves as a storeroom and part-time office. "And I don't know that all the technology has made it any easier, really. At least not for the trucker."

Hewitt broadcast the Estefan gig at the request of both Schilling and Doug Mountain, the Neve technical support person for the Miami area. The Silver Truck has a 48-input Neve VR/M console, with the center au-

GLORIA ESTEFAN PHOTOS BY SYVE JENNINGS  
MIAMI PHOTO: LUIS CASTAÑEDA / IMAGE BANK



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# Twelfth Annual



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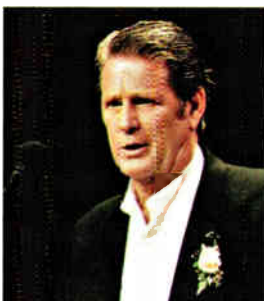
Emcee Father Guido Sarducci livened up the awards show with his unique brand of humor



Mix editor-in-chief/publisher Hillel Resner



Brian Wilson accepts the Les Paul Award



Presenters George Duke and George Massenburg



Carnie and Wendy Wilson presented the awards in the creative category



In a heartfelt and poetic speech, producer Don Was presented Brian Wilson with the prestigious Les Paul Award before a standing room-only crowd at the Twelfth Annual Technical Excellence & Creativity Awards, held November 9 at the Regal Biltmore in Los Angeles. Also, in a fitting elegy to a lifetime of entrepreneurial spirit, the late Dr. Willi Studer was inducted into the TEC Awards Hall of Fame.

More than 750 audio professionals also saw mastering engineer Bob Ludwig, equipment manufacturer Digidesign and audio post-production facility Skywalker Sound walk away as double-TEC Award winners.

But the highlight of the evening was clearly the Les Paul Award presentation. After sitting in on bass with the TEC house band for an instrumental rendition of "California Girls," Was stepped to the podium and delivered a five-minute rhapsody, placing Beach Boy Brian Wilson in the pantheon of modern musical geniuses—at one point saying that his complex chord structures made some of Coltrane's music read like "Happy Birthday."

Accepting the Hall of Fame Award for the

# TEC Awards

late Willi Studer was Studer Professional president Bruno Hochstrasser, who spoke of Dr. Studer's entrepreneurial spirit and the deep love he had for all styles of music. Studer, a pioneer in both analog and digital recording, passed away last year.

The evening was also special for its look back at the contributions of Hillel Resner, editor-in-chief/publisher of *Mix* and general manager of the Mix Foundation for Excellence in Audio. *Mix* editor George Petersen regaled the audience with an unauthorized biography of Resner, who is leaving as publisher this month after 17 years with *Mix*. (He will remain with the Mix Foundation.)

Making a return appearance as master of ceremonies was the irrepressible Father Guido Sarducci, who warned the audience of an invasion of aliens disguised as plastic lawn chairs and the "real" politics of the "bridge to the 21st century." On hand to present the awards were musicians George Duke, Russ Kunkel, Waddy Wachtel and Paul Barrere; producer/musician Don Was; engineers Ed Cherney and George Massenburg; and recording artists Carnie and Wendy Wilson.

The recipients of the Mix Foundation for Excellence in Audio Scholarship Grant were also announced. They are Erik Todd Lutkins, a senior at Middle Tennessee State University, majoring in Recording Industry Management with an emphasis in production and technology; and Daniel Overholt, a senior at California State University, Chico, majoring in computer engineering and music (recording arts).

The House Ear Institute's Hearing Is Priceless (HIP) campaign will receive 50 percent of the evening's proceeds to continue its efforts in hearing conservation. The remaining funds will be divided between the SPARS financial aid program, the AES Educational Foundation, various audio scholarship programs throughout the United States, and Hearing Education Awareness for Rockers (H.E.A.R.), based in San Francisco.

Photographs: Eric Charbonneau



Gloria Borders accepts the Audio Post-Production Facility award for Skywalker Sound



Bob Ludwig walks away with TEC Awards for Mastering Engineer and Mastering Facility



Gary Rydstrom accepts the award that he won with Gary Summers for Audio Post-Production Engineer



Don Was accepts the award for Outstanding Producer



Jim Mack (L) and Allen Wald show off the TEC Award Alesis won for the ADAT-XT in the Recording Devices/Storage Technology category

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# 1996 Winners



Double-winner Digidesign received TEC Awards in the category of Computer Software/Peripherals for DINR v.2.0 TDM and Workstation Technology for Pro Tools III v. 3.2



JBL Professional president Mark Terry accepts the TEC Award for the EDN system in the Sound Reinforcement Loudspeaker Technology category



(L-R) Engineer Ed Cherney, Record Plant president Rose Mann, engineer Al Schmitt and Mr. Bonzai



Focusrite's Phil Dudderidge accepts the TEC Award for Mic Preamplifier Technology for the Red 7



## Outstanding Institutional Achievement

Acoustics/Facility Design Company  
Walters-Storyk Design Group,  
Highland, NY

Sound Reinforcement Company  
Clair Brothers Audio, Lititz, PA

Mastering Facility  
Bob Ludwig's Gateway Mastering,  
Portland, ME

Audio Post-Production Facility  
Skywalker Sound, San Rafael, CA

Remote Recording Facility  
Westwood One Mobile Recording Division,  
Culver City, CA

Recording Studio  
Ocean Way Recording,  
Los Angeles, CA



## Outstanding Creative Achievement

Audio Post-Production Engineer  
Gary Rydstrom/Gary Summers

Remote/Broadcast Recording Engineer  
David Hewitt

Sound Reinforcement Engineer  
Robert Scovill

Mastering Engineer  
Bob Ludwig

Record Producer  
Don Was

Recording Engineer  
Bob Clearmountain



## Outstanding Technical Achievement

Ancillary Equipment  
Apogee Electronics AD-1000

Mic Preamplifier Technology  
Focusrite Red 7

Amplifier Technology  
Crown International Studio Reference I/II

Computer Software/Peripherals  
Digidesign DINR v. 2.0™ TDM

Microphone Technology  
Shure Beta 58A

Sound Reinforcement  
Loudspeaker Technology  
JBL EON System

Studio Monitor Technology  
Genelec 1039A

Musical Instrument Technology  
Kurzweil K2500XS

Signal Processing Technology  
Lexicon PCM90

Recording Devices/Storage Technology  
Alesis ADAT-XT

Workstation Technology  
Digidesign Pro Tools' III v. 3.2

Sound Reinforcement Console Technology  
Mackie SR 24\*4

Small Format Console Technology  
Yamaha 02R

Large Format Console Technology  
Euphonix CS-2000F

# JANN ARDEN

## CANADIAN SOUL

Jann Arden in concert is such a feast for the soul—you get the powerful and poignant lady of the records plus a wry comedienne who is spontaneous and surprising in her self-revelations. On her debut album, *Time for Mercy*, and the current *Living Under June* (both produced and engineered by Ed Cherney), Arden the singer/songwriter conveys her unique point of view in heart-rending tales of romance and desire. And the public is certainly responding: “Insensitive,” the latest single off of *Living Under June*, has been on *Billboard*’s Adult Contemporary chart for months.

Born in 1962, Jann Arden Richards grew up in the Rocky Mountain foothills of Calgary, Alberta. She learned her craft with a hand-me-down Yamaha acoustic guitar given to her by her mother. She began performing in her teens and then made the big move to Vancouver, where she played on the streets and in the clubs, perfecting a persona that is helplessly innocent yet worldly and wise.

**Bonzai:** *Living Under June* seems to have a life of its own.

**Arden:** Yes, it seems to be perpetually moving itself along. Initially, we had to tour a lot to get it going, but once we got the wheels in motion and people were aware, it continued. “Insensitive” had a life of its own—it didn’t need me at all.

**Bonzai:** Do you think that song could be sung by a man as well as a woman?

**Arden:** Oh, absolutely. That’s unfortunate, but I think men get a bad rap for the most part. Women are often more insensitive than men are, when it comes to dating. Maybe it’s because I’m a woman and I know what women talk about. Women can be very cruel. There’s nothing like being approached by a guy who’s asking you to dance and you just say, “No, thank you.”



PHOTO: REESE &amp; TAYLOR

It must be terribly difficult to go through that over and over again, but men still seem to have to take the initiative to ask us out.

**Bonzai:** How many singles did you release from this album?

**Arden:** We’re six deep here in Canada, and they’re stopping now. That’s been over a period of two years.

**Bonzai:** Can we talk about “Unloved,” which has a guest appearance by Jackson Browne? I was at the Troubadour in L.A. the night Jackson joined you onstage.

**Arden:** That was so great—not only doing it with him on a recording, which is something that I can cherish all my life—but that night, I phoned him and thought I would hear a resounding “No, I’m busy,” but he said, “I’ll be there with bells on.” When I mentioned that he was there in the audience, he just leapt up on the stage. I’ll never forget

that as long as I live.

**Bonzai:** What’s up with your upcoming third album?

**Arden:** I’ve still got some writing left to do, because I haven’t been able to do very much of it on the road. My schedule has just been stupid, between the press and the performances. By the time you get your ass into a hotel room at the end of the day, it’s just too much—a very uncreative feeling to pick up your guitar and write.

We start recording in November, with the tracking done before Christmas. Ed and I usually take ten days to track, and then we sit on it for a week to see if everything is jiving. Then we just carry on and finish the overdubs. It’s actually painless making the records—the easiest part of my life is making the records, although that seems odd.

**Bonzai:** What about this Ed Cherney guy?

**Arden:** Obviously, you get the best of both worlds when you work

BY MR. BONZAI





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with Ed. Actually, you get the best of many worlds. I first met him in 1992 on the ever-so-famous "producer's search" that every new artist goes on. I had no concept of what a producer did, really, and I kept saying to my manager, "What am I looking for?" He said, "Just find someone you like."

So, we set up about 20 meetings with various guys whose records I liked: John Leventhal, Gary Katz, Danny Lanois. Anyways, Ed was about at the bottom of the list. I was told that Ed was just starting to produce, and he'd worked with Don Was on the

Bonnie Raitt records, and he was a great engineer.

So, Ed showed up at the Hollywood Roosevelt hotel with long hair, T-shirt, jeans. He sat down and had that expression on his face: absolute kindness and acceptance. He's got these big, watery eyes—reminds me of a St. Bernard. But you wouldn't want to make him mad. He told me, "I don't know what to do for you, but I'm good at clearing the way." I thought, "Is that what I wanted to hear?" I thought someone was going to tell me to do this and do that, and he wasn't like that. In fact, he tried to not have me hire him for the job. He was telling me how great Larry

Klein was, and suggested I look to some other people. I was thinking, "What kind of a weirdo are you?"

I left the meeting after a lot of laughing and went on to some more meetings. Later on, I was in the elevator with Neil, my manager, and I said, "It's Ed. I don't have to go through 15 other people." It must be our personalities—we've always gotten along well, and he makes me laugh so much. He's a life-long friend whether or not we ever make another record together again. I feel like I've known him all my life. I like his wife, Rose, and he's just a brilliant guy with sounds.

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to a much better song.**

that's not about perfection, it's about imperfection. It's about the mistakes. There were so many things I wanted to re-sing, and he'd say, "Jane..." I'd say, "It's Jann." "Whatever," he'd say, "Jane, just leave it the way it is. You can go do it different, but I don't think you can do it better." He would wrangle with me, and eventually I would just give in. So most of the vocals on both albums are the original vocals that I did with the band. As much as they are very studio records, they are very live records as well. The only thing we didn't really have was a studio audience in there watching us do it, but we could have very easily.

**Bonzai:** You certainly work with some great musicians. Did the two of you work together to find people?  
**Arden:** On the first record, he picked out guys who he felt could do the job. In Jim Keltner's case, he said I needed a guy that played "sad drums." I didn't really know who anybody was, which was probably much to my benefit at the time. As I look back at all the things that Jim has done, and what Kenny Aronoff

# Gimme a... Compressor

## Expander/Gate

Background noise in the room, sound leakage from headphones, vocalist breathing etc. are all problems that can crop up while recording your vocals. These situations are all easily taken care of with the 286A's Expander/Gate. This multi-use design allows you to gate out any noise during breaks in the intended signal and when used as an expander, will push down any unwanted noise in the signal such as headphone bleed.

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## Enhancer

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The compressor in the 286A is a patented hybrid feed-forward/feed-back design that was engineered by a guy named Bob Orban. (His stuff is used on almost every radio station on the face of the planet). Using the classic dbx VCA (the heart and soul of a compressor) the 286A compressor is very easy to use with its drive and density controls. Drive is the amount of signal sent into the compressor and the Density is a combination of controls that allow you to achieve anything from a nice transparent gain reduction all the way to a fat squashy compression so popular on heavy rock vocals. The  $\theta$  stage LED meter gives you a great visual indication of how much the compressor is working on your vocals or whatever else you may run through your 286A. Now's actually a good time to tell you that you're not stuck just using the 286A as a mic pre, it's got a line input so you can use the 286A's 5 processors on any of your audio: guitars, keyboards, drums - anything!

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## Oh... and a GREAT Mic Pre

Another very cool device in the 286A is the Enhancer. The low frequency detail is a very trick circuit that not only adds warm low end but fattens up the signal by cutting out some of the mud in the lower mid-band at the same time! The HF (high frequency) detail adds sparkle to your signal. Now if you're thinking that the sparkle that you add with the Enhancer is going to put back the high frequency sibilance the de-esser is taking out, think again. The two circuits are tied together in an ingenious (and patented) way such that they work in tandem to do both jobs beautifully!

The 286A utilizes a precision laser trimmed ultra low noise (0.95 nV/√Hz) circuit that translates to an Equivalent Input Noise spec of -128dBu and an extremely wide bandwidth of >200kHz. All this engineering jargon translates to a gorgeous mic pre-amp circuit that you can count on to sound warm, transparent and accurate. With a precise 48 volt phantom power supply built in, you can count on the 286A to work with all your professional standard microphones.

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has done—I've worked with such great drummers.

**Bonzai:** Because Ed is both your engineer and your producer, have you grown to appreciate more of the actual nuts and bolts of making a record?

**Arden:** Absolutely. I don't think I ever listened to the sound quality in records before. I wasn't educated—things would either strike me as sounding good, or not very good. What Ed's taught me is how you go about making things sound good.

He really lets things sound as they are. He likes effects, but he says if you can hear an effect, you're using too much. He's also taught me that if you are thinking of an effect, then go ahead and try it. It only takes four minutes. He doesn't like talking about things; he likes to try it. But he really is such a great listener. The things that he hears I would never hear in a million years. And the pride and the care that he takes in recording a synth sound, or an acoustic piano—miking techniques, and the different mics he's used with me. Originally, we started out using a very expensive microphone but ended up with a \$250 Shure mic that he preferred because of the warmth. It's things that I would never hear. The way he produces, the way he communicates with musicians—he just gets such great performances out of people without hounding them.

**Bonzai:** Let's talk about Canada. Is there something unique about the Canadian experience?

**Arden:** I think so, but maybe it's because I'm a Canadian. I think what is indigenous to our whole country is that we all share something called "winter." It really unites us, and it makes us a robust people. In a country this size, there are 26-and-a-half million of us. We are Europeans, we're Asians, we're South Americans. Canada is such a new country that we haven't really had time to bungle it up yet.

When you think of a Canadian you don't picture any one type of person. You'd have to ask a Canadian if they were Canadian, you wouldn't know one to see one. We're friendly, and we're a peaceful people. There isn't one type of music either. It's as different from the West Coast to the East as America would be. We're a good bunch. And we've had so much success in the music business in the past few years, especially on the female side, with singers like Shania Twain,

Alanis Morissette, Sarah MacLachlan, k.d. lang.

**Bonzai:** Is it true that you gave up singing once to work on a fishing boat?

**Arden:** Well, I was kind of forced into it because I had gone out to Vancouver to pursue this fantastic career...no, just to go out and sing and learn how to become a songwriter, and to get away from home. I was 20 years old and wanting to do everything myself.

I got punched out in Gastown while I was busking. Somebody lambasted me and stole my money, which wasn't very much—considering it was Canadian dollars, it really wasn't very much at all. I ended up being frightened. It hurt

my cheekbone, and my eyes were black, and I said, "That's it." I ended up getting a job on a salmon trawler: "deckhand required, no experience necessary." I think the captain, who was about 80, thought I was a young guy there for awhile. I was 102 pounds, short hair and no breasts. When he discovered I was a girl, he wanted to chase me around the boat but I assured him that I could swim 100 nautical miles and that I knew how to call the coast guard. He turned out to be an okay guy and I worked hard, gutting six or seven hundred fish a day.

**Bonzai:** Weren't you also a golf ball cleaner?

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Lorin Alldrin, Sept/96

**Electronic Musician**  
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LUNCHING WITH BONZAI

thought, "Oh, I better tone that down—that's too real."

Hopefully, I'll have good guidance with my management and friends, and people that I trust. So that they can listen to my new stuff, and go, "I like that," or, "I don't like that." Sometimes, it's very important to have people not like something. "Great, that's what I wanted you to do."

**Bonzai:** Is it easier to write when you're in love, or when you're not?

**Arden:** When you're not. I think it's easier to write when you're devastated. Love songs can be really sappy when you're deeply in love and you've lost focus. Sorrow, despair and desperation lend themselves to a much better song. But that's just me. Give me Mozart's *Funeral Requiem*. I much prefer that over something happy by Tchaikovsky, "Dance of the Sugar Plum Fairies." I like sad music.

**Bonzai:** It certainly creates a contrast when you perform, because you're such a crack-up onstage.

**Arden:** But it's almost the same thing, isn't it? Comedy routines are built around embarrassing things. We laugh at that, or we laugh at the Three Stooges getting poked in the eyes or hit with a board. The reality of most humor is that it is true and we relate to it. It's a painful experience but when you share that with a group of people, it is funny.

I often talk about my mom and growing up. She once took me into the bedroom and showed me a drawer full of Kotex pads and belts. I was

**Arden:** Yes, I drove a tractor picking up balls and then I would wash them. Later, I graduated to washing the clubs.

**Bonzai:** And a singing waitress?

**Arden:** Yes, it was at Orlando's Bistro.

**Bonzai:** Have these experiences enriched your ability as a writer and performer?

**Arden:** Even deeper than that, they change you as a human being and your thought processes, which obviously affects how you write and the musical experience. If you don't have a life, you won't have much to write about. As much as I would never want to go through that stuff again, I can look back now with fonder memories. At the time it didn't seem like I was doing very well at all, but in hindsight I think I was. I was out there trying to discover what I liked and who I was and a lot of things a lot of us don't ask until we're 50 years old. It was an interesting journey.

**Bonzai:** You write very revealing songs. Now that you're getting recognition all over the world, as a songwriter will you be reluctant to bare so much?

**Arden:** I hope not. The things that I've written since starting to sell records are still very introspective. I don't think I'm quite as sad as I used to be. I know exactly what you mean, and there is always a danger of wanting to be a little more elusive about how you say things. But I think that is what people have always liked about my songs, so I'd be cheating them and cheating myself if I

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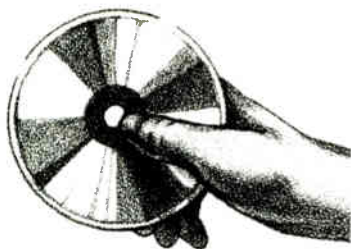
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At Groove Masters in Los Angeles, L to R rear: Ray Taylor-Smith (assistant engineer), David Resnik (guitar), Mike Lent (bass), Bob Foster (guitar); L to R center: Edd Kolakowski (tuner and prod. assistant), Kenny Aronoff (drummer), C.J. Vanston (keyboards, arranger); L to R seated: Duane Seykora (engineer), Jann Arden, Ed Cherney

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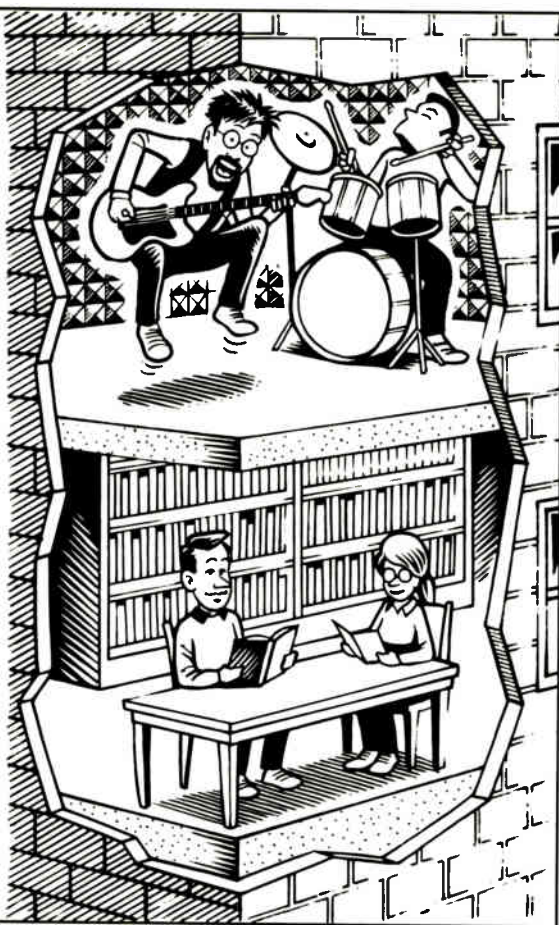
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just mortified. At the time, I thought this is the worst thing I've ever seen in my life. Why the hell are you putting me through this? It was awful for me, and I'm sure it was awful for her. I've told the story a couple of times and people kill themselves laughing. She told me, "They're right beneath your dad's underwear drawer." I'm thinking, "Dad's underwear drawer! How weird does that sound?" Married people have their stuff in the same dresser—they split it up. People do laugh, but it's just funny little everyday things. Like when you see somebody wipe out on the ice.

That's what music is to me. I think there is humor in there, and certainly irony in the music, but humor is just as sad. I've just found a way to express it and have people laugh with me, and at the same time they can be sad with me, too.

**Bonzai:** With the music business so different than when you started out, what advice would you have for an emerging artist today?

**Arden:** People have to do things their own way. It's one thing getting advice, but you have to be persistent. You have to have a good business head. It's important to at least have a high school education—there are a lot of numbers to crunch and things to keep track of, people to pay. I never realized how important that was.

The musical side? Absolutely be yourself, and don't let people tell you things like, "If you were more like Harlequin, we could do something with you." If somebody tells you to cut your hair or dress differently, walk away from them as fast as you can. There's a lot of wannabees out there and people who figure they'll hop on the next bandwagon. By the time they catch that bandwagon, it's already passed and gone, and finished.

Listen to yourself and your own instincts, and your heart. And failure is part of being successful. If you're not prepared to fail, then you're in the wrong business. I fail everyday, and it never ends. The next record could sell two copies, one to my brother and one to my mother, and that might be it. I have to accept that as easily and as comfortably as I accept any kind of success. ■

*Roving editor Mr. Bonzai learned everything he knows about Canada from the McKenzie brothers.*

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Photo shows the internal version, the RO-1420C.

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## CANADIAN ROAD STORIES



Upper left: The FM Systems rig at the Snow Job '96 festival. Above: Westbury National's production for Spinal Tap at the Canada Days festival, Molson Park, Barry, Ontario, in '94. Right: ABI Systems rig at the Fort Nights festival on Citadel Hill, Halifax, summer '96.

Although most Canadians would normally take exception to the perception held by our neighbors to the south that our country is continuously frozen over, and that our inhabitants live in igloos that may or may not have television, there is some truth to these stereotypes. And for Canada's regional sound reinforcement companies, the truth is that touring across the country inevitably involves dealing with severe weather conditions (hot and cold) and long distances between major centers. Multi-Platinum Vancouver rockers 54-40 were known to tour down the West Coast into the States rather than go east early in their career because of the simple fact that the Rockies were in the way. In other words, going out on the road is a bit more daunting when that

road is frozen over a good deal of the time.

Mix spoke to a few tour support companies across the country to gather the best and worst anecdotes about touring in Canada and beyond its borders.

#### ABI SYSTEMS, NOVA SCOTIA

ABI is a broad-based lighting and sound company on Canada's east coast; it does everything from sales, service, rentals and installations to live production and production management both nationally and internationally. Production clients include the Rankin Family, Sloan and Weird Al Yankovic.

"The two major challenges to overcome in Canada are the distances between cities, and weather," says company president Brad

Fox. "In the Southwest the trucks are always overheating, and our problem is they're always frozen. There's been plenty of times that I sat on the side of a highway waiting for a tow truck to arrive."

Fox says that currently, a lot of ABI's business is coming from the west rather than the east, particularly from California. "I really like the idea of a customer in Los Angeles calling a company in Halifax for a U.S. tour," he says. "Whether there's a cost offset or not doesn't seem to really matter to them as much as the quality of service does. If you take a company like Showco, which is based in Dallas, they're not in Los Angeles either, so I guess geographically speaking it doesn't matter as much as it used to."

One of the best road stories Fox remembers is traveling between

BY TIM MOSHANSKY

—CONTINUED ON PAGE 79

# MUSICLANE MASTERING

*Markham, Ontario*

**M**usicLane is a small facility situated on the outskirts of Toronto, Ontario, that specializes in CD/cassette mastering and sonic restoration. The studio is owned and operated by Ted Carson, a Miami-born transplant who got involved in mastering to stay in Canada. He had just gotten married, after eight years touring internationally as front-of-house engineer for a U.S. gospel group, and his new wife was Canadian. "To be able to stay," he explains, "you have to go to Immigration—just like in the U.S.—and they interrogate you intensively. We passed the test, but they said 'If you can find a job, you can stay.'"

Carson's first inclination was to find another sound reinforcement job, but consistent work was hard to find and not very conducive to family life. Finally, he was offered an administrative job at a mastering studio in Toronto, where he managed the facility and learned to cut lacquers and produce CD and cassette masters. "I found that my live sound experience was a valuable asset for mastering," Carson says. "Efficiency and attention to detail are particularly necessary to mastering where customers are paying hundreds of dollars per hour and any mistakes, if not caught, can be duplicated thousands of times over."

In late 1991, Carson left to open MusicLane. He started the facility at a time of flux for mastering technology and for the music industry at large. While digital audio workstations were streamlining the mastering process, the recession was in full swing in Canada. "Work was being lost to foreign mastering studios that had the latest and greatest in technology," says Carson. "Canadian mastering facilities just couldn't compete on the same scale and were also reluctant to make large purchases of state-of-the-art gear."

While Carson was in the process of building MusicLane, he installed a Sonic Solutions system in his apartment and began working on projects for the clients who sought him out. He moved the gear into the partially completed rooms in 1992, which meant that the construction work then had to be planned around mastering projects. The studios—which were acoustically treated by Terry Medwedek of Group One Acoustics (Mississauga) and constructed by Harry Huyer of Atria Wood Design (Toronto)—were finally completed in spring of '94.



**Studio A**

PHOTO: PAUL SHAW, TORONTO

Carson prides himself on working closely with clients on their projects and says the main room was set up deliberately to allow the mastering process to be a collaborative effort. Clients are invited to sit beside the engineer and assist in making decisions about the adjustments to their work. "A lot of people still don't know what mastering really is, and I try to show them what we can achieve compared to what they bring in from mixdown. I invite clients to bring a track they're very familiar with so that we can take a few minutes to preview the sound that they are after. It also gives them an opportunity to familiarize themselves with the sound in our studio. It's a different style from other facilities that may encourage clients to sit back and relax while their project is being done."

The rooms comprise the main studio (pictured) and a smaller pre-production room, though most of the gear is "floatable." In addition to the Sonic Solutions pre-mastering and NoNoise system, MusicLane has the Weiss BW102 digital processor with Penguin Software, along with Weiss ADC-1 20-bit A/D conversion. Digital recorders include Sony PCM 1630 ¼-inch U-Matic system and PCM 7010 DAT machines, and Studer's D-740 CD-R and A-727 CD player. The facility also has a Studer A80 ¼-inch analog deck with Dolby, Yamaha C-300 cassette decks and State of the Art CF-500 monitors.

Carson says that one of the major hurdles Canadian mastering facilities

**BY BARBARA SCHULTZ**

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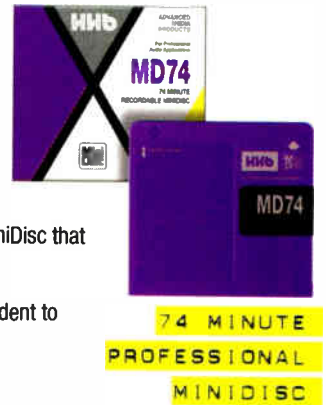
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employees, as well as 100 freelance people who work on the shows. Wilf Wagner, a sound engineer/tech recalls having a small currency problem when doing a quick tour of Ohio with Honymoon Suite.

"We were at a truck stop late at night after a gig," he says, "and we had both buses there and the trucks. We didn't have much American money, because it was a quick in/out tour. So we asked the lady at the front counter if she would take Canadian money, and she said she would. So we all sat down and had our late evening meal. When we were finished, a couple of us got up to leave, and by the time I got up there, she informed me right off the top that she wasn't taking Canadian any more, and proceeded to tell me that I should go out there for the guys who had paid already and tell them to come back and pay the difference in American money, because she had taken the Canadian at par.

"So, I borrowed some U.S. money from one of the drivers, and went to the bus and went to sleep, because it was already three in the morning by this time. The next day the bus driver pulled me aside and said, 'you wouldn't believe what happened last night.' Apparently about half an hour down the road the state troopers pulled everybody over and demanded the difference that was owed to this restaurant or they were going to impound everything."

Brent Clark, another of Westbury's employees, says most of the stories he knows probably couldn't be printed. He does, however, remember other instances, like the diesel in the tractor trailers freezing up as they went across the prairies, or waiting for the bar owner to pay them as he cleared out his video machines and pool tables. "I can never understand why people do it," he says, "but bands just love to tour Canada in the winter. I just don't understand the mentality. We were com-

ing back from Vancouver once and came across an avalanche at Golden, which is just outside of the B.C./Alberta border, and we had to take a 24-hour detour to get around it. Most of the funny stuff happens in the winter, which makes it sound like that's all it



Westbury National Shows Systems crew on the road with Anne Murray



ABI Systems setup for the band Shameless at the Metrocenter, Halifax

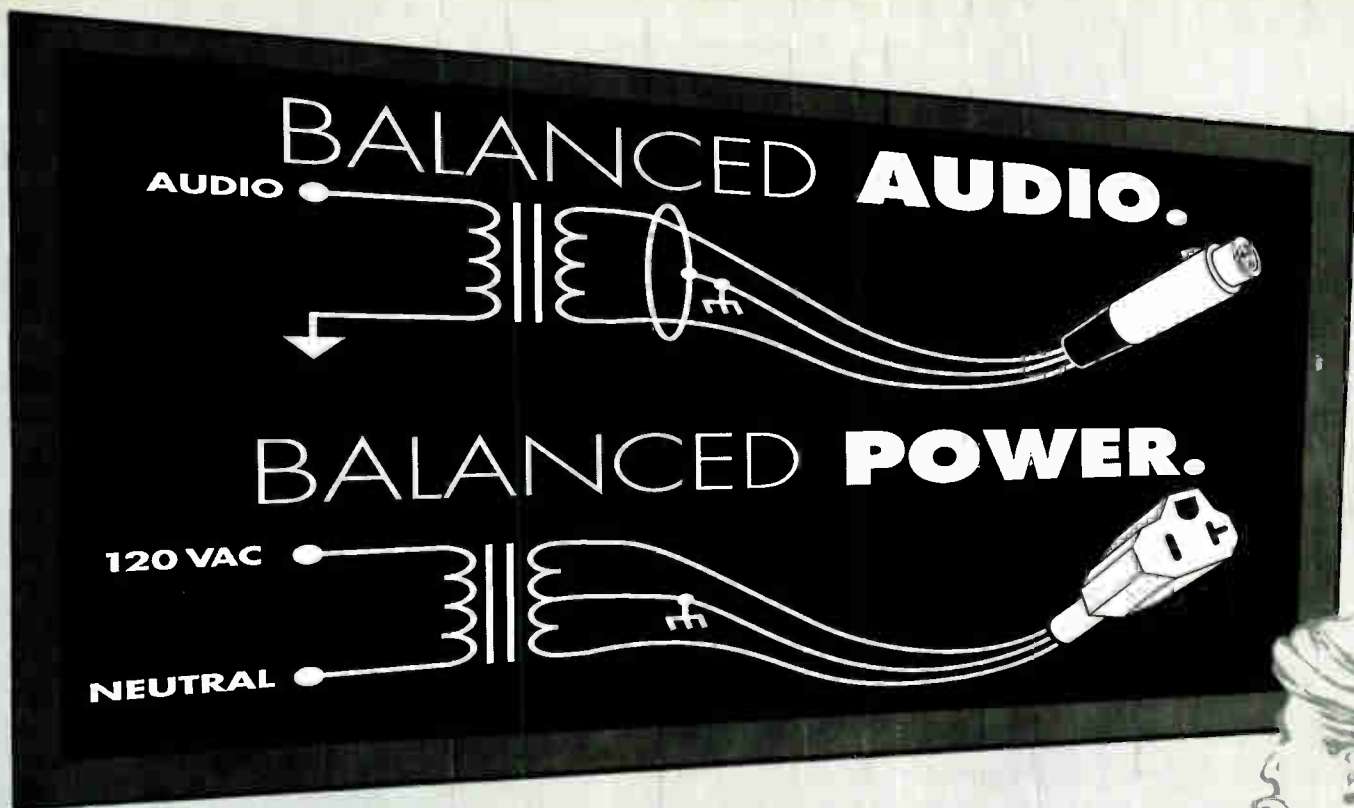
does up here, but that's not true. In the summertime we have the same problems they do down south, like overheating and people passing out from heat exhaustion."

Clark also agrees that the distances between venues can be a major factor when touring in Canada. "To give you an idea," he explains, "if you were doing Toronto, and then your next date is in Thunder Bay, then you need a day just to get there, and Thunder Bay is still in Ontario. It's an 18- or 20-hour drive. And the funny thing is you can go the other way, and in the same time you can be in Halifax, which is at the other end of the province, in 17 hours. The distances are just so vast."

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'DA FUNK"**

*Clockwise from top right: Vincent Bingham, Raymond King, Baakari Wilder, Savion Glover,  
Jared Crawford and Jimmy Tate at the Ambassador Theater in New York City WorldRadioHistory*



Cast members Raymond King and Jared Crawford



by Eric Rudolph

**N**ineteen ninety-six may go down in Broadway history as the year they miked the shoes, thanks to tap dancing artist Savion Glover. With the hit show *Bring in 'Da Noise, Bring in 'Da Funk*, Glover created a fresh challenge for Broadway audiences and for sound designer Dan Moses Schreier.

"Savion wanted almost rock 'n' roll-level foldback from his tapping," Schreier explains. "He sees his tapping as music; he is an instrument. He needs to physically feel the sound created by his feet. Savion is bringing tap up to the present day, and so logically he needs the sounds of today to help him do that. It is not just acoustic tap anymore; what Savion has created is funk tap."

ALL PHOTOS BY MICHAL DANIEL



Jeffrey Wright (in white)  
surrounded by cast members

The shoe mics were Schreier's idea, and grew primarily from Glover's desire for a loud onstage level. "I watched the show develop and gradually came to realize that we needed a new approach to sound. I decided to try running a wireless mic down Savion's leg and mounting it on his tap shoe. We started off with just one wireless mic down one leg; I thought that would be enough. When I began to understand the subtleties of what Savion was

doing, I realized that both feet would need to be miked."

Glover, 22, shot to fame at the age of 12 as the title character in the Broadway smash *The Tap Dance Kid* and with a recurring role on *Sesame Street*. He has since developed a wildly up-to-date style of tap dancing. He hits the floor so hard that the mics attached to his size 11½ EE tap shoes needed to be changed from Sennheiser Red Dot models, with their nominal padding, to

Blue Dots, which Schreier says are "padded to 50 dBs. All the other dancers still use the Red Dot mics," he notes.

So far, despite Glover's highly exuberant and athletic approach to the dance form, safety has not been a problem. "The wires from the mics to the transmitter packs are secured by ankle straps," notes Schreier. Mic placement



Ann Duquesnay takes the call

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able to compensate for those limitations."

The four speakers hung above the proscenium arch are Apogee AE-9s, divided left and right, for music. Another pair of AE-9s were specially cut in half, with the horns placed in the orchestra for vocals, and the other half on a truss for balcony low-end. Four Apogee SSMs are placed on the lip of the stage as fill for the first two rows. Music subwoofers are EAW SB-10s: two on the floor at house level and two above the box seats, for the balcony. Vocal speakers are all truss-mounted Apogee AE-5s, two for the balcony and two for the orchestra. Two other AE-5s placed wide left and right provide fill for vocals and music for the entire house. Surround is handled by four Apogee SSMs, two at the back of the orchestra and two at the front of the balcony reflecting off the Ambassador's ceiling.

The hectic pace of the production schedule did not prevent experimentation with a relatively new mic; the nine-piece pit band is making good use of the Sennheiser MKH-80. "There is noth-

ing you can't do with this mic," says Keister. "I don't know how anyone else is using it, but we've got it on our acoustic bass and the reeds. It is incredibly warm with a good high end. It is at its best here with the acoustic bass; it picks up the bowing sound on the



bass wonderfully. Usually with a mic that catches that sound, you end up trying to get rid of it."

The brass is miked with Sennheiser MD-504s. The drums use AKG C-408s on snare and rack toms, a Sennheiser 421 on the floor tom, an AKG D-112 on the kick and AKG 451s for the overheads. Electric guitars and keyboards use BSS direct boxes.

Amplification is handled by Crest and includes 11 Model 4801s (480 watts per channel), six 6001s (600 watts per

channel) and five 8001s (1,200 watts per channel). The main reverb unit is a Lexicon 480, which is used on the vocals to create different room sounds appropriate to different time periods. Other reverb units include one Yamaha SPX-1000 for the taps and one for the band. Delays are handled by eight Audio Digital PAD-300s; EQ is run through eight Meyer CPA-10 parametric units.

*Bring in 'Da Noise, Bring in 'Da Funk* has been scorned by theater traditionalists and hailed by young audiences for bringing the noisy and vibrant contemporary world to an establishment art form that is often seen as calcified. However, no one is saying that the show's consistent \$400,000-plus weekly grosses are a bad thing for Broadway. And for Schreier, the show is a source of great pride and pleasure. "*Bring In 'Da Noise* is a sound designer's dream," he says. "Just the title alone should communicate that! It is so thrilling to work with someone like Savion Glover, who is at such a magical level. He is truly one of the great performers working today." ■

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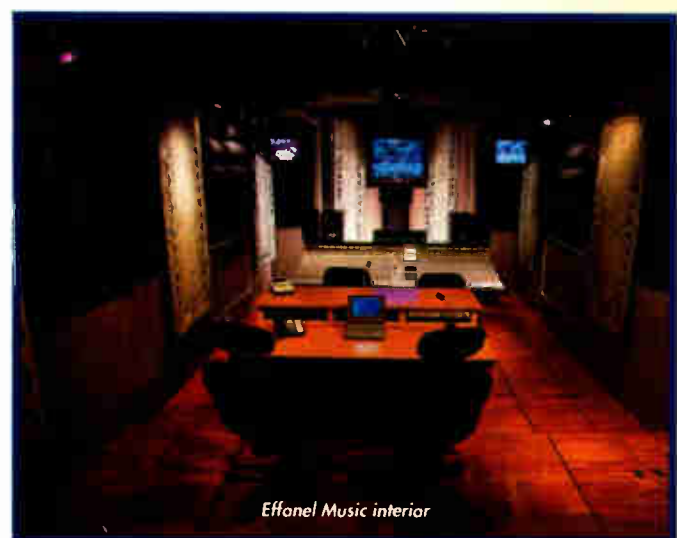
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NEW AND IMPROVED

# REMOTE RECORDING TRUCKS

BY CHRIS MICHIE

The new L7 remote recording truck owned by **Effanel Music** (New York, N.Y.) features an expander section that increases control room room size to 14 feet wide by ten feet high (the truck is also fully functional when "closed"). The 52-channel SSL console with G Plus automation is complemented by a comprehensive collection of outboard processing gear and Effanel's portable GML/Neve mixing system, which includes 40 Neve 3115 EQ mic pre's, 54 Hardy M-1 mic pre's and a 60-channel GML 9100 line-level mixer. Recording options include 48-track digital (DASH and DA-88) and 24/48-track analog with Dolby SR.





**Remote Recording Services** (Lahaska, Pa.) is now pulling the Silver Studio trailer with a new Peterbilt Model 385 tractor featuring a 400hp Cummins diesel. New audio gear purchases include a rack of Sony PCM-800 digital 8-tracks for film recording applications and an 8-joystick Desper Spatializer for surround mixing. Monitors are now Paradigms powered by Bryston 3B amps.

**Xtreme New Media Studios** (Seattle, Wash.) is an all-new company that offers both traditional music recording services and a wide range of specialized services for film and multimedia clients. Xtreme New Media's new mobile recording operation centers around an SSL 4040 G Plus console in a 35-foot truck. A Dynaudio LCRS system tuned by Bob Hodas is supplemented by Yamaha



*Producer/engineer Ron Nevison (L) and Xtreme New Media VP Steve Smith.*



*Design FX Remote Recording*

NS-10s and Auratone cubes. Open reel recording options include Studer A827 with Dolby SR and a Sony 3324-A; DA-88s, Otari timecode DAT, and Panasonic SV-3800 formats are also available. Sixty Beyer DT-102 single-muff earphones on a four-zone system are available for scoring sessions. The truck also features an Equi-Tech balanced power AC system, and ClearCom and closed circuit TV communications systems.

**Design FX Remote Recording** (Los Angeles, Calif.) reports that its aging (but much loved) API console has been completely rebuilt by Jeff Bork and John Dressel Associates. The new input modules feature all-discrete circuitry and comprehensive new routing options (eight aux sends per module) and the console may be

PHOTO CREDIT: JOHN GARRETT/STUDIO 3, INC.

channel mic pre's (bringing ASL's inventory of API mic pre's up to 48); an Audio Toys Pro<sup>®</sup> mic pre/EQ/dynamics module; a TC Electronic M2000 Wizard; Valley Audio's 730ADD DynaMap; and Otari UFC24 universal format converter. New transducers include pairs of Coles 4038 and 4104 ribbon mics and ATC SCM20 speakers.

**Black Entertainment TV (BET)** (Washington, D.C.) has a new TV production mobile unit. The audio section includes a comprehensive audio mixing suite featuring a 48-channel SSL console offering 40 mono mic/line modules and eight stereo line modules.



Monitor choices include Genelec and Fostex powered speakers and JBL monitors and recording options include DA-88, ADAT, DAT and 360 Systems DigiCart hard disk recording. The 50-foot trailer, which was built for BET by Communication Engineering Inc. of Newington, Va., features a 52-inch expander section, which allows for the temporary installation of additional satellite mixers.

**Le Mobile's** (Vista, Calif.) Guy Charbonneau recently purchased a Studer D827 48-track digital recorder and 84 Beyer DT108 headphones for film scoring applications. Charbonneau also has plans to add 32 new Studer mic pre's and a 20-bit fiber-optic stage box system.

**Big Mo Recording** (Kensington, Md.) has added an all-new digital truck called "Shorty." Designed by the Walters-Storyk Design Group, the truck includes a Mackie 48-8 console augmented with three Yamaha HA-8 mic pre units, for a total of 72 inputs. Monitors are Genelec 1030As and Yamaha NS-10Ms, and recording options include six DA-88s, two DA-38s and dual 32-track digital recorders. Outboard gear includes two Lexicon PCM 80s and two dbx 900 racks.

**The Nashville Network's** newest all-music truck, slated to be ready in February, will be equipped with a Neve Capricorn console. The 48-foot trailer is being built for TNN by Boulevard and will primarily be used for TNN's *Prime Time Country* TV show. The Neve Capricorn features 96 preamps, 96 MADI channels, and 64 AES inputs. Monitoring choices will include models from Apogee, and recording options will include TNN's Otari 24-track and a Mitsubishi X880; other DASH machines and DA-88s will also be available. ■

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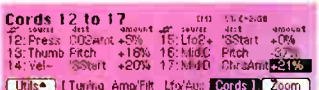
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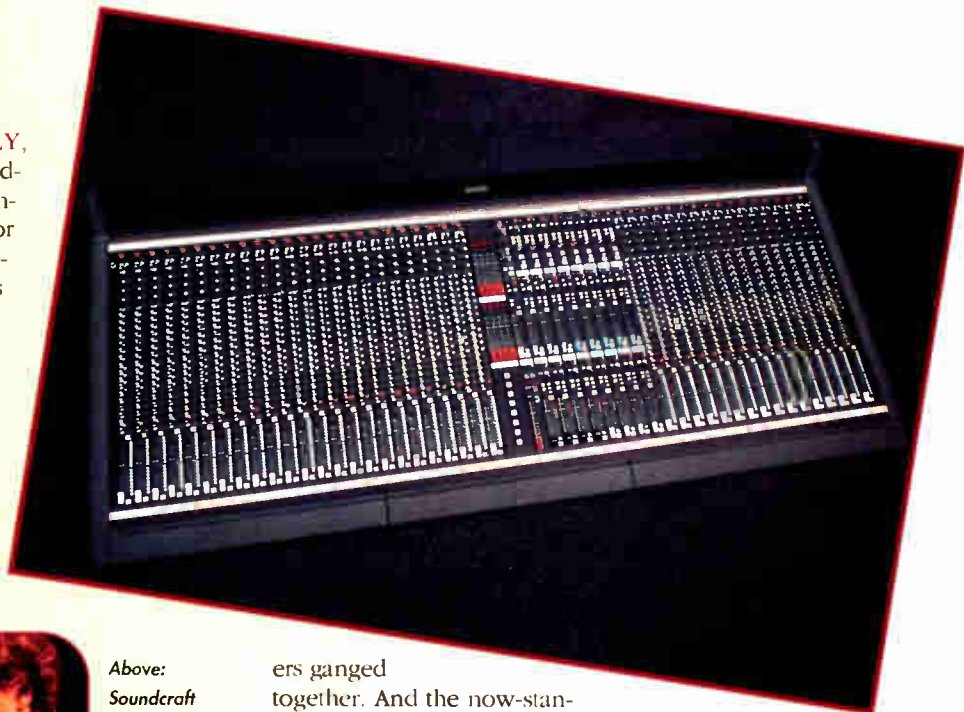
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DIALING IN THE MIX

# MONITOR MIXERS SPEAK OUT

BY CHRIS MICHIE

**UNTIL RELATIVELY RECENTLY,** live show production has depended heavily on products and technologies originally developed for other markets. For example, before the touring sound business grew large enough to support its own specialized manufacturers, most sound systems were based around cinema loudspeakers and amplifiers (A-7s, "RCA bins," 1568s, etc.). In the early '70s, the typical live mixing "console" was often no more than several four-input Altec 1567 radio mix-



*Above:* Soundcraft SM 24; *left:* Bill Bruford of King Crimson uses the Intelix remote control unit to adjust his own monitor mix.

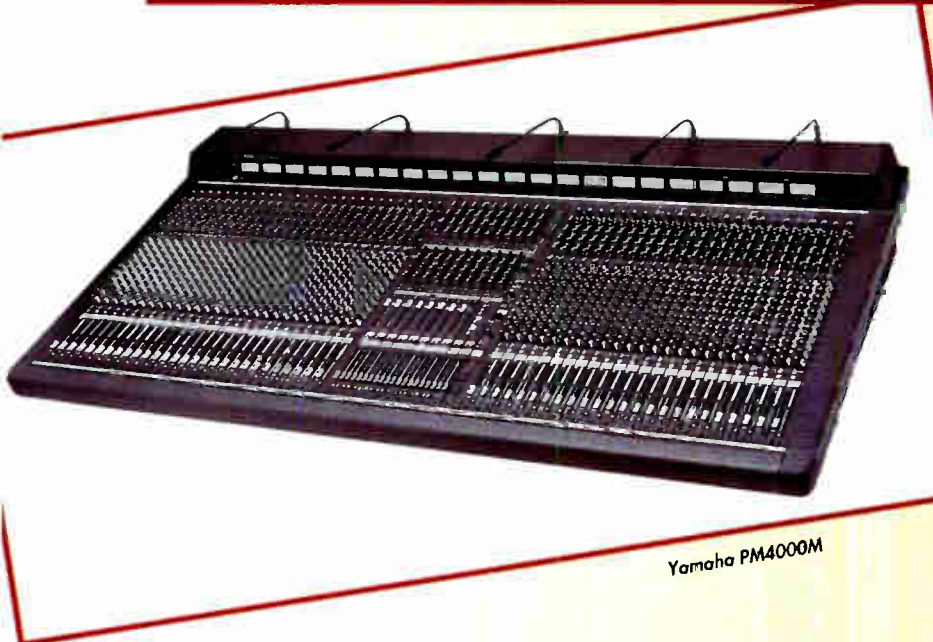
ers ganged together. And the now-standard front-of-house mixing position was made practicable by multicore cable, originally a telecommunications product.

In one area, however, the live sound industry has created a set of products from scratch. For at least two decades, performers in touring and theater-based musical shows have relied on onstage monitors—task-specific loudspeaker systems that (ideally) deliver mixes tailored to each performer's needs. Of course, monitor systems didn't appear overnight—there was a long and sometimes painful evolutionary process. But today, monitor systems are often more complex and powerful



PHOTO BY STEVE JENNINGS

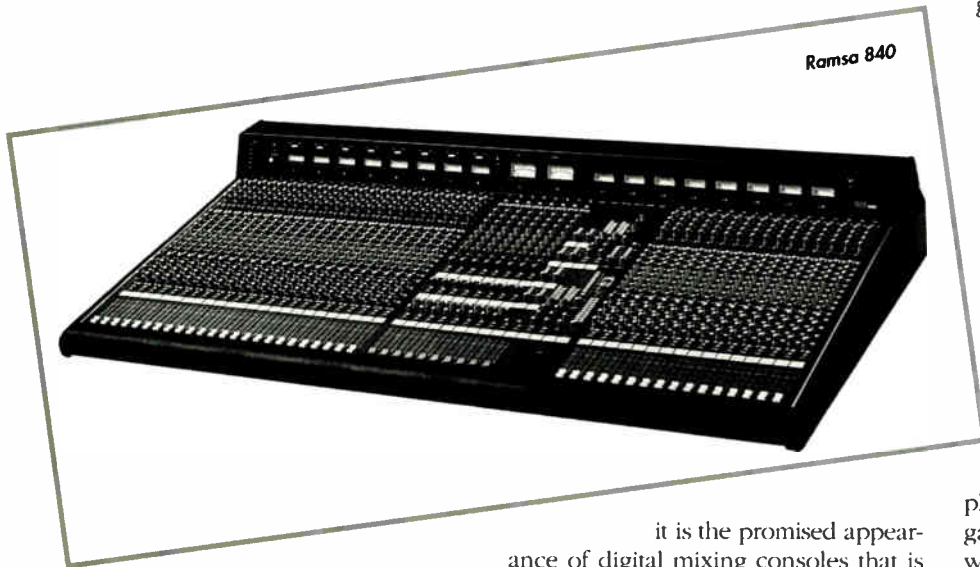
Above: the Midas XL-4; left: Steve Miller Bond monitor mix engineers Steven McCale and Dave Skaff each use a Midas XL-3 40-input monitor console with a 24-channel extender to create seven discrete stereo mixes. "The concentration and precision is too much for one person to handle more than two or three people at a time," says McCale, adding that the complexity of the in-ear monitor mixes "has to do with the intricacy of the effects." Below: David Bowie using a Garwood in-ear monitoring system



Yamaha PM4000M



PHOTO BY STEVE JENNINGS



than many FOH systems. For example, Paul Owen's monitor system design for Metallica provides 24 mixes through 60 monitors distributed across two stages.

To find out more about the current state of monitor mix technology and techniques, *Mix* conducted a series of interviews with some of the industry's leading monitor engineers. We spoke with the following: Mike Brady (Grateful Dead, Kool, Monterey and Playboy Jazz Festivals); Monty Carlo (Bruce Springsteen, Natalie Merchant, Ringo Starr); Bryan Clements (Sheena Easton, the Go-Go's); Don Dome (Aerosmith, Allman Bros. Band); Bill Head (Aerosmith, Skid Row, Pat Benatar); Fred "Gumby" Jackson (Bruce Springsteen, New Kids on the Block, Julian Lennon, Patti LaBelle); Paul Owen (Slade, Metallica, AC/DC, Slayer, Tesla); Sam Parker (Vince Gill); Mike Prowda (David Bowie); and Scott Scherban (Black Crowes, King Crimson).

#### MIXERS FOR ALL OCCASIONS

Though early monitor mixes were necessarily created on stock or modified FOH consoles, monitor-specific consoles have been available for well over a decade. Mike Prowda remembers 1976 as the year that he first saw a mass-produced matrix board, a 16x8 Stevenson; and sound companies and manufacturers have since put ever-greater emphasis on developing tools specifically for the monitor engineer. In-ear monitors are of course targeted at exactly this segment of the live sound industry, and digital programmable equalizers have obvious monitor systems applications. But among the various new audio technologies that have monitor mix applications,

it is the promised appearance of digital mixing consoles that is most eagerly awaited by monitor engineers, who generally have an even greater need for snapshot recall facilities than their FOH counterparts.

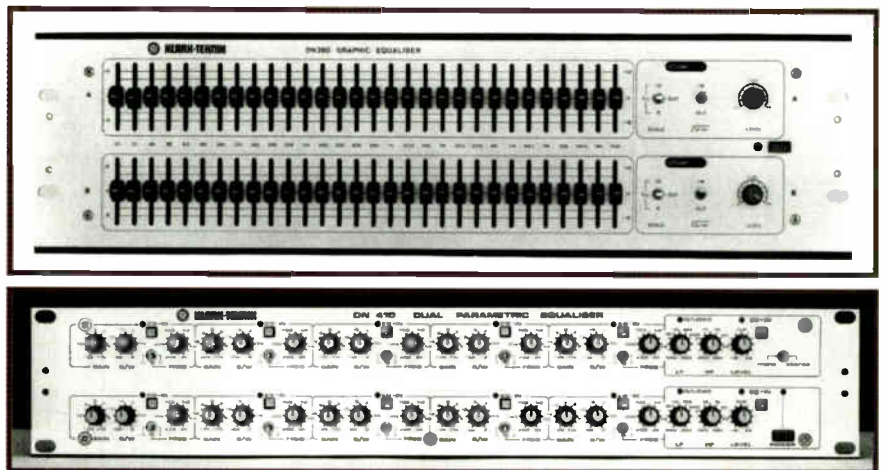
"I'd like to see digital consoles come along faster," says UltraSound's Mike Brady. "They're getting there...but I wish that they could step up the pace. The sonic quality isn't quite there yet, and [regarding] ease of use they're still a little too computerish for most engineers to deal with." But Brady foresees plenty of applications, especially for festivals, TV shoots and award shows; in fact any multimedia event which involves complicated preprogrammed sequences including video feeds from various sources. As he points out, such tapes are often recorded at different levels in different studios and often all sound different, yet may need to be smoothly sequenced in industrial presentations. "That would be really so handy, to be able to program all that stuff rather than suck up tons and tons

of inputs for every different tape that gets played," he says.

Mike Prowda is impatient to see digital console manufacturers address the needs of monitor mixers. "I'd like to take a Recall console out and give it a whirl," he says, but notes that, with only eight output buses, the Recall is not suitable for in-ear monitor mixing for bands with more than four members.

Scott Scherban found himself on the cutting edge recently when touring with King Crimson. The band elected to use the Intelix Studio Psychologist system, a remote-controlled monitor system initially designed for studio applications. For King Crimson, Scherban gave each player a pair of left and right wedges and used a Midas XL-3 to send 16 stereo and mono mixes to the Intelix base unit. Each member of the band used onstage remote control VCA mixers to create his own monitor mix while Scherban maintained internal balances and controlled overall levels. Though pleased with the results, Scherban notes that the system was at the time not quite roadworthy. "It was still an experimental system when we got it," he says. "You could hear calibration noise."

Among the analog mixers mentioned, the Midas XL-3 and XL-4 got consistently high praise. Paul Owen, currently on tour with Metallica, is running 24 mixes through 60 monitors distributed across two stages. "There's no back line at all, so I have to follow each member of the band 'round on the stage. I think I have over 2,000 possible combinations," he muses. The XL-4 that Owen is using has been modified; the last four stereo sends on the channels have been changed to dual con-



Top: Klark-Teknik DN360 graphic equalizer; above: Klark-Teknik DN410 parametric equalizer



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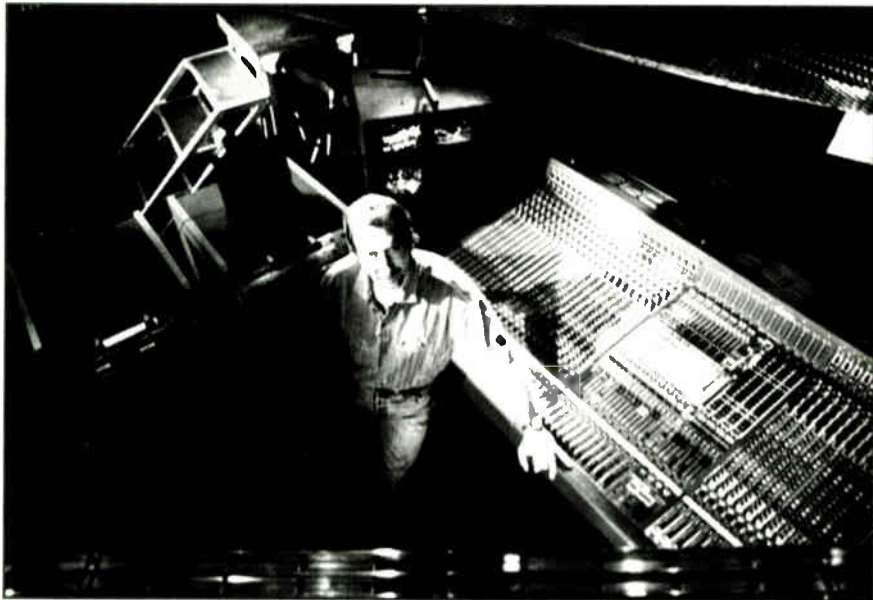
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Paul Owen uses a Midas XL-4 to create 24 mixes at 60 positions for Metallica.

stand it." Jackson agrees that "the easiest board to walk in and mix on is the Ramsa 840," and speaks fondly of the Audio Analysts CAD desks. "Tons of headroom; red lights mean nothing to you," he laughs. "For getting around on, the PM4000 is the best. And the one I keep running into that is small and easy to get around on is the Soundcraft SM24."

In fact, for Jackson, who is now working as an independent in London, the choice of mixing console is secondary. "I can mix on anything as long as I have some Klark-Teknik DN410s," he says. "I can get by on any gig as long as I have some Klark 410s for inserting on vocal channels." Owen also relies on Klark-Teknik gear. "I'm using all K-T DN360s, all K-T gates, which I think are pretty happening as well, and K-T compressors; that's about it," he says of his Metallica rig.

#### DIGITAL VS. ANALOG EQ

The programmable digital EQ was cited by several mixers as an example of new technology particularly useful to

that he makes extensive use of VCAs to set up in-ear monitoring scenes. "VCAs on the 4K or the new Ramsa are really nice to have, but on the Soundcraft SM24 the VCAs are [poorly positioned.] Your hand would be cramped halfway through the first tune," he says.

Bryan Clements likes the Midas XL-4, though he also praises the Yamaha PM4000M and the Soundcraft SM24.

"The EQ sections of these desks and the preamps sound so good now, compared to older desks," he says. Scott Scherban is using a Ramsa 840 for the Black Crowes tour and cites it as "an example of not needing a very high-quality desk to make the mixes sound good. On a festival I'd prefer to see the Ramsa than a Gamble because the new engineers out of the clubs can under-

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monitor engineers. "The Varicurve is really happening," says Bill Head. "Most graphics have 400 and 500—let's say you want to take 430 Hz out. The Varicurve'll take you right to that frequency." Don Dome is less enthusiastic about digital EQs, pointing out the potential difficulty in isolating a certain frequency via a keypad interface. "You could have a frequency that's ripping somebody's head off," he says. "You've gotta be able to attack it right away." But Dome also points out that some digital EQ units are more user-friendly than others. "The TC Electronic has a graphic as the main controller, and that makes it easier," he says.

"Until somebody finds a better way, the TC Electronic 1128 with a controller, even though it's expensive, is the way to go," says Fred Jackson. "It's easy, it's fast, and once you're familiar with certain monitor systems and have the curves in your head, you can just fly." Bryan Clements elaborates on the practical benefits of being able to adjust EQ from multiple remote positions. "I can travel around the stage and EQ with the remote head from the position that you're going to be tuning the wedge at," he says.

Jackson has also used the TC 1128 to create and store curves that help offset the effects of temporary threshold shift. Citing Bruce Springsteen as an example, Jackson says "Because his show is so long and your ears naturally start to deaden as the show goes on, we used the TC 1128 with pre-programmed steps all the way through the show. At certain points in the night I knew he'd ask for more as his ears were shutting down. I'd have curves programmed, ready to go—bang."

Mike Brady agrees that programmable EQs are particularly useful for coping with the effects of increasing deafness during a show. "At the same time, they ultimately serve to make everybody a little bit deafer," he points out. "What you're doing is emphasizing frequencies that are shutting down—there's a reason they're shutting down. At the same time, you need to make the client happy, and that's one way to do it."

Brady looks forward to further advances in digital EQ. "There's so much you can do in software, not only with EQ, but with time and phase, that if it was only clean enough you could really do it well. If you had a faster sampling rate and more bits and a wider data path, that would make it even better," he says. "The next step is to get

analyzers to talk to equalizers. I think we're making good progress on that, and that's exciting, both for the house mix as well as monitor mix. It gives you another tool, another way to get where you need to go very quickly."

But not everyone is enthusiastic about the newer digital devices. "I'm not a great lover of digital stuff, I have to say; I just don't think it sounds right," says Paul Owen, who tried an EV DX-34 digital crossover on Metallica's drum monitors but went back to an XEQ3 analog crossover after comparing the two.

#### PUT IT IN YOUR EAR

Most of those interviewed had some experience with in-ear monitors and were well aware of the systems' advantages. "It's a whole other league of monitor mixing and changes it drastically for everybody—for musicians, for the monitor engineer, for the house engineer," says Mike Brady, adding that, despite its obvious advantages in terms of separation, in-ear monitoring also has some disadvantages. "The big drawback is getting interactivity between musicians and creating a realistic environment within the headphone system itself," says Brady. "What you need to do is sort of create an artificial environment using the tools that we use for house mixing—essentially creating a house mix for every person who has a pair of ear molds. You're adding all the things you don't get from the room. You don't get reverb, you don't get delay, so you have to add them artificially. So that makes it somewhat more complex and more isolated, and the isolation is not good because the individual bandmembers often don't feel as connected as they would in an open environment. The advantage, of course, is that you can get all sorts of gain with a person who doesn't sing very loudly, or with a person whose mix is radically different from the one next to him."

Mike Prowda is hoping that new technology will address the issue of perceived isolation and is waiting for advances in the technology. "Right now I feel we've hit a ceiling on that [earpiece and transceiver] hardware," he says, though he has no complaints about the reliability of the Garwood equipment he customarily uses. Prowda notes that AKG is reportedly testing new in-ear technology that can reproduce electronically the directional and spatial cues normally created by the outer ear. "It'll give you more a sense of space and what's around you," he

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says. "That sounds pretty exciting."

Bill Head notes that among the positive aspects of in-ear monitors are effective freedom from feedback. But he wonders whether in-ear monitors are a health hazard. "The bands that I've dealt with, with ear monitors, are extremely loud," he says. "Guitar players still don't want to turn down onstage, so you've got to really slam it to them in their ears—I just don't think it's a real healthy thing. One drummer that I worked with wanted his cymbals slamming in his ears. Finally I went up to him and said 'I'm not responsible for any hearing loss.' That's when he finally decided to cut down on the cymbals a bit."

Even when an artist uses ear molds, Head always sets up wedges. "I make sure there's some kind of wedges happening because they also want to feel it. That's part of playing live," he says. Head also notes that a strategically placed wedge is essential for the traditional one-foot-on-a-monitor-cabinet rock star pose. "One way or another you've got to lug wedges around," he laughs.

### FUN WITH WEDGES

Many of those interviewed mentioned a welcome trend in monitor wedge capabilities. "The newer wedges that are out are much better than what we've had in the past," says A-1 Audio's Bryan Clements. "Even when they're flat without EQ they sound good off the bat. And they get quite loud." Clements particularly complimented the EAW SM Series wedges. "I think those are wonderful, particularly for vocals, but they sound nice and fat for other things as well—you can put bass and kick drum through them and make them sound really nice." He also noted that the new Martin wedges "are particularly good for loud rock 'n' roll." Scott Scherban has also been working with Martin LE700 wedges, of which he says, "They're easy to get a lot of volume out of quickly and their dispersion horn gives even coverage over a wide stage area." Don Dome speaks highly of the DML 1152, a dB Sound version of the Electro-Voice Deltamax wedge. dB Sound also fields the CPM, a custom-built monitor that contains a 12-inch woofer and a 2-inch HF driver. "I think they're comparable with the Clair 12AM," says Dome, "and I happen to like that."

Monty Carlo, perhaps not surprisingly, likes Audio Analysts' wedges. "We've got new single-12 monitors that

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## LIVE SOUND

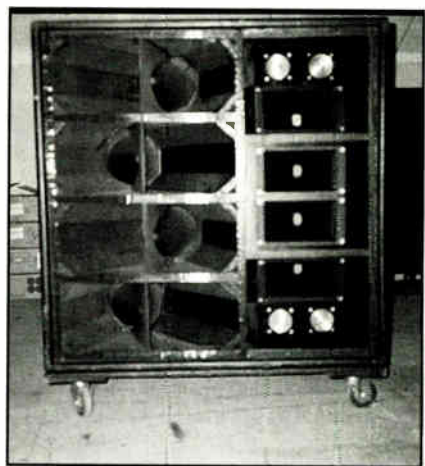
them, and we're very pleased and fortunate to have someone of his caliber on our staff and as a director of the technical department."

### BASS: THE JSI TRADEMARK

Berryman developed JSI's new proprietary speakers, the J30 Series theater system. The cornerstone of the series is the J33, a three-way, horn-loaded box. The boxes feature close-fit woodwork over the cones and contain 12-inch speakers, which Berryman prefers over the 8- or 10-inch for their output capabilities in the 200Hz range. The J31 subwoofers hold a pair of 18-inch drivers arranged in a push/pull position for distortion reduction. There is also a single 18-inch speaker in a box version of the J31, called a J35.

The real trademark of JSI since the beginning has been the low end. The precursor to the J61 and J31 bass bins was the J1, which was designed by Berryman on his kitchen table in 1973 using a brand-new S160 Hewlett-Packard calculator (which he still has to this day!). "We've always been really strong on computer-aided design, and we have proprietary programs that we've been working on since the early '70s," says Berryman.

The J61 subwoofers were designed to be flown, but the opportunity to do so hasn't come up much, because they need to be flown directly above center stage, which is where lighting companies usually want to set up. They did have a chance when Adams opened Vancouver's new GM Place, with a very positive response. "Now that we're affiliated with Westsun," observes Berryman, "one of the areas where we want to innovate is by making cooperation between lighting and sound a reality, because there is traditional antagonism



J63 enclosure

between those two crafts. We feel that the artists don't necessarily benefit from that, and that they would be much better off if we could establish some synergy between the two. That's what we're trying to do."

JSI has likewise been successful with its stage monitors, also designed by Berryman. Called the J17 Series, the units incorporate a low-profile, high-power output for their size and use a low-diffraction design—in other words, the cabinets are built so as to minimize reflections. "The result is that we end up with a wedge that really takes very little equalization and goes quite loud," says Berryman. "It's very pleasing on first listen—you can plug it in and turn it on, and it sounds good." Berryman estimates that the company has sold about 1,500 J17 monitors outside. "For sidefills in our monitor rig we just use our J30 system," he adds.

Besides the acoustical and performance aspects of a J30 or J60 Series system, Berryman has ensured that attention was paid to the rigging design of the boxes. They all incorporate a steel band that goes around the inside of the box, so they don't rely on wood for rig-



Jeff Lily (left) and Jeff Berryman at JSI



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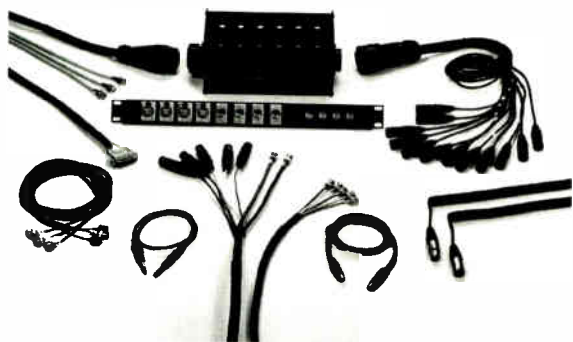
frequencies, with custom frequencies available. This crystal-controlled system utilizes three widely-spaced frequencies that allow the user to instantly select a clear channel in the event of interference. You'll feel confident recommending a system that's designed and built in the U.S.A. with our exclusive 3-year warranty. And behind it all is our reputation for reliability and performance. Just what you'd expect from a sound company like Telex.

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really sound nice and don't require a lot of EQ'ing," he says. Fred Jackson, though now independent, also speaks highly of former employer Audio Analysts' monitors. "Some people call it too heavy, but it works and does what it's supposed to do," says Jackson, who also cites the Clair 12AMs "for clarity and cut." Of off-the-shelf monitors, Jackson says that "Turbo and EAW are fine until you get to a certain level. I find the boxes themselves start resonating at certain frequencies, and they become a problem to control at high level."

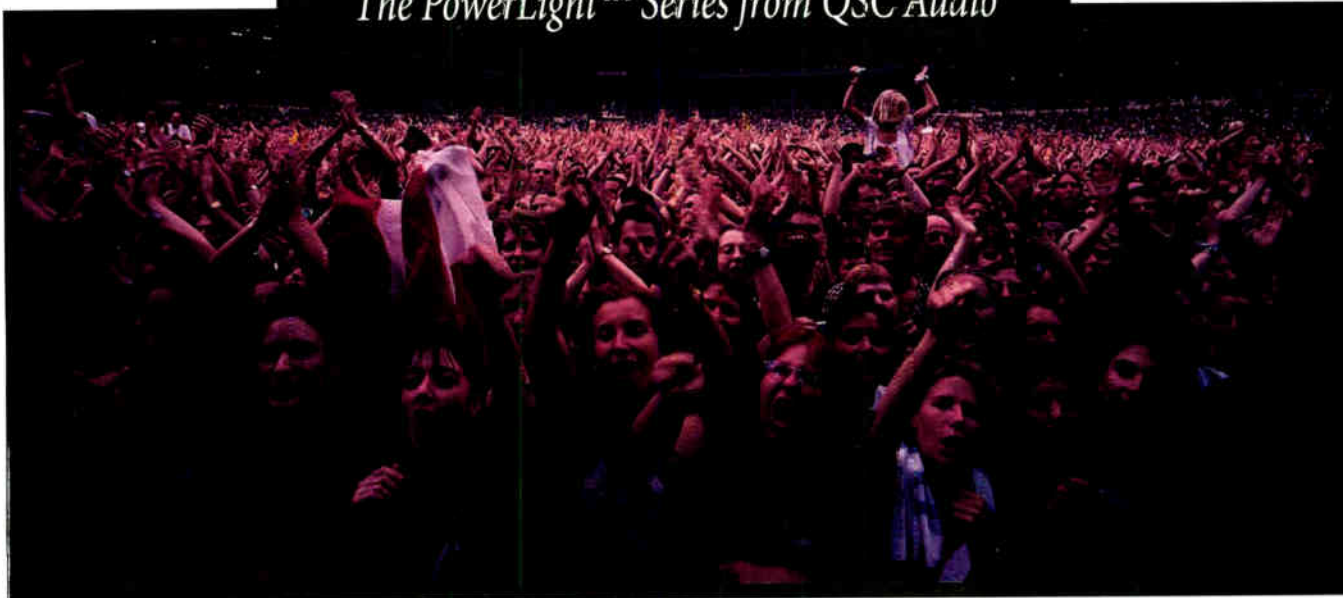
### DYNAMIC PERFORMERS

Several interviewees noted that artists now commonly expect a full complement of effects treatments in the monitor mix, and many make use of relatively exotic outboard gear once found only in the studio or the FOH effects rack. Mike Prowda has been using an ATI Pro<sup>6</sup> mic pre/EQ/compressor module on David Bowie's Shure Beta 58A and has also used Summit and Drawmer 1960 compressors. "People may see them in a monitor rack and think that's a bit excessive," he says, but he points out that in-ear monitor mixing calls for careful control of dynamics. "It's re-established my interest in mixing monitors," he says, comparing the task to "going back to my house chops. Everybody has a full mix, and to pull it off and remain within the parameters of the equipment, it's really important that you pay attention to the dynamics within the mix. If the guitar is too dynamic or there's something jumping out of the mix, it's going to throw your whole mix off. It's even more critical with in-ears because one thing at a particular frequency—a hi-hat hit, say—can cause the transmitter to over-modulate." Prowda uses Aphex Dominators to cope with gross peaks on the buses, and also inserts individual channel compressors as needed.

Mike Brady points out that many musicians may not be aware of the full dynamic range of their instruments. "We have systems that are capable of putting out a whole lot more power and transients than they're used to," says Brady. "And certainly with earmolds, that's a big consideration. While you'll use a protective limiter on a mix for an earmold system, in order to get a fairly even mix, I find myself using compressors on things that I normally wouldn't have to in a floor monitor situation."

—CONTINUED ON PAGE 234

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# SOUND CHECK

## THE STATE OF THE ART IN LIVE SOUND CONSOLES

As winter closes in and sound company owners huddle around their bar graphs and pie charts to plan for the coming year, thoughts inevitably turn toward new consoles. Regional companies may lust after that shiny new desk that will give them a leg up on special events, larger festivals and bigger one-offs. National touring firms need newer console technology to attract big-name artists and finicky engineers. But it can be hard to finance an extra board on top of other lease commitments and regular overhead, especially if the new console is not on the road every week.

Rather than find themselves depreciating a late-model console that may soon be rendered obsolete, some touring vendors choose to rent the big-ticket mixers from third parties. A fluid market in console rentals has sprung up, and cross-hires have made it easier to share the expense of ownership. This trend has created a market for newer consoles as separate profit centers, rather than as part of systems, which typically generate a lower return relative to investment



*Allen & Heath GL4000*

sooner a console has paid for itself, the easier it is to replace with a still newer one and stay competitive.

Today, the cutting-edge in live sound mixer technology is more often found in theme parks and Broadway theaters than in the back of an 18-wheeler. And as long as sound designers continue to specify increasingly complex signal control requirements, more and more powerful and sophisticated consoles will appear to meet those needs. Here are some new developments in 40-plus-channel consoles suitable for touring appli-

live sound.

Allen & Heath has enjoyed success with its multimode budget consoles, gradually leapfrogging its products forward with better specs and more features. The company's newest console is the top-of-the-line GL4000, which is a GL4 upgraded to compete with serious touring consoles. A 32-input GL4000 lists for about \$14,000 and can be expanded to 48 inputs in 8-channel sections (\$2,500 per section). The GL4000 retains the eight groups and 10 auxes of the GL4 but has four matrix outputs instead of two. The last aux send on each channel can be switched to control the direct out level. There are 127 MIDI-recallable mute scenes, and the EQ has a wide or narrow Q switch on the mid-bands. The inserts are individual send and receive jacks. A new PSU has been designed that works with the PSD dual-supply controller and monitor. There is improved metering on all inputs and a new heavy-duty fader is used. For monitoring applications, the talkback mutes the solo wedge mix for feedback control at the desk. As a mixer that can be used either as an 8-bus FOH board or as a 10-mix monitor desk (or as a combination of both), the GL4000 offers a lot of bang for the buck.

—CONTINUED ON PAGE 118



*Amek Langley Recall*

cost. By purchasing a highly rentable console, a company can funnel funds into capital investment that would otherwise go to other companies in rentals. And the

cations (some more suitable than others), and takes a look at the near future of mixer technology for

**BY MARK FRINK**

## TOUR PROFILE

# THE WHO

*Rock 'n' Roll and Theater Collide in "Quadrophenia"*

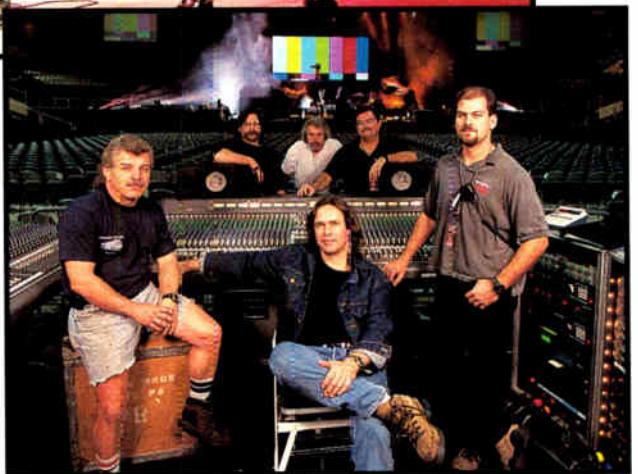


L to R: John Entwistle, Roger Daltrey and Pete Townshend

Nineteen ninety-six might very well go down in the annals of concert lore as The Year of Reunion Rock. Concertgoers had a plethora of choices in this regard: the Sex Pistols, Foreigner, Kansas, REO Speedwagon and Kiss all left their scent on arenas across the country. It's only fitting that the band battling cleanup would be one of the grand-daddies of raucous arena shows: The Who. But this was no rote performance of greatest hits. Pete Townshend mounted the ambitious staging of The Who's 1973 release *Quadrophenia* in its entirety.

I greeted the news of Townshend's endeavor with excitement and trepidation. *Quadrophenia* is a lyrically and musically complex work. The album explores the world of a character named Jimmy and the collision of conflicting emotions within his fragile teen psyche. The melodies mirror the ranging emotions of the lyrics, from the acoustic strains of "I'm One" to the thundering brass of "5:15." I was concerned that these musical and theatrical elements would be difficult to present in a large venue. When the show *Quadrophenia* made its way to the San Jose Arena in October 1996, I found that my concerns were for naught.

The stage version of *Quadrophenia* successfully walked the line between rock concert and theater. A video narrative by an actor playing Jimmy was projected via laserdisc



The Who crew: In the rear, L to R, are monitor mixing engineer Andy Sottile, technician John "Collie" Collins, monitor mixer/system engineer Rex Ray. Front: "Stagemeister" Tom Foehlinger, front-of-house mixer Dave Kob and front-of-house engineer Don Garber.

onto a huge screen that served as the stage backdrop, with corresponding audio fed to the P.A system. The on-stage performers included a 17-piece band: two keyboardists, percussionist, 5-piece horn section, two backup vocalists, Zak Starkey on drums and, of course, Roger Daltrey on vocals, John Entwistle on bass and Townshend on acoustic guitar. Simon Townshend, Pete's brother, handled the electric guitar duties and sang the part of the Bus Driver in "Dirty Jobs." Also pitching in on

vocals were Gary Glitter and Billy

BY MARY COSOLA

—CONTINUED ON PAGE 128

# JASON SOUND

## *From BTO to Bryan Adams (and Beyond)*

Jason Sound, located in Vancouver, B.C., began in 1973 as a one-system sound reinforcement company that hooked up with local bands such as Bachman-Turner Overdrive and Chilliwack, doing tours mostly throughout western Canada. Since then, Jason Sound Industries (JSI) has grown to a three-system company with more than a dozen full-time employees, providing touring sound support for an impressive list of hometown Canadian artists such as Kim Mitchell, Colin James, Burton Cummings, Loverboy and Bryan Adams, as well as international stars, including Peter Tosh, Julio Iglesias, Bon Jovi and Joe Cocker, just to name a handful.

But it was not always easy. After BTO became hugely successful in a short period of time, for example, JSI lost the contract to Clair Bros. But in late 1975, Clair Bros. had to pass on BTO because of a conflicting commitment—an Elton John tour—and...

"We were able to hit it off with him and his organization and have toured everywhere that Bryan Adams has toured since 1983—and will continue to do so," says Lily. Adams, of course, rose to international stardom, which put JSI on the map, and since 1992, JSI has established relationships with Sara McLachlan, the Tragically Hip and, recently, Crash Test Dummies.



PHOTO: TIM MOSHANSKY

Technical director Jeff Berryman with J33 boxes



Jason Sound's rig for Bryan Adams

"When BTO came back to us, we were a little more advanced and had been in business for a couple of years," says JSI founder Jeff Lily. "We decided to take a gamble and make the investment, borrowed money and built a system for BTO and went on tour with them from 1976 to '78. We designed and built a system pretty much from scratch." During that tour, the company met most of BTO's support acts, which led to relationships with some that lasted many years, Trooper being one example. Lily estimates that from 1977 to 1980, JSI was handling 50 percent of the Canadian tour business.

In 1981, when recession hit and the music industry took a beating, JSI's owners decided that they needed a "bread and butter client," someone along the lines of Bryan Adams.

"The other part of the history," recalls Lily, "is that we gradually learned over the years...that the nature of this business is capital-intensive. If you're going to buy a piece of [equipment] and rent it out over a period of time, you need to have a lot of different avenues to various capital. Because the nature of the music business is very cyclical, you can't just debt-finance an operation like this. By that I mean just going to the bank and taking out term loans, because the cash flow is not predictable enough. Look at any survey of sound companies, and you'll see that the percentage of revenue earned in the summer months is greater than the rest of the year. Convincing financial institutions of that sort of reality is very difficult, especially when they don't know anything about your industry. They've never even heard of your industry.

"We were able to keep up to a fair degree," he adds, "but we could see that our ability to finance our projects was hitting a dead end. We were only capable of raising certain amounts of money, and the demands kept getting greater and greater for larger investments."

Around 1993, Westsun, another local touring company—known mostly for its lighting support—began talking to JSI about similar capital problems. In 1995, Westsun offered to buy out JSI, while still allowing them

to operate independently as a subsidiary with the same name and

BY TIM MOSHANSKY

people in charge. The union took place in February 1996.

#### COMPETITION IS FIERCE

Lily says the competition for arena tours is very high, with the bulk of it coming from major U.S. players such as Showco and Clair Bros., and that there are plenty of Canadian companies (notably Vancouver's Cayenne Sound and Rocky Mountain Sound) that can compete on the theater-size venue circuits. "Competition is fierce," he says, "because while we don't have a lot of new players, there are a number of larger companies who continue to quietly expand. The number of systems that Clair and Showco can deploy compared to a couple years ago has gone up considerably. Also, there is no question that the number of arena headliners has gone way down. We're a very small company; we've just put together the third system, and it hasn't affected us yet but it's certainly going to."

One factor that has helped keep JSI afloat is the unusual set of skills that technical director Jeff Berryman brings to the company. A folk music fan and bass player in his youth, Berryman became interested in the problems associated with generating low frequencies. Also, one of his earlier jobs in the late 1960s was in the computer center at the Pentagon. In 1970, Lily, who was then managing and mixing for a band, was in a music store asking the staff why he had to mix from beside the stage. Berryman also happened to be in the store and offered to help Lily work out a solution. A few years later, Berryman became a founding member of JSI. To this day, he designs and oversees the construction and use of all of their systems.

As early as 1973 Berryman was running horn loudspeaker simulations on the mainframe computer systems at the University of British Columbia in Vancouver, where he was a senior systems analyst in the computer center. Although Berryman has been a part of Jason Sound since the early '70s (he calls it 20 years of moonlighting), he has been a full-time staff member for only the last four years.

"His unique combination of interests in sound, music and acoustics, with his knowledge of computing, was perfect for this industry," says Lily. "There's only a handful of people in the Western world that we know of who have similar skills, and these are well-known loudspeaker designers. He's one of

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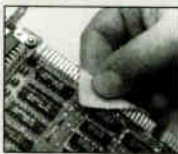
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### LIVE SOUND

them, and we're very pleased and fortunate to have someone of his caliber on our staff and as a director of the technical department."

#### BASS: THE JSI TRADEMARK

Berryman developed JSI's new proprietary speakers, the J30 Series theater system. The cornerstone of the series is the J33, a three-way, horn-loaded box. The boxes feature close-fit woodwork over the cones and contain 12-inch speakers, which Berryman prefers over the 8- or 10-inch for their output capabilities in the 200Hz range. The J31 subwoofers hold a pair of 18-inch drivers arranged in a push/pull position for distortion reduction. There is also a single 18-inch speaker in a box version of the J31, called a J35.

The real trademark of JSI since the beginning has been the low end. The precursor to the J61 and J31 bass bins was the J1, which was designed by Berryman on his kitchen table in 1973 using a brand-new \$160 Hewlett-Packard calculator (which he still has to this day!). "We've always been really strong on computer-aided design, and we have proprietary programs that we've been working on since the early '70s," says Berryman.

The J61 subwoofers were designed to be flown, but the opportunity to do so hasn't come up much, because they need to be flown directly above center stage, which is where lighting companies usually want to set up. They did have a chance when Adams opened Vancouver's new GM Place, with a very positive response. "Now that we're affiliated with Westsun," observes Berryman, "one of the areas where we want to innovate is by making cooperation between lighting and sound a reality, because there is traditional antagonism



J63 enclosure

between those two crafts. We feel that the artists don't necessarily benefit from that, and that they would be much better off if we could establish some synergy between the two. That's what we're trying to do."

JSI has likewise been successful with its stage monitors, also designed by Berryman. Called the J17 Series, the units incorporate a low-profile, high-power output for their size and use a low-diffraction design—in other words, the cabinets are built so as to minimize reflections. "The result is that we end up with a wedge that really takes very little equalization and goes quite loud," says Berryman. "It's very pleasing on first listen—you can plug it in and turn it on, and it sounds good." Berryman estimates that the company has sold about 1,500 J17 monitors outside. "For sidefills in our monitor rig we just use our J30 system," he adds.

Besides the acoustical and performance aspects of a J30 or J60 Series system, Berryman has ensured that attention was paid to the rigging design of the boxes. They all incorporate a steel band that goes around the inside of the box, so they don't rely on wood for rig-



Jeff Lily (left) and Jeff Berryman at JSI



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ging. Both Lily and Berryman are responsible for some of the design of the boxes, with the finishing touches added by consulting engineer Ron Clough. "Our flying systems are pretty well-known for being really fast getting up," says Berryman. "The J30 Series has been optimized for use in theater-sized venues and was designed with a lot of flexibility. In theaters, what's usually the scarce commodity is the number of rigging points." Two J31 boxes can be attached by custom hardware so that they can be picked up by a single point on the spine, then swiveled or tilted as needed.

Berryman, as always, is looking to the future of sound reinforcement, and he sees computers playing a larger role than they do currently. "For us, the biggest focal area is using computers to make the system sound better," he says. "We want to give the operator stronger tools for adjusting the system and to deal with the complexities associated with that. We would like to have the ability to adjust the different levels and delays of all our loudspeakers using computers; we want to give the operator computer readouts that tell what the sound is like at different parts of the venue, and we'd like to go wireless in a lot of cases, so he or she can adjust things.

"We'd also like computers to help people get things more consistent from night to night using memory settings as a starting point. If you look at adjusting a sound system to sound good in a venue, the first 75 percent of the job is fairly routine, and the last 25 percent is where the art is. Most people don't even get there because they don't have time. We're interested in using computers to help reduce that setup time, and to just help manage the complexity of large sound systems.

"Also," Berryman continues, "computers can play a big role in fault detection. There's a lot of things a power amplifier can deduce about a loudspeaker if it has some computer brains associated with it. Even if it's a 'soft' failure where the speaker hasn't really stopped working, but isn't working well enough. We need to detect those more, and it will help keep our quality up on the road in long tours when we don't have time to check out everything." ■

*Tim Moshansky is a freelance writer and publisher based in Vancouver, B.C.*

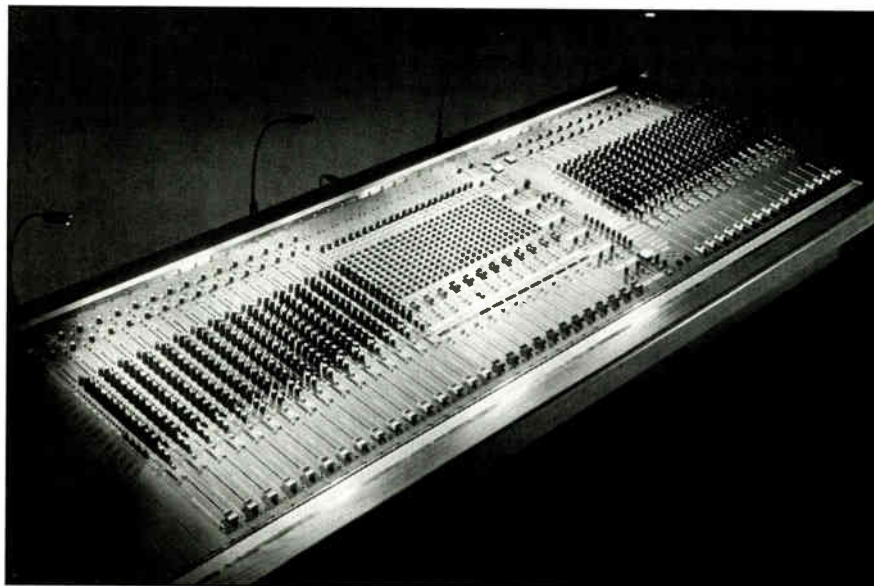
—FROM PAGE 112, TOURING CONSOLES

Amek's Langley Recall console caught on in touring circles this year. The Recall is available in two frame sizes, either 40 or 56 inputs (around \$70,000 and \$85,000, respectively), and stereo inputs can be swapped in for an additional \$58 per channel. The Recall has eight subgroups, eight VCA groups, eight mute groups, eight matrix outs and 12 aux sends. The sweepable 4-band EQ has switchable Q on the mids and switchable shelving for highs and lows. Snapshot automation includes the on/off switches for aux 1-2 and the mute switch on each channel, along with the grouping of audio, VCAs and mutes. Showtime software (runs on a 486 PC) allows operators to step through a cue list, changing VCA levels and the automated switches, along with firing MIDI messages. Knobs and switches are not all "automated," but their positions can be charted and stored; an onscreen template provides a cost-effective way to reset the board in a few minutes. Visual FX software allows certain digital effects to be controlled from the computer, as well as via sys ex commands. Another novel feature is the Virtual Dynamics software, which can take control of each channel's VCA with a dynamics algorithm offering gate, compressor or limiter effects. The option of using onboard dynamics for every input on the desk adds up to a lot of free inserts.

Newly introduced for the Recall is the Matrix Expander System, a control-surface that takes the space of several input channels and connects to rackmount matrix units to derive additional mixes. Borrowing technology from Amek's digital

console, the Matrix Expander has two columns of eight rotary encoders, each with 31-segment radial LED displays to show position, and a 10-character alphanumeric label for each "soft-pot." The rackmount units are 16x16 audio matrices, so that three can derive an additional 16 mixes from a Recall, with resettable scenes for each mix. The Expander's control surface will also access the Virtual Dynamics to provide knobs for adjusting parameters instead of having to use the cursor on the PC screen. Not yet priced, the Matrix Expander System will be available in early '97.

Audio Toys (ATI) has been making the Paragon (\$74,000 list), the original "no-compromise" large-format desk, for some time now. A 56-input version has 40 mono inputs and eight stereo effects returns, plus 16 subs and auxes, eight VCAs and a VCA master, four mono and four stereo matrices. Each input has a built-in compressor and gate. High-voltage mic pre's, heavy-duty switches, P&G faders—this is one well-built, well-thought-out mixing tool. A handy collapsible console stand is convenient and replaces "promoter supplied" folding tables. The three-way lighting scheme makes it attractive and pleasant to use. Owners who bought early will enjoy many more years of trouble-free use from this sturdy desk. Expect to see a new console from ATI in '97, code-named "Paragon II." The upper mic pre/EQ/dynamics module will remain largely unchanged but will be narrower in order to allow more input strips in the same-size frame, perhaps 52 instead of 40; the frame will have a lower profile, useful for those stuck mixing in the balcony. There will be major changes to



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## FULL AUTOMATION GETS CLOSER

Imagine the day when you can walk up to a festival FOH desk, insert a disk and have the band's input list appear on the board with all routing and control in place. Well, that day is closer than ever.

Stan Miller recently put the Yamaha ProMix 01 digitally programmable mixer to the test during Neil Dia-



Soundcraft Broadway assignable console

mond's tour. Miller uses a PM3500 front-of-house console for Dia-

mond's vocals and for routing instrument mixes and effects returns from the 01s. Two PCs with IQS SAMP software allow Miller to control 13 ProMix 01s, the PM3500 (including MIDI mutes), the monitor PM3500M and all of the audio outboard equipment, plus send timecode to the

lasers and lighting for the show. The 13 rackmounted 01s eliminate the need for a conventional large-format analog mixer and provide repeatability and automation for those channels.

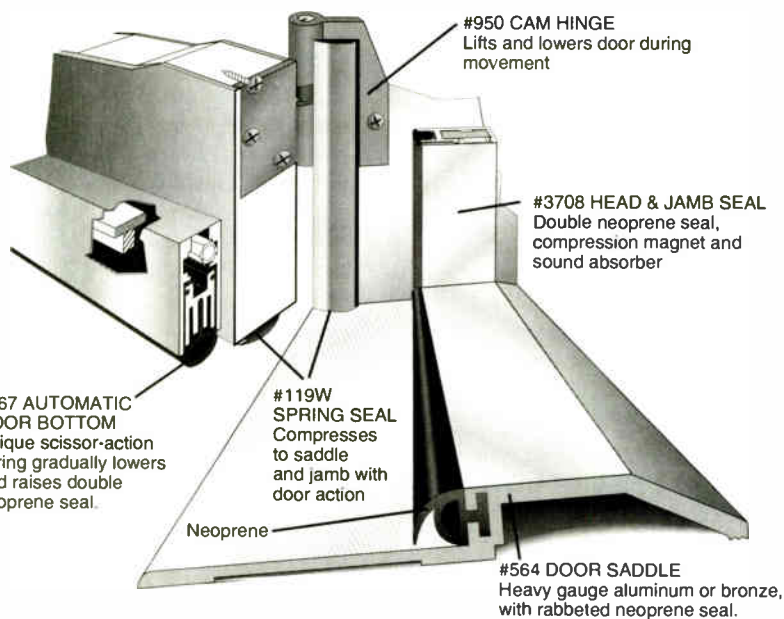
Miller's goal was to have the ability to control the entire show and create mixes, presets and cues during soundcheck, just once, and store them for use during the tour. During the show, Miller makes level adjustments for each instrument as needed, un-mutes song starts, effects sends and returns. EQ changes can be automated on the 01s via sequential cue changes stored in SAMP. Miller can literally program the entire show in his hotel room if he wants.

With SAMP software, up to 16 ProMix 01s may be controlled at one time. The 01 has 16 mic inputs on motorized faders, eight with phantom power and XLRs, and 3-band EQ. There are also two digital effects processors and three programmable compressor/gates onboard. Snapshots allow storage and recall of all mix settings instantaneously. MIDI control enables real-time automation of all console moves when used with a computer. The 01 lists for around \$2,000 each, so 13 (or 208 channels), would be about \$26,000.

Clearly, Yamaha tends to innovate at the base of the marketing pyramid and then grow those changes into larger, more sophisticated products. Rumors of the "Project Orange" console indicate that we can expect an all-digital, large-format resettable console in the future.

When engineers ask, "Why can't I push a button and have my mix instantly recalled?" they may not have thought of the Euphonix CS2000 system. Popular in broadcast, sound-for-picture and commercial music circles, the CS2000 offers digital control of analog audio with instant Snapshot Recall™ and Total Automation™ of every function, including EQ and dynamics. A 56-fader CS2000 system comes with eight auxiliary buses, two stereo buses and 12 additional buses that can be configured into stereo pairs. Each strip on the control surface has two gain controls, two pairs of aux send knobs and two long-throw faders, each with pan. Any fader can be made a DCA (Digitally Controlled Amplifier) group master, providing greater ac-

—CONTINUED ON PAGE 126



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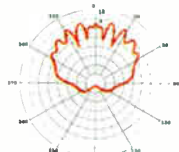
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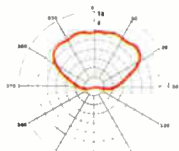
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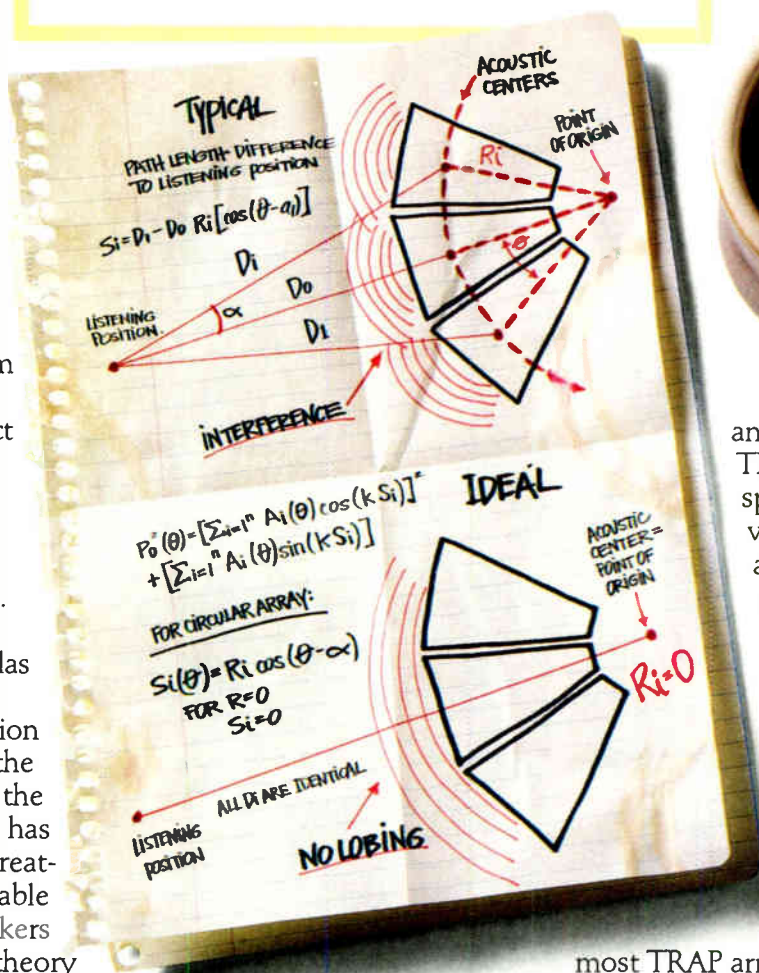
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**LIVE SOUND**

the lower deck to accommodate stereo buses and more routing options.

The new F-Type live production console from Cadac features a completely modular design that allows any of the five input module types to be placed anywhere in the compact (32-inch front-to-back) frame. The F-Type can hold up to 112 dual or single input channels featuring 4-band parametric EQ plus high- and lowpass filters and switched inserts. Sophisticated routing and configuration options enable users to set up the F-Type with up to 12 subgroups, 24 matrix groups and 16 auxes.



Top to bottom: Crest VX, MLX and GTX consoles

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The F-type uses the same automation as the J-type and Concert consoles; VCA and moving faders are optional. Integral I/O metering eliminates the need for a meter bridge, transformer-balanced outputs are optional, and there are dual-power and external PC connections for backup security. The first Cadac F-Type console sold in the U.S. was used for the Disney premiere of *The Hunchback of Notre Dame* and also at the Olympic Games Opening and Closing Ceremonies.

Building on the success of the GT and LM Century consoles, Crest has introduced three boards in the past two years. The Vx and GTX brought a new look to the line, with an integral meter bridge and LCR panning. Both consoles have eight audio subgroups and four mute groups. Other features include completely balanced internal bussing, dual insert jacks with balanced return, as well as a switch for the insert. The 4-band sweepable EQ has switchable high and low shelving, with switchable Q on the mids and variable highpass filters. The Vx also offers eight VCA con-

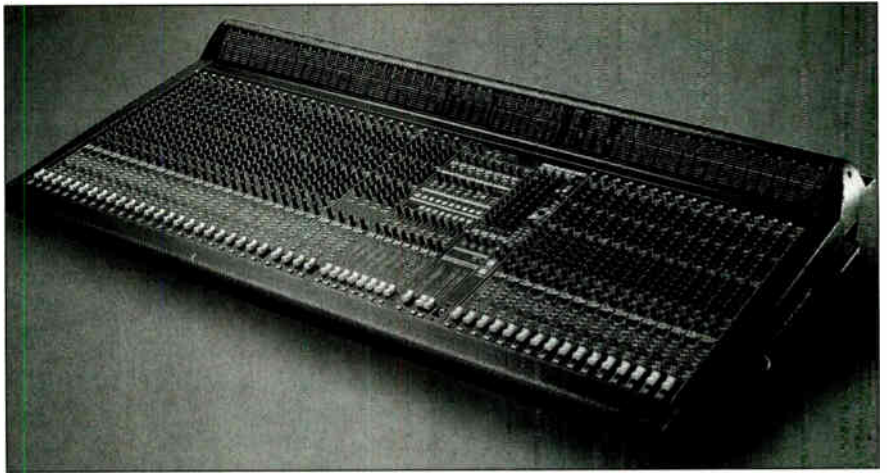
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trol groups and eight matrix outs instead of the GTX's two, although additional matrix modules can be added to the GTX in place of input modules. The 52-input Vx lists for \$48,700, with stereo modules available for \$145 each. The 52-input GTX lists for \$36,000, with stereo modules raising that by \$125 per channel. Both consoles are also available in 32- and 40-input frames.

The Crest LMx monitor desk was first shown at summer NAMM. This 22-output bus console has been designed from the ground up for in-ear monitoring applications, though the board is certainly flexible enough for other chores. Each input channel has dual-concentric controls for the first eight pairs of sends and individual controls for the last six. These can function as either 11 stereo sends with level and pan, 22 mono sends, or any combination of the two. Configuration for each aux pair is determined with the stroke of a single global switch on the corresponding output strip. Many manufacturers don't realize how cumbersome it is to quickly create workable stereo mixes without level-and-pan stereo buses—Crest has ably addressed the problem. Each of the ten group modules has a stereo 3-band sweepable EQ section for contouring in-ear mixes to taste. A dedicated stereo ambience mic input makes it easy to add room mics for in-ear monitoring without tying up input channels. A dynamics processor on this input automatically ducks the mics when there is program and opens them between songs. Numerous other features, like a built-in passive split, make this a choice console for in-ear operators. List for the 52-input version is \$49,800.

The newest console from Crest, expected mid-'97 and nicknamed the "Vx Heavy" (although we're not supposed to call it that), is a 16-aux desk with fully parametric EQ, eight mono and four stereo matrix outputs, plus micro-processor mutes and the ability to accept third-party moving faders. The 52-channel version is slated to list for \$60,000.

Mackie jolted the 8-bus live sound console market with the introduction of its 40•8 sound reinforcement board last NAMM. The \$8,995-list 40•8 finally began shipping this winter, and the larger 56-channel version (\$12,595 list) may be available by the time you read this. The 8-bus, LCR 40•8 console has eight auxiliaries and four matrix outs. In addition to 40 inputs with sweepable mids and an adjustable highpass filter, there are four stereo effects returns on



Mackie 40•8 console

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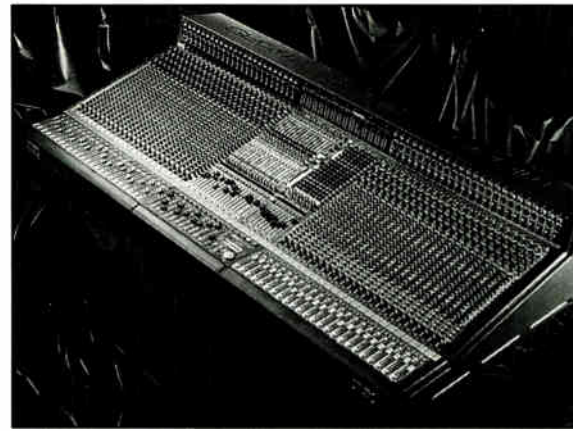
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faders with 4-band fixed EQ. Mackie has wisely forgone the TRS inserts found on budget designs in favor of dual insert jacks. UltraMute is Mackie's MIDI scheme for automating muting of group, aux and matrix outputs along with all input channels. "Fader Flip" swaps group and aux masters for use as a ten-mix monitor desk. Expect to see these consoles pop up at local festivals this spring.

Building on the success of the XL3, Midas had a ready and waiting customer base of top-name FOH engineers when it introduced the XL4 last year

(\$108,500 list for the touring package, which includes two PSUs, patchbay and road cases). Clearly falling in the "large" category, the XL4 has 16 groups and eight matrix outputs, along with 16 mono auxiliaries, plus four more stereo aux buses that share the main pan control. A fader "change-over" switch swaps the 16 mono aux buses with the group buses for monitoring applications. The XL464 comes with 48 input channels, 24 on each side of the center master section, and stereo inputs are available (\$1,400 list). There are an additional 16 inputs



Midas XL4

in the submaster section that can be assigned directly to the stereo mix bus or to the sub faders, and these can also be placed under VCA control. The automation can hold 99 scenes, with each scene capable of 99 subdivisions. Automation controls the motorized faders for the VCA masters, ten VCA subgroups and two grand-master VCAs, plus over 2,500 of the switched functions on the console, such as on/off, group assignments and mute switches. And, yes, Virginia, it sounds good.

The Midas XL-200 (\$43,100 list for the complete touring package), introduced over a year ago, offers regional sound companies looking for Midas quality a smaller feature set at a lower cost. The XL-200 comes with 40 inputs, four stereo inputs and four blank modules. Additional XL-202 stereo modules list for \$740. The XL-200's eight VCAs, eight groups, eight mutes and eight auxiliaries will satisfy many riders and offers an edge over older designs with similar features.

Ramsa's SX-1 is a 20-aux, ten-VCA, ten-matrix console. Available in a 48-input version with four additional stereo line inputs, the SX-1 can take up to 52 input strips in the largest frame size (\$69,900 list). Any number of additional stereo line inputs can be swapped for mono mic modules. For submaster grouping, a 20x2 matrix into the main stereo bus allows any auxiliary to become a submaster. The first six concentric aux pairs are "level-and-level," but the last four aux pairs can be "level-and-pan." A new fully parametric EQ circuit architecture uses extra op amps to provide gentler slopes and lower phase-shift. Unlike consoles with rows of switches or rotary selectors, inputs are assigned to VCAs and mute groups with an onboard processor and select scheme. Up to 128 scenes of MIDI-controllable snapshot automation record

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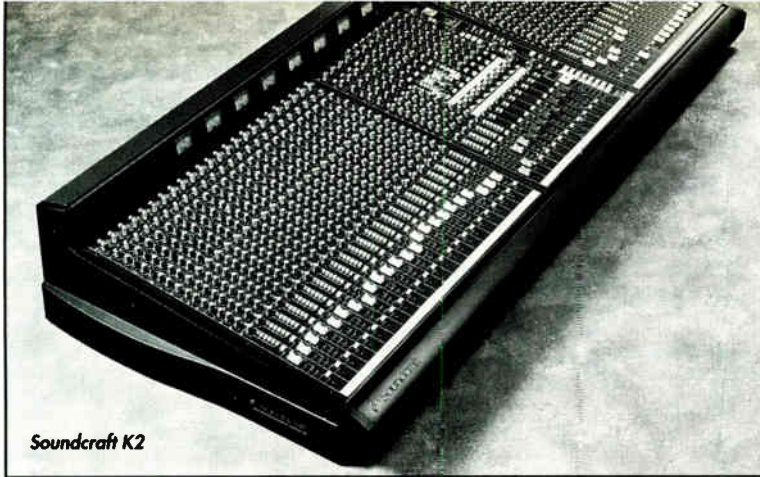
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Soundcraft K2

and restore all input fader levels, as well as grouping assignments and mute selection. This great-sounding console has flexible routing options and automation that may take awhile to appreciate.

By the time you read this, details of Soundcraft's VCA K5, not released at press time but showing at the Winter NAMM, will be public knowledge. Falling between the Europa and Vienna consoles, the K5 incorporates the new level of features found on '90s boards. The short list is ten VCAs, eight groups, 16 auxes—with four pairs configurable for stereo—and ten matrix outs. The EQ is fully parametric, and the mute scheme includes 128-scene MIDI control and eight manual mute groups. Please check this column for post-AES updates next month. This could be Soundcraft's most popular FOH console to date.

Soundcraft's K2 was shown at AES and is similar to the K3, but with semi-modular construction that has enabled very competitive pricing—a 40-channel K2 lists for around \$13,000. It comes standard with four matrix outputs and the same MIDI scene-set as the K3, but no MIDI fader. It retains the K3's monitoring and talkback facility. Other features include eight groups and auxes, with fader swap facility for ten-mix monitor applications, four stereo returns, LCR mix busing, LED metering on all inputs and a VU meter bridge for the outputs. The input combines the low-impedance design of Soundcraft's Ghost console with the range switch from the Europa. The EQ has swept mids and highpass filters, and the inserts are TRS jacks.

Recently seen in operation as an FOH submixer (opening act console) on the Soundgarden tour, is the best-kept secret in touring boards: Rugged and affordable, the Spirit 8 from Spirit by Soundcraft, (Auburn, Calif.) is a full-featured 8-bus console with built-in meter bridge and a 10x2 matrix. Available in 16/24/32/40-channel frames,

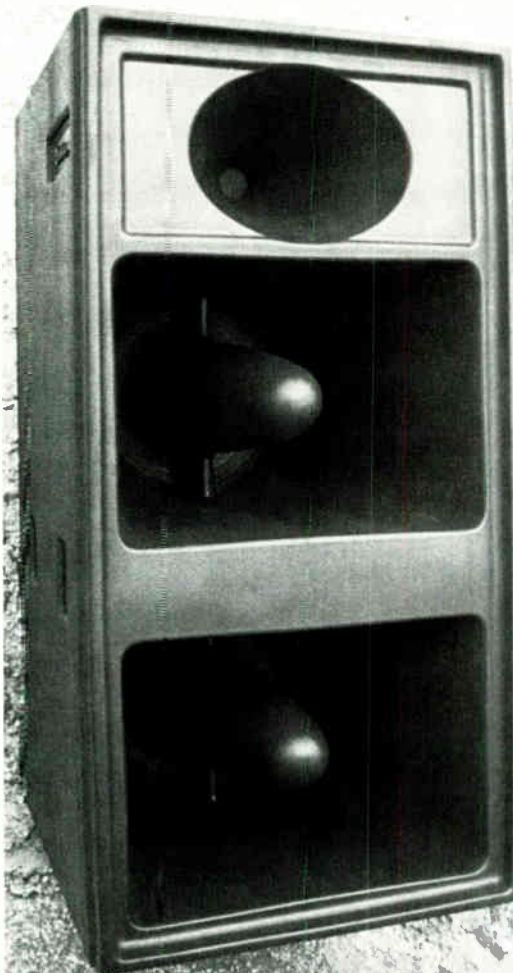
with up to 64 available inputs on a 40-frame, Spirit 8's modular input channels

offer 4-band sweepable-mids EQ (with EQ in/out switching), 100 Hz highpass filtering, six aux sends (each configurable as pre/post fader) and direct outs on all mono channels. Also standard are four stereo inputs, eight stereo returns (four with EQ), four mute groups and a "no-twist" all-steel chassis. A 40-channel board retails for \$8,299.

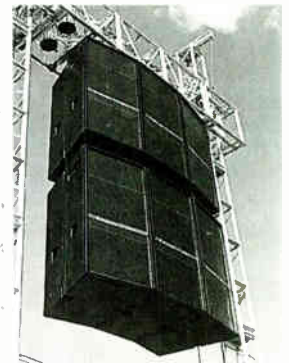
Yamaha's PM3500 console, introduced two years ago, enjoys widespread popularity in the touring market. In either the FOH or the monitor version, it comes standard with 48 mono channels and four stereo channels for \$55,000 list—\$20,000 less than the

—CONTINUED ON PAGE 127

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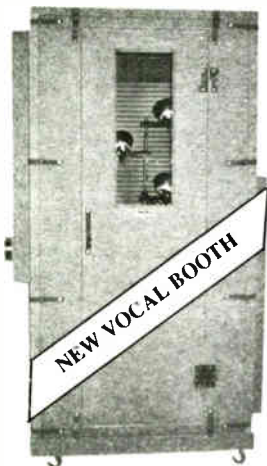
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—FROM PAGE 120, FULL AUTOMATION

curacy and none of the distortion problems found in traditional VCAs. The center section includes an active matrix color graphics screen for displaying EQ, dynamics and aux sends. Below that screen, a dozen rotary controls are used for making adjustments to matching onscreen controls. Besides the control surface, an accompanying 4-foot rack houses the electronics and PSU for the control surface, which must be located within 25 meters of the console. The dynamics come in 2U 8-channel units that list at about \$8,000 for each set of eight and tie in with the automation. Additional buses may be added with The Cube; a smaller rackmount card cage that allows additional auxes or mix buses to be added in increments of four. Each Euphonix system is custom-designed, but work done on one is compatible on others. List price is about \$200,000.

Soundcraft's Broadway is an automated, modular "virtual" mix system for digital control of analog audio over a network. Designed specifically for live theatrical sound, the Broadway was shown at the 1995 New York AES. Apparently, only one Broadway actually exists at present, but it is a hold concept and a gorgeous package. The flexible topology offers a comprehensive strategy for coping with the complicated configuration of control systems that contemporary sound designs demand and promises operational and ergonomic benefits not available with traditional large-format mixers.

The modular nature of the Broadway's audio racks allows for a large number of inputs, five main mix buses, plus 32 buses that can be designated as either groups or auxiliaries ("Graux"), and 20 or 40 matrix outputs. A 60-input starter system would list for about \$200,000, including cables and cases. Additional inputs can easily be added for specific productions, and extra input control surfaces might be rented-in for production rehearsals and programming.

The Broadway's basic building blocks are made up of two 2x3-foot control consoles for Inputs or Masters, connected over a redundant coaxial digital network to audio racks that can be located up to 300 meters away. The Input control surface has 20 moving faders, each with a meter, six assignable rotary encoders and an

eight-segment alphanumeric label. Above these "soft strips" is the Assignable Channel Strip, another bank of rotary encoders that represents all the controls for a single channel. This portion of the control surface can even be removed to travel throughout the listening area on a cable. Any combination of 20 inputs can be mapped to each of the eight display layers.

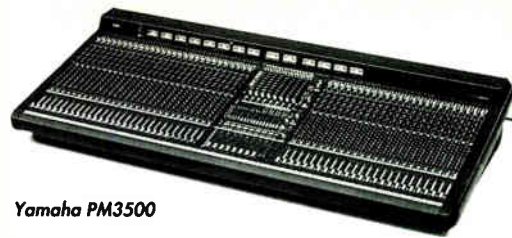
The Broadway's other control surface, the Master section, has eight faders for the 20 VCA masters, four faders for the five main mix buses, and the master faders for the matrix outputs or the group/auxiliary buses. It also houses a backlit, touch-sensitive screen and the CPU that runs the console and the automation. The software also runs on networked PCs to allow complete or partial control redundantly or remotely, say, at the audio racks. Future features will include optional dynamics modules.

Amek's year-old Digital Console performs all mixing operations in the digital domain, is based around a host PC, and features a flexible architecture, an assignable control surface and a touch-sensitive screen. The DSP Core audio rack is a large array of parallel 32-bit floating-point processors and works along with I/O frames that provide 20-bit A-to-D and D-to-A conversion. A modestly sized control surface can be designed flexibly in multiples of eight virtual channels, plus the central panel and monitor section with its Visual Display Unit (VDU). To the VDU's right are three spaces for the three parts of the virtual channel (Aux, EQ or Dyn). Each channel strip has a motorized fader, trim and pan knobs and a ten-digit alphanumeric label. Above that there may be one or two sections of a half-dozen rotary shaft encoders for control of aux sends, EQ or dynamics, depending on how the owner wants a unit assembled. Channels can control either inputs or outputs, and the assignments change with Fader Sets, 12 pages of which are instantly accessible via dedicated buttons below the VDU screen. Up to 160 inputs and outputs (four I/O frames) can be controlled, regardless of the size of the control surface. The screens displayed are grouped into related pages and selected with dedicated push buttons below the VDU or virtual ones onscreen. Full dynamic automation of faders, mutes and pans, plus snapshot

automation of all other channel parameters, is provided by the Supertrue Automation. As with AMEK's Recall, Visual Effects software allows control of digital effects by Lexicon, Yamaha and others over MIDI via sys ex commands. A simple 40-channel system starts at around \$150,000, and most of these systems are initially intended for broadcast and post, where much of the material is already digital.

Level Control Systems (LCS) introduced the RIF-280 80-channel remote interface for its SuperNova Series of modular digital mixing products. The "Riff" provides two rows of 40 motorized faders and four switches per channel to control mix parameters such as input levels, mutes, PFL, groups and matrix, all in a control surface that measures about 60x42 inches and lists for about \$80,000. An integrated LED meter bridge provides level information for up to 80 inputs and outputs. The combination of the RIF-280 and a number of LD-88 8x8 modular digital mixers (\$17,500 list) allows the creation of almost any mixing topology imaginable in a small package.

The future of mixing lends itself to a logical separation of mixing consoles into separate control surfaces, automation and processing. While there is currently more fruit on the analog tree for the money, increasingly affordable digital processing will begin to compete with digitally controlled analog. On the display end of things, the human interface, after it parts from the audio hardware, can start to take on virtual existence as heads-up display on goggles and data gloves. Console manufacturers will continue to hire more software engineers. Like other innovations in pro audio, virtual interfaces will be driven by outside industries. There will come a time when the advantages of a flexible virtual control surface will become more important to the next generation of engineers. By then, concert sound engineering may evolve into some Gibsonian technology that lets audio engineers with wireless data gloves and goggles eliminate the barrier between the audience and FOH by putting all the hardware backstage.—Mark Frink ■



Yamaha PM3500

—FROM PAGE 125, TOURING CONSOLES

PM4000. Modules must be swapped in blocks of four, with four additional stereo inputs adding \$1,690 to the price. The FOH PM3500 has eight VCAs, eight subs, eight auxes and eight matrix outs, with four of them being stereo. MIDI control of mutes allows automation of effects scenes. The monitor-version PM3500 has six concentric level-and-pan mixes, plus four mono aux buses and the main stereo bus, making it a candidate for in-ear applications. The success of the PM4000 and PM3500 consoles builds on the general acceptance of the PM3000, and it's likely that the familiarity and reliability of Yamaha consoles will keep them on many artists' technical riders. ■

Mark Frink, Mix's sound reinforcement editor, was working up his own version of a data glove but it was seized as evidence for the O.J. civil trial.

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—FROM PAGE 113, THE WHO

Idol playing the parts of the Godfather and the "ace face" Mod, respectively. The challenge for the performers and the crew was creating a theatrical rock production in which the anthemic segments rocked the building to its foundation and the introspective passages still tugged at the heartstrings of the fans in the far reaches of the arena.

"This show falls somewhere between a rock concert and what I refer to as 'The World's Loudest Play,'" laughs Dave Kob, front-of-house mixer for *Quadrophenia*. "We're really busy dur-

Kob mixed on two Yamaha PM4000 consoles. In addition to his usual Lexicon 480 reverb, Eventide H3500 Ultra-Harmonizer, TC Electronic TC 2290 delay, Yamaha SPX990 reverb, and Summit PLA100 and DCL200 limiters, Kob added some new processing gear for this tour. "I'm using a Lexicon PCM 90 that has some interesting reverb effects on it," says Kob. "And the new [TC Electronic] M2000 is nice on brass because you can do chorusing and reverb all in one unit."

For Entwistle's bass, Kob used the Crane Song compressor/limiter designed by Dave Hill. "John has a very esoteric, unique bass sound," says Kob.

"It has a huge dynamic range, from barely touching the strings to really nailing you to the wall. You have to use both a compressor and a limiter, and the Crane Song does both really well." A number of CAD microphones were used on the instruments. A matched pair of E-300s were placed for overhead miking of the drums. A matched pair of E-200s were used for the horn section. On the Townshend brothers' amplifiers were a pair of E-100s.

As far as the acoustics of the San Jose Arena go, most of the crew was satisfied with the venue's sound, but Kob noted that the room had a boomy low end that made it difficult for him to get a good, tight bass sound. And what about all that ice under the floor? "Oddly enough, the ice helps," says Kob. "For the show, it's covered with a cardboardlike substance that soaks up the sound better than a concrete floor does."

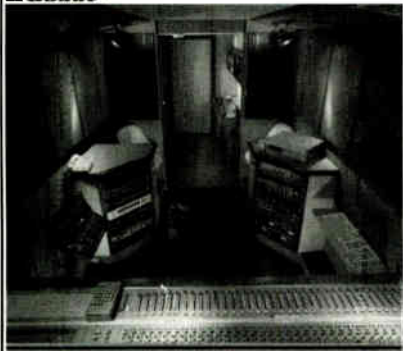
Working with Kob at the FOH position was engineer Don Garber. At the monitor mixes were engineers Andy Sottile and Rex Ray, who also served as system engineer. Tom Foehlinger rounded out the crew as the "stage-meister." Bobby Pridden, who has been coordinating The Who's live sound for more than 30 years, oversaw the monitor setup and orchestrated the sound-check, serving as liaison between the artists and crew.

Despite the theatrical nature of the show, the stage setup deviates minimally from that of the average large-venue show. The monitor mix setup included two PM4000 consoles, PLA100 and DCL200 limiters and nine reverbs: eight Yamaha REV5s and a Lexicon PCM 60, with a PCM 70 serving as a backup, all long-time favorites of Pridden. Daltrey used a Shure SM58, and I say "used" be-

—CONTINUED ON PAGE 233

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Daltrey and Townshend share a mic for an encore, "Behind Blue Eyes."

ing this show. It's 90 minutes of intense concentration, dealing with musical and video cues. The show has a lot of loud parts that are very busy, thickly orchestrated and difficult to mix. Then it'll break down to a passage that has a lot of dynamics and empty space. So at least sonically it's not a continuous rush."

The sound system for the *Quadrophenia* tour is provided by Clair Bros. The P.A. system is standard Clair Bros.: 56 S4 cabinets at 220 degrees (24 x P-series long-throw cabinets and 42 x F-series medium throws); R42s for delays, P/4 cabinets for front fill, and a TC Electronic TC 1128/TC 6032 graphic equalizer system. All of this is driven by Clair Bros. custom CTS (coherent transfer system) processors and powered by custom Crest amplifiers, with 9001s for low end (250 Hz and below) and 10001s for the mids and highs.

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# New Sound Reinforcement Products



## GEM SOUND AMPS

Gem Sound (Bronx, NY) debuts the PA750 and PA550, two power amps designed for continuous high-level sound amplification and dependable, low-heat operation in club environments. The PA750 provides 300 watts continuous into 4 ohms; the PA550 offers 275 watts continuous/4 ohms. Both models feature fan cooling, thermal and output protection circuitry, vented front panel and rack-mount chassis. The PA750 adds illuminated output meters.

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## QSC RAVE DIGITAL AUDIO ROUTER

QSC (Costa Mesa, CA) introduces the RAVE Digital Audio Router. Developed by QSC's Advanced Systems Group and Peak Audio, the single-rackspace unit routes multiple audio channels over standard Ethernet systems with no bit-rate reduction. Six RAVE models handle various digital and analog configurations, including 8- or 16-channel AES/EBU in and out and 8/16-channel D/A in and 8/16-channel A/D out.

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## EAW LA SERIES WEDGE

Eastern Acoustic Works (Whitinsville, MA) adds the LA215 full-range system to its LA Series. The LA215 is a two-way system designed for stage monitor and near-field P.A. applications, featuring a 15-inch woofer and a 2-inch compression driver on a proprietary Elliptical Conical Waveguide. The asymmetrical vented enclosure can be positioned horizontally as a floor wedge or stand-mounted or hung from its integral flying points. Maximum SPL is rated at 125 dB; the system is capable of 120 dB SPL continuous.

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## CYBERLOGIC NC-400/NC-005 AMPS

CyberLogic Corp. (San Rafael, CA) adds the 4U, 4-channel NC-400 Series Power System to its multichannel amplifier range. Using the same components as the 8-channel NC-800 Series, the NC-400 delivers 1,200 W/ch into 4 ohms (NC-412) or 700 W/ch into 4 ohms (NC-407). All CyberLogic amps combine individual field-removable power channels in a modular frame, so users can assemble multi-amp systems in a rugged, compact package. Power-Set™ programmable gain and voltage swing controls and calibrated 30-step attenuators are standard. The NC-005, a pure Class-AB amplifier (185W at 8 ohms), is suitable for powering HF drivers in bi/tri-amp configurations, and the amp is also available in a Power Frame system.

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## EV DELTAMAX EXPANDS

Electro-Voice (Buchanan, MI) has added two new speakers to its DeltaMax™ loudspeaker line and has upgraded all DeltaMax systems. The two new models are the DMS-1183/64 three-way system and the DMS-1181 single-18 subwoofer. Other DeltaMax models include the DMS-1122/85 and DMS-1152/64 three-way systems and the DMS-2181 dual-18-inch subwoofer system. All DMS DeltaMax systems have been upgraded with new drivers and horns (including rotatable horns in two models), new cabinet configurations and hardware, and upgraded electronics.

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## NEW SENNHEISER UHF

Sennheiser (Old Lyme, CT) introduces two rackmount UHF true-diversity wireless microphone receivers: the sin-

gle-channel EM3031-U and the 2-channel EM3032-U, which features an integrated antenna splitter. The units feature PLL synthesis, with 32 programmable UHF receiver frequencies within the 434-960 MHz range. Claimed frequency response is 40-20k Hz, and HiDyn plus® compansion noise reduction assures a S/N ratio of 100 dB. Both units are compatible with all Sennheiser UHF transmitters and include low-battery indicators when used with Sennheiser's SK50, SK250 and SKM500 transmitters.

Circle 217 on Reader Service Card

## GARWOOD SYSTEM 3

Garwood Communications (Newtown, PA) introduces the System 3 wireless in-ear monitoring system. Consisting of a 1U transmitter unit, belt-pack receiver and Garwood's IEM11 ear pieces, the system offers full stereo transmission on a single UHF frequency (six compatible operating frequencies are available). The transmitter's monitor section lets the operator monitor actual system output as the performer hears it. The unit also has an input level control and signal level indicators, a stereo/mono switch and a front-mounting antenna. I/O connections are balanced XLR or ¼-inch. The belt-pack's onboard noise reduction system ensures wide dynamic range. A 9V battery provides up to six hours of operation over a 300-foot range.

Circle 218 on Reader Service Card



# SPIRIT 8

THE EXTRAS COME AS STANDARD  
THE PRICE COMES AS A SURPRISE

Spirit 8 is a quiet, compact and rugged 8-bus mixing console, hardly surprising from a company with over 22 years of know-how in audio design.

What may be surprising is that it comes with every feature you could wish for, as standard, at a price\* that will make the competition wonder how we did it.

**DRAMIC\* PREAMPS**  
mono channels. An incredible 66dB of gain provides 28dB of headroom - enough to accommodate virtually any input signal, from the hottest line level electronics to the lowest level condenser mics.

**PHANTOM POWER**  
individually selectable on each mono channel

**H PASS FILTER** at 100 Hz with steep 18 dB/octave slope. Essential for combatting low frequency rumble and mic popping (mono channels)

**2-BAND EQ** with 2 swept filters on every mono input. ■ 2-BAND EQ on stereo inputs

**Q In/Out bypass** switch on every input

**AUX buses** with 6 controls. 2 of which are selectable pre- or post-fader at the master. Internal solderless jumpers can be accessed pre- or post-EQ for routing

**GROUP BUSES**

**MUTE GROUPS**  
scene setting

**Multi-tap PEAK/PFL indicator**  
**RECT OUT** on every channel allows multitrack recording or individual effects sends externally selectable pre- or post-fader for recording)

**MONO INPUT**

**DUAL STEREO INPUT**

**GROUP SECTION**

■ 8 STEREO RETURNS for additional stereo sound sources or effects units: 4 have EQ

■ 10 X 2 MATRIX section for additional mixes

\$4,299 **16**

\$5,299 **24**

\$6,399 **32**

\$8,299 **40**

\* Prices are 1995 US suggested retail

Also available:  
Spirit Live 3<sup>2</sup>-bus  
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**10 X 2 MATRIX SECTION**



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Fax: (916) 888 0480



**SPIRIT**  
By Soundcraft

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USE READER SERVICE CARD FOR MORE INFO

# PREVIEW

## DK-AUDIO MSD SERIES

DK-Audio (distributed by TC Electronic, Westlake Village, CA) announces a new electro-luminescence display with a 160° viewing angle and improved contrast and brightness, even in broad daylight. DK-Audio's MSD family of software-controlled audio test and display instruments offer stereo image and phase information, as well as PPM metering and FFT spectrum analysis.

Circle 226 on Reader Service Card

## Z-SYSTEMS 64X64 DIGITAL ROUTER

Z-Systems (Gainesville, FL) adds a 64x64 digital signal router to its Digital Detangler Pro family of products. Designed to work with digital audio signals (AES/EBU and S/PDIF), the new z-64.64r Digital Detangler Pro is an automated patchbay, router and distribution amplifier in one. Featuring 64 AES/EBU stereo pairs in and out, the z-64.64r allows users to interconnect all of their digital equipment and create and recall patch and routing configurations via the unit's remote control or a PC interface (Windows available now, Mac to come).

Circle 227 on Reader Service Card

## CABLETEK 4-CHANNEL DI

Cabletek (Port Coquitlam, British Columbia) debuts the Radial JD-4 4-channel, rack-mount passive direct box designed for large keyboard rigs and studio applications. Featuring Jensen Audio transformers and Mogami cabling, the Radial JD-4 also offers an HF filter to protect against supersonic output from keyboards, and phase reverse switch, ground lift, 15dB pad and stereo/mono summing on each channel.

Circle 228 on Reader Service Card

## ADA CABINET EMULATORS

ADA Signal Processors (Oakland, CA) announces the Microcab II stereo miked guitar cabinet emulator and the Ampulator, a power amp and speaker cabinet emulator, two single-rackspace units for studio/stage use. Microcab II accepts both preamp and power amp output levels via stereo inputs, and front panel controls allow the user to select various cabinet types and speaker arrays to emulate. Level control and clip indicator are provided as well as in/out switch for comparing emulated and direct signal paths. Stereo outputs are 1/4-inch and XLR at mic or line level. Ampulator eliminates the need to mic a guitar amp/speaker combination by emulating the sound of the complete setup.

Circle 229 on Reader Service Card



## E-MU SAMPLING SYNTHESIZERS

E-mu Systems (Scotts Valley, CA) has two new professional digital sampling synthesizers, the E4X and E4XTurbo. The E4XTurbo features 128-voice polyphony, 16 MB of RAM (expandable to 128 MB via 72-pin SIMMS), three CD-ROMs and a 1GB hard drive preloaded with 400 MB of sounds. The E4X has 64-voice polyphony (expandable to 128), 4 MB of RAM (expandable to 128 MB via 72-pin SIMMS) and a 540MB hard drive. Both models include a 18-bit dual stereo effects processor. The E4X and E4XTurbo are compatible with Akai S-1000/1100, Roland S-7000 Series, E-mu e-64, EIV, esi-32, EIII, EIIIx and Emax II sound libraries.

Circle 230 on Reader Service Card

## POWER TECHNOLOGY FX-PACK

Power Technology (San Francisco, CA) intros the FX-Pack 32-bit multi-effects system for PCs and Macs. The modular, 2U FX-Pack system can be configured with up to four DSP-FX effects processing cards, which are controlled from the PC via the DSP-FX graphical interface. With DSP-FX Version 2.1 software, users can now control eight DSP-FX systems from one PC.

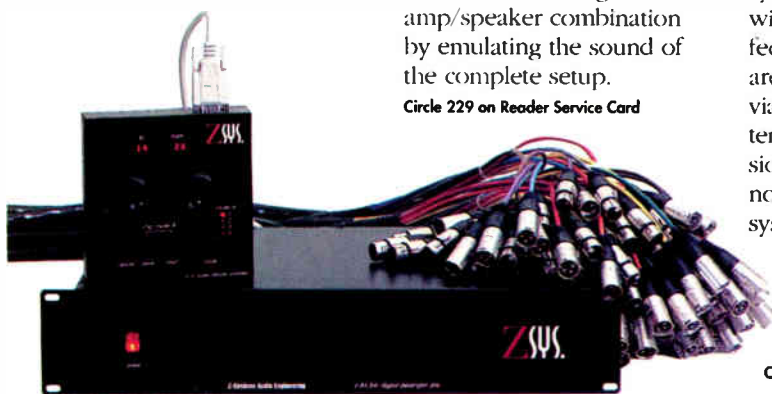
FX-Pack, which includes one DSP-FX effects card, will be available in early 1997 for \$1,229.

Circle 231 on Reader Service Card

## GROOVE TUBES "A REV" MICS

Groove Tubes (Sylmar, CA) upgrades its tube mics: The "A Rev" MD1A, MD2A and MD3A mics feature a dual-triode tube to lower distortion and increase dynamic range by 10 dB. Each complete mic package includes an upgraded PS2A power supply with a ground lift switch and adjustable polarization control for matching stereo pairs. The new PS2A can power two complete recording signal chains, each comprising an A Rev mic, a GT tube mic preamp and a GT EQ1 tube equalizer. The new GT Rev A mic systems are priced from \$1,195 (MD1A) to \$2,195 (MD3A). Current GT mic owners may upgrade their mics to A Rev status for a nominal fee.

Circle 232 on Reader Service Card





# PREVIEW

## NRG POWER PROCESSOR

NRG Research (Grants Pass, OR) offers the Power Processor, a device that converts any AC voltage in the world (80-300 VAC at 45-70 Hz) to 120VAC at 60Hz, regardless of variations in input voltage or frequency. Power Processor's six AC outputs are completely isolated, fully regulated and constantly monitored. Three models are available (desktop or rack-mount) for power levels up to 3,000 Watts.

Circle 233 on Reader Service Card



## SPACE STATION MIXING PLATFORM

City Music Fixtures' (Virginia Beach, VA) Space Station Mixing Platform provides a professional, functional equipment housing for smaller recording environments. Placed at eye level, the top-five-rackspace "towers" are adjustable and removable, locatable as separates in any environment or placed on a lower shelf. The main 46x30-inch platform accepts most smaller mixers, such as the Mackie 32•8 with meter bridge. Ten wire management locations allow for unobtrusive, organized cable routing. Finish is impact-resistant, black speckled melamine. Retail: \$499 plus shipping.

Circle 235 on Reader Service Card

## HOME RECORDING COURSE

The AudioPro Home Recording Course by Bill Gibson, published by MixBooks (Emeryville, CA), is the first of a two-book series on the basics of home recording. The 230-page text covers managing the signal path, EQ, dynamics and reverb, recording electric and acoustic instruments, mic technique and synchronization. Two included CDs contain more than 150 examples of audio effects and recording techniques. Retail is \$59.95.

Circle 236 on Reader Service Card

## APOGEE CD-R PRODUCTS

Apogee Electronics (Santa Monica, CA) announces the Apogee Recordable CD featuring gold Pthalocyanine dye, plus Apogee's own DataSaver resin protection layer. The Apogee CD•R is available in the 74-minute (650MB) format and also in a 63-minute format for older CD writers. Apogee's CD-R Pen answers the tendency of solvent-based permanent ink pens (such as a Sharpie) to shorten the useful life of recordable CDs (CD-Rs). The (\$2.99) CD-R Pen is a fine-point black marker with water-based ink suitable for writing on CD-Rs.

Circle 237 on Reader Service Card

## CLASSIC BLACKFACE 1176

Classic Audio (Lennox Hill Station, NY) has released the Classic Blackface 1176 peak limiter, a replica of the series "E" original. Based on an FET-driven, voltage-variable resistor circuit, the Classic Blackface 1176 exhibits the smooth peak limiting characteristics of the original 1176. Original parts are used where available and transformers are custom-wound to Classic specs. The Classic Blackface 1176 provides identical front panel controls to the original and the unit features balanced I/O.

Circle 238 on Reader Service Card



## AKAI DR8/DR16 UPGRADES

Akai Digital (Fort Worth, TX) announces new enhancements for the DR8 and DR16 hard disk recorders. The SuperView SVGA interface card connects the DR8/DR16 to a standard monitor and keyboard allowing for comprehensive display and keyboard-driven editing functions. Version 2.0 of the DR8/DR16 operating system offers many new features including manual punch in/out, backup to SCSI DAT and Exabyte tape drives, support for drives larger than 4 GB and a mode allowing users to save defined settings as templates.

Circle 239 on Reader Service Card

## RSP PROJECT X

RSP Technologies (Rochester Hills, MI) is shipping the Project X™ automated digital mixing system, which can be modularly configured for 32 to 64 channel inputs, and offers flexible, user specified I/O that may include AES/EBU, TDIF, ADAT and/or analog. All A/D and D/A conversion is 20-bit at 44.1 or 48 kHz. Dynamic range is stated at 110 dB. Comprehensive channel processing includes 4-band parametric EQ, high/low-pass filters, HUSH® noise reduction/gating, compression, delay and effects. Outputs include Circle Surround® 5.2.5™ encoding and direct links to MDMs.

Circle 234 on Reader Service Card



## PREVIEW

**WHIRLWIND MIC PRE/HEADPHONE AMP**

Whirlwind's (Rochester, NY) MD-1 battery-powered mic pre/line driver with headphone monitoring features a mic/line input switch and an input level control with a 40dB range and offers switchable 18V phantom power for condenser mics. Headphone monitoring can be pre/post the input transformer, and a level control with a 60dB range can drive headphones with mono impedances ranging from 30 to 600 ohms.

Circle 240 on Reader Service Card

**SUMMIT MPC-100A**

Summit Audio (Soquel, CA) introduces the MPC-100A, a single-channel unit offering a tube mic preamp section followed by a tube compressor/limiter section. The 2U device has mic and line inputs (and a Hi-Z instrument input) and the mic pre features an input pad, stepped attenuator and clip indicator. A switchable VU meter reads input, output and gain reduction. The MPC-100A's compressor/limiter has variable threshold and release controls, preset attack and release switches and dedicated clip indicator. Outputs are +4 balanced XLR and -10dB unbalanced 1/2-inch; both outputs may be used simultaneously.

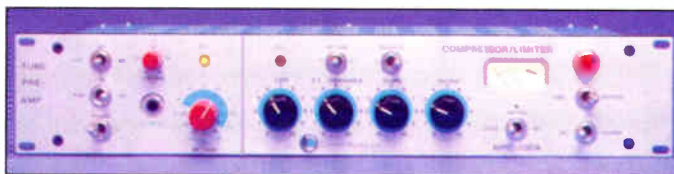
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**HOT OFF THE SHELF**

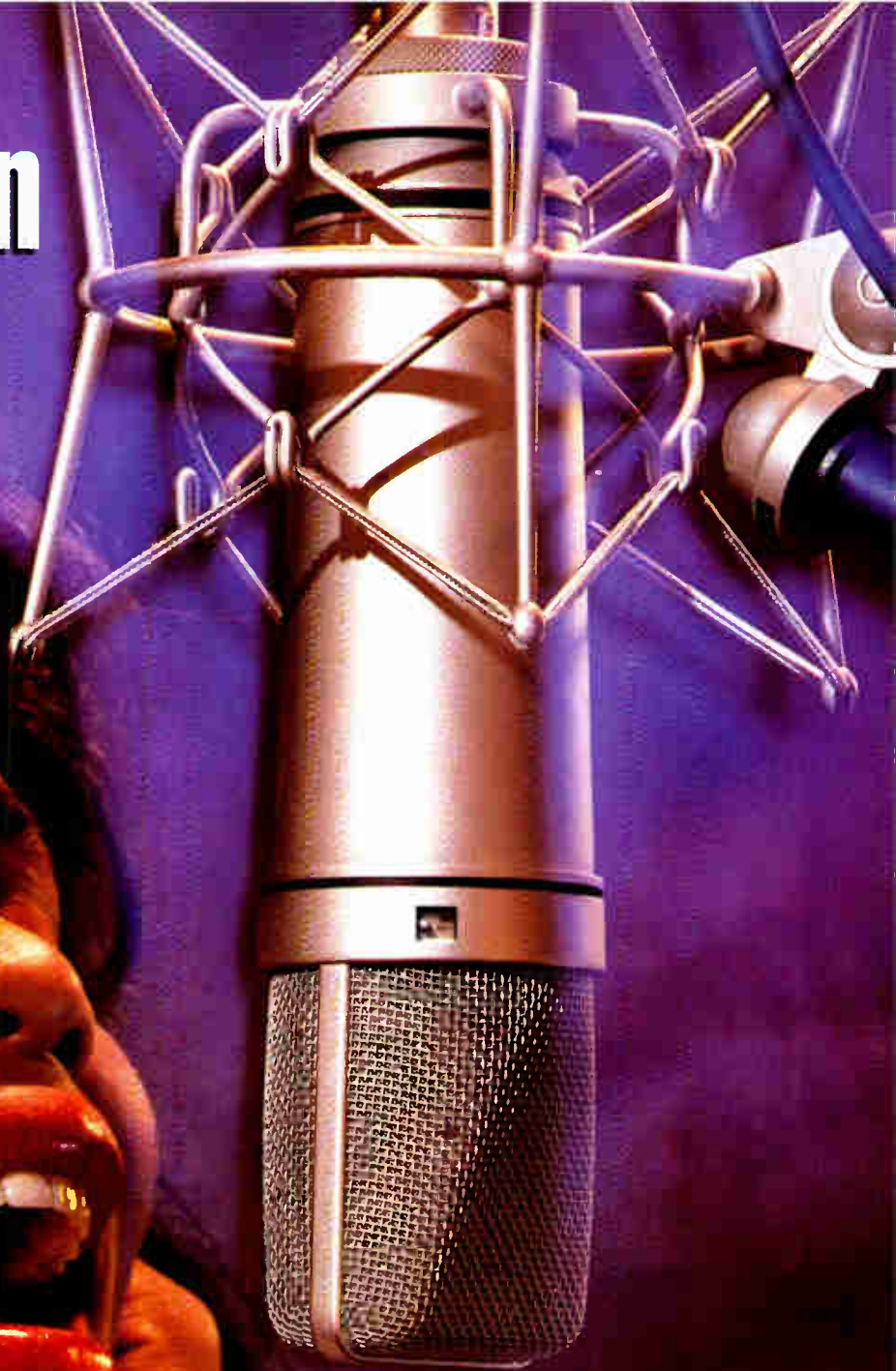
Hollywood Edge is offering T.H.E. Music Library at a buyout price of \$500 dollars plus a reasonable monthly fee for updates every quarter. Includes 550 10/30/60-second and extended length themes plus alternative mixes. Call 800/292-3755 or surf to [www.hollywood-edge.com](http://www.hollywood-edge.com)...Emagic's **ZAP Zero Loss Audio Packer** is a Mac compression utility that reduces the size of digital audio data files as much as 50%. Based on nonlinear redundancy elimination, the ZAP technology restores compressed files without distortion, frequency or phase deviations. Call 916/477-1051, or visit [www.emagicusa.com](http://www.emagicusa.com)...True Image Audio reduces the price of **The Speaker Design Toolbox** for Mac and Windows 95 to \$199. An interactive demo version of the software is available at <http://members.aol.com/spkrtools>. Or call 800/621-4411...**AirWorks Technology** predicts its TuneBuilder™, TuneFinder™ and PDCue trio of software programs will become the standard for music library users seeking to automate the search, audition, editing and reporting processes. Fifteen major music libraries have now adopted TuneBuilder. Call 403/424-9922 or try: [www.airworks.com](http://www.airworks.com)...ADC's **pull-out version of the ProPatch™** audio patch panel

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# EASTERN ACOUSTIC WORKS MM12

## COMPACT HIGH DEFINITION MULTIMEDIA SYSTEM

Names can be deceiving. Consider the EAW MM12 "Compact High Definition Multimedia System." Compact? Yes. High Definition? Yes. But I take issue with the Multimedia part of the name. To me, "multimedia speaker" has a bad connotation, bringing up visions of third-rate, 8-bit game graphics spewing out hokey laserblasts of equally third-rate, 8-bit, 11kHz .WAV files—all played back in "stereo" from a PC's ½-watt amplifier over 2-inch speakers! Yuk.

ries (larger MM60 and MM80 systems are also available), the MM12 system (\$1,625 list) combines two UB12S "satellite" speakers with the SB48-12 subwoofer, although the UB12Ss are also available separately at \$235 each.

Designed for visual unobtrusiveness with high musicality/intelligibility, the UB12S is a compact two-way speaker with a 5.25-inch woofer and 1-inch soft-dome tweeter in a front-ported, 10.75x6.375x5.75-inch enclosure. Frequency response is stated as 98 to

is 400 watts (AES) or 200 watts (continuous sine wave), for peak SPLs of 122 dB (119 dB long-term). LF response goes down to 38 Hz ( $\pm 3$ dB). Also provided are a vinyl-coated steel grille, recessed handle, fly points and internal passive crossover that routes a highpass-filtered stereo output for the UB12Ss.

Setup is uncomplicated. A stereo power amplifier connects to the subwoofer's barrier strip inputs, and color-coded (red/black) banana plug output jacks connect to the barrier strip inputs on each



Now if the phrase "multimedia speaker" was defined in a more traditional sense, referring to a system capable of handling a multitude of varied media and pro audio chores—such as small-scale sound reinforcement, near-field/front-fill theater work, foreground/background music playback, audiovisual installations, corporate/boardroom applications, industrial presentations and film/video surround sound—then that overused phrase would come closer to truly describing the capabilities of EAW's MM12 system.

The smallest in EAW's MM Se-

20k Hz ( $\pm 3$ dB)—respectable for a box that's about the height of this magazine. Peak SPL is stated as 113 dB, enough to put other "multimedia" speakers to shame. A vinyl-coated, steel screen grille and attachment points for Omnimount Series 75 hardware are standard.

The complete MM12 system includes the SB48-12 subwoofer system, a 53-pound, 12.5x22.5x19.75-inch box, with two 8-inch woofers, each mounted in individually vented sub-enclosures. Power handling

UB12S. As all of the speaker inputs are screwdriver-type barrier strip, I conclude that the system was intended mainly for fixed installations. I would prefer either Neutrik Speakons or five-way binding posts for quicker setups in portable applications. Perhaps future versions could include these or offer these as an option.

I began listening to the MM12 system using various well-recorded CDs and a 400-watt power amp. The system did not disappoint, delivering natural reproduction with an excellent balance of highs/mids/

BY GEORGE PETERSEN

# MORE HITS ARE MADE ON STUDER TAPE MACHINES.

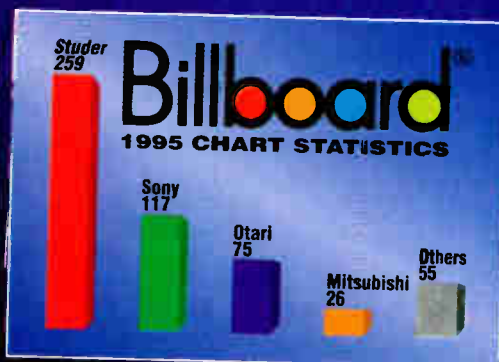


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*\*Based on an analysis of Billboard's Production Credits charts for 1995, Studer machines are used on many more hit records than any other open-reel recorder ("Others" includes both open reel, MDMs and disk-based systems).*

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**FIELD TEST**

lows. Transients, in particular, were accurate and punchy; the bass was tight and well-defined, without excessive boominess; and the midrange reproduction at the crossover points was smooth as glass.

I was more surprised by the UB12S's sound without the subwoofer. These little wonders pack an amazing sound for their size and with LF extending to 60 Hz (-10 dB), hold up quite well on their own. Alone, these are a perfect adjunct to a PC system (back to "multimedia" applications), as the speakers now include video shielding to prevent picture distortion caused by its drivers' magnetic fields.

Next, some exploratory surgery uncovered the secret of the UB12S's sound. The slightly overbuilt cabinet has a substantial 9-pound heft for its small size. Access begins with removing the seven screws that secure the metal grille. A foam underlayer prevents "grille rattle," and with the drivers removed, the crossover was visible. I expected a simple crossover circuit, and wasn't ready for a complex fourth-order network. This is serious.

While re-assembling the system, I listened to the UB12Ss without the grille and foam. What a difference! The top end opened up, with clearly improved imaging and definition. Obviously, metal grilles are an essential part of the rough-and-tumble life in the setup/tear-down/transport world of portable systems, but in a critical listening environment, the diffraction effects of a perf screen is a tough obstacle for a 1-inch soft-dome tweeter to overcome. This is not to imply that the UB12Ss don't surpass the requirements of a real multimedia speaker with flying colors—in fact, the UB12Ss are about as good as it gets in the genre of compact solutions for front-fill, under-balcony, industrial, corporate, theater surround, foreground/background music, computer and audio-visual applications. But those who dare to remove the grille will get an extra 5% to 10% performance edge that could put the MM12 system at the helm of the engineer working on tomorrow's next chart-busting hit.

Not bad for a little speaker. Just don't call it "multimedia"...

Eastern Acoustic Works, 1 Main St., Whitinsville, MA 01588; 508/234-6158; fax 508/234-8251; Web site: [www.eaw.com](http://www.eaw.com).

*George Petersen is the editor of Mix.*



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# AUDIX D SERIES

## INSTRUMENT MICS

The Audix D Series of dynamic microphones offers three powerful tools when used for the right job. When I first encountered these instrument mics, my reaction was, "Well which is the good one?" The D1 and D2 now list for only \$199, and the D3 lists for \$219, but that doesn't mean that the D3 is the best. Each has a unique characteristic that, coupled with Audix's outstanding sonic quality, makes it appropriate for particular applications.

The D3, I was quick to find out, is perfectly suited for electric guitar amps. It has a response and sensitivity similar to the OM-7 vocal mic, and it is really happy with a screaming Marshall stack or Fender Twin. Guitarists who have spent a lifetime getting their "sound" just right will be pleased by the clarity and transparency with which it places their axe into the mix. While many popular choices for electric guitar miking leave a little of their own tonal coloring, the D3 tends to let the true sound of the rig ring out. Many times I was able to use this mic "flat" and witness the guitarist's surprise at how good it sounded in the house. While the D3 is good for other live sound applications where even tonal balance is needed, it shines on electric guitar.

The D2 is a great mic for toms, all the way from large to small. Its contoured response puts a little emphasis down low and up top, while still letting the mids sound open and full. The D2 definitely gives more "oomph" to the toms than the D3, which might be better for percussion that is played more lightly. Compared to the D3, the

D2 has more response below 160 Hz, a low-mid peak and a rising response to about 4 kHz. I also used the D2 to great success with jazz kick drums miked from the beater side, for horns and for bongos and congas.

Try the D1 on snare. The D1 is a special version of the D2 that's had its response tilted to favor the high end. It is extremely strong from 200 Hz up to 2k and lets a snare really cut through a mix without overpowering it. The response of this mic complements that of the D2—I also had success miking

trenches may find that using a few of these can make setting up in front of a headliner on a small stage as simple as extending a few XLR connections to their D Series mics. After the set, they'll be asking, "Say, what were those microphones?"

Many engineers reach for a standard selection of a few dynamics, either out of habit or from what's available in the mic box. Few have the luxury of asking for esoteric products discovered in the studio or glossy magazines, while the majority are forced into the same old

boring knee-jerk

choices because they've

worked in the past. It's

sometimes difficult to

find a reason to try a new

microphone when the time

could be spent programming the

effects or console. I have been as guilty

as the next engineer,

but the reality is that several good microphones can

do more to improve a band's sound than a couple of

rackmount boxes that cost many times more. And they're easier to

carry with you, if not harder to keep track of at the end of the

night.

Though I continue to be a fan of Beyer, Sennheiser and Shure instrument dynamics, I dare say that a handful of D Series mics might just be the thing to put new life into the sound of your band.

Audix Corporation, 9730 S.W. Hillman Ct. #62, Wilsonville, OR 97070; 503/682-6933; fax 503/682-7114; Web site: [www.AUDIX-USA.com](http://www.AUDIX-USA.com). ■

*Mark Frink is Mix's sound reinforcement editor.*



saxes and trombones with the D2, while using D1s for trumpets. Others might experiment using combinations of D Series mics on bi-amp bass rigs or Leslie cabinets.

The D-flex is a \$30 accessory that is cheaper and smaller than an LP Claw and can be used for clamping the mics onto drum hardware. It is a mic clip and a clamp, attached by a small, flexible-but-stiff gooseneck. I also found it handy for miking guitars by clamping right onto a combo amp's handle. In many clubs, there are never enough mic stands anyway. Bands roughing it in the support-act

BY MARK FRINK



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# APOGEE AD-1000

## 20-BIT STEREO A/D CONVERTER

These days, with all the opposing analog/digital formats, multiple sync standards and converging audio/video technologies, analog-to-digital converters are called upon to handle a wide range of production applications. The Apogee Electronics AD-1000 is just such a jack-of-all-trades, combining premium dual preamps and 20-bit converters with a plethora of I/O connections (including ADAT optical), processing options and sync facilities.

### THE FRONT PANEL

The AD-1000 is a ½-rackspace, table-top unit housed in a sturdy, aluminum chassis. Dual preamps accommodate both mic- and line-level inputs. Left and right channel input gain can be separately and continuously adjusted by either multiturn CAL controls or front panel rotary knobs. The sensitivity for mic (but not line) inputs can further be coarsely adjusted in 10dB increments by an input selector switch. The preamps provide up to 54 dB of gain, 40 dB from the input selector switch and 14 dB from the L/R gain pots. Separate A/D converters for the left and right channels follow the preamps.

The input switch also selects +4 or -10dB levels for analog inputs, digital inputs, a built-in 1kHz digital oscillator (useful for setting system headroom) and two "mute" positions that output digital audio black (i.e., word clock with zero-level audio, useful for sync purposes). The only difference between the two mute positions is that one disables the built-in 48-volt phantom power (otherwise enabled by a front panel switch), the other doesn't. When set for digital input, the AD-1000 automatically performs format conversions between AES, S/PDIF and ADAT optical formats—a very useful feature.

The sync source switch selects

from various sync references: internal crystal, external word clock, optical (from consumer S/PDIF or ADAT), S/PDIF (RCA), AES and external video sync sources. Two AES positions allow for bridged or terminated settings, the latter useful if the AD-1000 is the last device in the AES chain. Video sync sources can be NTSC, PAL or 60 Hz (monochrome), and the input can be either video or sync.

the AD-1000 is set to the x1.001 position, a 44.1kHz rate will be presented, locked to the AD-1000's input. Synched to an external word clock, the AD-1000 can transmit any sample rate that it receives.

Also switchable from the front panel is Apogee's proprietary Soft-Limit® function, a transparent analog peak limiter evolved from the AD500E, Apogee's previous (18-bit) converter. A three-position power



A sample rate selector offers 32, 44.056, 44.1, 44.144, 47.952, 48 or 48.048kHz sampling frequencies. Pull-up/Pull-down modes are also supported, where the input sampling rate is multiplied or divided by 1.001. For example, if 44.056kHz word clock input is received and

switch toggles between Normal and ADAT modes, or off. The ADAT mode enables the AD-1000 to output ADAT-format optical signal for recording directly to ADAT in the digital domain. Both 16-bit output (with or without dither or UV22<sup>®</sup> processing) and untruncated 20-bit recording are supported.

The 20-bit recording mode in-

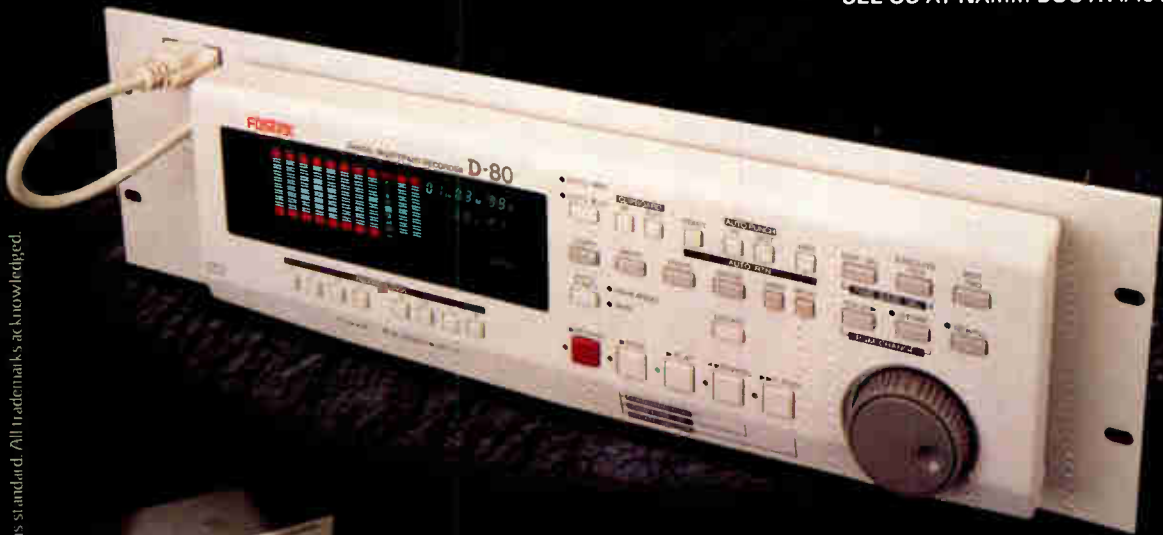
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## FIELD TEST

incorporates licensed technology from the Rane PaqRat, and uses four adjacent channels of an ADAT to encode the 20-bit audio. Tascam DA-88-compatible MDMs can also be used in this mode, with the addition of an Apogee FC-8 format converter (\$495 list). Unfortunately, the 20-bit ADAT mode can only be used with analog inputs to the AD-1000, precluding the use of the PaqRat encoding from the AD-1000's digital inputs. So anyone who wants to use PaqRat encoding directly from digital sources—say, the output from a Yamaha 02R—would have to use a Rane PaqRat for storing 20-bit mixes on MDMs. Another front panel switch lets users choose dither, UV22 or untruncated 20-bit output for digital signals.

The AD-1000's metering is somewhat rudimentary. Six multicolored LEDs (three for each channel) indicate when input levels exceed -12dB FS (12dB below Full Scale), -2dB FS or overload (three consecutive digital "overs"). You can actually customize the -12 LED to light anywhere between -20 and -12dB FS. The -2 LED will also light when SoftLimit is switched on and the limiter's

threshold is exceeded. The limiter's threshold is factory preset at -4dB FS but can be customized. Three additional LEDs indicate when the AD-1000 is locked, and to what sampling frequency.

### THE REAR VIEW

No fewer than eight connectors are found on the AD-1000's small rear panel. Two female XLRs for balanced analog mic/line inputs are also usable unbalanced. A male XLR services AES/EBU digital output. Two BNC connectors accommodate sync and digital audio inputs, including word clock, video, AES, and S/PDIF sync, and AES or S/PDIF audio (AES input requires a \$23.75 adapter). Two Toslink connectors provide optical I/O for S/PDIF or ADAT-format signals. The 15-pin HD connector provides +12 VDC power, word clock out, S/PDIF and SDIF audio out, and 256 Fs clock out, again requiring special adapters at an additional \$95. A rack-mount kit that holds three units is also \$95.

Obviously, there's a lot of I/O crammed into that 1/2-rack-space chassis. Indeed, the AD-1000's rear panel is very crowded, making it especially difficult to plug/unplug delicate optical connec-

tions and, to a lesser degree, BNC sync connections. Using the 15-pin HD and two BNC sync connectors to serve multiple I/O purposes and formats also necessitates frequent repatching. And none of the rear panel connectors are labeled, which initially makes setup somewhat confusing.

Because the AD-1000 is not self-powered, it must be powered by an external power supply such as the optional Apogee PS 1000E (\$495 list). It can also run off 12VDC lead acid or NiCad batteries for portable operation.

### GOIN' FOR A SPIN

The AD-1000's SoftLimit function is provided by analog circuitry before the A/D converter, so it's not available for treating "digital through" signals. I try to stay in the digital domain whenever possible, but the AD-1000's SoftLimit function gives me compelling reasons to suffer the conversion degradation to access its beautiful dynamics processing on mixed stereo program material.

SoftLimit sounds very transparent unless you overdo it by turning up the L/R preamp gain to excess. But this is not to say that you can't hit it hard! The effect is artistically pleasing on rock and pop mixes. Not only does SoftLimit all but

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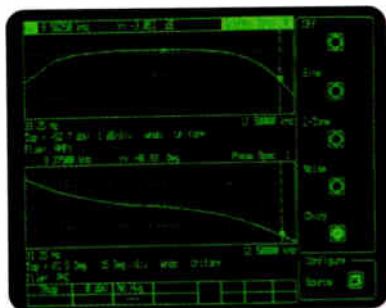
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## FIELD TEST

eliminate DAT "overs," the loudness, punch and fullness it lends to a mix are downright awesome. Especially on mixes with drums and bass, SoftLimit tightens and beefs up the bottom end of the mix beautifully without any pumping or unpleasant spectral smearing.

As mentioned earlier, the AD-1000 can even accept optical S/PDIF digital input. If you have a consumer-grade CD player, this is useful for sampling sounds off CDs in the digital domain or for performing an A/B comparison of a mastering facility's CD-R vs. a clone of the DAT master you send them.

Rather than listening to a CD-R through the stock 18-bit converters on my CD player, I patched the player's optical output to the AD-1000, which in turn automatically output AES-format audio to my Yamaha 02R digital recording console. (The AD-1000 actually outputs AES and both optical and coaxial S/PDIF simultaneously when in Normal mode). This allowed me to perform quick A/B comparisons between a clone of a DAT master and the CD-R via the same converters (i.e., the 02R's vastly superior 20-bit DACs).

The AD-1000 has no insert points

between the mic pre's and ADCs. This precludes the use of the pre's or converters on their own (and also prevented my A/B testing of individual features). That said, the combination sounds very clear and present. Compared to the head amps and converters on my Panasonic SV-3700, the AD-1000 was much clearer and offered better transient response, tighter soundstage localization and a wider stereo image.

Once in the digital domain, a front panel switch allows you to process a 16-bit digital output with "garden variety" triangular dither or Apogee's UV22 encoding, or provides an untruncated 20-bit signal output. (The AD-1000's maximum word length input—without truncation—is 20-bit.)

Why choose dither or UV22? If you're mixing to a 16-bit format such as R-DAT, the AD-1000's 20-bit output will be truncated when it gets there. When the word length of a sample is shortened due to truncation, the quantizing intervals get bigger and audible distortion of the original waveform results. Triangular dither and UV22 both move data from the least significant bits (that would otherwise be lost on truncation) to higher bits in the word, reducing re-quantizing distortion and preserving

high-resolution detail. Dither essentially adds broadband noise to the input before quantization. UV22 adds a signal that's spectrally confined to a high-frequency narrowband just below half the sampling frequency (Nyquist)—around 22 kHz for 44.1kHz systems such as DAT and CD. Unlike noise shaping, the noise floor stays stable and doesn't modulate with the UV22 process.

The subjective differences between the three switch positions (dither, UV22 and 20-bit) are exceedingly subtle on full-scale (peaks at 0 dB) recordings to R-DAT. That said, both the UV22 16-bit and truncated 20-bit outputs lent more clarity and detail than the triangular-dithered output. The UV22 process sounded a hair smoother than the truncated 20-bit output. The truncated output made vocals, sax and harmonica sound a tad edgy by comparison.

The differences were much more dramatic on program material (an ensemble of acoustic guitar, acoustic bass and sizzle cymbal) recorded at -40dB FS peak levels. At this level, the triangular-dithered recording sounded way too noisy to even consider using; both other options were a lot more pristine and clear. The UV22 process did not noticeably increase the overall level of the

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**FIELD TEST**

noise floor beyond what I heard in the 20-bit truncated recording, but it apparently altered the spectrum of the noise floor so that it had more high hiss than broadband noise. (My findings concur with Apogee's caution that "multiple passes through the UV22 process could degrade the noise floor in the upper frequencies." A compensatory Low setting is provided on the AD-1000 for optimizing UV22 use on multiple passes.) More importantly, the UV22-encoded recording sounded considerably more detailed than both the 20-bit truncated and triangular-dithered recordings. I would also characterize the UV22-encoded recording as a little airier, cleaner and clearer than the truncated 20-bit recording, which sounded more "choked" and fuzzy in comparison.

Both dither and UV22 can be added to the ADAT-format optical output signal. When you connect the AD-1000's optical output directly to an ADAT, the AD-1000's left input feeds odd-numbered ADAT channels and the right input feeds even-numbered channels. Unfortunately, this cuts the destination ADAT's inputs off from all other potential sources. A much more flexible

arrangement can be had by patching the AD-1000's optical output to a digital console fitted with ADAT Lightpipe I/O, where it can then be panned, processed and routed to any combination of tracks on any ADAT(s). Connecting the AD-1000 this way to my Yamaha 02R console also preserved simultaneous access to other tracks on the same ADAT from sources other than the AD-1000.

For some reason, I could not get my BRC and 02R to function as word clock slaves to the AD-1000 review unit. Fortunately, everything locked up when the 02R was chosen as master and the AD-1000 the slave. I also ran into problems when attempting to record untruncated 20-bit audio to ADAT, using the Apogee's PaqRat mode: I could not get the AD-1000 to sync up to the ADAT's optical output on playback.

**CONCLUSIONS**

My gripes with the AD-1000 are few (assuming the problems with ADAT mode are fixed). The metering could be more comprehensive for tracking with mics. A digital output fader would help the unit to better integrate with other digital gear possessing less headroom (while close, 0dB FS is not exactly the same for all digital equipment!). And the

AD-1000's crowded rear panel is a minor annoyance. On the positive side, the mic pre's, converters, SoftLimit and UV22 processing all sound terrific. And the unit is jam-packed with extra features and sync facilities.

The biggest consideration for me is the obsolescence timeline on a system that, fully equipped with power supply, retails at \$3,790 (AD-1000, \$3,295; PS1000E dual power supply, \$495). How long will it be before 20-bit converters become outdated? With products such as the 24-bit Sony Oxford console now in production, 20-bit products may someday be passé. But for today, the AD-1000 sounds awesome and there is an enormous market of DATs, MDMs and workstations that could benefit from an improved A/D front-end. If you can afford the initial cost and eventual turnover, the AD-1000 will take your digital audio immediately to the highest professional level.

Apogee Electronics, 3145 Donald Douglas Loop South, Santa Monica, CA 90405; 310/915-1000; fax 310/391-6262; Web site: www.apogeedigital.com. ■

*Michael Cooper is a producer, engineer and owner of Michael Cooper Recording in Eugene, Oregon.*

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- Jerry Finn (GreenDay)
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- NRG Studios
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- Noise Labs
- The Tonight Show
- Brian May
- Sheryl Crow
- Paul Weller
- Simply Red
- Pulp
- Jay Rifkin (Lion King)
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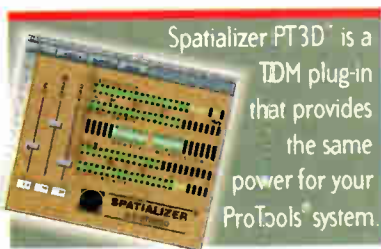
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### ABUSED IN KEY LARGO

The system we reviewed consisted of two of the new Crystal double-12 full-range enclosures and a single quad-18 Quartz subwoofer that employs Bag End's ELF technology to provide solid lows down to 20 Hz. We powered the system with two QSC PowerLight 4.0 amps and used and abused it for several months in Portland, Oregon's well-known Key Largo club, which has a capacity of roughly 300. The system's frequency and phase response as measured on the SIM II system is smooth and flat and needed little or no EQ—say a couple dB at 5k, 1k and at 200 Hz, though we ran it with no graphic inserted on most nights. It sounds great, relying on a processor only for the phenomenal low end, and it's quite compact for the SPL produced. The system sounded as good or better than most high-priced processor-based speakers on the market and puts out much more sound than many other similarly sized systems.

*Two additions to Bag End's Gem Series: the Quartz (above) and Crystal (top) speakers*

All three models in the Gem Collection are constructed of 3/4-inch Finland birch plywood, finished with a rugged black urethane and fitted with attractive powder-coated steel grilles. The dual-12 Crystal (\$2,750 list) has the same components as the smaller, single-12 Sapphire: two 3-inch voice coil 12-inch woofers and a titanium-diaphragm compression driver fitted to a 1.5-inch throat, with an oval-mouthed waveguide offering 50°x40° dispersion. An internal 1.9kHz passive

crossover is used to Time Align® the two 12s with the compression driver. The Crystal weighs 100 pounds, and is 39 inches high, 16 inches deep and only 18 inches wide. It has two different trapezoidal side angles, one of which allows it to be used on its side as a 45° angle floor monitor. The Crystal has Anchra fly points on the top, back

and bottom, and a 35mm stand-adaptor. Off-the-shelf rigging products are also available from ATM Flyware. Two similar adapters on the Quartz sub allow it to be used with short poles in a double-mast configuration supporting two Crystals for a complete system that sets up quickly, covering 100° of horizontal dispersion. Because of the compact size, the combination makes for a high-power, van-sized "no-crew" sound system.

The Quartz ELF subwoofer (\$3,500 list) is a powerful, compact sub-bass solution for those seeking a solid building block for any full-range system.

BY MARK FRINK

—CONTINUED ON PAGE 235

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# ART MODEL 210 PRO MPA

## PROFESSIONAL TWO-CHANNEL TUBE MICROPHONE PREAMPLIFIER



Just over a year ago, Applied Research and Technology created a stir with its Tube MP preamp, a single-channel tube mic preamp. Its great sound and affordable \$150 price tag made it a hit with users. However, due to the Tube MP's fuzz box-sized chassis, it was lacking amenities that pros prefer, such as flexible metering, rack mounting, internal power supply and stereo capability.

Enter the Model 210 PRO MPA. Priced at \$599 (with five-year warranty), this 2-channel, mic preamp/line driver in a two-rack-space chassis addresses the deficiencies of the Tube MP and adds some tricks of its own. Like the Tube MP, the PRO MPA combines tube and solid-state components. The transformerless, active balanced inputs use a hybrid (multipaired transistor and op-amp) triple-differential transistor design for low noise and excellent common mode rejection.

A second stage, using the time-tested 12AX7A tube—running on a regulated DC supply—provides 40 dB of additional gain. By enabling the signal to be overloaded before the input or output stages, the design provides users with a wide palette of tube saturation effects, ranging from squeaky-clean to subtle warmth to heavy crunch.

PRO MPA operations are plug-and-go. Tweaking the amount of saturation is really no more difficult than adjusting gain and master vol-

umes on a guitar amp. And to assist the process, the PRO MPA includes 10-LED Tube Character displays to visually indicate the degree of warm, even harmonics added to the signal.

The front panel is logical, with controls for input and output gain, variable highpass filters and switches (each with LED) for gain boost (+20 dB), phase reverse and 48VDC phantom power. Two large, illuminated VU meters are standard.

The rear has ¼-inch unbalanced and XLR balanced (pin 2 hot) inputs/outputs for each channel, and an attached AC cord. The ¼-inch, high-impedance inputs on the rear panel are ideal for using the unit as a guitar or bass direct box or line driver from synths or keyboards. For DI use, particularly when tracking bass in the control room, a front panel ¼-inch input would be useful; perhaps ART could add this in the next version.

The highpass (bass roll-off) filter is set at -6 dB/octave, with a continuously sweepable frequency range of 150 Hz to 7 Hz. No bypass is provided—signals are always routed through the filters. However, first-order filters generally degrade the signal far less than complex -12, -18 or -24 dB/octave designs, and the unit's filter was smooth at all frequencies.

I have a few minor gripes with the PRO MPA: The settings on the

HP filters and gain controls are marked only at the center and extreme positions, leaving users to guess on the values of intermediate settings. This is significant if you want to re-create a certain setting later, especially in a device where gain matching is critical to the sound. My ultimate wish list for the PRO MPA includes detented controls (and some front panel ¼-inch inputs), but such frills would probably add to the unit's cost.

I found the PRO MPA useful on all kinds of sessions, ranging from heavy metal guitar tracks to spoken word voiceovers. On stringed instruments, the unit's wide 40kHz (-1dB) bandwidth was apparent with clear highs. The output can be whisper-clean or add a nice warm thickness to ballad vocals or sax solos. PRO MPA does have its limits: A \$39 mic still sounds like a cheap \$39 mic, no matter what preamp you use. However, the PRO MPA is great for making mid-priced mics (such as 4033s, RE20s, 421s and Beta 58s) sound like pricey, big-ticket models.

Retailing at \$599, the PRO MPA is an excellent value. And with its line driver potential for warming up signals (perhaps patched between a console and a DAT machine) and direct box capabilities, ART has a winner on its hands.

Applied Research and Technology, 215 Tremont St., Rochester, NY 14607; 716/436-2720; fax 716/436-3942; Web site: [www.artroch.com](http://www.artroch.com). ■

BY GEORGE PETERSEN



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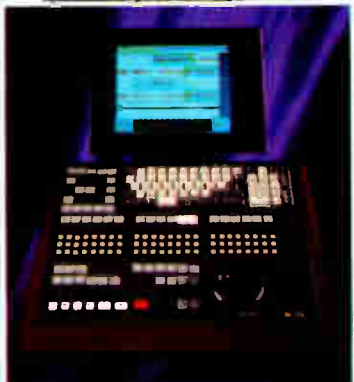
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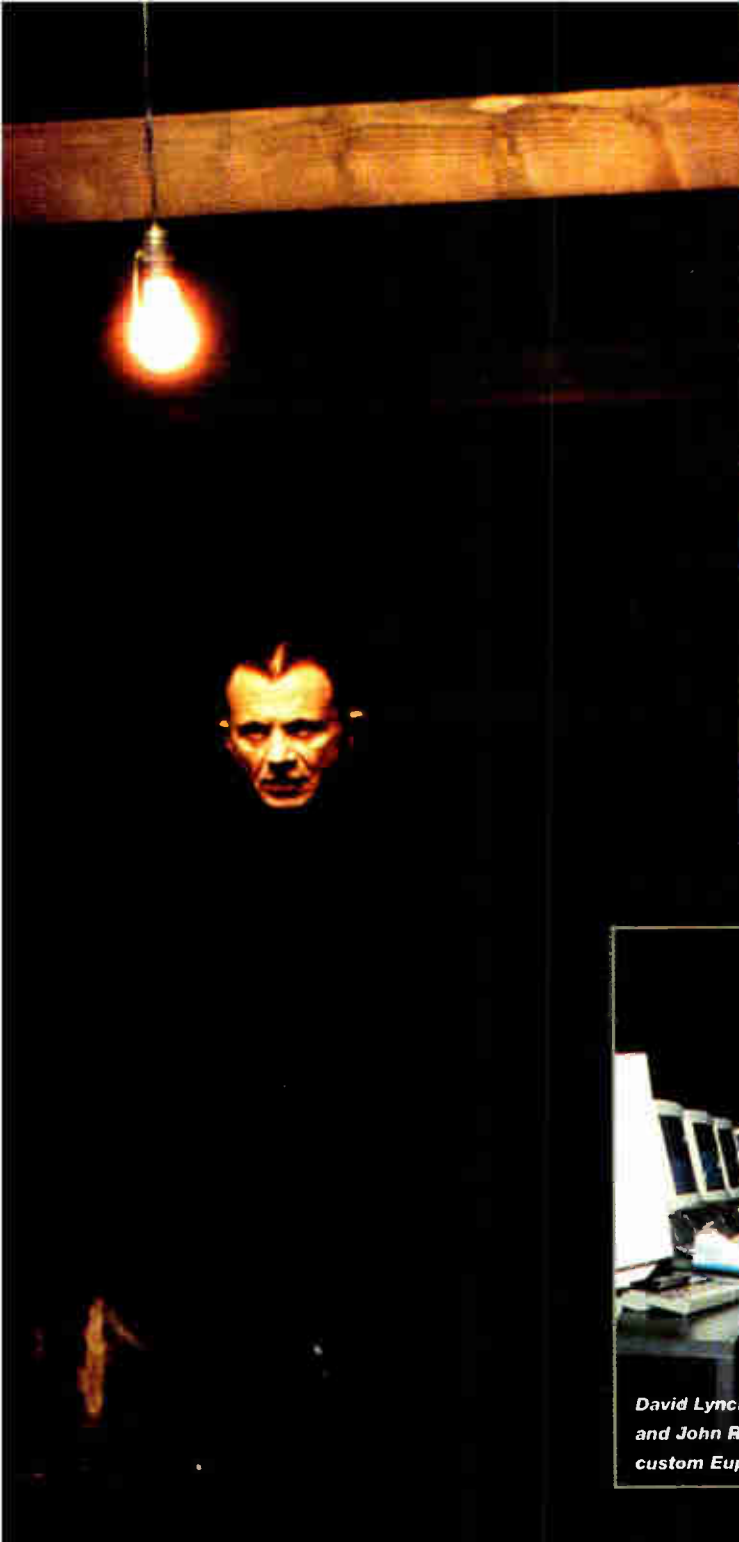
David Lynch

Down

The

# Lost Highway

BY TOM KENNY



MOVIE SKILLS: SUZANNE TENNER



David Lynch, front,  
and John Ross at the  
custom Euphonix

**N**othing about a David Lynch film is "normal." Not the script, not the visual stamp, not the editing and certainly not the sound. His films tend to occupy the Hollywood fringe, as well as the subconscious fringe, in a manner that defies genre-coding or "typical" definitions. Now after a four-year absence, he's back in feature films with the CIBY 2000 production of *Lost Highway*, distributed in the States by October Films.

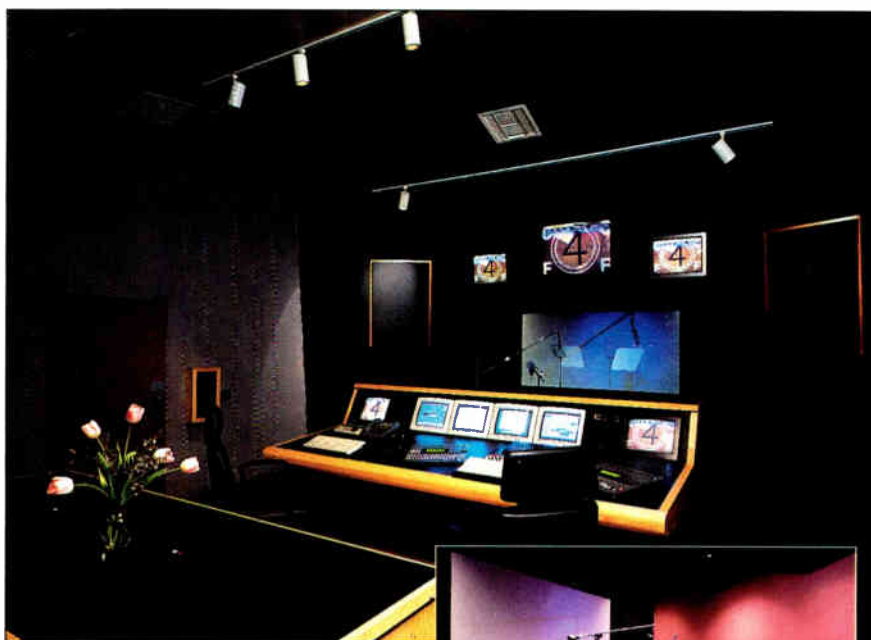
## Lost Highway

You will not find a director today, inside or outside of Hollywood, who is more involved with the creation of the soundtrack than David Lynch. From his very first short film, *The Alphabet*, through *The Grandmother*, *Eraserhead*, *The Elephant Man*, *Dune*, *Blue Velvet* and *Wild At Heart*, he worked in tandem with Academy Award-winning sound designer and close friend Alan Splet, one of the true gentle giants in the history of film sound. (The duo even shared sound design credit on *The Elephant Man*.) The mechanical-industrial dissonance that marked his early films established a sonic perspective that blurred the lines between music and effects, opening up sound montages that could be labeled backgrounds, but more appropriately called atmospheres.

"For me, a director designs everything, because [the film] has to pass through this one person for it to be cohesive and whole," Lynch says during a break from the final mix on reel 2AB at Digital Sound & Picture, Los Angeles. "That's not to say you don't rely on people, and that other people don't have a great deal of say and talent and do a lot to help shape the film, but it all passes through one person. I love working with sound.

"When I worked with Alan Splet, we were always making sound effects—before, during and after the shooting," he continues. "A lot of times, a piece of music or a sound effect up front gives you ideas that will help you in the shooting. And then I listen to the music while I'm shooting, so the more I have up front, the better. It helps the picture. I'm an action and reaction person. I have to hear something, and then go from there."

Lynch lost a dear friend and the industry lost a gifted talent when Splet passed away in December 1994. For the past few years, Lynch has turned to John Ross, owner of Digital Sound & Picture, for his post-production needs. Frank Gaeta, on staff at DS&P, supervised *Lost Highway* and admits to a bit of anxiety upon getting the assignment. "For me, or for any sound person, David is an icon. So of course it's a thrill to work with him. But at first I thought, 'What can I say to David that he doesn't already know about his film—a director who seems to have done everything and explored everything?' The picture was in-house for a month prior to the five-week final in



**The ADR stage and control room at Digital Sound & Picture, where dialog is recorded directly into a DAWN workstation.**

July, but Lynch and Gaeta began talking about and previewing sounds as much as six months before that, soon after shooting wrapped.

It would be impossible to describe *Lost Highway* in the *Player*-esque 25 words or less. Bill Pullman plays Fred Madison, an L.A. jazz saxophonist who, through a surreal chain of events, witnesses a murder (of his wife, played by Patricia Arquette) that he may or may not have committed. A highway is involved, but beyond that, it's hard to predict from a three-reel preview where the film ends up. But we know where it starts, and with this film, it seemed to start with music.

### MUSIC AND FIREWOOD

The first thing that needs to be stated is that Lynch mixes his own music at the final, and has since *Wild At Heart*. He's right there on the left side of the custom three-position Euphonix console (Ross chained three together years before Euphonix offered a film version of the CS2000), with Ross in the middle and Gaeta and Foley/sound effects mixer Derek Marcell to the right. Lynch is a composer as well (he's released a CD of original compositions with his longtime musical collaborator Angelo Badalamenti), and in a sense, he creates a music track right there at the final. No score at the last minute, competing with effects. This is music by design, and the bits and pieces he's assembled, literally from all over the world, he refers to as "firewood."



The primary arrangements and bits of firewood were written by Badalamenti and recorded in Prague. But pieces came from avant-garde jazz string sessions, written by Badalamenti and recorded at Capitol Studio A in Los Angeles. Also, Badalamenti synth sessions were recorded by Arthur Polhemus at Excalibur Studio in New York City. And there was a three-day stint at Trent Reznor's studio in New Orleans, where Lynch sought "drones"—various samples orchestrated for the video atmospheres. In London, Barry Adamson wrote and recorded Mr. Eddy's theme and several abstract pieces for the film.

"Since Fred Madison is a jazz saxophone player, I was thinking kind of crazy jazz at the beginning for his club scenes," Lynch explains. "Barry Gifford and I wrote a kind of '90s bebop sound into the script, which Angelo nailed extremely well. For the rest of the score, Angelo and I wanted to return to Prague, where we recorded the music for *Blue Velvet*. This time, however, the film required what we called a modern noir sound, and Angelo came up with some incredible compositions and orchestrations."

Because Barrandov Studios in Prague was not familiar with the 5.1-channel digital format for film, Ross accompanied Lynch to Prague to track and mix the orchestra, which at times numbered 80 players. "I know how David works," Ross says, "so I wanted



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## Lost Highway

to make sure we had the material recorded in such a fashion that we could pull it apart. I didn't want to come back with an LCRS recording, where either you have the cue or you don't. I wanted to set up the mics to get the split surrounds acoustically, in that space. We mixed in Prague, but nobody was familiar with the 5.1 environments, so we pretty much had to rewire the control room to make it work."

Schoeps mics were used on individual instruments and, with MD capsules, for the room, including a delta configu-

ration over the conductor. Ross mixed a 5.1-channel live version, as well as down to the 24-track analog machine, then mixed the 24-track down to a 5.1-channel version. In most cases, that multitrack mix was brought to the final.

It was not, however, as if Ross was mixing songs. These are motifs, passages, moods. "The pieces that were done in Prague were very open-architecture," Ross explains. "There were long, dark string moves that we could take and use as components—we could cut the front section, merge it into the middle section, and so on and so forth. Some of the relationships between the keys from various cues were designed

in such a way that they can be overlaid on top of each other or stripped back. A lot of the percussive elements were singled out. He would also divide the orchestra into various components and let them create sounds, like effects, on the instruments. Each player was basically given the responsibility to do their own little piece of time—it wasn't an organized event—and as a result, it was an interesting cacophony created within the orchestra, which we can then use as a color in overlaying another piece of orchestral music.

"In some sections, we recorded the orchestra the conventional way, as well as directly into containers—two long tubes and a large wine bottle. [Neumann mics were placed inside a large carafe and at the end of long piping tubes, then hung above and behind the conductor.] These sounds were then used to mix in with the orchestra, and we pretty much had no idea how it was going to play. I took sections of the bottle, copied it, looped it, and David used it as an overtone to some of the orchestral pieces. Very difficult to guess how that is going to sound. It has this reedy overtone, which David used as a high-frequency element to sting things with.

"We might take some of those elements into the workstations and process them and it comes out as a sound effect at the end of the day, or what would traditionally be a sound effect," Ross adds. "But it started out as an orchestral piece. So there's a real gray area between what is a sound effect and what is music.

"We've done things where he's pretty much taken a piece of music, reversed it, dropped it down an octave and played just the reverb return of that. Think of it more as music design. That's why he's physically sitting here. He wants a mood against the picture, and where he feels it, he puts those faders up. Sometimes he has no idea what's underneath those faders—it's pure surprise to him—but he brings it out, and if it works, great. If it doesn't work, we might take it, do something backwards and forwards, drop another element. Sometimes you get some really interesting results. No composer in the world is gonna sit there and say, 'Let me write this backwards at half-speed'—it doesn't work. David has a totally nontraditional approach, and he's comfortable with taking these chances."

"Score is a weird thing," Lynch says. "On a lot of pictures, directors don't really get to work with the composer until the eleventh hour, and then they're sad-

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# dbx BLUE Series



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When Antonio Stradavarius was creating the finest violins known to mankind he had to seek out the finest materials, parts if you will, available. Similarly, anytime artists choose to create the defining works of their creative lives they invariably seek to use the best instruments available for that work. The Blue Series from dbx represents the culmination of the finest art and engineering, and the experience of years' work from the best designers, engineers, and fabricators in the business.

When you invest in Blue Series processors, you know that you're getting instruments not only created from the finest components available, but built from the heritage and pride of the finest brand in signal processing - dbx. It's no wonder that dbx is in more studios and broadcast facilities, and on more major tours than any other signal processing brand!

Let's take a look at some of the parts that make up the sum of the parts:

The first thing you notice when you see your Blue Series processor is the gorgeous blue front panel. Carved from high grade aircraft aluminum, the Blue Series panels are held to 1/1000th of an inch tolerances. The result is a mechanical masterpiece worthy of the superb electronics inside. The Blue Series product will not only work brilliantly but will look as beautiful years down the road as it did the day you bought it.



Precision machined, chrome plated, stainless steel housed, high luminescent LED assemblies were the only choice for this product. Just one look...

At the heart of every high end signal processor is the power supply. As you would expect, the dbx Blue Series utilizes a heavy duty toroid noted for its extremely low-stray hum field characteristics. Although that would be, and is, good enough for most designers of gear, even of this caliber, it is not good enough for dbx. Coupled with the implementation of the toroid, the trans-



former is installed in an ultra high permeability, deep drawn, mu-metal canister that provides 30dB of shielding. This keeps power supply hum out of sensitive high gain circuitry and guarantees the unit to be a "friendly neighbor", even when installed next to inferior equipment that is susceptible to electromagnetic interference.

Furthering the philosophy that beauty and function are one and the same, dbx Blue Series processors that require an LCD display utilize a 240 by 64 pixel Cold Cathode Fluorescent Backlit Ultra High Contrast nematic display. This LCD represents the latest in the technology and is extraordinarily easy to read, even in the harshest ambient light environments.



If the Toroidal MU metal canned power supply is the heart of the Blue series, the Blue Series module is the soul. The hand selected, matched components are mounted in an aluminum-zinc chassis filled with a high thermal conductivity resin. This ensures that all critically matched components operate within tolerance over a wide range of temperatures. The three different "modules" the V8™ VCA, the M8™ mic preamplifier, and the Type IV™ 27 bit converter are found in the units for which they are specifically designed. The V8™ VCA module represents the state-of-the-art implementation of dbx's original Blackmer VCA and boasts an unheard of 127dB of dynamic range. The M8™ mic pre is a dual stage, high current, ultra low noise, wide bandwidth amplifier using triple servo technology. It provides over 60 dB of precision gain from DC to 200kHz with virtually no deviation from linear phase in the audio band. The Type IV™ conversion module is a 27 bit front end for a conversion system that is a radical departure



from traditional A-D converters. By offering substantial resolution in the sub-noise and overload regions, this converter captures critical audio information typically ignored by today's digital systems. The Type IV™ module allows you to capitalize on the superior dynamic range and editing capabilities digital media afford but record with the headroom and warmth of response formerly available only on world class analog machines.

These days a lot is bandied about as far as ergonomics are concerned. At the risk of using the buzz word of the day, let us state unequivocally that the knobs of the Blue Series *are* ergonomically designed. Hand tooled from *solid* aluminum, the feeling of surety is apparent at the first turn of the control, a feeling that will be steady and constant for years to come.

It does no good to execute the design of what is arguably the world's best knob (best knob? Sounds funny 'til you use 'em!) if you don't attach them to the best potentiometers and switches available. For this task, Electroswitch parts were the only real alternative. Their many-lifetime reliability, coupled with the most dexterous switching action available and custom resistive elements insure years of unrivaled performance.



Since we at dbx know that an audio system doesn't end at our rear panel, we designed our Blue Series output circuits to be nothing less than bomb proof. Our hefty output transformers look more like power transformers than precision audio devices, but the performance gains justify our apparent extravagance.

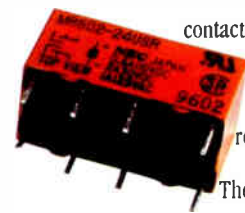
Probably the funniest looking parts in all of the Blue Series are the output load isolators. Because we know that Blue Series product will end up in touring situations and other places where there exists the possibility of extreme capacitive loads, these components were installed to isolate the output drivers from those highly capacitive loads. Combined with our output transformer and circuitry, this minimizes overshoot, eliminates ringing and provides maximum stability over extremely long cable runs. As a matter of fact, this ingenious patented output stage will drive 1000 feet of Belden 8451 cable to +30dBm! Yet the distortion of this circuit is immeasurable using today's standard test equipment.



Classic, custom designed, backlit VU's offer striking contrast to the sleek blue and silver tones of the chassis and hardware, and provide a highly visible indication of all critical level functions.



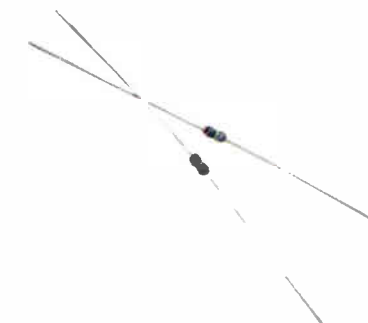
Gold contacts, sealed in a nitrogen-gas filled chamber to eliminate any possibility of contact oxidation, was just the first requirement necessary for the relays used in the Blue Series. These extraordinary relays are designed to function in any physical orientation and possess extremely low contact bounce characteristics for optimum contact closure. The relays are also designed for minimum interactivity enabling our engineers to populate the circuit board with them wherever necessary.



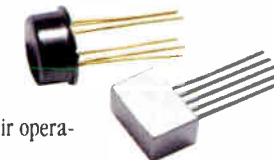
If your going to build the word's best mic pre you'd better pay close attention to the input transformer. During our rigorous pre-testing procedures, we found the Jensen® JT-16A to be the part that matched our spec perfectly. With bandwidth greater than 2Hz to 200kHz and less than 1.25° deviation from linear phase, the transformer exhibits excellent time domain characteristics. This, combined with a common mode rejection ratio of 117 dB @ 60Hz, provides the 786 mic pre with a deadly accurate reproduction of the microphone signal while eliminating the possibility of hum or other audio frequency noise from degrading the signal. Providing another 30dB of isolation, the mu-metal housing further insures the transformer will be completely isolated from any other possible stray hum or noise fields.



0.1% precision metal film resistors are used throughout the units in all critical stages where component tolerance matching is essential.



When was the last time you saw components that looked like this? These unique high-gain, matched pair transistors exhibit extremely low noise and maintain their operational characteristics over a vast range of thermal conditions.



Many manufacturers use consumer quality connectors which can lead to connection failure. In the Blue series we're using high reliability locking connectors and power harnesses originally designed for use in large mainframe computers. These dual-wipe, early entry, gold over nickel-palladium pins encased in a locking frame ensure absolute interruption-free closure regardless of how high the vibration environment may be.



From the beginning, you've spent your life, your energy and your career producing the finest audio you've known how. It's time you rewarded yourself with the tools necessary to produce the masterpieces experience tells you you're capable of.

Whether your next masterpiece is Gold or Platinum, dbx Blue can help you create it.

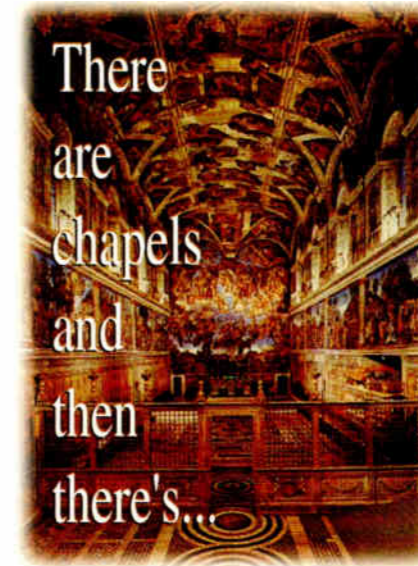
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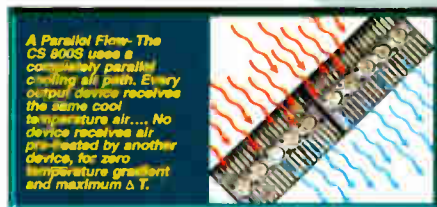
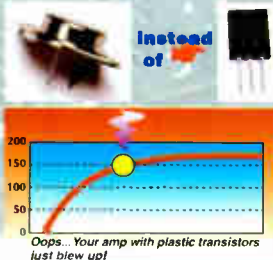
Popular wisdom says "don't change the recipe when you're making good biscuits." The reason the CS 800 has remained dominant for over twenty years is that we've only changed it a few times and when we did, we knew what to throw out and what to keep.

## What to Keep

The new CS800S uses metal (TO-3) power transistors, because plastic devices just don't deliver equivalent thermal performance.

While metal devices can be used right up to silicon junction failure, plastic devices degrade 50°C (90°F) sooner. This margin of "thermal headroom"

can be the difference between a really loud finale and something more final.



Books have been written about thermal management, but it all boils down to three things: air flow, heat sink area, and  $\Delta T$  (the difference between the heat radiator and ambient air). The CS 800S uses a unique "parallel flow" heat sink alignment so every transistor receives the same cool temperature air for optimum  $\Delta T$ .

With two variable-speed 32 CFM fans cooling hundreds of square inches of heat sink area, and metal (TO-3) power devices (in the air stream), the CS 800S will play very loud for very long (years - not minutes or seconds).

The audio amplifier section uses proven Class A/B ultra-linear complementary topology with several improvements that further reduce the distortion/noise floor even lower than the already "audiophile quality" CS® 800X (40  $\mu$ sec, <0.03 % thd, etc.)

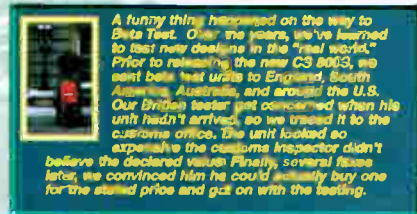
# Very carefully!

Our exclusive output circuit design (patents pending) completely compensates for amplifier output impedance. We conservatively spec damping factor at 1000 but it is only limited by component tolerance.

Modular inputs and outputs provide flexibility in configuring the CS 800S for your application. Binding post, or Speakon® outputs, it's your call. A clever input circuit accepts anything from XLR balanced line level signals to single-ended speaker level signals. Caution: don't try this with a non-CS amplifier; speaker level input signals will fry most amps on the market today!



**DDT™** - A fast-acting limiter, triggered by clipping or current limiting, which prevents speaker/equipment damage, is probably our most copied feature. Only Peavey Electronics offers "true" DDT. (U.S. Patent #4,318,053)



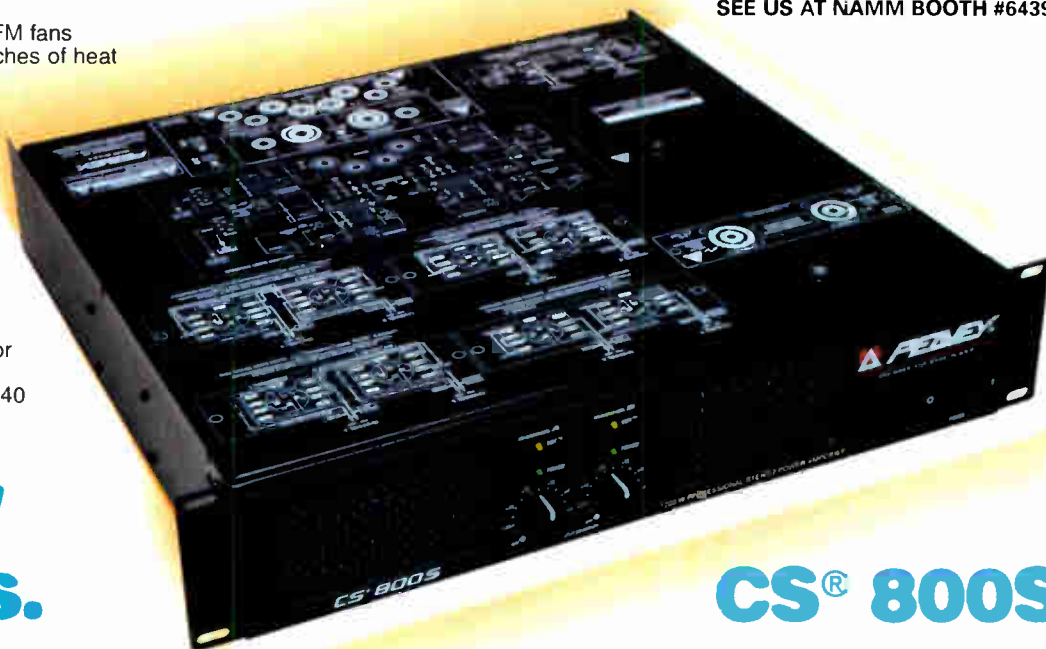
## What to Change

The new CS 800S is two rack spaces high and weighs only 23.5 lbs! The CS800S wasn't lightened by using a smaller power transformer and fewer output devices on a "trick" heat sink. We used our years of digital and "switchmode" experience to develop an advanced high frequency power supply. More than just a replacement for the old heavy iron transformer, intelligent load and thermal sensing dynamically interact to provide more power, longer, and more reliably than previous approaches.

This, combined with our more than 30 years of experience building the most reliable solid-state amplifiers in the world, allowed us to redesign the whole amplifier from input to output, merging the best of the old with the best of the new to deliver 1,200 watts of superior performance without breaking your back or your pocketbook. The CS800 just keeps getting better!

SEE US AT NAMM BOOTH #6439

# 1200 W 23.5 lbs.



# CS® 800S

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## Lost Highway

dled with a score that may or may not work perfectly for the film. Angelo and I work differently on scores now. He builds me modular music that can go here or go there, and get fiddled with. Beds and all kinds of little builds—small pieces, long pieces that are meant to be fiddled with.

"There are sound effects, there are abstract sound effects; there's music, and there's abstract music," he adds. "And somewhere music turns into sounds, and sounds turn into music. It's kind of a strange area."

### EFFECTS AND BACKGROUNDS

Because he is essentially creating the music track during the mix, Lynch avoids any semblance of the age-old conflict between music and effects fighting to be heard. In fact, he finds the notion of competition on the stage absurd. Music becomes effects; effects become music. It's the way he's always worked, and it's led to some incredibly inventive sound montages, from the eerie early squeaks of *Eraserhead* through some of the sawmill/industrial backgrounds of *Twin Peaks*. But as Ross and others point out, it's not really fair to label them backgrounds. They are atmospheres, designed to create a mood. More than once on the stage, Lynch pulled back on an effect—whether in a prison background, footsteps or a hard door-close—because "it sounds too real."

"When you think about backgrounds on a normal film, you think about birds, winds, traffic, etc.," says supervising sound editor Frank Gaeta. "On this film,

we're talking in abstract terms, a feel rather than a sound. David would say, 'I want it to sound oppressive, or I want it to sound ominous.' So we take tones and pitch them down, process them and make them run backwards, and that becomes a background for a scene, like the prison sequence we're in right now. Our first talks were all in terms of musical quality. And it's all atonal. When I sat down with the videotape to begin thinking about the elements, I had the music that David had been putting together. It was a big priority to have the music with the work copy, but it's very unusual."

"In some of the house sequences," adds Ross, "we've taken such elements as church reverbs, church room tones, air conditioners, refrigerators, and slowed them way, way down, then mixed them up to create this industrial background, this industrial tone, which we use in a house that is essentially quiet—which a conventional director would play quiet. There are no birds in these sections. The backgrounds are made of unusual elements, and in certain places they feel like music, in that they tend to suck you in, and they're played fairly loud. Music tends to do this function on certain shows, but we're using sound effects to do it."

Backgrounds and Foley were edited on DAWN workstations—Ross was an early supporter, as he tends to be with new technology, and now owns 22 systems, some of which serve as recorder/players on the stage. Effects were edited in Pro Tools and created in a combination of Pro Tools and Sample-Cell cards, triggered from Studio Vision.

—CONTINUED ON PAGE 236



The *Lost Highway* re-recording team, at the three-position Euphonix board, L to R: David Lynch, John Ross, Derek Marclay and Frank Gaeta

PHOTO: MAUREN DRONEY

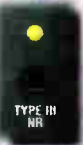


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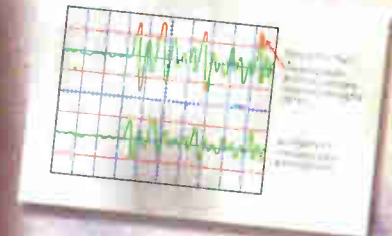
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## SOUND FOR FILM

## SON OF POPS AND TONES FOREVER

by Larry Blake

Last January's column was titled "Pops and Tones Forever" and dealt with the uses and abuses of sync pops and alignment tones. The response to that column was so good that I've decided to subject the rest of you to my shrill rants about this most prosaic of topics. While the majority of this column will be on alignment tones, let me start off with a reprise of my party line about sync pops:

Please, mixer brothers and sisters, lay down pops at the head and tail of *all* units, if not each and every track. In other words, if you are recording stereo stems on a multitrack, the dialog, music and effects stems should each have pops so that if they are strung off (i.e., individually copied) to mag or a workstation, the transfer person will not have to re-patch to get a pop. This applies to stems in every form, be they mono or for a stereo temp dub, when you might have various combinations of mono and 2- or 3-track stereo stems.

My other plea is that you let sound editors "pop" all 35mm mag recordings made on your stage, creating new start marks based on the head pop being placed at 9 feet. I know that you can sometimes get territorial about your mags, but please understand that in the long run start marks and timecode both cease to exist, and the negative cutter will once and

forever establish the printer start using the head pop. Sync is, of course, always referenced to the dialog track, and because the picture department and supervising sound editor have viewed the film using popped work tracks and temp dubs for many months, anything but a popped track is unacceptable.

Furthermore, elements such as ADR and Foley have been cut on the assumption that the work track is popped in the standard fashion, and any other approach to getting a start mark will result in Sync By Escher. Now, to the lengthier subject of tones.

The whole purpose of tones is to relate the record-

on mag units like tags or mattresses: People don't know why they're there but are afraid to take them off. While, yes, it is indeed true that the tone at the head of printmasters really should be set to the .50 setting on the optical camera's input meter, realize that this is because that print master (hopefully!) was monitored through optical clash simulation that gave the mixers a clue as to how it would survive the transfer to optical.

What I'm griping about is people putting "0 VU=50% optical" on *all* mag units, including premixes and stems, when the limits of analog optical recording have been a small influence, if any, on the levels contained therein.



ing at hand to relevant standards, such as "dBfs" for digital recording, meaning how many decibels below 0 digital "full scale." The standard lineup point for optical recording has always been the 50% point, or 6 dB below full modulation. (In actuality, you get a little more than that, but that's another discussion.) The notation "0 VU=50% optical" has been hanging around labels

A more valuable piece of information would be the monitor reference level, thus "0 VU = 85 dBc/slow." This will tell you that once you align the recorder output to 0 VU on the monitor output meters, you will be hearing the program at the same level as it was mixed.

The above assumes that the monitor level itself has been set by bringing pink

—CONTINUED ON PAGE 164

## COMPOSER SPOTLIGHT

# ED KAHLOFF

## PRIME TIME COMPOSITION

by Gary Eskow

"There's a real irony to the position I find myself in these days," says Ed Kaheloff, composer and producer of much of the music heard on prime time network TV. "When I came to Manhattan 25 years ago, I was the fair-haired boy who had a Moog synthesizer, which was all the rage. There were only a few Moogs in town at the time, and I might have been the only person who was on the session scene who could actually play the thing!"

Kaheloff's chops earned him primo gigs with the likes of Quincy Jones, Henry Mancini and John Barry, but his ability to compose memorable melodies, coupled with substantial arranging skills and a tuned business esthetic, led to the creation of his own music house. Although a New England Digital Synclavier, his original Moog and a variety of other synths maintain permanent residence in Kaheloff's Manhattan studio, the composer's sound is built on live ensembles.

"That's what's so ironic," he says. "Ever since the MIDI revolution, there seems to be a new kid on the block every week who has synth chops and a digital studio. I admire tremendously much of what these people turn out, but our sound has gone the other way to a certain extent. Not only do we orchestrate for live players on nearly every project we record (including biggies like



PHOTO: BART EVERY

the "Monday Night Football" theme, the Ray Charles Olympic version of "America the Beautiful" and this year's NBC election night theme], we have made a point of implementing a combination of analog and digital equipment here in a way that maximizes the contribution of both technologies. We have a 'house band' that we rely on, which includes Sammy Merendino on drums and as a drum programmer, Jeff Mironov and Steve Love on guitars, and Francisco Santana on bass. Every player has a personality, and that individuality makes its way onto tape, to the benefit of my music.

"Being a professional composer means having to

satisfy clients, but you must satisfy yourself first," Kaheloff adds. "Otherwise, you have little to give over time. The most grueling area of the business, in terms of being asked to spit back to clients that which they ask for, is the jingle business. Standards change very quickly, and jingle writers have to stay on top of things. Luckily, I was able to expand away from spots and go into television scoring and theme writing. At a certain point, I began to get recognized as having an individual style, or voice, and when a producer calls me, it's generally because they want me to contribute something that is personally mine to a project."

Kaheloff and his chief engineer, Brian McGee, find themselves traveling around the country to record artists quite a bit these days, and they make a point of bringing along equipment, particularly mics, that artists like Ray Charles and Hank Williams Jr. are comfortable with. "Mics are critical. Hank Williams Jr., who we've worked with on a number of 'Monday Night Football' pieces, likes to use a Telefunken C-12 tube mic, so we rent one when we go to Nashville to record him. The C-12 we have here is very special—I bought it from Capitol Records, and it's the one that Nat King Cole used to record with." Although the majority of his work is for television projects, which means that for many listeners, the sound will get squashed down through 3-inch speakers, Kaheloff is a stickler for pristine recording. "We apply record standards to the low quality of television sound, and you can absolutely tell the difference."

Standard operating procedure for Kaheloff and McGee is to record the rhythm section to an Otari MTR-90 analog machine, then mix through an SSL G Series console. "Laying down the rhythm section to analog tape definitely results in a warm and fuller low end," he says. "In order to get a crystal-clear high end, we move over to our Mitsubishi 32-track with Apogee filters. We have two generations of the modules that made SSL famous, and we use the inherent color of these modules to help shape our music. The first 24 strips are from 1981 to '82. The EQ bandwidth on these strips is wonderful—it was the first

—CONTINUED ON PAGE 168

noise into the console at 0 VU on the same meter while setting your amps, crossovers and room equalizers. The best way to really calibrate monitor level is to actually *record* pink noise at 0 VU and then play it back. This is the most critical test to see if you are getting both unity gain and frequency response through your whole chain, including the recorder, the monitor level and monitor equalization.

When I say the words “meter” and “calibrate” in the same sentence, I’m talking about an accurate standard VU meter or an LED meter that has an “exploded” calibration mode adjustable for various operating levels. I am horrified to find some very expensive digital consoles with only low-res peak metering. Not only are “cal” modes essential, I think every console should have standard needle VU meters across the main speaker output buses, with metering selectable pre- or post-cinema processor insert points (such as a Dolby DS-4 or a DTS Tower), all the better to verify unity gain. Such meters are absolutely essential when setting up the sound pressure level of a room with pink noise; 0 VU just looks different when viewed on an LED meter with 15 segments.

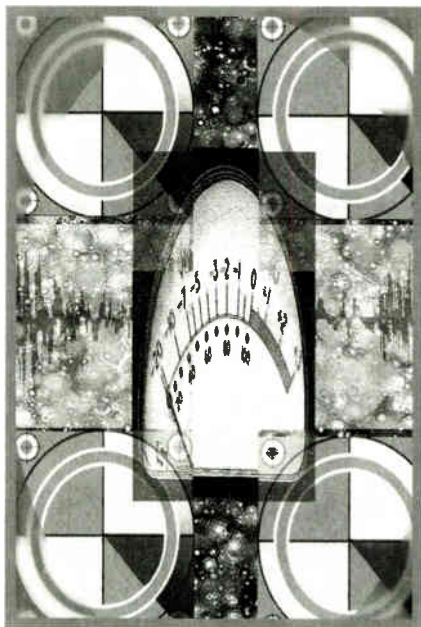
You should also tag onto your reference level notation the precise recorded level of the head tone as it pertains to that tape. For example, -16 DBfs is the standard level on most DTRS machines, although many in Hollywood have been modified to a -20 level, primarily for use in print mastering. Since these machines don’t normally have adjustable D/A outputs, the margin for error is great. On 35mm mag and 2-inch, the reference flux level should be expressed in  $nWb/n^2$ , along with the reproduce equalization standard (e.g., SMPTE, NAB, etc.).

But the documentation on your boxes doesn’t stop with the recording itself; there should be information on program length (both in feet/frames and timecode), the version date and/or version number. You *also* (will it ever end!?) should document the timecode frame rate, the sampling rate and any relevant software settings (such as the pulldown setting in DTRS machines). The more I use digital audio, the more I rely on frequency counters across the word-clock output to verify that I am running at the speed I think I am.

Thus, if I had my way, some transfer person might live to see the day when he or she gets boxes with all of the fol-

lowing inscribed: 0 VU=85 dBc/slow= $nWb/m^2$  SMPTE 35  $\mu s$  EQ, V2 LFOP 1128+06/04:12:32:08; 29.97 ndf/pull off/48.000 kHz. Let’s hope there’s still room for the name of the film and reel number.

Last but not least, box labels should have a clear description of channel ID. Most paperwork is pretty good in this regard, with my only complaint centering around not what is literally on a given track, but the context of that track. Tracks 11 and 12 might be the printmaster, but if you want to be sure that people know that this is the second-generation copy, they need to



know what and where the first-generation master is and that they *shouldn't use this copy*.

On the subject of channel ID, perhaps I should add my two bits on “voice slates.” Some people never use them, some only on printmasters, and I’m sure there are some who use them on every premix and stem. I tend to put them just on printmasters, which are the primary elements that will be handled outside of my direct supervision.

The first tape for each project, if you are recording on a real multitrack (24, 32 or 48) should have a complete, *lengthy* set of tones recorded with the deck freshly aligned for that batch of tape. Since you are creating the Rosetta Stone for this program, don’t skimp. Don’t be limited into thinking that this tape won’t leave your facility and, therefore, a) that it doesn’t need tones, b) that the tones don’t need to be very long, or c) you only need low- and high-frequency tones for EQ because that’s all you can adjust on your ma-

chines.

For example, some machines have a mid-frequency repro EQ adjustment, and what will happen when your tape is played back on one of these decks? The same holds true for mag film. Dolby preamps, originally made to reproduce mag-stripped 35mm and 70mm prints, are frequently used today in screening rooms in lieu of the preamps on the mag dubbbers themselves. Since these preamps have a mid-frequency adjustment, if the engineer setting up the room does not have access to a real-time analyzer to adjust to your supplied pink noise, the mid-frequency adjustment will remain where it was, while your highs and lows will be tweaked. Who knows what you’ll really be hearing?

I recommend, at the minimum, laying down the following on the head of reel 1 for each set of multitrack tapes (such as cut elements, premixes, stems or printmasters): one minute of 1 kHz, plus 30 seconds each of 40 Hz, 100 Hz, 4 kHz, 10 kHz, 15 kHz, pink noise and finally SR noise, if applicable. If you want to do more, either in terms of length of tones or selection, such as adding a continuous tone sweep or something really exotic, like “pink tone” (full-frequency tone that sounds like an organ stop), you will probably need to go to a separate tone roll. In either case, remember to put leader toward the end of your analog 2-inch tapes, leaving no doubt where the record pad begins. (Never leader DASH or PD digital tapes.)

After the tape with reel 1 (be it a ten-minute reel that’s accompanied by reel 2 on the same tape, or projection reel 1AB), I think it’s okay to put 30 seconds each of 1 kHz, 100 Hz, 10 kHz, pink noise and SR noise. It is very smart to pre-stripe the timecode on multitrack tape with your tone layout in mind, so that code is always continuous and ascending from head to tail. If this is your master roll, you might want to start it at 00:55:00:00; for other reels, 00:57:00:00 would leave enough room for tones before the program begins on the hour. And be considerate of anyone who will have to use this tape and start each tone on the timecode minute or half-minute.

If you’re going to do a lengthy set of master tones on your 35mm mag film masters, you will always have to go to a separate roll because large rolls of mag don’t shuttle very easily. Along these lines, you will endeavor yourself to someone if you make loops of 1 kHz and

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pink noise along with your tone roll.

Pink noise is a really powerful tool, and I advise that every mixer get a hold of a portable generator for their personal kit. While it's true that many consoles have them built-in, many don't, including, inexplicably, some *very* expensive digital consoles. Hello? And even if they do have a generator, you don't know if it's accurate. Make sure that yours is indeed accurate by patching it into the line inputs of a selection of real-time analyzers, comparing the results with the internal generators built in those RTAs.

Film engineers are completely enamored of pink, to the extent of the exclusion of discrete tones except for a 1kHz lineup. What is most lost by having no low, mid, high tones is the ability to quantify *exactly* where EQ was set, thus making precise adjustment more repeatable. This is especially important on the low end, where RTAs are more open to interpretation.

One factor that should always be remembered is that whenever you are recording with a noise-reduction system, be it dbx, Dolby A-Type or Dolby SR, frequency response record/reproduce anomalies will be magnified. One of the most clever and underappreciated parts of Dolby SR is Dolby noise. While it's correct to think of it as SR's version of the familiar Dolby A-Type warble (i.e., the signal used to set correct NR encode/decode level), it has a second and equally important use in the Auto Compare mode.

This function allows you to compare the recorded Dolby noise on a tape to that generated by the decoder, with four continuous seconds of noise telling you that you're listening to the generator, and two 2-second sections of noise indicating that you're listening off-tape. This is such a fiendishly clever idea: It's a help when recording, telling you that the record EQ is correct (assuming that you have set up the EQ of your repro and sync heads to your bible roll) and when playing back tapes from other facilities to show that your repro EQ is matching the original record characteristic. You really should be able to get a seamless match with any SR-encoded recording, although I'm excluding from this optical recording, which has roll-offs on the top and bottom ends.

If you are using A-Type noise reduction (which I think should only be confined to printmasters, SR being preferred for all other purposes), the main lineup signal on tapes should be the A-Type warble *only*, and not a 1kHz tone. It's okay to have 1 kHz in the

midst of other tones clearly there for EQ alignment. This is especially important if you are recording the printmaster on digital tape, which one would not normally expect to be noise reduction-encoded. The warble, in addition to your very clear paperwork and instructions (right?), should let the optical transfer person know that they should not encode this signal on the way to the camera. And, of course, remember to plaster yellow A-Type and blue SR stickers wherever possible. Also, printmasters for A-Type or SR optical can *only* have an 85 or 88 reference level, respectively.

A rarely used "alignment recording" is not a tone or a noise but simply *nothing*. Biased tape noise, with everything patched as normal but with faders down, is the best way to tell someone that the ground loop hum they're hearing is downstream of you, or in less polite terms, *their fault!* For example, if you know that the assistant picture editor will be checking the printmaster on a flatbed editing table, you can give them a loop of biased noise to play. If they hear any noise in the program, and it's still there when they play the loop, it's their machine.

I remember hearing a 120Hz buzz throughout the length of the optical print of the first film that I mixed. I knew it wasn't there, and the optical facility told us that it was on our master. We played the mag back at an extremely elevated level, and it was quiet as could be. They still stood by their party line, and eventually we had to get a reel shot by a competing company and A/B'd it with their print. We eventually found out that they had mulled the output of the dubber into the camera and into an RTA, and thus the buzz was created.

Since then, I have been in the habit of checking recorders when doing a printmaster by cranking the monitor gain a lot. Though this drives techs crazy, it's the only way I know of checking all the noise bases.

Send your stories of downtrodden pops and tones to PO Box 24609, New Orleans, LA 70184; fax 504/488-5139, or via the Internet: [swelltone@aol.com](mailto:swelltone@aol.com). ■

*Larry Blake is a sound editor/re-recording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would have to be the Celebration in the Oaks every holiday season, when the oak trees of City Park are decorated with lights.*

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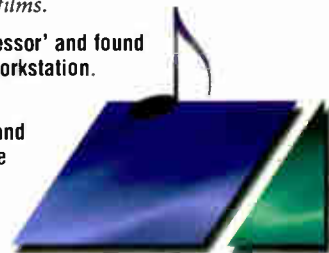
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*Music for the Future*

—FROM PAGE 163, ED KAHLOFF

time SSL started to encroach on Neve territory as far as warmth. We then ordered some 1985 EQ strips, which have a smoother top end. We feel that the earlier EQ fits rock 'n' roll quite well, while the later EQ handles classical or legit sounds perfectly."

On the day *Mix* stopped by Kaheloff's 24th Street Manhattan studio, final touches were being applied to tracks for an upcoming PBS television special starring Kaheloff's wife, Andrea McArdle. The singer, who closes "Andrea McArdle on Broadway" with a version of "Tomorrow," will be remembered as the precocious pre-teen whose voice tore at you like a pit bull when she starred in *Annie*. Well, she's all grown up now, and in the special displays an emotional range and maturity that fully complement her still prodigious vocal chops.

"Andrea McArdle on Broadway" was produced by Kaheloff, and the soundtrack will be released on his label, Magic Venture Records. Shot live in front of a Miami audience, tracks were brought back for sweetening at Kaheloff's studio. "We worked off a rough stereo mix of tracks we had laid down up here, as well as a sync track, then rescored the band and Andrea live down in Miami," he explains. "We knew that in addition to sweetening, we'd probably be replacing a lot of the tracks up here. However, as things turned out, we replaced a lot more than we'd originally planned on."

Kaheloff and McGee were adamant about using the audience sounds that had been captured in Miami. "Although we were re-recording a lot of Andrea's performances and adding tracks, we thought that the interaction she had with the audience was special, and so we used a lot of the crowd sounds we had on tape. We took these elements and laid them onto multitrack, where we imaged them with EQ and effects. In essence, we performed sound design on every ambient sound you hear, and the work was worth it to us; the emotional interaction between Andrea and the audience really pops out on the television special."

Kaheloff is currently considering adding a Pro Tools system to his arsenal of equipment. "Handling all aspects of post-production sound for our clients is something that we're taking a hard look at, and Digidesign has certainly established themselves as key in the business. We're always involved with the final assembly of the shows we work



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—ED KAHELOFF**

on, so we'll probably purchase a system by the end of the year.

"To date we've used a custom system for the IBM called AQ Design, which was designed by Peter Roos," he explains. "It's really a terrific workstation. There's probably not a single project that we complete here in a year that won't be worked on in our DAW. Peter's problem was that Digidesign has been able to partner with third parties in a very clever way, and that allows them to offer features at a very reasonable cost. No one individual could ever compete pricewise with that philosophy, and so Peter has gone back to his career as a full-time sound designer.

"You know, it's funny the way people think of the 'digital revolution.' We were sitting around the console having a few laughs the other day after completing work on a major project for Carnival Cruises. We had been importing cues into our DAW and experimenting with different possibilities, and we were noting that the only time savings that digital editing offers is the time you save not having to rewind tape. The greater palette that these tools give you generally means that you spend *more* time trying to come up with that perfect mix, not less. But hey, regardless of whether your working on the client's time or your own, you always want to put your name on the best-sounding product possible. This is an adventure, not a career!" ■




*Gary Eskow is a freelance writer, musician and producer based in New Jersey.*

## FORMAT TALES

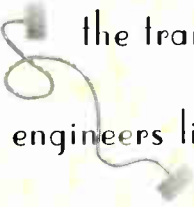
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# THE LATE SHOW WITH DAVID LETTERMAN — IN SAN FRANCISCO



PHOTO: STEVE JENNINGS

**M**ike Delugg, audio consultant for CBS's *Late Show with David Letterman*, took a break in the Sheffield Audio-Video Productions truck with Paul Shaffer. Normally found at the on-air audio mix board at the Ed Sullivan Theater in New York, Delugg contracted Sheffield for a week of location broadcasting in San Francisco last spring at the Palace of Fine Arts. Besides a 48-input SSL 4000 E Series console with G Series automation, the truck contains a 24-input 5104 Neve; a further 28 inputs were handled on an Amek Big Langley, which was rented for the Letterman gig. Monitors include Audix 1As and KRK 7000s; Delugg brought his own single Auratone. A veteran recording engineer, Delugg has been with the Letterman show eight years and mixes the Shaffer band and musical guest acts for every show, providing production mixer Jim Rose with a stereo premix. Audience P.A. is mixed by Tom Herman through a variety of Clair Bros. systems, aided by monitor mixer Larry Zinn and system tech Mike Wolf. Delugg's first-choice vocal mic is the Audix OM5, which he praises for its off-axis rejection. ■

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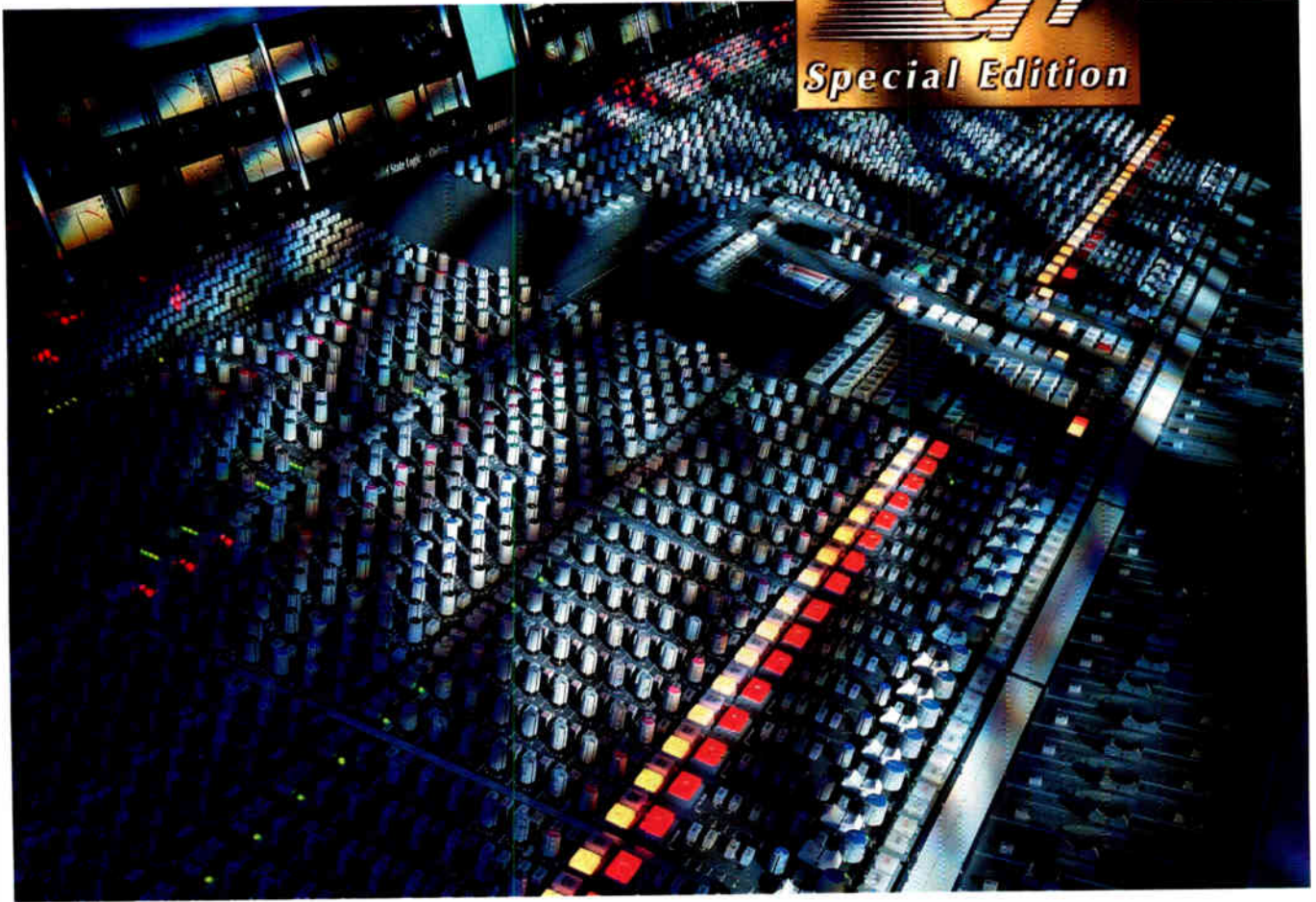
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# Digital Marrakech

## THE MARRAKECH MANDATE

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—Tom Hidley, project designer, builder and managing director

As a friend and business associate of Tom Hidley, I was asked in 1994 to organize the marketing/operations package for the newest Hidley-designed project: a huge audio/video studio complex in Marrakech, Morocco. Although I've built and operated 35 studios over the years, this was a daunting proposition that called on all my experience, resources and professional contacts worldwide. Just the story of acquiring the financing by Hidley's group and key attorney Paolo Gallone could fill a textbook (my fax file is two inches thick). But I am happy to report that we are on schedule for the building of a self-contained production and post-production center, almost a city unto itself, with construction scheduled to start before the end of 1996. The complex will include living facilities for management, personnel and international clientele. The site is on 30 hectares (approximately 75 acres) of undeveloped land adjacent to the opulent Palmeraie Golf Palace Hotel, which was completed four years ago. While the scope of the Marrakech

THE  
\$80  
MILLION  
MARRIAGE  
OF AUDIO  
AND VIDEO  
BY CHRIS STONE

project is considerable, there's a story here that can benefit anyone planning a studio, large or small.

## PROJECT OVERVIEW

At the center of the Marrakech complex (see plan) is a 16,500-square-foot Hidley-Infrasound™ musical performance and recording space (B) equipped for live television/film production and/or broadcast syndication. (Note: Infrasound is a term for the subaudible region of sound pressure levels below 20 Hz that have harmonic effects on the sounds we hear above 20 Hz. Hidley-Infrasound studios are isolated and infrasoundically "clean" to below 10 Hz, making them the ideal environment for expanded dynamic range digital recordings. See the August '95 *Mix* for a detailed explanation of Infrasound.) The room doubles as a scoring stage for up to 150 musicians and is equipped for

eight-camera video shoots, interfaced with a triple antenna digital teleport (eight independent signals) and commercial television station (D), for live transmission to the world via ARABSAT and other international satellites. Adjacent to the main stage is a 9,020-square-foot shooting stage (C) for television and film production. This room is also designed with Infrasound acoustics to accommodate sophisticated "theater in the round" productions.

Companion facilities (E and J) will be devoted to post-production, including two dedicated Infrasound dubbing theaters, 80-seat screening room with film/video projection and 38 editing suites of various configurations for film and video support. A second scoring stage (G) is designed to accommodate a symphony orchestra and doubles as a straight music-

recording studio with Infrasound control room. It can also be configured as a giant dubbing theater. Therefore, the Marrakech facility will be able to accommodate up to three major dubbing projects simultaneously. There is also an Infrasound 10Hz surround sound mix room with effects studio (A), and studios for Foley, ADR and voice-over (K) with an Infrasound control room, which will serve double duty as a smaller music production studio.

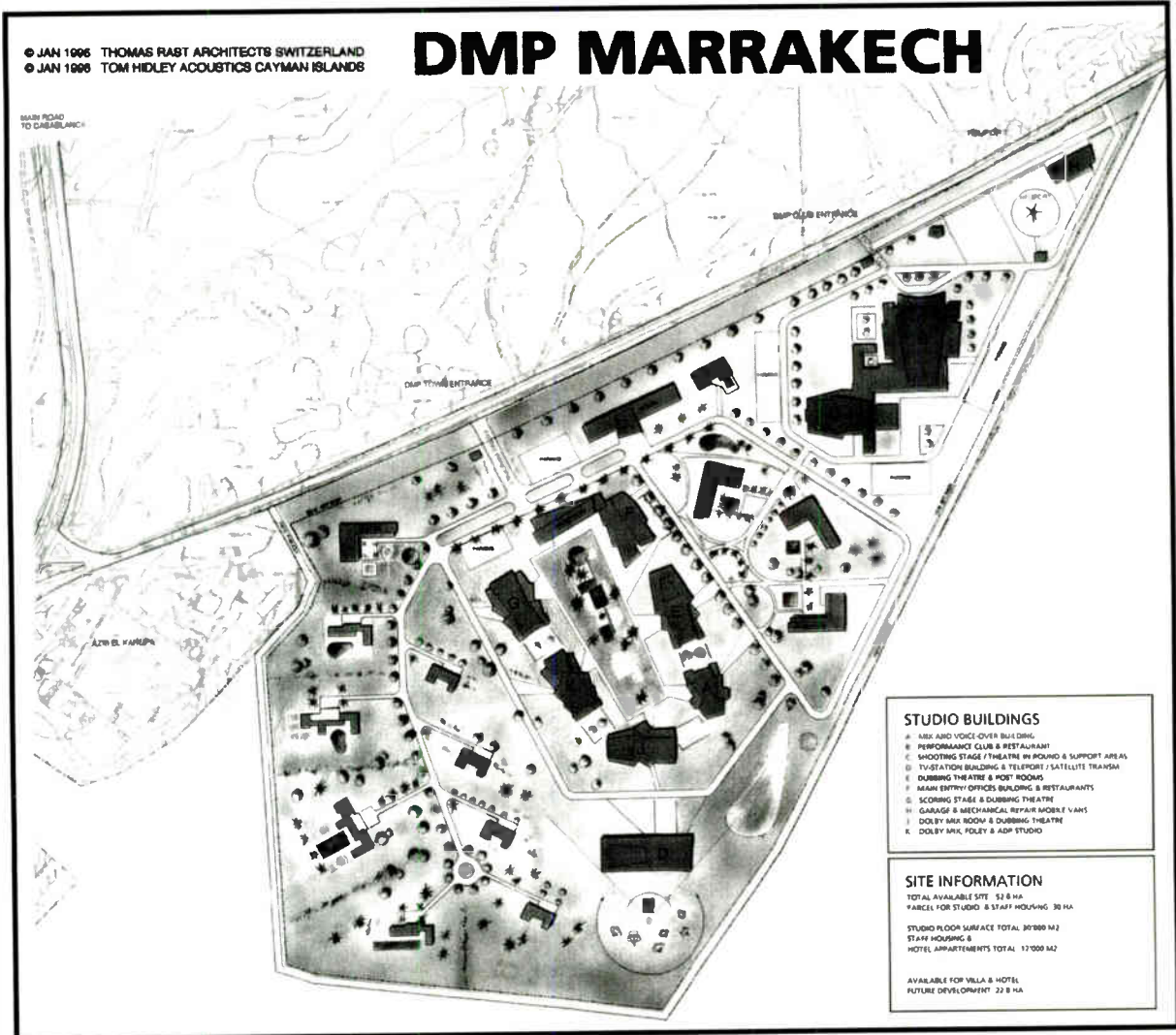
**FINANCING**

Finding investors and gathering financing for a project of this magnitude takes years. The first step is the development of a detailed business and marketing plan delineating the purpose, location analysis, projected competition and sources of sales revenue. Included in this prospectus is the expected profit development, timeline and cost of bringing the project to fruition, plus staffing requirements, resumes of key management personnel, projected cash flow and other bud-

getary requirements.

In the case of Digital Media Partners (DMP) Morocco, the Hidley group had strong government support and implied endorsement from both Morocco and Saudi Arabia, yet the funding process from private sources took almost two years to accomplish. This was considered quick, as many ventures of this size will take three to five years to complete. Countless meet-

*Right: On their camels, Tom Hidley and Chris Stone, two of the creators of the Marrakech digital recording oasis, shown below in final plan form. More than 75 acres of land make up the actual facility compound.*



ings, explanations of financial strategy and spending justifications, along with ascending levels of approval, all take lots of time. It reminds me of when the bankers say, "If you need an answer about your loan approval today, the answer is, No."

When comparing large and small building projects in our industry, I have heard it said "It is only a matter of zeros," meaning \$100,000 and \$1,000,000 budgets have the same challenges and require the same amount of effort from the entrepreneur. It's unfortunate that many ventures that deserve to be funded are not because the entrepreneurs presenting them to potential investors have not projected enough time for themselves to survive, economically speaking, while they accomplish the many tasks necessary to ensure investor approval and see the committed funds arrive in the bank. Patience is the most difficult part of successful funding, particularly in service industries such as professional audio and video.

The essential documents to assemble, whether your project is a single

recording room or a diversified complex, are a business and marketing plan, an acoustic design and construction plan, a list of potential sources of financing and a potential client and source list.

#### LOCATION

In the professional audio and visual industries, there are considerations beyond the "location, location, location" mantra of the real estate industry. With today's capabilities in satellite and telecommunications technology, it is more likely to be "How accessible is the location, how long will it take me to get there and how sophisticated is the technology?"

Marrakech is one hour and ten minutes from Nice, France, and 35 minutes from Casablanca, which has shuttle flights almost hourly. The climate is similar to Palm Springs, Calif. (being on the same latitude), and there are several flights from the major European centers such as London, Paris and Geneva on a daily basis by carriers such as British Airways, Swissair, Air France and Royal Air Maroc. For Americans,

there is a daily nonstop flight from New York's JFK direct to Casablanca aboard Royal Air Maroc, the national airline, which takes the same six hours as it does to fly to London. In short, there are no location problems in terms of transport, distance or the availability of required services and requested amenities.

The size of the Marrakech facility and the required duplicate equipment mandate that the technical department maintain parts inventory sufficient to handle any hardware breakdown. The facility will be totally self-sufficient, with backup equipment available to meet any technical problems. With the triple-antenna digital teleport, all popular forms of remote access will be available, including ISDN, T-1, T-2, T-3 and direct satellite uplink and downlink capability from virtually anywhere in the world. This will allow the ability to remotely manipulate audio and video post-production in terms of overdubs, editing, dubbing, etc.

Because there is virtually no professional audio or visual production or post-production industry in Morocco, an additional plus is the ability to help build these industries almost from the beginning, knowing there is government support, as long as the approach is sensible for the industry and for the surrounding culture. It's a classic example of, "If you build it, they will come," as long as you have the funds to do so and are prepared for the rather odd job of developing healthy competition in order to create an evolving modern industry. The same thinking can be applied to your next venture, whether it's a recording facility in Des Moines or a new-media startup in the San Fernando Valley.

#### EQUIPMENT

How do you choose the best gear to purchase today for use two to three years from now? Carefully! Some of the obvious questions are, how digital is it going to be in 1999? Will audio tape be used at all? Products such as digital recording consoles, in development or being initially offered today, will either come to fruition or not. Who will the additional major manufacturers be at that time? What will be the favored formats that you must have in order to be considered a 21st-century mothership facility? The answer in 1998-99 is not necessarily the same as 1996. However, there is little doubt the integrated systems approach will be the order of the day, along with the ability to refor-

## A MASSENBURG PERSPECTIVE

Renowned inventor/producer/engineer George Massenburg joined us in Morocco as a guest technical adviser at our first meeting. He also gave us his impressions as a potential client. Here are his thoughts.

"Visiting Marrakech and meeting with the studio team at their initial gathering was quite an adventure. I'm impressed with the uniqueness of this project, one which may very well be the first to fully realize the global nature of our industry as we prepare for the 21st century. As a producer and an engineer, it's gratifying to discover a group who aims this high, a group who is able, willing and anxious to elevate audio excellence and who grasp the interconnectedness of the sound, video and film communities. I, for one, can hardly wait for the opportunity to work there.

"The Marrakech complex might

serve as a beacon for the future of the sound and picture industries. In the studios, theaters, mixing and scoring stages, Tom Hidley has a mandate to, once again, build the finest and the best-crafted rooms that the current art and science can describe. He is clearly the pioneer in purpose-built recording facilities, yet he always takes the opportunity to experiment a bit and to update his defining philosophy. This is an area which can benefit the entire audio industry.

"As we evolve through the 'technology' break from analog and into digital audio production, the time may be upon us to successfully design and execute the full post-production effort as a 'digital enterprise zone'—a facility with a digital audio network as a backbone and digital production tools large and small. Time and time again we have innovations in science and technology coming not from the established media centers, but from the periphery. Marrakech provides us with the opportunity to utilize the newest technological refinements to bring together a truly new studio." ■

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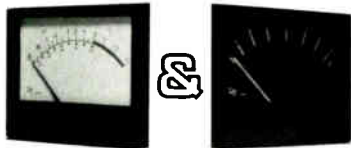
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## CONSTRUCTION

One of the first major decisions is your building contractor. Whether you know it or not, you are hiring a new member of the family to whom you will be joined at the hip and who will play a serious role in whether or not you are ultimately successful. Having designed and built more than 500 studios all over the world, Hidley is an authority on this subject. He says: "Timing, budget, general contractor, subcontractors—all of whom can destroy your budget projections and your opening date—are the components of your most important opening gambit."

Take your time and get references. Talk to other facility owners who have

used these companies. If possible, avoid anyone who has not been involved in the construction of your kind of facility before. If you don't take this precaution, it will logarithmically increase your chances for failure. Get three bids for everything. If that is not possible, talk to others who have paid to do the same work and find out how much it cost. Operating by the seat of your pants is a marvelous metaphor, just don't count on it when you have to determine how long it will take to build or equip a structure.

Get the specific costs and the timeline for services in writing and negotiate the penalty and its cost to you if the contractor does not deliver in the agreed-upon time frame. Hidley emphasizes: "If you do not wish to use a 'late' penalty clause, have the contractual option to terminate the contractor with a 30-day notice for 'late time' delivery based upon the agreed project timeline." Your cost in lost business and improper timing of facility promotion can be enormous. It is usually much more than you first considered, particularly if you have outside investors whom you must please. These lessons work for all facilities, large and small.

## PERSONNEL

Choosing the proper personnel and getting them up to speed at the proper time during your project development is the next important step. To accomplish this, you must first believe in your timeline, your budget and what level of employee you will need at what point in time. We all know that anyone can build a facility and purchase equipment. Many of us learned in our early days in the business that people make all the difference. Pick good people,

## A POST TESTIMONIAL

For our initial meetings in Marakech, we also invited film music producer Andy Hill to provide us with that all-important post-production client's point of view. Hill served as VP of music production at the Walt Disney Co. for the past seven years and is now an independent music supervisor who recently worked with Randy Newman on Disney's *James and*

*the Giant Peach*. Here is Hill's reaction.

"There is an ambition of the variety we typically see in our industry, which is generally self-serving, and then there is the kind of ambition which builds the Cathedral at Chartres. My impression from the meetings in Morocco is that Tom Hidley's ambition is of the second type. It's an absolutely first-class design, and great care is being taken to anticipate the post-millennium needs of music producers." ■



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and you are a hero. Pick the wrong ones, and you not only have to start over, your reputation may very well be ruined (or at the very minimum, tainted).

Timing is next. When do you need a studio manager or a sales department? Six months before opening? Three months? The answer is based only upon knowledge of your business market and what you think will be necessary. How long can you do it yourself before that path does not make good fiscal sense? And don't forget that it will take you a lot longer than you anticipate to find someone who will accomplish what you need, and the difficulty increases critically as you go up the management ladder. Plan ahead. Again, you must believe in your timeline projections. In Marrakech, for example, we are hiring approximately 150 people, most of whom will initially come from the U.S. and Europe on short-term employment contracts. These people will in turn hire and train their own replacements, over time, from the domestic labor pool. The end result will be a Moroccan facility that caters to clients from all parts of the world, but one that is truly Moroccan.

## THE MARRAKECH OF TOMORROW

The key to marketing our industry's services in the late 1990s depends on catering to a global group of prime music, TV and film clients who will be ready to work almost anywhere because of sophisticated communications and speedy travel. From the client's point of view, if the motivating incentives of time, quality and price for their production are better satisfied elsewhere, they will go. If you can provide all of the client services under those conditions and they also can visit an intriguing location, you have an excellent chance of getting their business.

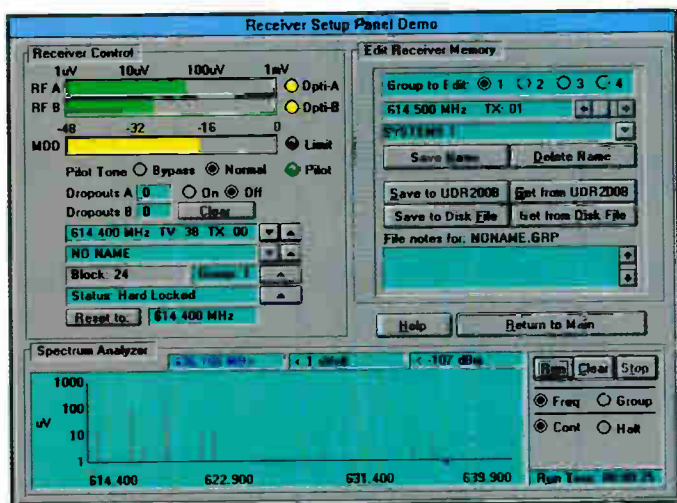
We are implementing all sorts of ways in which to develop the Marrakech venture, such as Web sites, traditional print brochures and electronic press kits. In your own project, you also might consider these and more for your needs, such as informing potential clients about your experience in meeting their requirements, your documented reputation for providing flawless results or a free trip to your facility to try it out. There are many variations on a well-developed strategic marketing plan; you just have to decide which is best for you and your facility. Then, as the Moroccans say, "In Sha'a Allah" (God willing), it will be successful. ■

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## CAPTURING THE CHEMISTRY IN NEW MUSIC


PHOTO: SIBILA SAVAGE

I want to be very careful not to put the work of producer Lee Townsend in too confining a box, because he's worked with a broad range of artists on many fine albums. That said, much of his best work has been on albums by modern jazz players, and to narrow that even further, he has a definite knack for getting the best out of guitarists. What I don't want to say is that Lee Townsend is mainly a producer of jazz guitarists, but let's look at his track record for a moment: two albums by the Bay Area's hottest guitar phenom, Charlie Hunter (as well as two by Hunter's fabulous side group, T.J. Kirk, dedicated to playing the music of James Brown, Thelonious Monk and Rahsaan Roland Kirk); two solo albums by John Scofield; a Scofield-Pat Metheny disc; one by John Abercrombie; and a whole assortment of different projects with the always fascinating and expressive axe-slinger Bill Frisell, including a duet album with Elvis Costello, two volumes of beautifully evocative music for Buster

Keaton films and a few others. But also in the Townsend discography are albums by drummer Jerry Granelli, composer/performance artist Rinde Eckart, jazz bassist Dave Holland, Argentine bandoneon master Dino Saluzzi and various discs by singer-songwriter types and purveyors of that undefinable genre known as "world music." Whatever the style, though, Townsend's work is marked by a palpable intimacy and attention to crystalline sonics.

Townsend grew up in the South Bay area near Los Angeles. Although he took piano lessons, played trombone in a junior high school band and taught himself guitar, "I never considered myself a performer really," he says. "It was always more just exploring, seeing if I could execute musical ideas I had in my head." As a teenager, he listened to lots of reggae, blues and roots music and eventually made the jump into jazz. "What has always attracted me," he says, "is

soulfulness and people playing together as one. That's the thing in music, besides a great song and a great vocal or whatever, that moves me the most—when people are listening to each other and are on the same wavelength and get a singular group feel that transcends all the individual parts. In the best of jazz and reggae and blues, that's what you find. Not to say that it doesn't happen in rock 'n' roll or classical music, too, but it was something that was really noticeable to me at an early point in those other kinds of music."

After high school, Townsend attended the University of California at Santa Cruz. It was there, he notes, "that it dawned on me that there was, if not an art, a craft to making a record, and that's what I felt compelled to pay attention to, more than my own musical chops. I started noticing producers and the recording process more. And a lot of that came from listening to ECM records, and then a little later, things like Brian Eno and David Byrne's *My Life in the Bush of Ghosts*. I realized there was something more than just documentation going on in recording; that there was a whole creative aspect that captured my imagination. So much so that it pulled me out of a doctoral program in clinical psychology and got me into a studio." He moved back to Los Angeles after he landed a job doing production at the progressive radio station KCRW. Later he worked with Palo Alto Records, a jazz label, booking sessions, coordinating manufacturing operations and doing some administrative A&R work. By his second year there, he was bringing projects to the label, and he even produced three records for the company that year. Next he was hired to be the director of U.S. operations for Manfred Eicher's always adventurous ECM Records label, and that be-

BY BLAIR JACKSON



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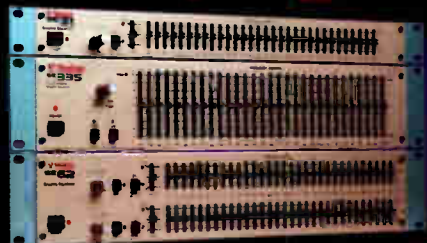
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came Townsend's springboard into independent production.

*What made you a producer?*

Good question. I was asking myself that question. I had been around studios a lot. In college I had a radio program. I took a recording engineering course. Then, when I started watching sessions, I really paid attention to what was going on. I know a lot of producers don't want to deal too much on the technical end, and that's valid, but for me, I wanted to demystify the process, so I sort of jumped in. I've learned so much from the various engineers I've worked with through the years. At the time, I tried to be as unobtrusive as possible, but I asked a lot of questions.

I think that more important than whether a producer has technical knowledge is whether you have a musical point of view that prods the artist to give you something they might not otherwise get to—if you have some musical suggestions that engender some trust with the artist and makes them think that they can make something better with you than without you.

*How influenced were you by the whole ECM aesthetic? Jazz engineers in earlier days were probably most influenced by Rudy van Gelder's classic work, which was very dry and intimate-sounding, whereas the 'ECM Sound,' if I can use that term, was much more airy and reverberant.*

ECM for me was a bridge between the classical attitude toward production and the more traditional way of recording jazz. It had the clarity and ambience of a lot of classical music, but it had the intimacy of a lot of the best jazz, and it really struck me as a new and beautiful thing at that time. I'm sure it had a big unconscious influence on me; I'm not sure how conscious it was. I loved the clarity, but I didn't want to sacrifice the intimacy and the grittiness of more pop-oriented recordings that I'd also been influenced by. What was more important to me about ECM, as an influence, was the seriousness with which the record-making process was viewed and the commitment behind it, and the fact that they were supporting musicians who were really idiosyncratic and had a lot of personality.

*Did you ever talk to Manfred Eicher or his main engineer, Jan Erik Konghaug, about actual recording techniques?*

I didn't know Jan Erik enough to ask him any questions, and I don't think

## DOING THE "SHANGO" WITH THE CHARLIE HUNTER QUARTET



PHOTO: JAY BLAKESBERG

Charlie Hunter likes to call his music "antacid jazz." As in anti-acid jazz. That's because the Berkeley, Calif., guitarist's musical approach, a blending of '60s-style traditional jazz with funk, rock and soul elements, defies categorization by the music critics who all-too-often brand his music with that all-encompassing label. "We know the lineage of jazz, and we're completely in debt to it," Hunter said in a recent interview with the *Los Angeles Times*, "but we also want our audience to know that we're from the 20-something generation, that we share the same experiences as a lot of people our age."

Lee Townsend met Charlie Hunter in early 1994, when Hunter and his handmates approached him to produce his side project, T.J. Kirk, a San Francisco Bay Area band performing the music of Thelonious Monk, James Brown and Rahsaan Roland Kirk. "In the process of doing that first record, we really enjoyed working together," says Townsend, "and he asked me if I'd be interested in doing [Hunter's other group, the Charlie Hunter] Trio stuff." The Charlie Hunter Trio, consisting at the time of Hunter, ex-Primus drummer Jay Lane and tenor

sax man Dave Ellis, signed on with Blue Note, with Townsend working on their albums; he has produced three Charlie Hunter and two T.J. Kirk records to date.

*Ready...Set...Shango!*, Hunter's latest endeavor, features the newly formed Charlie Hunter Quartet, including T.J. Kirk drummer Scott Amendola and a fourth ensemble member, Calder Spanier on alto sax. "Charlie wanted this record to be not so much involved in back-beat as all the other things we had worked on—the Kirk albums and [the Charlie Hunter Trio's] *Bing, Bing, Bing!*," explains Townsend. "It was going to be a little bit more in a swing kind of feel—what the band was calling 'Shango,' which was a sort of imaginary dance music idea. We still wanted it to be really funky without resorting to a back beat. And the drums and bass, in particular, had to be big and detail-oriented. But that's not really so different in what the approach would be if it was a back-beat record. We wanted the record to have a lot of rhythmic vibrancy and not have it sound old-fashioned, even though it was dealing with some of

—CONTINUED ON PAGE 184

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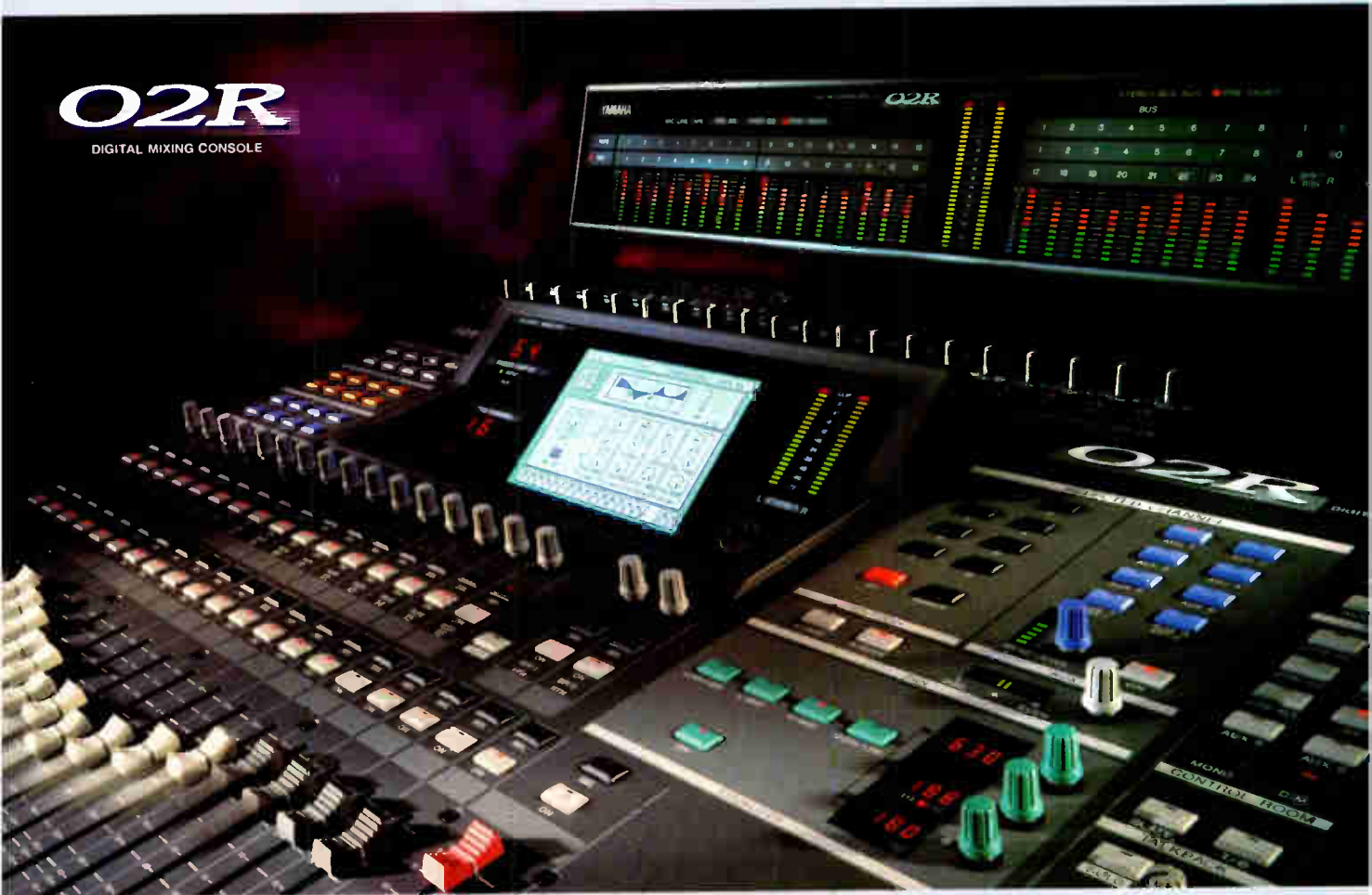
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Manfred was as detail-oriented on the technical side. But I talked to other engineers in New York, and that's an on-going thing for me: learning from what other people have to offer. That's one of the great things about record producing. It's a lifelong learning process, and as soon as I mistakenly think I have a formula that works, the next session it proves to be wrong and you learn something new.

**When you listen to early productions of yours with the knowledge you've gained and many years of hindsight, do you hear things you don't like?**

Most emphatically yes. [Laughs] But that's okay, because that was then, this is now. Sure, I cringe all the time. I might cringe at something I did a year ago. But there was always a reason behind everything I did, and actually I feel okay about most of them. How can I put this—I like it when productions take a stand; when you make a commitment and you do something and you live by it whether it's always successful or not. To use an example, I listened to Bill Frisell's *Lookout for Hope*, the first record we did together, and I can't believe some of the choices we made in EQ'ing the cymbals and the kind of reverbs we decided to go for. I probably wouldn't do something so crude and extreme now, but that record has a sound, so maybe I should. Nothing else sounds quite like it, so I guess in a perverse way I'm kind of proud of that.

**I think every artist who's been around has a few of those in his or her catalog, whether it's Leonard Cohen's disastrous record with Phil Spector, or something like the Jefferson Airplane's Surrealistic Pillow. No record needs as much reverb as that has on it, but it sounds like Surrealistic Pillow!**

Right. That's true. Ultimately you have to please yourself. But you're going to cringe because your tastes change and what you know about music and recording changes. The main thing is, 'Does the music come across?' If the music comes across, then you haven't failed. If you serve the music and it has a voice of its own and you present it in the highest way it can be presented, it doesn't matter what you think of your EQ or reverb.

**Is there a certain kind of artist who appeals to you temperamentally?**

I think there is. Like most people, I like artists who absolutely have their own original sound. I like people who are,

—FROM PAGE 182, CHARLIE HUNTER  
the rhythms of the '60s.

The Quartet, Townsend and engineer Joe Ferla spent four days recording and four more mixing at The Site in Marin County, Calif., where "they have an absolutely gorgeous, huge room and three iso booths," says Townsend. "Scott had the big room all to himself from a sonic standpoint even though Charlie was also standing in there just to get the intimacy of the rhythm section playing close together. And his bass was going direct through an evil twin tube direct box."

Hunter's unique style incorporates playing leads, bass lines and chordal accompaniment simultaneously on his dual-amped, custom 8-string guitar. "With Charlie, sometimes he went through a Leslie speaker, just a big old organ Leslie speaker, which we miked stereo in an isolation booth," says Townsend. "Or in the same iso booth, there were two guitar amps that we miked, and depending on what sound we were going for, we would choose between the two different setups."

The two saxophone players each tracked in their own isolation booths, situated in close proximity to the main room "so that the eye contact was still there," explains Townsend. "But they were isolated sonically behind glass doors. So it just allowed us to be able to do whatever we wanted to do to each of their sounds without being concerned about leakage from somebody else."

A wide array of mics was used. "The room mics for the drums were Coles ribbon mics with an overhead [Coles ribbon] room mic in the center of the kit," says Townsend. "And then

your various and sundry Neumanns, 87s for the main saxophone mics, and we had a stereo pair of 47s on each side of them that we just used very judiciously to fill out the sound. That was [engineer] Joe Ferla's idea, and it turned out really well."

Processing was mostly compression, on the drums and bass, "more so than it might sound like, not so much to deal with dynamics, but rather just to get a real textured sound out of the drums, to still have the detailing on top and the beef on the bottom," says Townsend. "But there wasn't anything that exotic done—we wanted it to sound big and intimate, but still somewhat naturalistic."

One of Townsend's favorite tracks on the album is the cut "Let's Get Medieval," an easy swing Hunter himself likens to "a Little Richard 45 played at 33." "That one I like a lot sonically," says Townsend, "because I feel the brush sounds on the drums are really textured and in-your-face, and I really like the guitar sound that we ended up getting on Charlie's solo, kind of a wah-wah distortion thing. To me, that's a pretty fresh-sounding track."

Townsend says that overall, the production on *Ready...Set...Shango!* was less involved in terms of overdubs than on many other albums he's worked on. "It was mostly about live playing—this really strong, congealed working band being documented in a sonic way that was hopefully really fresh and didn't make it sound ordinary, and to keep the funkiness of how the band is live, without sterilizing it," says Townsend. "It was really about capturing the special chemistry of these four guys."—Sarah Jones ■

like myself, motivated by the deeper powers that music can have and that are influenced stylistically in a multifarious way. The kind of artists who appeal to me are the people who are able to channel delicate and extreme emotions through their music, more than through some sort of interpersonal image they like to project or some public image they want to cultivate or create. There's a certain "realness" that I need to be able to feel from an artist so that he or she and I can have a connection.

**All these folks you've worked with are pretty hard to pigeon-hole.**

For me, that's the blessing and the plague. It's people whose work I find most compelling and challenging, but I

also know that it's the hardest to market...But that's okay.

**When you work with an artist in a number of different contexts—say someone like Bill Frisell, who does so many different kinds of music—do you tend to record him the same way time to time?**

It changes. With Bill we usually do it direct and an amp; sometimes the amp is both close-miked and far-miked, depending on our track situation. The direct is useless when it's a distorted sound, but it's very helpful with some of the more transparent sounds.

**What do you gain from working with the same artist over a period of years? Sometimes people get burned out work-**



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**PRODUCER'S DESK**

*ing together over many albums and they need a change, regardless of how the last record they made together was.*

Why I like it is because the people I've worked with over a long period of time are people I've grown close to and respect a lot and we've developed a certain kind of trust that also manifests in a certain kind of efficiency, so you don't have to hem and haw a lot.

*Have you had difficult projects, ones where it seemed like pulling teeth? And was it anything you could have foreseen?*

Yeah. Sometimes you can foresee it but you can't do anything about it.

*You're in denial, or you think you can work around it...*

Exactly. Or you have to make it work, or whatever. Or if you're astute and flexible, you can figure out ways to circumvent problems or diffuse them so the work still comes through in a positive way. My general feeling is that with the caliber of musicians that I'm fortunate enough to work with, if the process feels strong and sound and respectful, then the product is going to be good.

The artists that are harder for me to work with are the ones that aren't as concerned with the overall musical picture, and are instead more concerned with their parts or how loud they are in the mix or whatever. For me, the cardinal rule is we're there together because we can build something together that otherwise wouldn't get built. So if you're overly concerned with your own sound—and that goes for the producer, too—if that eclipses the overall picture and what's best for the music, you're in trouble. So it's important to determine as early as possible whether you're on the same wavelength in that regard, and it's not always easy to ferret that out early on.

The people I've worked with on a repeated basis are, generally speaking, great team players, and that's the inspirational part of doing the work—when everybody realizes the record itself is the most important thing. It takes on a life of its own and you can't get in the way of that.

There's also the thing of finding that balance between serving what they want, what they need, and challenging them, prodding them in a way that the music stays fresh and doesn't become something that's predictable or pat.

*When you're working in an idiom that has such a high degree of improvisa-*

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## PRODUCER'S DESK

*tion, what degree of familiarity do you need to have with the tunes to be able to judge whether something is a good take or not?*

The simple answer to your question is "a lot," most of the time, but not always. The more involved answer is, with someone like Charlie [Hunter], for example, they're out there writing new tunes and developing them onstage, and I'm always on him to give me tapes of the new tunes so I can become familiar with them—nothing more. I always tell him, "I don't care if it's a lousy version." Or if I'm working with a singer, I might say, "I don't care if all the lyrics are done; I just want to hear what's going into the process of making this, so I can understand it better." Then, when it's time for true pre-production, I go to rehearsals and we work on arrangements together and get inside the music in a different way.

So my personal preference is to know the music well before we go into the studio, rather than hearing it fresh, like a listener, in the studio. Regardless of what style of music it is.

*Most of the artists you work with are fairly idiosyncratic and, for lack of a better term, uncommercial. Have you ever had an artist say to you at the beginning of a project, "Hey, I want to make a more commercial record this time out"?*

Not in those words. But when, say, John Scofield decided to make more groove-oriented records that were perhaps less abstract than what he'd been doing, that was welcome for me, because I'm often really groove- and melody-oriented. I loved the records he'd made before we worked together, but I guess it's not a coincidence that when we got together he took this slightly different turn. And to take that groove-oriented approach to its full, blossoming potential is inherently more commercial, I guess. But the motivation is still musical rather than commercial.

I've listened to so much music, commercial and noncommercial, I feel like I've internalized what is the right kind of presentation, regardless of the musical idiom. At least I hope I have; that's what I'm trying to achieve. So it doesn't become so much an issue when you're in the studio making decisions—"Let's see, what's going to be more commercial?" It's more about "What serves this music the best? What's the goal of the record?" And if I feel like at the end of the day we've achieved that, I can look

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in the mirror that night and be proud when I hand it in to the record company and say, "Here, do something with this." [Laughs]

A lot of the artists I've worked with are not concerned with making something blatantly commercial, but I think they do care, and they don't want to discount their potential audience, and they count on me to help them shape it in a way that'll make it a presentation that people can appreciate and digest.

Also the engineers I work with over a long period, like Oliver [di Ciccio] and Christian [Jones] and Joe Ferla and James Farber in New York and Judy Clapp in L.A., have taught me a lot, and we've also built some sort of relationship where we're able to experiment and try new things, but in a time-efficient way. I have to give a lot of credit to those people, because they're high-caliber engineers who are creative in their own right.

*You've produced John Abercrombie, John Scofield and Bill Frisell, who are sometimes unfairly lumped together. Can you talk about what makes each of them tick?*

The thing that's valid about lumping them together is that Scofield, Abercrombie, Pat Metheny—all those guys grew up with a passion for jazz but with a lot of pop and classical music influences. They're people who have expanded the vocabulary of jazz because they've integrated other musics into it; it's not more complicated than that. It's just a fact. And it's a fact I appreciate because it's made the world of jazz a much more interesting place for me, whereas it might have not been as fun for me if it was more...museum-like, which I find is a less compelling trend with a lot of jazz that's happening in different circles.

What's different about those guys, though, is that they've all found a real individual sound and voice—not only the sound they get out of their instrument, but they all have compositional identities which are usually more than just one thing; there are a few compositional directions that each has developed and mastered that can't be mistaken for anybody else unless it's some Johnny-come-lately copy-cat. But in terms of people of their generation or before, there's nobody like that sound—Bill's sound, Sco's sound, Abercrombie's sound.

*What was your experience with Pat Metheny like?*

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World Radio History

I knew Pat for many years, since he was an ECM guy. So we had a long history and a friendship, but John's album with Pat [*I Can See Your House From Here*] was the first time I'd been in the studio with him as a producer. He's a musician on such a high level, it's really a challenge to stay focused and understand the things he's not satisfied with. There were a fair amount of overdubs, and we did some interesting editing between solo takes. But it was a good experience and it was a challenge because he and John have different ways of working. John is very spontaneous and doesn't want to overdo things, and Pat takes a long time to warm up and get inside something. For me, both are valid ways of working, so it was just a question of rectifying those two styles and making it so both were comfortable.

**Do you have favorite studios?**

Well, it depends on where I am. Here in the Bay Area I love Mobius and The Site, and I like mixing at Different Fur. In New York, I really like [the former] Power Station A and C; they're great recording rooms. For mixing, River Sound is fine, Power Station is fine.

**The record itself is the most important thing. It takes on a life of its own and you can't get in the way of that.**

There's a place in Germany I like working called Principal Studios; it's out in the country.

**You've talked about how much you love living in Northern California. How would your career be different if you lived in L.A. or New York?**

It's hard to say; it would probably be totally different. I probably wouldn't have worked with Kirk and Charlie and Rinde.

**Who are some of the producers who have influenced you?**

In the jazz realm it would be people like Teo Macero and Manfred, because they brought something active and fresh and different to the jazz world, rather than just documenting performances in the studio. In other areas, like anybody else, I admire Eno, Malcolm Burn, Daniel Lanois, all those people. Two other people I think are really

good producers are Joni Mitchell and T-Bone Burnett. They've both made some fantastic records. And, of course, you can't listen to what's interesting in popular music these and not pay attention to what Mitchell Froom's done.

**Do you think you have a sound as a producer? You mentioned Daniel Lanois; on Emmylou Harris' *Wrecking Ball*, I think I heard the sound of the reverbs before the first note of music appears!**

[Laughs] I'm told that I do have a sound—that there's a certain naturalism to it. I like big sounds. People say it's detail-oriented and warm. For me, I just know how I want things to sound, and how satisfied I am is a function of how close I get to that ideal that's in my mind. And actually, I don't want to jinx it by describing it too much.

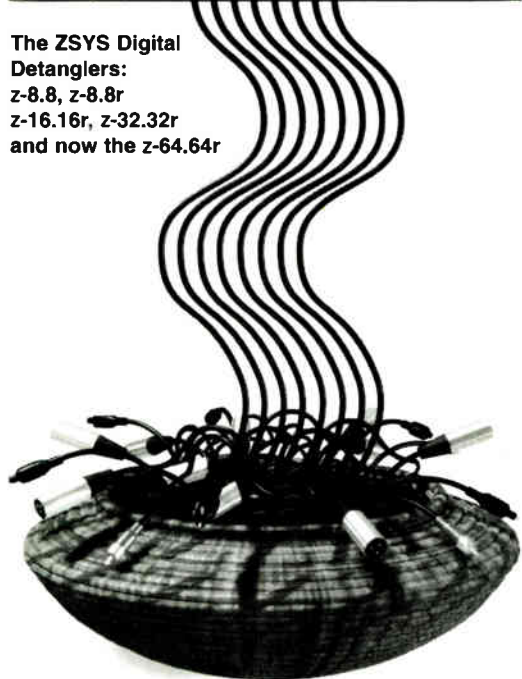
**Where do you see yourself in five years?**

I just hope I can keep making records I feel good about, and working with artists who have something deep to say. I want to make music that runs the gamut of human experience—that's about fun and entertainment but also has something real to say. I also want to work with people I haven't worked with before, so I can keep growing. ■

*Blair Jackson is executive editor of Mix.*



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World Radio History



# HUSH STUDIOS, VANCOUVER

## ROCKIN' IN THE BASEMENT

Vic Levak had always been interested in music and recording and, like many of us, started with a 4-track and a couple of effects to record his songs and ideas while in various bands. When the cover-band thing started to go nowhere in the early '90s, Levak's recording expertise grew stronger, and his gear became more sophisticated. When his parents gave him the opportunity to build a studio in the basement of the new house they were building in Vancouver, Levak decided to go for it.

Since that time, in 1994, Levak's Hush Studios has become a hub for many of Vancouver's best up-and-coming bands, including Damn the Diva, 27-year-old "Delta" blues sensation Dave Burton, Spiritus Mundi and hooksters the Bloody Chiclets, who recently signed with BMG records.

"People definitely like the feel to the studio," says Levak, who designed Hush Studios from scratch as the house was being built. "It's definitely different from going to a commercial facility in a building. The atmosphere that we're trying to create is more of a home feel." Levak is often assisted in the studio for larger sessions by his brother Rob and by Steve "The Breeze" Lamble. Rob Darch, who now owns Vancouver's Hipposonics Studios, was once a co-owner and engineer at Hush.

The studio, which takes up the entire basement level of the Levak home, consists of an 18x14-foot tracking room, a 12x11-foot control room, a large office/reception area and a rehearsal/Green Room that has tie-ins to the main room when Levak needs to record guitar amps

in a separate room. Even the bathroom was used on a recording session with vocalist Dave Burton. Because of that track, "Death Letter," Burton was the recipient of a handsome FACTOR (Foundation to Assist Canadian Talent On Record) grant.

"For that track," Levak laughs, "we put Dave in the bathtub; he played his acoustic, and I used the [Shure] 55 for his guitar and vocals. We put a candle in there and recorded the drums and bass in the main room. I used a lot of the room mics to get a more hollow, earthy sound."

Signals are fed from new and vintage Neumann, AKG, Sennheiser and Shure mics, through a Mackie 32•8 console and recorded onto three Alesis ADAT machines. A Macintosh Quadra 650 with 24 MB

and Alesis compressors, and the Focusrite Red 8 2-channel microphone preamp.

Levak is excited about the Red 8: "It's Class A circuitry, but the punch and warmth you get is amazing," he says. "I can't work without it. It's especially useful for digital and going to DAT." Monitoring in the mixing room is via a pair each of Audix 1As and JBL 4408s, powered by Phase Linear and JBL amps.

Levak's patient, modest personality, combined with his knowledge of music and recording, has made him sought after by hard rockers Random Damage, August Frost and other bands going for that punchy rock sound. At the same time, Levak is adaptable to the nuances and subtleties of mellow recordings, particularly on

his own instrumental tracks. Levak cites people such as Brendan O'Brien, Hugh Padgham and, of course, fellow Vancouverites Bob Rock and Bruce Fairbairn as influencing his production style. Levak is also in demand as an engineer at other studios in Vancouver including Hipposonics and Greenhouse, where he gets to try his chops out on SSL boards and larger rooms.

Levak hopes to continue recording bands and develop his soundtrack-writing skills to keep up with all of the film and video production being done in Vancouver. He has also recently released Hush Sounds, a compilation CD of some of the bands he has recorded. One thing Vic Levak's mom knows for sure is that if the red light's on downstairs, she might have to excuse him for being late for dinner again. ■



PHOTO: CHERRY YUET

of RAM runs several programs, including the Waves L1, Q10, C1 and S1 plug-ins. Hush also has a wide variety of outboard gear and processing units, notably the Drawmer 1961 Tube EQ and Quad noise gate, two Lexicon LXP-15s, dbx

BY TIM MOSHANSKY

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RECORDING SESSIONS



PHOTO: DAVID A. CANTOR

At Right Track (L to R): Rob Eaton, Pat Metheny and David Oakes

RECORDING PAT METHENY'S "QUARTET"

by Blair Jackson

Pat Metheny is in an enviable position: He is popular enough that he is allowed to do pretty much whatever he wants on his albums, whether it is overtly commercial or not. He's earned this right by making a string of popular albums

with the various incarnations of the Pat Metheny Group over the past 18 years; this gives him the latitude to cut more "difficult" albums like *Song X* with Ornette Coleman and the noise-fest *Zero Tolerance for Silence*.

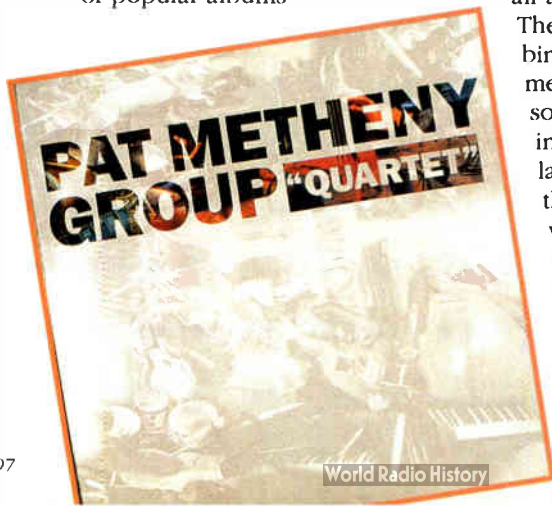
The guitarist's latest disc (and last for Geffen; he's moving to Warner Bros.) is called *Quartet*, and it finds Metheny, playing both electric and acoustic guitars, working with a skeleton crew from his group—bassist Steve Rodby, drummer Paul Wertico and keyboardist

Lyle Mays—in an all-acoustic setting. The record combines spare instrumentals that have some of the feeling of Metheny's late '70s work for the ECM label with some spell-binding live-in-the-studio improvisations. All in all it's a powerful and affecting work

that isn't afraid to go "outside," but which always returns to melodies of crystalline beauty. It's wonderful to hear Mays playing acoustic piano mostly, and Metheny, as always, comes up with a broad array of guitar sounds, from horn-like bleats to gritty acoustic slide riffs.

Metheny is known for making records of great sonic clarity and depth, and this one is no exception. Working at Right Track Studios in Manhattan with his engineer of over a decade, Rob Eaton, and longtime production manager (and FOH mixer), David Oakes, the quartet kept everything in the digital domain as much as possible, recording on Sony 48-track through a Neve Capricorn at 24 bits, mixing to a Sony 9000 optical recorder, and doing editing and assembly in a Sonic Solutions system. The digital decision paid off, too—the music sparkles with life, and the silences are deep and palpable.

I caught up with Rob Ea-  
—CONTINUED ON PAGE 204



World Radio History

## JOHNNY CASH "UNCHAINED"

by Barbara Schultz

Johnny Cash equals cool. And it's not just because he's the Man in Black; it's because he's got the voice and style to make every song he sings absolutely his own. Listening to his latest effort, *Unchained* (American Recordings), it's Cash's voice that defines every track, from rocking originals like "Mean Eyed Cat" and "Country Boy" to Tom Petty's "Southern Accents" and Chris Cornell's (of Soundgarden) throbbing "Rusty Cage." He makes it easy to miss the effort behind the art, but this effort was actually highly collaborative, with Cash, his bandmembers and producer sorting out every note *en masse*.

On *Unchained* Cash is backed by a well-known band: Tom Petty & The Heartbreakers, as well as guest playing by Marty Stuart, Flea, Lindsey Buckingham, Mick Fleetwood and Juliet Prater. The musicians were brought on-board by producer/label president Rick Rubin, who also produced Cash's striking 1994



Engineer Sylvia Massy

acoustic record, *American Recordings*. "We both agreed from day one that this was really an important album," Cash says. "We kind of opened the door for me with the first album, into other areas. Now the question is, am I gonna walk on through

the door? I hope so!" Certainly, in terms of broader appeal, genre crossover, etc., the musicians on this record open the door a bit wider. They also bring the album the depth that allowed Rubin and Cash to

—CONTINUED ON PAGE 211

## THE KING WITH STRINGS

"SYMPHONIC ELVIS"

by Rick Clark

Everybody's getting the symphonic treatment these days—The Stones, Yes, Pink Floyd. Now, almost 20 years after his death, Elvis Presley's music has been turned over to an orchestra, thanks to producers Ettore Stratta and Jeff Kaufman. The result is a 12-track instrumental collection called *Symphonic Elvis*, released last fall on the Teldec Classics International label and distributed by Atlantic Classics in the States.



"The idea for this project came from the realization that, interestingly enough, there never was an instrumental recording of Elvis'

songs," Stratta says. "We tried to pick the right elements—rock material, some gospel, some country, some blues—so that it created a

variety of possibilities with the arrangements."

To help add to the authenticity of the undertaking, Stratta and Kaufman enlisted musicians who had played live or on sessions with Elvis. Among those who participated were guitarist Scotty Moore (who re-creates his classic solos on "Heartbreak Hotel" and "That's All Right" for *Symphonic Elvis*), saxophonist Boots Randolph, harmonica player Charlie McCoy, guitarist Reggie Young, pianist Bobby Wood and bassist Mike Leach.

After much planning, Stratta and Kaufman decided to record the rhythm section tracks on Sony digital 48-track at Emerald Studios in Nashville, the city where

—CONTINUED ON PAGE 214

# THE ALLMAN BROTHERS' "JESSICA"

by Blair Jackson

I've long believed that Allman Brothers guitarist Dickey Betts is one of rock's most underrated figures. Aside from his mellifluous, always melodic and precise playing, he's an excellent songwriter who has turned out a fine body of work ranging from country-tinged ballads and rockers—"Blue Sky," "Ramblin' Man," "Southbound," "Back Where It All Begins," "Seven Turns" and many others—to brilliant instrumental compositions like "In Memory of Elizabeth Reed," "True Gravity," "Kind of Bird" and this month's Classic Track, the soaring tune "Jessica."

For my money, the Allman Brothers are one of the greatest bands ever. They managed to take elements of different Southern musical traditions—blues, country, gospel and R&B—added a dose of San Francisco-style jamming, a dollop of jazz chording, some western swing instrumental harmonies, and stirred it up into a big gumbo to come up with something that is utterly unique and unmistakably *them*. Few bands have come close to matching their instrumental fire. They were the most powerful early exponents of the double-lead guitar attack, with Betts and the late, truly great, Duane Allman ascending incredible heights with their spiraling runs up and down the fretboard. With Berry Oakley's thundering bass lines and Gregg Allman's earthy B-3 work often joining the guitarists in unison harmony flights, the Brothers were capable of laying down lines that had the complexity of bebop runs but with the crunch of electric rock 'n' roll. Having two great drummers—Jaimoe and Butch Trucks—who could simultaneously rock and swing, was another key ingredient in the group's success. They played the blues with uncommon authority and, dare I say, *beaviness* (Led Zep had nothin' on these guys), they perfected their own brand of

churning boogie music, yet they were also capable of playing melodic lines that had the delicacy of butterfly wings.

Their rise in the late '60s and early '70s was steady, but hardly meteoric—the Macon, Georgia-based group toured incessantly coast to coast, playing small theaters and ballrooms mostly, building their following largely on the strength of their live performances. Both of their first two albums, the second produced by Tom Dowd, ably showed the group's strengths as players, songwriters and interpreters, yet neither caught on with the public for some reason. In mid-'71, though, the

came out in March '72, and consisted of more live material from the Fillmore shows, studio tracks that had been completed before Duane's death, and just a couple of post-Duane songs. *Eat A Peach* made it all the way up to Number 4 on the *Billboard* album charts.

Work began on the first true post-Duane album, *Brothers and Sisters*, in the fall of 1972. Rather than augmenting the lineup with another permanent guitarist, the band instead enlisted pianist Chuck Leavell, who turned out to be the perfect choice—his tuneful keyboard romps were a nice stylistic match with Dickey Betts' guitar runs, and he



The Allman Brothers, 1973 (L to R): Jaimoe, Chuck Leavell, Lamar Williams, Butch Trucks, Gregg Allman and Dickey Betts

Allmans put out what remains one of the all-time classic records of the rock era. *At Fillmore East*, a two-disc set that found the band at an incredible peak. Propelled by heavy FM radio play and great word-of-mouth on nearly every college campus in the country (where the epic, 22-minute "Whipping Post" became a popular dorm anthem), the album made it into the Top 20 and established the group as one of the hottest acts in the country.

And then tragedy struck. On October 29, 1971, Duane Allman was killed in a motorcycle accident in Macon. Incredibly, this did not spell the end of the group. In fact, the surviving members carried on (correctly deciding that Duane was irreplaceable), with Dickey Betts emerging as the group's unofficial leader. Their next LP, *Eat A Peach*,

filled the hole that was left after Duane's death in a different but complementary way. There was a change in the producer's chair, too: This time out production was handled by a longtime friend of the group named Johnny Sandlin, working in conjunction with the band.

Sandlin had been the drummer for the Hour Glass, a group Duane and Gregg fronted before they formed the Allman Brothers Band, and it was through Duane that Sandlin first hooked up with Phil Walden, head of Capricorn Records (for whom the Brothers recorded), first doing studio session work, then eventually taking engineering and production assignments for Capricorn. Sandlin even recorded the demos for the Allmans' excellent second record, *Idlewild South*, which was produced by Tom Dowd. Later, Dowd had to drop

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off of *Eat A Peach* after the tracking sessions and Sandlin was brought in to mix the record; that in turn led to his being asked to produce *Brothers and Sisters*.

Even though the band was still reeling from the loss of Duane Allman, there was a certain optimism going into the sessions, which took place at Capricorn Studios in Macon, because the group was clearly still on the ascendancy, and they came into the studio with several fine songs, including Gregg's "Wasted Words," and a pair of new tunes by Betts, "Southbound" and "Ramblin' Man." They had laid down five or six tunes when tragedy struck again—this time bassist Berry Oakley

was killed in a motorcycle crash, not far from where Duane had perished a year earlier. Once more, though, the band regrouped; they hired Lamar Williams to fill Oakley's slot and kept going with the album sessions. One of the first songs they tackled with the new lineup was "Jessica."

What was the vibe like in the studio around that time? "It was real high and real low," Sandlin says. "These were heavy times. There was a great sadness going through that band from the time of *Eat A Peach* through the whole *Brothers and Sisters* album. Everybody was sort of wondering what was going to happen next. You know, we were

still kids. I've thought about it a lot since then, and I've realized that none of us really knew how to grieve and get that out and deal with it properly, so at times we tried to ignore it or go on like nothing had happened, and it probably wasn't the healthiest way to deal with the pain that was there, because Berry was such a wonderful person and such a great player. But we went along and we got it done, and there's a lot of joy in the music, in the playing. 'Jessica' is one of the most joyous and uplifting pieces of music I've ever heard."

Indeed, few songs can match the sheer exhilaration of Betts' tune, which at its heart is a sort of a country-gospel rave-up, with extended solo sections showcasing Leavell's buoyant piano work and Betts' fluid guitar lines. "I was thinking about Django Reinhardt when I was writing that song," Betts said, "and a lot of it is written so you can play it with two fingers. [Reinhardt, the famous Belgian gypsy guitarist, (1910-1953) played his intricate runs with just two fingers on his left hand because he lost the use of two fingers in a fire when he was just 18.] I knew what I wanted to do [with the song] but I couldn't quite find it. Then my little daughter crawled into the room and I started playing to her, trying to capture the feeling of her crawling and smiling. That's why I called it 'Jessica.'"

As for the actual recording of the song in December of '72, Sandlin says, "What the Brothers would usually do is come into the studio and work up the song there. Sometimes it would be just Dickey and Chuck; other times it was more of a full band rehearsal and working out the harmony parts and everything. On 'Jessica' I think it took about a week of them coming in and working on it a few hours each night until they finally had it down and we got the take of it."

What we hear on the record is a full take of the tune with the six players in the band, plus their friend Les Dudek helping out on acoustic guitar, all playing at once. There are a couple of percussion overdubs, but all the solos were cut live. At the time, the control room at Capricorn was outfitted with MCI gear—mainly a model 416 console, which was one of the first production line consoles the company made, and an MCI 16-track recorder.

The band was all together in the fairly large tracking room there: "I had both drummers set up on the end that had a wooden floor," says Sandlin, who engineered the project with Buddy Thornton

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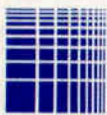
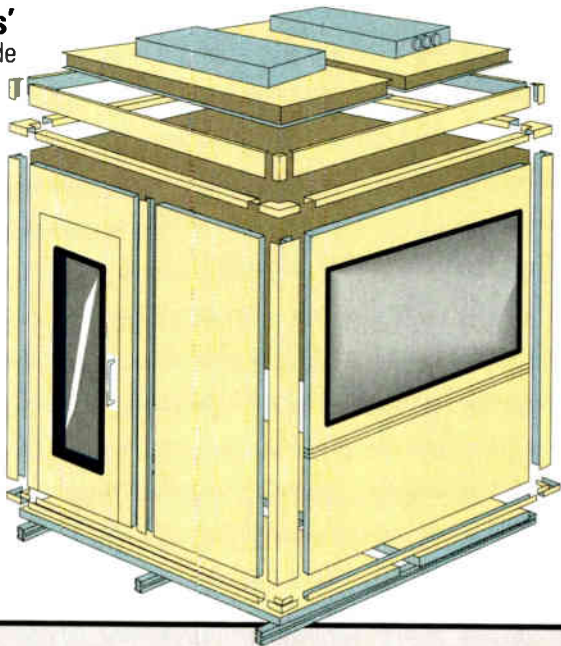
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and O.V. Sparks. "We usually had a chest-high baffle between the drummers for a little isolation, but we liked recording them side by side. For mics, we used [Neumann] 87s as overheads, a 666 on the bass drum, and for the snare there was a little Sony on a swivel, but I can't remember what the model number on that was. The piano was out front of the drums, with a bunch of packing blankets over it and the lid pretty far down, so we could isolate it a bit."

Les Dudek "was in one of Tom Hidley's drum booths off in a corner. It wasn't totally isolated, but it was quiet enough for what we needed." Sandlin says he miked both Williams' bass and Betts' guitar with 87s at each's cabinet, "and with Dickey we also tried something else—there was a huge basement under the studio, so we ran an extension Marshall cabinet down there and put up a couple of mics, one close and one ten or 15 feet away, and summed those mics. It gave us a nice, big sound."

Sandlin says that because he was dissatisfied with the MCI recorder at Capricorn, he and O.V. mixed the album on a 3M 79 series 16-track, "but we ended up having more trouble with that. At one point I had the tape parked right in the middle of 'Jessica' and we had a power failure. After everything came back up, when it came to that point in the song, which was that little breakdown section with acoustic guitar and piano, there was this pop, so I had to edit a couple of bars out of it on a 2-track."

*Brothers and Sisters* was a massive hit immediately upon its release in the summer of '73, becoming the group's first Number One album. "Jessica" and "Wasted Words" were instantly embraced by FM radio, and "Ramblin' Man" became the group's first hit single, rocketing up to Number Two on the charts. The configuration with Chuck Leavell and Lamar Williams undertook an incredibly successful tour that summer, too, joining the Grateful Dead for sold-out shows at RFK Stadium in Washington, D.C., and playing with the Dead and The Band at what remains the largest rock concert of all time, at Watkins Glen raceway in upstate New York, before 650,000 people.

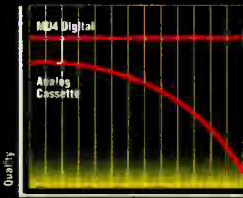
It's been an occasionally rocky road for the Allman Brothers since those glory days. There have been numerous personnel changes and long periods when they were disbanded, but through it all they've maintained a devoted hardcore following. The band has been in superb form for the last few years, with a lineup consisting of four original

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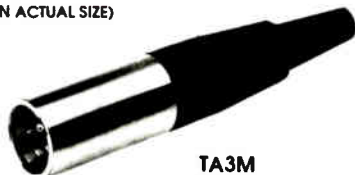
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members (Gregg, Dickey, Butch and Jaimoe), the dynamic and inventive bass player Allen Woody, and the astonishing Warren Haynes on guitar. Haynes is the first player to occupy the slot next to Betts who does not suffer in a head-to-head comparison with Duane Allman; in fact he may be more versatile. This lineup has made several fine studio records, and a live album that contains a version of "Jessica" that won a Grammy Award last year. The group is on another hiatus right now, but they expect to tour again in the spring or summer.

Johnny Sandlin has had a fine career since *Brothers and Sisters*. Besides co-producing the Allmans' 1975 hit album, *Win, Lose or Draw*, and various solo projects for Gregg Allman and Dickey Betts, he's produced records for Elvin Bishop, Bonnie Bramlett, Cowboy, Delbert McClinton, Tim Weisberg, Jimmy Hall (of Wet Willie fame), Bruce Hampton & the Aquarium Rescue Unit, Wide-spread Panic and many others. ■

—FROM PAGE 196, PAT METHENY

ton to talk about some of the particulars of recording *Quartet*.

*Pat's previous album, We Live Here, was a big production...*

Yes, it was. It was kind of a different vibe for him. Basically this new one was his last record for Geffen, and he wanted to do a record that didn't take as long as he usually takes to make a record, which is several months.

He came to me and said he wanted to do an all-acoustic quartet record, with the band playing a lot of improvisational stuff in the studio, and very unstructured for Pat. No sequencers, no computers, no electric synthesizers, none of that stuff. So I said, "Well, if we're going to do that, why don't we try to use the new technology and use the high-resolution digital?" which was just coming out around the time we were going to start the record. This was February of '96. And we started talking with the Neve people, because they had the Capricorn console, which is the only console that would actually do the full 24-bit recording. Sony got us a special modification on their 48-track machine, which is a MADI [Machine Audio Digital Interface] card—that's basically a BNC cable, like a video cable, that goes in and out, one cable each way, into the 48-track machine. It carries 56 lines per cable. It makes the machine a 24-

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track machine, because the other 8 bits go on tracks 25 to 48.

*But with an acoustic quartet that probably wasn't a problem.*

No, we're talking all microphones, so you're really able to hear it, as opposed to it being synthesizers or samples or anything like that, which are already 8-bit or 12-bit compressed samples and synth sounds. The microphones really capture what's happening here with the high-resolution digital. I'm convinced more than ever that it's not the sample rate that's important—people talk about higher sample rates and getting up to 96k, but if I have a choice between 96k 16-bit, or 48k 24-bit, I'll absolutely go 48k 24-bit. It's much, much better. It's the bit resolution that's important, not so much the sample rate. The 48k or 44.1 24-bit is infinitely better than 96k 16-bit. The extra bits mean everything, and I'll argue with any audiophile any day of the week over that one.

*So it's audible to you...*

Absolutely audible. What it is, is the low-level detail that the extra bits give you. And there's no such thing as a 24-bit D-to-A converter. We're still listening through 20-bit converters.

*Where do you hear the higher bit rate the most?*

The dynamic range is improved dramatically. The noise floor is well below what you're used to hearing with traditional 16-bit recorders. And the thing that is most stark about it is the way you can follow the sound into the music. On piano decay, for example, it doesn't diminish in its clarity as it gets quieter. There's an apparent audible volume of low-level stuff that you don't get with 16-bit. It's something that has to be heard; it's hard to describe. It was something I'd never heard before; nor had Ted Jensen, who mastered it.

*This was done at Right Track in New York?*

Right. We had to record in a tracking room there that normally has a new SSL J in it, the 9000, which wouldn't really work for what we wanted to do, so Neve gave us a small-framed Capricorn that we brought into Studio A for the tracking.

*I thought they had a Capricorn at Right Track.*

They do, but it's in B, and that room wasn't big enough to put the quartet in, because the band was playing live. We did all the mixing and overdubbing there, but we cut all the tracks in Studio A. I draped my tie-dyes over the SSL and we had the little Neve sitting right in front. [Laughs]

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But it really makes a difference. The mic preamps in the Capricorn are just fantastic, and the fact that the Capricorn is all 32-bit point processing and the 24-bit...It's really good. We used hardly any EQ. Everything was done with mic placement, and we used very few microphones, to keep the phase aligned properly.

**What sort of mics were you using?**

On Steve Rodby's acoustic bass, I used two TLM 170s, one placed sort of down toward the bottom of the bass to get the lower frequency, and one toward where the neck and the body meet, to get more of the finger and high end part of the bass. In conjunction together I got a little of both. I didn't use any DI on the bass because it's a little too grainy, and I wanted to keep it as pure as I could.

Then on Paul's drums I used two of the AKG C-12VRs, which is sort of the vintage reissue of the old C-12. And it's a good microphone, maybe even more consistent than the original C-12. So I used those over the kit, and then underneath I had a couple of 414 TLs, which is another sort of vintage 414-type microphone, in the same placement as the overheads but out of phase. Those were maybe a foot off the ground and two-and-a-half feet away. So I took a top image and a bottom image of the kit, and captured the exact sound of what it is from where Paul was sitting.

**What kind of room is it?**

It's a medium-sized wood room; fairly live. He was isolated in his own room. The only other microphone I had on the drums was a kick-drum mic so I could get a little extra thump. On the kick I used an old Neumann 47 tube, which is tricky because the capsule can easily blow out. He also had a few toys in the back that we miked up with a couple of 67s, but we didn't use that a lot.

But what miking it this way did was create a very phase-accurate drum sound; the image is very defined from left to right. Like where the snare is placed in the kit is not really in the center, but slightly to the left, and you hear that. You hear the drummer's perspective.

**How did you mike Lyle?**

Lyle's keyboard rig was very interesting, because it was all acoustic...again, in keeping

with Pat's idea of keeping it all as organic as possible, instead of having all the synthesizer rigs and the Oberheims and all the things people are used to hearing with Lyle, we had a nice Steinway which I miked with a pair of Schoeps, which is great for his piano sound. Then they brought in an old spinet from a rental company—the basic upright you find at grandma's house—and we left it in the tuning it came in! What Lyle then did is he played his left hand with the spinet and his right hand with the Steinway, and the natural chording that came out from the pitch discrepancy between the two keyboards sounds really unbelievable. He played a solo with both hands on two different pianos. It added a wonderful, natural, built-in effect that you'd spend hours trying to get with a box.

**Where do you mike a spinet?**

I used a couple of 414s in the back. It's really the only place any sound comes from. I guess some people open it up and get it by the hammers, but most of the sound comes from the back, and that gives a little bit warmer tone. Then for some bell stuff, we brought a celeste in, and I had a TLM 170 on that. And a harmonium, which is almost like a pump organ. We miked that with a couple of KM84s. The only electric keyboard we had was a Fender Rhodes, but they rationalized that because it still has a string and a hammer hitting it, so it fit the criteria of the record.

**What was Pat playing this time out?**

Pat usually plays his [Gibson ES] 175, but Ibanez has been building him these custom Pat Metheny-line jazz guitars, and he's got one that he's really gotten used to. So we used that for the first time. It's a good guitar; I'm not sure it's the 175, but for him it plays more like what he needs to have it play like. I took that direct, and I also miked up

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his rig, which is pretty much a custom rig with his own mish-mash of stuff: He uses the DigiTech 2101 studio preamp for his main guitar; and he's got a couple of TL15s, the old TL cabinets; and four 10-inch JBLs as a center cluster to the two 15s. He's got separate delay feeds for each of the 15s—he's got two Prime Time 2s, one with one chorus and delay on one side and one on the other, so it's basically a cool stereo sound. I mic the cabinets with a C-24, and I had it in MS, so I got a three-dimensional image of what his left-right-center rig sounds like.

*So is what we hear then a blend of the direct and the rig?*

Right, depending on what the tune required. Because there's more of the pitch bend and effects on the rig and on the more pure jazz ballads, we went more with the traditional 175-type sound. He played acoustic guitars on a lot of things, and for that I used a pair of Schoeps.

*Were you recording dry?*

Absolutely. I don't think I used any EQ at all on either the record or the mix side.

*What were the sessions like?*

The first three days were totally improvisational playing. They didn't have any sketches or tunes. They just wanted to go in and play. They'd come up with ideas and take them and see where they went. There are a few things on the record that are actually completely free improvisational pieces. I think those are some of the most interesting things on the record, from a sonic standpoint as well as musically. The free stuff, sonically, you really hear the 24-bit because of the space that they allowed themselves to play in. There were more points in the music where they would let it stretch out a little bit and let things decay, and it's really open and airy. The more traditional material, the more structured tunes, you still hear the 24-bit, but not quite as much.

*How would you characterize the material? Does it have the same kind of rhythmic pulse that so much of the Metheny Group music has had recently?*

No, not really. In a way it's very traditional [material in] Pat's melodic ballad style—there are lots of beautiful ballads on it. The melodies are extremely strong. Then the contrast is these free improvisational pieces sandwiched in around these beautiful ballads. But even the tunes that Pat and Lyle brought in weren't that well-developed before they came into the studio. They specifically didn't want to do a lot of

pre-production because they wanted it to be fresh. Pat and Lyle got together a few days before the recording started just to run over a few sketches, and they each came in with about 16 pieces of music—a lot of them vignettes more than songs.

*It sounds a little bit like his first couple of ECM records.*

It is. You'll be hearing people making comparisons to those records. In fact there were a couple of tunes we ended up not putting on because they were a little too close to *Bright Size Life*.

*Did the mix pose any special challenges?*

Well, in a way it was much easier than the Pat Metheny Group stuff, because it was only four pieces, but the tricky part was the free stuff, because you're trying to re-create what they were hearing when they were doing it. Everything was being played off each other, so you can't look at it in a traditional sense, because Pat's playing this way because he's hearing Lyle play this way and I need to hear Lyle more to make Pat's part make sense, and so on.

I tried to keep the effects as minimal as possible. The thing about the Capricorn that's so wonderful is that you can bring in digital effects all digitally—there are no analog converters anywhere. That makes for a much purer reverb or effect, and it was also enhanced by the resolution of what was on tape. I used a little bit of reverb—the Lexicon 300, which, with the new LARC they've designed for it, works more like a 480, but it's got the digital in and out. I used the 480 on a few things, too.

I mixed it 24-bit from the Capricorn to the 9000, which is a Sony PCM optical recorder. I kept it 24-bit 48k all the way till the end, then put it in the Sonic Solutions 24-bit 48k and did all the assembly and any editing that needed to be done in there. And at the very end I used the DB3000, which is a new box that DB Technologies has released that did my noise-shaping, bit-mapping and sample rate conversion all at the same time. So it eliminated having to use several boxes, like the UV-22 or something like that. It did it all at once, which kept more of what was really there.

*Pat has a reputation for being a picky perfectionist in the studio. Did the spontaneous nature of this project affect his overall aesthetic in that regard?*

It actually did. Normally we're all extremely picky. That's why they take so long to make. Because this was all live, there were a few more gremlins than

we would normally let slide, but Pat wanted to retain the vibe of the live playing, so we didn't tinker with it too much. There was very little fixing. The overdubs were very minimal, too; not at all what we're used to doing with Pat's music.

*So has working on the Capricorn spoiled you?*

Oh totally. Pat, too. The Capricorn is absolutely the coolest thing I've come across in the studio world in a long time. You can automate every single knob and button on the Capricorn. Plus the recall and everything else is so flexible. The thing about the Capricorn that is so cool is you can be mixing every time you put up a track to do an overdub, because there's no such thing as an overdub mode or a record mode; it's all the same. We're hoping to go in and make another Group record this winter, and I think the Capricorn will definitely be the way to go with that record, too. ■

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—FROM PAGE 197, JOHNNY CASH

move from rockabilly to gospel to country to folk, as the songs needed.

The titles were mostly suggested by Rubin, who during production would bring tapes to play to the assembled musicians every day. "He'd say, 'Okay, let's try this song,'" explains the album's recording and mixing engineer, Sylvia Massy. "He'd play the song to the band, and while the cassette is playing, [Heartbreakers' keyboardist] Benmont Tench is writing down the chord charts while he is listening. He has perfect pitch; he's amazing. And before they can sit down and start playing, we have copies of that chord chart on music stands for everyone and mics up on whatever they're playing—acoustic guitars or whatever—and they're running through the song."

Massy says that when the project started, she was hired on for about four days of work, but with the loose way the band was working, and given the success they were having with the recordings, four days grew into six months. The project started out at Sound City (Van Nuys, Calif.), but because of previous bookings, the group was forced to break camp periodically. They did some recording at Ocean Way (Hollywood), some at NRG (North Hollywood), and when they ran out of available rooms, at "Akadēmie Mathématiques of Philosophical Sound Research," which is really Rubin's Hollywood home studio. Rubin and Massy's main require-

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ment, wherever they went, was a good large, live recording room and an 80 Series Neve console. "That's what Rick prefers," Massy says, "and I prefer that, too. I own one myself; they always deliver a sweet tone. So Sound City was our first choice because they have an 8028 in their big room, and it's a really comfortable big tracking room with a good selection of mics and good monitoring, plus the A800 multitrack, which is Rick's favorite. Sound City is also where Tom Petty has gone on every one of his great records."

Massy's greatest challenge on this project was to be prepared for the huge variety of recording possibilities that could take place on any given day. "I don't think the artists would have ever known it; we were setting things up early in the day to anticipate any combination of performances, because we didn't know who was going to be playing bass or who would be singing at any moment—if it would be acoustic or electric, or if there were going to be drums in a big acoustic space or if they were going to move them into a booth.

"While they're running through the song the first time, I'd be getting levels in a mad panic—but of course no one would ever know that because I'm so calm and cool and relaxed," she adds with a laugh. "By the second time they're running through it, that could be the take, so tape was running all the time. Usually, they played no more than three or four takes for any song."

Most of the recording, obviously, was done live, with arrangements being developed on-the-fly. "The vocals were in a booth," Massy explains. "Sometimes Johnny Cash would play his acoustic while he sang. And the thing that shines through are the performances. There was very little time spent getting 'sounds,' so it just goes to show that my job is actually a lot less important than I ever thought. If you've got a bunch of great players in a room and there's that magic moment, it doesn't matter what the snare drum sounds like."

Massy's modesty aside, it seems to be the transparency of her ministrations that made working this way possible. As soon as the band was done with a track, while they were on a break, Massy and Rubin would get the necessary overdubs down quickly. "We were getting six songs done in a day, sometimes. We recorded many more songs than ended up on the record. I had a lot of help from the Sound City and Ocean Way assistant engineers—Jeff Sheehan and Greg Fidelman from Sound City and



**L to R, standing: Benmont Tench, Howie Epstein, Marty Stuart; seated: Rick Rubin, Tom Petty and Johnny Cash; barely visible: Lindsey Buckingham and Sylvia Massy.**

Eddie Miller from Ocean Way. Notes had to be taken constantly: 2-inch reel locations, DAT location points, song cue points, and changeovers had to be done in minutes."

Massy and Rubin captured the Cash vocal with an AKG C-12 mic that she says suited his voice well, and they stuck with it throughout the many studios and many months of the project. "Acoustics were [AKG] 451s or [Neumann] U87s. Some of it was so hurried that we just used whatever mic was available. We used [AKG] 414s on acoustics also. On guitar amps, I used a combination of [Shure] SM57s and [Sennheiser] 421s. Drums were 87s overhead with a 421 and a Neumann Fet U47 on the kick, SM57s on the snare and 421s on the toms. The Hammond C3 had 452s on the top and an 87 on the bottom, and the piano was miked with 87s. The bass cabinet had an EV RE20. I tried to select mics that were both versatile and familiar."

As far as getting great warmth from the mics she used, Massy says the 8028 "has everything you need. And in fact, one of the hardest things technically was, when we went into mix it, to get the same warm sound that you get from the old Neve."

Massy mixed on the Neve 8068 at NRG. "The trick that Rick showed me," she says, "that I'll use for the rest of my life, is bypassing the EQs and patching directly into the faders, and that's the only way that you

can get that sound. When you make rough mixes from an old Neve, you're using the monitor section, and the warmth is really hard to recapture. That's where problems come up later, and everyone says, 'Well, gee, the rough mixes sound so much better,' so the trick is to patch directly fader-in and bypass the EQs. If you want to use EQ, use outboard EQ or be very selective with which channels you want to use EQs on."

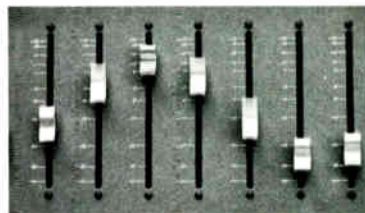
During recording and mixing, Massy stuck mainly with Yamaha NS10 monitors, but she says that Rubin also always checks mixes in his car ("an awesome Bentley," she says). Cash and band, however, generally steered clear of the mixing process, dropping in mostly just for last-minute overdubs. "Johnny did stop in once," Massy says. "He brought me a whole bag of candy bars. It was so sweet, because they were all melted. He must have brought them all the way from Nashville. He is just so sweet—he and June [Carter-Cash, his wife]. They're great people."



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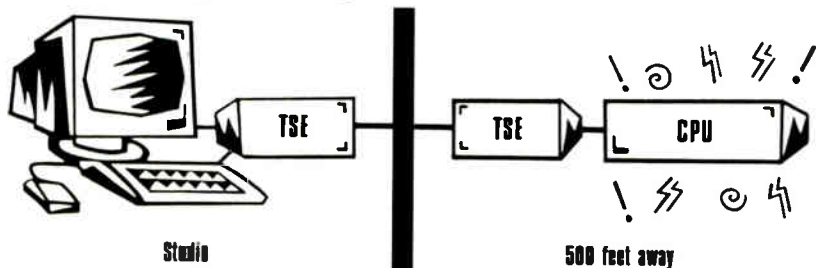
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At the end of the day, we have another in a long series of great Johnny Cash records—nothing surprising in terms of "sounds," but extremely evocative because of the great vibe Rubin, the players and Massy created, and because Cash can still take a good song and make it cooler than cool. And, incidentally, the backing vocals are awfully good—Cash and Petty sound wonderfully gritty together.

For Massy, this project was the caper on a year that included some really stellar work: recordings by Tom Petty, Luscious Jackson, the Red Hot Chili Peppers, Oingo Boingo and R.E.M. "But before this year, I had really never engineered recordings for other producers," she says. "I'd just engineered my own productions or hired an engineer. So when Rick's office called for this job, I jumped at the chance to watch how Rick works, and I think the experience has paid off tremendously. What a great opportunity. What a great record." ■

—FROM PAGE 197, SYMPHONIC ELVIS

most of the players and guest soloists lived. Reid McCoy, a veteran arranger and producer from Memphis, was brought in to write out the arrangements and provide further assistance to the project. McCoy was a natural for the project, having recently written a 12-minute overture for a Memphis Symphony performance honoring Elvis' birthday in 1995.

"The original Elvis players were very much into this and did a great job," McCoy says. "The drummer, Kenny Malone, is one of the best drummers I have ever worked with in my life. Reggie Young played great, and Bobby Wood did some fine solo work on 'Don't Be Cruel.' We stripped that song back to a trio setting, and Bobby played a real elemental, almost primitive solo that fits the track perfectly. It took it right back to the mid-'50s when it was cut. It was big fun.

"The biggest problem was to do an Elvis Presley tune without Elvis Presley's voice," McCoy adds. "We tried to address that with the use of soloists, who would try and evoke Presley's phrasing. On some things we ignored the Presley phrasing and just went for a straight orchestral pop treatment. There was a mix of the two."

Milan Bogdan, owner of Emerald Studios and an engineer and producer (whose credit list not only reads like a "Who's Who" of Nashville country

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greats, but also includes Motown legends such as Diana Ross, The Temptations and others) handled the recording and mixing duties for the Nashville part of the project.

"They had very good charts all written out, and I thought the overall concept was great," Bogdan says. "The fact that it was all instrumental and that it involved a large symphony was interesting. I never heard Elvis stuff done like that before. Other than a choir singing some background, there is no lead vocal on it."

After the rhythm section tracks were recorded, the project was moved to Memphis, where the Memphis Symphony Orchestra was added. Though a number of the players in the Memphis Symphony had extensive session experience (including playing on classic tracks from the golden R&B days of Stax and Hi Records), the orchestra itself didn't have an extensive recording track record.

"On the technical side, the Memphis Symphony Orchestra didn't have a venue for normal recording purposes, so we found a venue that they occasionally use called the Germantown Performing Arts Center outside of East Memphis," Kaufman says. "We had to bring in all of our Sony multitrack digital equipment from Sony in New York, which was quite a large undertaking. The rhythm tracks and solo material that we recorded at Emerald Studios in Nashville were transferred over to the Sony system, and we went in and recorded the Memphis Symphony over a period of three four-hour sessions.

"When we tried to record the orchestra in total, there was a major problem in terms of clarity, with respect to putting them down in one fell swoop," Kaufman continues. "What we ended up having to do was do the orchestra in sections. We did winds and strings in one pass. Then we did percussion and brass in a separate pass. The only one in which that wasn't the case was the inspirational medley. With everything else, we did the orchestra in two passes against the pre-recorded rhythm and solos. It was a function of the recording space. It was too compressed. As a result, the leakage in the room was so great that we certainly couldn't isolate the strings and some of the delicacy of the winds in a way that we otherwise would in a space that was more commensurate with symphonic recording."

The engineer for the orchestral elements of the production was veteran

symphonic engineer Bud Graham. Graham, who has recorded many of the world's great orchestras, says he was pleasantly surprised at the caliber of the Memphis Symphony. The initial orchestral *Symphonic Elvis* plan involved making a fairly faithful "classical"-style ambient recording with a few well-placed distance microphones. But as it became apparent that the orchestra had to be layered in the recording, a closer, more pop-oriented miking approach was adopted.

Graham, a fan of smart minimal miking, used a pair of his favorite symphonic overhead mics, B&K 4006s. Nevertheless, the orchestra's brass-to-strings ratio and the properties of the Germantown hall made it difficult to set the overheads in what he felt was an optimal setting. "I started at 12 feet with them, but it was just too high for that orchestra," he says. "The brass tended to overwhelm the strings. Since there was a lot of brass, I had to get closer to the strings than I wanted to. The miking for the orchestra was somewhere between orchestral and pop miking."

For close-miking the violins, violas and cellos, Graham used B&K 4006s. TLM-170s were used for the brass, French horns and tuba, and MK-4s on woodwinds and harp. Graham chose KM-140s on percussion and TLM-170s for timpani, and used MK-4s for the chorus. The string mics were omnidirectional, whereas mics on basses, horns and brass were cardioid. The overhead mics were omnidirectional.

One of the practical challenges to recording the orchestra involved setting up a 70-headphone cue system. "About four or five of us, including Ettore, were working on the earphones the night before the session, so we could get out and go home to bed," Graham recalls. "Everybody was there working on them. My wife was there. You had to pick up every earphone, while someone fed music from the control room, and check the pots. The biggest problem with the cue system was trying to get the players to turn them off when they took off the phones. They would take off the phones and they would be very loud, and the sound was leaking into the whole hall. There were so many earphones that it was also a major setup just checking them out and making sure they were working."

The night before the session, the engineers and producers listened to the Nashville rhythm tracks over and over until everybody had an idea of what was going to happen. The next day the

orchestra came in and laid the parts over the Nashville tracks. In a sense, the orchestra's recording situation felt much more like a large overdub session, as opposed to a true "classical" recording production.

"Even though we used 48-track tape, we were still limited to the number of tracks, we only had the availability of 14 or 15 tracks," Graham says. "All of the violins were on one track. The violas and cellos were on maybe another track. All the woodwinds may be on another track. The brass were on another track. We had to combine things, because we could get away with using only that number of tracks."

Once the strings were recorded, Milan Bogdan in Nashville and Ellen Fitton, at Sony Studios in New York, undertook the mixes. How to blend in the close-miked rhythm section tracks with the more natural acoustic orchestra recording proved to be challenging mixing for both engineers. "We didn't want to entirely trash the room that they had on the strings," says Fitton. "The problem was that room didn't match. They recorded the drums, bass, sax and all of the other band tracks at Emerald, which was a regular studio. That obviously has to have some artificial reverb. That is never going to sound normal in the space that an orchestra is going to sound normal in. So that caused us to have to bring the orchestra in a little tighter and somewhat less natural, so it would blend with the individual reverbs for all of the other stuff.

"We mixed it down to Sony PCM-9000 with 20-bit Apogee A/D," Fitton adds. "From the 9000, it was all loaded 20-bit into Sonic Solutions, and the little editing that needed to be done and assembling was done on Sonic Solutions."

The end result, in spite of some of the logistical problems, is an album that has earned praise from many staunch Elvis fans. On August 16th, the anniversary of his death, Stratta returned to Memphis to perform selections of the album with the Memphis Symphony Orchestra. It was a huge success, and confirmed that the concept was a sound one.

"We were a little concerned that the hard-core fans would look at an album like this and say, 'Well, since Elvis isn't singing, how could this be?'" Stratta says. "In fact, fans have come up and said that this was the best thing that could've been done to his music. It has been an absolute success, and it is very gratifying to know that we did something very special." ■





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# COAST TO

## L.A. GRAPEVINE

by Maureen Droney

The second half of '96 proved to be a busy time for Design FX Remote Recording, as the truck (part of the Emmy Award-winning team for Best Sound on Natalie Cole's 1992 PBS special) crisscrossed the West recording shows for The Cure one day and the Four Tops the next in Las Vegas, Tracy Chapman at L.A.'s Roxy, Sting with opener Jann Arden in Vancouver, B.C., three nights at Los An-



PHOTO: MAUREEN DRONEY

L to R: Michael May, Gary Ladinsky and Scott Peets at the API in the Design FX remote truck

geles' Playboy Jazz Festival, and the Andre Agassi Foundation's extravaganza in Vegas, where Humberto Gatica manned the board for performances by Elton John, Vanessa Williams, Baby Face, Seal, Tim McGraw, Faith Hill and David Foster.

It's all in a day's (or month's) work for the truck, says Scott Peets, who has been in charge of booking remotes for the past three years; Design FX crewmembers are used to racking up lots of miles and doing quick changeovers. Their truck was one of the original two commissioned by the L.A. Record Plant and still boasts its classic 44-in API console, now augmented with GML mic preamps. The console has just recently been refurbished by API's Jeff Bork under the auspices of Jon Dressel and Associates, and with the design assistance of Jack Crymes. New modules were installed in the frame, while retaining the original 550A EQs.

"It's a custom design," says Peets, "the only one like

—CONTINUED ON PAGE 220

## NY METRO REPORT

by Dan Daley

"New York's studio market is hot—hotter than I've ever seen it." Those are the words of Chris Dunn, general manager at rental company Dreamhire. The rental companies should know; with more gear available than ever before, no one studio can afford to buy it all, so they rent. And as a result, the rental companies become a pulse point to measure the market.

So what's been hot in NYC? According to Dunn—who also notes that Dreamhire will expand its present space beginning this month—it's everything, particularly DA-88s, which he says have been "blowing the ADATs out of the water recently." ADAT demand is still consistent though, as is demand for high-end tube outboard gear. Also, large projects are consuming more of Dreamhire's business. Dunn mentions the last-minute score changes on Ron Howard's *Ransom*, remixed at Todd-A/O East. "That's been keeping our stuff going out from August straight through November," he says.

Steve Tasch, audio rental manager at Toy Specialists, has seen similar trends. He notes that the on-site remix of a film slated to be shown at the Warner Bros. store's in-house theater on 57th Street and 5th Avenue pulled out a lot of rental gear. Tasch also says that demand for tube and vintage gear is steady, particularly from rock acts, more of whom are tracking and mixing in New York. But the heavily Urban scene in the city is also reflected in the fact that Toy Specialists is having trouble keeping

—CONTINUED ON PAGE 222



Facility owner Yoram Vazan stands behind the Peavey 2400 console with MegaMix automation at Firehouse Recording Studios (New York City). The studio recently installed a Bag End ELF subwoofer system.

# COAST

## SESSIONS & STUDIO NEWS

### SOUTHERN CALIFORNIA

Guitar genius Ry Cooder worked on a Cuban country music album at Alpha Studios in Burbank with engineer Jerry Boys and assistants Charles Nasser and Scott Burns... Engineer Rob Jacobs worked on Sheryl Crow's B-sides for A&M in Studios B and E at Westlake Audio (Los Angeles). Tim Gerron assisted... Über metallers The Scorpions were in Record Plant's SSL3 room working with producer David Foster, engineer Dave Reitzas and assistant Tim Lauber... At Master Control in Burbank Flaming June tracked and mixed an indie release with producer Tracy Chisholm... New Maverick Records act Summer Camp tracked and overdubbed at Ocean Studios in Burbank with producer/engineer Chris Shaw and assistants Erich Gobel and Tom Fiore... Rob Chiarelli mixed a solo MCA record for Jodeci's Dalvin Degrate at Larrabee North (North Hollywood)...

### SOUTHEAST

Work is in progress on a 25th anniversary tribute album to '70s secret icons Big Star, executive produced by the band's drummer Jody Stephens. Whiskey Town tracked and mixed their contribution at Ardent Studios (Memphis, TN) with Stephens and Jeff Powell co-producing. Powell engineered, assisted by Pete Matthews... The Sheffield Productions remote truck (based in Phoenix, MD) has been on the road recording artists including John Mellencamp and Donna Summer... At The Castle Recording Studios in Nashville, Bill Lloyd produced tracking sessions for the Thompson Brothers with help from engineer Rob Feaster and assistants Mike Purcell and Paula Montondo... Producer Barry Beckett tracked Arista artist Tammy Graham with engineer Pete Greene and assistant David Boyer at Masterfonics in Nashville... Universal Records artist Billie Myers cut basic tracks at Miami's Criteria Recording with veteran producer Desmond Child, engineer Charles Dye and assistant Chris Carroll... Dave Hollister tracked for a Def Squad/EMI release at Windmark Recording in Virginia Beach, VA, co-producing with John Mitchell. Skip DeRupa engineered, assisted by Dave "Tex" Spruill... Ryan Reynolds overdubbed for an Imprint Records release at Sound Emporium in Nashville with producer Steve Fishell and engineer Mike Poole... The legendary Doc Cheatham recorded

—CONTINUED ON PAGE 224

## SESSION SPOTLIGHT

by Adam Beyda

### DINK TRACKS AT HOME

When Ohio band Dink began working on their second Capitol release at the studio of their guitarist/programmer Sean Carlin, they thought they were mostly cutting demos. But, Carlin says, when producer/engineers Paul Kolderie and Sean Slade rolled into town, "We put up the tapes and went through the stuff to see what we could use, and we used like 7/8ths of it. I had thought they would want to go somewhere and recut everything, but they felt like they could work with what was there."

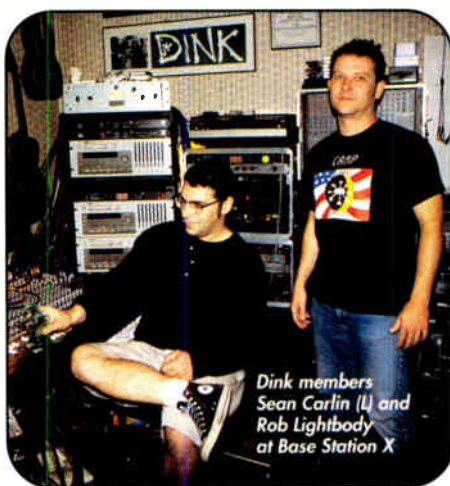
In fact, Dink are naturals for home recording. They're a raucous band that really works the line between guitar-driven and synthetic music—they like gritty, acoustic sounds but also use computers and MIDI gear. Being such a hybrid, they need a lot of time and space to explore a variety of approaches—luxuries that home recording affords.

The studio, dubbed Base Station X, is in Carlin's home, an 1835 farmhouse on six acres outside the town of Kent. Carlin has been collecting gear for years, and his current setup includes Mackie boards and mixers (a 1604, a 1202 and a 32•8); 24 tracks of Tascam DA-88 with the SY88 card; and Tannoy PBM 6.5 and JBL Control I monitors. He

has a large computer/MIDI rig, an array of guitars and substantial outboard, including his favorite piece, a Purkhiser CA1 tube preamp/compressor. ("I go straight to tape with that thing," Carlin says. "It's awesome.")

Dink tracked at Base Station X and also at their large rehearsal space in town. When Kolderie and Slade showed up (recordists with a well-known affinity for analog and guitars), they brought in some of their own vintage gear to recut vocals and add supplemental tracks (using different amps and guitars, and to try to get some different tones). They mixed the project on the Neve and the Studer 2-inch analog machine at Boston's Fort Apache, and the excellent results can be heard now on the EP *Blame It On Tito*, released late last year. The full length is due out this spring.

Considering the band's home recording experience in retrospect, Carlin says, "I can't even envision any other way to do it. It's incredible to be so comfortable and be able to mess around for hours on the same thing, looking at every different angle of a song from techno version to straight rock. If we had to pay for time, we'd never get anything done." ■



Dink members Sean Carlin (L) and Rob Lightbody at Base Station X

# Nashville Skyline

by Dan Daley

## OceanWay/Nashville was slated to open early in December '96.

The room's main equipment complement was to include a highly customized pair of vintage Neve 8078 boards linked together with GML automation in Studio A, the primary tracking room in the main part of the church building the studio is housed in. The connected consoles are the largest yet for Ocean Way—80 inputs and 64 monitor returns, as compared with the 80/32 configuration of the one at Ocean Way L.A., according to the new studio chief technician, Sal Grecco. Grecco formerly held the same post at Paisley Park in Minneapolis. Studio B will house a 96-input Sony Oxford console; Studio C, a small overdub room in the church vestry, will have a 36-input DiMideo API board and a fireplace. Speakers in A and B will be custom Ocean Way monitors; Studio C will have an array of near-fields.

The design for Ocean Way/Nashville, which is an equal partnership venture between Ocean Way owner Allen Sides and House of Blues Studios (formerly Kiva, in Memphis) owner Gary Belz, was done by Sides and Peter Maurer of L.A.-based studio bau:ton, which did the main studio drawings. Construction was handled by a crew headed by Michael Cronin, who also supervised the construction of Masterfonics' The Tracking Room. The Ocean Way/Nashville church building was constructed in 1852 and offers 15,000 square feet of studio space, including extensions built in the main room to accommodate two iso booths. "We used the same color bricks and stone to match the original facade," says Belz, "so there were no landmark issues to deal with. In fact, it still looks very much like the church must have originally appeared. We were very conscious of that." The main tracking space has 3,000 square feet; Studio B has 1,000.

Belz also says that interest in booking the facility has been running high from a combination of Nashville and other locations; Nashville producers Tony Brown, Brown Bannister and Jim Ed Norman have each made personal inquiries, as has L.A.-based producer George Massenburg. TNN has already booked a session for December, with Sides producing.

The refurbishment of **Randy's Roost/Studio A at Disc Mastering** is still an ongoing project, contrary to an item reported in this space in September. According to owner Randy Kling, several designers, including Russ Berger, have submitted plans to redo the classic mastering suite, a goal Kling has been considering for several years. "The thought has always been there, but there's been no real sense of pressure to just go and do it," explains Kling. "The room is still delivering plenty of Gold and Platinum records. The key thing for me is to do a refurbishment of the room in a way that's a marriage of the 21st century with the classic equipment the room is based on." Kling says the one-of-a-kind Neumann SP-75 console fitted with Neve mastering EQs (he calls it a "Neve-mann" console) will likely remain, and in the meantime, he's adding more tube-based equipment, such as Manley tube preamps, to replace solid state electronics.

What if they gave a 5.1 party and nobody came? **Woodland Digital added Dolby surround sound mixing** capability nearly three years ago. Yet in that time, few have availed themselves of it, says Woodland owner Bob Solomon. "We tried to develop a market for it here, but other than a few film projects, it's rarely been used," he says. Solomon is particularly baffled that country music videos, most of which are produced and posted in and around Nashville, do not provide for separate surround sound mixes of their songs for broadcast, despite the fact that TNN (which owns CMT, the largest single outlet for country music videos) regularly broadcasts in surround. "A surround mix costs only a fraction of

what a dance remix of a country music track costs," says Solomon. "MTV and VH-1 regularly broadcast rock and pop music videos in surround. I think it's a lack of awareness about TNN's surround broadcasting capability, and of surround in general."

Solomon said he's planning to try to change that in the coming months, talking directly with record labels about the service and utilizing the NAPRS interface. Surround sound is also being experimented with for use in prerecorded audio releases in other genres, but no country label has announced any plans to do so at this point. With country music record sales off by over 10 percent for the first three-quarters of 1996, the departure of A&M Records from Nashville, and a general tightening of rosters and staffs this year, you'd think they'd be willing to try anything.

**Engineer/producer Richard Dodd has opened Vital Recordings**, a personal studio facility in Berry Hill. Dodd, best known for his engineering work with the Traveling Wilburys, Roy Orbison, George Harrison and Tom Petty (he garnered a Grammy for *Wildflowers* last year) and production work with Little River Band, spent the last year ensconced in Treasure Isle's B room, two doors down from his new location. The studio's design is by Dodd and local architect/songwriter Roger Lavoie and features a lot of scrolled, hand-carved cedar finishes. The new facility features Nashville's first Soundcraft DC2020 console, with 32 inputs and Soundcraft's new automation system. Other components are a Studer A800 24-track analog deck, Furman balanced power throughout, and Logan monitoring. "I don't want to hire the place out," says Dodd. "It's really a collection of equipment that I think is the best for me and the work that I do, not necessarily anyone else. For instance, I only have one digital reverb. But I can make that do what I want." ■

*Nashville data? Fax Daley at 615/646-0102 or e-mail danurwriter@aol.com.*

—FROM PAGE 218, L.A. GRAPEVINE

it in the world, although it's as easy to operate as any API. We spent about a year deciding what we wanted and how to fit it in, so it's very practical from a live recording perspective, and it sounds great." Peets finds that the bookings for music recording are divided these days about 50/50 between 24-track analog with Dolby SR and digital 48-track, with

DA-88s the medium of choice for television production work. "Being a division of Design FX rentals makes us the only remote truck affiliated with a rental company," he comments. "We've got quick access to any specialized gear required, including the Pro Tools and Fairlight digital workstations."

Some of the more unusual performances they've recorded? The recent

KLOS radio Def Leppard Album Network release party held in the back yard of a UCLA frat house rates close to the top. "Big fun," says Peets. "It was the first live show the band had played in a while, and they smoked." Other memorable gigs: Blues Traveler for the episode of *Roseanne* where Dan (John Goodman) got to sit in and sing with his old band ("just parked outside the NBC

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soundstage and pulled the cables in"), and the week-long series in Mexico City for Latin megastar Luis Miguel—that's the one where the truck got detained at the border for a couple of days but still made the shows in time, and where the roads were so rough that the padlocks on the truck doors jammed and had to be forced off. Not to be left out: Aero-Smith on opening night of L.A.'s House of Blues (they're part owners, remember?), Neil Young's MTV "Unplugged," Bruce Springsteen's MTV "Plugged," and Michael Jackson's halftime performance at the '93 Superbowl. And then there was that night the MTV Awards were held at UCLA's Pauley Pavilion: 15 bands, three stages and one truck...all live. The finale—Guns N' Roses (with drummer on hydraulic lift) playing with an orchestra featuring Elton John on piano—required a set change during a quick commercial break. "A bit hectic," laughs Peets, with a generous amount of understatement. Not exactly like spending all day on that one tricky guitar overdub, eh what? We all know live sound people are a different breed than studio recording engineers, but then there's also this hybrid thing, live remote recording engineers...

**Music Grinder in Hollywood** took the night off and opened its doors for

an industry party during the AES convention. Transformed for the night into a live performance venue, complete with a piano bar/smoking lounge and a main stage area, the facility presented John Baker and Set Free, acts from House of Brick Music, their in-house production company, along with singer/songwriter Kathi Angel and classic-style crooner George Bugatti.

Owners Gary Skardina and Ron Filecia, together with sales and marketing director/manager Carol Davis, got a large cross-section of the local industry involved in the party; sponsors Tim Jordan Rentals, Design FX, SST, JBL, Quantegy/Ampex, Sony, *Music Connection* magazine and Sierra Audio Systems donated door prizes, and floral decorations were by Aya Reitzas, a talented designer and spouse of engineer Dave Reitzas.

The party reflected the recent action at Music Grinder, a two-room facility with large tracking areas and SSL and Neve consoles. There has been a steady stream of live music recording, including albums for White Zombie, Richard Marx with Bill Drescher engineering, Rick Nowles and Billy Sherwood producing the debut for Elektra act Coal, guitarist George Thorogood with producer Waddy Wachtel, and the much talked

about debut of Wild Orchid, executive produced by Ron Fair. Cutting-edge hip hop group Red Hot and Latin were also in recording for Jellybean Benitez's new label, Hola Records.

Some of the buzz at Music Grinder comes from the Producers Contact Directory that lives within the studio's Web site at [www.musicgrinder.com](http://www.musicgrinder.com). "We get calls from A&R departments all the time about this," says Davis, who was a vice president at Record Plant before moving to Music Grinder in February '95. "We've been compiling these listings for almost two years, and it now includes over 200 producers, engineers and their credits. It really started when Toby Wright was here doing the Kiss record—we built him a Web site. If you go into his listing and click on it, you get his discography, sound bites and you also get an interview, where he answers questions about how he gets certain sounds. A lot of other engineers have been intrigued by that! We are really into working with producers and engineers here," she concludes. "We encourage them to bring us projects that they are into, and if there's a way to help, we will." ■

*Fax your L.A. news to Maureen Dronoy at 818/346-3062.*

—FROM PAGE 218, NY METRO REPORT

more singular items in stock, such as MPC 1000 and MPC 60 drum machines, as well as samplers like the Akai S1000 and the Eventide units. "The hip hop and rap clients go mainly for the newer sorts of technologies," he says, "but they're also the ones who keep the demand up for the drum machines."

Toy Specialists has also been seeing more demand for post-production-oriented equipment. "Products like time-code DATs, slates, Nagras and communications systems are showing a lot more demand lately," he says.

Both companies, though, are having very different experiences with the hard drive recording market. Tasch is having a lot of success with Pro Tools rentals. And, he says, the clients for those systems tend to be quite familiar with it already and don't need any training, suggesting that they are not renting to evaluate them, but rather to use them. Dunn, on the other hand, said he's had some calls for Pro Tools, a few calls for Otari's RADAR, and a "smattering" of calls for Avid systems (Dreamhire already rents Avid drives).

but the company is still undecided about how that market will shake itself out. "The thing is, it's not a matter of whether recording is moving toward hard drive systems," he observes. "It is. But there were a lot of new systems coming out at AES. The demand for them at this point is not so intense, so it pays me to sit on the fence for the time being and see what new stuff comes out and which ones people want the most. It also means, though, that I'm going to have to hire someone who is more familiar with those systems, because I think that people will be looking for assistance in using them."

**Chung King** had the opening party on October 24 for its new studio complex in TriBeCa, and lest anyone think that my counterpart in LA-LA Land is the only one who gets to go to *les soirées très bon*, the ones on this coast are every bit as good. Chung King opened what's basically an all-Neve facility, featuring three new studios up and running with a 72-input Capricorn, a 72-input VRP and a VR 72. But you want to know about the party, *n'est-ce*

*pas?* It was good—the sushi chef could barely keep up and nearly enlisted studio manager Laura King into service.

Another great party: **The Sam Ash Professional Group debuted its new digs** at 1600 Broadway, site of the former Audio Techniques, with a major bash on November 19. The new pro division consolidates both sales and parts departments under one roof. The Ashes were all there—Rich, Jerry, Paul and David—as were 250 guests and reps from 50 manufacturers, many of whom kicked in products for the night's giveaways. The band, led by Homeboy Studios owner Fred McFarland, was abetted by guest singer Melba Moore.

**Superdupe Recording**, the voice-over recording and sweetening division of the New York Media Group (which also owns East Side Audio Video, Post Perfect and Mixed Nuts), is undergoing a facility-wide facelift. Designer John Storyk will do cosmetic and acoustical renovations on all six of the facility's studios and the client service/lounge area, which is the first to go under the knife. The first studio refurbishment is Studio 2, helmed by engineer/mixer

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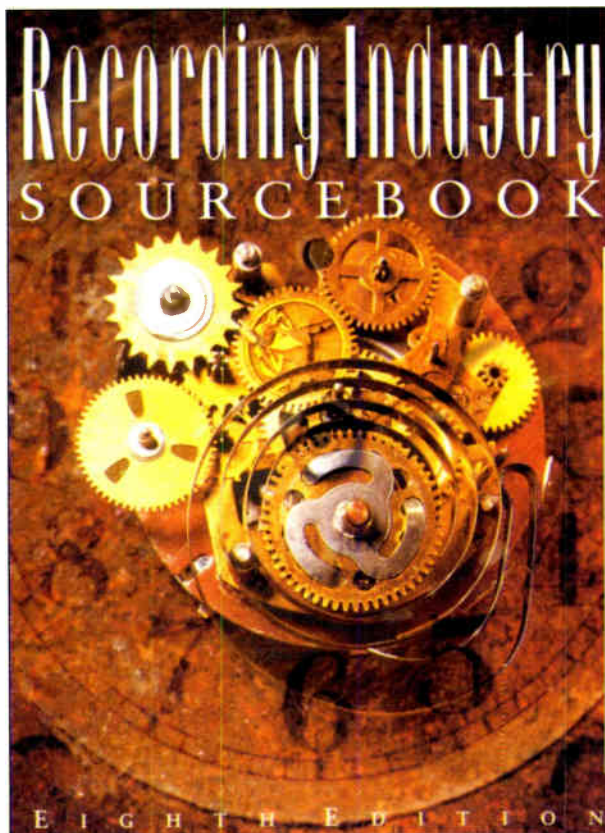
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Mitch Raboy. In addition to acoustical design changes, Raboy's room is having its DAR workstation and Sony MXP-3000 console replaced by a Fairlight FAME integrated DAW/console system. "My room will be the prototype for the rest of the mixing room upgrades," says Raboy. "We're looking for a unified systems approach to the extent that it makes sense." The other five rooms now hold SSL ScreenSound systems. The total facility upgrade is expected to be completed over the course of the next 18 months. Superdupe still performs the work that gave it its name over 25 years ago, continuing to handle high-speed audio tape duplication, as well as radio broadcast uplinks.

In other studio upgrade news, **Room With a View** purchased an SSL 9000 J console. The deal was finalized at the Los Angeles AES convention, according to Alessandro Cecconi, owner of the three-year-old studio. ■

*Spotted a New York trend or significant upgrade? E-mail Dan Daley at dan-writer@aol.com or fax 615/646-0102.*

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—FROM PAGE 219, SESSIONS & STUDIO NEWS

a new album with Nicholas Payton for Verve Records at Ultrasonic Studios in New Orleans, with producer Jerry Brock and engineer David Farrell...57 Records/Columbia artist David Harris mixed his debut in Studio E at Doppler Studios (Atlanta) with producer/engineer Brendan O'Brien and assistant Alex Lowe...

#### **NORTHWEST**

Producer Greg Landau and engineer Todd Tate tracked the new Patato Valdez CD, *Ritmo Y Candela*, at **The Blue Room Studios**, San Francisco...At **Toast** (San Francisco), Elektra recording artists **Better Than Ezra** remixed a single in Studio B with producer **Philip Steir** and engineer **Chris Haynes**. Green Day's **Billie Joe Armstrong** was in Studio A co-producing the new **Dead and Gone** album for **Alternative Tentacles** with producer/engineer **Billy Anderson**... They're baaack: **Night Ranger** cut tracks for a future release at **Studio D Recording** (Sausalito, CA) with producer/engineer **Ron Nevison** and assistant **Mike Cresswell**...

#### **NORTHEAST**

**Paul Andrews**, **Julian Marsh** and engineer **John P. Hopkins** worked on remixes of songs from **Dolly Parton's** new covers album at **The Cutting Room Studios** in New York City...At **Studio Unicorn** in

Redding, CT, veteran rockers **Wishbone Ash** recently tracked a new Renaissance Records release with engineers **John Etchills** and **Paul Avgerinos**...**Spyro Gyra** cut basic tracks for an upcoming GRP release at **BearTracks Recording** (Suffern, NY). Band saxophonist **Jay Beckenstein** is producing with **Jeremy Wall**. **Doug Oberkircher** engineered, assisted by **Kristen Koerner**...**Tracks East Recording** in South River, NJ, hosted sessions for **Tim Kross'** debut. **Bill Turner** produced the sessions (which featured members of Turner's band **Blue Smoke**), and **Eric Rachel** engineered...**Vanessa Williams** recorded her recent Christmas LP at **The Edison** in New York with producer **Jeff Kievit** and engineer **Gary Chester**...**EMI Argentina** artists **Los Pericos** mixed their new album in Studio A at **Mystic Recording** in Staten Island, with producer/engineer **Fernando Kral** and assistant **Steve Neat**...**New York City's River Sound** had **The Fugees** in working on mixes and overdubs for a self-produced Ruffhouse release with engineer **Warren Riker** and assistant **Tony Gonzalez**...**Kink Ray Davies** overdubbed and mixed new material at **Sound Techniques** in Boston... Producer/engineer **Martin Brumbach** remixed a track for **Skelton Key's** Capitol debut at the **Magic Shop**, New York City...**EastSide Sound** had **Crawlspace** in mixing a TVT release with producers **Mark Mendoza** and **J.J. Segal**, engineer **Denny McNearney** and assistant **Gary Townsley**...**The Bottle Rockets** worked on their new Atlantic release with producer **Eric (Roscoe) Ambel**, engineer **Tim Hatfield** and assistant **Grace Falconer** at **Coyote Recording** (Brooklyn, NY)...**Vincent Montana Jr.** tracked a solo effort at **Victory Recording Studios** in Philadelphia with engineers **Jeff Chestek** and **Gene Leone**...

#### **NORTH CENTRAL**

**New Brain** mixed ten songs at **Streeterville Studios** in Chicago with producer/engineer **Jeff Moleski**, who recently joined the studio's staff...Recent sessions at **Makoché Recording Company** in Bismarck, ND, included alternative rockers **19 Ledge** mixing their upcoming Iguana Spit Productions release *Moo Goo Gbai Pan*...**Hum** worked on their second album for RCA at producer **Keith Cleversley's** studio, **The Playground**, in Chicago...**Radio Iodine** (Radioactive/MCA) were at **Too-Relaxed Studios** in St. Louis, MO, remixing a few songs for upcoming release...**Jazz** guitarist **Bill Frisell** recorded an upcoming **Ryko/Gramma** Vision release with **Ron Miles** and his band at **Akashic Studio** in Boulder,

CO...At **Performance Recording** (Orland Hills, IL), **Bert Cattoni** mixed his first album for Midwest indie label **Our House Records**. The studio is going ahead with plans to break ground in March on a new five-room facility (designed by studio bauton) in the Chicago suburb of Lemont...**Day One** completed tracks for their second **Broken Records** release with producer/engineers **Jeff Murphy** and **Leroy Bocchieri** at **Short Order Recorder** in Zion, IL...

#### **SOUTHWEST**

**Lizza Lamb** recorded and mixed her new BMG album at **Houston Sound Studios** (Houston) with producer **Mando Lightenberger** and engineer **Randy Miller**...**Ani DiFranco** completed mixing a double-live album for **Righteous Babe Records** at the **Congress House Studio** (Austin, TX) with engineer **Andrew G.** and assistant **Mark Hallman**...**Atlantic Records** act **Storyville** (including members **Chris Layton** and **Tommy Shannon**—the **Double Trouble** of **Stevie Ray Vaughan** fame) recorded a live set for Houston radio station **KIOL** at **Rivendell Recorders** (Houston) with engineer **Jeff DeVerter**...**Spoon** recorded an upcoming EP for **Matador** at their producer **John Croslin's** studio in Austin, TX...**The Indigo Girls** self-produced sessions for **Sony** at **Arlyn Studios** in Austin, TX, with co-producer/engineer **Dave Leonard** and assistant **Marc Frigo**...

#### **STUDIO NEWS**

**Bearsville Studios** (Bearsville, NY) opened a 2,000-square-foot multi-use facility. Currently available for rehearsals and pre-production (the initial booking was **Blues Traveler**, in pre-production for their next A&M release), the new space is equipped with a complete stage monitor system. The facility will eventually include a recording package similar to Bearsville's three other studios...**Paradise Sound Recording** (Index, WA) installed an SSL 4056 G Series console with **Total Recall**...**Infinity Studios** in Brooklyn, NY, installed a **Neve VR60** with **Flying Faders** in its newly renovated control room, designed by **Francis Manzella/FMRTS**...**D.J. Pooh** installed a **Euphonix CS2000** in his **Digital Shack** studio in Los Angeles...**The Audio Loft** (Ambridge, PA) recently installed a **Yamaha O2R** console, with four **ADAT** cards...**Permanent Records Recording** in New York City recently relocated to new facilities and took delivery of a 32-channel **Soundcraft Ghost** console...**Millbrook Sound Studios** (Millbrook, NY) recently added an **ART Pro MPA** preamp. ■




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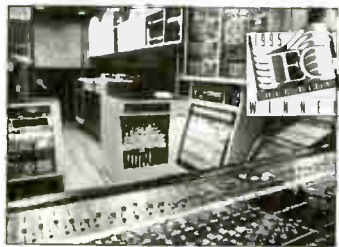
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Record Plant Remote has been an industry leader in location recording for over 20 years. We've kept abreast of new developments in audio technology without sacrificing our sonic integrity. Some of our recent clients include MTV, Aerosmith, Elton John, Michael Bolton, Spin Doctors, R.E.M., Live, Meatloaf, Wynton Marsalis, John Mellencamp, Keith Richards, Chuck Berry, Guns N' Roses, Whitney Houston, Pavarotti, INXS, James Taylor, Emmylou Harris, Shawn Colvin, Billy Ray Cyrus, Mary Chapin Carpenter, Trisha Yearwood and Harry Connick Jr. Our reputation speaks for itself!



## Skylabs Mobile Recording

520 Penngrove Ave.  
Penngrove, CA 94951  
(707) 792-2000; Fax (707) 792-2500

Skylabs offers the finest in mobile acoustics and equipment for live concert recording, remote broadcast, audio for picture, and in-house recording. We are the most popular live-to-2-track and multitrack mobile because of our ability to deliver clean, accurate sound with virtually no guesswork. If you are looking for more than just saturated tracks, or prefer recording and mixing at your own place, give us a call.



## Chalet Studio

RR #4  
Claremont, Ontario, Canada L1Y 1A1  
(905) 649-1360; Fax (905) 649-2951  
e-mail: studio@chalet.com  
http://www.chalet.com

A truly creative environment... Chalet Studio is a residential recording studio situated on 40 acres of rolling countryside with a panoramic view of Lake Ontario from afar (45 min. NE of T.O.). Chalet Studio offers 24-track analog and digital recording with an extensive array of mics, new and vintage outboard gear as well as production services. Chalet Studio's clients have included Rush, Moist, Barenaked Ladies, Jason McCoy, Blue Rodeo and The Watchmen. Contact David Chester.



## Rockingchair Recording Studios

1711 Poplar Ave., Memphis, TN 38104  
(901) 276-8542; Fax (901) 276-8546  
e-mail: rknchair@vdospk.com  
http://www.vdospk.com/rknchair

Rockingchair Recording Studios, located in the heart of midtown, adds to Memphis' rich musical heritage. Offering a relaxed and creative ambience, state-of-the-art equipment and an advanced staff, Rockingchair is the perfect retreat for today's recording artist. Our philosophy is simply this: An easygoing atmosphere allows for the best performance and maximum productivity. Established in 1989, the new facility went online December 1993 with two independent studios and an expanded equipment list.



## Gallery Recording Studios

132 West 22nd Street, 6th Floor  
New York, NY 10011  
(212) 366-6640; Fax (212) 727-7187  
e-mail: gallery@bbhinc.com

It's a recording studio and an art gallery! A beautifully designed new, spacious facility with outstanding acoustics, based in the heart of Manhattan. The best in vintage/modern gear and an inspiring atmosphere enhanced by ever-changing exhibits of striking modern artwork. Built to spoil the most demanding engineer, producer or musician. Some names: 148-in Trident 90 console with moving faders, Studer 827s, Lexicon, Quested, Pro Tools, DA-88s, Focusrite, Neve, Summit, Pultec, TC, Neumann, Steinway.



## Remote Recording Services

PO Box 334  
Lahaska, PA 18931  
(215) 794-5005; Fax (215) 794-3263

Remote Recording Services, owned by five-time TEC award winner David Hewitt, offers the Silver Studio, a first-class Neve and Studer equipped mobile recording studio. The evolutionary design of our facility allows us to handle over 100 inputs and gives us the flexibility to accommodate five multitrack machines. Our crew brings an unparalleled 25 years of location recording experience to your session, resulting in flawless execution of any audio task. Our credits range from the Allman Brothers to Frank Zappa; from the Metropolitan Opera to the Three Tenors and Beyond.

# STUDIO SHOWCASE



## Studio Frisson

835a Querbes Outremont,  
Quebec, Canada H2V 3X1  
(514) 276-6789; Fax (514) 276-4375

Who said it's colder in Canada? Studio Frisson offers a warm vibe complemented by a 72-input Neve that includes 36 x 1073, 14 aux. sends and automation. We also have a Studer A800 MkIII 24-tr., Studer 1/2-inch and a Class A Studer 1/2-inch, all with SR plus a 24-tr. Otari RADAR along with a wide selection of vintage mics (C-24, U47) and tube equipment.



## Midcom Remote Services

6311 N. O' Connor Rd. Suite 108  
Irving, TX 75039  
(972) 869-2144; Fax (972) 869-0898  
<http://www.flash.net/~midcom>

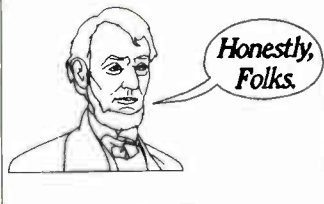
Midcom is a full remote audio production facility providing 24/48-track recording to the music, video, film, and live broadcast industries. Credits: Metallica, The Black Crowes, Eddie Money, Queensrÿche, Jackyl, Anthrax, Dolly Parton, Mark Chestnutt, Aaron Tippin, Rick Trevino, George Strait, Alan Jackson, Dallas Cowboys Radio Network (1991-1996), Aida, Nixon in China, The Aspen Papers (PBS Great Performances). Awards: three Emmys, two Gold Medal IRI/NY, Best Program SECA and an RIAA Gold record.



## Ocean Lab Studios Ltd.

James Fort Bldg.  
Hincks St., Bridgetown  
Barbados, West Indies  
(246) 431-0865; Fax (246) 431-9156  
e-mail: [dginniss@caribsurf.com](mailto:dginniss@caribsurf.com)  
<http://www.angelfire.com/pg1/ocean/index.html>

Located on the Caribbean Island of Barbados, Ocean Lab Studios offers a relaxing atmosphere for creativity. Our control room features a custom 48-input Harrison console, analog and digital tape machines and standard mics and outboard gear. Situated on the West Coast, the studio is near restaurants and watersports activities. An attractive package, including accommodations and transportation, is available to suit your budget. Relax on a tropical Caribbean Island and "let your creative juices flow!"



## Yaking Cat Studios

3107 Butte Drive  
Santa Teresa, NM 88008-9509  
(505) 589-6111

It's a boy! We just had our latest arrival delivered: the PostPro. Now our other twins (Synclaviers) don't feel so lonely. Want to come over and play? Located in the beautiful Southwest, just outside of El Paso, Texas.



## The Hook Studios

12623 Sherman Way, Suite 8  
North Hollywood, CA 91605  
(818) 759-4665; Fax (818) 759-0268

"The best overdub facility in L.A."

With a focus on vocals and overdubs, The Hook is a facility dedicated to serving one client. Our goal is to provide a no-compromise microphone choice for each vocalist and instrumentalist. We feature a Neve 8068, a Studer A827, and 50 microphones including AKG C-12s, C-24s, Neumann U47s, U67s, M-249s, SM-2s, 582s; Schoeps C-221s, Telefunken Elam 250, 251. We are confident that we can meet your needs.

## Carmel Digital PURE SOUND

## Carmel Digital

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Carmel, CA 93921  
(408) 622-0522; Fax (408) 622-0660  
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<http://www.carmeldigital.com>

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## TASCAM 102 MKII / 103 Stereo Mixdown Cassette Decks



Best values for musicians, studio operators and production houses. The 102 MKII and the 103 consistently produce only the highest quality tape recorded output.

- They Feature:**
- 60dB signal-to-noise ratio and wide frequency response using any type of cassette tape.
  - Dolby B/C noise reduction and Dolby HX Pro extends high frequency performance up to 8kHz and minimizes distortion.
  - Bias-sensing electronics automatically chooses best recording settings for the type of tape you load - Normal, Metal or CrO2.
  - Record/Mute autopacer automatically inserts 4 seconds of silence between songs or broadcast segments.
  - Independent L/R stereo level and master record level controls.
  - Tascam 103 Advanced Features:
    - 3-head system allows you to record on a tape and monitor it at the same time without rewinding.
    - MPX filter button eliminates pilot and sub-carrier broadcast tones that can interfere with Dolby noise reduction.

## 202 MKIII Dual Auto Reverse Cassette Deck



- Provides high-fidelity sound reproduction and a wide frequency response, as well as a host of features to help you easily dub, edit, record or playback onto/from one or two cassettes:
- Normal speed and high-speed dubbing
  - 4-second autopacer
  - Dolby HX Pro sound extends high frequency performance and minimizes distortion on Normal, Metal and CrO2 tape.
  - Create a professional-sounding composite tape from several sources. Functions like Intro Check, Computerized Program Search, Blank Scan and One Program quickly find the beginning of tracks you want.
  - Twin two-head cassette decks in a durable rack-mount housing that can be used separately or in tandem during recording and playback for total flexibility.

## 302 Double Auto Reverse Cassette Deck

- All the features of the 202 MKIII plus more recording and playback flexibility. This because the 302 is actually two independent cassette decks, each with their own set of interface connectors, transport control keys and noise reducing functions.
- Auto reverse capability on both decks
  - Individual/simultaneous record capability—both decks
  - Independent RCA unbalanced in/out for each deck
  - Cascade and Control (C) let you link up to 10 additional machines for multiple dubbing or long playing record and playback applications.

## 112 MKII Stereo Cassette Deck



The classic, no-frills production workhorse. The 112 MKII is a 2-head, cost-effective deck for musicians and production studios. Extremely rugged and reliable, the 112 MKII is ideal for production mastering and mixdown. It also features a parallel port for external control and an optional balanced connector kit means it is flexible enough to integrate into any production studio.

## 112R MKII BI-Directional Stereo Cassette Deck

The 112R MKII is a sonically uncompromising auto-reversing and continuous play cassette deck. It offers the finest independent head auto reverse design at this price level plus it has extra dubbing and editing features for long program recording.

- All the features of the 112 MKII plus—**
- Three-head transport with separate high-performance record and playback heads. The heads combine with precision FG servo direct-drive capstan motors to provide the highest standards of reproduction quality and performance.
  - Hysterisis Sensing Servo Control (HSSC) virtually eliminates wow and flutter by maintaining consistent back tension on the tape all through the reel, combating inconsistencies brought on by extreme temperatures and humidity.
  - Auto Reverse mode plays or records in both directions before stopping, switching sides on the fly.
  - Continuous Reverse mode allows you to loop the tape during playback up to 5 times, or record in both directions without pausing to flip the tape and re-engage the record mechanism.

## marantz

### CDR620 Compact Disc Recorder

The CDR620 is a next-generation stand-alone write-once CD recorder. It offers a truly comprehensive set of features for a wide range of applications including recording studios, mastering facilities, post production, broadcast and more.

- Includes a sample rate converter, a DAT start/ID/CD track converter, auto-increment mode, an ISRC encoder, programmable digital fade-in/out and an index recording capability.
- SCSI-2 interface for connection to popular hardware/software and virtually any PC for use as a CD-ROM recorder.
- High oversampling 1-bit AD (64k and DIA (128k) converters).
- Subcode sensing or adjustable level sensing for automatic track incrementing. Also supports manual track incrementing.
- Wired remote provides control and status of all CDR620 operations. Both index and ISRC code recording can be activated, as well as catalog number recording (EAN/UPC). The remote also supports copy prohibit on/off and emphasis on/off.
- Ignores SCMS (Serial Copy Management System), permitting unlimited archiving.
- Has a comprehensive array of analog and digital inputs/outputs including multiple digital audio interfaces (AES/EBU and IEC-958-II) and balanced +/-10dBu selectable analog input and +/-40dBu balanced analog output.
- Cascade feature provides simultaneous parallel operation of multiple machines, and a 9-pin parallel (GPI) interface facilitates external automation.



### PMD-101/201/221/222/430 Portable Professional Cassette Recorders

The world standard for field recording, the PMD line is also the value leader. They all feature RCA line input/outputs, 1/4-inch headphone jack, built-in speaker, pause control, audible cue and review, tape counter, full auto shut-off and low battery indicator.

General	PMD-101	PMD-201	PMD-221	PMD-222	PMD-430
Stereo/Mono Heads	Mono 2	Mono 2	Mono 3	Mono 3	Stereo 3
Inputs/Outputs					
Mic Input	1/4-inch Built-In	Miniplug Built-In	Miniplug Built-In	Mini-XLR Built-In	1/4-inch
Condenser Mic Remote Jack	—	Yes	Yes	Yes	—
Modular Tel. Jack	—	Yes	Yes	Yes	—
External Speaker Jack	—	Yes	Yes	Yes	—
Record Controls					
VU Meters	—	1	1	1	2 (Illuminated)
2-Speed Recording	Yes	Yes	Yes	Yes	—
Dolby B NR/dolby NR Mic Attenuation	—	0-10dB -20dB	0-10dB -20dB	0-10dB -20dB	0-15dB -30dB
Ambient Noise Cont.	—	Yes	Yes	Yes	—
MPX Filter	—	—	—	—	Yes
Manual Level Control/Limiter	—	Yes	Yes	Yes	Yes
ALC	Yes	Yes	Yes	Yes	—
Peak Indicator	—	—	Yes	Yes	—
Playback Controls					
Pitch Control	+20%	+20%	+20%	+20%	+6%
Bias Fine Adj.	—	—	—	—	Yes
Tone Control	Yes	Yes	Yes	Yes	—
Memory Rewind	—	—	Yes	Yes	Yes

• All models except the PMD-430 have 1/2 speed playback/record capability. With 1/2 speed playback, musicians can slow down complicated passages for analysis. And when played back at 1/2 speed, the pitch is lowered by exactly one octave, so the notes are still musically correct—ideal for figuring out complicated solos or picking patterns.

• By recording at 1/2 speed, a three hour meeting can be recorded on a single tape. A built-in mic and automatic level control make operation simple and built-in speaker makes transcription convenient.

• 1/2 speed recording is equally ideal for churches, because 90 minutes can be recorded on a single side of tape—no interrupting to flip the tape over.

• Three standard D-cell batteries provide up to 7-1/2 hours of operation and the optional RB430 rechargeable battery delivers up to 5-1/2 hours.

## Telex

### ACC2000/4000 Cassette Duplicators

Designed for high performance and high production, Telex duplicators also offer easy maintenance and ease of use. The ACC2000 is a two-channel monaural duplicator, the ACC4000 is a four-channel stereo duplicator. Each produces 3 copies from a cassette master at 16X normal speed and with additional copy modules you can duplicate up to 27 copies of a C-60 original in under two minutes. And they copy both sides at once.

The XL Series feature "Extended Life" cassette heads for increased performance and wear characteristics. They also offer improvements in wow and flutter, frequency response, S/N ratio and bias.

- Easy Maintenance:**
- Slanted work surface and "heads-up" cassette platform prevent oxide build up on the heads and makes cassette loading and unloading easier.
  - Three point tape guidance system eliminates skew problems and prevent unnecessary wear and tear on the tape head mechanism.
  - Audio and bias, along with head adjustments, are made easily from the top of the unit and a switch on the back engages the head and pinch roller for convenient cleaning.
- Fingertip Operation**
- Individual rotary audio level controls
  - Peak reading LED indicators
  - Side A or A/B select button
  - Stop all tapes instantly, at any point during the copy or rewind cycle.
  - Short tape indicators alert you if a tape stops before the original does, identifying incomplete copies caused by jam or short.
  - Automatic or manual selection of rewind and copy operation:
    - Rewinds tapes to the beginning or end automatically (AUTO mode) or manually.
    - In AUTO mode the copy button activates the entire rewind/copy/rewind sequence. In manual it starts copying immediately.

- ACC2000 Mono Master Module:**
- 1/2 track two-channel monaural duplicator produces 3 copies from a cassette master at 30 ips (16X normal speed)
  - Expands up to 27 positions by adding ACC2000 copy modules
- ACC2000 XL Mono Master Module:**
- Same features as ACC2000, plus—Extended Life cassette heads
- ACC4000 Stereo Master Module:**
- 1/4 track four-channel stereo duplicator. Same features as ACC2000 Mono Master Module.
- ACC4000 XL Stereo Master Module:**
- All features as ACC4000, plus—Extended Life cassette heads
  - Can be configured for chrome or ferric cassette duplication
- ACC2000 Mono Copy Module:**
- Each module has four copy positions with erase heads and controls for side select
  - LED displays indicate end-of-tape status for each pocket
- ACC2000 XL Mono Copy Module:**
- Same features as ACC2000 Copy Module, plus—Extended Life cassette heads. Connects to ACC2000 XL Master Module
- ACC4000 Stereo Copy Module:**
- Same as ACC2000 Copy Module except 1/4 track, four-channel
- ACC4000 XL Stereo Copy Module:**
- Same as the ACC4000 Copy Module, plus—Extended Life heads. Configurable for chrome or ferric cassette duplication

### Copyyette EH Series Duplicators

The Copyyette series produce high quality, low cost cassettes in large quantities at nearly 16 times normal speed. Available in two versions the Copyyettes are capable of duplicating either one cassette or three at a time. Also available in both mono and stereo models.

- Stereo Copyyette 1+2+1**
- Weighing only 8 lbs (3.6 kg) this unit has a durable impact resistant housing and includes a removable power cord, carrying handle and protective cover. An optical non-reflective end-of-tape sensing system that provides gentle tape handling.
- Stereo Copyyette 1+2+3**
- This duplicator copies both sides of three cassettes at once yet it's as small as the 1+2-1. It weighs only 12 pounds (5.4 kg) and includes a hard cover to protect the unit while not in use. It uses all DC Servo motors for the ultimate in reliability.

## Equitek Series Studio Condenser Mics

The "bench mark" for cost and performance, the Equitek series of microphones incorporate a unique servo design and exceptional flexibility to provide extraordinary ballistic capability and exceptional transient response.

**E-300**

A multi-patterned side address mic that combines vintage capsule design with advanced head amp electronics, the E-300 has an unusually wide frequency response of 10 Hz to 20 kHz and an exceptional dynamic range of 137 dB. Also extremely low self noise of 11dB. Ideal for the most critical applications.



Unique powering of all mics is accomplished with a pair of rechargeable nickel 9-volt batteries in combination with 48-volt phantom power. This overcomes inherent current limiting associated with most phantom power supplies and can supply ten times the current.

## E-200/E-100

The first member of the current Equitek family, the E-200 is also a dual capsule side address multi-pattern condenser mic, but with lower specifications than the E-300. The E-100 uses the same electronics as the E-200, but with only one of the same capsules in a supercardioid pattern.

- Frequency response of 10 Hz to 18 kHz
- Dynamic range of 137 dB • Low self noise of 6 dB

## audio-technica AT4033 Cardioid Capacitor Microphone

The AT4033 is a transformerless studio microphone designed for use in the most demanding applications.

- Utilizes a gold-plated, "aged-diaphragm" condenser element with an internal baffle plate to increase signal to-noise ratio, which coupled with low-noise, transformerless electronics, makes the AT4033 ideal for critical digital recordings.
- Dynamic range is 123 dB without the built-in attenuator.
- Accurately up to 140 dB SPL without capsule or electronic system distortion above 1% THD and a built-in switchable 10 dB (nominal) pad increases it to 150 dB.
- 2-micron-thick vapor-deposited gold diaphragm provides accurate reproduction of even the most subtle sounds.
- Permanently installed internal open-cell foam windshield.
- Integral 80 Hz hi-pass filter for easy switching from a flat frequency response to a low-end roll-off.

## AT4050/CM5 Multi-pattern Studio Capacitor Microphone

Supremely transparent and accurate, without sacrificing warmth and ambience, the AT4050 expands upon the AT4033 to set the standard for studio performance mics.

- New large-diaphragm design utilizes two capacitor elements to provide consistent, superior performance in cardioid, omnidirectional and figure-of-eight polar pattern settings.
- To achieve a warm, true-to-life sound in all polar pattern settings, Audio-Technica vapor-deposits pure gold onto specially-contoured large diaphragms which are aged through five different steps to ensure optimum characteristics over years of use. The transformerless circuitry results in exceptional transient response and clean output even under extremely high SPL conditions.

## SENNHEISER HD 265

The HD-265 is a closed dynamic stereo HiFi professional headphone offering a high level of background noise attenuation for domestic listening and professional monitoring applications. It is a suitable choice for monitoring applications in professional studios and to match the top of the range HiFi systems, delivering a clear and tonally balanced sound with a minimum of distortion.

## HD 580

The HD 580 is a top class open dynamic HiFi professional headphone. The advanced design of the diaphragm avoids resonant frequencies. The HD 580 can be connected to HiFi systems of the highest quality, in particular DAT, OCC, and CD players. This headphone is an ideal choice for the professional recording engineer recording classical music.



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## APHEX 106 Easyrider

### 4-Channel Auto Compressor

- Four individual channels in one rack space
- Automatic layered attack and release times
- Independent switches for fast or slow processing
- Dial in compression up to 20 dB
- Independent on/off switches
- -10 dB/+4 dB switch on each channel
- Voltage Controlled Attenuator (VCA) 1001 outperforms all other VCA's
- Linkable pairs for stereo applications

## 107 Tubessence Dual Channel Thermionic Mic Preamp

The 107 provides two discrete preamp channels, each with its own dedicated controls. A switchable 48 volt phantom power supply makes it compatible with all mics. The 107 delivers outstanding sonic performance, as well as a great degree of presence, detail, openness and image. It also provides extended high frequency response without any harshness and an improved bass response.

- Two independent channels with front panel XLR inputs
- Up to 64dB of gain available
- 20dB pad with red LED indicator
- Two LED 1/4" meter
- Full 48 volt Phantom power with red LED indicator
- Low cut filter with red LED indicator 80Hz, 120dB/octave
- Polarity inversion switch with LED indicator
- Individual channel remote mute capability
- Switchable +4dB/+10dB output with 1/4" TRS phone jacks

**TUBESSENCE:** Combines the best attributes of both tube and solid state circuitry to provide performance unmatched by conventional designs. The solid state front end is transformerless and only expensive, great sounding capacitors are used in the signal path. The tube circuit imparts the sonic characteristics of tubes without the extremely high voltages, heat, fragility, and short life span of conventional tube circuitry.

## 109

### Parametric EQ with Tubessence

The Alpha 109 is an extremely versatile and high performance single rack space parametric vacuum tube equalizer with unique features, flexibility and sound.

- True tubelicious (Tubessence) in the output stage for a "warm," "sweet" and "rich" sound.
- Dual (stereo) two band or mono four band equalizer configuration offers flexibility for general sweetening to critical problem solving situations.
- In Dual Mode: each channel has +/-10dB of input gain, a Low-Mid (20Hz-20kHz) band and a Mid-High (200Hz-20kHz) band.
- Each band has +15dB/-15dB boost or cut with center detent (flat), swappable frequency adjustment, variable bandwidth and switchable peak or shelving filter mode.
- Op rates in the EQ flat (calibrated center detent) mode yet still passes signal through the Tubessence vacuum tube stage. This is helpful for "warming up" digital signals.
- 1/5 octave to 2 octave bandwidth adjustment.
- Switchable -10dB/+4dB operating level.

## t.c.electronics Wizard M2000 Studio Effects Processor

The M2000 features a "Dual Engine" architecture that permits multiple effects and six different routing modes. There are 25+ factory programs including reverb, pitch delay, delay, chorus, flange, phase, ambient, EQ, de-essing, compression, limiting, expansion, gating and stereo enhancement. The M2000 also features 20-bit analog conversion, AES/EBU and SPDIF digital inputs/outputs, "Wizard" help menus, 32-bit filtering tools, Tap and MIDI tempo modes and a single user parameter editing.

- The array of enhanced pitch shift (up to 8 voices), chorus, and delay effects are characterized by their precision and versatility. Everything from the fine and subtle to the wide and spectacular is handled with equal superiority. The algorithms in the dynamics section are unique as stand-alone effects, but are particularly useful in combination with other effects. Those might be de-esser/room, gated hall or compressed pitch. The possibilities are endless.
- Tempo Tap function allows tempo to be adjusted in beats-per-minute and sub-divided any way you like—even in triplets. The tempo can also be read from MIDI.
- Preset "Gilding" (morphing) function ensures seamless transition between effects. Very useful in mixing situations.

## ALESIS 3630 Compressor

### RMS/Peak Dual Channel Compressor Limiter with Gate

The most powerful compressor in its class, the 3630 is a dual-channel compressor that offers Ratio, Threshold, Attack and Decay controls to handle the toughest signals. It also offers a choice between RMS and Peak compression styles, plus Hard and Soft Knee dynamic curves for every application from subtle gain control to in-your-face punch. Ideal for use in applications from studio recording and mixing to live sound reinforcement and broadcast.

- Dual mono or linkable true stereo operation.
- User selectable Peak and RMS compression styles as well as hard knee/soft knee characteristics
- Dual 12-segment LEDs display gain reduction and input/output levels.
- Each channel's built-in noise gate has an adjustable threshold and close ratio to ensure clean, transparent performance
- Sidechain input for ducking and de-essing
- 1/4-inch inputs/outputs switchable for -10dB and +4dB

## M-EQ 230

### Dual 1/3 Octave/Precision Equalizer

Used extensively in recording studios since 1989 the M-EQ 230 provides 60 bands of EQ in a single rack space. Covering every band from 25 Hz to 20 kHz in 1/3 octave increments the M-EQ 230 is ideal for tuning the monitors in your project studio or even getting the most out of a home stereo setup.

- Two independent 30-band 1/3 octave graphic equalizers
- Engineered with Alesis' Monolithic Integrated Surface Technology, gives you more features and better audio performance than many 2-space rack devices
- Equipped with 1/4" and phono jacks
- Auto Power Muting function protects your components from power on/off transients
- Input switch allows you to easily compare your original signal to the equalized sound

## NanoVerb

### 18-bit Digital Signal Processor

The NanoVerb breaks new ground in performance and sound by implementing an advanced, high-fidelity digital signal processor in an ultra-compact, easy-to-use and incredibly affordable package. If you're on a tight budget, you want to check out the NanoVerb, it has the features you need to get started.

- Introduces 16 powerful preset effects, including hall, room, plate and non-linear reverbs, true stereo chorus, flange and delay.
- Also includes three multi-effects programs—chorus/room, chorus/delay/room and rotary speaker/room—allowing you to achieve a complete instrument or vocal effects setup from a single unit
- Adjust knob provides complete control over delay time, reverb decay etc. by allowing you to tweak each program until it's just right for your music.
- Equipped with professional 18-bit A/D and D/A converters and a 20-bit internal processor that operates at three million instructions per second
- Front-panel includes input level effects mix, output level, program and adjust controls and dual-color signal input/output LEDs. Rear panel interfaces include stereo 1/4-inch input and output jacks
- Incredibly affordable, you can put two or three in your rack for dedicating to multiple sources. (Ultra compact, it requires only a 1/3 rack space)

## MicroVerb 4

### Preset/Programmable 18-bit Signal Processor

An affordable solution for great sounding effects processing, the MicroVerb 4 goes far beyond the capabilities of any processor in its class. It offers the ability to edit and store your own customized programs, to utilize versatile multi-effects configurations and to take advantage of complete MIDI implementation.

- 18-bit D/A and A/D converters and 20-bit internal processor combine with the clean effects algorithms to offer a frequency response from 40 Hz to 20 kHz and a wide dynamic range. The result is ultra-clean, great-sounding effects for every application
- 100 preset and 100 user-editable effects include many varieties of reverb, delay, chorus, flange and more
- Advanced effects include rotating speaker simulation, auto-pan, tap tempo delay and dual-send setups (send one effect to one channel and a completely different effect to the other)
- Many of the effects are in true stereo and several offer up to three effects at once.
- Each program provides two logical effects parameters that you can adjust in real time using two front-panel edit knobs or MIDI controls. For example, on a reverb program you can change decay and frequency control, and you can edit time and feedback of delays. Up to 100 edited programs can be saved to a dedicated user bank
- Responds to MIDI program change and modulation, and it provides a special two-way TRS footswitch jack that offers both bypass and control functions
- Easy-to-use "set-and-forget" interface offers a bright LED program number display. Just dial up a program number and start playing—that's all
- Fits in a standard single rack space

## MidVerb 4

### Dual Channel Parallel Processor with Auto Level Sensing

The MidVerb 4 extends Alesis' line of affordable professional multi-effects processing. It provides the sonic quality and programming power required for studio recording and live sound reinforcement while maintaining an incredible degree of affordability.

- Superb effects algorithms provide a wide variety of dense, natural-sounding reverbs, rich chorus and flange, versatile delay, rotating speaker simulation, pitch shift, panning and more
- Auto Level Sensing feature automatically sets your input signal to the optimum level to take advantage of the MidVerb 4's wide dynamic range.
- 18-bit oversampling digital converters add to the excellent audio fidelity, with a resulting 20 kHz frequency response and a dynamic range over 90dB.
- Provides complete MIDI implementation, so you can change programs and modulate parameters in real time with MIDI controllers (pedals, mod wheels, etc.)
- Each of the 128 preset and 128 user-editable programs use one of 32 configurations, or arrangements of effects. You can set up mono or stereo single effects, dual mono effects with separate mono-in and out for each channel, and multi-chain configurations that provide two or three effects at once

## QuadraVerb 2

### Dual Channel Octal Processing Master Effects w/Digital I/O

Alesis' most powerful signal processor, the QuadraVerb 2 offers the amazing audio fidelity of a high-end dedicated vocal reverb while providing powerful multi-effects capabilities.

- 300 programs (100 preset and 200 user-editable)
- Octal Processing allows use of up to 8 effects simultaneously in any order. You can choose between 50 different effects types for each block, including reverb, delay, chorus, flange, rotary speaker simulation, pitch shift, graphic and parametric EQ, overdriver and more.
- Special features like five seconds of sampling time, triggered panning and surround sound encoding are also built in
- Selectable -10 dB and +4dB levels, servo-balanced TRS inputs and outputs
- ADAT Digital Interface allows you to work entirely in the digital between the Q2 and an ADAT XT

## A R T

### Tube MP Personal Preamp Processor

Power/Peak LED for precision monitoring of power status and clip point.

- Input control has two ranges of gain, +26dB - +60dB and +6dB - +40dB.
- +20dB gain boosts input level for mic use, or pad for accepting line levels.
- Phantom power supplies power to mics that require +48V phantom power.
- Phase reverse for worry-free multi-microphone placement
- Output control for trimming back to unity gain
- Genuine 12AX7 tube shapes and warms the sound of any transducer from mics to piezo pickups

## BEHRINGER MDX 1200 Autocom

Attack and release times, with Intelligent Program Detection, prevents common adjustment errors

- Newly-developed, powerful noise gate
- Switchable soft knee/hard knee characteristics for varied sound pressure levels
- Bright, illuminated LEDs show gain reduction

## MDX 2100 Composer

Integrated auto/manual compressor, expander & peak limiter

- Compresses "musically" in dynamic range without any audible "pumping" or "breathing"
- Attack & release times are controlled automatically or manually
- Interactive Gain Control (IGC) combines a clipper and peak limiter for distortion-free limitation on signal peaks.
- Servo-balanced inputs and outputs are switchable between +4dB and -10dB



## 4200A and 4400

### L-C Series 1/3 Octave Active Equalizers

The 4200A (active, cut only graphic EQ) and 4400 (active graphic EQ) provide 28 1/3-octave filters on 15 Q centers from 31.5 Hz to 16kHz. Hand-tuned inductor/capacitor (L-C) resonant circuits provide the ultimate in performance and reliability.

- Better than 108 dB signal-to-noise ratio with no degradation even when filters are used
- Continuously adjustable high and low-pass filters band-limit unwanted subsonic and ultrasonic noise
- Three outputs and powered accessory crossover socket facilitate distribution and level control to three subsystems (Bi-amp or tri-amp operation with optional 2-way and 3-way plug-in crossover networks)
- The 4200A has a -15 dB control range, the 4400 has a ±10 dB control range

## 4700 1/3 Octave R-C Active Digitally Controlled Equalizer

Similar in specifications to the 4200A/4400 EQs, the difference is that all functions of the 4700 are digitally controlled.

- Ten non-volatile curve memories and ten preset memories using EPROM, so no need for battery backup
- 10dB boost/cut in 0.5dB steps
- Adjustable high and low pass filters and gain (8 steps)
- Digitally controlled by front panel or remote control
- Password access assures security
- The control circuits of multiple 4700s can be linked together to form a network of equalizers. The network can be controlled from the first 4700's front panel or optional RS-232, PA422 interfaces. Each network features 10 user-programmable presets accessible via computer control, front panel selection or contact closure using the optional Remote Preset Select Interface

## DSP 5024

### Digital Signal Processor

2 input, 4 output signal processor with 107 dB of dynamic range

- Crossover can be configured as 2-way, 3-way, 4-way or dual 2-way
- Adjustments can be performed in frequency, 1Hz steps, slope is 12, 18, 24 dB/oct. shape (Butterworth, Bessel, Linkwitz-Riley).
- Parametric filters include boost/cut, high pass, low pass, rising shelf and falling shelf, adjustable in 1 Hz steps, 1/10 dB steps and bandwidth from 1/70th octave to 4 Hz octaves
- Delay up to 680 ms on each output
- Ten non-volatile memories and presets with password security
- Remote preset select interface includes PA422



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## JBL

### Control 5 Compact Control Monitor Loudspeaker



The Control 5 is a high performance, wide range control monitor for use as the primary sound source in a variety of applications. Its smooth, extended frequency response combines with wide dynamic capability to provide acoustic performance that's ideal for recording studios, A/V control rooms & remote tracks.

- 6-12 inch (165mm) low frequency driver provides solid, powerful bass response to 50 Hz and a pure titanium 1-inch dome handles high frequency response to 20 kHz.
- Both transducers are magnetically shielded, allowing use in close proximity to video monitors.
- Dividing network incorporates protection circuitry to prevent system damage and utilizes high quality components including bypass capacitors for outstanding transient accuracy.
- Molded of dense polypropylene foam with a choice of black, gray or white finish.
- Pleasing enclosure allows it to easily fit into any environment.
- A host of mounting systems including ceiling, rack and tripod allow positioning in exactly the right spot for best performance.

### 4200 Series Studio Monitors

The 4200 Series are console-top monitor models designed specifically for use in the near field. Both the 6.5-inch (4206) and the 8-inch (4208) offer exceptional sonic performance, setting the standard for today's multi-purpose studio environment.

- Unique Multi-Radial sculptured baffle directs the axial output of the individual components for optimum summing at the most common listening distance (approx. 3 to 5 ft).
- The baffle also positions the transducers to achieve alignment of their acoustic centers so that low and high frequency information reaches your ears at the same point in time, resulting in superb imaging and greatly reduce phase distortion.
- Curved surface of the AES baffle serves to direct possible reflections of the shorter wave-lengths away from the listening position, eliminating baffle diffraction distortion.
- Vertical alignment of the transducers across the baffle center produces natural mirror-imaging.
- Pure titanium diaphragm high frequency transducer provides smooth, extended response.
- Magnet assembly is shielded, allowing placement near magnetically sensitive equipment like CRT tape recorders, etc.
- Low frequency components also feature magnetic shielding making the 4200 Series monitors ideal for use in video post production facilities as well as music recording studios.

### 6208 Near Field Studio Monitor



An internally bi-amplified near field studio monitor, the 6208 provides excellent reference in a small, portable package. It combines optimized electronics with an 8" two-way speaker system on a Multi-Radial baffle that aligns acoustic centers of high and low frequency transducers. The transducers are magnetically shielded to allow safe placement near sensitive equipment such as tape recorders and video monitors.

- Electronically balanced input is compatible with both -10 dBV and +4 dBu nominal operating levels and input connection can be via XLR or 1/4" connectors.
- An electronic, 2.6 kHz crossover, designed specifically to complement the acoustic characteristics of the transducers, feeds dual amplifiers utilizing discrete circuitry. The amplifiers feature a low distortion design with no slew rate limiting and extremely low distortion.
- The eight inch, low frequency transducer delivers a long, linear excursion resulting in a smooth extended bass output with low power compression. It is coupled to a one inch titanium diaphragm, high frequency transducer with patented "diamond pattern surround" exhibiting flat response, +/- 2 db from crossover point to 20 kHz.
- The Multi-Radial (m) baffle aligns the acoustic centers of the high and low frequency transducers, insuring that all frequencies arrive at the listening position at precisely the same time. This unique baffle design also greatly reduces diffraction and phase distortions. Dispersive characteristics of the 6208 reduce the effects of changing acoustic environments and achieve consistent, accurate imaging.

## MACKIE

### MICRO SERIES 1202-VLZ 12-Channel Ultra-Compact Mic/Line Mixer

Mackie's fanatical approach to pro sound engineering has resulted in the Micro Series 1202-VLZ, an affordable small mixer with studio specifications and rugged construction. It delivers no-compromise, non-stop, 24-hour-a-day professional duty in permanent PA applications, TV and radio stations, broadcast studios and editing suites—where nothing must ever go wrong.

- Working S/N ratio of 90dB, distortion below 0.025% across the entire audio spectrum and +28 dB balanced line drivers
- 4 mono channels with discrete, balanced balanced microphone inputs and 4 stereo channels (12 inputs total)
- Line inputs and outputs work with any line level, from instrument level to semi-pro -10dB, to professional +4dB.
- Switchable phantom-powered (48V) inputs for condenser mics
- Every input channel has a gain control, pan pot, low EQ at 80 Hz, high EQ at 12.5 kHz and two aux sends, with 20dB gain
- Master section includes two stereo returns, headphone level control and metering.



### MS1402-VLZ 14 x 2 Compact Mic/Line Mixer

Balanced inputs and outputs, 3-band EQ, AFL/PFL and deluxe tape monitor/Control Room feature. Nice long 60mm faders, six studio-quality mic preamps and extra Alt 3-4 stereo bus—in less than 1.3 square feet of space.

- Studio grade mic preamps (chs 1-6) with high headroom, low noise and phantom power. Also incorporate low cut filters to cut mic handling thumps, pops and wind noise. Lets you safely use low shelving EQ on vocals.
- Trim controls (ch 1-6) with ultra wide range (+10 to -40dB) handle everything from hot digital multitrack leads to whispering lead singers and older, low output keyboards.
- Pan control with constant loudness and high/L/R attenuation so you can pan hard left or right without bleed-through.
- Two aux sends per channel with 15dB extra gain above unity.
- 60mm log-taper faders are accurate along their whole length of travel and employ a new long-wearing contact material for longer fader life & user resistance to dust, smoke, etc.
- Control room/phone matrix adds incredible live monitoring, mixdown and live sound versatility.
- Mute switch routes channel output to extra ALT 3-4 stereo bus. Use it for feeding multitrack recorder channels, creating a sub-group via control room/phones matrix, monitoring a signal before bringing it into the main mix or creating a "mix minus".
- Solid steel chassis instead of aluminum extr. pl. shell.



The new MS-1202, 1402 and 1604 all include VLZ (Very Low Impedance) circuitry at critical signal path points. Developed for Mackie's acclaimed 0-Bus console series, VLZ effectively reduces thermal noise and minimizes crosstalk by raising current and decreasing resistance.

### CR-1604 VLZ 16-Channel Mic/Line Mixer

Hands-down choice for major touring groups, studio session players, as well as broadcast and sound contracting. The CR-1604 VLZ features everything you would expect from a larger console, and then some! 24 usable line inputs with special headroom/ultra-low noise Unityplus circuitry, seven AUX sends, 3-band EQ, constant power pan controls, 10-segment LED output metering and discrete front end phantom-powered mic inputs.

- Lowest noise and highest headroom (90 dB working S/N and 108 dB dynamic range)
- Genuine studio-grade, phantom powered, balanced input mic preamps on channels 1-16. All CR-1604 VLZ discrete input mic preamp stages incorporate four conjugate-pair large-emitter geometry transistors. So whether recording nature sound effects or heavy metal miking flutes or kick drums, you get the quietest, cleanest results possible.
- 3-band EQ with mid-frequency sweep and low cut switch
- AFL/PFL solo and mute switches with overload and signal present indicators.
- Rear panel features include insert points and 1/4-inch XLR connectors on every channel, as well as RCA tape inputs/outputs.
- Rotary input/output "pod" allowing three different positions for set-up.



## Digital Multi-Track Recorders

### TASCAM DA-88

ATF system ensures no tracking errors or loss of synchronization. All eight tracks of audio are perfectly synchronized. It also guarantees perfect tracking and synchronization between all audio tracks on all cascaded decks—whether you have one deck or sixteen (up to 128 tracks!).

- Incoming audio is digitized by the on-board 16-bit D/A at either 44.1 or 48kHz. The frequency response is flat from 20Hz to 20kHz while the dynamic range exceeds 92dB.
- Exceeds seamless Punch-ins and Punch-outs. This feature offers programmable digital crossfades, as well as the ability to insert new material accurately into tight spots. You can even delay individual tracks to generate special effects or compensate for poor timing.



## SONY PCM-800

Flawless sound quality, outstanding reliability and professional audio interfacing with AES/EBU digital I/O and XLR analog I/O connections.

- Combines audio functions such as precise auto punch-in/out digital cross fade technology, external synchronization with SMPTE/EBL time code and selectable sampling frequencies of 44.1 and 48kHz.
- Shuttle dial for precise tape control, variable speed playback of 5% to 0.1% increments and a flat frequency response from 20-20,000Hz.
- Operate up to 16 PCM-800's in perfect sync with optional RCC-S1 sync cables; for up to 128 channels of digital audio recording.
- Optional DABK-801 Sync Board provides SMPTE/EBU time code generation and chase sync. It locks to the incoming time code with subframe accurate offset—ideal for audio-follow-video applications. Also synchronizes to external video reference signal.
- Optional RM-D800 provides comprehensive remote control over all PCM-800 functions. The RM-D800 can control up to six units for up to 48 channels of digital audio.



## ALESIS adat xt

### 8-Track Digital Audio Recorder

An incredibly affordable tool, the ADAT-Xt sets the standard in modular digital multitrack recording. With new features and enhanced capabilities, the ADAT-Xt operates up to four times faster than the original ADAT, offers an intelligent software-controlled tape transport and provides onboard digital editing and flexible auto-location.

- Onboard 10-point autolocate system provides quick access to multiple tape locations. Four specialized locate points make your recording sessions quicker and easier.
- Includes remote control with transport and locate functions, offers a footswitch jack for hands-free punch-in.
- Advanced transport software continuously monitors autolocate performance and the head constantly reads ADAT's built-in sample-accurate time code—even in fast wind modes.
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.
- Servo-balanced 56-pin ELCO connector operates at +4dB to interface with consoles with 44 dB dbu/anti inputs/outputs. Also unbalanced -10dB inputs/outputs (phono connectors).
- Has an electronic patch bay built-in so it can be used with stereo and 4-bus consoles.
- Make flawless copy/paste digital edits between machines or even within a single unit. Track Copy feature makes a digital clone of any track (or group of tracks) and copies it to any other track (or group) on the same recorder. This allows you to assemble composite tracks for digital editing.



## ALESIS Monitor One

### Near Field Studio Reference Monitor

Designed by engineers with decades of experience, the award-winning Monitor One provides the last critical link in the recording studio's signal chain, giving you an accurate reproduction of what is being recorded.

- Delivers excellent image and transient reproduction, powerful bass, and smooth, extended high frequency detail.
- Exclusive SuperPort speaker venting technology eliminates the "choking" effect of port turbulence for solid high-power bass transients and extended low frequency response.
- Ferrofluid cooled 1" silk-dome driver eliminates the harshness and ear fatigue associated with metal or plastic tweeters, making it easy to mix on for extended periods.
- Monitor One's powerful bass incorporates a proprietary 6.5" low frequency driver with a mineral-filled polypropylene cone and a 1.5" voice coil wound on a high-temperature Kapton former.
- They come in a mirror-image left/right pair covered with a non-slip rubber textured laminate for stable mounting.

### Monitor Two

### Mid Field Studio Reference Monitor

While today's popular music demands more bass at louder volumes than a small near field monitor can possibly produce—the Monitor Two delivers—at a price no higher than many of these smaller speakers.

- Utilizes a 10" three way speaker design with a unique asymmetric crossover to maintain the same accurate tonal balance and imaging of the Monitor One—but with a much larger sound field.
- 10" low frequency driver incorporates Alesis' SuperPort speaker technology to provide powerful, extended bass.
- 5" mid frequency driver offers exceptional mid frequency detail.
- 1" silk dome high frequency driver delivers a broad but natural frequency response from 40Hz to 18kHz.
- Covered in a non-slip rubber finish, the Monitor Two comes in a mirror imaged pair for mixing accuracy.



## TANNOY

### PBM Series II Reference Monitors

The PBM II Series is the industry standard for reference monitors. They feature advanced technologies such as variable thickness, injection molded cones with nitrile rubber surrounds and the highest quality components including polypropylene capacitors and carefully selected inductors. With a Tannoy monitor system you are assured of absolute fidelity to the source, true dynamic capability and most important, real world accuracy.



### PBM 5 II

- Custom 5" injection-molded bass driver with a nitrile rubber surround for extended linearity and accurate low frequency reproduction. They are better damped for reduced distortion and exhibit more naturally open and detailed midrange.
- Woofer blends seamlessly with the 3/4" polyimide soft dome ferro-fluid cooled tweeter providing extended bandwidth for extremely precise sonically-balanced monitoring.
- Designed for nearfield use, the PBM 5 II cabinets are produced from high density media for minimal resonance and features an anti-diffraction radused front baffle design.

### PBM 6.5 II

- Transportable and extremely powerful, the PBM 6.5 II is the ideal monitor for almost any project production environment.
- 6.5" lowfrequency driver and 3/4" tweeter are led by a completely redesigned hardwired hand selected crossover providing uncompromised detail, precise spectral resolution and flat response.
- Fully radused and ported cabinet design reduces resonance and diffraction while providing deep linear extended bass.

### PBM 8 II

- High tech 1" soft dome tweeter with unmatched pattern control and enormous dynamic capability. 8" driver is capable of powerful bass extension under extreme SPL demands.
- Hard wired crossover features true bi-wire capability and utilizes the finest high power polypropylene capacitors and components available.
- Full cross-braced matrix media structure virtually eliminates cabinet resonance as a factor.
- Ensures precise low frequency tuning by incorporating a large diameter port featuring laminar air flow at higher port velocities.

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## TASCAM DA-P1 Portable DAT Recorder



- Rotary two head design and two direct drive motors for the best transport in its class.
- XLR-balanced mic/line inputs (with phantom power) accept signal levels from -60dB to +4dB.
- Analog line inputs & outputs (unbalanced; plus S/PDIF (RCA) digital inputs and outputs enable direct digital transfers.
- Uses next generation A/D & D/A converters for amazing quality.
- Support: 32/44 1/48kHz sample rates & S/MAS-free recording.
- MIC limiter and 20dB pad to achieve the best possible sound without outside disturbances.
- TRS jack & level control to monitor sound with any headphones.
- Built tough, the DA-P1 is housed in a solid, well-constructed hard case. It includes a shoulder belt, AC adapter & 1 battery.



## PDR1000/PDR1000TC Professional Portable DAT Recorders



- Direct drive transport with 4 heads for confidence monitoring.
- Balanced XLR mic and line analog inputs and two RCA analog line outputs. Digital inputs and outputs include S/PDIF consumer (RCA) and AES/EBU balanced XLR.
- Left/Right channel mic input attenuation selector (0dB/30dB).
- 48V phantom power, built-in limiter & internal monitor speaker.
- Retention Red LED display shows clock and counter, peak level metering, margin display, battery status ID number, tape source status and machine status.
- Supplied Nickel Metal Hydride rechargeable battery powers the PDR-1000 for two hours. The battery has no "memory effect" and is charged in two hours with the supplied AC Adapter/charger.
- PDR1000TC Additional Features:**
- In addition to all the features of the PDR1000 recorder, the PDR1000TC is equipped to record, generate and reference to time code in all existing international standards.
- All standard SMPTE/EBU time codes are supported, including 24, 25, 29.97 (drop frame and non-drop frame) and 30 fps.
- External synchronization to video, field sync and word sync.

## Roland®

### A-90EX Master Controller for the Next Century



The A-90EX is an 88-note, weighted master controller with the best keyboard action currently on the market—bar none. It offers incredibly realistic piano sounds, powerful controller capabilities and "virtual" programmable buttons which can be configured to operate your software and other devices. The A-90EX combines the majestic sound of a concert grand, the expressive action of a fine acoustic keyboard and the comprehensive MIDI functions of a master controller—all in a portable stage unit.

**Keyboard Controls**

- Master volume slider lets you control the volume of your entire MIDI setup without changing the balance between connected devices.
- A Global Transpose switch transposes all connected sound sources without changing the transpositional relationship between the individual devices.
- Sequencer Control Section lets you control song selection, tempo and other parameters easily and quickly.

**Superb Sound**

- The A-90EX's sound source is the result of an exhaustive and detailed sampling process. First, the best of the world's finest concert grands were sampled. Then each note was sampled under controlled conditions (mic position, stage and hall acoustics etc.) Only after extensive trial and error were the very best samples selected and incorporated.
- The A-90EX's sound source gives you access to a wide variety of sounds, including two types of stereo-sampled grand pianos, various styles of acoustic and electric pianos (including classic Rhodes sounds) and a generous selection of synthesizer textures.
- The versatility of these sounds is enhanced by 64-voice polyphony—indispensable for realistic piano sounds, giving you all the capacity you need for lush, sustained passages.
- For additional texture, there is also a generous selection of built-in effects, including several types of reverb and chorus.

- Extensive Performance Configurations**
- The A-90EX can store up to 64 Performances, which may consist of up to four of the A-90EX's preset Patches along with various user-configurable parameters such as zone, effects on/off and MIDI channel. Optional M-512E Memory Cards, stores an additional 64 Performances (per card).
- 88 Key Keyboard**
- Proprietary 88-note hammer-action keyboard offers the natural resistance and rebound of an acoustic piano.
  - Velocity-sensitive, the keyboard brings out every nuance of your dynamics, from pianissimo to forte. Selectable velocity curves let you choose the sensitivity that best suits a particular musical style or sound source.
  - Keyboard also offers channel aftertouch-sensitivity—a powerful function for controlling external sound sources.
  - The keyboard can be split into eight zones (four internal and four external, or you can assign all eight zones to external devices). It also has 20 different controls and connectors for instant access to internal and external devices.
- Built-in Sounds**
- 128 patches from the Roland JD-990, JV-1080, Sound Expansion Series, JV-Series and SR-V80 Series expansion boards. Customized patch names can also be stored in the database. Optional Voice Expansion boards like the VE-GS1 offer a wide selection of GM and GS sounds and the VE-JV1 offers synth textures from Roland's JV-Series synthesizers.

## SOUNDSCAPE DIGITAL TECHNOLOGY LTD.

### SSHRD-1 Hard Disk Recorder/ Editor



A professional Multitrack Digital Audio Workstation for the PC, the SSHRD1 combines the highest quality processing hardware with easy-to-use Windows-based software for the most complete and affordable solution for high quality digital audio recording and editing on the PC. The SSHRD1 has over 50 powerful editing tools and is expandable from 8 to 128 tracks, with up to 12 inputs & 64 outputs. Ideal for a wide range of applications—ranging from recording music in project studios with an 11 track system to multiple unit 32, 48 and 64 track systems; used by major TV and film studios for audio production linked to video.

The SSHRD1 consists of two main components, a 19" rack unit which contains all the audio processing hardware and an intuitive and elegant software front end for Windows. The hardware, which connects to the PC via the included host interface card, can record 16 bit digital audio from the analog or digital inputs in stereo and play back up to 8 tracks simultaneously mixed through 2 or 4 analog or digital outputs.

- All audio processing, disk handling and synchronization is carried out by the powerful DSP in the hardware, so literally any PC can be used—even a 386 with only 1MB of RAM. By putting all of the processing power into its own hardware instead of relegating it to your PC, the SSHRD1 also frees up your PC: allows it to act merely as a "front-end" view into the hardware workings. Multiple units can be locked together with sample accuracy, a feature which requires no additional software or hardware upgrades. SoundScape DAWs have "rock solid" synchronization to analog, digital or video tape recorders and even chase timecode when timecode is used.
- Using the virtual tracks, up to 64 audio takes can be recorded at the same time in position, time arrangement, allowing for instance, a sub mix of multiple backing vocal harmonies, dialogue or sound effect, to be selected on any physical track later.
  - Arrangements are created in the arrange window which display PARTs of a soundtrack and play the actual recorded audio TAKES or disk. A TAKE can be used in different ways by any number of PARTs which can play all or any section of the TAKE, e.g. a chorus vocal can be recorded just once, but used four times within an arrangement. These PARTs build up the soundtrack, and can be edited in a non-destructive way at wave/16 level on the fly, even while chasing incoming time code.
  - Move, Copy, Trim, Split, Solo, Repeat, Delete, Cut, Glue edit functions.
  - Solo and Multi-track audio scrubbing.
  - 969 named markers (user or the fly)
  - Realtime fade In/Out (B selectable curve).
  - Automated Punch In/Out
  - V. Line colouring
  - Powerful noise gate (0 parameters with "flow" settings to remove silence or signals from a mix, ideal for AD/RS).
  - Non-realtime process to DdB.
  - Stereo link tool for stereo editing.
  - V. Speed  $\pm 10\%$
  - Nudge edit using arrow keys
  - Supports all SMPTE formats, including 29.97 and 29.97 Drop frame.
  - 9 customizable Tool Pages
  - All video file support with full synchronization (requires Video for Windows v1.1)
  - Optional EDL File support with full auto conform via RS422.
  - Zoom in/out history (3 levels) Windows V1.1
  - Volume and Pan controls (real-time, non-destructive, with full automation via MIDI).
  - Adjustable fader grouping
  - Merge (stereo digital mix-down)
  - Reverse/Phase Invert/Compute tempo
  - Optional Time Modulo features Time stretch/Time compression Pitch shift and Sample rate conversion.
  - Insert: Left/Right Locators on the fly.
  - 8 physical output channels, selectable for each PART within a virtual track
  - Non-destructive sample-resolution editing with "glitch-less join"
  - Total disc space is dynamically shared by all tracks
  - Cycle/reorder mode with stacked TAKES and re-roll (like analog multi-track tape recorders):
  - Synchronization MIDI Song Positioner + MIDI clock or MIDI time code
  - Time axis display in SMPTE (hours, min seconds and frames) or Measure (bars and beats), re-arrange of time between locators
  - Arrangements are saved in separate arrange files on the host PC

## Fostex D-25 Digital Master Recorder



Professional digital master recorder featuring the confidence monitoring, and insert editing using a 4-head transport. Sync functions for any pro application including the ability to chase sync into a master timecode. The D-25 will resolve to external references such as WORD/VIDEO/DAT from signal + WORD features:

- 16 MB RAM buffer • Instant Start & Edit • Scrub from tape or buffer, Jog/Shuttle from 1/2X to 16X • SMPTE/EBU TC generator/reader • On board chase/lock sync • RS-422 slot • Independent level control recording • 4-head 4 motor transport.

## D-30 Digital Master Recorder

The Fostex flagship professional post production DAT recorder. The D-30 contains all the features of the D-25, plus large high resolution backlit LCD display which shows all parameters at a glance. Intuitive hierarchical menus from 11 dedicated soft keys, two RS-422 ports for added flexibility.

## Panasonic SV-3800/SV-4100 Professional DAT Recorders



Designed for professional applications, the SV-3800/SV-4100 have highly accurate and reliable transport systems with search speeds up to 400X normal, and 20-bit D/A converters to satisfy the highest professional expectations both in terms of sound and functionality.



## DM-800 Digital Audio Workstation

A compact, stand-alone multi-track disk recorder that provides an amazing array of features at an unbelievably low price. Whether for music production, post production or broadcast, the DM-800 lets you work easier and faster. A full function workstation, the DM-800 performs all digital mixing operations from audio recording, to editing to rotation, track-bouncing, to final mixdown. It fully supports SMPLE and MIDI time codes and also features a built-in Sample Rate Resolver to synchronously lock to any time code.

## VS-880 Digital Studio Workstation

The VS-880 is an integrated digital recorder, mixer, editor and processor in one. A complete digital studio workstation, the VS-880 handles everything from data input and recording to mixing and mastering in one superbly styled, compact unit. It provides 64 recordable tracks, CD-quality digital audio, and studio-quality multi-effects with the optional VS8F-1 Effect Expansion Board. Storage is accomplished via the internal Omega Jaz drive. You can record 500 total track minutes or 60 minutes of recording time per track in Standard Mode on one 1GB Jaz disc.



- Digital Recorder**
- Eight discrete tracks, each with eight "layers" of virtual tracks. Record up to eight "takes" per track for a total of 64 recording tracks. At final mix-down, simply select the best take for each discrete track. You can even compile the best parts from various takes to create a perfect track.
  - High-quality 18-bit A/D and D/A conversion, selectable sampling rates include 48, 44.1 or 32 kHz. The VS-880 is a non-linear, random access recorder/editor, so no memory is wasted on unused tracks or blank sections within recorded tracks.
- Digital Editor:**
- Non-destructive recording and editing lets you easily return to any pre-recorded or pre-edited state. You can "Undo" up to 999 edits, even after conducting multiple recording/editing sessions. You can redo your song from any desired point, instead of going back to the beginning and starting all over.
  - Copy, move and replace like using a sequencer or word processor. Cut and paste on one track or on multiple tracks (like track bouncing on an analog machine)—sound quality is always the same no matter how many editing steps are done.
  - Compress or expand playback time. Specify time length from 75% to 125% of the original while the original playback pitch remains unaffected.
  - Insert a "marker" anywhere in a song up to 1000 markers with instant access to any mark. Preview/Scrub function lets you execute a pin-point search for the first notes or the beginning of a phrase, while you monitor.
  - All virtual track performance data can be stored and named as a Song (up to 200 Songs), complete with mixer, effects, mark and locate settings.
- Studio Effects:**
- Optional VS8F-1 Effect Board provides two completely independent stereo multi-effects processors, allowing you to control every aspect of your recording without leaving the digital domain. Access during either recording or mix-down.
  - 200 patches (preset & user) based on 20 resident algorithms.
  - Effects include everything from delay, reverb and chorus to distortion and speaker emulation. Some feature 3-D sound processing from the Roland Sound Space (RSS) system.
  - Guitar effects like overdrive and distortion are included as well as a COSM-based guitar amp simulator.

- Digital Mixer:**
- Digital mixer features 8 + 6 inputs, 8 recording buses, 1 stereo AUX send and 1 stereo master output. A coaxial digital input accepts a stereo (2-channel mono) digital signal.
  - There are 4 analog audio inputs (1/4" phone and RCA jacks).
  - You can record up to 6 channels, including 4 analog and 1 digital stereo source simultaneously on 4 tracks. 1 using the digital coax out, you can archive your final mixes to DAT.
  - For the simplest mixer/recorder configuration, the VS-880 gives you an 8-channel mixer with mixer channels and recorder tracks corresponding directly. The Input Mix/Trac Mix mode turns the VS-880 into a 14-channel mixer capable of mixing 6 input sources and 8 recorded tracks at one time.
  - Sync sequence data from an external MIDI system, along with 8 recorded tracks, for simultaneous playback and mix-down right on the VS-880, no submixer required.
  - Built-in parametric EQ, with all tonal contouring represented on the display for instant confirmation. In Input - Track mode, EQ offers three bands—High (Shelving), Mid (Peak) and Low (Shelving) and 8 channels in Input Mix/Trac Mix modes, a 2-band EQ is available.
  - Every mixer parameter setting, including internal routing and EQ settings, can be captured as a "snapshot." Up to 8 snapshots can be stored and switching among them is as simple as touching a button. Fader movements can be recorded with an external MIDI sequencer for fully automated mix-down.
- Other Features:**
- Built-in 1G Jaz drive for storage lets you take audio with you—just like tape. Built-in SCSI ports offers additional storage capability with SyQuest, MD drives, DAT tape etc.
  - MIDI connectors let you sync the VS-880 with a MIDI sequencer, either as a master or slave: Sync through MIDI Time Code or MIDI Machine Control.
  - You can record mixer settings and fader movements into a MIDI sequencer. Playing the sequence back, in sync with the VS-880, affords fully automated mix-down capabilities. Has a MIDI Clock-dedicated track independent of the main tracks, so you can even sync to a non-MTC MMC compatible sequencer. Stack two VS-880s via MIDI and you'll get a digital recording system with 16 discrete tracks and as many as 28 total tracks.

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—FROM PAGE 128, THE WHO

cause he does more than sing with it. Pridden tapes up the mic so Daltrey can do his signature swinging and tossing at will. The other vocalists sang through Shure's new wireless UHF system, using Beta 87 capsules. Daltrey and Glitter used Garwood Radio Station in-ear monitors.

The stage monitors were a prototype Clair Bros. design, a new version of their 12AM, but further details were not available at press time. I can tell you, however, that they sport a very cool, angled "stealth" design that, according to the crew, has a great angle for effective monitoring. "You know how performers always have 2x4s under their monitors, no matter what angle you come up with? I think we've finally got it figured out," says Ray. In addition to the audio monitors, video monitors were employed so that Townshend and Daltrey could see their cues without turning around to look at the video on the big screen.

The sound levels were a tolerable 95 dB, and according to Ray the performers could speak in a normal tone on-stage and still hear each other. "The loudest guys are the two keyboard players, and they're behind Plexiglas, so they can just knock themselves out," he explains. "We're using the Plexiglas barriers because Pete is sensitive to loud levels. So the percussionist, keyboard players, and horn section are all behind Plexiglas. Those performers are on risers upstage, along with Zak, so having them behind the barriers keeps them from killing the guys downstage." The Plexiglas barriers were open on the side so the upstage bandmembers could hear each other, and the players downstage relied on the monitors.

"One unusual thing about this tour is that it's the first time I've ever mixed by a script, at least since school," says Sotile. "For most shows, we get a cue sheet that has instructions for different songs like 'So and So needs this guitar or that guitar up at this point,' but this show just has a ton of cues. The script really helps keep it straight, which is important with the narration on laserdisc, 22 mixes, and 17 people onstage."

The script is entitled "*Quadrophe-nia: A Musical Play for Arenas.*" I couldn't pen a more apt description. ■

Mary Cosola is the managing editor of *Mix's* sister publication, *Electronic Musician*, and a devout *Who-head*.

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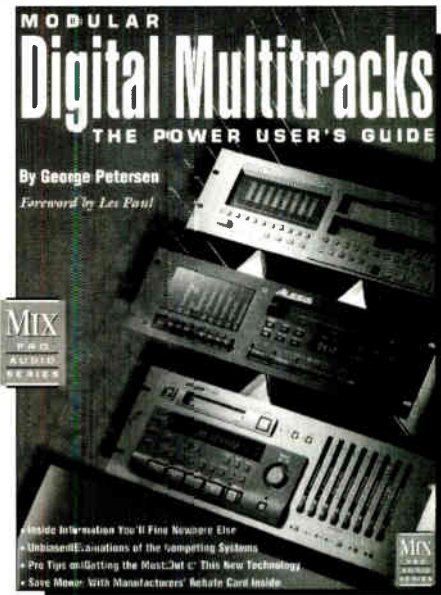
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# FEEDBACK

## GET ON THE GOOD FOOT!

I read "Recording Horns" by Rick Clark in the October '96 issue with much interest. In my 25 years as a recording engineer, I have spent much time recording horns. As James Brown's engineer from 1971-1976, I recorded 15 albums with the famous JB horns. I have also had the opportunity to work with New York's top session players, as well as on numerous Latin albums with large horn sections.

Here's how I recorded James Brown's horns in the studio. When Brown was recording with his road band, the JB's [as opposed to session players], we would usually work live in the studio, recording the rhythm section, horns and vocals at the same time. I would set up the rhythm section on one wall of the studio, with the horns set in a semi-circle with the mics off axis to the rhythm section and Brown's vocal. Since leakage was a factor, I would use dynamic mics, which offered a tighter pickup pattern than condensers. Typically, I would use RE20s on the saxes, a 421 on the trumpet and a 441 on the trombone. When they would use two trumpets, I would have them play into the same mic. The Sennheisers on the brass were bright and helped keep any low-frequency room leakage to a minimum.

On 8-track sessions, I would record the horns on two tracks, brass and reeds. On 6-track sessions, I would put them each on their own tracks. I would use a slight amount of compression on the trombone and trumpet (LA3A) just to control any peaks. The horn section would be seated for the recordings but often Brown would call Fred Wesley or Maceo Parker over to his vocal mic to take a solo. This could get tricky, as I usually recorded the vocal with a Neumann U87 and an 1176 compressor set to control the peaks on Brown's dynamic voice. The mic was set up on a large boom stand slightly above Brown's mouth level. This made the mic a little too high for the sax solos, so Maceo would hold his horn up higher, but the trombone was right at the mic level and sometimes caused the diaphragm of the U87 to overload slightly.

It was a sacrifice I had to make at times to capture the spontaneous way Brown liked to record.

You can learn a lot about mic placement when you work with experienced session players. I was always glad to try any placement that a player might suggest if I wasn't getting the sound I wanted. As with any recording, the better the quality of the sound source, the easier your job of capturing it becomes.

*Bob Both  
Twin Recording  
West Milford, N.J.*

## DAW CLARIFICATIONS

This is regarding the article on multi-channel workstations [Sept. '96]. Given the large, fast-changing and often confusing range of options available in the DAW market, anything that demystifies the differences between the systems must be helpful. However, you seem to have been supplied with some inaccurate data regarding Solid State Logic system specifications, etc. We would like to correct some of the key points and point out other considerations that may be helpful to those selecting a DAW. [The following corresponds loosely to the chart categories in the article—eds.]

1. Analog In/Out: Axiom can process up to 96 input channels and 80 output channels selected from over 2,000 potential sources/destinations, using the integrated HubRouter. These inputs/outputs can be a mixture of analog or digital, as required. OmniMix has 38 fully featured input channels and a further 48 channels that can be used as Reverb/Delay/FX channels or additional input channels. There are also up to 46 outputs available. Scenaria similarly has 38 fully featured input channels with ten outputs. ScreenSound is 8 In/8 Out.

2. Digital I/O: Capacity is similar to analog I/O. We can also handle SDIF-2 on Scenaria, OmniMix and Axiom.

3. Other Sync Protocols: All SSL digital systems have multiple 9-pin serial control ports.

4. Dynamics in Base: Axiom, OmniMix and Scenaria have comprehensive dynamics in the base models.

The SSL VisionTrack integrated digital video system is standard on Omni-

Mix and Scenaria but is also available for Axiom and ScreenSound. It provides powerful ADR capabilities. ScreenSounds are linkable for more tracks.

It is difficult to interpret "Internal Processing," as it seems that the figures stated mostly refer only to the audio word length. Internal processing, of course, will vary through systems, depending on the task. EQ, for example, typically requires in excess of 24 bits to obtain high-quality processing. Much higher bit resolutions or floating point solutions are necessary to manage large amounts of data at the mix bus. A combination of processing "power" and software techniques applied to these tasks are critical to the real performance of the systems concerned. It is not sufficient to merely look at bit resolution. The acid test is with your ears. Testing the system by driving it hard usually indicates what might become problematic in a practical environment. Undo levels are similarly task-specific and should vary according to the job.

There are a couple of other issues regarding Proprietary/Nonproprietary choice and the Integrated/Modular approach selection that your readers may wish to consider. It is essential that someone investing in a DAW checks with the hardware and software suppliers to see that the relationship and understanding between all parties is stable and cooperative. You may be stuck with an old version of hardware/software that cannot be upgraded because of limits imposed by available hardware or a breakdown in cooperation between the companies. Modular/nonproprietary options sometimes offer some lower-priced systems compared with proprietary/integrated systems, but the latter tend to avoid the potential problems described. They also offer a one-stop shop for operational/technical support, thus avoiding the possibility that suppliers of individual elements of a system argue over who should deal with a problem while the customers' work and credibility suffer. I hope this is useful.

*Alan Martin MacLeod  
Solid State Logic  
Begbroke, Oxford, UK*

—FROM PAGE 128, THE WHO

cause he does more than sing with it. Pridden tapes up the mic so Daltrey can do his signature swinging and tossing at will. The other vocalists sang through Shure's new wireless UHF system, using Beta 87 capsules. Daltrey and Glitter used Garwood Radio Station in-ear monitors.

The stage monitors were a prototype Clair Bros. design, a new version of their 12AM, but further details were not available at press time. I can tell you, however, that they sport a very cool, angled "stealth" design that, according to the crew, has a great angle for effective monitoring. "You know how performers always have 2x4s under their monitors, no matter what angle you come up with? I think we've finally got it figured out," says Ray. In addition to the audio monitors, video monitors were employed so that Townshend and Daltrey could see their cues without turning around to look at the video on the big screen.

The sound levels were a tolerable 95 dB, and according to Ray the performers could speak in a normal tone onstage and still hear each other. "The loudest guys are the two keyboard players, and they're behind Plexiglas, so they can just knock themselves out," he explains. "We're using the Plexiglas barriers because Pete is sensitive to loud levels. So the percussionist, keyboard players, and horn section are all behind Plexiglas. Those performers are on risers upstage, along with Zak, so having them behind the barriers keeps them from killing the guys downstage." The Plexiglas barriers were open on the side so the upstage bandmembers could hear each other, and the players downstage relied on the monitors.

"One unusual thing about this tour is that it's the first time I've ever mixed by a script, at least since school," says Sotile. "For most shows, we get a cue sheet that has instructions for different songs like 'So and So needs this guitar or that guitar up at this point,' but this show just has a ton of cues. The script really helps keep it straight, which is important with the narration on laserdisc, 22 mixes, and 17 people onstage."

The script is entitled "*Quadrophe-nia: A Musical Play for Arenas*." I couldn't pen a more apt description. ■

Mary Cosola is the managing editor of Mix's sister publication, Electronic Musician, and a devout Who-head.

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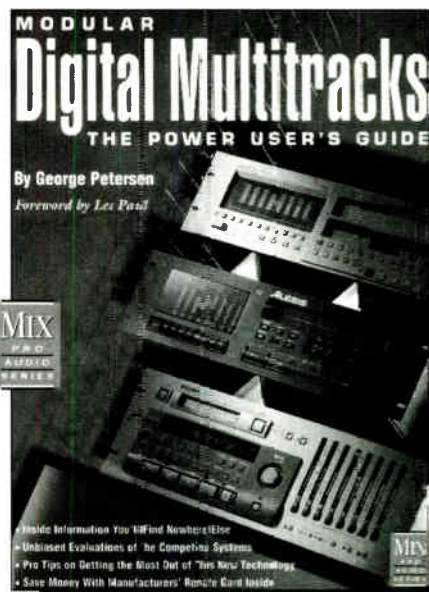
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## TURN IT UP TO ELEVEN!

As noted above, today's monitor systems are more powerful than a previous generation of FOH systems. Paradoxically, these advances can present new problems. Whereas monitor systems once used to merely supplement the performers' onstage balance (or lack of it), today it is common for the monitor engineer to be required to create a complete sound environment for each player. As Mike Brady describes it, "What you try to do is create little micro environments for each musician that give the space that they're looking for. Often you end up going too far in augmenting that space, and it just gets louder and louder." Brady says the tendency toward louder stage volume is most noticeable among newer bands. "It's sad to see that happen because I think that the house mix and the audience ultimately suffer from that," he says. "The louder it gets onstage, the less of a chance you have to make it good in the audience. Yeah, you need to have some volume on stage, you need to feel it and get in touch with the music, but at some point you reach diminishing returns. With the power that's available today it's really easy to get to that point very quickly."

Bill Head describes a recent monitor gig with "the loudest band I've ever done. Your teeth rattle and you almost feel sick; it's that loud." Head's challenge was to create a vocal and harp monitor mix, complete with heavy reverb, in competition with 124 dB guitar amps. "The tricky thing with wedge monitors is getting super wet effects [in the mix]," say Head. "If it's loud it's hard for them to hear, especially reverb." But loudness and rock music seem inseparable. Sam Parker notes that, whether the gig is a club, theater, arena, or shed, "most drummers want the kick drum to move their pants leg." And Paul Owen admits of his 80 kilowatt Metallica rig, "It's quite horrendous, you know."

On a more hopeful note, Bill Head says that he's noticed that some older bands are tending toward more sensible onstage SPLs. "It's not because of their age, not because they've played a million gigs," he says. "I think it's because they've had much more time in the studio and they hear the sounds they're getting at a lower volume and they're more aware." Of course, an artist who is more familiar with the studio than the stage may have unrealistic expectations. Mike Prowda recalls a female artist who "hadn't toured in so

long that her realm of reality was from 13 years ago, or from spending time in the studio in front of a really smooth tube microphone with a pair of cans on. She just wanted it to sound like she was in a studio, and to get her to feel comfortable took some communication and creative mic selection."

### MIXING FOR AN AUDIENCE OF ONE

Many of those interviewed had spent a significant portion of their careers as FOH mixers, and quite a few started monitor mixing in a crisis situation. For Monty Carlo, it was a case of being "in the wrong place at the right time. I had to fill in for the normal monitor engineer on the Springsteen tour. I had an idea of what the show was, so they threw me in." Sam Parker had been "a man called crew" for Vince Gill, but also worked as Emmylou Harris' FOH mixer for about three or four months a year. One year, Gill's popularity blossomed during those three months. "When I came back the FOH slot had been filled," says Parker, "and the monitor position was open."

But however they got there, none of the interviewees expressed any dissatisfaction with the monitor mix gig. "Given the choice, I'll never ever go back to FOH again," says Fred Jackson. "I have only ten people to please every night consistently whereas the FOH engineer has got to please anywhere from 3,000 to 40,000 people, each with a different opinion and each sitting in a different environment. Plus you have family members, record execs over your shoulder, everyone with an opinion on how it should be mixed."

Several interviewees expressed the view that, despite the increasing complexity of the technology, there really are no hard and fast rules as to how it should be applied. "The bottom line is: Does the mix sound good to the artist or not?" says Don Dome. "You have to be able to know what he wants and

A lot of the time you have to mix by the seat of your pants and just make something happen. It's definitely a strange science.

what he doesn't want and how to get the sound. A lot of the time you have to do it by the seat of your pants and just make something happen." As Fred Jackson says, "It's definitely a strange science."

"Gear is not as important as making a mix," adds Mike Prowda. "How much difference is there really between say a 166 or a 160x and a 241? You know what I mean? I'm more into the romance with mixing." Sam Parker agrees. "I'm a less-is-more kind of guy," he says. "I don't have a huge rack, I don't use any compression, gates, anything in the monitors. Good speakers and good amplifiers are what has made it better for me."

The interviewees all agreed that, however technically complex the job might be, much of the challenge of monitor mixing is political. "You're the person in the hot seat—you're the first to know if there's something wrong on stage," says Don Dome. "I would say that 80 percent of being a good monitor engineer is knowing how to deal with the artist and talk to them properly. They may be pissed off about something, but you can't fire an attitude back at them—it's the easiest way to get fired."

"I think that an honest open relationship with the artist and band is key," says Sam Parker. "I think you can be less technical and more personal and be just as good a monitor engineer. They can look over there and see that face and they know that that guy over there is doing the best he can do. That appeases them sometimes when it's not exactly perfect, because it's not perfect every night, by any means." ■

*Thanks to Sara Elliott (A-1 Audio), Bruce Judd (dB Sound), Ted Leamy (Electrotec Productions), Albert Leccese (Audio Analysts), Robin Magruder (Shouco), Spy Matthews (Delicate Productions), and Ronnie Smith (Maryland Sound) for their help in finding willing interviewees.*

—FROM PAGE 150, BAG END GEM SERIES

ELF is an acronym for Extended Low Frequencies. The principle behind the ELF technology is both simple and elegant. The ELF transducers are not the kind of 18s that would be installed into a ported cabinet, but a low-compliance woofer designed for a sealed cabinet. As the cabinet is not tuned to a specific low frequency using a port, the woofers can be relatively small. Such a sealed speaker, by itself, exhibits a falling response at lower frequencies. Make no mistake—the ELF technology requires special speakers and an ELF Integrator to work.

The other half of the ELF system is the processor, or Integrator, that has a response that increases inversely with frequency at 12 dB per octave, providing the complement to the response of the sealed-chamber woofers below their resonance. At higher frequencies, the falling response of the integrator attenuates the woofer. This approach provides very low frequency response without the larger frequency-dependent delay inherent in traditional lowpass crossover filters. An ELF cabinet also presents the amplifier with a load that it's happier driving, as the transducer's resonant frequency is nearly out of the operating band. I won't go into all the details, as they are available in a Bag End technical paper on the subject. Suffice it to say that ELF subwoofers sound tight and musical in a way that's just not possible with traditional ported bass reflex subs. Sound Image of Southern California incorporated ELF technology into its five-way touring P.A. several years ago, and the first time I heard live music on the system I marveled at the in-your-face clarity and detail in the low end of the bass guitar and kick drum.

#### ENTER THE INTEGRATOR

There are three versions of the ELF Integrator processor, which connects into an audio system in the same place an active two-way electronic subwoofer crossover would. The ELF-1 (\$2,460 list) is a full-featured model with 45 DIP switches (behind a security panel) for individual channel adjustment. The switches permit precise adjustment to tailor the response of ELF enclosures and match them to any full-range speaker system. All you can see after the steel security panel is in place is three pairs of large LEDs that indicate signal presence and thresholds for low and high frequency protection for each

channel. Because of its daunting control surface, the ELF-1 is best used with the same speaker system on a regular basis, whether touring or installed.

The ELF-M (\$895) is a much simpler version that runs on 11 to 18 VDC that can be supplied by the provided wall wart or from other DC sources for creative applications (e.g. custom car audio systems). The ELF-M has balanced stereo inputs, and unbalanced outputs for the stereo highpass and mono ELF signal, and is typically installed in the amp rack. The crossover frequency is preset at 130 Hz, but this can be changed by doing some math and swapping several internal resistors on plug-in sockets. The ELF-M2 (\$1,095) is identical, with the addition of limiters to the stereo highpass outputs. Though the functionality and packaging of the ELF-1 is impressive, users will find the less expensive processors adequate for all but full-blown professional touring applications and installs.

The compact Quartz quad-18 sub measures 40 inches high and 30 inches deep. It is 30 inches wide at the front, six inches wider than at the back. It weighs 225 pounds, has four casters on the back and, on its wheels, presents two recessed handles on each side. The Quartz has two pairs of sideways-mounted transducers, each in its own sealed enclosure and facing each other into a shared mouth. There is a pair of Neutrik NL4 connectors for each pair of 400-watt, 8-ohm transducers, presenting two 4-ohm, 800-watt loads.

Our review system was generously powered with QSC PowerLight 4.0 amps running nominal 4-ohm loads on all channels, full-range and subs, with plenty of headroom all around, and we could have easily doubled the loads down to 2 ohms, had we wanted.

The output from the single Quartz in our review system was more than enough to keep up with the two Crystal full-range enclosures, and I dare say that a 1-to-2 ratio of these subs will work with any full-range speaker on the market. If you don't need an entire new front end, this radical sub may be the simplest way to upgrade the impact of your mains without replacing everything. Together, the Bag End Gem Series speaker products offer sound vendors the ability to put together a wide variety of system designs from a very simple inventory.

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—FROM PAGE 19, IT COULDA HAPPENED

ers. But damn it, Jim, Windows bites!

To date, the Mac OS is faster, more intuitive, more customizable and superior in a hundred other ways. PowerPC (604e) engines blow the doors off of those malformed Intel toaster-ovens you call Pentiums when it comes to graphics and audio DSP. The Mac's physical architecture is so far superior to the PC architecture that it is truly one of those *Twilight Zone* mysteries that the Mac is losing its struggle to survive.

I get more done in a day on my Mac than most people can do in three days on a monster-fast Pentium. When I want to add hardware, I just throw it on the floor somewhere near my Mac and it runs—no jumpers, no hours of configuring, no conflicts, no trouble. Can you Wintel guys say that?

Now I know that there are powerful things coming, like true application partitioning, but come on! The environment is blatantly hostile compared to the Mac, and the hardware is kluged to the point of absurdity.

But it is done. There is nothing we can do at this time to reverse the slip into the Wintel abyss. Even my company writes for both platforms now. Sad...so very sad.

4) Stephens Multitracks—What's up with this? Why weren't these machines the hottest thing since sliced tape? Let's examine what was so terribly wrong with these things that the industry basically ignored and finally rejected them. Okay. They had no tape-crushing capstan and pinch-roller. Was that the problem? They were unnervingly reliable and stable. Maybe *that* was it. They were shockingly small and portable. Ah, that must have been the problem. Or maybe it was that they were easy to repair. No, it had to be that they sounded great. No, wait! I've got it! The problem was definitely...They were not expensive. That is definitely the crime that terminated the company.

Too bad for everybody. I was as skeptical as the next MCI owner every time I found myself facing a project on a Stephens, but as it turned out, I never had one lunch on me, and I definitely liked the way they sounded. Oh well, chalk this one up to Man's Fear of The Unknown. ■

*SSC is undeniably in the throes of one of his verbose periods.*

## Lost Highway

—FROM PAGE 160

One of the more interesting design elements in the film involves a series of videotapes, delivered mysteriously to Fred Madison (the Bill Pullman character). The series of tapes, with the images and static-like crackles, convey some of the horror and tension as the film builds. Madison plays them back on a

standard television, with very unstandard crackle and sparks.

"John had built this tube preamp," sound effects mixer Marciel says of the root video static sound. "So we took this sound Frank had of the cord being pulled out of an amplifier and basically overloaded the input stage of the tube, creating tube distortion out of tube distortion in the process. That makes it a little more earthy and takes the edge out, but still makes it cut through. It's

## A New Way of Working

The whole industry has been waiting patiently for digital dubbers as a means to make changes and conforms much easier on the mixing stage in this age of shortened post-production schedules and constant picture changes. For Ross, they arrived years ago.

"Think of our workstations as intelligent digital dubbers, if you like," Ross says. "They are digital dubbers in that they are running to the picture in sync and playing back the sounds. The difference is that I can *see* the sound. I can interact with the sound. What's the difference? It's a hard disk device that plays back sound digitally.

"I understand that some mixers like to mix in reverse—set automation and make EQ decisions as the film is in rewind," he continues. "But you don't need the rewind. I can hear a piece of dialog far better running forward. If I want to get rid of clicks and pops, work around a piece of dialog or interact with my props, it's easier to do that in a manner that they were designed to work, which is forward. If I want to match a piece of ADR with production, I highlight a start point, highlight an end point, and just put the workstation on a loop in front of me and EQ it as much as I want. I don't have to see the picture—sometimes I can actually get a clearer sense of what it sounds like without picture. Obviously, I then play it against picture to make sure it's a wonderful thing, but I think the conventional philosophy was that if the picture rolls, you have sound; if the picture is not rolling, you don't have sound. There's no reason for it to be that way. Ulti-

mately, it all rolls as a single entity, but I think you can do far more productive work without having the burden of dragging this 35mm piece wherever you go.

"The trick to this whole operation is that the projector is actually slaved to a ¾-inch videotape, which is the master for everything. So there's a Lynx device that locks up the projector. I have local [video] monitors at my mixing positions and also in various places within the room, so that we can see timecode, we can see feet and frames, we can see those relationships. So if we need to have a particular hit of music occur at a certain cut, I can scrub it backward and forward using the DAWN driving the ¾-inch machine via Sony 9-pin control. When I park to a particular area and snap the sound at that location and go back and hit Play, the projector comes online and locks up very quickly.

"And on the big screen, we see 35mm film, we hear the full mix, but the projector is not driving it. The projector is a back-base device that is fairly dumb: It can count pulses one way or count pulses another way; it doesn't have any more smarts than that. Dealing with timecode, it's a lot more flexible [to work in video], and that's why we made the projector the slave. But, you have to have a good projector. We have a Sondor machine, which is an excellent device. We go from the beginning of a 2,000-foot reel, play it back then go back to the head to do fixes. By the time we sit and discuss the few changes in the reel, we're ready to go." ■



not like pink noise, and it could very easily get that way. At some point, when you run out of volume, you start going for EQ to make things come up, but that sound is right in the range where it can be painful, so the tube really helps to lighten that up a bit."

That distorted tube sound was then miked in an open room to add grit and drone, then processed through an H3000 for a wider and thicker feel. Then, as the camera moves in on the television and the electro-static becomes more pressing, Gaeta added some reversed metal doors. "That was a David thing," Gaeta says. "One of the first things he told me was, 'Frank, I like things pitched down, I like them reversed, I like reverb.' His whole concept was that he wanted [this static] to be harsh, very steel-like and metallic, grinding. And he's always looking for sounds that cut through."

There are two huge effects moments—the transformation scenes—where Lynch wanted it pedal-to-the-metal, Gaeta says. "We have already started introducing the sounds that are going into Fred's transformation, in which we sort of follow the character along in the film," he adds. "The basic notion was that there is going to be a lot of motion, a lot of static and a lot of turbulence. It's not your typical Hollywood morph special effects. It's done very cool through the way they shot it, on good old film."

"I got a lot of inspiration for the sounds from some of the drones and tracks that David played me of what Trent Reznor was doing," he continues. "Basically, I came back to process things, and they were sounding too sweet. So I took some screams, put 'em through reverb and let 'em repeat—loop and loop, over and over—so that it would build as constant acceleration. Then I put a microphone in the middle of my room, in front of the speakers, to get the feel. I recorded that sound, and it will play somewhere in the scene. It's rough and full and gritty and as ugly as anything we've heard."

#### LIVE AT THE MIX

The film sound industry has a reputation for accepting new technologies slowly. Workstations have made their way onto mixing stages, and DA-88s have become *de rigueur*, but each facility seems to be working out its own transitional hybrid methods of working, often with an integration of the best of mag and the best of disk. At DS&P, though they can work on film, the transition to completely

sprocketless, tapeless post was made about six years ago with the purchase of the DAWN systems, which also act as player/re-recorders.

"There is no sound effects prelay or anything along those lines to send to a multitrack format, whether it be DA-88, 24-track or mag," Ross explains. "It all runs directly from the DAWN and Pro Tools [with SampleCell RAM cards] workstations. We can work in the conventional manner, as in hanging everything on the screens and just mix. But often our clients, and David in particular, want to make changes—they want to interact with the audio environment. David sees things and makes calls based on his gut reactions at the time. It's difficult to pre-dub in that sort of situation, so we keep everything pretty much hanging live here, except for Foley. That's the only thing we pre-dubbed, just because it requires a fair amount of finessing, and I prefer to put that time in up front."

"Everything we have here, for a particular show and in our libraries, is published on a LAN [local area network]," he continues. "So all our editors can make sure that whenever we come into the main character's front door, it's always this group of sounds that is used, and if we make changes on the stage, where we want to add or subtract elements, we have access to those same databases. So we hang all the units directly from the computers, mix through the Euphonix under automation, and go down to six stems on DA-88."

"The flip side of mixing a show in this manner is that the dialog tracks have to come to me pretty smooth, so as a result, the editors are making some decisions that may have been made by a mixer in the past. But I can always undo those decisions. It's not as if they've mixed something and given it to me on tape. Same thing with sound effects. Our editors are set up with surrounds, so they can actually do a fair amount of panning, movement and the like under controllers—not actually as part of the sound but as automation controllers."

There was no standard pre-mix on this particular show, though there was a temp mix, sort of a "fleshing out" period, a few weeks before they went into the 25-day final. And the nice thing was that the moments they liked in the temp were used from then on, perhaps augmented and updated, but pretty much intact. This is not by any means a new standard for the way audio post works in film, nor is it recommended

for those who don't enjoy the challenge of pulling a soundtrack together all at once. It works for David Lynch, and it works at Digital Sound & Picture.

"David wants to hear every element, and you can't do that when you pre-mix traditionally, with BG, Foley and dialog mixes," Marcil says. "We have to keep everything separate. You can see that David has these tracks in his head all the time. He can say to you articulately what he wants, and when he hears it, that's it. Don't touch it. Accidents happen, and as you see, they stay because they work. He has an amazing attention to detail and knows every little click and pop. He'll say, 'The third pop should come down a little bit, with the fifth one as we move in on her face.' Very few directors seem to have the focus in that amount of detail."

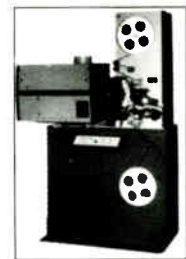
"The one thing I've learned from working with David is that there are lots of ways to solve a problem," Ross concludes. "There are ways to look at a problem area and find various solutions. He's definitely not a 'See a dog, hear a dog' kind of guy. He's more, 'See a dog and possibly imagine what the dog is thinking.'" ■

*Tom Kenny is a Mix associate editor.*



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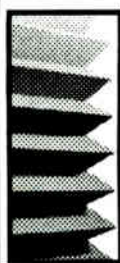
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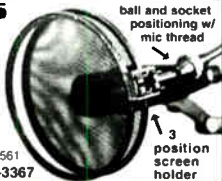
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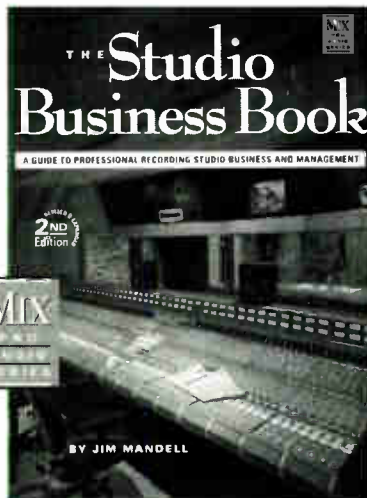
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# FEEDBACK

## GET ON THE GOOD FOOT!

I read "Recording Horns" by Rick Clark in the October '96 issue with much interest. In my 25 years as a recording engineer, I have spent much time recording horns. As James Brown's engineer from 1971-1976, I recorded 15 albums with the famous JB horns. I have also had the opportunity to work with New York's top session players, as well as on numerous Latin albums with large horn sections.

Here's how I recorded James Brown's horns in the studio. When Brown was recording with his road band, the JB's (as opposed to session players), we would usually work live in the studio, recording the rhythm section, horns and vocals at the same time. I would set up the rhythm section on one wall of the studio, with the horns set in a semi-circle with the mics off axis to the rhythm section and Brown's vocal. Since leakage was a factor, I would use dynamic mics, which offered a tighter pickup pattern than condensers. Typically, I would use RE20s on the saxes, a 421 on the trumpet and a 441 on the trombone. When they would use two trumpets, I would have them play into the same mic. The Sennheisers on the brass were bright and helped keep any low-frequency room leakage to a minimum.

On 8-track sessions, I would record the horns on two tracks, brass and reeds. On 6-track sessions, I would put them each on their own tracks. I would use a slight amount of compression on the trombone and trumpet (LA3A) just to control any peaks. The horn section would be seated for the recordings but often Brown would call Fred Wesley or Maceo Parker over to his vocal mic to take a solo. This could get tricky, as I usually recorded the vocal with a Neumann U87 and an 1176 compressor set to control the peaks on Brown's dynamic voice. The mic was set up on a large boom stand slightly above Brown's mouth level. This made the mic a little too high for the sax solos, so Maceo would hold his horn up higher, but the trombone was right at the mic level and sometimes caused the diaphragm of the U87 to overload slightly.

It was a sacrifice I had to make at times to capture the spontaneous way Brown liked to record.

You can learn a lot about mic placement when you work with experienced session players. I was always glad to try any placement that a player might suggest if I wasn't getting the sound I wanted. As with any recording, the better the quality of the sound source, the easier your job of capturing it becomes.

*Bob Both  
Tuvain Recording  
West Milford, N.J.*

## DAW CLARIFICATIONS

This is regarding the article on multi-channel workstations [Sept. '96]. Given the large, fast-changing and often confusing range of options available in the DAW market, anything that demystifies the differences between the systems must be helpful. However, you seem to have been supplied with some inaccurate data regarding Solid State Logic system specifications, etc. We would like to correct some of the key points and point out other considerations that may be helpful to those selecting a DAW. [The following corresponds loosely to the chart categories in the article—eds.]

1. Analog In/Out: Axiom can process up to 96 input channels and 80 output channels selected from over 2,000 potential sources/destinations, using the integrated HubRouter. These inputs/outputs can be a mixture of analog or digital, as required. OmniMix has 38 fully featured input channels and a further 48 channels that can be used as Reverb/Delay/FX channels or additional input channels. There are also up to 46 outputs available. Scenaria similarly has 38 fully featured input channels with ten outputs. ScreenSound is 8 In/8 Out.

2. Digital I/O: Capacity is similar to analog I/O. We can also handle SDIF-2 on Scenaria, OmniMix and Axiom.

3. Other Sync Protocols: All SSL digital systems have multiple 9-pin serial control ports.

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It is difficult to interpret "Internal Processing," as it seems that the figures stated mostly refer only to the audio word length. Internal processing, of course, will vary through systems, depending on the task. EQ, for example, typically requires in excess of 24 bits to obtain high-quality processing. Much higher bit resolutions or floating point solutions are necessary to manage large amounts of data at the mix bus. A combination of processing "power" and software techniques applied to these tasks are critical to the real performance of the systems concerned. It is not sufficient to merely look at bit resolution. The acid test is with your ears. Testing the system by driving it hard usually indicates what might become problematic in a practical environment. Undo levels are similarly task-specific and should vary according to the job.

There are a couple of other issues regarding Proprietary/Nonproprietary choice and the Integrated/Modular approach selection that your readers may wish to consider. It is essential that someone investing in a DAW checks with the hardware and software suppliers to see that the relationship and understanding between all parties is stable and cooperative. You may be stuck with an old version of hardware/software that cannot be upgraded because of limits imposed by available hardware or a breakdown in cooperation between the companies. Modular/nonproprietary options sometimes offer some lower-priced systems compared with proprietary/integrated systems, but the latter tend to avoid the potential problems described. They also offer a one-stop shop for operational/technical support, thus avoiding the possibility that suppliers of individual elements of a system argue over who should deal with a problem while the customers' work and credibility suffer. I hope this is useful.

*Alan Martin MacLeod  
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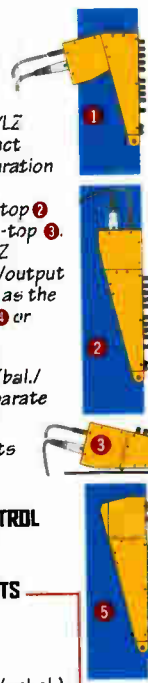
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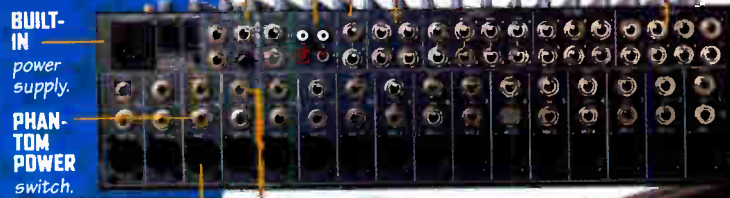
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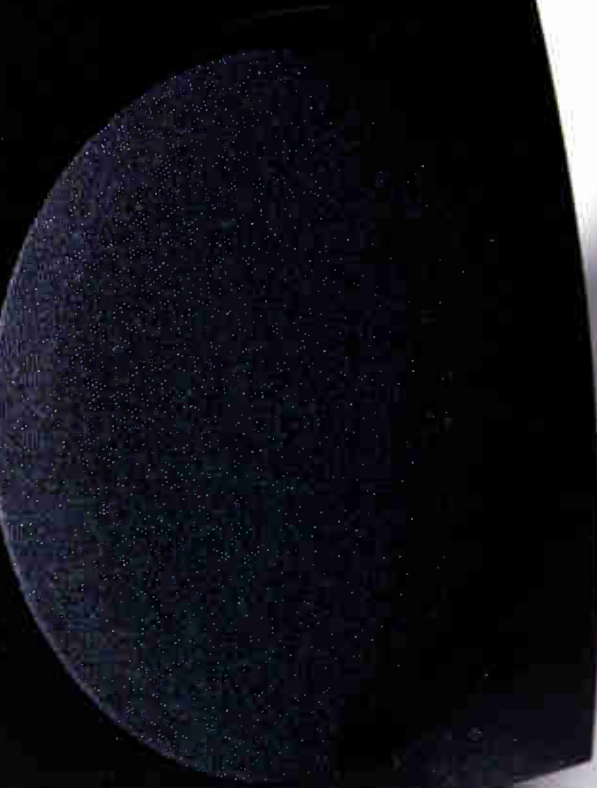
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## The Best System Starts with the Best Parts.

JBL has more experience in designing and building transducers for professional studio monitors than any other company in the industry. We not only use the latest engineering and design equipment, but also the most important test device of all, the human ear. We believe in physics, not fads, so while other companies pick parts off somebody else's shelf, we create our components from scratch. And by utilizing more than 50 years of experience in transducer design, we create the perfect transducer for each system.

## Multi-Radial Design - An Ideal Solution to a Complex Problem.



Combining individual transducers into a system is a delicate balance of acoustics, electronics and architecture. Our exclusive Multi-Radial baffle is contoured to bring the drivers into perfect alignment, so the high and low frequencies reach your ears simultaneously. This reduces time smear for a smooth transition between the low and high frequency drivers. In addition, the gently rounded edges of the 6208 provide controlled dispersion and balanced power response. That means even off-axis, you will hear an accurate representation with wide stereo separation and an immense depth of field.

## Gold/Titanium Hybrid Dome.



By mating the materials to a large magnetic structure, the 6208 can produce extremely flat frequency response and low distortion for hours of fatigue-free listening. JBL pioneered the use of the light but rigid gold/titanium hybrid construction to provide a transient response that is quick and precise for pinpoint accuracy.

## Shielded Drivers for Flexible Placement.

JBL shields all of the drivers so you can place the 6208 right next to your audio workstations without interaction. Gone are the days of compromised monitor placement in your production environment.

## Why Bi-Amplification?

It's a simple fact, a separate amp for each speaker produces the most accurate sound. Each of the 6208's two amplifiers is designed to reproduce the assigned frequencies. And by combining the amplifiers inside the cabinet, you improve the amplifier's ability to control the speaker it's driving for controlled low end punch.

“ We played just about every type of instrument through these speakers and they reproduced it with flying colors.”

- Bobby Owsinski  
EQ Magazine

## Active Crossovers Provide Accurate Response Tailoring.

By carefully tailoring each amplifier's performance to the response characteristics of the drivers, you get the most faithful reproduction possible. By using active crossovers, power is not robbed by passive components like inductors and resistors. The result is clear, accurate sound at the highest levels.

The passive 420 Series provides accurate, natural and powerful value for about \$500 per pair.



TEC AWARD WINNER



Technical Excellence & Creativity

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**JBL**

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